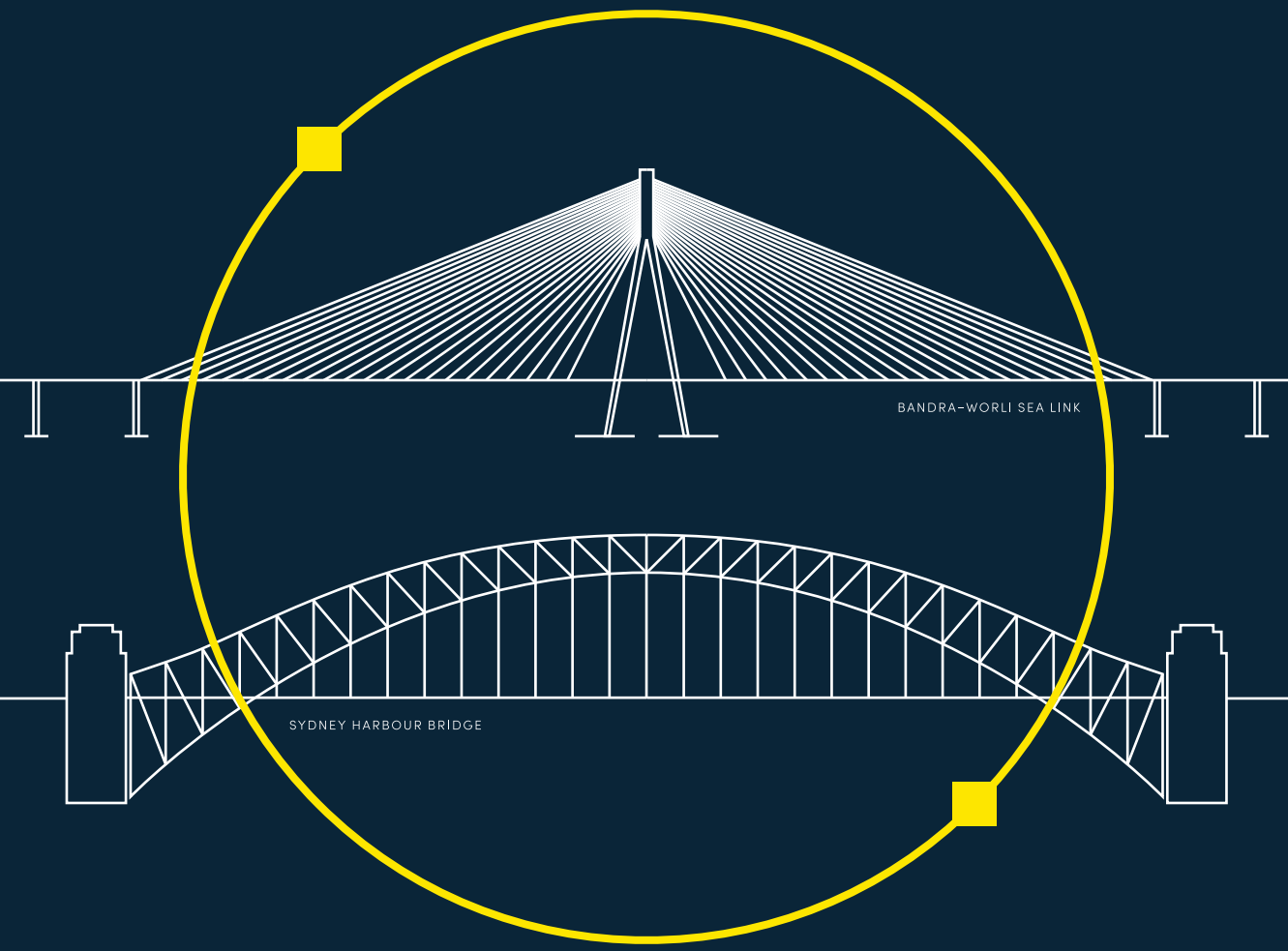
AN INDIA ECONOMIC STRATEGY TO 2035

NAVIGATING FROM POTENTIAL TO DELIVERY



A report to the Australian Government
by Mr Peter N Varghese AO

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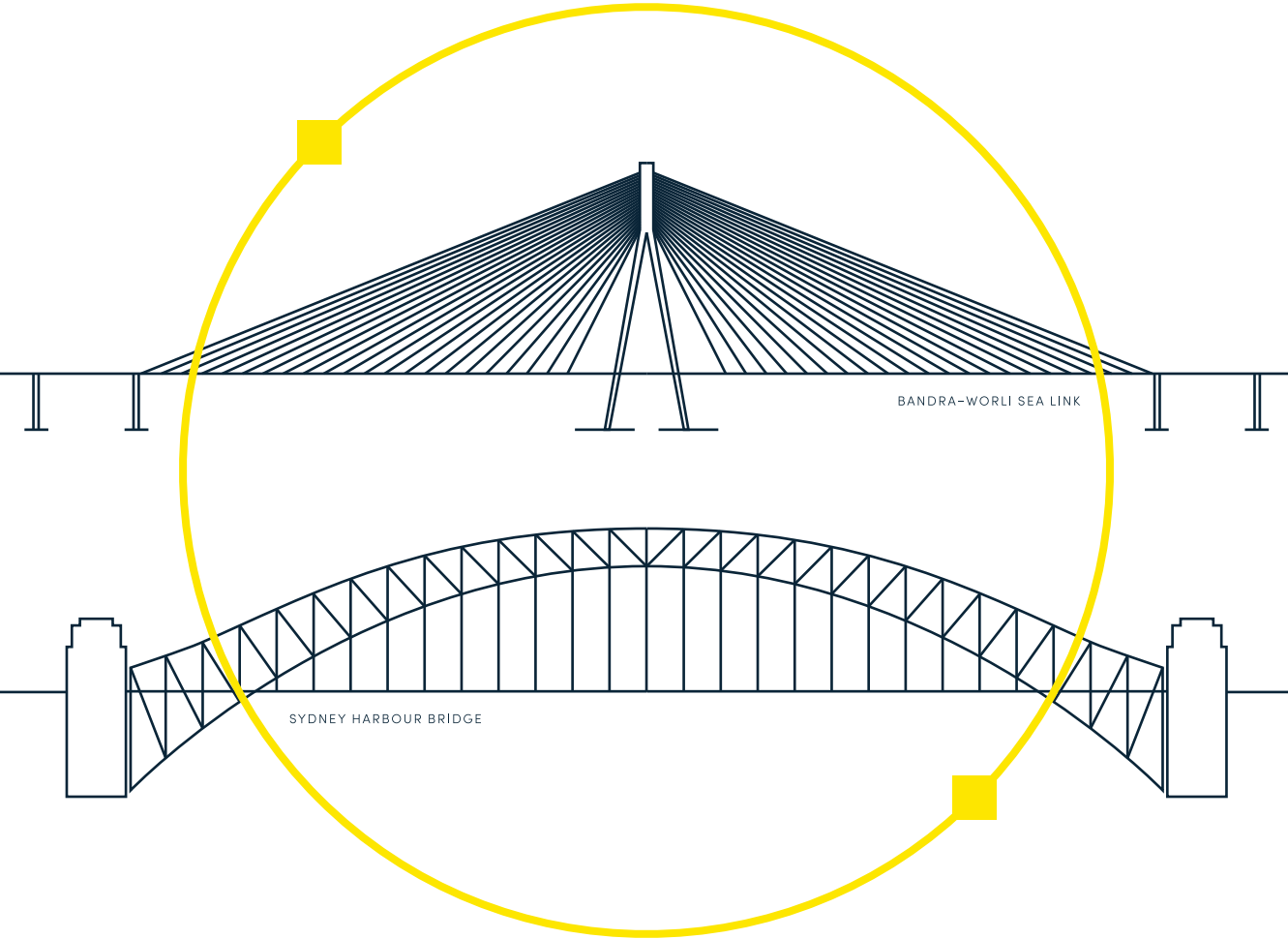

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http://indiaeconomicstrategy.dfat.gov.au

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THE UNIVERSITY OF QUEENSLAND
AUSTRALIA

Chancellor
Mr Peter N Varghese AO
BA(Hons), Hon DLitt Qld

27 April 2018

The Hon Malcolm Turnbull MP
Prime Minister

The Hon Steven Ciobo MP
Minister for Trade, Investment and Tourism

India Economic Strategy
Letter of Transmission

Dear Prime Minister and Minister

On 4 May 2017 you asked me to lead the development of an independent report to the Australian Government on an India Economic Strategy.

I have the honour formally to submit to you my report: *An India Economic Strategy to 2035. Navigating from potential to delivery.*

In commissioning the strategy you sought a report which would help transform Australia's relationship with India, elevate our understanding of India's trajectory out to 2035 and take our economic partnership to a new level.

India is already the world's fastest growing large economy and the third largest contributor to global growth. Over the next twenty years it will need many of the goods and services which Australia is well positioned to supply. But over that time India will also become a much more crowded and competitive marketplace. Australia must prepare for that through a strategic investment in the relationship and a long term and ambitious strategy led at the highest levels of government.

There is no market over the next twenty years which offers more growth opportunities for Australian business than India. Getting our India strategy right will both enhance the prosperity and security of Australians and help realise the aspirations of the 1.3 billion Indians who sense their time has come and a better life is within their grasp.

Yours sincerely

Mr Peter N Varghese AO
Chancellor

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The membership of these two reference groups is listed at Appendix 2. They are people of deep experience who provided insightful comments on the key judgements. Any flaws in the judgements of the report are mine alone.

As we developed the report I had the benefit of advice from a Steering Committee of Commonwealth Agencies which provided expert perspectives on the sectoral papers. I am grateful to them for their wise contributions and for their forbearance as I finalised the recommendations. As an independent report to government, the recommendations are of course mine alone.

The report also draws on an extensive program of consultations in Australia and India and discussions with stakeholders in government, private sector, non-profit organisations and economic analysis provided by McKinsey & Company. To the McKinsey team in Australia and India, led by Tarandeep Ahuja and Sahil Shekhar, I express my thanks for their professionalism and support.

In addition I visited Singapore, Japan, Germany, United Kingdom, United States and Canada to learn about how other countries were approaching India.

Taken together these consultations enabled me to draw out the views and perspectives of a wide range of people from the business community, state governments, industry groups, non-government organisations and the Indian diaspora in Australia.

In all we conducted 232 consultations in Australia and received 20 submissions. A full list of those consulted and those who made submissions is at Appendix 3.

I want to thank the many people in the Department of Foreign Affairs and Trade (DFAT), the team at the Australian High Commission in New Delhi led by High Commissioner Harinder Sidhu, the Consulates-General in Mumbai and Chennai and the Austrade network in India, all of whom made valuable contributions to the report.

Above all I wish to thank the secretariat in DFAT, ably led by Clair McNamara and under the supervision of Paul Myler, which provided such wonderful support from the beginning to the end. I could not have asked for a more hard working or patient team. The membership of the secretariat is listed at Appendix 2.

Introduction

Timing has always been a challenge in Australia's relationship with India.

In the past substance often lagged enthusiasm. Today the risk is that we are not moving fast enough and Australia might fall behind as other countries accord India a higher priority. This is already happening in some areas.

Momentum is important to relationships. We cannot afford to lose momentum or to assume that the logic of complementary interests will be enough to take the economic relationship to the level it needs to rise.

To counter this, Australia needs an ambitious India strategy. This report recommends that we should strive by 2035 to lift India into our top three export markets, to make India the third largest destination in Asia for Australian outward investment, and to bring India into the inner circle of Australia's strategic partnerships, and with people to people ties as close as any in Asia.

Australia has long seen India as an important country in its own right and one with which Australia should have a relationship of substance anchored in shared interests and shared values. But finding that alignment has proven difficult over time.

Australia has never been in the first rank of India's international priorities. India's focus has understandably been on its neighbourhood and after that on the major powers.

Outside of areas such as resources, education, mining and, in a different sense, sport India does not naturally look to Australia as a first order partner. That perception needs to change if the relationship is to find the traction to take it to the next level.

From when it first became independent in 1947 until relatively recently, India and Australia also saw the world very differently. Our hard interests, strategic and economic, rarely intersected.

India's economy went down the path of self-sufficiency, not global trade. During the Cold War we inhabited different strategic universes. Our communities had little to do with each other.

Today however we are as close as we have ever been to getting the timing right and finding the content to underpin the relationship.

Our thinking on the merits of an open economy is closer. We are building common ground on the geopolitics of the Indo-Pacific. And our communities are getting to know each other better, not least through the rapid increase in the Indian diaspora in Australia, now 700,000 strong.

The Australia India relationship has had false starts in the past but that must not distract us from the opportunities of the future.

This report seeks comprehensively to set out those opportunities. It is the most detailed analysis so far of the complementarities of our two economies over the next two decades. It is designed to give the Australian business community something they can touch and feel; to translate the headline story about India's potential into a road map of where the opportunities lie and how best to pursue them. In short, to move the relationship with India from potential to delivery.

As a report to government I have sought to emphasise the importance of a strategic investment in the relationship with India led at the highest levels of the Australian Government. A strategic investment means a clear signalling of the priority the government attaches to the relationship, a willingness to devote focus and resources to it, and a commitment to work closely with Australian State Governments, Australian business and community groups in delivering an integrated strategy.

STRUCTURE OF THE REPORT

Central to this report are judgements about why India matters to Australia. India is the fastest growing large economy in the world. It will have the world's largest population well before 2035. Beyond scale and complementary economies, India also offers us an opportunity to spread our trade and investment risk in Asia.

In the Overview chapter I have summarised the core of the strategy the report recommends ('sectors and states'), how things in India are changing for the better, the challenges that remain and the importance of locating our economic strategy within a broader relationship with India, of which a growing geopolitical congruence and people to people ties are the other two pillars.

The report contains detailed chapters on each of the 10 sectors identified as areas where Australia has a measure of competitive advantage.

The chapter on Indian states is designed to answer the question: where should Australia focus and where do you start in a market as large and diverse as India?

Throughout the report I have sought to provide a balanced perspective of both the challenges and opportunities in the Indian marketplace. The scale of India and the rhetorical flair of its leaders can at times gloss over the challenges on the ground or the way in which India can test the patience of even the most committed. I have sought to put the challenges in perspective and to acknowledge the significant changes and reforms which are taking place, concluding that the balance sheet overwhelmingly favours opportunities over constraints.

Indian policy makers know what needs to be done. They do not need tutorials on the policy options. But they also know that managing a country as big and diverse as India with a robust democracy and a vocal media will inevitably mean compromises, delays and less than ideal policy approaches. In this India is not unique.

RECOMMENDATIONS

The report contains 90 recommendations. They are summarised and prioritised within the Prioritising Recommendations section and each sectoral chapter contains detailed recommendations relevant to that sector.

The recommendations span the short, medium and long term. Not all the recommendations can be implemented straight away and some will have to wait until more resources are available. But taken together they form a body of practical steps, some to be taken now and others to which governments and business can return at the appropriate time.

Ultimately a strategy is only as good as the commitment which backs it and the resources and priorities which drive it. Taking the relationship with India to the level it deserves is a long haul journey. It will take leadership, time, effort and consistent focus.

No strategy goes exactly to plan. All strategies have to be nimble enough to adapt to the unforeseen. But the logic of a strategic investment by Australia in the relationship with India is compelling.

Overview

WHY INDIA AND WHY NOW?

Australian business has long put India in the 'too hard' basket. There are three overriding reasons why this must change: scale, complementary economies and spreading risk.

For Australian companies with a global focus the key question is whether they can afford not to be in what is the fastest growing large economy in the world.

India's scale is extraordinary. By 2025, one-fifth of the world's working age population will be Indian. By 2030 there will be over 850 million internet users in India. By 2035 India's five largest cities will have economies of comparable size to middle income countries today.

There is no market over the next 20 years which offers more growth opportunities for Australian business than India. The targets set out in this report would see Australian exports to India grow from $14.9 billion in 2017 to around $45 billion measured in today's dollars, and outward Australian investment to India rise from $10.3 billion to over the $100 billion mark, reflecting a transformational expansion of the relationship. That is the size of the opportunity and the key lesson for Australia of India's scale, the momentum which is already built into its growth trajectory and the underlying complementarity between our two economies.

The opportunities however will not fall into our lap. They require a sharper national focus on India by government, an unambiguous commitment by Australian business and a deeper understanding by both government and business of the magnitude of what is unfolding in an Indian market place which will only get more crowded. They will also require an approach to the investment relationship with India that markedly differs from the trajectory of Australian investment in most other Asian markets.

This report has a simple message. The transformation of the Indian economy is underway. Its progress will be uneven but the direction is clear and irreversible. To realise the opportunities this opens up, we need as a country to make a strategic investment in India which is backed up with an ambitious, long term and multidimensional Australian strategy driven at the highest levels of the Australian Government.

Australia should set itself the goal by 2035 to lift India into its top three export markets, to make it the third largest destination in Asia for Australian outward investment, and to bring it into the inner circle of Australia's strategic partnerships and with people to people ties as close as any in Asia.

THE LONG VIEW: PATIENCE, PERSPECTIVE AND PREPARATION

What follows is a deliberately long term perspective about Australia and India: out to 2035.

A strategy with this time horizon has to try and capture not just how India will change over the next 20 years but also shifts in the Australian economy. We are today poised globally at the edge of a revolution in technology. Artificial intelligence, big data, machine learning and other innovations will likely change the nature of work and the productivity of both the Australian and Indian economies. So looking out to 2035 means plotting the points of intersection of two moving parts.

A long view is important for any strategy. For India it is essential. India is a market which requires patience, perspective and preparation. Change in India is often invisible to the naked eye. That is one reason why perceptions of India in the Australian business community are caught in a time warp: largely unaware of the significant positive changes taking place in India and shaped by a 'once bitten twice shy' perspective.

The opening up of the Indian economy is a good example. Australian business still tends to think of the Indian economy as relatively closed. Yet the Indian economy of today is very different to the days of the license raj. And the Indian economy of 2035 will be different again.

India's average applied tariff is today one-tenth what it was in 1990. In 1990, total trade as a proportion of Indian gross domestic product (GDP) was around 13 per cent. Today it is 40 per cent. India's two way foreign direct investment (FDI) to GDP ratio at just under 20 per cent is still low by global averages. But the stock of inward FDI has grown by 19 per cent a year over each of the last 20 years.

None of this is to suggest that doing business in and with India will not have its challenges. India is too complicated for its growth story to be linear. Its economic progress will be uneven and incremental, constrained by the political compromises demanded by a diverse democratic federation, held back by thinly resourced institutions, burdened by a bureaucracy too susceptible to arbitrary interference, dented by endemic corruption and shaped by a political tradition which puts much greater faith in government intervention than the efficiency of markets.

There is no point lamenting these constraints. They are wired into the Indian experience. We need to understand them but also acknowledge that they are changing and look beyond them to grasp the significance of the opportunities created by a growing Indian economy.

INDIA MARCHES TO ITS OWN TUNE – IT IS NOT THE NEXT CHINA

India needs to be understood on its own terms. It will always march to its own tune. It is the only country with the scale to match China but it will not be the next China. Indeed comparisons with China only get in the way of understanding the nature of the opportunities in the Indian market.

No Indian Government will be able to direct the economy in the way China does. Nor will it ever have the control over the allocation of resources which has been intrinsic to China's economic success. China has a discipline to its economic planning which flows from its one party political system and the competence of its state institutions. Also for all its diversity, China has a strong Han Chinese core which has no counterpart in the linguistic and cultural diversity of India.

India's economy will be big but not as big as China's (which is currently five times its size). China's economy would have to crash and India's grow at over 10 per cent a year for several decades for India to catch up. Neither is likely.

Nor will India's economic model mirror that of East Asia's. Its growth will be driven by consumption and services, not exports. It has demographics on its side, a long entrepreneurial tradition, an expanding consumer class, significant headroom for productivity improvements and the confidence that comes from a strong sense of its civilisational pedigree and destiny.

The drivers of Indian growth are deeply structural which suggests they are also sustainable. They include the urbanisation of the world's largest rural population, the gradual movement of the informal economy, currently comprising 90 per cent of India's workers, into the formal economy, a young demographic with a mean age of 27, considerable investment in infrastructure, and the beginnings of an ambitious program to upskill 400 million Indians.

These structural drivers will likely keep India on a relatively strong growth path. I have deliberately taken a moderate view of the rate of growth out to 2035, assuming that it will be in the order of 6–8 per cent each year over the next 20 years. This assumes incremental rather than radical structural reforms. But for what is already the world's fastest growing large economy to grow by 6–8 per cent each year for the next two decades will still be transformative for India itself, its region and its economic partners.

Most of all India has scale. It will by 2035 overtake China as the world's most populous country. This means a deep domestic market which will likely make India the world's third largest economy by 2035 after China and the United States measured by market exchange rates. It is already the third largest economy measured by purchasing power parity.

Scale encourages ambition but it is the structural complementarity between the Indian and Australian economies which is the key to translating ambition into opportunities. Put simply, a growing Indian economy will need more of the things Australia is well placed to provide from education services to resources and energy; from food to health care; from tourist destinations to expertise in water and environmental management. Indeed services are likely to be the fastest growing segment of our future economic relationship with India.

Beyond scale and complementary economies there is a third important reason to bring India into the first tier of our economic relationships: spreading risk.

Exports and attracting foreign investment are key elements in the strength of the Australian economy and our ability to maintain a rising standard of living. In a global economy, it pays to hedge against volatility by diversifying. If we can count India in our top three export destinations and if we can tap more two way investment between our countries, Australia's exposure to global risk is reduced. A strong economic relationship with India strengthens Australia's economic resilience. That is important for a country where 40 per cent of our exports currently go to just two markets with ageing populations. India – a large and young population – adds balance and spreads risk in Australia's economic relationships. A partnership with India in science and innovation can also help drive domestic productivity and create Australian jobs in sectors we are yet to imagine.

A THREE PILLAR STRATEGY: ECONOMICS, GEOPOLITICS AND PEOPLE

The focus of this report is on building a sustainable long term India economic strategy. But an economic strategy works best within a much broader and deeper relationship with India.

Our economic strategy should be seen as one of three pillars on which the bilateral relationship should rest, the other two being geopolitical congruence and people to people ties.

Geopolitical convergence

Our geopolitical congruence flows from three core factors.

First, as partners in the Indo-Pacific we are each grappling with the implications of the fading of US strategic predominance and the sharpening ambition of China to become the predominant power in the region.

Second, both Australia and India support a rules based international order. That order, the product of decades of United States-led investment in global institutions and public goods, is under increasing threat. Its defenders are shrinking and its challengers growing. Since Australia can neither buy nor bully its way in the world, a system based on rules not might is important.

Third, India is a partner in seeking to forge regional institutions in the Indo-Pacific which are inclusive, promote further economic integration and can help at the margins to manage the tensions which inevitably flow as economic growth across the region shifts strategic weight and

relativities. That is why India should be brought into the Asia-Pacific Economic Cooperation (APEC). Moreover, both Australia and India see China as an important part of inclusive regional institutions, especially the East Asia Summit (EAS). And both countries attach a high priority to our relations with the Association of Southeast Asian Nations (ASEAN) and the individual countries of Southeast Asia.

So while India will always march to its own strategic tune and cherish its strategic autonomy, the scope for us to work together on the broader challenges of the Indo-Pacific is growing as is India's willingness to work with the United States, Japan and Australia in ways which capture the growing strategic convergence of these four democracies.

From Australia's perspective it is India's liberal democratic and secular character which provides a foundation for this evolving strategic congruence. Some worry that this defining and tested feature of India is under strain. That seems an exaggerated fear at this time. But anything which materially weakens India's democratic credentials or its commitment to a secular liberal society would not only be a tragedy for India but also call into question the very basis of our strategic partnership.

People to people ties

The third pillar of the relationship – our growing people to people links – may over time prove to be the most significant asset of all.

India is currently our largest source of skilled migrants, our second largest source of international students and a substantial proportion of those who come to Australia under temporary visas to fill skilled positions that Australians cannot.

In the last decade we have seen a very large increase in the size of the Indian diaspora in Australia, now 700,000 strong and the fastest growing large diaspora in Australia. To reach this size in a little over a decade is remarkable.

This diaspora will have a big role to play in the partnership of the future. They can go into the nooks and crannies of a relationship where governments cannot. They can shape perceptions in a way governments cannot. And they create personal links, in business, the arts, education, and civil society which can help anchor the relationship.

Chapter 18 provides a detailed analysis of the Indian diaspora in Australia and its potential role in building the business relationship with India. It points to the likely growing political influence of the Indian diaspora, something which is already evident in state politics. As they have in Canada, the Indian diaspora may prove over the next two decades to be the most politically active of any migrant group in Australian history since the Irish. This will have implications for the priority our political leaders will place on the relationship with India.

TEN SECTORS AND TEN STATES: THE CORE OF THE STRATEGY

Economics, geopolitics and people form the three core pillars of the relationship we must build with India. But Australian business needs something beyond this macro framework; a mapping of the terrain of opportunity; an entry point into how best to think about the Indian market; how to make sense of its size and diversity and where to begin.

The core of the economic strategy set out in this report is 'sectors and states'.

Sectors

This report identifies 10 sectors in an evolving Indian market where Australia has competitive advantages. These in turn are divided into a flagship sector (education), three lead sectors (agribusiness, resources and tourism) and six promising sectors (energy, health, financial services, infrastructure, sport, science and innovation). I have not included defence and security among the priority sectors but, in

light of the government's broader priority on defence exports I have included a chapter on the opportunities in this area.

Identifying sectors is not choosing winners: only pointing to the areas which hold promise for Australian trade and investment in a growing market where there will be large gaps between what India needs and what it can provide from domestic resources.

The sectoral analysis is forward looking but it cannot escape extrapolations from the current situation. I recognise at the outset that the future may in some areas be quite different to extrapolations. Indeed over a 20 year period there may well be opportunities which no one can clearly see today.

Education is identified as the flagship sector of the future because of a combination of Australian expertise, the scale of India's education deficit and the way in which an education and training demand weaves its way through virtually every sector of the Indian economy.

Education is so much more than increasing the number of Indian students coming to Australia. It also signals engagement, collaboration, a responsiveness to the priorities of India and a bridge between our two communities. Australia's education relationship with India needs to focus on a message of quality, on postgraduate and research collaboration, on science and innovation, on forging partnerships to deliver cost effective vocational education in India and partnering with India in the digital delivery of education. The last will be crucial if India is to meet its ambitious target of upskilling 400 million Indians.

The three lead sectors are chosen because they are areas where Australia is well positioned to become a top five partner of India. The six promising sectors represent areas where Australia can position itself as a niche provider in a large market.

In the chapters that follow we delve deeply into each of these 10 sectors: providing an analysis of its trajectory out to 2035, the drivers of growth including which Indian states to focus on, the constraints, and the opportunities for Australian exports and two way investment in the short, medium and long term.

States

The focus on states reflects a number of judgements. First, India is best seen not as a single economy but as an aggregation of very different state economies, each growing at different rates, driven by different strengths, led in different ways and likely to continue to be uneven in their progress.

Second, competitive federalism is becoming a larger part of the underlying dynamic of the Indian economy. It is encouraged by the centre and is being enthusiastically embraced by the states, especially those five states which produce 70 per cent of India's exports.

Third, many of the hardest structural reforms holding back the Indian economy, such as land access and labour market regulation, are more likely to be progressed by state governments rather than centrally.

Fourth, as barriers to trade across state borders reduce, and the introduction in 2017 of a Goods and Services Tax (GST) was the single biggest step in this direction, labour and capital will gravitate towards those states which offer the best conditions and prospects for business.

The Central Government will always be important for doing business in India. It sets the macroeconomic policy framework, especially in terms of foreign investment policy. Constitutionally powers are both divided and shared between the centre and the states. But the centre has a reach which often goes well beyond the black letter of the constitution.

However it is states which practically control many of the things which make the day to day life of a foreign business in India easy or difficult: access to land, regulation of labour, provision of infrastructure, the application and interpretation of regulation and so on.

For all these reasons, the strategy recommends that a focus on sectors be matched with a focus on states. Ten states are selected: Maharashtra, Gujarat, Karnataka, Tamil Nadu, Andhra Pradesh, Telangana, West Bengal, Punjab, the National Capital Region of Delhi and Uttar Pradesh. Other states may also present opportunities but the weight of effort should be in these 10 states.

The choice of states reflects a combination of their economic heft, their commitment to reform, their relevance to the sectors where Australia has competitive advantages, the ease of doing business there, their investment in the social and physical infrastructure which drives growth and their economic potential in the future.

A focus on states includes an important role for Australian states, each of which are keen to do more in India and are especially important in promoting Indian investment in Australia.

The intersection of these 10 sectors and 10 states is at the heart of the strategy recommended in this report. It is a strategy designed to play to Australia's economic strengths, make planning for entry into the Indian market more manageable, respond to India's priorities, identify where the future growth is, and plug into the benefits of competitive federalism in India.

INVESTMENT

Chapter 2: The Investment Story looks at the broader investment outlook in India. Each of the sectoral chapters also includes a section on the two way investment opportunities and how trade and investment can reinforce each other.

Today, the Australia India investment relationship is small. Yet we are both countries dependent on foreign investment to lift our growth and standard of living.

In virtually all of Australia's relationships in Asia, direct investment lags trade by a wide margin. India holds out the prospect of being different. It has a relatively open foreign investment regime, more open than its approach to trade. It has the rule of law although long delays (it takes an average of four years for courts to resolve a commercial case) considerably erode this advantage. Its institutions are familiar to Australians, both derived from British models, and English is widely spoken – a very significant asset. Automation, artificial intelligence and India's own services sector moving up the value chain means investing in India is no longer about offshoring labour-intensive tasks.

In short, we may have a better chance with India to secure more balance between our trade and investment relationship than we have with any other major Asian economy. Indeed we should set ourselves the ambition by 2035 for India to be the third largest destination in Asia for outward Australian investment.

This is a big target given our low starting point. But attracting foreign investment is a key element in the Indian economic model and over 20 years India's policy framework on foreign investment will become more and more open. India also offers big opportunities in the long term for Australian pension funds and Australian expertise on infrastructure finance is well suited to a country where addressing the infrastructure deficit is essential to economic growth. As the business environment in India improves Australian investors will hopefully pay much closer attention to investment opportunities and the way in which investment and trade come together in the Indian market.

THE ROLE OF GOVERNMENT

In an ideal world an economic strategy would rest on the business to business relationship with a light touch from government. It is business on both sides which should drive the trade and investment relationship. India however is a market where government cannot be left out of the equation. Indeed governments on both sides have an important role to play in bringing a successful economic strategy to fruition.

A number of countries that are currently doing well in India adopt a national strategy which puts government coordination and leadership at

the forefront of their India strategy. Japan and Singapore are two good examples.

At one level an 'Australia Inc' approach to India also makes conceptual sense. The government plays an important role in the Indian economy. Public enterprises still constitute a significant part of India's corporate structure, especially in the banking sector and in resource extraction. The government set policy and regulatory framework is key to many of the sectors which this report identifies as areas of opportunity for Australia in India. Also, the role of market forces is less strong in India's political culture than it is in Australia.

The Australian experience however does not lend itself so easily to an Australia Inc approach. Australian Governments have neither the capacity nor the inclination to direct business much less expend substantial resources to assist Australian companies enter and thrive in the Indian market.

We have to find our own settling point for the role of government in an India economic strategy: one that reflects the Australian system and experience where business is done by companies not governments.

But this does not mean a hands off approach by government. This is a report to the Australian Government with a natural focus on what the government should do. It starts with the premise that the government has an important role to play in facilitating trade and investment with India.

This report identifies six areas where the Australian Government should play an active role.

First, applying sustained high level attention to the bilateral relationship with India led at the highest levels of the Australian Government and including a regular pattern of prime ministerial and ministerial visits. Each of the 10 sectors identified in this report should have a ministerial champion at the federal level, reinforced by the work of the Commonwealth Public Service and Australian state governments.

Second, government has a role in raising awareness of the opportunities in the Indian market. This does not mean boosterism. We need to navigate between the hype that India is the next China and the outdated pessimism that India is just too hard.

Third, government, and particularly agencies such as DFAT and Austrade, have an important role in helping Australian firms understand the complexities of the Indian market place and India's business culture, including how to go about finding the right Indian partner and understanding the broader political economy of India.

Fourth, the government should invest the resources to ensure we have an adequate diplomatic and trade footprint in India. This is particularly important for a strategy that focuses on Indian states and cities. Australia starts in a strong position. We have one of the most extensive networks of diplomatic and especially trade offices in India, now numbering 11 offices. But we need to do more including opening new Consulates-General in Kolkata and Bengaluru.

Fifth, government is the only player that can lead a policy dialogue with India that looks at our respective experiences in policy reforms and regulatory controls. Virtually all of the sectors identified in this report are highly dependent on the right policy and regulatory framework. The economic opportunities in both directions will depend on the economic policy settings of each government. This underlines the need for a deeper policy dialogue between Australia and India which also brings in the private sector to ensure that policy changes reflect commercial realities and priorities and facilitates business engagement. A deeper policy dialogue with India will help us better understand the drivers of Indian economic policy and the role of the state in India's political culture, just as it might help India better understand the limits that government can play in the Australian context.

Sixth, government has a unique role to play in enhancing the understanding of Australia in India. The truth is – that at a community level – neither of us know much about the other. The Indian elite has traditionally not looked to Australia. That is beginning to change, but only slowly. And for the broader Indian community, images of Australia tend to be sketchy, shaped by cricket, historical connections and sporadic coverage in the Indian media.

Similarly, in Australia, there is very little understanding of contemporary India in the wider community. Australians, for the most part, have only a partial glimpse of India's diversity, its sophistication and of the scale of its prospects.

If our partnership is to reach its full potential we must modernise our perceptions of each other. It is in our interests to do away with misconceived notions of what the other stands for.

What we achieve together in coming decades will have little to do with a shared imperial past. It will have not much to do with the English language, although that will greatly help. And it will have to be a tighter bond than anything forged on a cricket field. Rather, it will turn on gaining a real understanding of each other, of where we differ but also what brings us together including shared interests and the strength of our diversity.

THE ROLE OF BUSINESS

Just as government has a large role to play in an enhanced India economic strategy, so also do we need stronger business to business relationships.

The current structures which underpin the business to business relationship are not strong enough to support a larger trade and investment relationship. The Australia-India CEO Forum is a useful vehicle but it needs an agenda beyond its meetings which themselves should be brought into a regular annual cycle.

Similarly the Australia India Business Council (AIBC) needs more clout. It should include the big corporates who do business in India as well as the small and medium enterprise (SME) membership which is its current focus. The AIBC also needs to broaden much further beyond the diaspora community and in the process be less susceptible to the factionalism which too often plagues diaspora groups.

A more active role by the Business Council of Australia (BCA) would be one means of strengthening the business to business relationship. The BCA would make a good secretariat for the CEO Forum, giving it some business heft and aligning it more closely with Australia's business priorities.

There should also be a much closer relationship between the BCA and AIBC and the Indian industry groups such as the Confederation of Indian Industries (CII), the Federation of Indian Chambers of Commerce and Industry (FICCI) and the Association of Chambers of Commerce which play such a key role in promoting India's business links with its major trading partners.

The current business to business architecture struggles to keep up with the existing relationship let alone pave the way for the larger relationship to come. Its leadership is dedicated and eager to do more but it is constrained by limited resources and a volunteer base. This must change and the government should do what it can to facilitate that change.

The strategy outlined in this report goes to how Australia positions itself to build a long term and sustainable partnership with India. It is for the most part a strategy about Australia in India. For the partnership to be complete however there also needs to be a strategy for India in Australia and I hope that is something the Indian Government will consider. A unilateral strategy can only partially succeed. A partnership, on the other hand, rests on that most enduring of foundations: mutual interests.

India is already in the first tier of Australia's diplomatic relations. It has been a high foreign policy priority for at least two decades. But the economic relationship is stuck in the second tier. This report is about how we can change that and place the economic relationship at the centre of our partnership with India.

Prioritising Recommendations

The intersection of 10 sectors and 10 states is at the heart of the strategy recommended in this report. It focuses on aligning Australia's economic strengths, makes planning for entry into the Indian market more manageable, identifies where the future growth is, and works with the grain of competitive federalism in India.

To reach the 2035 targets of India becoming our third largest export market and third largest destination in Asia for Australian outward investment, the strategy outlined in this report has five underlying drivers: grow the Australia India knowledge partnership; make the most of the complementarities between our economies; improve the ability of our markets to operate with each other; develop well-informed understanding of each other; and build relationships which will sustain themselves for the long term.

Within these drivers, the strategy identifies 90 specific recommendations. This report proposes many be implemented now, but recognises that some will have to wait until more resources are available or India's domestic reform agenda is more advanced. I have highlighted the top 10 recommendations for immediate implementation and the top 10 recommendations that could make the biggest difference.

As a report to the Australian Government, these recommendations are primarily for government to act on and lead. But collaboration with the private sector and Australian state governments is essential to their success. The recommendations also serve to inform businesses of where government is best placed to put its resources.

Two fundamental factors define our approach. First, a long term commitment to India is essential. Second, Australia must keep improving its international competitiveness to succeed in India's increasingly crowded landscape. This of course applies not just to success in the Indian market.

The recommendations of this report form a body of practical steps that can serve the relationship for years to come. Developments in both economies will affect when the timing is right for individual recommendations.

While each of the recommendations presents a strategic opportunity, some will have a greater impact than others.

FIGURE 1: THE ORGANISING PRINCIPLES OF THE INDIA ECONOMIC STRATEGY

A focus on key sectors and states

Play to Australia's strengths

Target current markets and future growth

A Knowledge Partnership	Complementarity	Interoperability	Understanding	Relationships
Education, training and research underpin our economic and people to people engagement across all sectors	Target India's economic needs and government priorities where they align with Australia's competitive advantages	Make our markets and industries more compatible, harmonise standards and remove barriers to trade and investment	Foster a contemporary and objective mutual understanding of how our industries, governments and societies work	Invest in long term and workable relationships with the people and institutions that matter

PRIORITY RECOMMENDATIONS TO BE IMPLEMENTED NOW

6.1.2 Reposition 'Brand Australia' to improve the perception in India of the quality of Australian education

- A 'Study in Australia' education hub should be established in New Delhi based in commercial offices rather than in our diplomatic mission
  - India is big enough to accommodate all Australian providers, which need to stop seeing each other as competition and instead to collaborate in a coordinated manner
  - this hub would be responsible for the international marketing and promotion of Australian education and training, and be led by an upgraded Austrade presence with on the ground support from the Department of Education and Training and Universities Australia
  - the hub would work directly with industry, peak bodies, and local providers to build a 'Study in Australia' brand which highlights the quality of Australian education
  - universities that have a presence in India could consider co-locating in the hub.

15.3 Universities Australia should explore options for a consortium of Australian universities to be the lead partner in the establishment of one of India's six new proposed Indian Institutes of Technology (IITs)

- The Indian Government plans to open six new IITs by 2020. An Australian consortium should be the lead partner with one of these six.
- Andhra Pradesh or Karnataka would be good locations for such a joint venture.

29.1 Work with the Indian Government to put in place mechanisms to provide better forecasting and greater visibility of fluctuations in Indian demand for agricultural commodities imported for Australia

- Australia could provide globally-competitive forecasting services directly to India's Directorate General of Foreign Trade to help ensure earlier advice on policy decisions such as tariff increases
  - including through deeper relationships between the Australian Bureau of Agricultural Resource Economics (ABARES), the Bureau of Meteorology (BOM) and the Indian Meteorological Department.

- Import tariffs and trade restrictions are often applied in response to changes in domestic production driven by seasonal conditions or due to specific Indian Government schemes.
- Improved weather and monsoon forecasting, and monitoring of Indian Government schemes, could add an element of predictability that could assist India to know earlier its likely harvest levels.
- Understanding and managing climatic variability is an area of Australian strength and working with India could also support the provision of timely information to the Australian side.

37. Promote increased direct air services between Australia and India

- Though air service arrangements are not inhibiting aviation capacity in the short term, no Australian carrier currently flies directly to India.
- The Australian Government should encourage Australian and Indian carriers to increase direct air services between the two countries.
- Australian airports should explore options to increase incentives for Indian airlines to use Australian airports, or for third country airlines if they are connecting directly from India.
- The Australian Government should consider increasing aviation access to additional regional Indian tier two cities under air service negotiations, with a mind to opportunities evolving out to 2035.

55.1 Convene an Australia-India Infrastructure Council as a forum for collaboration between government and the private sector from both countries, including at the state level

- A platform for the exchange of expertise in infrastructure financing and guidance on how companies identify opportunities, mitigate risks, and develop appropriate entry and exit strategies to investing in India.
- A mechanism for sharing regulatory expertise, potentially through the joint development of a policy roadmap. This could include sharing Australian expertise in infrastructure financing, value capture and user charges, in issuing municipal bonds or green bonds, and in toll-operate-transfer and 'Build-Operate-Transfer' models.
- Support for state government engagement, given a large proportion of the expertise in regulation, implementation and management of transport infrastructure sits at the state level in both Australia and India.
- Share Australian Governments' asset recycling and privatisation experiences. This represents a practical way to respond to India's infrastructure priorities and potentially open up opportunities for Australian funds seeking brownfield infrastructure investment opportunities.

67. Scale up the Australia-India Strategic Research Fund (AISRF)

- Double the current total funding for the AISRF, remove funding from the Australian aid program, and make funding ongoing (that is, make Australia's contribution $10 million per annum).
- Consider three possible revisions to the AISRF:
  - larger projects along the lines of the 'Grand Challenge Fund' which have been conducted in the past
  - more direct funding to ensure all PhDs on projects spend time in the other country; this forms lifelong networks that build on and exceed the valuable institutional networks that AISRF collaboration already brings
  - while maintaining a necessary focus on industry partnerships and commercialisation, increase investment in priority areas of fundamental science, for example, joint activities in gravity waves or quantum computing which could deliver long term benefits.

74.1 Upgrade the small Austrade presence in Kolkata into a full Consulate-General

- Focusing on economic diplomacy in mining and resources in India's eastern mineral-rich states of West Bengal, Chhattisgarh, Jharkhand and Odisha.
- A mission in Kolkata would represent a strategic investment in Australia's ability to access opportunities in India's resource-rich eastern states and the emerging north-eastern states.
- This could build closer relationships with state governments, including on shared policy experiences and advocacy for reforms in the Indian mining sector and to service the expanding mining equipment, technology and services (METS) sector in Kolkata, other mining-related activity and attract inward investment.

78.2 Australia should take the lead in working with other countries to bring India into APEC

- India is interested in joining the APEC but only if there is a consensus to admit it. Taking the lead on this would serve the bilateral relationship well and would be consistent with Australia's Indo-Pacific Strategy.
- It would bring India into the circle of APEC's important trade facilitation work.
- It would also ensure that if APEC were eventually to negotiate an APEC wide Free Trade Agreement (FTA), India would be a party to it.

82.1 Establish a Strategic Economic Dialogue with India to facilitate a broader and deeper discussion of the economic relationship and reform priorities

- It should convene every two years with the Australian Treasurer, Trade Minister and the chair of the Productivity Commission alongside the Indian Ministers for Finance and Commerce and the Deputy Chair of the National Institute for Transforming India (NITI Aayog).
- This would take the place of the Joint Ministerial Commission.
- The dialogue could include Australian state representatives when meeting in Australia and Indian state representatives when meeting in India.

84. Strengthen the Australia-India CEO Forum

- The BCA should take on the secretariat duties of the CEO Forum. In doing so, it should work closely with the relevant Indian chamber to convene participation on the Indian side.
- The BCA should also draw on guidance from its members and advice from Government to take forward an intersessional policy agenda for the CEO Forum.

PRIORITY RECOMMENDATIONS TO BE IMPLEMENTED OVER THE MEDIUM AND LONG TERM

16. Increase financial support for Indian and Australian doctoral students by introducing a Joint Research Fund

- The availability of financial support is a major 'pull' factor for Indian students considering undertaking PhD programs overseas.
- Australia should increase the availability of funding for Indian and Australian PhD students by establishing a Joint Research Fund with strong links between industry and academia
  - the inclusion of PhD students from both countries would be a compulsory requirement of some or all applications for funding
  - short term mobility for PhD students from both countries should be a subset of this fund.
- A Joint Research Fund would be separate from and broader than the AISRF because the AISRF does not fund doctoral students at present. This fund would also not be limited to research in the sciences.

18. Australian universities should partner with business to promote India literacy in Australia through the expansion of Indian studies, including language studies, in Australian universities

- Large Australian and Indian corporates with commercial interests in both countries should sponsor new faculties and courses on Indian studies in Australian universities
  - a small number of Chairs of Indian studies in major universities should be established
  - the study of Indian languages should be expanded
    - six universities in Australia taught an Indian language in 1996, now only two do, while over a dozen universities offer courses in Mandarin and Japanese.
- Another way to increase the credibility of Australian education in India is for Australian universities to boost research and teaching on issues of high priority to India
  - we need to make our education offerings more relevant to Indian students as well as increase the India literacy of Australian students.

27.1 Increase financial and political support for the Australia-India Mining Partnership at the Indian School of Mines Dhanbad (IIT-ISM) to ensure it continues to grow out to 2035

- Use the partnership with the IIT-ISM to showcase Australian expertise.
- The framework for engagement under this partnership is established. Modest funding of activities is essential for it to deliver outcomes in the short to medium term. Support could be directed to:
  - executive training programs, with a focus on Australian standards and systems and advanced technology applications
  - joint research projects on extractive and refining technologies
  - facilitating student and faculty exchange between the IIT-ISM and Australian institutions
  - promoting further linkages between Australian industry and the IIT-ISM in the fields of clean coal and mine safety
  - making the Austrade-managed Business Development Manager embedded in the IIT-ISM a permanent role in addition to the Austrade presence in Kolkata.
- Such activities could build further institutional and branding support for Australian universities to develop and deliver management training courses and study tours in partnership with the IIT-ISM.
- Develop a communications and marketing strategy for the partnership at IIT-ISM.

32.3 Establish an Australia-India Food Partnership, including an International Agricultural Services Hub to package Australian policy, implementation and services expertise

- The Food Partnership would provide a framework for:
  - strengthening engagement between Australian and Indian agriculture and food industries
  - strengthen Australia's reputation as a longstanding reliable partner in agriculture
  - work with Indian policy makers to assist in the design and implementation of effective agricultural legislation, regulation and policy making.
- The Hub could offer:
  - a one-stop shop of advice across university, industry and public sectors
  - blended financing, including in-kind contributions from the private sector
  - a unique Australian brand
  - bespoke services available through fee for service
  - if successful in India the concept could be extended to other developing markets.

41.1 Develop 'India ready' training programs aimed at raising awareness of cultural tastes, preferences and expectations of Indian leisure and business tourists

- This could be undertaken through a tender process allowing for a consortium of commercial stakeholders (VET providers and Indian partners) to put forward innovative proposals.
- The Australia India Tourism & Travel Council has industry-wide links and should act as an advisory body.

51.1 Establish an industry body to package Australian health sector offerings specifically for India

- Similar to the Water Industry Alliance or the Australian Water Partnership, perhaps affiliated with an existing health sector peak body.
- This initiative would support public and private partnerships for sharing Australia's health sector expertise with India, open opportunities for Australia to learn from India's approaches and seek co-investment collaborations.
- It would likely require seed funding.

68.1 Explore the option of collaborating with India through its Global Innovation Technology Alliance (GITA)

- The 2+2 model for funding industrial research encourages greater industry buy-in and has a focus on commercialisation.
- Before such a program is conceived, the Australian Government should make a medium to long term commitment to engage with the market, test appetites and build partnerships. Lessons could be learnt from India's experience with GITA in the next two to three years.

69.1 Put India in the top tier of target countries for each of Australia's six industry Growth Centres

- The industry Growth Centres seek to boost sector productivity by:
  - increasing collaboration and commercialisation
  - improving access to global supply chains and international opportunities
  - enhancing management and workforce skills
  - optimising the regulatory environment.
- As part of their focus on international opportunities, engagement with India should be given priority.

74.2 When resources permit, establish a Consulate-General in Bengaluru to focus on economic diplomacy in technology and innovation

- A post in Bengaluru would represent a strategic investment in Australia's ability to access opportunities in the world's fourth-largest, and second fastest growing, technology cluster.

78.1 Establish an Australia-India Standards Trade Enabling Program, to facilitate and promote standards harmonisation, technical alignment and regulatory coherence

- This should be a multi-year initiative to promote common standardisation and would build on Standards Australia's existing relationship with the Bureau of Indian Standards.
- In the first instance, the government should commission Standards Australia to produce a Standards Market Potential Report to inform the development of this program. This would identify the opportunities, technical gaps and challenges for further Australia-India collaboration on a sector-by-sector basis, including digital trade.

IMPLEMENTATION OF THE INDIA ECONOMIC STRATEGY

- Assign a cabinet level ministerial champion for each of the 10 priority sectors identified in this report.
- The Minister for Trade, Investment and Tourism to chair a Ministerial Committee to oversee implementation of the recommendations in this report and to ensure that the India Economic Strategy receives high level political leadership and focus.
- This Ministerial Committee be supported by a committee of senior officials, chaired by a Deputy Secretary of DFAT, and comprising senior officials from the federal departments and agencies most directly involved in the Australia India economic relationship
  - with state government officials invited to participate as appropriate.

THE MACRO STORY

CHAPTER ONE

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SUMMARY

- India's economy is of global importance. It has a large and young population and an open and democratic political system. It is already the third largest economy and contributor to global economic growth, yet there is considerable untapped potential. With more than a sixth of the world's population, India produces only 7 per cent of the world's output.
- India has enjoyed a step up in growth rates over the past few decades supported by reform efforts and the expansion of its aspirational, consumer class. This report assumes a growth rate of 6–8 per cent annually over the next two decades, underpinned by productivity improvements.
- Given the challenges of policy making in such a large, diverse country with a federal structure of government, reforms will likely proceed incrementally and be politically opportunistic. Both the central and state governments have important roles to play. Making the most of India's demographic advantages will require labour market reforms, measures to improve education and skills and significantly improving women's participation in the economy. Constraints on investment and infrastructure pose a challenge, while India's services-oriented growth path will take it into uncharted territory.
- India's economic progress will not be linear. It will be subject to structural shifts and will be shaped by technological and environmental disruptions.

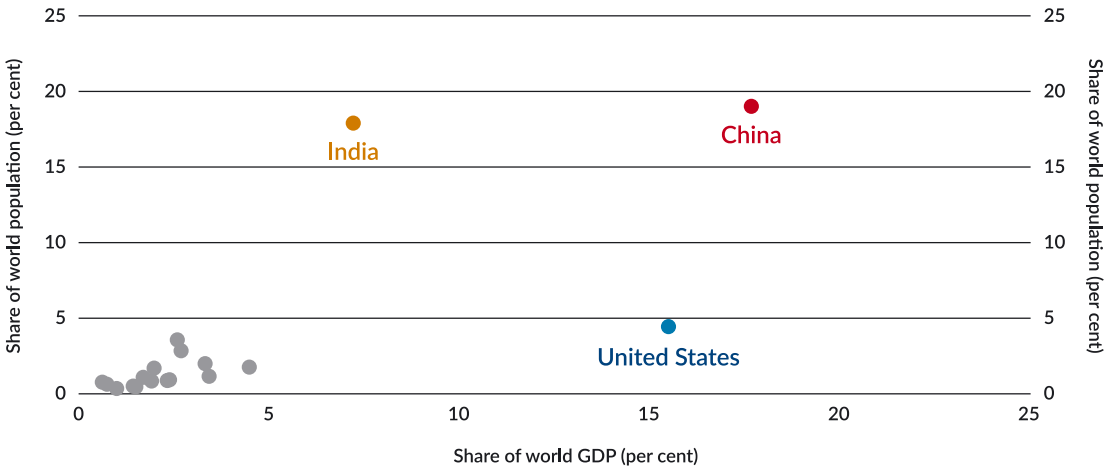
OUTLOOK FOR THE INDIAN ECONOMY TO 2035

India's economic potential and importance

India's growth path will be driven by how effectively it harnesses and rewards the efforts of its greatest natural asset – its people. India has the second largest population in the world with more than 1.3 billion people. Of India's 29 states and 7 union territories, 18 are home to more people than Australia. India's largest state, Uttar Pradesh, is bigger than Brazil, the world's fifth most populous country.[1,2] Within the next decade India's population will overtake China's to become the world's largest. By 2035, the United Nations projects that India's population will have reached almost 1.6 billion people, on its way to a peak of almost 1.7 billion by the early 2060s.

India is the world's third largest economy measured in purchasing power parity (PPP) terms and, on some measures, will be the fastest growing large economy in the world in the coming years (Figure 2).

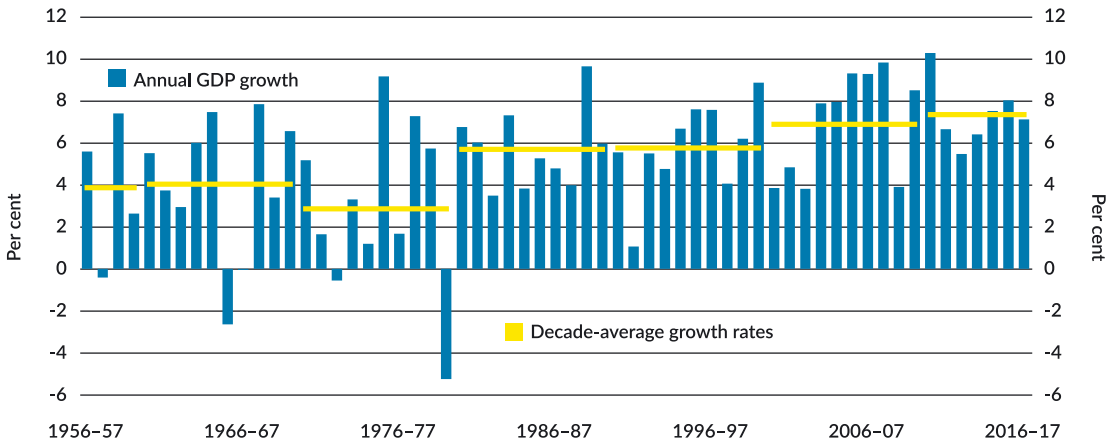
FIGURE 2: SHARES OF WORLD GDP AND POPULATION (G20 COUNTRIES)



Source: International Monetary Fund. World Economic Outlook - April 2018. International Monetary Fund; 2018.
Note: GDP is in purchasing-power parity terms. Data refers to 2017.

India's population has benefited from this strong economic performance. India's steps towards liberalisation and openness in the 1980s, which accelerated in the 1990s, saw India's GDP growth rise from an average annual rate of less than 3 per cent in the 1970s (the so-called 'Hindu rate of growth') to over 7 per cent in recent years (Figure 3).

FIGURE 3: INDIA'S GDP GROWTH[i]



Source: 1) The World Bank. GDP growth (annual %). World Bank national accounts data and OECD National Accounts. The World Bank; 2018. 2) International Monetary Fund. World Economic Outlook - April 2018. International Monetary Fund; 2018. 3) Ministry of Statistics and Programme Implementation (ID). Summary of macro-economic aggregates at constant prices. New Delhi ID: Government of India; 2018.
Note: Data in India fiscal years (April to March)

Since 1970, India's real GDP per capita has increased fivefold. As a result, millions of people have been lifted out of poverty. Key development indicators such as infant mortality and life expectancy have steadily improved.

These trends have contributed to the creation of a substantial and aspirational consumer-class that, since household consumption accounts for 60 per cent of India's GDP[3], is an important source of optimism for growth in the Indian economy.

BASELINE SCENARIO

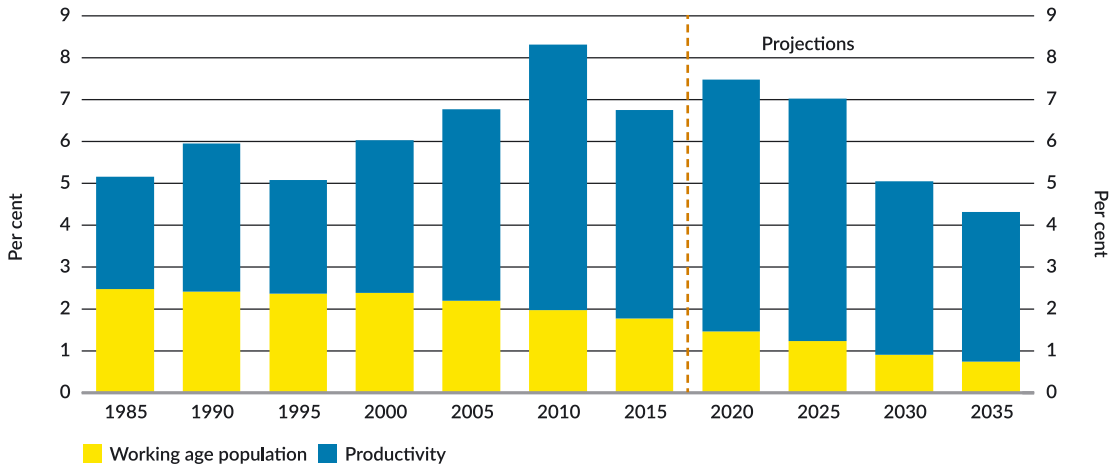
Under even moderate policy progress, the Australian Treasury's long term projection framework projects that over the next two decades (and beyond) India can maintain the relatively high economic growth required to lift its share of global output.

[i] Annual percentage growth rate of GDP at market prices based on constant local currency. Aggregates are based on constant 2010 USD. GDP is the sum of gross value added by all resident producers in the economy plus any product taxes and minus any subsidies not included in the value of the products. It is calculated without making deductions for depreciation of fabricated assets or for depletion and degradation of natural resources.

Under Treasury's projections, India will enjoy an average of around 6 per cent annual growth over the next two decades.[ii] As population growth continues to slow, improved productivity will remain the critical driver of GDP growth (Figure 4). Based on the incremental reforms outlined in the next section, this Strategy judges India is likely to grow at 6–8 per cent annually to 2035.

India's success will have significant implications for its international economic and strategic weight. In 2035, the global economy is likely to be increasingly weighted towards Asia, as India, China and the ASEAN economies catch up to slower-growing advanced economies. Even with an average annual growth rate of only 6 per cent, India's economy would be more than two times larger than it was in 2017. In PPP terms, India's share of the global economy will likely increase from 7 per cent in 2016 to around 13 per cent (Figure 5), making it one of the major poles of global economic power and on par with the United States.

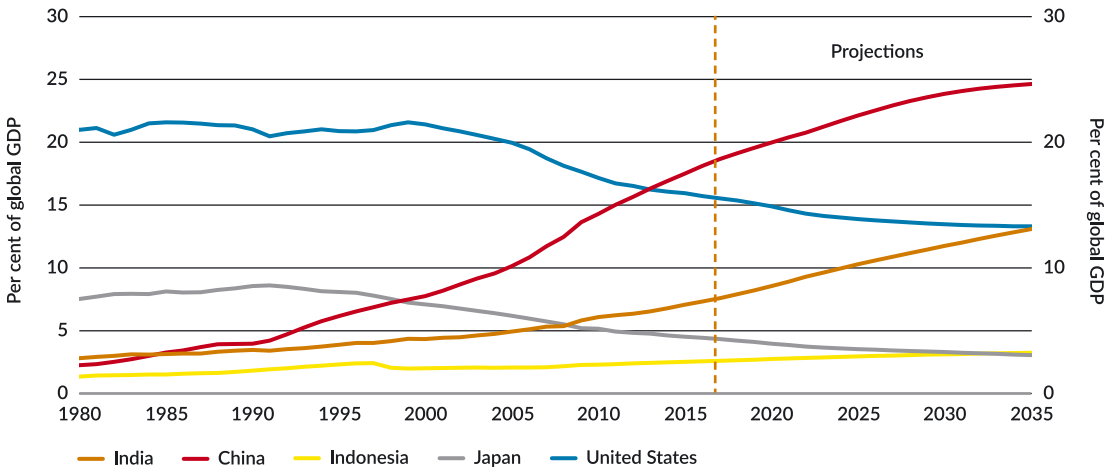
FIGURE 4: DRIVERS OF INDIA'S LONG TERM GROWTH



Source: 1) International Monetary Fund. World Economic Outlook - April 2018. International Monetary Fund; 2018. 2) Treasury (AU); The Commonwealth of Australia; 2018
Note: Years in Figure 4 refer to five year periods ending in that year. GDP is in PPP terms.

[ii] Treasury's long term projection model is based on assumptions about productivity and working age population growth. For productivity, the model estimates each country's 'steady state' level of productivity relative to the United States, based on an assessment of the country's competiveness (the World Economic Forum Global Competitiveness Index, or GCI). The model then assumes that countries approach this steady state level over time. Reforms that increase a country's competitiveness, and hence its GCI score, would lead to a higher estimated steady state level of productivity relative to the United States and an upward revision to projected productivity growth. All else equal, this in turn would mean higher projected GDP growth. The working age population projections are based on those published by the United Nations.

FIGURE 5: SHARE OF WORLD GDP PROJECTIONS (PPP)



Source: 1) International Monetary Fund. World Economic Outlook - April 2018. International Monetary Fund; 2018. 2) Treasury (AU); The Commonwealth of Australia; 2018

INCREMENTAL REFORMS ARE LIKELY, WHICH WILL BOOST GROWTH

In recent years, a greater recognition in India of the urgency for reforms to lift productivity has led to important policy achievements, including implementation of a national GST in 2017. As well as simplifying the tax system the GST sets new precedents for cooperation among the states. Future reforms will likely proceed incrementally. Both the central and state governments have the political appetite to do more, and both levels of government have important roles to play. The Central Government has direct control over several important areas, including the financial sector, [*see Chapter 10: Financial Services Sector*], international trade [*see Chapter 16: Trade Policy Settings*] and investment policy [*see Chapter 2: The Investment Story*].

India's state governments control crucial elements of the business environment [*see Chapter 14: A Collection of States*]. The Central Government has fostered a political dynamic in favour of reform, which will see uneven progress between states. Organisations such as NITI Aayog have used initiatives like competitive federalism to help states recognise the need for, and speed up the pace of, reform.

Weak capacity, at both the central and state level, to implement challenging policy changes is a key constraint. Attempts to circumvent the 'licence Raj' by moving regulatory approval systems online will improve the business environment in some areas.

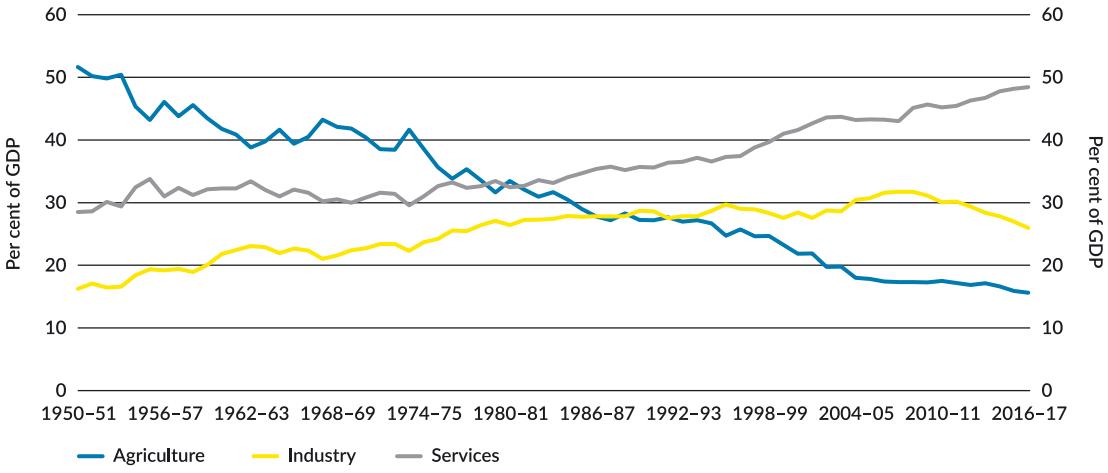
Recently enacted fiscal targets and formal guidelines for monetary policy will also continue to support a favourable environment for growth. Macro stability through improvements in external indicators such as current account, foreign exchange reserves and inflation have also helped. However, fiscal pressure continues to pose a risk for many state governments, where borrowing has increased rapidly in recent years and the scope to increase debt and expenditure appears limited.

India's economic reform agenda must address three themes: its growth model and international openness, its workforce, and building the infrastructure to improve productivity.

India's growth model

Like other emerging economies, India's growth has been marked by major shifts in the structure of its economy, most notably away from low productivity agriculture (Figure 6).

FIGURE 6: SECTORAL SHARES OF THE INDIAN ECONOMY



Source: 1) CEIC Asia Database | CEIC [Internet]. Available from: https://www.ceicdata.com/en 2) Treasury (AU); The Commonwealth of Australia; 2018. 3) Ministry of Statistics and Programme Implementation (ID). New Delhi ID: Government of India; 2018
Note: Data in India fiscal years (April to March). Data prior to 2011–12 use Treasury calculations based on discontinued series.

The shift away from agriculture and strong growth in services is not unusual for a developing economy like India. What is less common is the limited role that manufacturing has played in India's development. For a typical developing economy, manufacturing drives growth and employment in the early development phase before giving way to services. For many East Asian economies, this last stage typically has occurred at much higher levels of development than in India.[4]

However, in many parts of South Asia, the services sector has grown ahead of manufacturing. In the traditional growth model, the services sector in developing economies is considered to be of lower productivity than manufacturing.[5] In South Asia, and particularly in India, the reverse has been true. The level of India's services productivity is comparable with China and Thailand, countries with substantially higher GDP per capita. As a result, India's early shift to services has supported, rather than hindered, rapid growth.

POLICY SETTINGS HAVE SUPPORTED THE DOMINANCE OF SERVICES

The strong expansion of India's service sector has been enhanced by a series of reforms introduced by the Indian Government through the 1990s and early 2000s. Notable reforms included financial market deregulation, a relaxation of foreign ownership regulations and moves to increase competition in a wide range of service industries. Along with the relatively high cost of capital, policy choices also appear to explain India's relative underperformance in manufacturing. Burdensome regulations – including outdated labour laws and complex land acquisition regulations – have been particularly onerous for manufacturing.

India's services success extends to exports, where a range of Indian services are globally competitive, particularly in information and communication technology and in back-office processing tasks. This reflects India's comparative advantages: a relatively low-cost workforce with a small high-skilled component, many of whom are English-speaking.

While India's services sector output has grown substantially, services sector employment has been far more modest. This has meant that a relatively small proportion of India's population has seen direct benefits. The more large scale

employment the services sector can provide India, the greater the benefit for India's development.

Over coming decades, the services share of the economy is likely to gradually continue rising and the share of manufacturing stabilise. As incomes rise, the demand for consumer goods and services is expected to grow strongly, creating opportunities for domestic manufacturing. Global manufacturing firms are also likely to be attracted by India's large and growing consumer class and its relatively low operating costs.

INTERNATIONAL OPENNESS

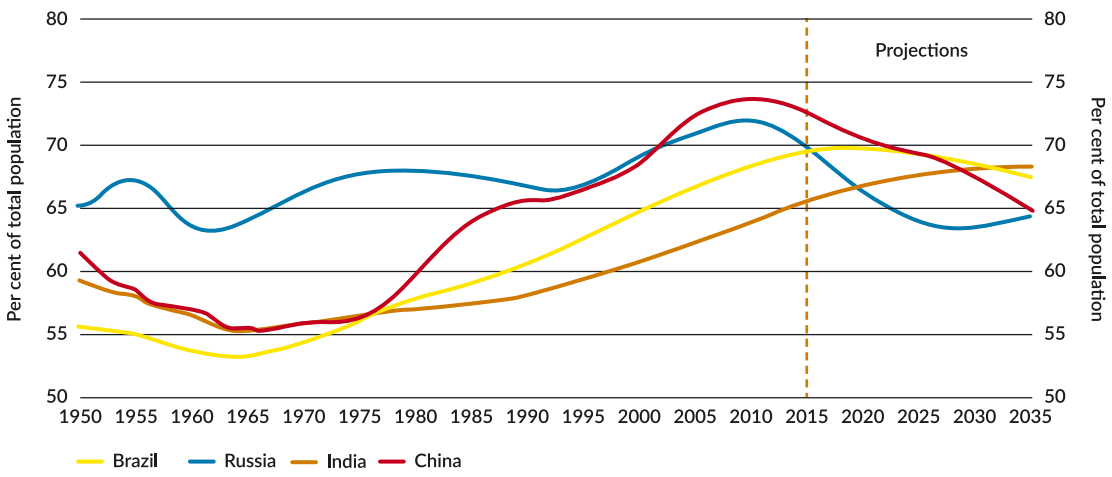
India's structural transformation towards higher value added production would be aided by further moves to open the economy. Historically, India's size and the appeal of self-sufficiency has encouraged a degree of insularity. While the trend is positive, India's openness to trade remains among the lowest in Asia[6] [*see Chapter 16: Trade Policy Settings*]. While India is unlikely to pursue an export-oriented growth model to the same extent as East Asia, greater openness would enable India to leverage its comparative advantage in labour intensive production, encourage innovation and lift productivity.

Greater openness to foreign investment would also support growth by providing additional sources of capital and technology [*see Chapter 2: The Investment Story*].

India's workforce is an opportunity and a challenge

India has a great economic opportunity provided it can create an environment that supports education, training and job creation for the millions of young Indians set to enter the labour force. Over the next two decades India's working age population is predicted to increase by almost 200 million, to over one billion, to become the world's largest.[1] While the rate of increase is expected to slow, the working age share of the population will continue to rise out to 2035 (Figure 7). The working age populations in southern states will peak by around 2020 but further increases in workers are expected to come from the northern states for decades to come.[7]

FIGURE 7: BRIC[III] WORKING AGE POPULATION SHARES



Source: United Nations. World Population Prospects 2017 [Internet]. United Nations; 2017. Available from: https://www.un.org/development/desa/publications/world-population-prospects-the-2017-revision.html

iii In economics, **BRIC** is an acronym that refers to the countries of Brazil, Russia, India and China, which are all deemed to be at a similar stage of newly advanced economic development.

GENERATING PRODUCTIVE JOBS

India's human capital formation lags many high growth East Asian countries. Firms operating in India cite access to skilled labour as a key constraint to growth. Though rising, India's working-age population had on average just over seven years of schooling in 2015. Current government initiatives are moving in the right direction, but India will need further substantial investment in its education system to make the most of its people [*see Chapter 3: Education Sector*].

Capitalising on a skilled workforce will require India to increase women's workforce participation and generate more productive jobs. SMEs employ around 40 per cent of India's workers.[8] They make up a disproportionate share of India's economy and remain relatively inefficient, low skilled and rural-based. SMEs account for more than 80 per cent of industrial firms compared to 65 per cent in Indonesia and 25 per cent in China. However, across all sectors, India's smallest firms are only 25 to 65 per cent as productive as their peers across Asia. Firms that employ more than 200 people in India tend to be as productive as comparable firms across Asia. The preponderance of SMEs is a factor holding back India's productivity.

In part due to the dominance of SMEs, 90 per cent of Indian workers are either in the unorganised sector (self-employment or in enterprises of fewer than 10 workers) or are informal workers in the organised sector. The low rate of formal employment reduces job security and access to employer provided social security benefits for those workers.

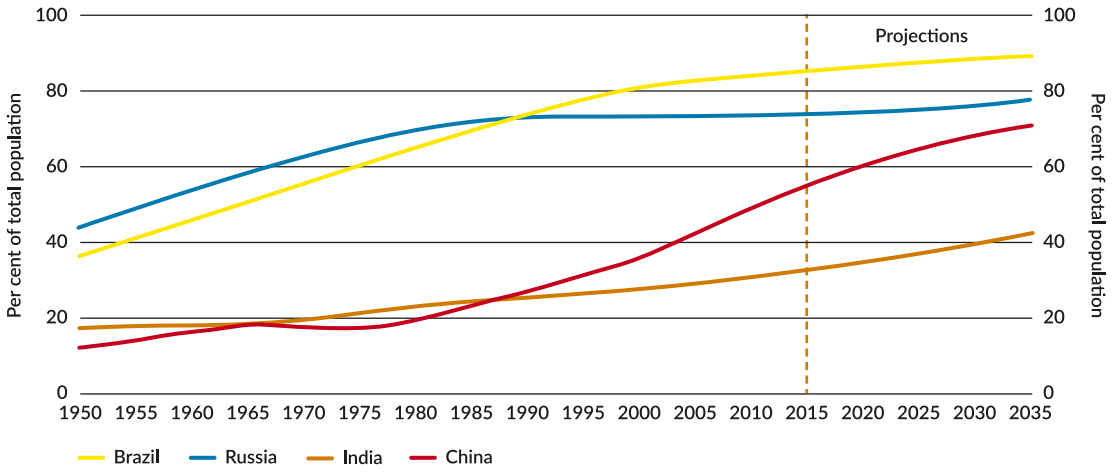
URBANISATION

Urbanisation is driving a shift in India's workforce from lower productivity (agriculture) to higher productivity sectors (services and industry). Since 1950, the proportion of Indians living in urban areas has almost doubled, reaching 33 per cent in 2015. However, India's urbanisation rate remains low compared to other emerging economies (Figure 8). The United Nations projects that India's urbanisation rate will rise to 42 per cent by 2035, lifting the urban population from 64 million in 1950 to 640 million.[9]

LABOUR MARKET REFORMS

Reforms to India's complex labour regulations would likely reduce informality, lift productivity and attract investment. There are roughly 45 national and 200 state laws governing labour relations which impose cumbersome requirements on businesses. As in other countries, labour market reform is a sensitive issue and wholesale changes will be difficult. However, attempts at reform at both the central and state level have been seen in recent years. As India's economy grows and firms look to expand their workforce more firms are likely to be affected by labour regulations and pressure to reform them may grow.

FIGURE 8: BRIC URBANISATION RATES



Source: United Nations. World Population Prospects 2014 [Internet]. United Nations; 2014. Available from: https://www.un.org/development/desa/publications/wesp2014.html

Strong investment will be needed to sustain growth

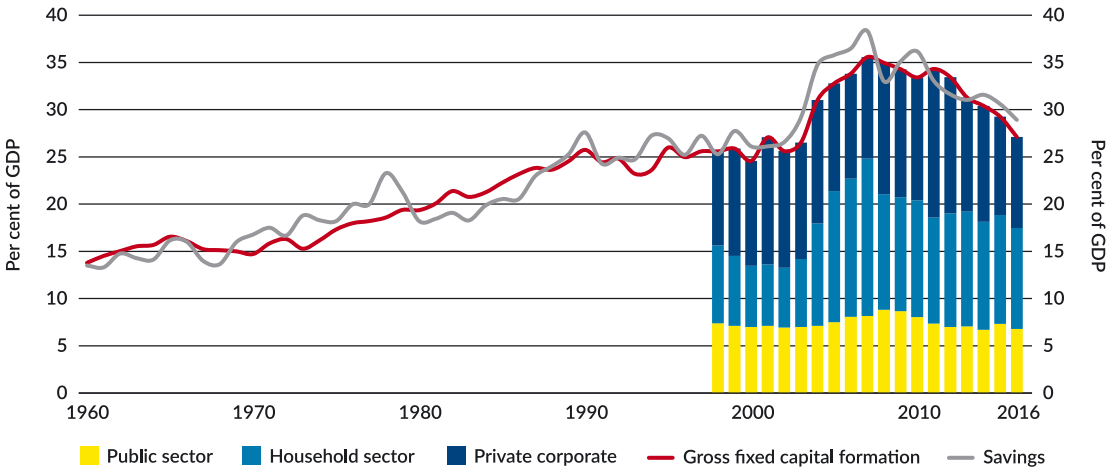
To achieve high growth in the coming decades, India will need to sustain strong investment. Capital in India has traditionally been mobilised by raising domestic savings and investing it in productive assets.

India's investment and savings rates, as a proportion of GDP, have fallen in recent years (Figure 9). Private investment has started to shrink – contracting by 22 per cent between 2014 and 2016 according to World Bank data. Turning this trend around will require a supportive environment for business, an efficient and innovative financial sector and dealing with the non-performing assets (NPAs) that have impaired new lending and weigh heavily on India's dominant public sector banks [*see Chapter 2: The Investment Story*].

Investment into infrastructure that enables growth, particularly in transport, energy and communications, is critical to India's prospects. How well India can deliver on this will go a long way to determining its growth path. For example, some 240 million Indians still lack access to electricity.[10] The Indian Government has estimated that its infrastructure gap over the next decade will be over USD1.5 trillion.[11] As a result, the central and state governments are developing new financing models to attract private, and particularly foreign, capital.

Improving India's business climate will also help increase investment. The Indian Government's renewed focus on achieving reforms has contributed to India's jump of 30 places in the 2018 World Bank's global ease of doing business ranking.[100] Important areas that continue to affect the business environment in India include the effectiveness and pace of the judicial system, and business licencing regulations. Improving India's business climate will take time, but will be important in shifting focus toward opportunities available in India [*see Chapter 15: Understanding the Business Environment*].

FIGURE 9: INVESTMENT AND SAVINGS TO GDP



Source: World Development Indicators | DataBank [Internet]. 2018. Available from: http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators

Complex land regulations also constrain investment and growth by limiting the sale, lease and conversion of land and creating uncertainty around the true price of land holdings. The dominance of inefficient SMEs is likely to continue until more land for industrial use in urban areas is made available by local governments and it is easier for industrial firms to expand their land holdings. Existing land regulation ties farmers to their land, hinders urbanisation and the transfer of labour to more productive sectors. States which move to rationalise land markets will improve their growth prospects.

STRUCTURAL SHIFTS AND SOURCES OF DISRUPTION OUT TO 2035

A strategy out to 2035 must anticipate volatility. While deep-set structural drivers enable us to project the broad direction of India's growth, it is unlikely to be linear or evenly distributed.

This is partly due to the inherent uncertainties associated with forecasting over such a long horizon but also the complexities of India's economic model and reform path. India's economic progress will be influenced by an accelerating global rate of technological change and by trends and events in ways we cannot foresee.

Potential structural shifts

This report highlights three potential structural shifts that could change the composition, size and shape of India's economy out to 2035, including productivity, labour inputs and domestic consumption.

FUTURE OF WORK

Technological advances in automation and digital connectivity are changing how labour markets and businesses operate, including in India. Technology has always shaped the workplace, but the current and forecast rate of global technological change is faster than ever before, and increasing.

This will offer some positive outcomes for India. Automation technologies such as robotics and artificial intelligence can increase productivity and help Indian companies compete internationally. New jobs will be created, including in information systems to build tools for managing workers alongside machines. While India's private sector is yet to make a significant global impact in artificial intelligence development, its strong IT base gives it potential to do so.

Concurrently, digital connectivity will contribute to the decentralisation of economic activity away from large corporations, seeing production become more fragmented. This will support more flexible employment and enable more workers to participate as micro-entrepreneurs. By connecting workers and firms, digital job matching platforms can link developing economies, like India, with consumers and investors in rich countries underpinning economic convergence. This will lead to more digitally enabled services trade, new markets for exporters and potentially cheaper inputs to Australian companies. The question is whether India's high proportion of SMEs, currently a drag on productivity, will become an asset.

The future of work will also have negative effects on India's economy. Decentralisation will create more precarious and irregular forms of work and weaken job security in the formal sector. Automation has the potential to stifle India's exports because trading partners could use automation to onshore services and resources. Automation also risks displacing workers who perform routine or processing tasks,[12] impeding India's net job creation, which is already growing slower than its working age population.

India's uptake of automated technologies is likely to be slower and proportionally smaller than in other economies. Low wages and abundant labour weakens the demand for it. But as with everything in India the numbers are still big. Some 125 million Indian employees are currently working in automatable areas.[13] Of these, women will make up a disproportionately large number. Workers in India's manufacturing and transport/warehousing industries are most at risk of displacement, along with middle class jobs in India's back-office processing operations.

So while India's economy will continue to grow, jobs could become less secure. A scenario with more irregular forms of work would reinforce inequality while also placing a greater onus on the adequacy of social safety nets such as cash transfers. Indian policy makers are aware that managing these risks rests on equipping workers with sufficient education, skills and access to digital infrastructure. The challenge lies in developing an agile workforce and providing new skills quickly.

POVERTY AND EQUALITY

India's economic progress will be defined by how its growth is distributed.

As India's economy has grown every year in the last 35 years, the share of India's population living in extreme poverty (USD1.90 a day equivalent) has fallen by 30 per cent.[4] While this is to be celebrated, extreme poverty in India remains high (21.2 per cent). Most poor – some 80 per cent – live in rural areas.[14] By 2035, if current trends continue, extreme poverty will fall to 9.5 per cent of the population, around 150 million people.

Sitting just above the poverty line is a large low-income bracket, many of whom are rural labourers. Mobility for those rising from poverty to low income is greater than from low income to high income. At the same time, downward mobility is also relatively high. Many families in the low-income bracket have little to no accumulated wealth and are vulnerable to shocks and falling back into poverty.

So while Indian wealth is growing faster than the global average, the distribution of this wealth remains relatively narrow. India is one of the most unequal economies in the world and the gap between rich and poor has increased over the last decade. India's richest 1 per cent earn 22 per cent of all income[13] and have 58 per cent of the country's wealth.[14]

Together, these two factors – poverty and inequality – influence the structure of India's economy in three ways. First, the acute hardship and deprivation of large scale poverty mean India will continue to have a significant unmet need for basic services, such as water and sanitation, energy and health care. Second, poverty and inequity sharpen political sensitivities and shape the political space for economic reforms. A primary objective of India's reform program is to lift basic incomes and many of the Indian Government's market interventions, from price controls to tariffs, are designed to minimise social disruption amongst its poorest constituents. Third, inequality constrains growth, limiting the potential for consumption-led growth and discretionary spending.[iv]

Although Australia does not have a bilateral aid program with India, Australia is well placed to work with India to reduce inequality and lift people out of poverty. As outlined in the sectoral chapters that follow, this includes working with India to provide basic services, lift incomes in rural areas and improve productivity in India's large and inefficient agricultural sector. Australia can work with India to deliver education and training, health care and access to basic infrastructure. Australian resources and expertise can power India's development. Engaging with India on policy frameworks and regulatory settings can better connect India with international value chains and markets.

Alongside these efforts, Australia's South Asia Regional Development Program should continue to support policy dialogue, institutional and regulatory reforms in critical sectors such as water, agriculture, energy, infrastructure and trade through the Sustainable Development Investment Portfolio and regional trade and infrastructure connectivity activities across South Asia, including in India. These should focus, where possible, on priority states identified in this Strategy [*see Chapter 14: A Collection of States*].

GENDER EQUALITY

India's economy has more to gain by achieving gender parity than any other in the world.

Out to 2035, on current participation rates, women will represent one of the largest underutilised economic forces in the country. The extent to which India can achieve progress on closing the gender gap in employment, education and in financial and digital inclusion will determine not only how equitable a society it has, but how dynamic and fast growing its economy is. According to the International Monetary Fund, raising women's participation in the labour force to the same level as men could boost India's GDP by as much as 27 per cent.[17] Failure to remove barriers to women's economic participation will prevent India from reaching its potential.

The rate of women's workforce participation in India has declined over 15 years despite India's high levels of growth. India has one of the world's lowest

[iv] OECD analysis finds a negative and statistically significant correlation between income inequality and economic growth.

rates of female workforce participation, 24 per cent compared with 40 per cent globally.[4] Female disadvantage pervades Indian social and economic spheres. The 2017 World Economic Forum's Global Gender Gap Report ranked India 108 out of 144 countries in terms of gender parity.[18]

The level of women's empowerment in India is determined by variables such as geographical location, education, social status and age. But across the economy, barriers to women's employment include prohibitive social norms, women's disproportionate share of unpaid care work, a rise in household income and the absence of local job opportunities. Women who do work in India are over-represented in industries with low pay, poor labour conditions and low productivity.

The Indian Government has made commitments to boosting its female labour force participation and released policies in 2017 designed to improve paid maternity leave and childcare assistance. While changing societal norms takes time, many of India's large corporate firms are emphasising the business case for increased diversity, especially the IT sector, which employs more women in India than any other except agriculture.

These efforts build on other positive trends. The gender gap in literacy rates has narrowed by 25 per cent since 1991.[4] The education gap between boys and girls has been virtually eliminated at the primary and secondary school levels and is narrowing at the tertiary level. The number of girls in India getting married before 18 has nearly halved in the last decade.[19]

Growing attention in India's public and private sectors to the economic benefits of workplace diversity and women's workforce participation provides an entry point for Australian advocacy and business engagement. Initiatives we pursue across our priority sectors from research and development collaboration to skilling programs, must emphasise gender equity and inclusiveness.

Sources of disruption

This report examines three non-linear trends that will affect productivity as well as supply and demand of key inputs to the Indian economy. Later chapters provide further detail on the ways water and technology will impact specific sectors.

WATER SCARCITY

The problem of water scarcity in India is a long term challenge that will get worse before it gets better. India has around 18 per cent of the world's population but only 4 per cent of the world's water resources. Population growth, pollution and water distribution management are contributing to the depletion of available water reserves. India is therefore likely to face a water scarcity crisis before 2030, when demand is projected to outstrip supply. Many of India's large cities already face water shortages on a daily basis. Most of India's river basins could face severe deficits unless concerted action is taken, with some of the most populous regions – including the Ganga, the Krishna, and the Indian portion of the Indus – facing the biggest gap.

Water scarcity has implications for India's food and energy security. Agriculture is the largest consumer of water (around 80 per cent). Over-extraction of groundwater by farmers will see some regions exhaust their subterranean supplies within 10–15 years. While India's renewable energy agenda might alleviate the high dependence on water for energy generation, any constraints on supply to consumers and industry (which currently uses around 10 per cent of water) will adversely impact economic growth.

A water scarcity crisis in India would also have implications for stability and security in South Asia. Many cross-border agreements are under re-negotiation or dispute and India's domestic water disputes between states are just as intractable.

India has a comprehensive National Water Policy but this does not intersect with state policies and is not supported by the strong institutions, infrastructure and cross-border partnerships which are necessary for effective implementation. India also requires significant investment in infrastructure, such as water treatment plants, waste management systems and industrial water recycling technologies. The sector is crowded and coordination is challenging, as India has limited capacity to absorb assistance from multiple channels.

TECHNOLOGY

By 2035, technological developments will unlock growth and new markets in India in ways beyond current imagination. India may be able to leapfrog dated technologies to spur faster growth. Computing speed, device connectivity, data volumes and many other indicators of technological capability are increasing at exponential, not linear, rates.

There are many prospective technologies about which to speculate. Three examples that could change India's flow of capital and open new markets are:

E-commerce is taking off in India propelled by rising smartphone penetration and dropping data costs. Today, around 14 per cent of India's internet users shop online, compared with almost 64 per cent in China. But Indian online retail is expected to grow to 12 per cent of India's retail market, up from 2 per cent now. This rate will climb further by 2035. E-commerce will support employment, including in tier two and three cities and in micro, small and medium enterprises by increasing access to finance and revenues from export. With the introduction of the GST it should also support tax collection and curtail tax evasion – especially beneficial given India's low tax base.

Financial inclusion systems will continue to slowly transform India's economy and mobilise capital inputs. India has already introduced a universal biometric identification system (Aadhaar), initiated measures to boost the number of bank accounts (Jan Dhan) and rolled out real time payments systems (Unified Payments Interface and Bharat QR). Along with the GST, these advances will lead to greater tax compliance and revenue for the government, enable welfare spending with smaller leakages, and help combat corruption. Through electronic transfers and lower costs of managing loans, digitisation offers platforms for providing credit to micro enterprises, including in rural areas, leading to greater productivity.

The future of transport will influence India's energy and connectivity scenarios. Faster progress in electric vehicle development could lead to shifts away from liquids-driven transportation, presenting risks and opportunities to India's automotive manufacturing sector. Autonomous and electric cars, ride sharing, and other technological innovations in heavy-duty vehicles could substantially reduce oil demand and could see a trend away from private ownership of vehicles. For example, cab-hailing app based companies such as Uber and Ola have been successful in India, with about 700,000 vehicles in operation in 2017, up from 300,000 in 2015.[12] India, as a major oil importer, has benefitted from the low oil prices of 2015 to 2017 which has been a boon for its current accounts. Any trends or technologies which contribute to lower global oil prices or drive down domestic demand will have a net positive effect on India's economy.

CLIMATE CHANGE

Changing environmental conditions lead to economic, environmental and security risks. The challenge posed by climate change will deepen out to 2035. India, like Australia and the rest of the world, will need to factor climate change into long term planning and investment, including its implications for our economies and national and regional security.

For India, climate change is compounding and hastening its water crisis, with forecast changes to the monsoon patterns, rising temperatures, more intense weather events, and glacier retreat in the Himalayas. Less, and less consistent, rainfall will impact food and energy production, especially as India lacks the storage capacity to capture monsoon rains. The production of staples like wheat and rice are particularly susceptible to extreme heat and water scarcity.

An increasing frequency of natural disasters brings with it human suffering and rehabilitation costs. A growing body of evidence shows that the poor are the most affected. Disasters from climate change have the potential to push those most vulnerable even deeper into poverty and interrupt the economic mobility of millions.

Indirect risks include potentially less availability of global capital to finance India's thermal power projects, with the lenders citing climate change concerns. Companies will need to adjust to price volatility of raw materials and commodities as well as increased regulation. The impact of climate change on agriculture and livelihoods could increase the number of climate refugees.

Responses to climate change and environmental pollution will open up opportunities for Australian capabilities. This includes areas as diverse as renewable energy, sustainable cities, climate smart agriculture and infrastructure, water management and climate finance. Our shared interest in transitioning to a low emissions, climate resilient global economy should see us continue to work closely together bilaterally, regionally and multilaterally.

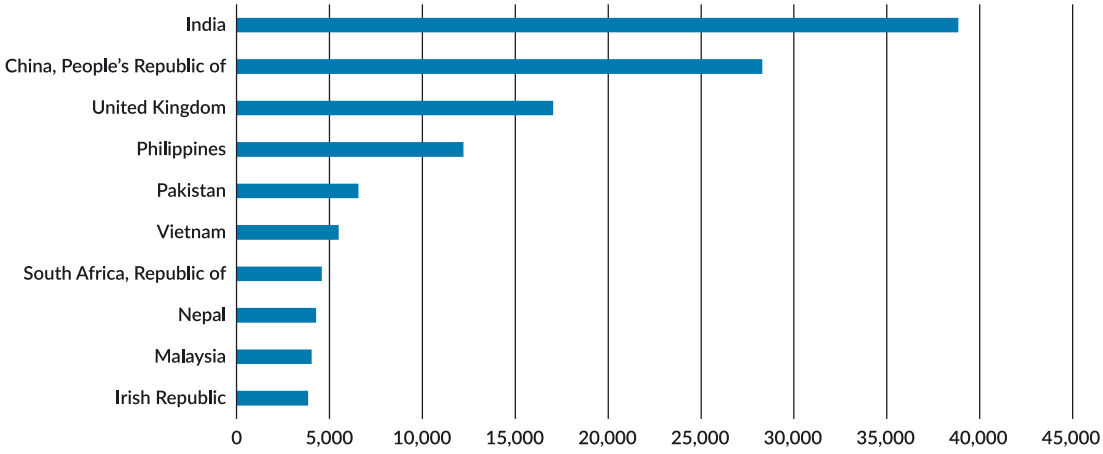
OUTLOOK FOR THE AUSTRALIAN ECONOMY TO 2035

An Australian strategy for engagement with India out to 2035 must take account of how our own economy will evolve. We need to understand the position of both economies in order to plot their intersection.

On average, the Australian economy is estimated to grow at around 2.75 per cent annually over the next two decades, based on projections regarding population growth, participation in the workforce and productivity growth.

In the 2015 Intergenerational Report, Australia's population is projected to grow at around 1.3 per cent per year, slightly below the average growth rate of recent decades, to reach around 32 million in 2034–35. This projection is based on the assumptions that fertility will remain at around the 2013 rate of 1.9 births per woman and net overseas migration will continue at a level similar to recent migration intake settings.[20] Of note, India is currently the largest source country of Australian immigration, making up 21.2 per cent of all immigration in 2016–17 (Figure 10).[21]

FIGURE 10: TOP 10 SOURCE COUNTRIES OF MIGRANTS BY CITIZENSHIP 2016–17



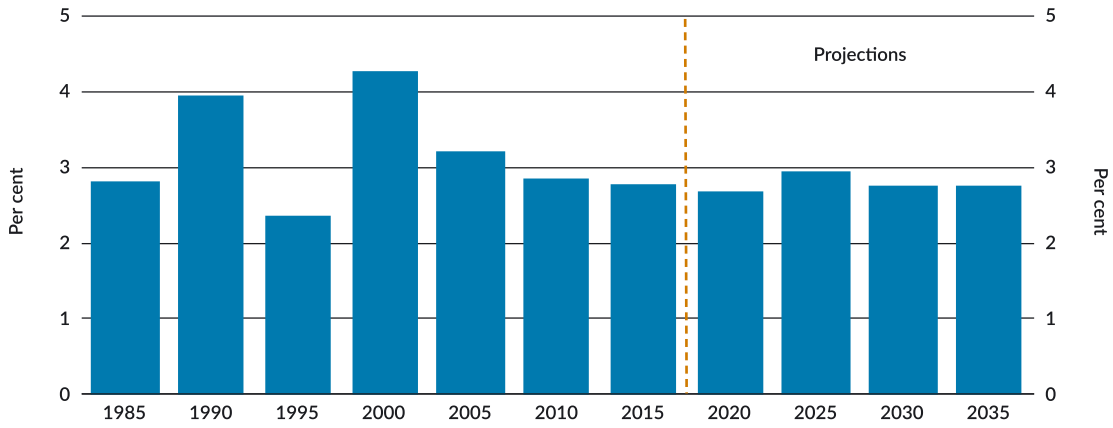
Source: Department of Home Affairs (AU). 2016–17 Migration Programme Report. Canberra: The Commonwealth of Australia; 2017.

The age profile of Australia's population is also projected to change as the overall population grows. Australians are projected to live longer and continue to have one of the longest life expectancies in the world. As a result, there will be fewer people of traditional working age compared with the very young and the elderly. This trend is already visible, with the number of people aged between 15 and 64 for every person aged 65 and over having fallen over the past few decades.

Over the coming decades, the proportion of the population participating[v] in the workforce is expected to decline as a result of the population ageing highlighted previously.

Of the three key drivers of economic growth, productivity[vi] has historically been the most important to Australia's economic performance (Figure 11).

FIGURE 11: AUSTRALIA'S LONG TERM GROWTH[VII]



Source: 1) Australian Bureau of Statistics (AU). ABS cat. no. 5206.0; MYEFO 2017–18. Canberra AU: The Commonwealth of Australia; 2018. 2) Treasury (AU), The Commonwealth of Australia.
Note: Growth rates are average annualised growth for five financial years, 1985 represents growth from 1979–80 to 1984–85. Historical GDP growth rates have been used up to 2016–17. Australian projections use published growth rates from the 2017–18 MYEFO from 2017–18 to 2020–21, 3 per cent for the first three years after the forward estimates, then 2.75 per cent beyond. On average, over the next two decades annual economic growth is estimated to be around 2.75 per cent.

v Participation refers to the proportion of the population of people aged 15 years and over who are actively engaged in the workforce.

vi Future productivity growth is inherently uncertain, so historical productivity growth is used as a guide. Labour productivity is assumed to grow at the average annual growth rate of the previous 30 years (1.5 per cent at the time of the Intergenerational Report).

vii The projections of the drivers of potential growth are developed using a range of assumptions and therefore are not without uncertainty. The sensitivities of economic growth to assumptions for the projection of annual net overseas migration, the participation rate and productivity growth are presented in the Intergenerational Report.

THE INVESTMENT STORY

CHAPTER TWO

Summary 42

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SUMMARY

- The opportunities for Australian investment in India are significant. Out to 2035, India's policy framework on foreign investment will continue to open, its business environment will continue to improve and its growth story will provide an active diversification strategy for investors.
- India is keen to attract foreign investment. It has made substantial progress in liberalising foreign investment policy settings. The stock of inward and outward direct and portfolio investment has grown from a little over 1 per cent of GDP in 1990 to more than 30 per cent in 2017. India's reforms to foreign portfolio investment (FPI) are impressive and ongoing.
- However, India will need to further liberalise investment frameworks and be willing to offer greater certainty to investors if it is to attract the capital required to boost productivity, create employment opportunities, and deliver real improvements to living standards. In recent years India has cancelled and sought to renegotiate its Bilateral Investment Treaties (BITs).
- Australian direct investment in India is under-developed. The converse is also true. Major investment opportunities are emerging or will appear in a range of sectors that match Australian strengths. Similarly, there is potential for large-scale Indian direct investment in Australia, including to address security of supply in support of India's energy and infrastructure needs.
- For Australian investors the key messages about what it takes to be successful are consistent. Businesses must make use of local knowledge about the business environment, find an appropriate local partner and be willing to be in India for the long term. This recipe is seeing companies from other countries successfully invest in India.
- Direct investment in India is challenging due to its business environment and regulatory unpredictability. The Central Government's reforms are only part of the picture. Many of the permits and approvals required for investment are in the hands of state and local authorities, where delays and setbacks remain common. Over the longer term, reform among the Indian states will improve the investment climate.
- Stocks of Australian portfolio investment in India have increased from a very low base. India may be appealing to Australian funds seeking to diversify the geographic and asset class exposure of their portfolios.
- The Australian Government plays no part in directing private investments but it has a role familiarising investors with markets in both directions. Changes to protect investors and facilitate investment are required and replacing the terminated bilateral investment agreement should be a high priority. There is an increasing role for investment vehicles which help manage risk and deliver steady returns.
- While Australian investors will make their own commercial decisions, increasing Australian investment stocks in India would correspond with deeper economic integration contributing to increased Australian trade and competitiveness. The target set out in this report of India becoming the third largest destination in Asia for Australian outbound investment is ambitious. But if India's growth and regulatory reform continue at pace and if Australian investors shift focus to India, the target is achievable.

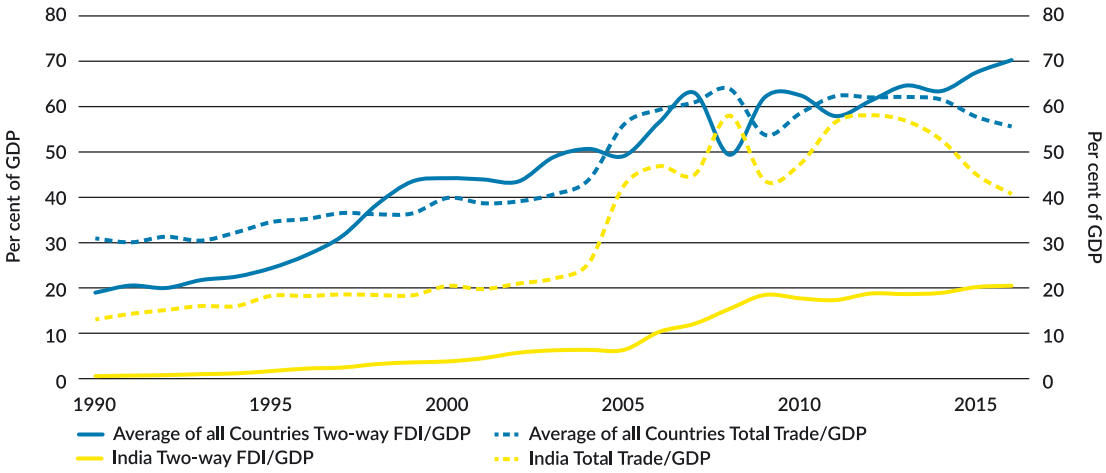
INTRODUCTION

While there is a firm basis to expect average GDP growth of 6–8 per cent, as set out in Chapter 1, there is nothing pre-ordained about India's modernisation.

India is traditionally a labour-surplus economy with a severe shortage of productive capital. Increasing and maintaining steady flows of investment is vital for India's industrial development and facilitating productivity growth.

India's economic growth will be just as dependent on productive investment as it will on an increasingly larger and richer population and greater access to international markets. As in the past, the great bulk of this investment will be sourced from domestic savings. But a significant part – possibly 4–6 per cent of gross domestic capital formation judging by trends since 2000 – might be from FDI, making FDI a significant component of India's modernisation and development. But policy makers will have to increase their emphasis on enabling investment flows for this to happen – the gap between India's investment and trade flows lags well behind global benchmarks (Figure 12).

FIGURE 12: GLOBAL BENCHMARKING OF INDIAN TRADE & DIRECT INVESTMENTS TO GDP



Source: 1) The World Bank. Balance of Payments Statistics Yearbook and data files. The World Bank; 2018. 2) The World Bank. World Bank National Accounts Data. The World Bank; 2018. 3) Organisation for Economic Co-operation and Development. National Account data files. Organisation for Economic Co-operation and Development; 2018.

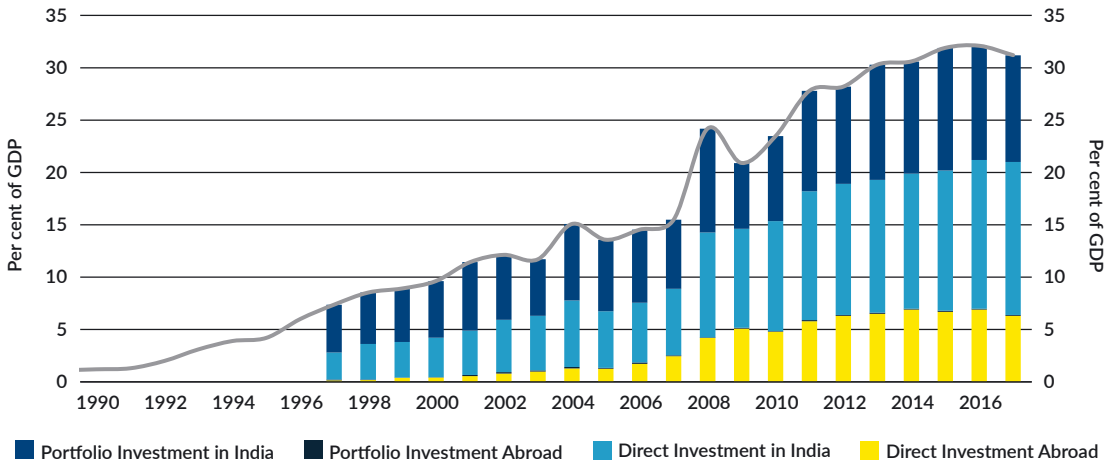
Securing foreign capital will require India to implement further economic reforms and improve its investment climate. This chapter is organised in four parts:

- How India has increasingly drawn on foreign direct and portfolio assets to help fill the gap between its domestic savings and investment requirements.
- The factors that encourage and limit flows of FDI in India, including for Australian investors.
- The factors that encourage and limit flows of FPI in India, including for Australian investors.
- What could affect Australia's future investment relationship with India.

OVERVIEW OF INDIA'S INVESTMENT INTEGRATION WITH THE WORLD

India's external financial assets and liabilities have grown from a little over 1 per cent of GDP in 1990 to more than 30 per cent in 2017 (Figure 13). Outward FDI has also become prominent in the last decade or so, though portfolio investment abroad is negligible. Outward FDI flows are much lower than inward FDI but are growing and significant in sectors like minerals and energy.

FIGURE 13: FINANCIAL INTEGRATION OVER TIME: DIRECT AND PORTFOLIO ASSETS AND LIABILITIES



Source: 1) Adapted from Lane P, Milesi-Ferretti G. Working Paper of the International Monetary Fund. International Monetary Fund; 1999. 2) Reserve Bank of India (IN). New Delhi IN: Government of India; 2017

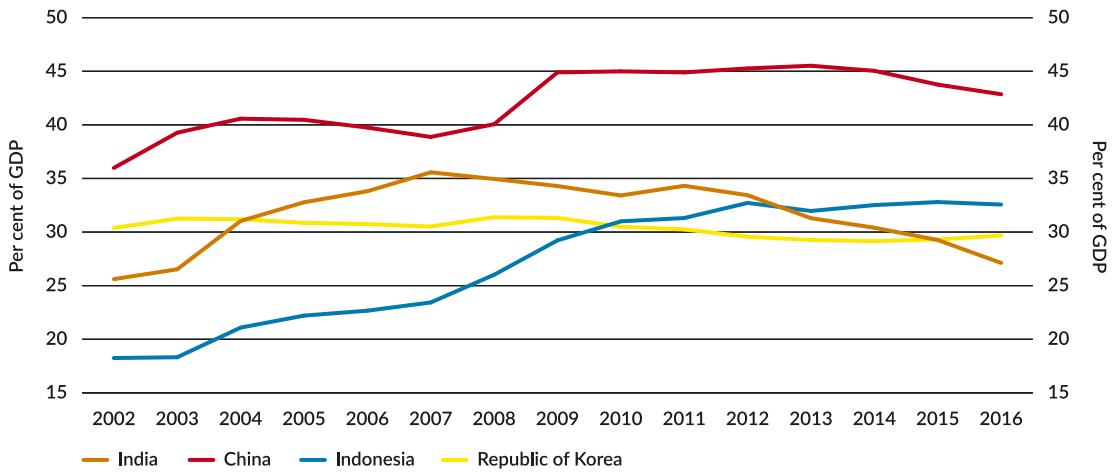
Over the past two decades, capital inflows have been prominent in areas like telecommunications, transport infrastructure and information technology. This has helped boost productivity and create employment opportunities through transfers of technology and skills.

Regulatory improvements have supported these trends. Foreign investors can now, in principle, invest in most sectors with minimal government policy barriers (though transaction costs on the ground still remain high). Investment in government and corporate bonds has also been deregulated gradually in the last few years.

Despite this growth, India's investment rate as a proportion of GDP is relatively low compared to some other major Asian economies (Figure 14). This is related to India's services-led growth which requires less capital per unit of output than heavy manufacturing. The recent downward trajectory highlights India's struggle to attract investment.

Foreign investment is still impeded by high levels of corporate debt, financial sector stress and regulatory and policy challenges.

FIGURE 14: INVESTMENT RATE



Source: World Development Indicators | DataBank [Internet]. 2018. Available from: http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators)

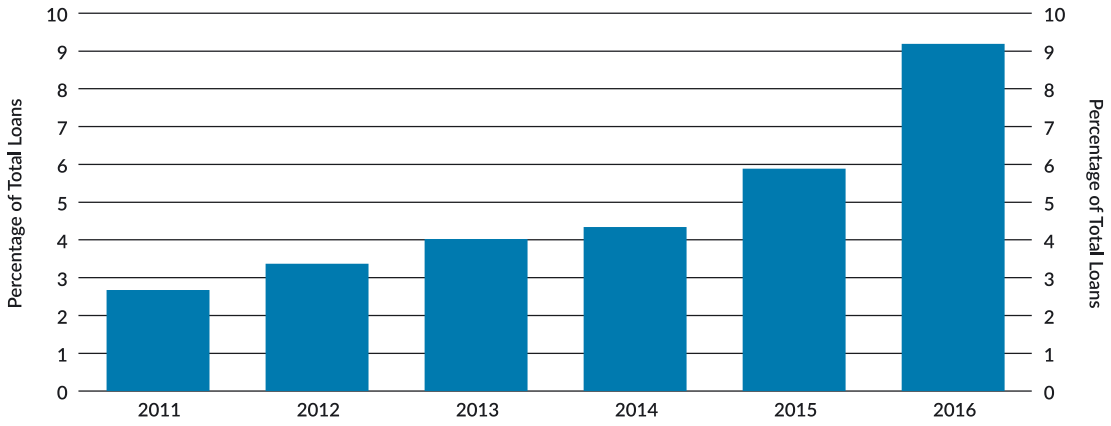
Non-performing assets

Weak credit growth and India's high cost of capital are slowing investment flows. This is driven primarily by the level of NPAs on public and, to a lesser extent, private banks' balance sheets. On a year-on-year basis, gross NPAs now stand at nearly one-tenth of all loans (Figure 15 and Figure 16).

NPAs at this level put pressure on banks' profitability, constrain their capacity to lend and therefore limit the non-bank sectors' ability to invest. With investment and credit growth highly correlated, NPAs are perhaps the largest single factor hindering investment growth. In a bid to mitigate these pressures, in October 2017 Finance Minister Arun Jaitley announced a public sector bank recapitalisation plan of Rs2.11 trillion (approximately AUD40 billion).

While this should spur lending, without associated reform any positive outcomes may prove short lived. Indian taxpayers have bailed out India's state-run banks on a number of occasions. Systemic reform is needed, involving aligning public banks' incentives more closely with profitability and sustainability and strengthening the capability of regulatory authorities.

FIGURE 15: INDIAN NON-PERFORMING LOANS



Source: International Monetary Fund. Global Financial Stability Report. International Monetary Fund; 2018

FIGURE 16: INDIAN COMMERCIAL CREDIT TO COMMERCIAL SECTOR

Source: The high economic costs of India's demonetisation [Internet]. The Economist. 2017 [cited 3 May 2018]. Available from: https://www.economist.com/news/finance-and-economics/21713842-benefits-withdrawing-86-rupees-circulation-remain-elusive

CASE STUDY: SUZLON: TAPPING INTO AUSTRALIA'S WIND POTENTIAL

India's Suzlon Group started Australian operations in early 2004 having identified Australia as one of the world's largest untapped wind generation markets.

Suzlon is reaping the rewards of being an early mover - Australia is now one of its key markets. Suzlon group commands approximately 17 per cent of the Australian market share by installation with a footprint of 764 megawatts (MW) and a cumulative annual turnover of $1.7 billion since 2005.

Suzlon's Australian operations are managed locally and all decision-making activities are performed locally which allows for quick responses to stakeholders. Suzlon has also established an Australia-based 24/7 monitoring centre which gives a competitive advantage in the market.

Suzlon's operations contribute to jobs and growth in regional communities. Each Suzlon wind farm has been constructed employing a local work force. This had led to the creation of over 325 permanent jobs and 500+ constructions jobs across nine wind farms in NSW, Victoria and South Australia. The technical nature of Suzlon's business has also created the opportunity to provide skill enhancement for local employees and contractors, improving Australia's long term skills base.

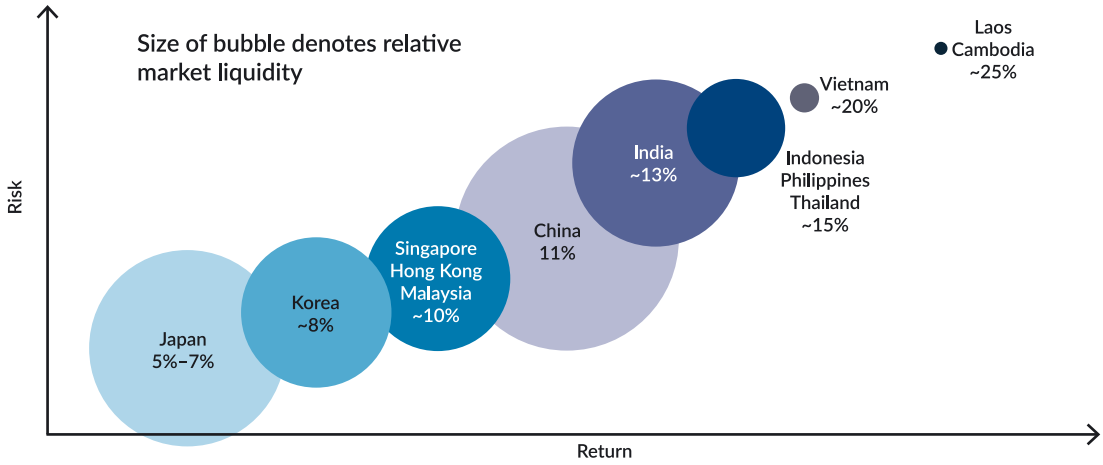
Established in 1995, Suzlon Energy is present in 18 countries across 6 continents and is one of the leading global renewable energy solutions providers. With a support network of over 8,500 employees of diverse nationalities, Suzlon has one of the largest in-house research and development capabilities with facilities in Germany, the Netherlands, Denmark and India.

Risk and reward in India

India is a relatively high-risk country for investors with its complex federal system of government, bureaucratic obstacles and arbitrary interventions in the market. Particular risks stem from the unequal playing field between ordinary private investors and state owned enterprises or well-connected family conglomerates, labour laws that prevent efficient firms from growing and inefficient firms from restructuring, and land laws that can tie up land-intensive projects for years. In addition, many of the Investor-State Dispute Settlement (ISDS) cases against India (see section on options for investment protection below) stem from problems with India's domestic investment regime for foreign investors.

Significant reform is occurring, including through new insolvency and bankruptcy laws. The different tiers of government have ambitious investment programs and even intractable issues like land reform are being advanced in some states. But until enough incremental reforms accumulate, the number of commercially attractive projects will remain limited as investors look for higher returns to compensate for the risk level. Figure 17 shows India's risk/return ratio relative to other Asian infrastructure investment destinations.

FIGURE 17: ESTIMATED INTERNAL RATE OF RETURN, RISK AND LIQUIDITY OF ASIAN INFRASTRUCTURE MARKETS, 2017

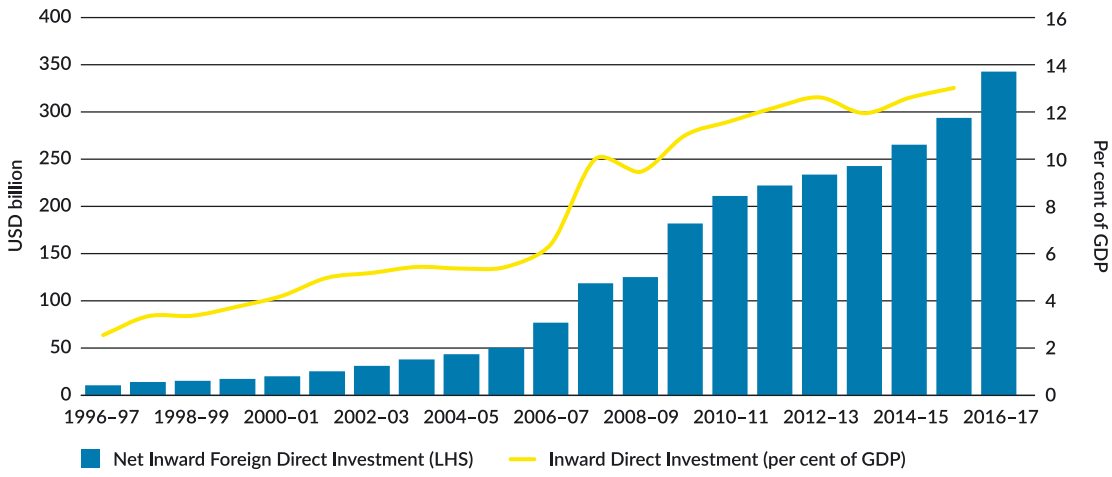


Source: Macquarie Capital. Meeting the Challenge - Infrastructure Development in Asia. Macquarie Group Limited; 2018.

FOREIGN DIRECT INVESTMENT

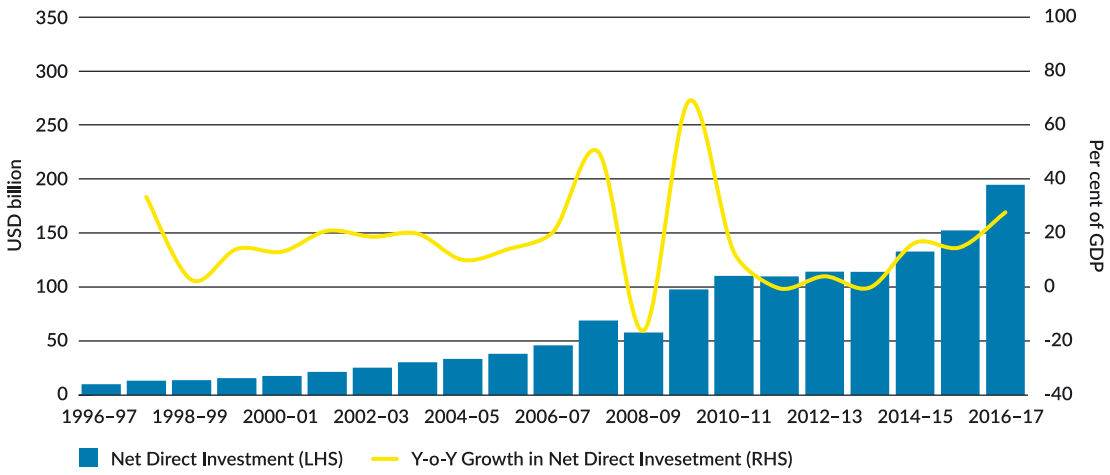
Attracting FDI is a chief priority of the Indian Government at all levels. India considers FDI a less erratic source of capital than FPI. Over the last decade India has been remarkably successful in increasing the stock of inwards FDI (Figure 18 and Figure 19). Stocks have grown by nearly 19 per cent per year over the past 20 years. This has occurred in the context of incremental trade and investment liberalisation and efforts to attract direct investment. Notable reforms include: raising foreign equity limits across many sectors; diluting the most onerous provisions of the *Foreign Exchange Regulation Act*; allowing automatic FDI approvals in most sectors; tax reforms; capital market liberalisation and interest rate deregulation.

FIGURE 18: NET INWARDS FOREIGN DIRECT INVESTMENT STOCK, USD BILLION



Source: United Nations Conference on Trade and Development. Foreign direct investment: Inward and outward flows and stock, annual, 1970–2016. Geneva: World Trade Organisation; 2016

FIGURE 19: YEAR-ON-YEAR GROWTH, NET DIRECT INVESTMENT STOCKS



Source: 1) Reserve Bank of India (IN). New Delhi IN: Government of India; 2017. 2) Department of Foreign Affairs and Trade (AU). Unpublished internal calculations. Canberra AU: The Commonwealth of Australia; 2017.

These trends have contributed to India attracting investment from 155 countries between April 2000 and March 2017, across multiple sectors, particularly manufacturing and communication services.[22] Well developed and more reform-minded states, including Maharashtra, Delhi National Capital Territory, Karnataka, Tamil Nadu, Gujarat and Andhra Pradesh, have attracted over 70 per cent of these inflows since 2000.[22]

Invest India, India's investment promotion agency, seeks to promote and facilitate inward (and outward) direct investment and provide policy inputs into FDI settings. *Invest India* also works with Indian states to advise them how to refine their areas of competitive strength when seeking foreign investors.

Most FDI applications are now made via a single window portal run by the Department of Industrial Policy and Promotion and subject to compulsory approval provisions. Restrictions such as foreign equity caps, divestment conditions and lock-in-periods are being scaled back across sectors.

Despite these improvements, real challenges remain in converting potential FDI in India into investment on the ground, and into the sectors in which it is needed. The three most limiting factors are:

- India's challenging business environment which produces a shortage of projects with commercial appeal, even in those sectors that are completely open to investment. This is compounded by unpredictable government intervention.
- Equity, screening and personnel restrictions on foreign investors.
- Complete closure of some sectors to FDI, such as legal and accounting services.

Trends in Australian FDI to India

The Australian direct investment relationship with India has been weak for a long time. Just 0.24 per cent of India's total equity inflows since 2000 have been sourced from Australia.[22] This should be considered in the broader context of corporate Australia's low direct investment footprint in Asia in general.

India hosted a modest 0.3 per cent share (USD1.8 billion) of total Australian direct investment stocks in 2017.[21] In comparison, a traditional investment market like the United States hosted over 20 per cent of Australia's outward FDI in that year (Table 1).

TABLE 1: AUSTRALIAN INVESTMENT ABROAD DIRECT STOCKS, SELECTED COUNTRIES: 2016

Country	$ million	% of total
India	1 827	0.4
United States	127 291	21.6
United Kingdom	83 855	14.2
New Zealand	62 094	10.5
Combined ASEAN economies	38 221	6.8
China	13 506	2.3
Republic of Korea	858	0.1

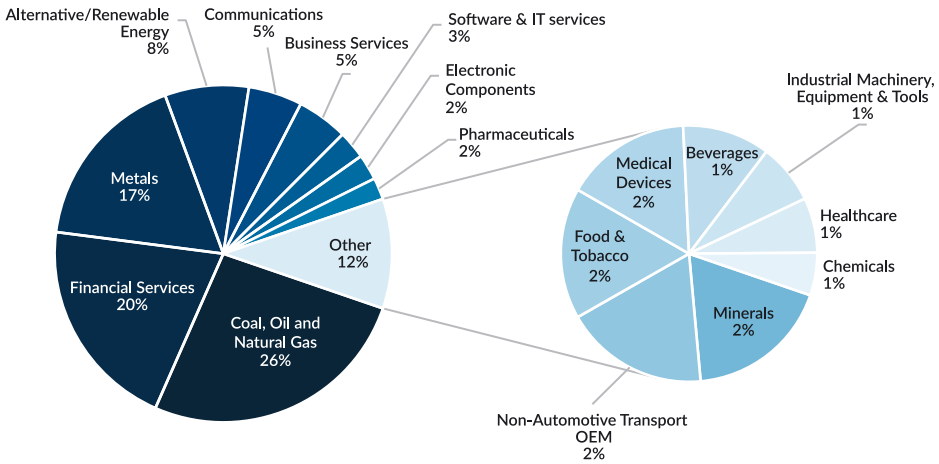
The difficulty of the Indian market does not fully explain the low levels of our bilateral direct investment. More companies from other countries are successfully investing in India. And these same risks have not discouraged a sub-set of Australian companies from investing in India because they want to be closer to a major growth market or reduce costs (see Figure 20).

What seems to distinguish successful companies from the rest is the level of effort put into understanding market compliance and risk, and a sufficiently long term view in pursuing returns. It also depends on the sector and the corresponding levels of government intervention. Mining is an example with relevance to Australia. India has rich mining assets and Australia has relevant expertise, but regulatory unpredictability and difficulties dealing with the state enterprises have made this a difficult sector to secure FDI.

Australian direct investment in India should therefore rise over time with better information on market potential and as India's economic growth continues to present opportunities. Direct investment could rise appreciably if India also opens up to more trade with Australia and the rest of the world and if it comes to see an efficient international trading and investment system as an integral element of its own economic security [*see Chapter 16: Trade Policy Settings*].

Trade and investment tend to go hand in hand. Outward Australian direct investment can build trust, establish networks, enhance business to business ties and reinforce the competitiveness of Australian firms. Ultimately, this can support trade and reinvestments in the Australian economy. Automation and innovation are rapidly changing India's services offerings. India's services sector is moving up the value chain. Working with, and in, India is no longer about offshoring labour-intensive tasks.

FIGURE 20: AUSTRALIAN CAPEX IN INDIA BY SECTOR (JANUARY 2003 – SEPTEMBER 2017)



Source: Fdiintelligence.com. 2018 [cited 3 May 2018]. Available from: https://www.fdiintelligence.com/

Trends in Indian FDI to Australia

Direct Indian investment in Australia presents a similar picture. Stocks were valued at $0.9 billion in 2016, or 0.1 per cent of total Australian stocks. There does not seem to be any discernible trend in India's intended annual capital expenditures in Australia with expenditure fluctuating markedly from year to year. What is clear is that some Indian companies are building investments in Australia from a low base in a few strategic areas: renewable energy followed by hydrocarbons, other minerals and a range of services (Figure 21). Prominent Indian investors include Tata Steel, Adani Green Energy, Suzlon Energy, BlazeClan Technologies and the Indian Farmers Fertiliser Cooperative.

Investment from India will flow more readily as Australia's presence in the Indian market grows. The potential for large-scale Indian direct investment in Australia is real: India's outbound global investment tends to be in sectors where Australia presents many of its largest investment opportunities.

CASE STUDY: TATA CONSULTANCY SERVICES: STRENGTHENING ITS COMPETITIVE EDGE THROUGH AUSTRALIAN INVESTMENT

Headquartered in Mumbai and founded in 1968, The Tata Consultancy Services (TCS) is a global IT services, consulting and business solutions company. TCS has grown to become one the world's top 10 IT companies, with a market capitalisation of more than $100 billion and a workforce of 394,000 consultants in 46 countries. As an active member of Australia's IT sector and wider business community for 30 years, TCS employs around 15,000 consultants and associates.

Australia's high technology adoption rates, local IT flair and reputation as an incubator for fresh ideas are some of the factors that attracted TCS to invest in Australia's IT sector. For instance, the company's flagship global banking product, a suite of world-class solutions for banks, capital market firms and insurance companies - TCS BaNCS - was developed in Sydney.

The company also recognises Australia's deep technology research expertise. The University of New South Wales, University of Technology Sydney and the University of Melbourne are core participants in TCS's academic alliance program, which brings together experts from the start-up, research, and corporate worlds to collaborate on innovation and solutions for TCS's customer base worldwide.

TCS is driving the agility and competitiveness of Australian enterprises by helping them to take advantage of advances in digital technologies such as analytics, artificial intelligence and the Internet of Things. This, in turn, is benefiting their customers, employees and the communities in which they operate.

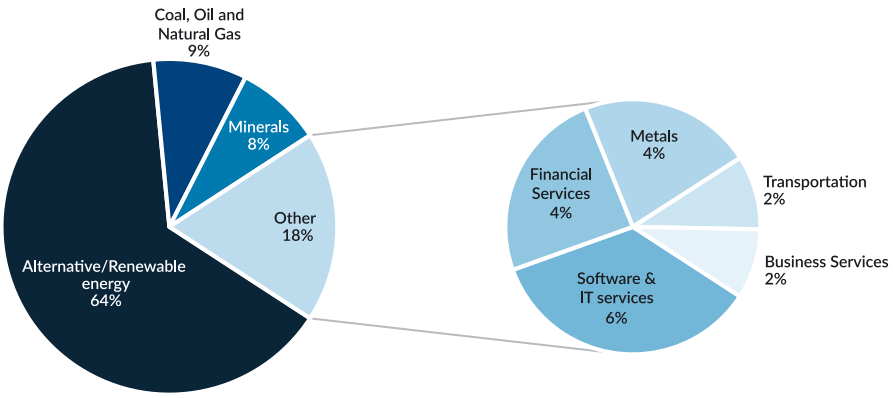
TCS is also deeply committed to investing in the Australian technology workforce of the future. So far more than 1,000 students have taken part in the TCS Go IT program that aims to inspire young Australians, particularly girls at secondary level, to consider careers in technology.

As one of India's largest companies and one with a significant global presence, TCS is partnering with DFAT to give university students a taste of work and life in India as part of the New Colombo Plan.

At the same time, TCS is contributing to the Commonwealth's science and technology agenda via a number of initiatives. TCS is a key participant in the Australian Government's Cyber Security Cooperative Research Centre and is building an innovation laboratory in Australia, which will operate as a collaborative space for TCS and its industry partners to utilise the company's vast network of expertise in innovation.

TCS is giving Australian companies access to leading technology platforms to support their growth and productivity. As one of India's largest companies, TCS acts as a bridgehead to Australian research and technology businesses seeking to take advantage of opportunities in of the world's fastest-growing economies. TCS's ongoing investment in Australian ideas, innovation and people is strengthening both countries' competitive edge in global markets.

FIGURE 21: INDIAN CAPEX IN AUSTRALIA BY SECTOR (JANUARY 2003 – SEPTEMBER 2017)



Source: Fdiintelligence.com. 2018 [cited 3 May 2018]. Available from: https://www.fdiintelligence.com/

PORTFOLIO INVESTMENT

India's capital markets

Twenty-five years of gradual reform effort has added depth and flexibility to India's capital markets. Commercial bank cash reserve and asset requirements are lower, India's administered interest rate structure has been eliminated, the exchange rate became determined by the market, prudential banking reforms were introduced, private sector commercial banking licenses were provided, and a contractual savings system was developed. As a result, and despite the NPAs, large parts of India's financial sector are profitable, efficient and growing rapidly.

India's equity market is well developed. At the end of 2017, the Bombay Stock Exchange was the world's 10th largest by market capitalisation, with USD2 trillion in assets. It aims to have 250 million investors by 2035 (up from more than 25 million today) and a market capitalisation of over USD15 trillion.[24] India's government bond market is large and highly liquid and India has a large private mutual funds industry, with around USD200 billion under management, and good growth prospects.

However, further hard reforms are needed to increase the availability of financing and lower India's cost of capital. Calls to further privatise India's banking sector in a bid to increase its profitability are compelling. Public sector banks hold approximately 70 per cent of total banking assets but account for only 43 per cent of banking sector profits.[23] Pension sector privatisation and privatising India's public-sector dominated insurance industry would add further depth to India's domestic debt and equity markets.

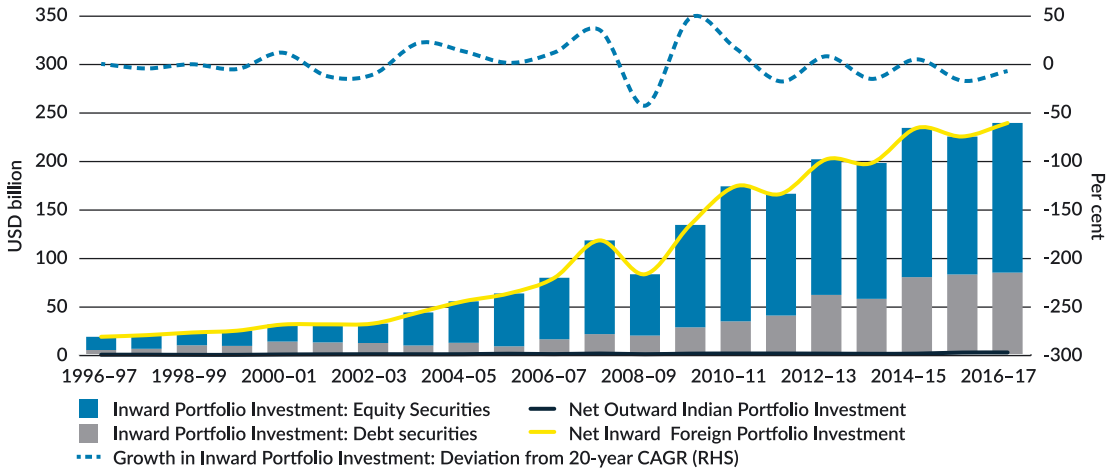
Foreign portfolio investment

India has allowed foreign institutional investment in Indian shares and debentures since 1992. This has been transformative, with FPI stocks growing at a compound average rate of 13.6 per cent over the past 20 years (Figure 22).

FPI reforms over the past decade have also been impressive and are ongoing. Foreign investors are now able to invest directly in India's listed companies and the Securities and Exchange Board of India (SEBI) has recently relaxed approval norms for registered foreign portfolio investors in India.

The number of registered investors has grown rapidly as a result. According to SEBI data, more than 1,000 new investors were registered with the regulator in the first six months of the 2017–18 financial year alone, bringing the total number to just over 8,800.

FIGURE 22: PORTFOLIO INVESTMENT, NET FOREIGN STOCKS



Source: Reserve Bank of India (IN). International Investment Position: 1997–2017. New Delhi IN: Government of India; 2017.

Reforms could go further, particularly with regards to facilitating FPI in the corporate bond market. Foreign portfolio investors are prevented from investing more than USD51 billion in Indian corporate debt by a hard FPI investment cap (which has been fully taken up).[viii]

Tentative steps have been taken to mitigate the cap's impact. In 2017, Masala bonds (rupee-denominated overseas bonds) were removed from India's FPI corporate debt investment cap, making an additional USD6.79 billion in domestic corporate debt available to offshore investors.[24]

In 2016, requirements for foreign portfolio investors to purchase bonds through Indian brokers were also relaxed, reducing transaction costs. Given the need to boost domestic investment and facilitate hedging, a gradual further expansion of FPI caps would seem a logical policy outcome.

[viii] 99.8 per cent was utilised as of 24 November 2017 according to India's FPI Monitory database.

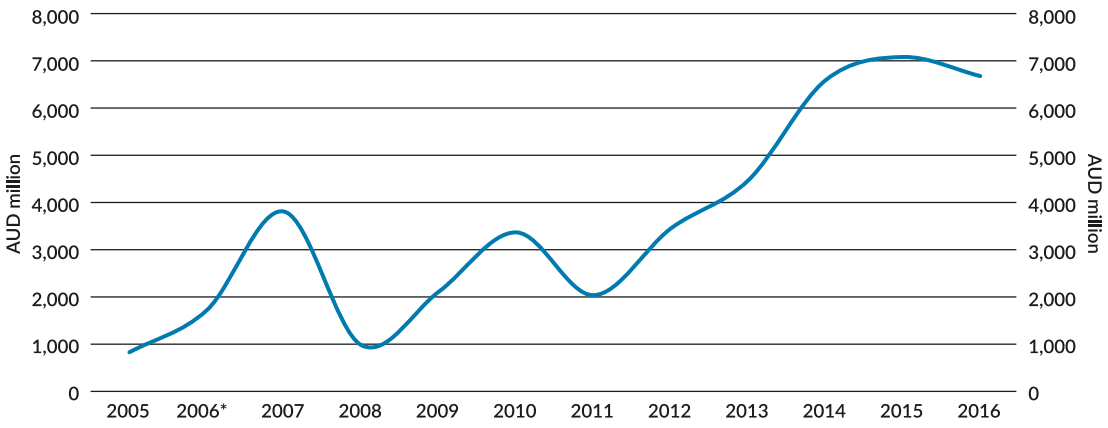
Outward Indian portfolio investment

Outward Indian portfolio investment has much scope to grow from a very low base. Again, regulatory reform will be key. Currently, Indian individuals are prohibited from investing more than USD250,000 per annum in overseas instruments such as mutual funds, or private equity vehicles.[25] Indian funds with greater than 35 per cent exposure to international assets are subject to a higher rate of tax on capital gains. As a result, while there are more than 40 Indian funds with exposure to international markets, no major fund has more than one-third of total assets in foreign positions (as of 31 May 2017).

Trends in Australian Indian portfolio investment

Stocks of Australian portfolio investment in India have increased from a very low base to $6.7 billion in 2016 (Figure 23). Over time, India's growing economic importance should become more attractive to Australian investors, with a rising share of funds likely to seek out Indian investment opportunities. India may be particularly appealing as a natural hedge to Australian funds seeking regional or global portfolio diversification.

FIGURE 23: AUSTRALIAN PORTFOLIO INVESTMENT IN INDIA



Source: 1) Australian Bureau of Statistics (AU). ABS cat. no. 53520.0; Canberra AU: The Commonwealth of Australia; 2018. 2) Treasury (AU). Unpublished internal calculations; Canberra AU: The Commonwealth of Australia; 2018.
Note: 2006 are estimated figures

WHAT COULD AFFECT AUSTRALIA'S FUTURE INVESTMENT RELATIONSHIP WITH INDIA?

Greater familiarity of opportunities and limits

One of Australia's advantages as a potential source of investment in India is the scale of its managed funds industry. On the one hand, having $2.7 trillion in funds under management excites Indian interest.[28] On the other, it stimulates unrealistic expectations that a significant portion of funds could reasonably be invested in India, including in greenfield Indian infrastructure opportunities.

Greater familiarisation between Australian investment professionals and Indian interlocutors can bridge expectation gaps, including on time horizons for investment decisions by Australian funds – in some instances these are comparatively short term unlike defined benefit funds in other countries, such as Canada. Small Australian funds are unlikely to establish commercial presence in India due to cost considerations, or invest in high-risk, long term, projects which the Indian Government is most keen to promote. Rather, small Australian funds are more likely to operate on a fund the fund type basis.

While Australian infrastructure funds are collectively large with $220 billion under management,[26] the relatively fragmented sector generally seeks comparatively de-risked brownfield opportunities.

Australian delegations visiting India play an important role in enhancing knowledge about Australia's foreign investment settings and regulatory environment, particularly outside Delhi.

Bridging the expectations gap between the Indian Government and Australian investors will contribute to a sustainable, long term portfolio investment relationship.

Investment vehicles

Ultimately, facilitating Australian fund flows will require developing more, and more appropriate, investment vehicles – either by the Indian Government or by investment banks[ix].

India has developed several promising vehicles such as the Railway Infrastructure Development Fund in 2017 and India's quasi-sovereign National Investment and Infrastructure Fund in 2015 [*see Chapter 9: Infrastructure Sector*].

Private sector-focused multilateral development institutions such as the World Bank Group's International Finance Corporation (IFC) have an established presence in emerging markets such as India and a clear mandate for attracting international investment. They can be a valuable ally in pursuing policy and regulatory reform, developing context-appropriate investment vehicles, and attracting Australian investment funds.

There is a role for the Australian Government in promoting the benefits of, and need for, such funds. Intermediary institutions such as the IFC can be an avenue to cement closer bilateral investment ties, and help Australian industry navigate the challenging Indian market.

Negotiations and options for investment protection

India unilaterally terminated its BITs in 2017. These provided various legal protections for foreign investors in India (and Indian investors in other countries), including through ISDS mechanisms. The Australia-India BIT, which entered into force in 2000, will continue to apply for 15 years to investments made on or before its termination date of 22 March 2017.

[ix] Vehicles which significantly pool assets and minimize idiosyncratic project/firm-specific risk are likely to appeal to a broader swag of Australian investors with relatively limited market knowledge and no appetite or ability to establish in India.

India's actions send mixed messages. On the one hand, the Indian Government is seeking to increase foreign investment to support initiatives like Make in India. On the other hand, the new Model BIT weakens protection both for foreign investors in India and for new outward investment from India. This is consistent with the Indian Government's broader instincts to intervene and control the market.

Prospects for agreeing a high quality BIT with mutually acceptable terms appear low in the short to medium term. However, conclusion of a successful trade agreement negotiation, such as Regional Comprehensive Economic Partnership (RCEP), could secure improved legal protections for investors in India.

Ongoing reform in India

The attractiveness of India as an investment destination rests with its reform and should be substantial over the period out to 2035: the relevant metric is not what Indian policy makers can achieve in a handful of years, but what they might achieve over a generation.

The likelihood of sustained reform does not mean that India will become an 'easy' market for investment, or trade, any time soon. But if India steadily becomes a much bigger market in sectors where Australia has a competitive advantage, how long can Australian business afford to stay under-weight in the investment elements of the relationship?

The approach of Australian business and the Australian Government

On the issue of successful investment at the company level, the message from business surveys is clear. First, be cautious, patient and invest for the long term. India moves at its own pace. It provides real opportunities for traders and investors, but also presents them with multiple risks that may be hard to define and harder to quantify. Investing in India is not a science and should not be hurried.

Second, prepare meticulously. Investors must develop an in-depth knowledge of the local market and reinforce that knowledge by choosing a trusted local partner to provide local context and access to networks. Focus on sectors or sub-sectors that are priorities for India's governments – like agricultural technology, resources management, infrastructure, and upskilling. And focus too on high performing states and where, ideally, Australian companies have already made inroads.

The Australian Government could play a valuable role by reinforcing these messages and addressing information gaps, including by highlighting the practical results of Indian reform. Introducing interested parties to private-sector focused multilateral institutions such as the IFC can help Australian industry manage risk and expand market access at the central and state level in India.

The approach adopted for India should be part of an overall Australian Government strategy for outward investment that is prominent and well-resourced – as should be the strategy for inward investment. Austrade logically would have policy responsibility for both inwards and outwards investment.

An ambitious target for investment

While the government has no role in directing the allocation of investments, even by its sovereign wealth funds, the Australian Government should support the facilitation of outbound investment where these projects support trade and increase the competitiveness of the Australian firm. This report sets the target of India becoming the third largest destination in Asia for Australian outward investment by 2035. Were this achieved it would represent a transformational increase of economic integration.

Given the current stock of investment, this is ambitious. Currently Japan, China, Singapore, Hong Kong and the Republic of Korea are larger destinations for Australian investment in Asia and

flows there will of course continue to grow. A simple analysis indicates that investment to India would need to grow by at least 13 per cent per annum[x] to achieve this target.

Moreover, to generate the critical mass of on the ground presence needed to build trust, establish networks and enhance business to business ties, Australia will need a greater proportion of future investment to India in the form of FDI.

As laid out in this chapter, there are multiple risks and challenges with reaching this target. However, that it is even conceivable points to the potential and scale of the India story over the next 20 years.

[x] This is based on basic regression analysis to estimate projected growth rates for Australia's investment with India and other markets out to 2035. It assumes investment to Singapore, Hong Kong and the Republic of Korea will grow at an average of 4.5, 3.5 and 1.9 per cent respectively. This is provides a simple indication of the order of magnitude between India and other major markets. Given the growth in total FDI and FPI stocks in India over the last 20 years (19 and 13.6 per cent respectively), it is possible to imagine total Australian investment in India growing at 13 per cent out to 2035.

RECOMMENDATIONS

1. Bridge knowledge and expectation gaps in India and with the Australian business community

1.1 The Australian Government should seek to address information gaps in the Australian business community. Given the Australian Government has no role in private sector investment decisions, this recommendation is about facilitating adequate information to optimise decision making. It can do this by:

- highlighting the practical results of Indian reform to the Australian business community
- detailing any common threads underpinning successful market entry, including the need for: a well-resourced and patient approach to investment; meticulous due diligence and triangulation of accounting data inputs; and a trusted local partner to provide local context and access to networks.

1.2 The Australian Government should seek to bridge the expectations gap between the Indian Government (which views the large Australian managed funds sector as potential green-field infrastructure funding source) and Australian fund managers (who are typically interested in brown field, income-generating and low-risk opportunities).

1.3 The Australian Government should support familiarisation visits to help Australian investors understand opportunities in India

- there is merit in the Australian Government regularly bringing out a small group of Australian superannuation funds representatives and institutional investors for a targeted program of meetings in Mumbai, New Delhi and south India
- this will provide an opportunity for Australian investors to hear first-hand experiences from other foreign investors and also to sit down with Indian Government officials to build mutual understanding about realistic opportunities in India
- in the first instance, delegations should be comprised of fund managers – ministerial engagement should be considered once there is a clear appetite for investment into India
- premature ministerial attendance could raise Indian expectations of the quantum and timing of Australian investment, which industry may not be able to fulfil.

2. Build institutional ties

2.1 Australia should build closer institutional ties with Indian agencies responsible for investment policy and regulation. Australia has a good story to tell on financial market reform and has internationally recognised institutions with proven records of achievement in implementing reforms which support investment.

2.2 Share Australian Governments' asset recycling and privatisation experiences. This represents a practical way to build capacity and potentially open up opportunities for Australian funds seeking infrastructure investment opportunities

- regular policy dialogues between Treasury and Ministry of Finance and NITI Aayog present one opportunity for this to be done at an officials' level, including through the 'GST working group'.

3. Strengthen Austrade's mandate for investment promotion

3.1 Austrade should give greater priority to inwards investment attraction from India.

3.2 Austrade should strengthen efforts to provide facilitation services for direct investment to India where these projects support Australian trade and increase the competitiveness of the Australian firm, particularly among SMEs.

3.3 Australia should also seek to strengthen its presence in India to support corporate issue resolution and approvals-related interaction between Australian firms and Indian Government departments at the state and central levels

- this could be supported by exchanges and secondments with Indian Ministries which control approvals or incentives relevant to Australian investors, as well as between Austrade and Invest India.

4. Joint research projects on bilateral investment opportunities

4.1 The Australian Government, through Austrade or DFAT, should commission short research projects to better understand the experience and potential of Australian institutional investors in India or of Indian investors in Australia.

4.2 A separate report could be commissioned to compare risk-adjusted returns across sectors in India and Australia, following on from the PricewaterhouseCoopers/Asialink Match Fit report which noted that Australian businesses underestimate the risk of the business climate in Australia and overestimate the risk in Asia.

5. Pursue greater investment protection

With the Australia-India BIT now terminated unilaterally by India, a successor arrangement covering investor protection and investment facilitation should be a high priority

- given significant concerns about the level of protection that India's model BIT would provide, the prospects of an Australia-India investment treaty are currently very limited
- concluding a workable investment chapter in the current RCEP negotiations is a more realistic alternative.

EDUCATION SECTOR

CHAPTER THREE

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SUMMARY

- There is no sector with greater promise for Australia in India than education.
- Australia's future growth and prosperity will be driven by our ability to generate and attract the 'best and brightest'.
- Getting education right is also critical for India to maximise the potential of its demographic dividend.
- India cannot meet the demand for education on its own.
- As a world-class education provider, Australia is well placed to partner with India across secondary, university and vocational sectors.
- Australia should look to increase the number of high calibre Indian students at its universities and deepen two way research links while continuing to welcome Indian students who seek an Australian education primarily for a migration outcome.
- Australia's vocational system is highly regarded in India and providers can benefit from this reputation if they can adjust their business model to reflect India's low-cost, high-volume environment.
- Online education will be crucial if India is to meet its massive education needs and Australia should work more closely with India in this area.
- Increasing the recognition in India of Australian qualifications will give a significant boost to the education relationship and should be a priority for the Australian Government.
- India is big enough to accommodate all Australian education providers, which need to collaborate more and place increased emphasis on the quality of an Australian education in their marketing.

1.0 THE MACRO STORY

KEY JUDGEMENT

Getting education right is critical for India to maximise the potential of its demographic dividend by ensuring its millions of young people are equipped to enter the workforce and able to adjust to rapid technological change. India's young population is increasingly willing to pay for education if there is a clear path to more and better jobs. India will not have the capacity to meet this demand on its own. Its institutions cannot currently service the number of prospective students and quality remains patchy. As a world-class provider of education and training across secondary, university and vocational sectors, Australia is well positioned to partner with India.

Education as the flagship sector

A strong and productive Australia-India education relationship should be seen as the flagship of the bilateral relationship. The Australian Government has four key roles to play in realising this vision.

First, it should seek to expand the Indian student base beyond those who come to Australia for an education and stay to add skills to our economy. This cohort should be augmented with an increase in Indian students who value an Australian education for its high quality and who will return to India to lift its human capital, and also create bridges between our societies. Second, the Government should deepen the research and innovation relationship. Third, it should position Australia as the foreign provider of choice for India's technical and vocational education and training (TVET) system. Fourth, it should create platforms to enable collaboration on the online delivery of education in India.

Boosting our education links with India is also a hedging strategy against an over reliance on the Chinese market, which accounts for roughly 30 per cent of our education exports. China is investing heavily in its domestic education institutions, is moving up the quality curve quickly and has adopted aggressive targets as a provider of international education. China will remain the largest source of international students in Australia for the foreseeable future but there will be less need in the future for Chinese students to seek an Australian education.

1.1 The scale and key structural drivers of the sector

INDIAN DEMAND

The increasing willingness of Indian parents to pay for their children's education, strong demographic tailwinds and the changing nature of the economy and employment, will drive demand for quality education and training.

Rising incomes have created a willingness and ability among large swathes of Indian families to pay for a quality overseas education for their children

- a recent HSBC report found the number of Indian parents wanting their children to study abroad had jumped from 47 per cent in 2016 to 62 per cent in 2017 [29]
- other surveys have found that over 70 per cent of Indian parents were willing to take on debt to fund education, higher than the global average of 60 per cent.[30]

India's demographic profile will also be a key driver of demand

- India's tertiary-age (18–22) population is the largest in the world and is projected to peak at 126 million in 2026 before stabilising at 118 million by 2035
- Indian enrolment in higher education (27 per cent) lags far behind peers like China (43 per cent) and Brazil (51 per cent)

- by 2030, India aims to lift the enrolment rate to 50 per cent, which would mean that one in four graduates in the world would be a product of the Indian higher education system.

India created additional capacity for over 40 million students in the last two decades, but requires a further 200,000 secondary schools, 35,000 colleges and 700 universities to meet growing demand.[31]

India's growth model will not mimic the East Asian experience of the 1970s, 80s and 90s

- manufacturing as a proportion of GDP is likely to remain lower in India than its East Asian peers
- which means India's workers will not have access to the same proportion of unskilled and lightly skilled export-oriented manufacturing jobs.

The expected increase in the urbanisation[xi] of India's population and formalisation of India's labour market will likely lead India's growing economy to create the bulk of its new domestic jobs in services and capital-intensive manufacturing

- without plentiful low-skilled manufacturing jobs, India will need to equip its population with high quality education and training so that new entrants into the labour market have the required skills
- services will also be an important source of jobs for Indians wishing to seek opportunities in international markets.

Indian Government estimates suggest an additional 120 million skilled workers will be required by 2022, fuelling demand for vocational training

- only 2 per cent of India's workforce has received any skills training
- India has an estimated 7 million people a year enrolled in vocational training[32] (compared to 90 million in China and 11 million in the United States[33])
- surveys of employers find that half of new hires and graduates are not adequately prepared for their job
- poor assessment and certification systems make it difficult for employers to distinguish the quality of institutions and graduates.

INDIAN SUPPLY

Despite much effort and some improvements over the past decade, India's education sector suffers from limited international collaborations, low focus on research, outdated curricula and a lack of job-relevant courses

- this is reflected in global university rankings, where India has no entrant in the top 100
  - in contrast, six of Australia's 39 universities are ranked in the top 100 [34]
- an inadequate emphasis on curriculum design limits the industry relevance of some courses
- cultural attitudes and remnants of the caste system also constrain efforts to skill more young Indians in vocational trades, as some young Indians maintain a traditional outlook that may constrain their willingness to undertake manual or physical labour.

Public spending on education in India remains low, both in absolute terms and as a proportion of government expenditure, even compared with other emerging economies

- measures are needed to improve the effectiveness of spending, including better incentivising teachers and more efficiently allocating higher education funding.

Technology will be important in delivering scalable solutions to India's university and vocational needs.

India will also need to turn to foreign education and training providers to bridge the gap between demand and supply.

AUSTRALIA'S COMPETITIVE ADVANTAGE

India is already Australia's second biggest education market and Australia is the second most popular destination for Indian students after the United States

- Australia's competitive advantage resides in our capacity to provide a high quality tertiary

[xi] The United Nations projects that India's urbanisation rate will rise to 42 per cent by 2035, lifting the urban population from 410 million in 2014 to 640 million in 2035.

education taught in English, with attractive work and migration options for Indian students, alongside a world-class vocational system

- if Australia maintains its growth in international students and can recapture its share of Indian students from its 2009–10 peak, direct revenue from Australian education exports to India could exceed $12 billion by 2035.[xii]

1.2 How the sector will likely evolve out to 2035

India is unlikely in the medium term to loosen restrictions that prevent foreign universities operating standalone campuses in India

- even if regulations are eventually relaxed, foreign universities face a historical reluctance from Indian parents to pay large sums of money for their child's education in India
  - tuition at public universities and colleges in India is virtually free
  - undergraduate study at elite Indian Institutes of Technology (IITs) costs roughly $4,000 per annum.

In contrast to the university sector, vocational education is relatively less regulated

- foreign companies are already allowed to establish for-profit enterprises in India to provide training, assessment services and content.

The gradual formalisation of the Indian workforce out to 2035 will increase standards for skilled labour and stimulate demand for quality vocational training

- for example, Indian Government departments may soon require mandatory certification for employees – the Skill Development and Entrepreneurship Ministry wants to make skill certification mandatory for public sector jobs by 2020.[xiii]

As simple and repeatable tasks become automated, the skills required for employment will shift, increasing demand for quality vocational training

- existing workers and new entrants alike will need to upskill more regularly throughout their career.

Technology will increasingly change the way education services are delivered and consumed in India over this period

- despite reluctance to accept higher education courses that incorporate online teaching, India has become the second largest market for e-learning after the United States, currently worth USD2 billion and expected to reach USD5.7 billion by 2020[31]
- traditional education suppliers will be forced to compete with low-cost online and virtual options, from both Indian and international players.

Within 10 years, digital learning content could entirely replace printed books

- mobile education applications like Byju, which helps hundreds of thousands of Indian K–12 students study for competitive exams, are on the verge of billion dollar valuations[xiv]
- augmented, blended and virtual learning environments are being taken up by some Indian schools.

[xii] To reach this figure the following assumptions are made: 1) the growth rate of total international student numbers to Australia from 2002–2016 (roughly 6 per cent) continues out to 2035; 2) India consists of 18 per cent of total inbound students to Australia in 2035 (which it reached in 2009); 3) the total number of Indian students will therefore be 192,000 by 2035; 4) each Indian student contributes approximately $39,000 in direct revenue – this is calculated by dividing FY2016/17 revenue ($2.3 billion) by the number of Indian students in 2016 (60,000). These assumptions produce a revenue figure of $12.7 billion. Modelling commissioned for the India Economic Strategy using rates of growth of outbound Indian students globally and Australia's market share of Indian students produced a figure of $9.4 billion by 2035.

[xiii] To secure a job in government, applicants will need to have National Skill Qualification Framework certification. The proposed competency-based framework will measure skills and accomplishments on a scale from one to 10 from entry to doctoral levels.

[xiv] The Chinese tech company Tencent made an investment in mid–2017 in Byju which reportedly valued the company at USD800 million. Other investors in Byju include the Chan Zuckerberg Initiative and Sequoia Capital.

CASE STUDY: ACER: AUSTRALIA INVOLVED IN DEVELOPING INDIAN SECONDARY SCHOOL STANDARDS

With a large and growing young population, demand in India for quality education is increasing exponentially. Improving standards in secondary schools across the country will be vitally important if India is to make the most of its demographic dividend.

An Australian not-for-profit organisation has the technical expertise to play a role. Australian Council for Educational Research (ACER) has decades of experience developing tools to assess educational standards. For many years, it coordinated the assessment of reading, mathematics and science across 60 OECD countries to enable international comparison.

ACER has been involved in developing India's first national benchmark for secondary school students. *The National Achievement Survey* for Year 10 students gives Indian policy makers information on student outcomes with results broken down by gender, socio-economic status and school location.

The survey assessed students in five subjects; mathematics, science, social science, English and Modern Indian Language. It tested 275,000 students in more than seven thousand schools, across 33 Indian states and in 12 different languages.

ACER collaborated with India's National Council for Educational Research and Training (NCERT) and educational consultants Cambridge Education, from 2014 to 2016, providing technical support and capacity building for NCERT to design and implement the survey. It also developed an online tool for data to be reported by jurisdiction and manuals for future surveys.

This was complex and challenging work, involving many geographical regions, governing boards and languages. Through careful planning and applying already well-established procedures, ACER has been able to contribute to a rigorous and successfully implemented new Indian benchmark.

2.0 OPPORTUNITIES FOR PARTNERSHIP

KEY JUDGEMENT

India will look to other countries for three things: to provide on-shore training; to provide offshore education; and to offer pathways for Indian workers to take up jobs overseas. Australia is well placed to partner with India across all three. Australia and India are also natural partners in online education and should deepen research links.

2.1 Export opportunities

HIGHER EDUCATION (MIGRATION PLUS)

Australia offers a high quality student experience in a safe, multilingual and multicultural society with a temperate climate

- the 2017 International Student Survey, which sought views of international students from all countries, ranked Australia: the most welcoming country for international students; the 'safest' country for international students; and the country offering the 'best lifestyle' for international students
- the familiarity that comes with a growing diaspora community provides an additional boost to prospective Indian students.

Work rights associated with student visas are welcomed by Indian students[35], even though Australian regulations do not guarantee international graduates post-study work rights

- changes made in 2013, including the lifting of restrictions on the kind of work graduates can do, mean post-study work rights in Australia compare favourably with those in other major host countries
  - graduates who apply for and obtain a Temporary Graduate visa can now work in any role for which an employer is willing to hire them.

For as long as Australia maintains a large immigration program, Australia's interests are served by attracting Indian students whose primary goal is migration, thereby adding to our skills base

- there is considerable capacity, particularly outside the east coast, to cater to more Indian students
  - Indian student numbers are growing at a slower rate and off a lower base than students from China.

That said, we need to ensure we are attracting the science, technology, engineering, mathematics and medicine (STEMM) talent that will drive Australia's future growth

- the most popular field of study for Indian students is management and commerce (45.6 per cent of university enrolments and 45.4 per cent of vocational education and training [VET] enrolments).

Indian higher education students overwhelmingly choose to pursue their Australian education through a Masters by coursework degree (70 per cent)

- pathways should be expanded for Indian undergraduate, postgraduate and doctoral students who target Australian universities for specific, world leading qualifications, and then return to India to continue their career.

Attracting the best international students helps to maintain the quality of Australia's higher education system

- it also builds links with the next generation of Indian leaders in business, government and academia.

However there is a mismatch between the quality of Australian institutions and Indian perceptions of their quality and prestige

- Indian students and parents place Australian universities on a rung below universities in the United States and United Kingdom
- like Indian students, hundreds of thousands of Chinese attend university in the United States and United Kingdom
  - but unlike India, 52 per cent of Chinese students who choose to study in Australia do so at a Group of Eight university, compared to less than 10 per cent of Indian students.

Changing long-standing perceptions about the quality of Australian higher education in India will require new approaches and take time

- this opportunity is enhanced in the short term by political developments in the United States and United Kingdom, which have a negative effect on Indian perceptions of these markets.

These perceptions can also be improved by having Australian students undertake exchange programs and internships in India

- the New Colombo Plan, in conjunction with Endeavour Scholarships and Fellowships, play a vital role in this area by connecting young Australians with Indian universities and businesses
  - in particular, Australian students completing internships in India with Indian companies help raise awareness among Indian managers of the quality and value of Australian education
- likewise, the formation in 2017 of the Australia India Institute's New Generation Network fosters early-career researchers in Australia to conduct policy relevant research on India.

ONLINE AND DISTANCE EDUCATION

Online education will play an important role in India's education future, particularly in reaching students in rural and regional areas who may have previously lacked access to the same opportunity as their peers in urban centres

- once Australian providers have developed strong brand recognition – perhaps through the provision of massive open online courses (MOOCs) – delivery of fee-for-service courses can follow.

By 2025 India is projected to have 850 million online users, many of whom will have moved from lower-generation network connectivity (2G) to higher-generation (3G, 4G and 5G)

- half of India's internet users will be rural (up from 17 per cent) and 40 per cent will be women
- currently only 20 per cent of Indians enrolled in MOOCs are women, suggesting latent potential but also challenges in reaching more women through online delivery.

As a result of rising digital connectivity, users of online education in India are expected to reach 9.6 million by 2021, up from 1.6 million in 2016

- this includes vocational training, secondary school tutoring and exam preparation, and university courses and degrees delivered online

Australia has world-leading distance education platforms which offer flexible study options that are scalable and can reach isolated students

- our competitive advantage in online education is enhanced by Australia's favourable time zone compared to competitors in the United States and Canada
  - Western Australia, for example, is only two hours ahead of India.

There is also opportunity for Australian digital educational providers to partner with India's large multinational conglomerates to pilot new education technology, using Australian content, and scaled up in India as a pathway to global markets.

CURRICULUM DEVELOPMENT

India's education quality challenge is widespread.

At the tertiary level, 91 per cent of accredited colleges are rated average or below average by India's National Assessment and Accreditation Council; at the primary school level, only 37 per cent of Year 4 students can read at Year 2 level.

Australian providers can contribute to the work that India is doing to lift standards by packaging courses, curricula and school programs to Australian/international standards, and where

relevant benchmarking to Indian requirements and occupation standards.

Courses could also be developed to consider requirements for other international markets, especially the Gulf states

- for example, the Australian Council for Educational Research (ACER) worked with India's National Council of Education and Training (NCERT) to design, implement and report a new National Achievement Survey for students in Year 10.

2.2 Collaboration

TECHNICAL VOCATIONAL EDUCATION AND TRAINING

There are immense opportunities for Australian vocational providers in India, where Australia's TVET system is held in high regard for the global employability of its skills training.

These opportunities will occur across three distinct parts of India's TVET system: working with the Indian Government; partnering with Indian training providers to offer courses for both onshore and offshore employment; and working directly with large Indian corporates to meet their skills needs.

Australia's strength in vocational training is aligned with the Skill India campaign, a flagship reform effort of the Modi Government, which originally announced its plan to upskill 400 million workers by 2022, although formal targets have since been abandoned

- quality trainers and assessors are the cornerstone of a modern, industry-relevant vocational education system, and demand for high quality vocational trainers and assessors will grow as demand for Indian skill levels rise
- Australian TVET providers can help India develop a large pool of qualified trainers and assessors capable of imparting industry relevant skills and knowledge.

Technical vocational education and training for jobs both in the Indian market and in third countries will need to be delivered in India through a partnership model

- Australian providers need to spend time to understand the labour market requirements and not produce a high-end training product that may unnecessarily increase the cost and time commitment of workers
- Australian providers will need to be selective in deciding which partners to take on and should develop courses across two tiers that differentiate between employers in India and employers in third countries
  - accreditation requirements for the Indian domestic labour market may be lower than the requirements of employers in third countries, such as the Gulf states, where qualifications will need to be developed to international standards
  - Australian providers should adjust their products to reflect this reality, which would allow them to reduce their costs and become more price competitive in the Indian market, without diluting the value of Australian qualifications in the sector.

Employers and employees in India's private sector both recognise the need to upskill and invest in training

- 88 per cent of India's top 50 companies invest in skill development[36]
- a survey of over 5,000 job seekers and employers found nearly two-thirds of graduates aged 18–34 felt underprepared in their first job[37]
- many Indian companies would prefer tailored courses focused on being 'job ready' rather than longer, more generic accreditation programs
  - Australian providers can respond to this need by including fast-tracked courses for professionals that recognise existing experience.

CASE STUDY: DEAKIN UNIVERSITY: INNOVATIVE MARKETING STRATEGIES APPEAL TO INDIAN STUDENTS

One Australian university making its mark in India is Deakin. In 1994, Deakin was the first Australian university to set up an office in India. Since then, the university has continually expanded its engagement with Indian students, business, research institutions and government.

Deakin has found success by connecting with Indian students through media and popular culture, and investing in collaboration with industry and research partners to address India's development needs.

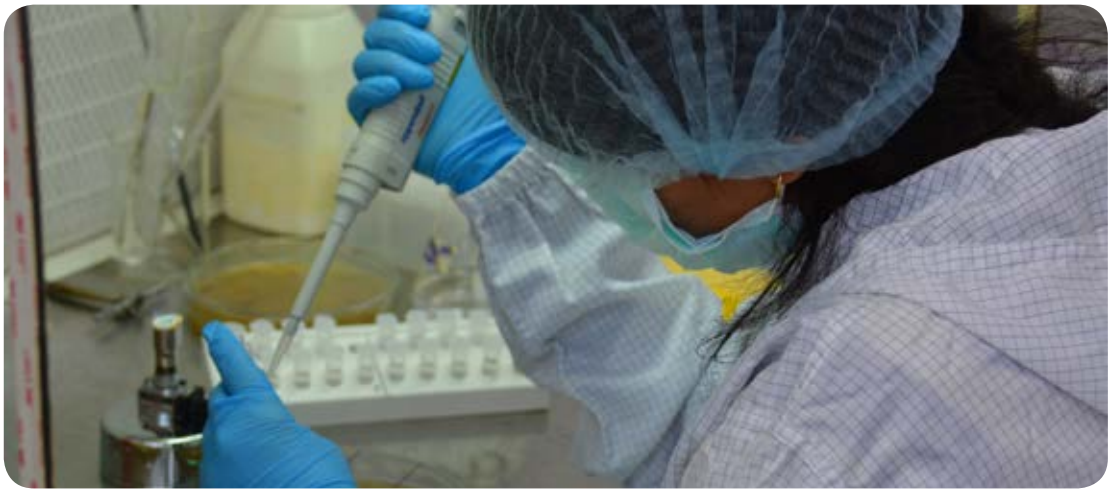
Deakin takes a novel approach to attracting enrolments and interest in its courses. The NDTV Deakin Scholarships Competition is an annual televised contest broadcast across India for four students to win 100 per cent tuition-free enrolment at Deakin. This showcases the potential of the Australian education experience to the largest tertiary age population in the world.

This approach is bearing fruit. The latest annual commencement figures at Deakin for Indian students have grown almost seven-fold since 2012.

Deakin's innovative approach to engaging students is complemented by an ambitious program of partnership development, with research investments exceeding $10 million.

Deakin's work with Indian corporations aims to develop new commercial technologies in the industries of the future: material science and advanced manufacturing; data analytics for health; and biotech applications in pharmacology, health (diabetes and obesity), agriculture and the environment.

A centrepiece of Deakin's engagement with India is the TERI-Deakin Nano-Biotechnology Centre. Established in 2010, near Delhi, the Centre brings together up to 100 researchers and PhD students to solve some of the world's biggest problems, from developing biofuels to early detection of crop diseases. These practical solutions create commercial prospects for both Australia and India, furthering our economic partnership.



JOINT PROGRAMS AND TWINNING

Opportunities for Australian universities to establish their brand in India for the foreseeable future will continue to be through joint partnerships and twinning programs of the sort pioneered by Deakin University and Monash University.

Even if India loosens regulations on foreign universities, Australian universities may find it more difficult to successfully establish a standalone physical presence in the Indian higher education market compared to recent expansion into Southeast Asia

- our universities may need to adjust their business models to adjust to the price sensitivities of the Indian consumer and constraints on faculty availability and research capability.

PHD AND RESEARCH COLLABORATION

India is determined to lift both the quantity and quality of PhD students its universities generate

- this is partly a matter of pride for India, which currently does not have any universities in the top 200 of world rankings, but it also wants its graduates to be recognised as being job-ready at home and abroad.[34]

The Indian higher education system on its own does not have the capacity to expand the annual cohort of PhD graduates to meet demand

- in relative terms, India produces a tenth of the number of PhD students that Australia does[xv]
- in the critical field of STEMM, which has historically drawn considerable numbers of Indian students, India graduates less than a third of the number of PhDs compared to the United States.

Although the proportion of Indian PhD students who go overseas for their doctoral training has decreased, competition for limited places in PhD programs at India's top universities forces a significant number of talented students to look for opportunities overseas

- however, Australia attracts relatively few PhD students from India
  - the ratio of Indian PhD to Indian undergraduate enrolments is lower than the ratio at United States universities
  - Australia also attracts significantly more Chinese PhD students than we do from India.

Attracting high quality students in advanced courses helps build our reputation as a premium education destination, establishes important people to people links, improves the visibility of Australia's academic expertise, and can be a precursor for a more established partnership between universities.

Research collaboration is a pathway to commercialisation and technological advancement; twinning programs; student exchanges; and the establishment of a pipeline from undergraduate to postgraduate and doctoral studies

- the effect works in reverse too – student exchanges, particularly at the higher degree research level, are a pathway to research collaboration.

While collaborative research between Australian and Indian researchers has increased significantly in the last two decades, and is up 40 per cent since 2015, there is considerable scope for further improvement

- India consistently ranks outside the top 15 countries for Australian collaborative research projects funded by the Australian Research Council.

[xv] The proportion of PhD students to total student enrolments in India is 0.4 per cent; in Australia it is 4.1 per cent.

3.0 CONSTRAINTS AND CHALLENGES

KEY JUDGEMENT

The Indian university education system is heavily regulated but the vocational sector has a more welcoming regulatory environment.

3.1 The policy and regulatory environment

SLOW PACE OF REFORM

Government reforms in the university sector will continue to be slow and difficult

- particularly in the online education sector, where Indian regulators hold outdated views on curriculum delivery and are reluctant to acknowledge or accredit higher education courses that include an online component.

While Central Government ministries have a mandate from the Prime Minister to prioritise reform in the sector, and are working on online learning regulations, bureaucratic capacity constraints and underfunding mean it is unlikely to see transformational reform in the next 15 years.

AUSTRALIAN QUALIFICATION RECOGNITION IN INDIA

Foreign qualifications must be formally recognised by the Association of Indian Universities (AIU) for the purposes of further study and for some employment opportunities in India, including the public service

- the AIU will not recognise degrees that include a pathway course (such as a diploma or foundation course) or any degree wholly or partially taught online or through distance study
- these restrictions are applied uniformly to foreign countries
- the restrictions which most affect Australia include a lack of recognition of: three-year bachelor degrees, higher education qualifications obtained through a TVET pathway and master's degrees of less than two years.

Australia would benefit from having its qualifications 'validated' and the resulting fillip to the perceived quality of its qualifications, while India would gain from the qualifications that alumni bring home if those qualifications were recognised without impediment.

Incremental change has occurred regarding qualification recognition

- intensive courses that count units of study rather than length of time have been recognised, allowing, for example, degrees undertaken on a trimester basis to be counted
  - but this stops well short of what Australia would like to see.

INDIAN FOREIGN PROVIDERS BILL

The most recent Foreign Universities Bill was introduced in 2010 but faced significant opposition and lapsed in 2014. Previous bills floundered in 1995 and 2005

- the 2010 Bill would have allowed foreign institutions to establish campuses in India
- support for the Bill has been stymied by the many vested interests, including Indian politicians and local business owners, who have a business stake in Indian universities and do not want to see foreign competition enter the market.

In 2015, Prime Minister Modi commissioned a report by NITI Aayog which found that allowing foreign universities into India could help meet the demand for higher education in India, increase competition and improve standards of higher education

- opportunities could be made available to 'reputed' institutions or 'institutions of excellence' – understood to be top 200 global universities – to operate in India.

Even if these mooted changes to the Bill do take place, government monitoring and regulation of the fees which foreign providers charge may deter Australian providers from establishing a presence in India.

CHANGES TO VISA SETTINGS

International students from most major source countries, including India, consistently identify post-study work rights as an important factor that influences their choice of where to study. This is particularly relevant for graduate students

- changes to our visa settings are closely followed in India
- reforms to our visa processes currently under consideration would have a beneficial effect on the speed and simplicity of visa processing
- any changes in the opposite direction have the potential to affect the broader bilateral relationship.

3.2 Skills, infrastructure and other constraints

REPUTATION

Despite Australia's strong international reputation in the education sector and a high quality education 'system' as a whole, Indian students perceive Australian education to lack gravitas

- this is partly explained by history – when India's nascent professional middle class first studied abroad in the 1970s and 1980s they tended to go to the United States or United Kingdom
- Australia also has fewer very highly ranked institutions (only one university in the top 40) and lacks an education powerhouse brand such as Harvard, MIT or Oxford.

Australia's education reputation can also be affected by the significant variability in the quality of education agents in India

- Indian students, over half of whom will use an agent at some stage, can find it difficult to discern the credibility of the many international universities competing for their attention, and often rely on unregulated agents to navigate the complex process for studying at a foreign institution
  - students still prefer human contact with their agents although the use of virtual advice is increasing
  - unscrupulous agents representing Australian private institutions can do great harm to Australia's education reputation
- initiatives to improve transparency of agent performance are an important response
  - including Australia's Department of Education and Training's 'Education Agents Data Project', which gives registered education providers access to reports about the education agents they engage to recruit overseas students
- significant disintermediation of the agents market in India will likely occur within the next five years
  - this will affect the smaller end of the agent market disproportionately, thereby addressing some of the concerns around agent quality.

DIASPORA CONCENTRATION IN VICTORIA AND NEW SOUTH WALES

Australian universities outside Victoria and New South Wales report difficulties in attracting Indian students.

The presence of large diaspora communities on the east coast produces a network effect

- as the diaspora in those states grows, word of mouth and the presence of family, friends and familiar communities increases the desirability for Indians to choose to study there.

AUSTRALIAN UNIVERSITIES ARE PERCEIVED TO LACK CLOSE CONNECTIONS TO BUSINESS

Employability is a major consideration for Indian students when choosing university options.

Many Indian students perceive Australian universities to lack close connections to industry, especially compared to competitor countries like Canada that have highly evolved cooperation projects for students to gain business experience as part of their coursework

- Indian students in Australia feel they miss out on practical opportunities that would enhance their job prospects
- Australian businesses are wary of engaging with international students because they may not understand relevant visa settings.

This also causes Australian businesses to miss out on a significant talent pool of international students due to a lack of exposure, even though visa arrangements allow international students to work while they study.

LIMITED DOCTORAL FUNDING

Compared to the United States and United Kingdom, Australian universities offer limited funding for doctoral research, lowering demand for Australian education at postgraduate level

- we have a comparative lack of scholarships and an inability to match the suite of United States price points
- the prevalence of United States scholarships means less than 10 per cent of Indian PhD students pay the sticker price for their degree.

MISALIGNMENT OF BUSINESS MODEL FOR AUSTRALIAN VOCATIONAL PROVIDERS

The high volume, low cost model needed for India does not stack up economically for most Australian providers, who operate on a low volume, high cost structure

- providing a quality product is central to Australia's competitive position in vocational training
- Australian providers are wary of diluting the quality of Australian qualifications to meet the cost needs of Indian consumers.

COMPETITION IN ONLINE EDUCATION

Competition from domestic local low-cost providers will hinder the rate of adoption of online distance education from international suppliers.

Existing brick and mortar education companies with a strong understanding of local conditions are able to quickly and efficiently scale up their online presence

- for example, EduComp – the largest education company in India – runs over 200 pre-schools, 94 test preparation centres, 50 K–12 schools, six colleges and one higher education campus
  - it also has an online user base of 5.5 million customers.

4.0 WHERE TO FOCUS

Australian education providers should focus on Indian states with high literacy rates, a demonstrated commitment by the state to spending money on education, and states with good English language skills. The states highlighted below reflect a judgement on both current demand and future demand. Despite being among the poorer Indian states, Chhattisgarh and Himachal Pradesh fit the latter category because state spending on education is far above the national average. While literacy rates and the proportion of state budgets directed at education are not the determining factors, they point to the size and sophistication of the education markets in these states into the future.

4.1 The Centre and the states

Expansion and reform of the higher education system will be driven by the states.

Higher education in India is witnessing a rapid move towards greater state autonomy

- responsibility for higher education budgets and governance is being devolved from Central to state governments, where state institutions and their affiliated colleges account for 97 per cent of higher education enrolment in India.

Within states, school and tertiary education providers should focus on high income urban clusters such as Ahmedabad, Chandigarh, Chennai, New Delhi and Mumbai

- these will provide a customer base of students who demand and are willing to pay for an international education.

For deepening research links, Australian universities should connect with Indian counterparts that are serious about increasing their global rankings, have good governance structures and faculties that align with Australian expertise

- up and coming private universities are most prospective in this regard
- leading Indian public universities are sometimes seen to be hard to deal with
- utilising the Indian academic diaspora in Australia to navigate some of the complexities of the Indian research system might help [*see Chapter 18: The Role of the Diaspora*].

For vocational providers, the choice of sector will drive decisions on which states to target

- for example, skilling in health care could be focused on Kerala and Karnataka, given their history of exporting health care personnel and the presence of a developed health care market respectively
- hospitality providers could consider Kolkata in West Bengal because of its status as a hospitality training hub for students from the north-east, who comprise a substantial proportion of the Indian hospitality industry nationwide.

CASE STUDY: IDP: ENABLING INDIAN STUDENTS TO ACHIEVE THEIR EDUCATION GOALS IN AUSTRALIA

International education is Australia's third largest export industry. India's growing population, expanding middle class, rising disposable incomes and the perceived value of an international higher education means increasing educational demand that Australia is well positioned to meet.

IDP, an ASX listed company 50 per cent owned by Australian universities, is a global leader in international education services and has become a key player in supporting the industry's growth.

Since opening its first office in Delhi in 1995, IDP's Indian operations has grown to 32 student offices, 49 International English Language Testing System (IELTS) centres and more than 900 staff. In the financial year of 2017, close to one in five Indian students who arrived in Australia used IDP's services.

IDP's Indian growth strategy has been built on its long term investment and understanding of market conditions. The international education market shifts quickly and education providers need to make sure they understand and, where possible, anticipate the needs and behaviours of students.

This was tested in 2009, when Australia's international education sector faced challenges. The combination of negative media attention, a rising Australian dollar, closure of some colleges, student safety concerns and tightened visa rules led to perceptions that Australia was no longer a welcoming destination for students. As a result international student numbers from India to Australia declined significantly.

IDP remained committed to its students and clients during this challenging time, which held it in good stead as market conditions improved and growth returned.

The company's growth in India relies on teams maintaining absolute passion for improving the experience of students and test takers. IDP has six Australian offices providing education and support services that help students feel connected, engaged and empowered throughout their studies, including after students arrive in Australia.

IDP's success also comes from its investment in training staff to be experts in the education systems of key English-speaking countries' and its commitment to connect students with the right course that will help them achieve their global education and career aspirations.

4.2 Key states

KERALA

- Literacy rate: 94 per cent – highest in India
- Education spend as proportion of state budget: 15.3 per cent

Skill development has good potential given Kerala's demand for skilled labour exports as well as the state's practical approaches, including the Additional Skills Acquisition Programme, Kerala Academy for Skills Excellence and Asian Development Bank-funded Community Skills Parks.

TAMIL NADU

- Literacy rate: 80 per cent – one of the few large states in India with a literacy rate above 80 per cent
- Education spend: 14.7 per cent
- Highest Gross Enrolment Ratio of Indian states: 44.3 per cent

There are 83 active Memorandum of Understandings (MoU) between Australian Universities and educational Institutions in Tamil Nadu. Tamil Nadu was one of the early states to open its higher education sector for private participation.

MAHARASHTRA

- Literacy rate: 82 per cent
- Education spend: 18.2 per cent – one of the highest spend rates on education in India

Maharashtra had the highest number of students trained by National Skill Development Corporation partners in 2015–16.

CHHATTISGARH

- Literacy rate: 70 per cent
- Education spend: 19.7 per cent

Despite literacy rates slightly below the national average, Chhattisgarh stands out for spending nearly 20 per cent of its state budget on education.

HIMACHAL PRADESH

- Literacy rate: 83 per cent
- Education spend: 19.1 per cent

Himachal Pradesh's recent performance on educational outcomes is exceptional by north Indian standards. In 2015–16, there were 993 schools per 100,000 people in the state compared to the national average of 475. The average student-classroom ratio for upper primary school (11–12 years old) in Himachal Pradesh was 10 compared to the national average of 17.

Much of this is as a result of government investment in public service delivery, enabled by the greater fiscal space that the state has enjoyed from its special category status (this status entitles states to greater assistance from the federal government). These investments culminated in a 15–30 per cent increase in the learning outcomes of primary students in 2016–17.

CASE STUDY: KANGAN INSTITUTE: AUSTRALIAN INSTITUTE TEAMS UP WITH CAR-MAKING GIANT TO TEACH AUTOMOTIVE SKILLS IN INDIA

As a nation with a young, growing population, India is focused on growing the skills of its youth to prepare its workforce for the future.

The Kangan Institute, an Australian technical education provider, is using its track record in innovative training solutions to be part of India's transformation. Partnering with the Government of Gujurat and Maruti Suzuki, a major Indian car manufacturer, the Kangan Institute is India's knowledge partner in delivering the first International Automobile Centre of Excellence (i-ACE) in India. The Centre in Gujarat will be based on its own centre in Melbourne, recognised as a cutting-edge facility at the forefront of automotive training.

The significance of this project lies in its status as an industry initiative. The involvement of Maruti Suzuki puts the centre at the nexus of industry and education, focusing on the job-ready skills which business needs. With India's automotive sector forecast to quadruple in size to US$300 billion by 2026, the venture is a strategic investment in India's industry training.

A major project of this nature takes time. Kangan Institute teamed up with enthusiastic and committed partners, and hosted these partners to visit its Melbourne centre numerous times, to share experiences.

This project is the first of its kind in India, and a great opportunity for the Kangan Institute to showcase its facilities internationally.

RECOMMENDATIONS

6. Consistent and deliberate branding to unite fragmentary approach to education marketing in India

6.1 Reposition 'Brand Australia' to improve the perception in India of the quality of Australian education.

6.1.1 Make India a priority market as part of the global refresh of Australia's education brand in line with the National Strategy for International Education 2025 and Austrade's 'Australia International Education 2025' initiatives.

6.1.2 A 'Study in Australia' education hub should be established in New Delhi based in commercial offices rather than in our diplomatic mission

- India is big enough to accommodate all Australian providers, which need to stop seeing each other as competition and instead to collaborate in a coordinated manner
- this hub would be responsible for the international marketing and promotion of Australian education and training, and be led by an upgraded Austrade presence with on the ground support from the Department of Education and Training and Universities Australia
- the hub would work directly with industry, peak bodies, and local providers to build a 'Study in Australia' brand which highlights the quality of Australian education
- universities that have a presence in India could consider co-locating in the hub.

6.1.3 Develop annual visits and roadshows to target prospective students, as well as specific schools and universities

- including matching Indian students with Australian universities
- attention should be given to encourage Indian students to explore options beyond Victoria and New South Wales, including by working with Australian states to identify areas of competitive advantage they can promote in India.

6.1.4 A united Australian approach to education in India should emphasise the quality of Australian education and could also address the problems with agent quality by increasing trust and confidence in Australian education institutions

- bringing together providers with government and industry groups would strengthen information dissemination channels so that prospective Indian students can rely less on agents, including by helping students enrol directly with their institution of choice.

6.1.5 The emphasis on quality should be a commitment shared by all Australian institutions marketing in India

- if this commitment is weakened by even one or two institutions it tarnishes the reputation of all.

6.1.6 The Australian Government should monitor visa rejection rates, and urge those institutions with high rejection rates to review their approach to selecting quality students.

6.2 In line with Austrade's global Digital Engagement Review, deliver cohesive, consistent and fit-for-purpose information for Indian students across all online channels, including information available in significant Indian languages.

- Austrade's 'Study in Australia' website and any future digital channels should have pages in major Indian languages, including Hindi, Tamil and Punjabi
  - Austrade's current portal for international students can be viewed in 11 languages, including Russian and Italian, but there are no Indian languages available
  - Indian language content is particularly important for the parents and grandparents of prospective students, who will usually be responsible for paying their child's tuition fees.
- Austrade should also consider a digital platform that is capable of leading students from initial inquiries and research through to course and institution selection, scholarship applications, enrolment, and visa information using a single account
  - this account should allow students to repeatedly return to the site to check their progress against the various steps required to realising their Australian education ambitions.

6.3 Expand this collective effort to attract Indian secondary school students to attend Australian schools

- Australian secondary schools – particularly those with boarding facilities – as well as relevant industry groups should consider joining this upgraded marketing effort to attract affluent Indian students to attend Australian secondary schools for Years 11 and 12.

6.4 Given the priority assigned to education by Australian state governments, consider establishing a forum for Australian states to discuss with each other their approach to education in India.

A state to state forum can provide an opportunity for different state and territory governments to learn from each other, avoid duplication and, where appropriate, leverage current activity to spread the benefits of engagement more broadly

- information is being gathered by individual states, territories and the federal government but not being shared in a regular and coordinated manner

- this should be a new forum, held twice yearly, separate from the Australia India Education Council (AIEC), for representatives from the states and territories to share information on their work on education in India
  - but this forum should feed into the AIEC, which has little visibility of state and territory activity
- representatives from the Department of Education and Training should be present as this would allow the states to plug into government discussions with India
  - it would provide a conduit for the states to raise education issues with Indian officials, via Australia's education representatives who are based in our High Commission in New Delhi
- by pooling resources, states can learn from each other's experience in India
  - this would be particularly valuable for those states and territories that have historically been less active in education in India
  - education providers should be invited to parts of the meeting to raise concerns or lessons learned from being on the ground in India.

7. Increase Australian involvement in the development of Indian curricula

Collaboration on the setting of education standards, syllabuses and assessments will associate Australian education with high quality in the minds of Indian parents and students

- the payoff for this approach may not be immediate
- in the long term, promoting the quality of Australian education will entice some of these students to consider postgraduate education in Australia.

The successful approach undertaken by ACER, which helped India's NCERT to design, implement and report a new National Achievement Survey for students in Year 10, could be a template for deeper engagement in curriculum development

- in particular, Australian providers should target affluent Indian secondary schools to offer accreditation for higher classes in school education (Year 10–12).

8. States and territories should develop exchange programs for secondary school students

Secondary schools should introduce exchange programs for students and teachers

- these programs should aim for two way engagement so as to encourage Indian students to consider attending Australian secondary schools for their last years of secondary education
- a model for this engagement is the Victorian Government pilot program, which will see up to 200 Victorian Year 7–9 students and 25 teachers travel to India and complete two to four-week immersion programs.

9. Attract top Indian students by introducing an 'Alfred Deakin Scholarship'[xvi] for India

Akin to a Rhodes or Fulbright, the Australian Government should establish a fund to provide for a select number of annual, merit-based scholarships that range across disciplines and level of study

- the overarching goal would be twofold
  - to attract the best and brightest Indian students
  - to generate marketing momentum
- to achieve this, the scholarship should be prestigious and generously funded, with notable brand ambassadors and political attention to attract the best talent
- at least half of the available scholarships in any given year should be set aside for women
- to help generate momentum and attention, the final round of the application process could be made into a television event in India, with the winners announced on television
- initially six scholarships should be offered.

10. Improve peer to peer marketing

Australia should make better use of Alumni networks, as well as the Indian diaspora, to serve as advocates for Australia's education system

- beyond DFAT's Global Alumni Ambassadors, we should identify Alumni Ambassadors from targeted universities, disciplines and states
- we should also draw on the growing pool of successful Indian-origin Australians to act as brand ambassadors in target disciplines
- and encourage the establishment of alumni associations from Indian IITs and Indian Institutes of Management (IIMs) in Australia, allowing feedback from those in Australia into the IITs and IIMs.

11. New Colombo Plan funding for India should be maintained

Since its inception in 2014 the NCP has enabled 3,350 young Australians to study and intern in India, enhancing mutual understanding between our two countries and helping to raise the profile among Indian universities and businesses of the quality of Australian education

- funding for NCP scholars and interns to select India should be maintained at current levels.

[xvi] Named after Alfred Deakin, Australia's second Prime Minister. Deakin was Australia's most India literate political leader and author of two books on India.

12. Coordinate with other countries to advocate for increased recognition of non-standard qualifications in India

The AIU does not recognise the standard three-year Australian undergraduate degree because Indian degrees are four years in length

- Australia should pursue joint advocacy on this issue with other countries, including the United States and United Kingdom, which face similar problems in getting India to recognise qualifications that do not identically match Indian standards
- emphasis should be placed on convincing India to recognise qualifications partially or wholly delivered online.

13. Industry associations in both countries should work together to recognise qualifications

Our advocacy efforts should focus on professions and universities that would make the biggest difference to Australian industry

- for example, given the common law system in India, if the Bar Council of India recognised more Australian law qualifications or allowed foreign lawyers to practice in India, many business links would follow
- this could be encouraged through pilot programs where the Bar Council of India and the Law Council of Australia agree to recognise law degrees from a select number of Australian and Indian universities, respectively
  - this could build on precedent; in 2017, the Law Council of Australia for the first time recognised a law degree from an Indian university – OP Jindal Global Law School – provided the applicant pass at least four compulsory Australian law subjects.

14. Encourage India to join the Tokyo Convention

The Australian Government should encourage India to sign and ratify the Tokyo Convention, a dedicated forum for cooperation in ensuring qualifications are recognised as fully and widely as possible, as a way to improve the recognition of Australian qualifications in India as well as the recognition of Indian qualifications throughout the Indo-Pacific

- the Convention lays down basic principles for recognition of higher education qualifications, including increased information and transparency, in order to smooth cross-border mobility of students, academics and professionals within the region
- efforts to pursue Indian ratification could also be undertaken in conjunction with Japan (along with Australia, one of the five original countries to ratify the Convention) through established trilateral forums.

15. Increase number of twinning programs

Although India currently prohibits joint degrees, Australian universities should make the most of Indian regulations that allow for the establishment of joint study/twinning programs between local and foreign institutions. Expanding the number of these programs would help improve any inaccurate quality perceptions of Australian universities and could in turn help to accelerate the recognition of Australian qualifications.

15.1 Increase research links by introducing jointly-badged PhD programs with Indian universities

- in addition to increased financing, more Australian universities should consider jointly-badged PhD programs with Indian universities
  - this would expand access to PhD training to more Indian students for whom the costs of studying and living in Australia for the duration of a PhD are prohibitive.

15.2 Introduce short term research intensives

- universities should jointly develop formal programs with Indian universities to allow Indian undergraduate students to undertake short term research internships during the Australian summer break as a way of introducing prospective PhD students to possible supervisors.

15.3 Universities Australia should explore options for a consortium of Australian universities to partner in the establishment of one of India's six new proposed IITs.

- In 1959, a consortium of 10 United States universities assisted in the development of IIT-Kanpur. Each consortium member participated in three components of the program: consortium faculty taught at IIT-Kanpur; IIT-Kanpur faculty received on-the-job experience in consortium institutions; and planning and procuring equipment and materials for research infrastructure at IIT-Kanpur.
- The close relationship and academic exchanges between Consortium universities and IIT-Kanpur established the foundation for attracting bright engineering and technology graduates to pursue postgraduate and doctoral degrees at these institutions.
- The Modi Government plans to open six new IITs by 2020.[xvii] An Australian consortium should partner with one of these six, along the lines of the United States effort half a century earlier in Kanpur
  - Andhra Pradesh and Karnataka would be a potential location for this consortium because they are among the priority states identified in this Strategy [*see Chapter 17 – A Collection of States*]
  - this consortium could also consider joining with universities from third countries to deliver a new IIT.

[xvii] The IITs will be opened in: Kerala, Jammu and Kashmir, Andhra Pradesh, Karnataka, Chhattisgarh and Goa.

16. Increase financial support for Indian and Australian doctoral students by introducing a Joint Research Fund

The availability of financial support is a major 'pull' factor for Indian students considering undertaking PhD programs overseas.

Australia should increase the availability of funding for Indian and Australian PhD students by establishing a Joint Research Fund with strong links between industry and academia

- the inclusion of PhD students from both countries would be a compulsory requirement of some or all applications for funding
- short term mobility for PhD students from both countries should be a subset of this Fund.

A Joint Research Fund would be separate from and broader than the Australia-India Strategic Research Fund because the AISRF does not fund doctoral students at present. This Fund would also not be limited to research in the sciences.

17. Collect reliable data on state of origin from Indian education visa applicants and where they go following study in Australia

The Australian Government does not collect reliable data on the state of origin from Indian education visa applicants or where they go following Australian study

- improving this data collection would help Australian education institutions and government efforts to improve their marketing and outreach to Indian students
- current data is unreliable as it relies on self-reporting by the applicant
- having Indian visa applicants provide a copy of their Aadhaar card will improve the quality of the data.

18. Australian universities should partner with business to promote India literacy in Australia through the expansion of Indian studies, including language studies, in Australian universities

Large Australian and Indian corporates with commercial interests in both countries should sponsor new faculties and courses on Indian studies in Australian universities

- a small number of Chairs of Indian studies in major universities should be established
- the study of Indian languages should be expanded
  - six universities in Australia taught an Indian language in 1996, now only two do, while over a dozen universities offer courses in Mandarin and Japanese.

Another way to increase the credibility of Australian education in India is for Australian universities to boost research and teaching on issues of high priority to India

- we need to make our education offerings more relevant to Indian students as well as increase the India literacy of Australian students.

19. Set aside places in Australia Awards for Indian students

Indian students currently lack access to scholarships from the Indian Government for overseas study and have received a disproportionately low share of scholarships from the Australia Awards – the Australian Government's access scholarship program for countries in the Indo-Pacific

- these scholarships are merit based and predominantly go to master's and PhD students
- from 2007–2017, 32 students from India were offered Australia Awards scholarships, out of 2,484 offered to students from other countries in South and West Asia (Bangladesh, Nepal, Bhutan, Maldives, Afghanistan, Sri Lanka, Pakistan)
  - no Australia Awards scholarships have been granted to Indian students since 2014
- DFAT should set aside a number of scholarships for Indian students.

20. Universities, particularly those without a campus in Melbourne or Sydney, should better integrate opportunities for employment for Indian students during their degree

Universities should nurture links with businesses and develop co-operative programs that facilitate work experience for their international students that is relevant to their degree

- it helps students earn money while they are studying and improves their employment prospects once they have graduated
- this is one way that regional universities in particular can provide value to Indian students without needing to establish a satellite campus in a major city.

21. Expand the Indian courses under the International Skills Training program

A suite of three international training and assessment courses has been developed by the Australian Government under the International Skills Training (IST) program. The courses allow Australian training providers to access Indian Government funding for training delivery

- these have been mapped to Australian training and assessment qualifications and benchmarked against Indian national occupational standards for trainers and assessors
- the Department of Education and Training manages the program, granting licences to approved Australian Registered Training Organisations (RTO) wishing to deliver the IST courses for trainers and assessors
- the IST courses could become a catalyst to unlock Australia's potential to offer skills training at a price point which India's skills ecosystem will pay, while maintaining Australian credibility for delivering high quality skills training at scale.

Preliminary discussions indicate strong Indian interest in working with Australia as a partner of choice to build India's skills capacity

- the strong preference of India's National Skill Development Corporation is to outsource its training to Australia
- a critical factor to realising this opportunity in timeframes palatable to India is a coordinated, nationally driven approach.

However, only 10 Australian RTOs are currently licensed to deliver the IST courses in India

- these RTOs are operating independently of each other, making it more difficult to capitalise on economies of scale
- options to incentivise a consortium approach should begin by funding, for three years, two or three locally engaged Business Development Managers to hold the consortium together and present a credible front to Indian partners.

22. Australian providers should partner directly with Indian corporates to tailor qualifications based on industry requirements

The variability in education quality from Indian institutions means Indian companies can struggle to hire suitable employees, even if their credentials appear strong on paper

- as a result, some private Indian TVET providers have demonstrated that formal government recognition of degrees and courses is not critical for success in the Indian market – as long as industry (and therefore job seekers) appreciate the quality of training being provided
- Australian providers should consider working directly with large Indian businesses to develop programs and assessments that meet the needs of individual businesses
  - the scale of India's biggest corporates would provide sufficient revenue for Australian providers.

23. The Australian Government should advocate for Indian authorities to recognise online courses in both the higher education and vocational sectors

Courses delivered online are not recognised by the University Grants Commission, the statutory body responsible for regulating Indian institutions.

- For India to meet its education and skills needs, its regulations will need to change to recognise online learning.
- Advocacy should focus on how online courses will help Indian providers reach a bigger pool of students.
- Recognition of online learning would also encourage Australian providers to deliver courses from Australia to students in India while providing on the ground support in India.

24. DFAT's Innovation Exchange should promote an 'ideas challenge' to develop online courses that target the skilling of women

The challenge[xviii] should identify ways to boost the enrolment of women in MOOCs by suggesting how to overcome barriers to reaching women in the online delivery of education courses, particularly in rural areas.

[xviii] An 'Ideas Challenge' is a platform to source new ideas which can be discussed and refined and, where they show great potential, supported to implementation.

RESOURCES AND MINING EQUIPMENT, TECHNOLOGY & SERVICES SECTOR

CHAPTER FOUR

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SUMMARY

- Out to 2035, India's increasing urbanisation, rising household incomes and industrial activity will drive demand for greater volumes of key Australian resource commodities.
- Australian resource exports to India, particularly metallurgical coal, but also copper and gold, will continue to make up the bulk of our merchandise trade.
- Our mineral resources relationship will continue to be dominated by exports, rather than outbound Australian investment. The Government of India is very active in this sector and the weight of state-owned enterprises, layering of central and state regulations, and poor contract enforcement issues, complicate foreign participation on the ground.
- As part of spreading risk, we should continue to seek Indian investment in Australian resource assets including through sustained messaging on Australian investment settings and business culture. This will need to be managed in light of the problematic experience of Indian companies investing in the coal sector.
- India is one of the most important future markets for Australian METS companies. As India grows and seeks to modernise its mining sector, METS will increase across the board. Australian METS companies have a competitive edge, particularly in the coal value chain and beneficiation.

1.0 THE MACRO STORY

KEY JUDGEMENT

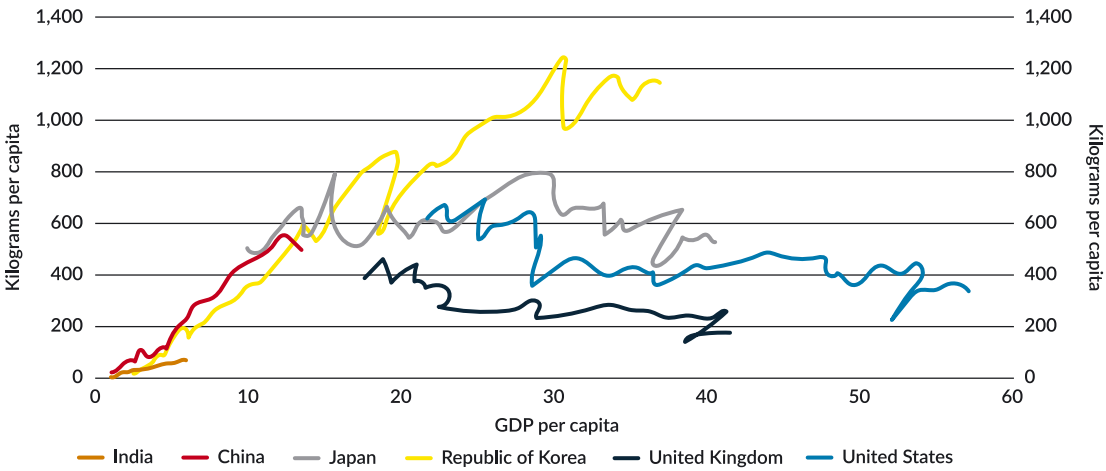
India's projected growth will keep resources trade high in our bilateral economic relationship. Demand for Australian resources will be strongest where domestic Indian reserves are limited, including in metallurgical coal, copper, and gold. India's demand for both metallurgical coal and copper is forecast to grow at around 5 per cent per year to 2035; over 90 per cent of this is expected to be met by imports. India will continue prioritising price over quality and product life-cycle costs, creating some unpredictability for resource commodity exports to India. As a result, the extent of our market share in these key commodities will depend primarily on the competitiveness of our exports against others.

1.1 The scale and key structural drivers of the sector

Resources are, and will remain, a significant component of the Australia India economic relationship

- commodities at the heart of this include metallurgical coal, copper, gold and, to a lesser extent, iron ore [*see Section 1.2 for commodity breakdowns*]
- with demand for minerals and metals driven by India's economic development, increasing urbanisation, rising household incomes and industrial activity, market conditions for Australian resource exports to 2035 look promising
- India's low level of steel intensity (which is less than one-third of the world average, see Figure 24[38]) is indicative of the catch-up growth in resource-use India is likely to experience as its economy grows out to 2035.

FIGURE 24: STEEL USAGE INTENSITY 1950 TO 2017: HIGH INTENSITY PATH COUNTRIES AND INDIA



Source: Department of Industry, Innovation and Science (AU). Resources and Energy Quarterly September 2017 [Internet]. Canberra AU: The Commonwealth of Australia; 2017.

India has significant resource endowments of its own and the Government of India needs to – and is seeking to – modernise its mining sector and improve efficiency

- India has a large reserve base of minerals and metals (such as iron ore, zinc, lead, bauxite, and thermal coal)
  - it is the second largest global producer of thermal coal and fourth largest producer of iron ore[39]
  - but it has few reserves of metallurgical coal, gold and copper
- India's mining sector is underdeveloped
  - the contribution of the mining sector to India's GDP has been stagnant at around 2.5 per cent over the last decade
  - in the period 2004–2014, the Indian mining sector grew at an average of 7.3 per cent per annum compared to 22 per cent in China[40]
  - India's spend on exploration projects is 0.3 per cent of the global spend (compared to 19 per cent for Canada and 12 per cent for Australia)[40]
- given the scale and growth of India's resources and mining sector, and the need for better productivity, demand for METS will increase across the board
  - fuelled by an increasing proportion of underground mines in India and growing concerns for environmental and safety issues
  - accordingly, India is one of the most important future markets for Australian METS companies, along with Indonesia and the United States
  - Australian equipment and services that deliver more productive, cleaner, safer mining and resources extraction are particularly of interest to India.

AUSTRALIA'S COMPETITIVE ADVANTAGE

As the world's largest exporter of iron ore and metallurgical coal, the sixth-largest exporter of gold, and the third-largest exporter of copper, Australia has a sophisticated and export-focused industry with established channels into India

- as illustrated in Figure 25, metallurgical coal, gold and copper make up over half of all Australian goods and services exports to India, providing the baseload of our trading relationship
- Australia provides 80 per cent of India's metallurgical coal imports.[38]

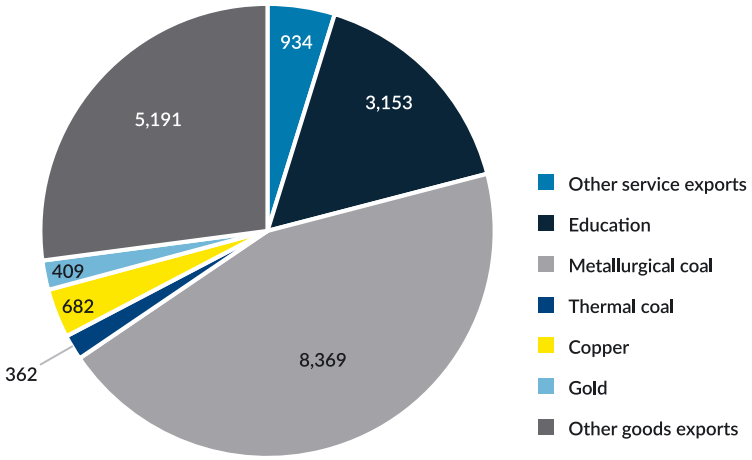
Australia is a recognised global leader in METS.

Australian METS companies have a competitive edge in the following areas:

- sustainable environmental management and safety experience (mine closures, mine site rehabilitation, groundwater conservation, mine safety)
- advanced technology and systems (including in underground mining and to raise productivity and product quality)
- advanced mineral exploration (large parts of India have no, or very little, data on resources potential)
- initiatives to manage structural change in the mining sector (for example through technical upskilling and increasing awareness of environmental externalities).

Australia also has experience in managing the relationship between mining companies and communities including traditional landowners.

FIGURE 25: AUSTRALIA'S GOODS AND SERVICES EXPORTS TO INDIA 2016–17 ($ MILLION)



Source: Department of Foreign Affairs and Trade (AU). Services Trade Access Requirements Database. Canberra AU: The Commonwealth of Australia; 2017.

1.2 How the sector will likely evolve out to 2035

GLOBAL TRENDS WILL RE-SHAPE THE INDIAN AND AUSTRALIAN MINING AND RESOURCES SECTORS

Current trends[41] indicate that out to 2035 we will see:

- the application of more advanced mining and processing techniques, including new digital technologies, data analytics and automation to make extraction and distribution more efficient
- growing interest in corporate accountability will see greater public scrutiny of environmental and sustainability considerations
- increasing rates of urbanisation and infrastructure development in emerging economies will lead to greater global demand for mineral resources
- there will be a greater global emphasis on expertise in services and technologies to exploit mineral reserves efficiently
- the need for innovation will increase in the face of declines in ore grades and rates of discovery relative to rates of depletion.

INDIA HAS AMBITIONS TO IMPROVE ITS RESOURCES AND MINING SECTOR

India is seeking to improve the utilisation of its mineral resources through 'scientific and sustainable mining practices and geo-scientific research and development' by[40]

- expanding its resource and reserve base through greater exploration and acquisition of strategic minerals
- reducing permit delays
- improving mine infrastructure, human capital and technology
- enforcing sustainable mining through regulatory changes.

Progress in any of these elements is likely to be incremental.

CASE STUDY: TATA BLUESCOPE STEEL: TWO INDUSTRIAL GIANTS MAKE A SUCCESSFUL MATCH

For Australian steel producer BlueScope, forming a 50–50 joint venture with major Indian conglomerate Tata in 2005 has been a highly successful match. While it took a number of years for the business to become profitable, in the first half of fiscal 2018 Tata BlueScope Steel had underlying earnings of approximately $28 million, with revenue growing by 7 per cent.

In India, the Tata brand is ubiquitous, covering everything from salt to motor vehicles to steel. Tata was chosen as the joint venture partner due to its corporate values, local brand recognition, well-established distribution channels and secure sources of raw materials. As an Indian private sector conglomerate, Tata also understands how to work with government in India, where relationships are key.

BlueScope offered complementary skills and experience. It had long-established expertise in metal coating and painting technology, marketing skills and customers around the world for its pre-engineered building products.

The joint venture produces a range of steel products supplying well-known global brands such as COLORBOND® steel and LYSAGHT®, as well as local brands such as the flagship DURASHINE® steel. The principal market is India's building and construction sector. Economic activity and urbanisation in India has ensured strong local demand for its coated steel building products, as well as demand from across South Asia and around the world.

The business did face a number of challenges that required dedication and commitment from the partners to overcome.

The construction of a metal coating and painting plant ran into some difficulties with significant delays, but Tata Steel's local knowledge assisted with development approvals and local government relations to complete and commission the plant, which has since been operating successfully.

The joint venture took a number of years to become profitable and some parts of the business were underperforming and required restructuring. The joint venture partners worked together on a suitable revised business plan and to develop an appropriate approach to deal with the restructured assets.

Over the last few years, the joint venture business successfully refinanced term loans and exercised an option for early redemption of debentures. Both shareholders supported the joint venture in its dealings with lenders and regulatory authorities.

More than a decade later, Tata BlueScope Steel has six major manufacturing plants across India, employing 550 people, with revenue of around $400 million. Expansion of production facilities is on the cards.

Recent changes to sales tax, resulting in more uniform taxes across Indian states, has worked in the joint venture's favour.

Perseverance by BlueScope in India has been important. It took a long term view, and specialised in doing what it knew how to do best. Working with Tata, the right partner in India, has also been key to the joint venture's success.

INDIAN DEMAND FOR KEY RESOURCES COMMODITIES OUT TO 2035

India's demand for resource commodities will continue to grow. Of significance for Australia's areas of competitive strength, India is likely to remain import reliant for metallurgical coal, gold, and copper out to 2035.

Metallurgical coal

India's National Steel Policy 2017 sets a highly aspirational steel consumption target of 255 million tonnes per annum by 2030 (India's crude steel production is currently around 100 million tonnes). This would require around 196.4 million tonnes of metallurgical coal per annum – an expected growth in demand of 4–5 per cent per annum from 2016 to 2030.

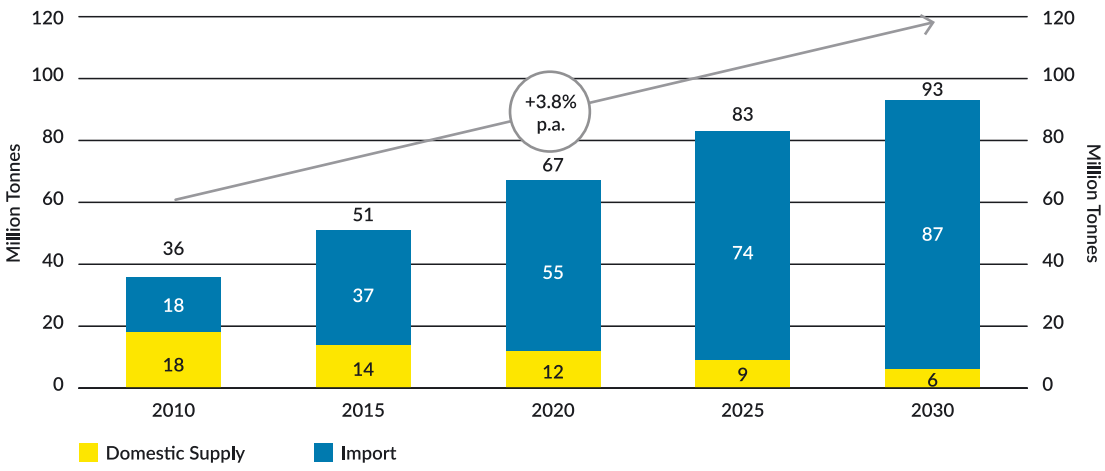
By 2030, over 90 per cent of India's metallurgical coal demand is expected to be met by imports (see Figure 26)

- domestic reserves are limited, poor quality and extraction is increasingly difficult due to dwindling shallow seams, increasing protests against new open cut mines and low productivity for underground mines
- domestic production is expected to continue declining; by 2030 it will have fallen by half to 6–8 million tonnes.

While India is looking to diversify its import sources, Australia will remain well-positioned to meet India's continued strong import demand, given the high quality of our metallurgical coal and that we are India's top supplier by a considerable margin[42]

- Australia dominates India's metallurgical coal imports due to its low landed cost
- our total exports should continue to grow, even if our market share slips.

FIGURE 26: INDIAN COAL DEMAND



Source: Work commissioned by the India Economic Strategy Secretariat to support this report.

Iron Ore

Although India has about 30 billion tonnes of iron ore reserves and was a net exporter of iron ore as recently as 2012, India has recently become a net importer[12]

- domestic Indian production is limited due to challenges in product quality and accessing land and capital; production is also affected by uncertainty around government regulations
  - for example, concerns around environmental damage led to temporary bans on several mines in Goa and Karnataka.

In the short to medium term, these challenges will mean Indian domestic production is unlikely to meet demand and opportunities will continue for Australian iron ore exporters

- the prospect for growth in imports is reinforced by limitations in India's rail and port infrastructure which make it easier to supply steel mills on the east coast with imports, rather than with iron ore transported from domestic mines.

In the long term, Indian iron ore import growth is uncertain

- technical developments in India's steel industry could see sustained demand for imported iron ore with a lower impurities content, like Australia's
- but Indian domestic production could increase from investments in beneficiation capacity, making low-grade iron ore suitable for steelmaking.

Copper

Indian demand for copper is being driven by urbanisation, increased rollout of electrical transmission networks, and the manufacturing sector.

India has limited copper ore reserves, constituting just 2 per cent globally, and imports around 95 per cent of its copper requirements as concentrates.[12]

Supported by India's growing refining capacity, India's import reliance on copper will likely remain above 90 per cent as demand continues to grow at a steady pace. Future demand growth is expected to be in the range of 5–6 per cent per annum.[12]

Growing demand presents opportunity for Australia to increase its 11 per cent market share, if it can maintain landed cost parity with competitors.

Gold

India is one of the world's largest consumers of gold, with almost 80 per cent of demand coming from end-use in jewellery and as household investments

- India has the world's largest private gold holdings
- consumer preferences for gold are culturally entrenched and unlikely to change meaningfully out to 2035.

CASE STUDY: GEOSCIENCE AUSTRALIA: CONTRIBUTING TO A MORE ADVANCED INDIAN MINING INDUSTRY

Hundreds of millions of years ago, Australia and India were both part of the ancient super-continent Gondwana. Today both nations share geological similarities and Australian geoscientists can apply their knowledge and experience in the Indian context.

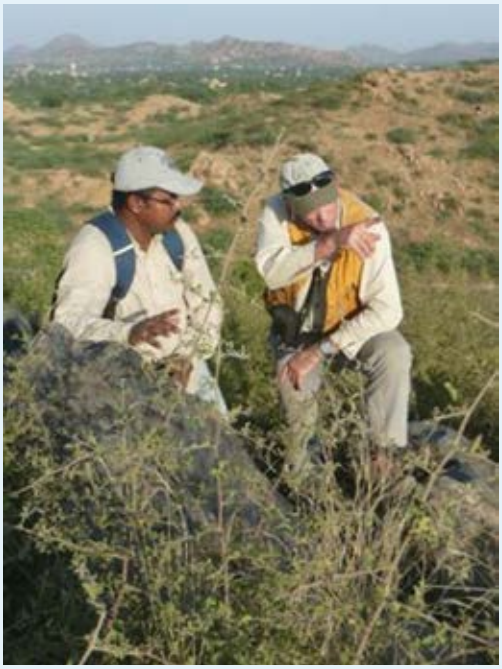
As India becomes more urbanised, and demand for mineral resources grows, understanding regional geology, and being able to predict the potential for undiscovered mineral deposits, is becoming increasingly important.

India has an ambitious vision to develop its vast mineral resources, and to do so needs a modern exploration and mining sector. Geoscience Australia is using its internationally recognised technical expertise to assist the Geological Survey of India in becoming a world-class geoscience organisation.

Through a Memorandum of Understanding, Geoscience Australia is building the capacity and technological capability of the Geological Survey of India to assess the potential for minerals deep underground. It is holding 'train the trainer' workshops in India, inspecting equipment and facilities, and seconding Indian officers to work inside Geoscience Australia.

Together, the agencies are developing a ten-year vision for the Geological Survey of India.

Collaboration has mutual benefits for Australia and India. Through its engagement with Geoscience Australia, India is also set to draw on the expertise of Australian universities, Australian geoscience contractors, and the mining equipment, technology and services sector more broadly.



India has scant domestic gold reserves to meet this demand. Imports are either in refined or doré (partially refined) form. Doré imports have grown as the Indian Government has sought to incentivise domestic refining while imposing import restrictions on bullion imports.

Australian gold exports are primarily in bullion and Australia competes with South Africa as the primary producer of gold exports to India, with Swiss traders and to a lesser extent the United Arab Emirates and the United Kingdom as the largest exporters

- internationally, bullion is often traded through the United Kingdom and the pathway for Australian gold to India can be through the London Bullion Market, or other markets, which affects our export figures.

Australian exporters may be affected by Indian regulatory settings including

- efforts to monetise domestic gold holdings to recycle it back into the Indian gold sector and lessen the need for imports
- efforts to formalise gold transactions and clamp down on gold smuggling
- the establishment of physical gold exchanges, which would increase transparency in the market and standardise prices.

The value of Australia's gold exports to India in recent years is set to keep fluctuating with these domestic policy settings as well as international gold prices.

Critical Metals and Rare Earth Elements

The increasing adoption and use of new technologies, including environmental technologies, will mean India will require commodities such as critical metals and rare earth elements, of which Australia has reserves.

India is one of the 10 or so countries that also has its own rare earth reserves and active mining projects. The Indian Government is trying to promote rare earth mineral exploration and production from a very low base. If India looks to increase its rare earth refining capabilities out to 2035, there may be the opportunity for partnership with Australia.

2.0 OPPORTUNITIES FOR PARTNERSHIP

KEY JUDGEMENT

Out to 2035, there are good growth opportunities in the value and volume of our metallurgical coal, copper, and gold exports to India. Attracting Indian investment into the Australian resource sector can bring in capital and create jobs. For India, vertically integrated investments into Australia can help smooth commodity price volatility. As India's exploration and extraction continues to grow, so too will opportunities for Australian METS companies. However, the well-trodden pathway for Australian METS companies to follow Australian resource majors into markets is unlikely to eventuate in the Indian market.

2.1 Export opportunities

COMMODITIES

Table 2 projects the demand, supply and import figures out to 2030 for key commodities.[12]

TABLE 2: RESOURCES AND METS KEY COMMODITIES OUT TO 2030

Resources	Units	Indian Demand		Indian Domestic Supply		Indian Imports	
		2016	2030	2016	2030	2016	2030
Metallurgical coal	Million tonnes	52	90–100	15	6–8	87%	90–95%
Iron ore	Million tonnes	154	290–300	156	290–300	5%	0–3%
Copper	Thousand tonnes	511	1000–1200	26	70–100	95%	91–94%
Gold	Tonnes	735	1000–1100	1	2–3	~100%	~100%

SERVICES EXPORTS – METS

Some 35 Australian METS companies are already active in India.

India's demand for METS will grow out to 2035, particularly in connection to those commodities for which India is prioritising greater domestic output, such as thermal coal where Coal India has big and sophisticated aspirations [*see Chapter 7: Energy Sector*]

- Australian METS companies are strong across the entire coal value chain
- Australia's underground coal mining, geomechanics, ventilation, and safety expertise is particularly relevant and well regarded by Coal India.

Beyond coal itself, there will be opportunities in advanced Indian mining projects for exporters of mining IT, planning software, safety, health and risk management technologies and methods, and training in all its forms

- partnering with Indian IT firms, with operations in Australia, such as Tata Consulting Services, Wipro and Infosys, might help Australian METS firms looking to enter the Indian market in the technology space.

The projected growth in India's METS sector offers Australian firms, a large number of which are SMEs, the opportunity to increase participation in Indian supply chains through research and development collaboration and joint ventures

- we will require new approaches to collaboration to succeed – a united Australian METS brand in India would be a useful starting point.

Although manufacturing products in India could help Australian products compete in the price-sensitive Indian market, any sort of large-scale METS manufacturing hub is unlikely, as Australia manufactures only certain niche products and little by way of automated equipment.

2.2 Collaborations

The METS sector in particular offers a number of collaborative opportunities as India's mining sector grows out to 2035.

RESEARCH AND DEVELOPMENT

At the peak of the resources cycle in 2012–13, Australian METS companies generated revenue of $90 billion globally and employed an estimated 386,000 people[41]

- post-boom, a particular challenge is the need for new sources of productivity at lower costs[41]
- in Australia's highly capital intensive mining and resources sector, this productivity will continue to be driven by innovation and new technology.

Collaboration between Australian and Indian mining technology research institutions can be the precursor to joint commercialisation and METS exports

- there are numerous areas of research interest to India where Australia can not only provide expertise, but could also result in cooperation including in carbon capture storage and utilisation, coal preparation upgrading and fugitive emissions from coal mining.

A number of Australian METS companies have an established local presence, or use a local partner, in India. This investment, while modest in overall dollar terms, has the potential to grow and create Australian company clusters

- to an extent, this is already taking place in Kolkata (West Bengal), a regional hub for METS and a gateway to the mineral-rich states of Jharkhand, Chhattisgarh and Odisha.

EDUCATION AND TRAINING

Collaboration on education and training could include Australian METS providers partnering with training organisations and offering industry-embedded courses and research degrees

- the Government of India and mining industry are interested in adopting suitable elements of Australia's safe, productive and efficient mining culture in India
- this could extend to introducing Australian best practice mining legislation and regulation.

PLATFORMS FOR PARTNERSHIP

The Australia-India Mining Partnership at the Indian School of Mines at IIT Dhanbad (IIT-ISM) provides a platform for training, research and development engagement

- this has the potential to create a cluster for Australian engagement in the coal belt states of India and could be replicated across other institutions, and expanded beyond research and training to incorporate industry
- the existing framework includes a Centre of Excellence in Mining Technology and Training, memorandums of understanding between eight Australian institutions and IIT-ISM, a joint doctoral program with Curtin University, technology transfer (particularly in mine safety) and industry-funded research and development
- the Australian Government has also funded an Austrade partnership coordinator at IIT-ISM to facilitate activities between stakeholders

- further funding, particularly for the research and development component will be required to make the most of this platform.

2.3 Investment

INTO AUSTRALIA

A key focus should remain attracting Indian investment in the Australian minerals sector.

Australia's vast resources base requires foreign capital, technology and markets for further development.

Indian steel manufacturers could look to secure Australian metallurgical coal assets, considering the projected increases in Indian demand. Coal India has also expressed an interest in acquisitions in Australia.

India's investment experience in the Australian coal sector (both metallurgical and thermal [*see Chapter 7: Energy Sector*]) has been problematic. The absence to date of a high profile and profitable flagship investment could deter Indian investment interest. However, Indian investment into Australian resources projects would provide important returns for Indian companies in mining related skills.

INTO INDIA

Resources is one of the most challenging direct investment sectors in India for foreign participants with limited prospects of anything more than incremental change

- even the largest international companies have found it difficult to secure necessary clearances and permits across various central, state and local jurisdictions to undertake exploration or extraction
- land acquisition is difficult and needs reform, while approval timelines are slow and recourse to legal avenues lengthy
- there are few examples of successful foreign investments in India's resources sector although BlueScope Steel has persevered in partnership with the Tata Group and its Indian operations are now performing well.

3.0 CONSTRAINTS AND CHALLENGES

KEY JUDGEMENT

While making up the bulk of our merchandise exports, the government-dominated resources sector in India brings with it a range of regulatory barriers, which constrain commercial activity. Despite an apparently open FDI regime for resources, the costs associated with domestic regulatory compliance remain a hurdle to foreign investment. A lack of investment in exploration, and inadequate information about proven reserves, are also key issues impeding India's mining industry with India having explored only 10 per cent of its mineral resources to date. For METS especially, behind the border restrictions on licencing and permits inhibits the delivery of professional services into the Indian market. Corruption, poor contract enforcement, and uncertainty over land tenure adds to this complexity and cost. In terms of commodity exports, a key challenge for Australian firms is the increasing global competition from emerging economies where the cost of production is significantly lower.

3.1 The policy and regulatory environment

Constraints in the policy and regulatory environment within the mining and resources sector are unlikely to improve meaningfully out to 2035.

Tariffs on minerals and metals are among the lowest categories across the Indian schedule

- but India's customs tariff and fee system is complex and lacks transparency in determining net effective rates of other duties and charges

CASE STUDY: SIMTARS: QUEENSLAND MINE SAFETY EXPERTISE REWARDED FOR BUILDING RELATIONSHIPS

Mining plays a major role in the Indian economy, and the Indian Government has ambitious plans for growth. But India needs new technology and modern mine safety and health systems to develop its reserves, and power its economy.

Queensland's Safety in Mines, Testing and Research Station (SIMTARS) offers this expertise. It has taken a long term view, starting in India in 1998 with small training projects delivered to India's Directorate General of Mines Safety. It has gradually built relationships since then.

SIMTARS is now seeing results. India's 2017 national mine safety law is based on Queensland legislation. SIMTARS has a contract with the Indian School of Mines to supply and deliver a virtual reality theatre and spontaneous combustion and explosion laboratory. It also has major contracts with Coal India and its associated subsidiary Singarini, to deliver training and a real time underground gas monitoring solution.

SIMTARS has built relationships by making regular visits to India every year, attending conferences, giving keynote speeches, providing specialist advice and delivering training and gas monitoring solutions.

SIMTARS has made the most of its institutional connections. Working through the Indian School of Mines it has been able to connect with some of India's best researchers and gain access to those making purchasing decisions.

Government to government frameworks have been important for SIMTARS' initial engagement in India because Coal India, Singareni and SAIL are all state owned enterprises. However SIMTARS also works with private sector groups in Australia and has introduced them to the Indian market. It is also working with Indian private sector mining entities.

Ultimately, the Australian mining equipment, technology and services sector as a whole stands to benefit from the work of SIMTARS which demonstrates the value of international technology and expertise to India's efforts to develop a more advanced local mining sector. SIMTARS is one of many Australian groups from this sector working in India.

WELCOME TO MORANBAH

- there are multiple elements and rates are often adjusted at short notice.

Tariffs are higher for METS (often three to four times higher than for ores and concentrates) and are also accompanied by a host of other fees and border charges

- as well as restrictions on skilled worker access to India, particularly for engineering and construction services.

Due to the unpredictability of business conditions, India does not attract FDI commensurate with its importance as a producer of minerals and energy or its potential to increase output substantially

- the Minerals Council of Australia assesses 'without more clarity and predictability, the easiest option for perhaps the majority of foreign mining and METS companies is to trade with India and stay away from the bureaucratic complexity of operating businesses there'.

The list of regulatory barriers to investment and foreign participation in India's resources sector is long. Some of these challenges are applicable to other sectors of the economy, and include:

- fragmented Ministerial responsibility across the sector
- difficulty in transitioning from exploration to exploitation disincentivises foreign investment and participation
  - greater security of minerals leases would make the regulatory environment more predictable, but is not guaranteed
- the current tendering process for mining projects prioritises price over quality, efficiency or life-cycle costs
  - this negatively affects Australian companies, which have a higher cost of production and higher quality services and exports
- land acquisition remains a persistent constraint on resources productivity
  - State Government-led land acquisition reforms could improve the ease of doing business in this sector.

3.2 Skills infrastructure and other constraints

THE STRUCTURE OF INDIA'S MINING SECTOR

Mining is concentrated amongst a few large public sector companies including Coal India Limited, Singareni Collieries Company Limited, Steel Authority of India Limited and Hindustan Copper Limited

- though inefficient, it will be challenging for India to privatise these assets due to the political risk of job losses
- while the dominance of these companies complicates foreign investment and participation India's February 2018 announcement of auctioning coal blocks for commercial mining opens the sector to private investment and erodes the monopoly of Coal India.

Over the last decade, the private sector has played an increasingly active role in the mining sector and large Indian corporations including Tata Steel, Vedanta, Aditya Birla and Jindal are making investments in mining and related technology.

India also has some smaller, disparate companies operating at the margins of India's regulatory environment. In general, this third group are less reliable partners for investors or suppliers.

DIVERSIFICATION

India's aims to diversify supply, along with its natural preference for import substitution, could see it look to reduce Australia's dominant market share in metallurgical coal.

METS PRICE POINT

The price-sensitivity of the Indian market makes it difficult for foreign METS companies – who could offer cutting-edge technology and services – to compete with domestic players.

THE PROFILE OF THE AUSTRALIAN METS SECTOR

Many Australian METS operators are SMEs and may not have the resources to undertake loss leader strategies while establishing themselves in India.

COMPETITION

In the METS sector competition will continue from North America and Europe, while India's domestic METS sector will grow out to 2035.

INDIA'S BUSINESS ENVIRONMENT

While improving, contracts are often re-interpreted, leading to delays in payment or in granting licenses [*see Chapter 15: Understanding the Business Environment*].

CORRUPTION

Independent reports have identified metals and mining to be some of the most vulnerable sectors for corruption in India[43]

- there is potential for automation to reduce opportunities for corruption, including in permit and license allocation, and some progress is being made in this respect.

4.0 WHERE TO FOCUS

West Bengal and the eastern states of India (Jharkhand, Chhattisgarh, Bihar and Odisha) are home to the majority of India's resource deposits and mining activity. This critical mass of Indian and Australian interest makes these eastern states natural targets for increased political investment in support of our long term export and investment relationship with India.

4.1 Key States

WEST BENGAL

A regional hub for engagement on mining and METS, including as the gateway to the mineral-rich states of Jharkhand, Chhattisgarh and Odisha, West Bengal will likely remain the most significant METS market for Australian companies in India.

The state's capital Kolkata is re-emerging as a growth centre

- Coal India, the world's largest coal company, is headquartered in Kolkata
- the Australian Government (Austrade) has maintained a presence in Kolkata for over 15 years, as have more than a dozen Australian METS businesses.

JHARKHAND

Around one-quarter of India's total steel production comes from Jharkhand. With the proposed expansion of a number of integrated steel plants, Jharkhand is a steel hub of India.

The state is the sole Indian producer of coking coal, uranium and pyrite, and ranks first in the production of mica, kyanite and copper.

Investment: Jharkhand was ranked fifth as an FDI destination in India and seventh in Ease of Doing Business in 2016.

Australia's engagement with IIT-ISM is based in Jharkhand.

ODISHA

Odisha accounted for 21.6 per cent of India's coal production in 2015–16, and the state ranks first in India in the production of chromite, manganese, iron ore and bauxite.

The state accounts for a third of India's iron ore reserves, a quarter of coal reserves, half of bauxite reserves, and almost all chromite and nickel reserves.

Odisha has around 50 per cent of India's aluminium smelting capacity and around 20 per cent of India's steelmaking capacity.

A number of Australian METS suppliers are based or working in Odisha.

CHHATTISGARH

Resource-rich Chhattisgarh produces 27 per cent of India's iron and steel, 20 per cent of iron ore and 15 per cent of aluminium, presenting opportunities in METS.

Some of the best quality iron ore deposits in the world are located in the south of Chhattisgarh.

The state is also endowed with considerable reserves of bauxite, limestone and quartzite, and is the only state in India that produces tin concentrates.

ANDHRA PRADESH

There is also mining activity in south India, focussed around Andhra Pradesh

- world's largest deposit of baryte
- India's largest bauxite deposit, major ilmenite deposits, and largest off shore gas field
- Australian mining and extractives companies already have a presence in Andhra Pradesh.

CASE STUDY: CSIRO: WORKING TO IMPROVE SAFETY AND PRODUCTIVITY OF INDIAN COAL MINES

India has ambitious plans to double domestic coal production by 2020. India has the fourth largest deposits of thermal coal in the world and is looking to Australia to provide mining technology and expertise.

The Commonwealth Scientific and Industrial Research Organisation (CSIRO), the Australian Government's scientific research agency, is helping meet that demand, working with Singareni, one of India's state owned coal mining companies, in the southern Indian state of Telangana.

Underground mining in both countries uses longwall mining techniques and mechanisation to increase safety and make production more efficient.

The CSIRO and Singareni signed a Memorandum of Understanding in 2006 to work on geomechanics and other research related to coal mining. This has led to collaboration on three major projects, worth $7.3 million.

At Singareni, high capacity longwall was introduced in their Adriyala mine with technical assistance from the CSIRO.

The collaboration has paved the way for advanced longwall mining technology to be introduced in more Indian mines. It is also set to improve safety and productivity as India strives to meet its energy needs.

RECOMMENDATIONS

Australia can continue to position itself as a trusted bilateral partner and a strong, reliable supplier of resource commodities and METS services. Government should look to provide greater support to Australian METS providers as they seek to create opportunities in the market. These efforts will be reinforced by continued government to government and industry engagement in India, including through upgrading the Australian Government's presence in and around India's resources hub of Kolkata. Our major resources play in India will remain export-based.

25. Leverage our status as a key supplier of resource commodities to support ongoing advocacy for improvements to the business environment

Our standing as a major resource commodities trading partner with India, and a country that India looks to as a leader on mine management, gives us currency within the Indian system. We should use this to build the Australian brand and further entrench engagement.

25.1 Strengthen regular Ministerial-level engagement, including through the Australia India Energy Dialogue

- given the prevalence of state-owned enterprises in the sector, it is important to keep Australia among the forefront of the Indian Government's partners in the sector, relative to our competitors
- Australia should commit to this Dialogue as the mechanism to advance a resources policy agenda, address regulatory barriers, and as a platform to bring together industry and government stakeholders to discuss areas of mutual interest
- under the Dialogue, support the Australia-India Coal and Mines Joint Working Group
  - focusing on policy frameworks and cooperation to support our METS and commodity exporting sectors
  - incorporating industry and academia participation.

25.2 Consider funding Geoscience Australia to strengthen its existing collaboration with the Geological Survey of India.

25.3 Provide targeted funding to joint activities identified under the above frameworks, drawn from government and business, to give us a basis for further collaboration

- explore options to establish a joint fund between Australia and India, with co-investment from industry, similar to a resources sector AISRF
- draw on Australian development assistance to establish a mechanism for Australian METS companies to provide, on a commercial basis and protecting IP, research and development, technology and expertise to regional partners, with a priority placed on developing India's mining sector and METS standards

- such a fund could support practical activities between Geoscience Australia and Geological Survey of India.

25.4 Explore options to work with India, and potentially a third country such as Japan, on the development of India's rare earth minerals and critical metals refining capacity.

26. Expand support mechanisms for Australian business in METS

26.1 Elevate branding of the Australian METS sector in India

- supporting a stronger national presence at trade fairs such as the International Mining and Machinery Exhibition
- with a coordinated communications and marketing strategy
- these efforts should be funded by industry, with Australian Government facilitation support.

26.2 Explore options to set up an Australian industrial cluster at a demonstration mine in India showcasing Australian practices and leveraging the site for training

- for open cut and underground technology
- as a collaboration between government, industry and peak bodies
- would need Indian Government support to manage regulatory and tendering challenges
- these efforts should be funded by industry, with Australian Government facilitation support.

26.3 Facilitate study tours for Indian mining executives to visit Australian mine sites

- to allow participants to observe technology solutions and understand management issues such as contract and contractor management
- these could be aligned with the dates of relevant Australian conferences and incorporate meetings with key Australian equipment and service providers.

27. Support the knowledge partnership in resources and mining

27.1 Increase financial and political support for the Australia-India Mining Partnership at the IIT-ISM to ensure it continues to grow out to 2035

- The partnership with the IIT-ISM should be used to showcase Australian expertise.
- The framework for engagement under this partnership is established. Modest funding of activities are essential for it to deliver outcomes in the short/medium term. Support could be directed to:
  - executive training programs, with a focus on Australian standards and systems and advanced technology applications

  - joint research projects on extractive and refining technologies
  - facilitating student and faculty exchange between the IIT-ISM and Australian institutions
  - promoting further linkages between Australian industry and the IIT-ISM in the fields of clean coal and mine safety
  - making the Austrade-managed Business Development Manager embedded in the IIT-ISM a permanent role in addition to the Austrade presence in Kolkata.
- Such activities could build further institutional and branding support for Australian universities to develop and deliver management training courses and study tours in partnership with the IIT-ISM.
- The Australian Government should develop a communications and marketing strategy for the partnership at IIT-ISM.

27.2 Explore options for capacity building programs

- with Indian officials using our mine safety and environmental standards
- explore options to provide short course training for Indian regulators to familiarise them with new technologies and enable faster approval processes.

27.3 Support pathways for exchanges of post-doctoral employees and industry-embedded PhDs in both countries

- using the networks of Australian industry bodies such as METS Ignited, Austmine and the Minerals Council of Australia.

28. Promote Indian investment into the Australian resources and mining sector

28.1 Continue to advocate (through high-level visits, trade missions and Austrade) for investment opportunities in Australia

- including targeting Indian investment in the resources sector to our Northern Australia development initiative.

28.2 Ensure regulatory settings that are predictable and attractive to foreign investors in Australia's resources sector and convey this to India.

28.3 Domestically, ensure ongoing complexities with the social licence for domestic thermal coal developments do not adversely impact investments and trade regarding metallurgical coal.

AGRIBUSINESS SECTOR

CHAPTER FIVE

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SUMMARY

- Out to 2035, India can provide a new source of growth for Australia's agribusiness sector. Despite India's focus on domestic production, the gap between demand and supply will grow out to 2035.
- Growth potential for Australian exports remains in commodities that India needs due to shortfalls in production (pulses, grains, horticulture, oilseeds). Opportunities also exist, or will emerge, for value-added products sought by the growing middle class (wine, processed food) and for providing specialised services to Indian Governments, institutions and farmers.
- India's agriculture sector is politically sensitive (with a protectionist sentiment that is unlikely to fade). The central and state governments seek to balance smallholder and consumer needs with the broader goals of minimising social disruption and maximising electoral rural support. The Indian Government has three objectives: food security, food self-sufficiency, and income support for farmers.
- So India will remain a difficult market, prone to fluctuating import demand and sharp policy changes – hedging against this volatility is part of spreading risk. But there is scope for it to become more predictable.
- A strategic decision by the Australian Government to work more closely with India on reducing the need for market distortions and developing import pathways can both respond to Indian priorities and ultimately help commercial engagement.
- Towards 2035, we should seek to pair exports of raw commodities with exports of value-added products, integrate into value chains, and export of services to work with India on productivity improvements and increasing farmer incomes.
- We should be seen as a trusted partner to India's agriculture reforms and land and water management priorities, and be the lead partner for these issues in key states.
- There are opportunities for Indian investment in Australian agriculture, including in Northern Australia.

1.0 THE MACRO STORY

KEY JUDGEMENT

The structural gap between what India can produce and its demand for agricultural commodities and investment will grow out to 2035. India wants to minimise this gap and has a corresponding appetite for capital, technology and services to improve productivity and market efficiency. Diversifying Australian exports to a large and expanding market like India can spread risk and provide prospects for long term growth.

1.1 The scale and key structural drivers of the sector

INDIAN DEMAND

India's overall food demand will grow at 2–3 per cent until 2025, and demand will outpace supply out to 2035 even if Indian productivity increases

- annual food demand in India is expected to increase up to 400 million tonnes per year by 2025 – a 37 per cent growth from 2015 levels – primarily in pulses, fruit and vegetables[12]
- this is driven by demographics and a corresponding increase in volume demand and the growing consumer class, changing diets and a shift in favour of higher value products (such as proteins, fruit, dairy, packaged goods, high end products) similar to the trends seen in other developing countries
  - importantly, increased meat production can have a multiplier effect on demand for grains, protein meal, and fodder.

Growth is unevenly distributed regionally and across sector segments

- parts of India will be self-sufficient, but others deficient
- urbanisation is creating pockets of concentrated demand for high value products.

INDIAN SUPPLY

India is a major agricultural producer and agricultural output has grown at an average of 3.6 per cent per annum since 2011[44]

- but the sector is highly inefficient and output is volatile.

Supply is constrained by:

- inadequate linkages to markets and distorted pricing mechanisms
- low resilience to the vagaries of nature, particularly fluctuations in monsoon rains
- scarcity of resources – especially water
  - over extraction of groundwater by farmers will see some Indian states exhaust subterranean supplies by 2030, with significant implications for food security
- suboptimal acreage distribution and small holdings with challenges around development, appropriation, tree felling and land clearing
- food loss and wastage: by some estimates around 30 per cent of India's total yield is 'wasted' annually[12]
- land degradation: 40 per cent of India's land area is degraded through inefficient crop rotations or overuse of agrochemicals[45]
- infrastructure and storage gaps and logistical challenges for distributing produce
- India's reactive and retrospective policies exacerbate domestic production and price cycles.

Indian policy makers understand what is needed to improve the sector but political constraints make change difficult

- agriculture is the biggest employer in India with a highly migratory labour force and chronic underemployment
  - nearly 60 per cent of the agricultural labour force is female
- poverty and debt of small farmers are region-wide problems and the government allocates a lot of unproductive capital in an attempt to alleviate these issues through subsidies.

AUSTRALIA'S COMPETITIVE ADVANTAGES

Australia's existing agribusiness trade relationship with India is strong, but sporadic

- India was Australia's sixth largest market for agricultural exports in 2016–17[xix]
- trade is prone to sharp changes related to Indian Government policy and the level of domestic Indian production.

Australia has a lot to contribute to India in the agribusiness space. Australia:

- can offer agricultural science expertise to improve Indian food security by increasing productivity, sustainability and food system resilience
- is an efficient exporter of staple and high value products
- has world-class expertise in agri-services and land and water resource management.

These offerings are based on the following Australian food and agribusiness comparative strengths[46]

- clean and green
  - strong reputation
  - low prevalence of food-borne illness
  - high safety standards
- unique geography
  - close to growing Asian markets
  - diverse range of agro-ecological zones
  - counter-seasonality to northern hemisphere
- world-class research
  - strong research and development sector, especially in agricultural science
- established sector with a global mind-set
  - strong knowledge, skills and infrastructure base
  - globally focused industry
- high proportion of SMEs
  - fast, agile and high innovation potential.

1.2 How the sector will likely evolve out to 2035

While there are unlikely to be big changes to Indian protectionism overall Indian demand for imports will be maintained or increase. Developments in technology, resources and attitudes will change the way the industry works.

THE GOVERNMENT OF INDIA WANTS TO IMPROVE THE SECTOR

India has set an aspirational target of doubling the income of farmers by 2022. To do this, NITI Aayog has laid out an agenda to

- ensure farmers receive adequate prices
- raise productivity through enhanced irrigation, faster seed replacement and precision agriculture
- shift to high-value commodities such as horticulture and fisheries.

[xix] India takes 80% of Australian chickpea exports. India consumes about 40% of Australia's vegetable exports.

CASE STUDY: RIVERINA OILS AND BIO ENERGY: INDIA IS THE FASTEST GROWING MARKET FOR CANOLA OIL FROM WAGGA WAGGA

India's growing population means an ever-increasing demand for cooking oil, a major ingredient in Indian food. At the same time, with the incidence of diabetes rising, Indian consumers are becoming more aware of the health effects of the oils they consume. Canola and other vegetable oils are rapidly replacing tallow and palm oils.

Canola oil produced by Riverina Oils and Bio Energy (ROBE) in Wagga Wagga is marketed in India to appeal to this demand. It is labelled as 'pure and chemical free, from pollution free lands' and as an oil to help reduce blood sugar levels, assisting with diabetes control. The high-grade Australian oil is a natural product, processed from non-genetically modified canola seeds and with the high smoke point required for Indian cooking.

ROBE was founded by Indian born Australian entrepreneur Dhruv Deepak Saxena, known as DD Saxena. At a custom-built oilseed crushing and refining plant at Wagga Wagga, in New South Wales, it is crushing 25 per cent of the state's canola crop, producing 250 tonnes of refined oil a year.

In 2016 ROBE formed a joint venture with a major Indian food group that has put its canola oil on the shelves of 20,000 shops in India. Should the consumer penetration achieve predicted levels, ROBE will be sending a significant percentage of their oil to India and in time the plant may require additional capacity.

It took DD Saxena half a decade to build the plant and then only a year reach full capacity. When it was difficult to find finance in Australia, banks in India and other international investors provided capital. Planning approval took longer than expected and the cost of the project doubled, to $150 million. But perseverance has paid off, with DD Saxena hoping to double the plant's capacity in the next few years.

CASE STUDY: ACIAR: IMPROVING INCOMES THROUGH CLIMATE SCIENCE

Agriculture is the biggest employer in India. Climate change is posing a new kind of threat to rural livelihoods. Partnering with Indian researches and farmers, Australian services and expertise in agriculture and climate science can contribute to increasing productivity and farmer incomes.

Adapting to Climate Change in Asia (2010 - 2015) was a collaborative project between Indian and Australian institutions and funded by the Australian Centre for International Agricultural Research (ACIAR). The project, based in Telangana, tested options for farming communities to enhance their ability to adapt to a changing climate and manage climate risk. The research team worked with policy makers, government departments, NGOs and farmers.

Climate Information Centres (CLICs) were one outcome of the project. The CLICs are a platform which combines ICT, traditional and scientific knowledge of weather, and local rainfall measurements to inform farm management decisions. This improves decisions on when to sow crops based on soil moisture and climatic conditions, and increases local capacity to manage climate risk and variability.

Three pilot CLICs were established in the districts of Warangal, Mahboobnagar and Nalgonda. Their success led to subsequent funding and a further 33 centres in Telangana State alone. CLICs will also form an important component of an International Fund for Agriculture Development's Drought Mitigation Project in Andhra Pradesh's five dryland districts.

This partnership improves the ability of smallholder farmers to improve their livelihoods and increase their incomes through resilience to climate variability.

WHAT AUSTRALIA WOULD LIKE THE AGRIBUSINESS RELATIONSHIP IN 2035 TO LOOK LIKE

By 2035, we should aspire to have a bilateral agribusiness relationship where Australia has:

- Greater predictability of Indian market interventions
  - and is able to manage exposure to India through advanced warning of changes to Indian domestic production, particularly those that will trigger increased tariffs and other penalties on imports.
- Captured a greater share of Indian commodity imports, even as the size of India's imports has grown
  - having maintained our agricultural commodity exports in established markets in North Asia and beyond
  - having tapped into growing Indian urban centres as established markets with mature export paths and involved in all links of the value chain
  - having increased and improved engagement with Indian policy makers.
- Matched our strengths in exporting unprocessed goods with exports of value-added commodities
  - having paired our wealth in raw ingredients with world-class science to create new exports of premium and unique products.
- Established itself as a leading provider of professional services to improve India's productivity
  - targeting commodities in which we do not compete in the Indian domestic market
  - having built comprehensive agricultural partnerships with leading states
  - be a leading contributor to Indian conservation agriculture and water management.

THE SECTOR IS ALREADY BEING RE-SHAPED CONSISTENT WITH GLOBAL TRENDS

Out to 2035, the global agribusiness sector, including in India, will see:

- Fewer and less predictable resources
  - water scarcity and weather events will make supply more volatile
  - water shortages could derail production in certain parts of India and could force a shift to less water-intensive crops
    - to increase productivity, NITI Aayog says India's area under irrigation needs to be expanded by 1.7 million hectares[47] but groundwater level is dropping at a metre per year and two-thirds of India's irrigation comes from groundwater
    - groundwater is also being progressively contaminated
  - increasing consumer demand for environmental credentials will put a premium on sustainable produce at the high-end of the market.
- Smarter food chains
  - big data, digital connectedness, e-commerce, vertically integrated and decentralised value chains will lead to more agile and low waste logistics.
- More efficient markets
  - e-commerce will improve business to consumers links
  - online retail sales (not just foodstuffs) in India are growing at 140 per cent per year[45]
  - cheap data will underpin market information services and universal agriculture marketplaces.

- More choosy customers
  - rising wealth, urbanisation, greater demand for convenience and tailored products, and willingness to switch brands will lead to more dynamic markets
  - increasing societal health awareness and the importance of food safety will shift demand up the value chain
  - the desire for convenience and indulgence will shift consumption patterns to high value and nutritional products, especially in growing urban centres
    - improved cold chain infrastructure and new distribution channels like online retail will support this trend.
- Greater connectivity
  - as food and beverage chains become increasingly global, new competition will be introduced
  - connectivity will increase risks of biosecurity threats and supply shocks including livestock or plant disease.
- New farming techniques
  - along with precision agriculture, concepts like hydroponics, enabled by research in bioengineering and biotechnology, could change how and where we grow food
  - modular refrigeration units could make cold chain storage more affordable
  - regional take up of innovative farm management platforms using data from multiple sources (for example soil, weather, aerial imagery)
    - yield improvements and food waste reduction could increase India's food supply by 45 per cent by 2025, increasing India's agriculture output by $230 billion by 2025 over 2015 figures[12]
  - automation in farm operations and logistics
  - the introduction of new and better plant varieties
  - acreage shifts towards high value crops and broad acre cropping.
- Better access to financing
  - enabled by direct benefit transfers and digital financing and insurance pay-outs (credit, insurance, payments, risk management)
  - supported by data from digitised land records, images and digital sales that will enable producers and processors to invest in new technology
  - the emergence of Farmer Producer Organisations and Farmer Producer Companies will give the fragmented Indian sector a more united voice and purchasing power for inputs, services and research and development.

2.0 OPPORTUNITIES FOR PARTNERSHIP

KEY JUDGEMENT

Growth potential for Australian exports remains in commodities that India needs due to shortfalls in production (pulses, grains, horticulture, oilseeds). Opportunities also exist, or will emerge, for value-added products sought by the growing consumer class (wine, processed food) and for providing specialised services to Indian Governments, institutions and farmers.

2.1 Export opportunities

Given the profile of our respective sectors, there is a spread of opportunities out to 2035 as shown in Table 3.

TABLE 3: AGRIBUSINESS EXPORT OPPORTUNITIES TO 2035

		Near term	Medium/Long term
Goods	Raw commodities	Export commodities Investment in import pathways	Export commodities Investment in different links in the supply chain (food processing, packaging, cold chain)
	Processed products	Export processed value-added products Investment in import pathways	Exports Invest in food processing in India
Services	On-farm	Precision farming Seed treatment and soil health solutions Plant and animal genomics	Supply full range of agri-services Collaborate with Indian scientists and start-ups working on plant and animal genomics
	Post-farm	Logistics and bulk storage solutions Food processing	Logistics and bulk storage solutions Food processing
	Safety and quality	Safety and quality consultancy to government and large export oriented businesses	Provision of food safety management systems
	Water	Policy engagement Research and development projects Water information systems Water use efficiency Water governance Irrigation projects	Policy engagement Research and development projects Water information systems Water use efficiency Water governance Irrigation projects

CASE STUDY: AUSTRALIAN PULSES: AUSTRALIA THE BIGGEST EXPORTER OF CHICKPEAS IN THE WORLD

Pulses, which include chickpeas, lentils, mung beans and dried peas, are an essential component of the Indian diet, providing a valuable source of protein, especially for the hundreds of millions of vegetarians in India.

For Australian farmers, pulses provide an essential 'break crop' in their cropping cycle. Pulses provide a necessary disease break within the wheat and barley cropping cycle, while returning valuable nitrogen from the atmosphere to the soil.

Australia exports more than 700,000 tonnes of pulses to India each year, worth more than half a billion dollars per annum. As India strives towards self-sufficiency, growing enough pulses for its domestic market, Australia supplies 'top up' pulses in times of crop shortage in India, due to climatic or supply variations. The superior quality of Australian pulses helps ensure strong and resilient demand from Indian buyers while pulses become more firmly entrenched in Australian broad-acre farming.

While the Australia-India trade in pulses fluctuates from year to year, with supply and demand fundamentals in any one season contributing to a volatile trading environment, the underlying prospects remain very positive.

PULSES

- India's demand for pulses is likely to increase from 21.5 million tonnes in 2015 to 32–37 million tonnes by 2025, and could reach 40–46 million tonnes by 2035.[12]
- India has set a target of producing 28 million tonnes of pulses by 2025 under its 'Pulse Program' but even if this is achieved India might need to import 5–10 million tonnes. Australia could potentially export 4 million tonnes by 2035.[12]
- Processed and packaged pulses, although small in their current share of pulse consumption, will be key pockets of growth with demand for packaged and branded pulses growing at 12 per cent per annum to 2025.[12]

WOOL

- As a growing market, India offers diversification for Australian wool exporters
  - 7 per cent (by value) of Australian wool exports currently go to India, compared to 74 per cent to China.
- India's textile industry (currently worth USD108 billion) is the second largest employer after agriculture, especially for women.[145]
- Australian fine merino wool does not compete with Indian wool which is predominantly used for carpets.
- Wool operates outside of the food self-sufficiency paradigm making it easier to approach.

WHEAT

- Long term Indian demand for wheat will likely outpace population growth. This implies wheat demand could grow from about 84 million tonnes in 2015 to 97 million tonnes by 2025 and 115 million tonnes by 2035.[12]
- One of the biggest future drivers of grain demand will be increasing per capita meat consumption, leading to growth in the Indian livestock sector (primarily poultry), and a corresponding growth in the stockfeed industry. Feed conversion ratios entail a multiplier on grain demand: for example, one kilogram of chicken meat needs two to three kilograms of grain input.
- Self-sufficiency for wheat in India is technically achievable, but unlikely to be economically efficient or environmentally sustainable.
- The volume of Indian wheat production is heavily dependent on the monsoon and government supports. In good years, India is a net exporter.
- Competing uses of land also means India's import demand could grow at a faster rate than consumption. As India focuses on pulse production, the area planted with wheat declines, increasing demand for wheat imports.

DAIRY

- There is a widening gap between demand and supply of milk in India.
- India is the largest milk producing country in the world, with production of 156 million tonnes in 2015–16. Demand for milk is growing at an average 7 per cent per annum while milk production is growing at 4 per cent with strong demand for value-added milk products.
- As the animal to land ratio has reached saturation, the focus of India's dairy industry is on milk processing and improving yield per animal. There are systemic shortfalls in cattle nutrition and genetics.
- Aligning health protocols and standards with Australian specifications can unlock genetics export opportunities.[xx] If we don't, others will as they have in China – potentially reducing market access.

[xx] NITI Aayog – Livestock productivity is very low: 5 kg per in-milk buffalo and 3 kg per in-milk cow. Needs better breeds, nutrition and health. Coverage of artificial insemination is only 35 per cent

- There will be a sustained need for management skills, technologies and services: training, breeding, rearing, fertility and disease management, veterinary skills and services, milk quality and safety.
- The dairy industry in Australia can be complementary to the food industry in India. Australian dairy manufacturers largely export high quality product in bulk that could be further processed in India for domestic consumption or export to the region.

FRUIT, VEGETABLES AND NUTS

- The demand for fruits and vegetables is expected to grow at 5–7 per cent by 2025. This is, in part, driven by increasing demand for premium products and corresponding higher prices.
- Australia has counter-seasonal production.
- Nuts, in particular, are a largely noncompeting commodity which ticks nutritional and consumer preferences. Fruit and vegetable processing levels are likely to increase significantly, driven by reduced wastage and benefit from value add.

SHEEPMEAT

- Strong growth in Indian demand for food products, especially sources of protein, is projected out to 2035. Coupled with the Indian market's strong affiliation with sheepmeat through cultural and religious customs, this present tremendous potential for Australian exporters.
- Beyond the Indian consumer's demand for food, demand will also grow for the wider variety of animal products and red meat by-products.
- Australian sheepmeat services a different (higher-end) market segment to that supplied by Indian domestic red meat production and this non-competitive differentiation should be emphasised and leveraged in any dialogue around potential regulatory reform.
- India's import certification requirements for Australian red meat products are some of the main obstacles to maximising opportunities.

SUSTAINABLE INPUTS

- The market for organic foods in India is expected to triple by 2020.[45]
- Fertilisers are only used in 30 per cent of India's arable land, with demand expected to grow strongly, including for microbial and organic fertilisers and bio pesticides.

OTHER COMMODITIES

- Demand for 'luxury' commodities like wine, poultry and aquaculture is predicted to grow faster than the overall growth of India's agricultural sector.
- Demand for other key commodities like cotton, wood and paper products is predicted to grow in line with the overall growth of India's agricultural sector.

2.2 Collaboration

There will be strong and sustained demand in India for agri-services, consulting and technologies in areas where Australia has expertise. The kinds of long term partnerships that can achieve collaboration beyond simple exports and connect Australian players directly with industry include where Indian demand and Australian capabilities converge.

SOIL HEALTH

Global soils are depleted and Australia and India are no exceptions. Soils contain three times as much carbon as the atmosphere. If managed properly, they could be a significant long term sink for carbon dioxide. Getting it right means more income for farmers and better long term sustainability. This presents opportunities in:

- land management inputs and advisory services, including agroforestry, low-till agricultural methods, holistic grazing, shallow underground drip irrigation of broadacre crops compatible with no-till crop establishment
- joint research and development – we have relatively little information about the physical and biological soil–plant interface, or how to improve soil carbon consistently.

CASE STUDY: AUSTRALIAN ALMOND BOARD: AUSTRALIAN ALMOND EXPORTS TO INDIA TRIPLE IN A DECADE

Almonds are a big part of Indian culture and are sought-after gifts during festivals like Diwali, as well as for weddings and other large family celebrations.

Australian almond producers have invested in additional supply in the Mildura region to meet this ongoing demand. In the last decade, almond exports to India have more than tripled, from $28 million in 2006–07 to more than $113 million in 2016–17. Australia is now the second biggest source of almonds for India after the United States, and India is Australia's biggest export market for almonds.

Timing helps. Australia's season is opposite to that in California. This means we are well placed to meet the demand of the major gift-giving period prior to the Indian festival of Diwali in November, and the major wedding period of northern India.

Working together and perseverance has been key to success. The industry peak body, the Almond Board of Australia, has developed a collaborative export marketing program funded by contributions from growers. This program has promoted Australian almonds to key markets, including India, for the past 15 years.

The world's largest annual food and beverage show, Gulfood in Dubai, has been a significant marketing and promotional opportunity for Australian almonds for many years. In 2018, almost a hundred participants, including representatives of all the major almond traders in India, attended a networking seminar organised annually by the Australian Almond Board.

FOOD WASTE

Food waste is a global challenge that has environmental, economic and social impacts. Like India, Australia seeks to address this challenge

- food waste costs the Australian economy about $20 billion a year
  - the Australian Government's National Food Waste Strategy, released in November 2017, aims to halve Australia's food waste by 2030 through technical improvements and innovative practices and polices
- there is acute demand for logistical and supply chain improvements in India to minimise food waste and also consumer prices – this presents opportunities for collaboration and investment in
  - bulk storage systems, which could increase in importance as Indian supply chains grow
  - cold chain storage, including the provision of solutions to government institutions like the Food Corporation of India which are responsible for handling agricultural products
  - supply chain standards and practices and the application of advanced analytics to identify bottlenecks
- collaborating with India to develop and roll out high yielding varieties of plants, seeds, and animals can help offset food waste
  - including through joint research and development investments to increase productivity

- the development of efficient farm machinery can help minimise food waste at the point of production
  - which could be designed in Australia and manufactured in India.

WATER MANAGEMENT

Water management underpins the food and agriculture sector

- water supply is not assured in much of the country with 80 per cent of India's water resources used in agriculture
- With Australia's expertise in irrigated, rain-fed and arid-zone farming and groundwater management there is scope to build further engagement with local partners to link water and agriculture thereby increasing food and water security
- for example, the Australian Centre for International Agricultural Research (ACIAR) is trialling water-efficient farming technologies and practices in two Indian states and the Australian Water Partnership, BOM, CSIRO, University of Western Sydney, International Centre of Excellence in Water Resources Management (ICEWaRM) and eWater have water engagement activities to build on.

2.3 Investment

While Indian regulation prevents foreigners from buying agricultural land, India is seeking to attract investment into its agribusiness industries and companies

- India currently allows 100 per cent FDI in agricultural businesses, plantations and food processing industries through the 'automatic route'[48]
- there are fiscal incentives from the government like capital subsidies, tax rebates, depreciation benefits, and reduced custom and excise duties for processed food and machinery.

Investing in food processing and import pathways in India could achieve more stable trade regimes for Australian exporters and could provide long term opportunities given that demand will shift in favour of processed categories like packaged and branded, fortified, and ready-to-eat snacks and meals

- but the regulatory environment currently makes investment risky and will need to improve to provide confidence to investors.

Indian investment in Australia's agribusiness sector is small

- the wide range of investment opportunities in our agri-sector could attract Indian investment in the long term and vertically integrate supply chains
- Australia's policies to develop northern Australia, which includes a focus on agriculture, should also be a good fit with India's key economic priorities, including the possible purchase of properties
  - though this would be a long term outcome: India is not currently investing in northern Australia in a substantial way.

3.0 CONSTRAINTS AND CHALLENGES

KEY JUDGEMENT

The attractiveness of India's agricultural market for exporters swings sharply with tariff and policy changes. The sector is politically sensitive and protectionist – this won't change over the medium term, at least. The Government of India seeks to balance the needs of smallholder farmers and the needs of consumers with the broader goals of minimising social disruption and maximising political support.

3.1 The policy and regulatory environment

Defining features of India's policy environment include:

- Political sensitivity, which constrains big reforms
  - agriculture is the biggest employer in India and a commanding political constituency
  - for example, the granting of farm loan waivers has been an expedient political tool
    - political pressure to support farmers is compounded by the relatively high numbers of farmer suicides
  - the sector is also culturally sensitive: central and state governments have intervened from time to time to regulate the slaughter of cattle.
- Unpredictability
  - tariff and regulatory changes are abrupt, consequential and lack transparency, diminishing the confidence in foreign partners
    - for example, in December 2017 India increased tariffs on chickpeas from zero to 30 per cent, and up to 66 per cent in February 2018
  - these changes are often prompted by Indian production that is affected by monsoons, seasonal conditions and election cycles
  - this disincentivises supply contracts and both Australian exporters and Indian importers/processors underinvest in the business relationship because of this unpredictability.
- India's entrenched philosophy of food self-sufficiency permits arbitrary and ad hoc protectionist measures
  - India could theoretically achieve self-sufficiency, but few forecast it could do so consistently, sustainably or economically
  - India periodically exports goods related to food security (wheat, rice) during periods of high production and seeks to export goods not linked to food security (buffalo meat, table grapes, mangoes).
- Food, agriculture and water policy is spread across several central ministries, making policy management and renewal very complex.

AGRICULTURE IS ONE OF INDIA'S MOST REGULATED SECTORS

The Indian Government has three objectives: food security, food self-sufficiency, and income support for farmers

- in pursuit of these objectives, it applies competing regulatory regimes: suppressing domestic food prices; supporting producers; barriers to imports
- India spends nearly 20 per cent of its budget on these measures[44]
- the budget impact of these competing policy ideals will increase in the future, raising questions of fiscal sustainability.

Major market distorting regulations include the Essential Commodities Act and Agricultural Produce Market Committee (APMC) Act which restrict price, supply and distribution for domestic producers, hindering the development of private markets

- the latter requires wholesale trade to pass through an APMC, hindering the establishment of contract farming, the development of private markets and the direct trade of agricultural products from farmers to consumers
- small regulated markets lead to a fragmentation within states
- this limits investment, including in warehousing, cold storage and cold chain logistics, as well as food processing.

The Central Government has opened the door to reform, and implementation is being taken up at various speeds in the states

- the launch of the online National Agriculture Market portal by the Central Government can facilitate better links between sellers and buyers, as can the rationalisation of taxes on agricultural commodities as a part of the APMC Act Reform
- the Central Government is considering incentivising states to accelerate some of their reforms by linking part of the financial grants for states under Central Government schemes to the agriculture reforms implemented.

Current barriers to trade include:

- Minimum support prices: for certain commodities, underpinned by the Food Corporation of India and state governments
  - producers are able to sell as much as they wish to procurement agencies at set prices, subject to quality.
- Input subsidies: fertiliser support is one of the largest input subsidies, where the government controls prices and pays the difference to market prices
  - other subsidised inputs include irrigation, electricity, diesel and seeds.
- Import tariffs: which are applied to most imported food products, keep domestic food prices above world levels
  - India's simple average applied tariff for all products is 13.4 per cent, compared with 9.9 per cent for China and 2.5 per cent for Australia
  - but India's average applied tariff for agricultural products is 32.7 per cent[49]
  - while applied tariff rates have declined significantly since 1991, they are volatile and remain among the highest in the world.
- Food subsidies: the Central Government subsidises food to support the section of the population living in poverty, and to offset the impact of policies (such as the maintenance of Minimum Support Prices and tariffs) that keep food prices high.
- Divergence from internationally accepted standards: including from the World Organisation for Animal Health, the Codex Alimentarius Commission, and the International Plant Protection Convention
  - this means India imposes import certification requirements which are not in accordance with international food safety measures or those adopted by the majority of Australia's other trading partners

  - nor does India currently recognise Australia's disease freedom and management of export certification procedures.
- Other non-tariff barriers: include import bans (animal products), quality standards (fumigation of pulses by methyl bromide), and labelling and packaging rules.
- Sanitary and phytosanitary (SPS) issues: are often treated inconsistently, without transparency, and driven by politics over science.
- A weak intellectual property (IP) regime: seed, fertiliser and pesticide companies can be required to provide proprietary knowledge to domestic industry.

3.2 Skills, infrastructure and other constraints

Constraints and limits on the Indian side include:

- the Government of India's view that more imports of Australian products will undermine the livelihoods of farmers, despite many Australian higher-priced products catering to the wealthier segment of Indian society
- a lack of reliable supply chain logistics and cold storage options (including due to lack of capital and erratic electricity supply although the latter is improving)
- lack of skilled personnel to operate or maintain systems, for example micro irrigation
- the small scale of much of India's farming (around 80 per cent of farms are less than two hectares) hinders the adoption of capital-intensive equipment like precision agriculture
- lack of access to financial services and formal credit for Indian farmers
- while Australia has a lot to offer in agri-services, unlike the market for METS, the Indian agricultural sector is fragmented and predominantly smallholder, and with few institutions with budgets for research and development or new technologies.

Constraints and limits on the Australian side include:

- the bandwidth limit of Australian producers
  - Australian agricultural producers are selling all their stock in global and domestic markets already
  - they would need to take on higher value crops under reliable Indian demand to shift focus
  - trade policy fluctuations in India, often with little notice, affect market confidence; Australian farmers are less likely to take a chance on India until they see more surety in its trade policy
- it is challenging for Australian peak bodies to convince industry to sponsor collaboration given short term returns are scarce and India is a long term competitor
- Australia's current engagement with India on water involves development cooperation, commercial transactions and twinning partnerships. But given Australia does not have a bilateral aid program in India, many funding sources are confined to regional funds or multilateral bodies.

CASE STUDY: FLETCHER INTERNATIONAL EXPORTS: HIGH-END HUNGRY FOR AUSTRALIAN LAMB

Indian cities are rapidly growing and with them high-end hotels and restaurants. This is opening up new markets for premium Australian food, and particularly meat and wine.

As a world leader of quality sheep meat, Australia has been positioning itself to supply the growing middle to upper class segment of the market.

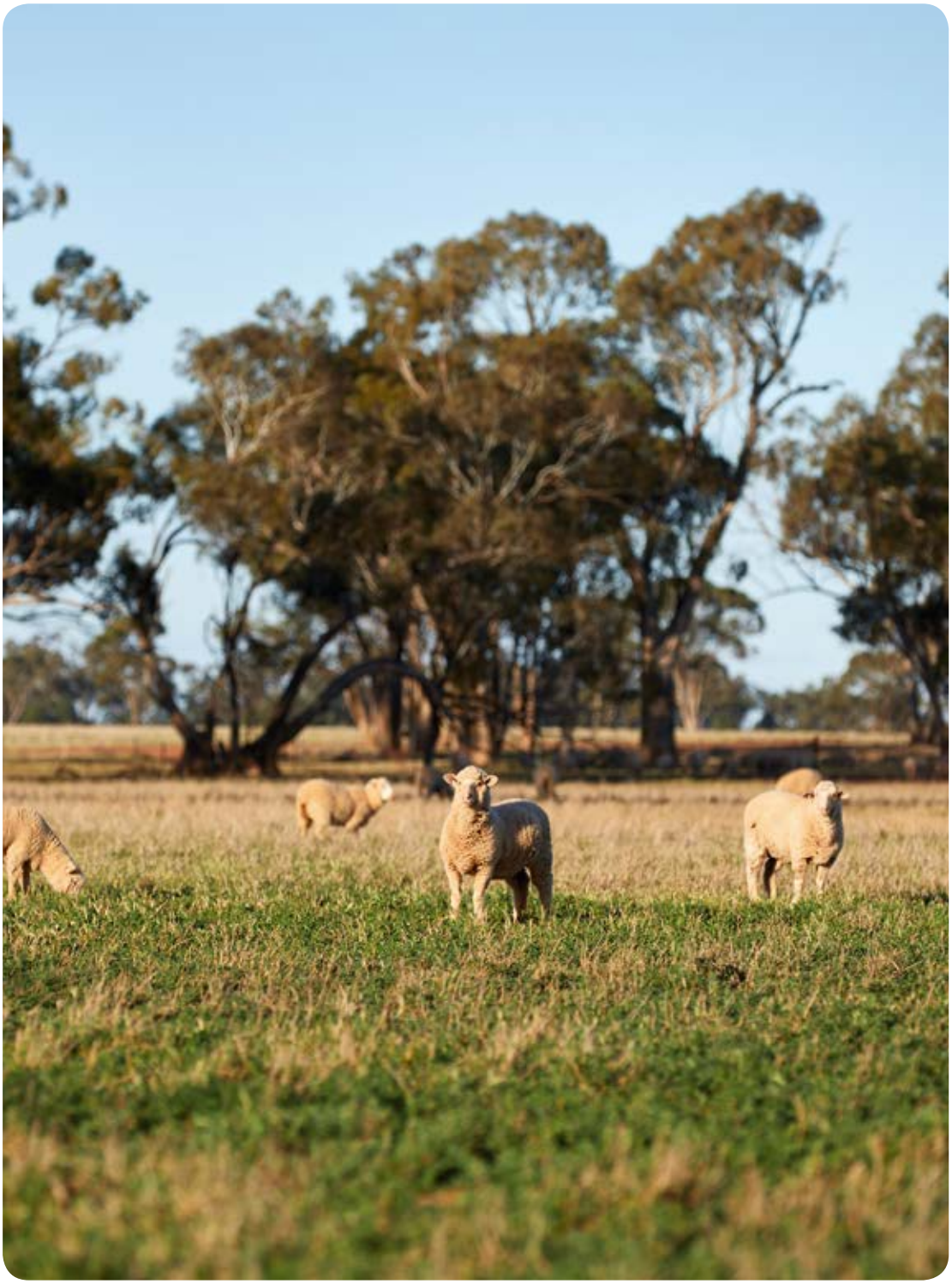
With processing facilities in Western Australia and New South Wales, Fletcher International Exports was an early exporter of lamb meat to India in 2012, after the Indian Government opened its markets to lamb imports.

Fletcher International Exports focused on the growing interest in lamb in the fine dining sector and spent time to get to know the market before the company entered. It identified a market gap in high value lamb racks and large lamb legs. Importantly in this market segment, it identified that Australian products would not compete with India's farmers, as local producers focus on smaller sized lamb and mutton preferred for curry.

Displaying their products at trade fairs including Fine Food India, Fletcher International Exports focused on building brand prestige based on the consistent high quality of Australian lamb and sheep meat products underpinned by stringent quality control methods.

Fletcher International Exports also used brand prestige associated with other high-end Australian products already in Mumbai, Delhi, Bengaluru and Chennai and was able to make use of already established distribution lines through a series of Australian food and beverage events organised by Austrade.

Through their Halal certification, Fletcher International Exports are now looking to expand to nearby countries Pakistan and Nepal.



4.0 WHERE TO FOCUS

Australian efforts should: focus on the Central Government for market access and policy issues; and target states which are responsive to implementing reforms, willing to spend on infrastructure, and have conditions conducive to trade and investment.

The Central Government sets price controls, tariffs and other barriers. It also plays a role through promotional schemes for particular varieties of crops and agricultural products.

The states have responsibility for implementing agriculture policies, meaning states affect conditions for delivery of agri-services, technology and investment.

Besides taking account of the size, dynamism and infrastructure in each state, target states can be identified by considering several factors: urban centres provide big and accessible markets, including affluent consumers; special economic zones lend themselves to food processing and investment; well-developed agri-sectors and favourable policies provide opportunities for delivery of services and technologies; we can double-down on established relationships on water engagement.

4.1 Key states

ANDHRA PRADESH

- Net State Value Added (NSVA)[xxi] for agriculture sector: 34 per cent
- Investment: Coastal economic zone around Vizag presents potential for setting up food processing hubs. As a new state, Andhra Pradesh is seeking to attract investment and establish liberalised markets. It has a newly created agritech accelerator, Gastrotope, focused on tech-enabled smart agriculture.
- Services: Andhra Pradesh has a growing agri-sector with opportunities for better dairy productivity, sustainable fisheries and aquaculture management, especially given strong growth in agriculture and aquaculture (26 per cent and 33 per cent in 2015–16).

MADHYA PRADESH

- NSVA for agriculture sector: 41 per cent
- Services: Madhya Pradesh has India's highest agricultural growth rate and output, including strong production of wheat, pulses and dairy. During 2012–17, growth in agriculture averaged 21.5 per cent. One of the contributing factors to this includes a massive expansions in irrigation.

MAHARASHTRA

- NSVA for agriculture sector: 11 per cent
- Trade: Mumbai provides a major urban market, affluent consumers and a big port.
- Investment: Maharashtra has a coastal economic zone which presents potential for food processing hubs.

NEW DELHI NCR

- NSVA for agriculture sector: 1 per cent
- Trade: New Delhi provides a major urban market.
- Conservation agriculture: Stubble burning in surrounding regions contributes to intense air pollution and opportunities for agri-services.

PUNJAB

- NSVA for agriculture sector: 31 per cent
- Punjab is widely regarded as India's breadbasket and contributes over 20 per cent of India's food production, including wheat, rice, barley and dairy.
- Even as agriculture's share of Punjab's Gross State Domestic Product (GSDP) has sharply declined, it continues to play an important role in the state (and indeed national grain production), with more than 83 per cent of Punjab under intensive agriculture.
- As with much of India, Punjab suffers from falling water tables and poor soil quality.

[xxi] NSVA data is for 2015–16. India's national NSVA for agriculture is 17 per cent.

RAJASTHAN

- NSVA for agriculture sector: 28 per cent
- Services: Given the extensive areas of desert and dry land farming, there are opportunities in water management services. As a major producer of milk, cereals, pulses and oilseeds there should be long term opportunities in food processing.

TAMIL NADU

- NSVA for agriculture sector: 13 per cent
- Trade: Chennai provides a major urban market. Tamil Nadu is a major agricultural producer and a major importer of Australian pulses and grain.
- Investment: Tamil Nadu has established strengths in fisheries, aquaculture and agri-technology.
- Australian wheat has a freight advantage into south India over India's domestic production which is predominantly grown in northern India.

UTTAR PRADESH

- NSVA for agriculture sector: 28 per cent
- Trade: India's most populous state (over 200 million people) and a corresponding broad based market.
- Services: Major producer of milk.
- Investment: Acute demand for cold-chain logistics.

WEST BENGAL

- NSVA for agriculture sector: 17 per cent
- Trade: Kolkata provides a major urban market. It is the biggest city in eastern India, an economic hub for the north east, and one of the fastest growing cities in the country. It is the main point of entry for Australian pulse exports to India.
- Water: West Bengal is in the Eastern Gangetic Plain. ACIAR has established irrigation, water and conservation agriculture projects showing good results.

RECOMMENDATIONS

India's demand profile will keep changing out to 2035 so businesses should continue working to reach current markets, while also playing with a long view for the markets of tomorrow. Providing services or technical cooperation to India could be on an outright commercial basis. It could also align with Indian policies to build perceptions of Australia as a constructive partner and develop links for future exports or commercial services.

29. Seek to mitigate fluctuations in Indian demand for raw agricultural commodities

29.1 Work with the Indian Government to put in place mechanisms to provide better forecasting and greater visibility of fluctuations in Indian demand for agricultural commodities imported from Australia

- Australia could provide globally-competitive forecasting services directly to India's Directorate General of Foreign Trade to help ensure earlier advice on policy decisions such as tariff increases
  - including through deeper relationships between the Australian Bureau of Agricultural Resource Economics (ABARES), the BOM and the Indian Meteorological Department
- import tariffs and trade restrictions are often applied in response to changes in domestic production driven by seasonal conditions or due to specific Indian Government schemes
- improved weather and monsoon forecasting, and monitoring of Indian Government schemes, could add an element of predictability that could assist India to know earlier its likely harvest levels
- understanding and managing climatic variability is an area of Australian strength and working with India could also support the provision of timely information to the Australian side.

29.2 Conduct a feasibility study of investment in Indian storage facilities for pulses and grains at ports of importation

- so India has better capacity to manage surges in its domestic supply without recourse to suddenly imposing tariff increases on imports
- any subsequent investment in import pathway infrastructure should be on the condition that India will provide advance notice of regulatory changes to enhance predictability.

29.3 Work with other countries to encourage Indian policy makers to action tariff changes in a manner that allows for business continuity

- concerted and coordinated messaging with like-mindeds (for example, the Organisation for Economic Co-operation and Development [OECD], Canada, United States), including through the World Trade Organisation (WTO), to encourage India to recognise its role in the global food chain where abrupt changes affect India's food security in the long term.

30. Seek to make our agricultural markets more interoperable

30.1 Within the broader effort of harmonising standards with India, [*see Recommendation 78.1*] pursue greater alignment of food standards

- facilitate further engagement between India's Food Safety and Standards Authority and the Australian Department of Agriculture and Water Resources (DAWR), including through work sharing, information sharing and regulatory convergence activities
- enhance collaboration on Codex standards between the lead Indian and Australian agencies through Codex processes, including with Codex Australia (within DAWR) and Food Standards Australia New Zealand (FSANZ).

30.2 Fund FSANZ to deliver capacity building and regulatory capability development activities with India.

31. Build targeted relationships with decision makers and seek to address regulatory barriers

31.1 Institute greater policy dialogue to discuss market access requests, technical market access issues, domestic policy and regulations

- pursue annual Agricultural Minister meetings
  - elevate water/irrigation to be a topic covered by ministers
- continue and expand the Joint Working Group on Agriculture
  - seek to promote international standardisation and technical cooperation activities, for example on biosecurity; quarantine and SPS accreditation schemes; harmonisation of treatments; pest risk analysis
    - provide more resources to make this core business of the Joint Working Group more effective
  - including the pursuit of recognition of Australian certifications and protocols
  - expand to include water-related dimensions such as irrigation

- give greater emphasis under existing MoUs (for example wool, textiles, water cooperation) to collaborating with India on the regulatory environment
- provide technical and scientific capabilities to India to support adherence to international standards.

31.2 Activities under these policy dialogue frameworks need funding and improved coordination with commercial/financial sectors

- explore, together with industry, options to either establish a 'cooperation fund' to kick-start agricultural technical exchanges and capacity building to underpin policy dialogues
- expand existing government funds such as DFAT's Government Partnerships for Development Fund and Sustainable Development Investment Portfolio
  - particularly in support of ACIAR.

31.3 Develop a coordinated advocacy strategy to address the concern that Australian agriculture would flood India's market and dislocate farmers if tariffs are lowered

- building on the work already being undertaken by Austrade and the DAWR.

32. Work with Australian Industry to provide platforms to take Australian agricultural services, consulting and technology to India

32.1 Facilitate agribusiness pilot projects to showcase expertise with a view to commercialisation

- in close consultation with ACIAR establish pilot dairy programs to showcase Australian genetics, storage, nutrition and transportation
  - for example, where Australia provides expertise on productivity improvement along with the basic product, such as milk powders, caseins, protein concentrates and India provides next stage manufacturing and packaging to export products to third markets.

32.2 Establish model agricultural zones/centres of excellence in conjunction with a target state government to showcase Australian practices and technology to increase productivity

- Andhra Pradesh presents itself as a state likely to be receptive of this.

32.3 Establish an Australia-India Food Partnership, including an International Agricultural Services Hub to package Australian policy, implementation and services expertise

- the Food Partnership would provide a framework for
  - strengthening engagement between Australian and Indian agriculture and food industries
  - strengthen Australia's reputation and a longstanding reliable partner in agriculture

  - work with Indian policy makers to assist in the design and implementation of effective agricultural legislation, regulation and policy making
- the Hub could offer
  - a one-stop shop of advice across university, industry and public sectors
  - blended financing, including in-kind contributions from the private sector
  - a unique Australian brand
  - bespoke services available through fee for service
  - if successful in India the concept could be extended to other developing markets.

33. Foster a knowledge partnership in agri-science

33.1 Seek to grow ACIAR's technical exchange relationship with India

- create a pathway to more easily invest aid funds in bilateral projects with India
- concurrently, ensure ACIAR's relationship with India is framed around technical partnership, rather than donor-recipient, with India making parallel investments to ensure Indian scientists work in and alongside research teams with appropriate Australian engagement.

33.2 Foster collaborative training and education services focused on agriculture through:

- sponsoring masters/PhD offerings in food science and agronomy including through Australia Awards
- training, workshops and executive courses in farm management and across all stages of production cycle with a focus on including female farmers.

33.3 Foster further collaborative research and development and subsequent commercialisation of Intellectual Property

- establish an Austrade Business Development Manager in an Indian agricultural university/research institute to foster institutional linkages (like the India School of Mines model) [*see Chapter 4: Resources and METS*]
- foster deeper collaboration between Australian research agencies (such as ACIAR, ABARES, the Rural Industries Research and Development Organisation and the Grains Research and Development Organisation) and Indian agencies (such as the Indian Agricultural Research Institute, National Dairy Research Institute) and with international agencies with an India focus (the International Crops Research Institute for Semi-Arid Tropics and the World Bank).

33.4 Offer internships and support for Australian students to engage with Indian agricultural start-ups

- provide specific funding under the New Colombo Plan

  - for example at Andhra Pradesh's agritech accelerator, Gastrotope, which is supported by Japanese investment and focuses on Internet of Things applications for smart agriculture.

34. Foster targeted relationships directly with Indian industry, markets, and producers in key states

34.1 Sponsor farmer to farmer exchanges

- Draw from Australia's farmer-driven research and development buying groups to send experienced practitioners to India. These would essentially be exchanges between small business owners and entrepreneurs to complement scientific research and help lead to commercial uptake of Australian technologies. This model would get beyond relationships built on fly-in/fly-out researchers.

34.2 Facilitate Australian producer delegation visits to India to understand the markets and the environment in target Indian states, targeting fairs and conferences with Indian industry bodies.

34.3 Deepen engagement with Farm Producer Companies to promote and coordinate private sector cooperation and technical exchange with India

- Indian counterparts could be paired with Australian farmer cooperatives
  - including with a focus on improving female participation in Indian cooperatives
- one focus for exchange should be on irrigation: industry-industry engagement is currently limited, noting Australia is hosting the World Irrigation Congress in 2020
- out to 2035, Farmer Producer Organisations and Companies in priority States could become useful engagement points, enabling engagement directly with suppliers and customers.

35. Consolidate Australia's branding

Better coordinate Australian branding in agriculture and water

- drawing on Australia's 'clean and green' brand
- deliver the message that Australian agricultural commodities don't pose a threat to domestic suppliers and service different market segments, or are counter seasonal
- build on success of MasterChef to promote quality of Australian products
- leverage hotel chains as a lobbying force for access to high value produce, for example ITC Hotels, or the Federation of Hotel and Restaurant Associations of India.

36. Continue to improve Australian productivity and efficiency

The Australian Government must maintain an ongoing focus on improved domestic productivity to ensure Australia remains cost-competitive relative to its global competitors, including through

- reducing regulatory burdens and building human capital through improving labour availability and skills
- investing in agricultural research and building strong multinational research programs that support productivity and help ensure our farmers have access to the latest technologies.

TOURISM SECTOR

CHAPTER SIX

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SUMMARY

- By 2035, the number of Indian tourists to Australia is expected to grow four-fold, from 300,000 in 2017 to nearly 1.2 million. This puts India on track to go from being Australia's eighth largest tourism market today to our fourth.
- An estimated 70 million Indians will travel overseas annually by 2035 meaning Indian tourism could be worth over $9 billion each year to the Australian economy.
- Attracting a greater share of travellers and more high-value travellers from India will be important for sustaining the profile and scale of Australia's tourism sector.
- Australia should continue to grow the number of Indian tourists visiting friends and relatives in the diaspora and student bodies in Australia and we should continue to target luxury holiday-makers and business travel niches as new growth markets.
- Australia can do this by stimulating Indian demand and improving the supply offering through tailored development and marketing, an 'India ready' tourism workforce, visa settings and greater connectivity. While the sector is private-led in both countries, government can play an important enabling role.
- We should use tourism to enhance perceptions of Australia in India as a welcoming, diverse and advanced economy.
- Favourable tourism outcomes can also build bridges in the broader bilateral economic relationship, by improving cultural literacy and facilitating face to face relationships.
- More direct flights between Australia and India are essential to building the tourism and broader economic relationship.

1.0 THE MACRO STORY

KEY JUDGEMENT

Rising household incomes and more accessible connectivity will continue to open up international travel to a larger proportion of India's population. Out to 2035, an estimated 70 million Indians will travel overseas. India's sizable worldwide diaspora and international student base will continue to provide a pull factor for visiting friends and relatives. Alongside this, affluent Indian travellers will seek premium and personalised experiences that exude cachet. Business travel will expand in line with commercial interests with the Meetings, Incentives, Conferences and Exhibitions (MICE) travel segment the most prospective. The next generation of Indian travellers will be younger, more gender-balanced and be less likely to travel in multi-generational family groups. Capturing a greater share of India's outbound travel market will help shore up the long term prospects of our tourism sector. By 2035, there is potential for expenditure from Indian travellers to Australia to increase from $1.5 billion to $6.1 billion in a moderate case, or up to $9.1 billion in an aspirational case. More direct air services are crucial to the development of this market.

1.1 Scale and key structural drivers of the sector

INDIAN DEMAND

India is one of the world's fastest growing outbound travel markets

- in 2017, 23 million[50] Indians travelled overseas, with this figure expected to approach 70 million by 2035.

Growth in India's outbound tourism market is driven by

- rising personal income levels and changing lifestyles for the burgeoning consumer classes
- affordable airfares and diverse travel packages
- India's 30 million[51] strong diaspora and international student base which serves as a pull factor for those visiting friends and relatives (VFR).

There are two distinct types of Indian holiday-makers:

- The Luxury Traveller: experienced global travellers, accustomed to five star + facilities, wide culinary palate, expects personalised and premium services, shorter but more expensive trips
  - the number of high net worth individuals (HNWI) in India is expected to triple, from 400,000 in 2016 to over 1.2 million by 2030[96]
- The Cost-Sensitive Traveller: with past international travel experience typically limited to Asia-Pacific destinations, more likely to be VFR than a pure leisure traveller, expects Indian food options, longer but budgeted trips, with a dispersal radius of two to three metropolitan cities.

On the business side, India's outbound MICE travel segment is projected to grow at an average of 22 per cent annually, generating around 30 million outbound travellers by 2030.[52] There is an increasing propensity for Indian MICE travellers to be accompanied by spouses and children and combined with short leisure trips.

In India, travel is increasingly perceived as a demonstration of success. The status offered by travel varies by destination. Travel within Asia is the first threshold, out-of-region travel exudes greater clout including to countries in North America, Europe and, to a slightly lesser extent, Australia.

SUPPLY DRIVERS (MAKING IT EASIER TO TRAVEL)

Technology-led travel research and booking platforms are increasingly accessible to the average Indian consumer

- the internet allows people to be their own travel agents
  - depending on familiarity with international travel or the destination, travel agents are engaged at a later stage of the decision cycle (if at all).

Greater aviation connectivity out of India is making travel more convenient

- around the world, airfare costs have decreased in real terms and yield per passenger per kilometre is the lowest on record[53]
  - international airfares represent around 25–30 per cent of tourism budgets; savings can be used to upgrade experiences on the ground
- the entry of low cost carriers for short haul destinations has opened up international travel to new demographics and income groups in India
- the Government of India is seeking to remove limits on air services capacity – as announced in 2016 through India's National Civil Aviation Policy which proposed reciprocal open skies air services agreements with countries beyond 5,000 km from New Delhi.

The ability to use the Aadhaar card (a national biometric identity card) or voter card as proof of identity in India is improving ease of obtaining and renewing passports

- only 5.5 per cent of India's population held a passport in 2017[54]
- this could become important for Australia regarding fraud and visa issuance
  - for example, if voluntary access to individual biodata on the Aadhaar card were negotiated it could improve confidence in Indian documentation and facilitate faster visa processing.

AUSTRALIA'S COMPETITIVE ADVANTAGE

Australia is one of the world's leading tourism destinations, ranked seventh on the Travel and Tourism Competitiveness Index Ranking 2017. In 2017, 8.8 million people visited Australia, and this figure could reach 20 million by 2035.[55] The sector thrives due to comparative strengths:

- world-class natural beauty and wildlife (such as the Great Barrier Reef, along with 18 other world heritage sites)
  - world-class natural beauty and wildlife are consistently reported as the most important factors for Indian holidaymakers[56]
- perceived safety and low crime rates
  - safety and value are the next most important factors for Indian holidaymakers
- provision of alternative tourism options like cruise shipping, adventure sports
- culinary experiences from different cultures
- mix of sophisticated urban centres and wide-open spaces.

Australia has a substantial and growing Indian diaspora and student cohort to draw VFR travellers

- Australia's Indian diaspora has trebled over the decade to 2017
- in 2017, there were more repeat visitors to Australia from India than first time visitors.[55]

Visitation from India to Australia has grown strongly over the past decade (to 2017) at an average rate of 12.7 per cent per annum, with spending growing by 15.1 per cent per annum

- today, India is Australia's eighth largest international tourism market, attracting around $1.5 billion in spending[55]
  - in passing the 300,000 visitors milestone in the year ending 2017, the Indian tourism market has already surpassed the 2020 targets set under the Tourism Australia India Strategic Tourism Plan

- visitation from India is forecast to grow four-fold to reach between 1 to 1.2 million by 2035 with leisure travel expected to near the 500,000 mark
  - this would make India our second fastest growing inbound tourism market (behind China), and fourth largest market in aggregate[57]
- by 2035, expenditure by Indian visitors to Australia is expected to reach $6.1 billion in a moderate case and up to $9.1 billion in an aspirational case.

1.2 How the sector will likely evolve out to 2035

GLOBAL TRENDS IN THE TOURISM SECTOR WILL AFFECT INDIAN AND AUSTRALIAN MARKETS

The growing global middle class will fuel international travel and tourism

- with good English language skills, Indian middle class travellers can gain independence from guided tour groups, leading to an increase in free and independent travelling[58]
- as the global population becomes more urbanised, natural attractions will become increasingly important for those seeking a unique holiday destination
- visitors will demand more authentic experiences reflecting local culture rather than curated experiences manufactured by tour operators (these preferences are already exhibited by India's small but growing young and independent travel market).

Technology will keep empowering consumers

- tourism will continue to be a buyer's sector with the onus on providers to meet heightened consumer expectations and deliver tailored offerings (for example, communicating in Indian languages).

The shared economy will threaten traditional modes of hospitality

- hotels are not expected to regain market share lost to Airbnb and are being driven to offer services on new and dynamic platforms.

As a labour intensive sector, automation will transform how tourism services are delivered. Automation will disrupt the pre-booking stage and will also be increasingly visible at destination

- jobs most prone to be automated in the short to medium term are tourism operators, customer care at hotels, along with processing at tourist sites and events
  - large scale roll-out of robotic and virtual tourism assistants is expected to materialise within the next decade
    - for Indian tourists who are accustomed to overservicing in their domestic lives, loyalty could be enhanced for tourism operators able to retain a human touch
- engaging with the community is a quintessential part of the tourist experience and will see enduring value placed on human touch in service delivery (for those prepared to pay).

Big data will enable in-depth analysis of visitor preferences and behavioural patterns, enabling customisation at lower cost.

More hotels will evolve into multi-activity complexes, where accommodation sits alongside a range of leisure, sport, casino, convention, retail, dining and entertainment facilities

- for example, Barangaroo in Sydney, Aquis Resort in Gold Coast, and Queen's Wharf in Brisbane are following leaders in Dubai, Singapore and Hong Kong in hotel diversification.

The rise of virtual reality tours and 3D simulations could become an affordable alternative for those unable to afford to travel physically

- this technology could also be used for marketing destinations and enhancing on-the-ground experiences.

CASE STUDY: TOURISM AUSTRALIA: BOLLYWOOD STAR TOURS AUSTRALIA

Bollywood star Parineeti Chopra is young, enthusiastic and a popular household name across India. Tourism Australia has tapped into her networks to connect with the rapidly increasing number of Indians looking to travel overseas.

In-bound tourism from India is a high-growth market for Australia, with this strategy projecting the market to be worth over 9 billion by 2035.

As a signed-up 'Friend of Australia', Parineeti visited Central Australia and the Gold Coast in September 2017, posting photographs and positive descriptions of her experiences.

Parineeti's 13.1 million followers on Instagram watched her helicopter flight over Uluru and her gleeful response to seeing dolphins and whales on the Gold Coast.

Tourism Australia has found a trusted local voice and a celebrity who creates headlines. A 10 day visit to Australia by Ms Chopra generated media coverage reaching an audience of more than half a billion, the equivalent of spending more than $4 million in advertising.

Tourism Australia built on this success, when Parineeti returned in April 2018, visiting Sydney, Melbourne and the Whitsundays in Queensland, popular destinations for Indian tourists.

For a relatively modest investment, Tourism Australia has significantly increased awareness of Australia in India, and maintained a healthy growth in visitor numbers from this market.

LIVE RAILS

Changes in workplace communications and digital connectivity are changing the need to travel internationally for business, particularly at lower and mid-management levels

- growth is expected from MICE events rather than from individual business travellers over the long term.

INDIA'S DOMESTIC TOURISM AMBITIONS

Tourism forms part of the Indian Government's mainstream agenda – in recognition of its importance for employment (particularly for young adults and women), promoting social cohesion domestically and projecting images of India's modernisation to the world

- annual inbound tourists to India are forecast to increase from 10.2 million in 2017 to 15.3 million by 2025–26 (excluding returning diaspora).[50]

To spur visitation and attract private sector investment, the Indian Government has launched schemes such as Swadesh Darshan[59], National Mission for Pilgrimage Rejuvenation and Spiritual Augmentation, expanded e-tourist visa facilities and relaxed coastal land and air regulation.

Indian Government policies persuading the country's cash-based economy to embrace digital payments will have a positive long term effect on tourism, lifting confidence to move across tourism supply chains, and book and pre-pay holidays online and on mobile platforms.

CHANGES IN AUSTRALIA'S TOURISM SECTOR

Australia will need to make supply-side investments to support the expected increase in global visitors, including in:

- the tourism workforce, which is expected to become more stretched as Australia's population ages and pay and conditions in the tourism sector fail to attract sufficient local employees[60]
- high-end experiences, retail, gambling and entertainment offerings
- regional transport infrastructure upgrades and expansions.

Australia will keep transitioning to the new market of travellers from Asia over historically important sources in the United Kingdom, United States and Europe.[61] This will drive:

- culturally appropriate training for tourism workforce, noting tastes and language differ across Asia
- the expansion of more popular Asian retail and food chains into Australia.

There will be heightened attention on preservation. Climate change, extreme weather events and pressures of increased tourist traffic could limit access to Australia's iconic natural attractions.

There is a perception Australian tourist visas are difficult to secure. Looking ahead, Australia's visa system will be transformed to make it more responsive to our economic, social and security interests and to enhance the client experience. This includes:

- investing in innovative visa processing and facial recognition technologies
- improved service delivery, including a shift towards a digital visa processing platform
- simplification of existing, highly complex visa arrangements.

2.0 OPPORTUNITIES FOR PARTNERSHIP

KEY JUDGEMENT

The Indian diaspora and student cohort will support the dominance of VFR travellers, repeat trips, and Australia literacy. Growth potential exists in luxury travel niches. In a status-driven market, effective brand ambassador choices can bring immediate uplifts. As a relatively high-cost destination, Australia must compete on a value basis. In the medium to longer term, opportunities will emerge in business and MICE travel and in two-way investment in tourism infrastructure.

2.1 Export opportunities

ATTRACTING HOLIDAY VISITORS

The range of measures to attract holiday visitors include:

- continuing to use our shared passion for cricket to promote the broader tourism relationship, particularly in the short to medium term
- increasing the number of Indian honeymooners, capitalising on the alignment between Indian wedding season and peak travel period for Australia[62]
- attracting Indian destination weddings to Australia
  - destination weddings are rising in popularity within the high net worth individual market
  - Indian weddings typically involve multiple events over a number of days and large wedding parties
- backpacker holidays from India could increase in the medium to long term, as younger middle-class Indians look to explore destinations on their own or with a group of friends
  - the proportion of visitors from Asia travelling as backpackers has increased from 1 per cent to 6 per cent in the past decade[12]
  - however, there are constraints to growing this market – Indian youth are not currently eligible for working holiday maker visas and it can be more challenging for single young people to get a visa.

ATTRACTING BUSINESS VISITORS

As India's commercial presence in Australia grows there will be opportunities to broaden business travel and events, including through coordination with convention bureaus

- MICE travel opportunities could take a sectoral approach, particularly those with a large sales focus (IT, pharmaceuticals, financial services and insurance).[63]

Australian convention bureaus have the potential to set up a presence in India, similar to bases in China, Hong Kong, Japan, United States and United Kingdom. This could then connect with Australian retail outlets already present in India that focus on servicing corporate clients.

2.2 Collaboration

AIRLINES

Australian airports, with State Governments, could consider:

- partnering with airlines of regional hub countries to target Indian travellers
- incentivising Indian airlines as two-way visitation grows
  - international competitors in Europe already offer temporary waivers or discounts on hangers, landing fees and check-in leasing arrangements to entice pilot routes.

FILM

Incentivising Bollywood film production in Australia could help promote Australia to both the mass market and HNWI

- for example, Switzerland's tourism marketing strategy targets film; it is consistently ranked as the number one destination for natural beauty by Indian visitors and sees a better conversion rate between aspirational and actual trips than Australia, despite higher in-country travel costs
  - Spain, Israel, Czech Republic and Singapore have successfully offered filming package incentives to lure Bollywood production
- at least 10 Bollywood films have been totally or partially shot in Australia since *Salaam Namaste* in 2005, and a number of Indian soaps have featured Australian themes and episodes.

VOCATIONAL EDUCATION AND TRAINING

Training can provide a pathway for Indian hospitality workers to crossover from the informal to formal economy domestically. There is an opportunity for Australian VET providers to develop and deliver industry-led curriculum in India

- this could focus training on the mid-tier segment in which Australia has significant experience [*see Chapter 3: Education Sector*].

OTHER COLLABORATIONS

Other collaborations could include further leveraging existing points of market recognition, including:

- MasterChef Australia: is one of the highest rated English-language programs in India; the MasterChef India franchise visited Australia in 2016
  - this can play a powerful role in marketing the quality of Australian produce and wines to India; with scope to pair with food destinations.
- Cricket Australia: using former and current players to showcase products and Australian cities that will host the Indian cricket team
  - there is an opportunity to add female cricketers to Tourism Australia's 'Friends of Australia' ambassador program, or leverage the presence of Australian cricketers across Indian cities during the Indian Premier League in April-May each year and Indian cricketer presence in Australia during Big Bash League in December-February to promote Australian tourism.

2.3 Investment

INVESTMENT IN AUSTRALIA

There is an opportunity for Indian international food chains to expand their presence into Australia

- Indian tourists value the availability of their local cuisines while travelling internationally, particularly those with vegetarian or Jain dietary requirements[62]
  - Indian food chain outlets are already appearing in Western destinations.

There is an opportunity for upmarket Indian international hotel chains to follow outbound visitors to Australia, as has been the case for the Taj Group and Oberoi Group with Indian visitors in Southeast Asia[12]

- the demand for upmarket hotels is expected to increase
- while the value proposition model employed by upmarket Indian hotel chains is labour intensive and difficult to sustain in Australia's relatively high labour cost environment, automation of customer care, reception and concierge services at hotels could see this model shift in the medium to long term
- franchise agreements, to lease affiliation with an Indian brand and fitted to an existing hotel can reduce the risks of greenfield investment.

INVESTMENT IN INDIA

India is seeking investment in its tourism sector and has lifted the FDI cap to 100 per cent. Notwithstanding the constraints and challenges, opportunities include:

- expanding hotel accommodation: India has an unmet demand of 200,000 hotel rooms, largely in India's mid-tier and backpacker accommodation sector
  - investment is also being sought for theme parks, convention centres and the cruise market[12]
- Australian investors looking to gain indirect exposure to India's growing tourism sector could use Real Estate Investment Trusts (REITs)
  - the success of REITs in India has driven property sales by hotel chains, whereby the hotel building is sold and leased back under management contracts, with investors immune from short term fluctuations in occupancy rates and profits.

CASE STUDY: ACCOR HOTELS: MAKING INDIAN TOURISTS FEEL WELCOME

As India grows wealthier, international travel is growing too. Passenger arrivals in Australia have been increasing rapidly, with over 300,000 Indian arrivals in 2017. Spending was also up by 15 per cent to $1.5 billion.

Australia's biggest hotel operator AccorHotels is positioning itself to meet this increasing demand, and has created a market leading Optimum Service Standards program for Indian visitation. These standards are to make Indian tourists to Australia feel welcome and comfortable.

The Optimum Service Standards program has been designed to better address the specific lifestyle and cultural needs of Indian travellers, to ensure premium comfort when holidaying in Australia.

Accredited AccorHotels' have adopted services to meet the needs of the Indian travel market which includes the translation of hotel welcome kits, menus and business cards in Indian languages, Indian meals in the restaurant, Indian adaptor plugs, TV channels and newspapers to make guests feel at home.

AccorHotels is seeing an increase in the Indian inbound market from both the leisure travel and conferencing and incentives markets. Their areas to focus on over the coming years will be Indian travel dispersal to other regions in Australia.

Since launching these standards in 2016, the number of Indian guests staying at AccorHotels has grown. This includes guests travelling for leisure, conferences and as part of customer incentive programs.

AccorHotels partnered with the Australia India Travel and Tourism Council to endorse the standards, which it now plans to extend to more hotels in regional Australia.

3.0 CONSTRAINTS AND CHALLENGES

KEY JUDGEMENT

Australia is seen as a difficult long haul destination given limited direct flights and perceptions of lengthy and variable visa processing. The challenge will be developing an India literate workforce and viably delivering on expectations of over-servicing from Indian tourists.

3.1 Ease of connectivity

Air India is the only direct flight provider, with eight flights (three Melbourne and five Sydney) to New Delhi per week. Qantas, Virgin Australia and Jet Airways serve the Indian market through code-sharing arrangements via a hub outside India

- Sydney Airport identifies India as its most under-served market, with five of its 16 under-served cities worldwide located in India (Mumbai, Bengaluru, Hyderabad, Chennai and Ahmedabad)
- air service agreements (ASAs) are not a short term deterrent to growth for direct flight routes (only 45 per cent of the 6,500 seats per week are being utilised)
- but factors that are typically required to expand direct flight routes are still low
  - business travel is low on both sides, with business class typically providing a large portion of airline profits
  - there is insufficient critical mass of leisure and VFR travellers from Australia to India outside of seasonal surge periods (December–February and May)
  - nevertheless, Tourism Australia estimates that an additional 345,000 seats will be required by 2020 to meet expected demand for India
    - to absorb demand fully, an increase in both direct and indirect flights is needed – through hubs like Bangkok and Colombo (Singapore and Malaysia have reached capacity under current ASAs for New Delhi and Mumbai)
  - one enabler for more direct flights is if operators can more easily offer flights through Australia to other destinations, including New Zealand.

Visa arrangements and processing times inhibit spontaneous leisure and business travel where shorter lead times apply (for example, less than three months)

- in general, visa processing times are a point of frustration for Indian visitors, affecting Australia's attractiveness in a market where word of mouth counts
  - since 2012, processing times for Indian tourist visa applicants have increased, in part due to higher lodgement rates
- significant reforms in Australia's visa systems are underway and will help address this
  - the introduction in 2016 of online visa processing and faster fee-for-service options for Indian nationals is already helping
  - reduced documentation, faster processing and multiple entry for low-risk cohorts are earmarked, but will take time to take effect in a market as large and diverse as India
  - Australia should ensure India is a priority country when streamlined processes are phased in and that processing timelines are reduced.

3.2 Skills, infrastructure and other constraints

Low expenditure by those visiting friends and relatives

- VFR represented 41 per cent of arrivals to Australia from India in 2016–17, yet contributed only 14.8 per cent of total trip expenditure. Indian VFR travellers stay 50 per cent longer than the average non-Indian VFR to Australia, but spend almost 70 per cent less during their stay. Indian VFR have low rates of dispersal (one to two cities per trip), and around 95 per cent stay in private accommodation.
- no major international film production has occurred in Australia since 2010 without top-up grants.

Skills shortages in the Australian tourism sector could affect the visitor experience. An estimated 123,000 Australian tourism jobs are projected to be unfilled by 2020 and will challenge the ability of Australia's tourism sector to give visitors a world-class experience. Within the workforce, literacy of Indian culture, preferences and tastes is limited[63]

- SMEs lack the capacity to offer training on a market-by-market basis
  - country-specific training in larger tourism operators has generally concentrated on China and Japan.

Australia lags key international competitors in the heavily contested leisure segment

- for Indian holiday-makers, Australia resonates with affluent and experienced out-of-region travellers but is perceived to be less prestigious than the United States, France, Italy, Switzerland and the United Kingdom[62]
- Sri Lanka, Thailand, Singapore and United Arab Emirates are the top destinations for Indian MICE travellers, supported by direct flight routes, geographic proximity and facilities to cater for 1,000+ size delegations.

Business travel to Australia is nascent (at only 13 per cent of total visitation) and not yet supported by strong and broad Indian commercial presence. Marketing to this group has been reactive, rather than through a deliberate strategy.

Australian infrastructure needs investment

- for example, cruise ship terminals at Sydney and Brisbane are approaching capacity, while facilities at Cairns, Augusta, Hobart, Broome, and Port Hedland are in need of upgrades or expansions to the wharf to sustain visitor economy.[61]

The online presence and digital capabilities of the Australian tourism sector (particularly SMEs) is improving but remains low. This affects the capacity for businesses to link into centralised booking sites and engage with the tech-savvy younger Indian audience through mobile platforms.

Australian investors have shown limited interest in investing in India

- the business environment, difficulty navigating state and federal approvals processes, and land acquisition regulations remain a concern
- while other Asian markets, such as Singapore, Hong Kong and Malaysia are seen as more lucrative for comparable return, at lower risk.

4.0 WHERE TO FOCUS

Engagement with the Central Government is important for any issues pertaining to aviation access, visa policies and biometric data. To bring travellers from India to Australia it makes sense to target cities with high numbers of outbound travellers and good connectivity. Tier one cities offer established markets, tier two cities offer growth potential.

Tourism strategies for India typically focus on cities because Indian international travellers tend to be from urban centres, with a tertiary qualification and a relatively good command of English.

Around 85 per cent of all visitors to Australia in 2017 originated from India's 10 wealthiest states: Maharashtra, New Delhi, Karnataka, Tamil Nadu, Andhra Pradesh, Punjab, Kerala, Gujarat, Telangana and West Bengal, with visitation patterns correlated strongly to tier one cities with gateway airports

- the typical Indian traveller to Australia is an affluent member of a tier one city, all with major international airports: New Delhi, Mumbai, Bengaluru, Chennai, Hyderabad and Kolkata
- but tier two cities like Jaipur, Ahmedabad, Cochin and Amritsar are emerging as important source markets for outbound travel from India and should be targeted in the medium to long term.

RECOMMENDATIONS

Australia should seek to stimulate demand in the Indian market while also seeking to improve the supply offering to the Indian market. Recommendations on visas appear in *Chapter 16: Trade Policy Settings*.

37. Promote increased direct air services between Australia and India

Though ASAs are not inhibiting aviation capacity in the short term, no Australian carrier currently flies directly to India.

The Australian Government should encourage Australian and Indian carriers to increase direct air services between the two countries.

Australian airports should explore options to increase incentives for Indian airlines to use Australian airports, or for third country airlines if they are connecting directly from India.

The Australian Government should consider increasing aviation access to additional regional Indian tier two cities under air service negotiations, with a mind to opportunities evolving out to 2035.

38. Maintain an up-to-date understanding of India's outbound tourism market

India's economic outlook, the maturity of its out-of-region travellers, and ensuing opportunities for Australia, have changed since the development of Tourism Australia's India Strategic Tourism Plan in 2012. Within government and across industry, there are gaps in the understanding of trends unique to India. In Australia, tourists from India are perceived as a low-spending and a demanding market for which to cater. Better understanding of the different preferences of HNWI and VFR holiday-makers and the influence of the diaspora could support more effective targeting of segments.

38.1 Renew the Tourism Australia India Strategic Tourism Plan out to 2035, highlighting tourism export potential through five-year targets, including tracking and reporting. The Plan should be accompanied by supporting material, such as a calendar of major events and planning marketing campaigns that industry can leverage

- this would complement the Tourism 2020 review currently underway and the Beyond 2020 Strategy under development.

38.2 In addition to Tourism Research Australia, Tourism Forecasts and Tourism Australia Market Profiles, research projects should be commissioned:

- on regional dispersal initiatives for Indian travellers to Australia
- on leveraging off the international student cohort

- on the contribution of the Indian VFR segment, capturing spending of hosts and cumulative spending of returning VFRs over time
- on why conversion between aspirational demand to actual visits for MICE travel is not higher (for example, impact of visa processing, direct flight availability versus facility and venue constraints).

38.3 Develop research partnerships between Tourism Research Australia, the Department of Infrastructure, Regional Development and Cities, International Aviation and Transport Association and India's Ministry of Tourism

- with a focus on pairing analysis between combinations of Indian and Australian capital cities, and onward connection to third market destinations (such as New Zealand and the United Kingdom).

39. Sharpen Australia's marketing voice in India

39.1 Increase Tourism Australia funding for additional marketing activity in India

- either increase allocation of funding to Tourism Australia for additional marketing activity in India, potentially through the establishment of a country-specific India Tourism Fund
- or consider options for a review of Tourism Australia's existing budget to increase Australia's marketing impact in India
- supported activities could include:
  - continuing to harness the influence of celebrity endorsements on this market by recruiting high profile Australia brand ambassadors
  - supporting further partnership arrangements with Tourism Australia between two or more Australian states to promote tailored tourism packages for the luxury leisure segment.

39.2 As marketing to the Indian market increases, ensure there is strong coordination between Australian states to minimise message dilution and build a common brand

- continue to seek to coordinate marketing between Tourism Australia and State Governments with the marketing budgets of Australian airports.

39.3 Ensure new scalable marketing ploys (for example, virtual reality tours and 3D simulations) are provided in the appropriate Indian languages.

40. Target Bollywood to promote Australia to Indian travellers

Repeated Bollywood and Indian vernacular film production in Australia has the benefits of generating short term uplifts in tourism; setting up early association of romanticism and adventure with Australia for India's next generation of travellers; and stimulating collaborations with our domestic film industries. Australia's natural landscapes and urban centres have appealed to Indian production houses, but the lack of incentives in a relatively high production cost market is a deterrent. There are several avenues the Australian Government can explore to address this.

40.1 Conclude an Australia-India Audio Visual Coproduction Agreement (AVCA)

- Australia offers three, mutually exclusive, tax offset incentives for films
  - the location offset (a 16.5 per cent tax refund)
  - the production, digital and visual effects (PDV) offset (a 30 per cent tax refund)
  - the Producer Offset (a 40 per cent tax refund for feature films)
- concluding the bilateral AVCA means India would qualify for the Producer Offset for official joint productions
- alternatively, to increase either the location or PDV offsets for India current Australian budget rules require budgetary offsets to be identified.

40.2 Provide concessional filming packages for Bollywood films on a case-by-case basis

- for example, 'one-off' benefits and top-ups that have been offered to foreign film productions in the past and should be considered where there is strong alignment between proposed film and niche leisure markets (destination wedding, honeymoon, cruise, sports and adventure).

40.3 Austrade should support film and production house familiarisation exchanges, as well as tours of prospective shooting sites and facilities.

41. Develop an 'India ready' tourism work force

There are currently no Australian tourism training programs tailored for the inbound Indian market, but there are precedents for such programs for other markets. For example, in 2017 Austrade provided support to the Australian Tourism Export Council and TAFE NSW to deliver training to Chinese-speaking tour guides, within the confines of the Approved Destination Status scheme.

41.1 Develop 'India ready' training programs and digital toolkits aimed at raising awareness of cultural tastes, preferences and expectations of Indian leisure and business tourists

- this could be undertaken through a tender process allowing for a consortium of commercial stakeholders (VET providers and Indian partners) to put forward innovative proposals
- the Australia India Tourism & Travel Council has industry-wide links and should act as an advisory body.

41.2 Ensure coordination between convention bureaus and government to accommodate business travel and events for the inbound Indian business community

- establish an online request-for-proposal portal through Business Events Australia for Indian business event planners to submit their requirements
- including a database of event planners, unique experiences and event cities for planners and links for spin-off leisure activities for delegates.

42. Partner with the Indian Government on our collective tourism priorities

A constant flow of people is required for a stable and enduring economic partnership, including through people to people links, cultural exchange and knowledge transfers. We therefore have an interest in encouraging more Australians to visit India for leisure and business purposes. India is keen to learn from Australia's experience to develop its domestic inbound tourism market. We should use this opportunity to counter perceptions Australia is commoditising Indian tourists without due reciprocity.

42.1 Continue to develop a fuller work program under the Australia-India Tourism MoU and progress intersessional outcomes under the existing Joint Working Group

- seek to broaden industry representation at the Joint Working Group, beyond aviation, to reflect wide touch points of the tourism sector (for example education and training; sports and agriculture).

42.2 Government to government engagement should include:

- continuing to share experience from Tourism 2020 design, implementation, tracking and industry engagement to support India's development of its own tourism strategy
- engagement between Australian tourism researchers and Indian Government agencies, researchers and policy groups to share research and data, highlighting the contribution of tourism, trade, investment and international education to their respective economies
- share experiences on regulatory mechanisms that provide access to, yet conserve, world heritage assets – this should involve collaboration with states
- engaging with India on the parameters for accessing Aadhaar biometrics to support more efficient visa processing.

42.3 Prioritise tourism in future Australia Business Week in India (ABWI) delegations and better align ABWI with Tourism Australia's annual India Travel Mission.

ENERGY SECTOR

CHAPTER SEVEN

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SUMMARY

- India's demand for energy is set to outpace domestic supply, providing the largest contribution (30 per cent) to global energy demand growth to 2035.
- Energy is central to achieving India's development ambitions: bringing electricity to those who do not have it; and developing infrastructure.
- India will remain reliant on energy imports, particularly for fossil fuels. It will also provide a market for services and technologies that improve energy efficiency and the uptake of renewables.
- In terms of commodities, India will be heavily dependent on imports of oil and gas.
- India will be largely self-reliant in thermal coal in the longer term, but will need to import thermal coal well into the medium term.
- India will present a significant market for uranium out to 2035, though opportunities for Australia will not be more than moderate.
- There are emerging prospects in hydrogen, including through partnerships with Japan, if Australia is able to stay ahead of the technological curve.
- How all these opportunities play out will depend on India's reform path. India's aspirations to simultaneously and rapidly: change its energy mix; be energy self-sufficient; ensure energy security; and meet its climate change goals, will be difficult to achieve but show India's energy policy sentiment. The political compulsion to provide affordable 'power to all' will shape other reforms in this sector.
- India's energy sector is characterised by myriad, often highly inefficient policy interventions. Controls on supply and the lack of transparent price signals reduce incentives to invest. Distribution is a bottleneck and a bigger problem than capacity. While political constraints will make any change incremental rather than wholesale, India is seeking to tackle these challenges.
- India's integration into global energy markets will be a key shift in the global economy out to 2035, with India having a greater stake in their efficiency.
- To support greater economic partnership with India in the energy sector, Australia should encourage India's deepening ties with the international energy policy regime, engage on regulatory barriers and foster a deeper bilateral knowledge partnership. We should also seek to build on our bilateral investment relationship in this sector, particularly Indian investment in Australian renewable energy sources.

1.0 THE MACRO STORY

KEY JUDGEMENT

Out to 2035, India will keep depending on imports to meet its large and varied energy demand profile. Prospects for Australian energy commodity exports to India are not as strong as for non-energy resource commodities (such as coking coal) due to price dynamics (liquefied natural gas [LNG]) and India's own endowments (thermal coal). India seeks greater energy efficiency and there is a growing market for technology and services that can help deliver it. Energy is one of India's most dynamic sectors and opportunities will evolve rapidly in renewables, energy technologies and power infrastructure. Political sensitivity around the provision of affordable electricity drives government intervention.

1.1 The scale and key structural drivers of the sector

INDIAN DEMAND

India's demand for energy will increase significantly out to 2035, driven by economic growth, urbanisation, rising incomes and industrial activity

- energy consumption is forecast to grow at around 4.5 per cent annually to 2035 (up from 3.5 per cent from 2000–2017)[12]
- India starts from a low base for relative per capita energy consumption and has considerable scope for growth
  - per capita electricity consumption in India is 1,010 kilowatt hours (kWh), against a world average of 3,200 kWh[10]
  - India is a relatively inefficient user of energy indicating significant improvement potential[xxii, 12]
- all four major energy-consuming sectors – industry, household, transport, and agriculture – will see a rise in demand
- electricity constitutes 15 per cent of final energy consumption in India and demand is set to keep growing at 5.8 per cent per annum[12, 74]
- India's largest sources of energy (coal and biomass) have traditionally been domestically procured, allowing India a fairly autarkic approach to energy policy
  - but India is becoming a major global energy player with a strategic interest in well-functioning energy markets.

The nature of Indian power demand is evolving. India's uptake of renewables is driven by:

- the advent of new and cheaper energy technologies
- the need to reduce air pollution which results in more than one million premature deaths in India each year.

Indian demand for energy is, and will remain, extremely price sensitive.

Energy demand in India varies geographically

- urban population growth is outpacing rural areas, driving demand in new sectors such as buildings, air conditioning and transportation.

[xxii] With an overall energy intensity at 0.56 kg of oil equivalent per USD.

The scale of demand and technological changes have made energy one of India's most dynamic sectors

- as well as energy resources, India is looking for solutions to address storage, grid and baseline capacity requirements
- a nascent shift from long term contracts to diverse sources, taking advantage of lower spot market prices and hedging via forward contracts, indicates a that more dynamic approach to energy trade could emerge.

INDIAN SUPPLY

India will remain dependent on imports of traditional energy sources

- its share of the world population is 18 per cent but its share of world gas and oil reserves are only 0.6 and 0.4 per cent respectively[75]
- on a per capita basis, India's domestic production of fossil fuels is the lowest among major emerging markets[76] but India relies on fossil fuels for around 75 per cent of its energy demands
- India relies on imports of crude oil but is also a significant net exporter of refined products, including to Australia ($1.1 billion in 2016–17) – our largest import from India; this reflects the sheer scale of its refining capacity
- rapid technological change makes India's future energy mix difficult to predict but even taking account of enhanced domestic energy supply and greater energy efficiency, India's energy import dependence could still rise from the current 36 per cent to as high as 55 per cent by 2040.[75]

One implication of India's dependence on key energy imports is a growing strategic engagement with trusted suppliers, including to fill India's strategic reserves

- for example, India is buying stakes in oilfields in Gulf States and India's National Infrastructure and Investments Fund has partnered with Dubai Ports to invest in India's logistics infrastructure.

India is richly endowed with clean sources of energy

- there is high potential for generation of renewable energy from various sources particularly wind and solar, as well as biomass and small hydro
- the Government of India has put increasing emphasis on renewable energy, including grid-connected and off-grid systems.

India is a long way from meeting its supply and energy security objectives

- some 300 million Indians lack access to electricity, and about 500 million people are still dependent on solid biomass for cooking[75]
- the large majority of those without access live in rural areas.

India has ambitious targets for energy production growth

- for this to occur capital, labour and infrastructure availability will require appropriate policy and financial support.

India's power challenges are more to do with reliability and distribution than capacity

- India has experienced overcapacity in thermal energy
  - for example, several states reneged on power purchase agreements in 2017
- given poor transmission and distribution grids, power access will remain challenging though a move to distributed networks could help
- as the energy mix evolves, the type of infrastructure India requires will change (including storage solutions and the integration of distributed and renewable resources).

CASE STUDY: ENTURA: APPLYING ITS EXPERTISE TO GENERATE CLEAN POWER IN INDIA

India's large population and fast-growing economy has led to a huge demand for electricity, including for clean, renewable hydropower. By some estimates, India has developed less than a third of its hydropower potential.

A decade ago, Entura established an office near Delhi to offer India its expertise in planning, building, managing and maintaining hydropower systems.

Entura has since worked as a consultant on large and small hydropower projects throughout India. For example it collaborated with the developer of the major Chanju-I hydropower project in the north Indian state of Himachal Pradesh, which opened in 2016.

Entura uses the skills of local engineers, geologists and other staff and its Indian office is used as a base to coordinate projects in other countries in the region, including in Nepal and Laos.

AUSTRALIA'S COMPETITIVE ADVANTAGE

Australia has considerable conventional energy resources (LNG, thermal coal, uranium) and largely untapped unconventional resources (shale gas, coal seam gas)

- Australia's major commodity traders are generally well placed to navigate the Indian market for commodity sales
- our energy resource fields are relatively close to Indian markets
- the sector is established and has a global mindset.

These competitive advantages are complemented by other, globally comparative, strengths. Australia has:

- world class research and development facilities and knowledge
- recognised expertise in: renewable innovation, remote electrification, smart grids, dispatchable renewable energy, innovative finance models, low carbon emissions technologies and battery storage
- strong regulatory and legal frameworks that protect intellectual property
- access to high quality renewable energy resources, which could translate to Australia becoming a leading exporter of renewable hydrogen and low carbon mineral resources
- highly skilled workforces in energy sectors including mining, technology and innovation.

1.2 How the sector will likely evolve out to 2035

Carbon constraints will shape global supply and demand

- policy attention to air quality is rising across the globe with energy generation assessed against air, water and environmental damage
- government regulations, subsidies, and rapid cost reductions of renewables are all pointing to continued decarbonisation of the energy sector
- the Paris Agreement set goals to remain within two degrees and achieve net zero emissions by second half of the century.

Supply and demand will be affected by new technologies

- in extraction
  - enabling new resources to be unlocked cost-effectively (shale gas and tight oil)
- in generation
  - rapidly falling costs of clean energy technologies
  - ultra distributed generation systems
  - new generation technologies (making hydrogen a viable fuel)
    - LNG as fuel has the potential to increase LNG demand
- in delivery
  - smart grid and metering technologies, better monitoring and prevention of fraud will increase efficient use of resources
  - battery storage technologies will support renewables and electrification (more electric cars and solar and wind micro tanks)
  - cost reductions in utility scale storage, pumped hydro and concentrated solar thermal will enable use of renewable energy at night
- in demand management
  - network management technologies
  - virtual power plants which group together battery power from consumer premises.

Technologies unlikely to be commercially viable before 2035 could still draw investment

- superfracking could enable oil to be low cost for decades
- new superconducting materials could enable interconnecting electric super grids or 'global grids'

  - India could receive 18 hours of solar power, including consuming solar power from the Sahara.

Increased transparency in international markets for fossil fuels, especially LNG

- several countries are seeking to create more transparent and reliable price discovery benchmarks – including spot market auction platforms
  - this is likely to result in more flexible short term contracts.

INDIA HAS POLICY AMBITIONS TO IMPROVE ITS ENERGY SECTOR

Achieving all of its targets and policies will be hugely challenging, but the scale and nature of India's ambitions indicate electrification rates, power consumption and use of renewables will increase.

NITI Aayog's National Energy Policy aims to chart the course for energy and power use in India. The plan it outlines includes:

- electrification of all census villages by 2018, followed by the universal electrification of households, with 24 hours, seven days a week power for all by 2022
- reduction of cross-subsidies in the power sector to ensure the competitive supply of electricity
- clean cooking access through efficient and affordable fuel.

The Government of India is seeking to rapidly increase the share of renewable power generation

- its Nationally Determined Contribution under the Paris Agreement includes targets to reduce emissions intensity of GDP by 33–35 per cent by 2030 from 2005 levels
- it has set a target of 175 gigawatt (GW) of renewable installed capacity by 2022
  - 100 GW from solar (60 GW from plants and 40 GW from rooftop), 60 GW by wind and the rest from hydro and geothermal power.[12]

The Government of India recognises the need to improve downstream delivery and is aiming to:

- rationalise tariffs and introduce peak pricing to increase power uptake
- improve transmission and distribution infrastructure and the financial status of distribution companies.

AUSTRALIA'S ENERGY SECTOR WILL NEED TO IMPROVE TO KEEP PACE WITH CHANGES OUT TO 2035

Australia must find a path to a lower emissions economy whilst also securing energy reliability and affordability as well as international competitiveness by:

- reducing extraction processing and conversion costs
- improving productivity and efficiency
- commercialising investments in research and knowledge.

The changes the Australian energy sector needs to make to remain globally competitive out to 2035 will be conducive to increasing trade and investment in India.

WHAT AUSTRALIA WOULD LIKE THE ENERGY RELATIONSHIP IN 2035 TO LOOK LIKE

To have captured a greater share of Indian energy commodity imports, while the size of India's imports has grown

- to be a reliable source of baseline energy inputs
- through efficient market mechanisms, long term contracts and the spot market.

To supplement sales in traditional commodities with new markets, new customers and by providing new services to improve efficiency

- through new or unconventional commodities (coal seam gas, hydrogen)

- providing energy related services, for example grid management, energy systems optimisation, distributed energy resources, smart grid technologies, metering, and training and development.

To be a centre of innovation across the lifecycle of energy resources

- having developed and commercialised technologies for export, including in collaboration with India
- for example in low carbon emission technologies, hybrid power generation, battery storage, smaller scale concentrated solar thermal systems, carbon capture and storage (potentially geosequestration where Australia's geology provides a strong competitive advantage).

To be a top ranked jurisdiction for energy resource investment, including from India

- with a possible Australian investment presence in India.

To be cooperating closely with India in regional and global forums on energy security and efficiency.

CASE STUDY: ITP RENEWABLES: RENEWABLE ENERGY CONSULTANTS ADVISE INDIA ON EXPANDING SOLAR POWER

The potential for solar power in India is immense as the country races to meet its growing energy needs and as solar technology and storage becomes more cost effective.

Consultancy group ITP Renewables, part of the ITP Energised group of companies, specialises in consulting and implementation of renewable energy projects and has run successful collaborations in India.

ITP Renewables produced a major report on concentrated solar power, which uses reflectors to concentrate sunlight and create steam which can be used in industrial processes or to drive a turbine for electricity generation. The in-depth study, commissioned by the Australian Government, reviewed the Indian market, the barriers to uptake of concentrated solar power and approaches to increasing capability.

ITP Renewables presented the Indian Ministry of New and Renewable Energy with 13 recommendations for improving their ambitious National Solar Mission policies for concentrated solar power (CSP). The report was welcomed by the Indian government. Subsequently three large scale CSP plants have been completed in India.

Collaboration between ITP Renewables offices in Australia and India has been key. Producing the studies involved multiple site visits to India, consulting Indian stakeholders and presenting at renewable energy conferences in India and Australia. Having ITP Renewables staff on the ground in India was essential to completing the work effectively.

2.0 OPPORTUNITIES FOR PARTNERSHIP

KEY JUDGEMENT

There is growth potential for Australian commodity exports, subject to a range of variables, notably price. Opportunities will emerge through diversifying into new products. There will be a growing market for services and technologies in areas where Australia is competitive, including to support the development of a resilient, low emissions energy sector in India. India is looking to invest offshore, including for energy security and price-hedging reasons.

2.1 Export opportunities

Table 4 provides the spread of opportunities out to 2035.

TABLE 4: ENERGY EXPORT OPPORTUNITIES OUT TO 2035

		Near term	Medium/Long term
Goods	Conventional Commodities	Export conventional commodities Import refined oil products Export of specialty minerals and metals required for renewable energy sources	Export conventional and non-conventional commodities Invest in different links in the supply chain
Services and solutions	Renewable technologies	Export of technologies Joint research and development	Export of technologies Joint research and development Manufacturing of Australian technologies in India
	Training	Partner with Indian institutions to deliver training	Partner with Indian institutions to deliver training
	Grid management	Knowledge sharing on distributed systems, integration of renewables and remote electrification	Smart grids Smart metering Joint venture with Indian manufacturers
	Fossil fuel generation efficiency	Joint research and development and technology exchange, for example beneficiation and efficient coal use technologies	Collaboration on new technologies
	Energy Efficiency	Export of technologies Systems engineering	Collaboration on new technologies

LIQUEFIED NATURAL GAS

India's appetite for gas is expected to grow out to 2035 and domestic production is not projected to meet demand – sustaining significant import reliance

- the Government of India aspires to double the share of gas to 15 per cent by 2030[75]
- the International Energy Agency (IEA) expects India's natural gas consumption to increase from 50 billion cubic metres (BCM) in 2014 to 159 BCM by 2035 while Indian gas production rises from 33 BCM to 75 BCM in 2035
- if international pipeline projects do not materialise, India will require 84 BCM of LNG imports in 2035.[74]

Australia's capacity to build LNG trade with India will depend on:

- price economics
  - gas does not compete with low-priced coal in power generation
  - large demand segments (for example fertilisers) are highly regulated and dependent on subsidies, preferring domestic gas at administered prices over imported LNG
  - oil prices, which influence industrial use gas or liquid fuels
  - the landed cost of Australian LNG in India compared to competitors
  - spot market auction platforms and more flexible contracts, which should see prices drop in an oversupplied market
- the pace of infrastructure installation
  - India's gas pipeline infrastructure is relatively underdeveloped, with the northern and eastern regions of the country gas-deficient and the existing infrastructure at full carrying capacity
  - city gas demand (mostly limited to urban areas as a transport fuel) will depend on the speed at which city gas distribution infrastructure is extended
  - there are a number of greenfield and brownfield LNG projects at different stages of conceptualisation and development on the eastern and western coasts of India
- India's desire to diversify supply
  - currently, India has most of its long term contracts with Qatar, followed by the United States
  - Australia is the world's second largest LNG exporter
    - if India sought to diversify supply for energy security reasons, it could be to Australia's benefit including through Indian investment in LNG projects in Australia.

THERMAL COAL

India's demand for thermal coal will increase in absolute terms although the share of thermal coal in India's power mix is projected to drop from nearly three-quarters in 2016 to about half by 2035

- while there are a range of projections[76], Indian thermal coal demand is expected to grow at 3.5–4 per cent per annum out to 2030[12]
- falling costs of renewable energy and storage could mean India gets cheaper baseload power from renewables before 2035
- however, existing and under-construction coal-fired power stations point to sustained demand for thermal coal.

Demand for India's thermal coal is driven by the power and cement sectors:

- thermal coal use in the power sector is expected to almost double by 2030, from around 600 million tonnes (MT) in 2016 to 1,000–1,100 MT by 2030
- the housing and infrastructure sector is expected to drive cement demand with 6 per cent growth per annum with thermal coal a key input.[12]

However, India's domestic supplies are projected to increase at a comparable scale

- Coal India production is expected to grow at a steady rate of 6 per cent per annum

to 2030 with domestic supply reaching 1200 MT by 2030[12]

- if this happens, India's coal imports could fall significantly in the longer term, declining from 156 MT in 2016 to 40–50 MT by 2030.

There are a range of factors which will determine the quantum of overall Indian thermal coal imports and Australia's prospects to capture a share

- to increase domestic production, Coal India will need to expand capacity by raising environment/forest clearance limits, utilising excess available capacity and clear bottlenecks in rail infrastructure across main and connecting lines
- where it has sought thermal coal imports, India has purchased thermal coal from Indonesia and South Africa, which offer coal that matches India's coal specifications at a lower price point than other international suppliers
- due to high transport costs, it is likely that the only coal plants that utilise imported coal in the near future will be those on the coast
- there could be a significant increase in Australia's thermal coal exports to India if Adani's Carmichael coal project commences production and exports
- India will roll out new High Efficiency, Low Emissions (HELE) power plants over the next 10 years
  - in principle, India's high ash, low energy domestic thermal coal is less suited to these plants than Australian thermal coal
  - but it is unlikely this would offset domestic coal consumption with imports due to India's price sensitivity and the potential to use technologies (including from Australia) to wash/upgrade India's domestic thermal coal supplies
  - while small quantities of higher quality thermal coal may be imported to blend with domestic mixes, HELE should not be relied on to create large-scale opportunities for Australian exporters.

URANIUM

Given rising demand, India is likely to become a key uranium market by 2035

- India currently has about 6 GW of nuclear power capacity spread across more than 20 nuclear power plants
- by 2032, India wants to increase nuclear power capacity to 63 GW[75]
  - this goal appears unlikely but there should still be significant expansion in India's nuclear generation capacity over the period
  - current projects under construction add up to 10 GW of additional capacity by 2027
  - India has a longer term target for nuclear power to supply 25 per cent of the nation's electricity by 2050[76]
- India has limited domestic uranium reserves and the growth in demand for uranium will be met through imports
  - along with China, India is a rare growth spot for global uranium markets
  - the most realistic option for scaling up nuclear energy in India lies with their indigenous pressurised heavy-water reactors (PHWR)
    - most nuclear energy generated in India is by PHWRs.

India's growing demand offers some long term opportunities to Australian exporters

- Australia has the world's largest known reserves of uranium and is the third biggest producer
- Australia and India signed the Civil Nuclear Cooperation Agreement in 2016, opening the prospect of uranium trade
- India's goal appears to be to accumulate significant stockpiles of uranium.

The size of the opportunity for Australia will be influenced by:

- the number and proportion of nuclear power plants that are subject to International Atomic Energy Agency safeguards

  - several reactors are being set up in technical cooperation with Russia, these contracts include supply of fuel by Russia
  - other third party reactor and fuel supply arrangements may present opportunity
- how other countries respond to India's increase in uranium demand
  - Kazakhstan and Canada each exported over 900 metric tonnes of uranium ore concentrate to India in 2017[77]
- India's desire to develop its indigenous reactor fleet appears to be delaying the roll-out of foreign reactors and may temper its ability to meet nuclear energy target goals.

India is pursuing the development of domestically designed advanced heavy-water reactors, fuelled by thorium

- given the lengthy process required to produce certain key materials and deploy such reactors, this scenario is beyond the term of this report.[38]

HYDROGEN

Out to 2035, innovations in energy storage and transport technologies could see hydrogen become a more common energy source

- with few changes to equipment, clean burning hydrogen can be directly used in combustion including stationary power generation, as well as used directly in fuel cells for power and transport
- this could present an option to diversify our export base and lower emissions intensity of fertiliser production.

Recent Australian and Japanese technology breakthroughs have solved technological issues and pilot projects for export are already underway

- these projects will only be economically viable once affordable conversion technologies are commercialised to support the point-of-use hydrogen applications
- there will be opportunities if Australia stays ahead of the curve and establishes itself as supplier of hydrogen fuel to India, possibly through partnerships with Japan.

Exporting 'green' hydrogen (hydrogen produced using solar or wind) in the form of ammonia could save the Indian Government millions of dollars in subsidies for the fertiliser industry.

RENEWABLES

India has a large and growing demand for renewable energy and it will be a strong growth segment out to 2035

- the share of renewables in India's energy mix is expected to increase from 19 per cent in 2016 to approximately 39 per cent in 2030[12]
- India views energy independence and sustainability as mutually reinforcing because fossil fuel requirements are currently met mostly by imports
- the falling cost of solar photovoltaic (near parity with coal) will ensure its competitiveness with fossil fuels
- India's pumped hydro sector is emerging
- India is already the fourth largest generator globally of wind energy.

The uptake of renewable technology brings with it the need for support services, investment, market reforms and regulatory support.

India's financial support will be aimed at promoting generation and infrastructure creation, and not just capacity creation

- for example, India is seeking to develop residential off-grid capacity through a regulatory policy framework including a remunerative net metering policy.

The rapid uptake of renewables in India will have positive knock-on effects

- the scale of India's demand (especially in solar) will drive down prices of technology imports for Australia, supporting our long term energy transition.

Minerals and metals that are inputs to renewables are all produced in Australia and could also provide a trading opportunity as much as the technology itself

- inputs to solar panels include bauxite, silica, tellurium and cadmium.

2.2 Collaboration

The current challenges Australia faces in its energy policy and price structure should not crowd out the quality of Australian expertise in many parts of the energy sector. In addition to energy commodities, India needs support services, consulting, systems engineering and technologies in areas where Australia has expertise. This offers opportunities for partnership beyond commodity exports.

For example, the International Solar Alliance (ISA), launched by India and France in 2015, presents opportunities to collaborate on finance and technology in its pursuit of increasing the uptake of solar power

- the ISA is the first international inter-governmental organisation headquartered in India and marks a foray by India into global energy engagement which should be strongly supported
- the ISA's vision is to enable the deployment of solar at scale by aggregating demand across member countries for finance and technology, de-risking investments, collaborating on financing mechanisms and best practice.

Examples of where Indian demand and Australian capabilities converge include:

- improvement of transmission and distribution, including efficient management of renewable generation
  - installing and managing distributed solar systems
  - smart grid technologies (including advanced analytics)
  - energy curve balancing strategies
- pumped hydro design and management
- scalable concentrated solar thermal systems
- delivering training on renewable energy skills, engineering, science
- collaborating on policy frameworks, performance standards and regulatory environments
- pursuing joint research, development and commercialisation of new renewable technologies
  - for example battery storage technologies
- integrating variable and dispatchable generation, including remote electrification
- market mechanisms including demand response initiatives
- combining Australia's expertise with India's manufacturing capacity will help produce technologies and equipment at a lower cost.

Given the sustained predominance of coal in the Indian energy sector, India will offer opportunities to companies with expertise in

- coal washing
- reducing methane emissions during the coal mining process
- next generation coal combustion technology
- carbon capture, usage and storage where Australia has made significant investments and built expertise (though this technology is currently too expensive for the Indian market).

Australia and India could also strengthen climate cooperation in international fora, and link climate and energy engagement to support the emergence of lowest-cost energy investment options

- including information sharing and collaboration on research and development.

2.3 Investment

The current regulatory environment in India presents limited opportunities for investments.

However, over the timeframe of this report, investment in India's power infrastructure could become more appealing

- Indian policy-makers are making large efforts to remove obstacles to investment in energy supply
- the transmission segment is seeing some deregulation and private participation

- as the renewable energy generation segment matures it could offer more investment opportunities.

Indian investment in Australia

- nearly two-thirds of Indian FDI in Australia between 2003 and 2017 was in alternative or renewable energy, reflecting the growth and global outreach of Indian companies in this sector
- more broadly, Indian outbound investment is increasingly driven by energy security considerations
  - India seeks overseas assets to deliver energy resources in times of crisis and as a hedge against price volatility
  - this is an extension of India building strong bilateral relationships with major energy suppliers
- Australia's vast resources base requires foreign capital, technology and markets for further development and Indian investment could play an important role
- projects such as Adani's Carmichael mine are viewed as a 'test case' for potential future investments
  - there is a view that this experience may lead Indian investors to put Australia in the 'too hard basket'.

3.0 CONSTRAINTS AND CHALLENGES

KEY JUDGEMENT

Despite the immense opportunities in India's growing demand, the energy sector in India is characterised by monopoly players, state-run corporations, controlled pricing and high barriers to market entry. Controls on supply and the lack of transparent price signals reduce incentives to invest, improve efficiency or rationalise supply. Distribution is a bottleneck, impeding the effectiveness of reforms and innovation.

3.1 The policy and regulatory environment

The four key objectives of India's energy policies are: affordable prices; improved energy security and self-sufficiency; greater sustainability; and economic growth

- in pursuit of these objectives, India's energy sector is characterised by myriad, often inefficient, policy interventions.[10]

The following defining features of energy policy and regulation in India will likely endure in some form out to 2035, with change being incremental

- subsidies (especially for oil, gas, electricity) that are aimed at improving access for poor and rural communities
  - central and state governments also provide financial support for distribution companies, including occasional bailouts, to cover losses for supplying power at artificially low rates[78]
- regulated energy prices
  - electricity tariffs to end-users are regulated by state utilities below the cost of supply in many states, making any pass-through of higher priced imports difficult
  - currently, there is no formal provision for different peak and off-peak tariffs making it harder for distribution companies to recover costs[12]

- difficult land acquisition laws
  - development of transnational pipelines has been limited because of strict land acquisition laws
- environmental concerns
  - policy and investment decisions are influenced by the sensitivity of land and water use, as well as the worsening air quality in many of India's major cities.[76]

3.2 Skills, infrastructure and other constraints

For the foreseeable future, constraints and limits to trade and investment on the Indian side include:

- poor transmission and distribution systems
- price sensitivity and its prioritisation over product life-cycle costs
- government overriding the commercial viability of power purchase agreements
- corruption
  - independent reports have identified power and utilities to be some of the most vulnerable sectors for corruption in India[43]
- complex processes to get certification and licences especially for renewables
- the continued dominance of state-owned enterprises in the resources sector creating inefficiencies and raising transaction costs
- severe water shortages
  - for example hydro and thermal power plants have gone idle for various periods due to water shortages.

Constraints and limits on the Australian side include:

- perceptions Australia has growing sovereign risk for capital investment due to regulatory burdens, 'lawfare' challenges in the courts, and changes in policy
- Australia's public debate on the flaws in our energy sector is detracting from our ability to convince India we have world-leading expertise
- challenges to the industry's social license to operate, including negative community perceptions of the social and environmental impacts of unconventional developments
- limited commercialisation of research activities
- relatively high operating costs due to high labour costs contributing to higher costs for our export commodities.

4.0 WHERE TO FOCUS

India's energy policy landscape is diverse, spread across several ministries and often divided at central and state levels. The prioritisation of energy issues varies across states. Australian efforts should focus on the Central Government and Public Sector Undertakings (PSUs) for bulk trade and progressive state governments for engagement on renewables and energy efficiency.

4.1 The Centre and the states

At the central level, energy is handled by different ministries that set their own sectoral agenda. The Central Government has responsibility for public sector generation companies.

But states alone have the power to set and collect tariffs. States are responsible for day to day operation and maintenance of their grids.

States are the only customers big enough to fully support the renewable energy industry.

State Governments run programs of clean energy deployment, and other interventions related to the energy sector (for example electric vehicle deployment, decentralised renewable energy solutions in villages).

4.2 Key states

Trade in energy resources: a state focus is not judged as critical as generation companies are not bound by states and major energy PSUs are owned by the Central Government.

Renewables and associated technology and services: the share of renewable energy is expected to be highest in eight states – Tamil Nadu, Andhra Pradesh, Telangana, Karnataka, Maharashtra, Gujarat, Rajasthan and Madhya Pradesh.[75]

ANDHRA PRADESH

India's highest installed solar capacity and strong potential in wind power. A state focus on innovation and technology.

TAMIL NADU

A leading solar and wind energy producer with among the highest installed capacity in India and the world's largest solar plant. A well-developed manufacturing sector which could be tuned to renewable energy technologies. Plans for a high capacity transmission corridor.

TELANGANA

India's largest generator of solar energy, with plans for further expansion. Outperforms most states in terms of power supply.

RAJASTHAN

Recent oil and gas discoveries are expected to drive numerous upstream and downstream ventures. Strong solar prospects due to high solar irradiation and land for setting up solar parks.

WEST BENGAL

Not for its renewable sector, but as the coal industry hub West Bengal is a natural target for engagement on fossil fuel generation efficiency.

RECOMMENDATIONS

Australia should continue to position itself as a strong, stable supplier of commodities and services to help India meet its energy demands. As India looks to strengthen energy ties with strategic international partners, Australia should seek be part of India's inner circle of reliable energy partners.

43. Promote Australia as a destination for Indian investment in the energy sector

Address regulatory and social license concerns to ensure Australia continues to be perceived as a politically stable and economically reliable destination for future capital investment

- building, for example, on Indian investments in Australia's renewable energy sector.

44. Build targeted relationships with decision makers and seek to align regulatory efforts

The Australian Government can support commercial activity through the pursuit of policy and regulatory convergence and efforts to address obstacles. This includes for large players and multinationals who will continue to dominate energy commodities trade with India and who are generally large enough to operate without recourse to or support from governments or industry bodies for access to the Indian market.

44.1 Continue to maintain regular ministerial engagement on energy issues, particularly on clean energy innovation

- ensure the Australia-India Energy Dialogue takes place annually and is effective in advancing policy engagement on energy (and non-energy resources)
  - support in India by Australian industry bodies, businesses and research organisations helps any advocacy on reforms and policies to be effective.

44.2 Ensure policy engagement under the frameworks described above, and through the Joint Working Group, promote regulatory convergence to support private sector engagement. Do this by focusing

- where Australia has distinct expertise
  - sharing experiences on accreditation of solar panels for quality checks
    - for example the Australian Solar Council's Positive Quality Program
  - battery storage solutions
  - bioenergy systems (to help address air pollution)
  - smart grids and metering
  - new energy systems related to agriculture
    - for example solar panels that either pump water or feed energy back into the grid
- where Indian reform could catalyse greater trade and investment, for example
  - work with India to develop technical forecasting capabilities to underpin viable energy pricing models, particularly as more variable power sources come online
  - share experiences on tariff rationalisation and adoption of peak power prices in a federal system
  - fossil fuel energy generation technologies
  - improving industrial energy efficiency, including high voltage grid maintenance.

44.3 Build relationships and share expertise focused on regulating energy and grid management in a federated system

- offer internships or exchanges for India Administrative Service officers involved in energy or regulators in India's Central Electricity Regulatory Commission to the Australian Energy Market Operator and Australian Energy Market Commission.

44.4 Explore opportunities with third parties on energy technology

- seek accords with third country partners whereby we promote the use of their technology (where Australia is not itself a technology leader) that would open up new supply opportunities for Australian energy resources
  - for example hydrogen.

45. Support India's participation in global energy organisations and work with India in international institutions

Given India's dependence and influence on international energy markets will only grow, India shares our strategic interest that these markets function well. But India is not a member of most energy specific regional and global organisations. Aligning India's energy frameworks with regional approaches to reliability, affordability and sustainability can support conditions for trade, investment, technology cooperation as well as promote information sharing and collaboration on research and development.

45.1 Advocate in support of India's engagement with the IEA

- India's new status as an Association Member increases India's relevance in global energy governance and aligns with Australia's advocacy for the IEA to reflect evolving global energy market dynamics
- Australia should support ongoing affiliation, including cooperation in numerous fields such as forecasting and data
- India cannot currently become a full IEA member as membership is limited to member nations of the OECD, but this restriction should be reviewed.

45.2 Support development of a practicable ISA

- Australia, having joined as a founding member in late 2017, should:
  - facilitate engagement for Australian businesses in initiatives across the ISA's growing membership base
  - explore options for establishing regulators' forums under the ISA
  - use the ISA to share our solar expertise with India and ISA member countries and promote further research and development and capacity building collaboration with Australian institutions
  - leverage the ISA's work to reduce costs of equipment and finance and remove other barriers to increase the deployment of solar in Australia.

45.3 In the context of support for India's APEC membership, promote potential collaboration through APEC's Energy Working Group.

45.4 Continue to work with India through fora such as the United Nations Framework Convention on Climate Change, Mission Innovation, the Clean Energy Ministerial and the International Renewable Energy Agency.

46. Foster a knowledge partnership on technologies and systems

46.1 Promote research, development and commercialisation of energy efficiency technologies between Australia and India, or with a third party, for entry into the Indian market

- continue to foster deep collaboration between Australian research agencies (for example CSIRO) and Indian agencies
- leverage existing funds directly relevant to India such as the AISRF
- promote opportunities to collaborate with India through Living Labs
- seek to draw on Indian venture capital or funding from large conglomerates.

46.2 Australian institutions and commercial providers should seek to establish partnerships with key Indian institutions to deliver skills training

- including on-the-job skills training this could be through ramping up engagement with the National Institute of Solar Energy on curriculum and assessment design and train-the-trainer modules on solar rooftop infrastructure development and maintenance (Australia is a recognised leader)
- the ISA could prove a useful platform for this
- Government could play a role in facilitating this effort.

46.3 Foster collaborative training and education services focused on clean energy technologies and energy efficiency, through sponsoring of:

- masters/PhD offerings in energy research, including through the Australia Awards
- training, workshops and executive courses.

47. Consolidate private sector engagement mechanisms (state and business level) to help unify Australian branding, improve knowledge sharing and coordinate lobby efforts

Explore options to work under an existing body (such as the Australian Solar Council or Clean Energy Council) to package Australian renewable energy offerings specifically for India (for example, akin to Water Industry Alliance)

- an initiative to support public and private partnerships for sharing Australia's energy sector expertise with India, especially key states
- could link with the ministerial level Energy Dialogue
- could aggregate full set of Australia's expertise
- could open opportunities for Australia to learn from India's approaches
- could seek co-investment for collaborations.

48. Continue to improve Australian competitiveness

The Australian Government should continue to seek to optimise regulatory frameworks and also incentivise greater research and development in the energy sector

- for example, explore options for an industry-wide research program for the energy sector
  - emulating Australian Coal Industry's Research Program whereby the Australian coal sector provides a small, voluntary but sector-wide levy to support research programs, including funding PhD scholarships
  - such an independent and focused scheme could build an industry wide and transparent research community
  - complementing the joint industry project model more traditionally employed by the sector.[63]

HEALTH SECTOR

CHAPTER EIGHT

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SUMMARY

- The Indian health sector will grow rapidly out to 2035, with increased availability of medical infrastructure and more government spending, albeit off a low base.
- But this improvement is unlikely to bridge the current gulf between supply and demand.
- Many of the strengths of the Australian health sector complement India's needs and the objectives of India's National Health Mission.
- The importance of the health sector imbues the whole economy. It is central to the well-being and progress of the nation, an employment generator, a productivity enhancer and a driver of innovation and entrepreneurship.
- Australia could significantly grow its health relationship with key Indian states out to 2035, especially if it can commercialise its expertise and integrate value chains.
- Sustained engagement with the Central Government will be important. In the short term, ministerial-led government engagement can provide the basis for greater trade, investment and interoperability in the future.

1.0 THE MACRO STORY

KEY JUDGEMENT

Demand in the Indian health sector will continue to dwarf India's domestic supply capabilities out to 2035. Australia has strengths that align with India's priorities for improving the sector, though the reality is we will be a niche provider in a large market. Technological and systemic changes, along with the rise of non-communicable diseases, will radically transform how India delivers healthcare and the nature of our engagement.

1.1 The scale and key structural drivers of the sector

INDIAN DEMAND

Demand in India's healthcare market will keep growing out to 2035, driven by:

- a large and growing population, accounting for almost one-fifth of the global population
- the double burden of infectious diseases and rising non-communicable diseases
  - over 250,000 Indians die from tuberculosis each year[80]
  - non-communicable diseases (NCDs) such as heart disease, diabetes and obesity account for 60 per cent of deaths in India currently
  - urbanisation and lifestyle changes will fuel NCDs
  - by 2035, 109 million people in India are expected to suffer from diabetes[81]
- a growing consumer class, able to spend on healthcare
- a growing penetration of insurance supporting greater spending
- the proportion of elderly (over 65), which will rise from the current 6 per cent to 13 per cent by 2050 [82], will increase the number of age-related ailments and demand for aged care
- under-provision of medical goods (technologies, devices, pharmaceuticals)
  - India's medical device market is growing at 15 per cent annually and stands at $7.5 billion, of which 77 per cent is imported[12]
  - India is likely to be the second largest driver of growth in the global nutraceutical market to the 2030s[83] (after China), driven by rising incomes and consumer awareness.

There is a nexus between health, energy and agribusiness

- air pollution results in more than one million premature deaths in India each year[84] highlighting a need for cleaner energy sources and conservation agriculture
- for example, Delhi's extreme air pollution in its winter months is the result of a combination of weather conditions, vehicular and industrial emissions and the burning of chaff in neighbouring states.

INDIAN SUPPLY

India's health sector is also growing and modernising but cannot keep pace with rising demand

- the sector is growing at 16 per cent CAGR[85]
- spending on health in India is only 4 per cent of GDP (sum of public and private spending) while the global average is 9.9 per cent
- government spending is 1.4 per cent of GDP (sum of central and state spending)[86] while the global average is 6 per cent

  - this percentage has remained roughly constant for a decade
- weak public healthcare facilities result in reliance on expensive private care
  - low levels of public expenditure shift the burden of financing healthcare to out-of-pocket expenses at the point of care, which accounts for 62 per cent of total health spending and without any widespread financial protection scheme[87]
  - a workable coding framework, under a holistic health financing system, is required for after-fact payment systems
  - the private sector has fostered pockets of efficiency, but is fragmented
  - an inadequate filtering and referral system
- medical infrastructure, while growing, does not cater to the market
  - India has 1 hospital bed per 1,000 people against the world median of 2.9
  - India has 0.7 physicians per 1,000 people against the world median of 2.5.[12]

AUSTRALIA'S COMPETITIVE ADVANTAGE

Australia's engagement with India's health sector has been longstanding but ad hoc.

Our bilateral commercial health relationship is modest

- in 2017, Australia imported $335 million of medicaments (including veterinary) from India (7 per cent of our total imports) and exported $16 million.

The Commonwealth Government is committed to a range of funding mechanisms for the Medtech, biotech and pharmaceutical (MTP) sector including MTPConnect (≈$30 million), the Biomedical Translation Fund (≈$250 million, with another $250 million from industry) and the Medical Research Future Fund (≈$1 billion per annum at maturity). This funding and activity is intended to drive a step change in the economic contribution of the sector.

But there is clear alignment between Indian policy priorities and Australian experience. Australia's offerings are based on comparative strengths such as:

- a strong health system,[xxiii] including a world-leading publicly funded universal healthcare system and a growing private sector (health is our fifth largest contributor to GDP[88])
- provision of healthcare in a federated system at relatively low cost
- a reputation for quality (for example, Therapeutic Goods Administration [TGA] standards on medical technologies and pharmaceuticals)
- geography and familiarity with remote-care delivery – we are a leader in remote care practices which are being enhanced by digital platforms
- established export channels for complementary medicines and niche devices
  - medical technologies and pharmaceuticals remain Australia's largest commodities export sector to global markets not directly linked to primary industries such as mining and agriculture[89]
- a vibrant medical research environment
  - albeit with a patchy record of commercialisation and tendency to see research drained offshore for development
- expertise in developing medical coding frameworks
- expertise in chronic disease management.

[xxiii] The MTP sector is a significant contributor to the Australian economy, generating $4.4 billion in gross value add (GVA) (4.5 per cent of Australia's total manufacturing GVA), $4.6 billion in annual exports from manufacturing (10th largest) export sector) and employing 48,000 people across Medtech (10,000) biotechnology, and pharmaceuticals (22,000), and health and medical research (16,000).

CASE STUDY: GLOBAL PATIENT PORTAL: PROVIDING DIGITAL HEALTH SOLUTIONS FOR LOW AND MIDDLE INCOME POPULATIONS

Noting the lack of access to health records and preventative care in India and much of the developing world, Global Patient Portal (GPP) was launched in India in 2015 as a free, online health resource that allows users to build and maintain their own electronic health records; a service designed to expedite the information flow for healthcare professionals and individuals.

Before launching this product, a year and a half of market research was conducted in the north, south, east and west of India. It quickly became evident to GPP that India would not adopt an American style consumer culture like other emerging markets. Instead, CEO Michael Koss underlines the importance of heritage and culture in India, emphasising that those who take the time to understand this, find it a wonderful place to do business. He also shares two key rules on doing business in India:

1. Commit to India and she will commit to you; go often, build relationships and learn how to do business there.....We have won awards in India, given speeches around the country and sit in senior positions in industry bodies. However, that all pales in comparison to the strength of the relationships we have built on the ground. Their importance cannot be overstated in whatever success we enjoy.

2. Know your India; it is not a market of 1.3 billion people. However, if you can distil the market down to an actionable group who need your product, then the opportunity is superb.

Mr Koss also underlined the benefit of the State Government business offices in India, the High Commission and Austrade, which can contribute greatly to achieving traction in India by opening opportunities, though he stresses "it is incumbent on the Australians to go back and turn those introductions into meaningful relationships".

GPP are now seen as leaders in digital health for low and middle income populations. Their team are frequently involved in discussions with government, policy formation and are regular speakers at conferences in India and abroad.

1.2 How the sector will likely evolve out to 2035

WHAT AUSTRALIA WOULD LIKE THE HEALTH RELATIONSHIP IN 2035 TO LOOK LIKE

To have deeper integration (joint research and development, investment, co-development of goods).

To be considered a close international partner for healthcare in target states

- including through common delivery methods like eHealth and digital health with strong focus on cybersecurity and privacy issues.

To have captured a greater share of Indian health commodity imports, as the size of India's imports has grown

- especially value-added commodities such as medical devices and complementary medicines, including co-development of such products
- having tapped into growing Indian urban centres as established markets with mature export paths
- and having greater interoperability of our healthcare standards.

To have Australian companies delivering professional services in India's health sector.

To be cooperating closely with India in regional and global forums on health security.

GLOBAL TRENDS IN HEALTHCARE

Whether systemic changes or technical disruptions, global trends will re-shape the Indian and Australian sectors:

- Digitisation and automation: of appointment systems, of remote monitoring and analysis, of clinical decision support systems and of device and medicine manufacturing and supply chains
  - will change the game for providing affordable quality healthcare services to remote areas, including low-cost consultation and diagnosis facilities
  - will improve efficiency and change the employment mix of medical goods manufacturing and transport.
- Improved data systems: will lead to better health records and measurement of outcomes, greater healthcare delivery efficiency and more effective research
  - the downside is cybersecurity and privacy risks around personal information.
- Shifting care out of hospitals: will be driven by high capital costs associated with hospitals and better technology-enabled solutions.
- Greater consumer control: with technology empowering patients to manage their health more proactively, including through wearable devices and portable monitors.
- Increased focus on genomics and revolutionary treatment technologies: could improve assessments of susceptibility to diseases and the side effects of drugs and enable more personalised treatments.
- Global biosecurity: with more frequent travel and interconnectedness, and with increasing antimicrobial resistance, infectious disease outbreaks are becoming more common.
- Increased chronic disease burden: in low and middle income countries like India there will be a big shift from acute episodic care to lifelong chronic disease prevention and management.

INDIA HAS POLICY AMBITIONS TO SIGNIFICANTLY IMPROVE ITS HEALTH SECTOR

The extent to which India's health policy aspirations will be implemented will depend on how much political and financial capital India's leaders are able and willing to spend on health.

The National Health Policy 2017 focuses on 2025 as a marker year, but points to the direction the Indian Government might try to take out to 2035

- increase health expenditure as a percentage of GDP from 1.15 to 2.5 by 2025

- increase state health spending to at least 8 per cent of their budgets by 2020
- increase use of public health facilities by 50 per cent by 2025
- achieve universal health coverage and deliver quality and affordable services
- provide free drugs, diagnostics and emergency care services in all public hospitals
- develop mid-level service providers, such as nurse practitioners and public health personnel
- reform medical education
- ease the manufacture of drugs and Medtech
- align Indian standards and regulatory regimes with the norms of key trading partners, leading to more trade and investment opportunities
- attract greater level of private investment.

AUSTRALIA'S HEALTH SECTOR WILL NEED TO IMPROVE TO KEEP PACE WITH CHANGES OUT TO 2035

Without improved rates of commercialisation and improved pathways from research to market, Australia will not be able to compete in the international market.

Onshore Australian manufacturing of medical devices and pharmaceuticals is not assured

- the number of companies in the sector has remained broadly constant over the last decade but onshore manufacturing has declined in recent years
- a substantial increase in research funding and improved pathways to commercialisation will be needed to turn this around.

Australia's health financing and business systems will be stressed by

- an ageing population – the number of people over 85 years old will increase from 0.4 million now to 1.8 million in 2050
- risk factors for chronic diseases like diabetes are increasing, as are community expectations of ever higher health standards.

2.0 OPPORTUNITIES FOR PARTNERSHIP

KEY JUDGEMENT

Opportunities for Australian exports exist across a diverse range of goods and services and can grow in line with Indian demand. Co-development of products, value chain integration and regulatory alignment could substantially turn the dial. Globally, significant official development assistance (ODA) and philanthropic money is spent seeking to address India's communicable disease burden. The Australian Government can focus on the gap: targeting our engagement on working with India to combat NCDs and to develop health delivery systems.

2.1 Export opportunities

Trusted collaboration between governments and private sector health players could realise these prospective opportunities (Table 5).

TABLE 5: HEALTH EXPORT OPPORTUNITIES OUT TO 2035

		Near term	Long term
Goods	Complementary medicines	Export to India	Export to India, potentially with manufacturing facilities in India or working in ecosystems and supply chains
	Medical devices	Export to India, including joint production for third markets	Export to India, including joint production for third markets
	Pharmaceuticals	Import generics	Co-development for Indian manufacturing
Services	Digital Health	Consultancy services as India establishes its digital health system	Providing commercial services – including telehealth in rural communities
	Hospital Management	Business Process Outsourcing	As operators/advisors Hospital partnerships
	Training and Skill Development	Delivering training	Recognition of qualifications and accreditations
	Medical Tourism	In both directions, but particularly to India	In both directions, but particularly to India in hospitals with Australian affiliation
	Research and development or clinical trials	Research partners in clinical trials Bring trials from India	Mature joint clinical trial systems
	India as a source of skilled labour	India is the largest foreign source of qualified medical practitioners in Australia (6 per cent)[90]	India remains a major source of workers in Australia's healthcare sector

OPPORTUNITIES IN MERCHANDISE GOODS

Complementary medicines (also known as traditional or alternative medicines): India could become a major market for Australia if trade is supported by strong regulatory regimes

- Australia's complementary medicines sector gets 26 per cent of its income from exports, a proportion forecast to grow strongly; in 2015, 14.3 per cent of China's complementary medicine market share was delivered by Australia[12]
- Indian demand is projected to grow in line with the urban consumer class
- Australian companies could target specific segments like vitamins, minerals and milk-based supplements and strengthen distribution channels by partnering with locals
  - for example, malted milk drink Horlicks is consumed in 38 million Indian homes
- in the longer term, once Indian market demand is established, Australian players could consider establishing joint research, development and manufacturing facilities in India.

Medical devices: India could become a market and partner for the export of Australian medical devices, including to third markets

- Australia exports $2.7 billion of medical devices annually[12]
- Australian companies could leverage India's lower manufacturing costs, concessions for domestic manufacturing and medical device zones to pursue licenced manufacturing deals and joint research and development, with manufacturing in India and final assembly in Australia to get TGA accreditation (to get this, Indian manufacturing would need to be to Australian standard).

Pharmaceuticals: Australia could increase imports of Indian generic drugs and pharmaceuticals which meet our safety and quality standards.

OPPORTUNITIES IN SERVICES

Digital health: Commercially sustainable partnerships will hinge on developing business models which can package Australian intellectual property and expertise, including through:

- consulting on establishing digital health services, facilitating better connectivity and comparing notes on data analytics
- leveraging Australian expertise in remote care delivery to provide rural healthcare services to State Governments (consultative/software/system provision)
  - telehealth, telemedicine (for example, online consultations, online appointment scheduling, including for home calls).

Hospital management: India is attracted to Australia's world leading hospital management services. Australian companies could provide services and hospital system design in India, including billing and payment management solutions, clinical support systems and diagnostic technologies

- as operators/advisors (commercialisation of model is still at nascent stage)
- Australian medical administrators to use India for quality and cost competitive business process outsourcing (such as clinical coding and transcriptions).

In the long term

- as investors delivering aged care services in India
- hospital partnerships covering quality, facility and leadership development (either on a not-for-profit basis or via consultancy fees and shared revenue)
  - Australian public hospitals could develop non-subsidised commercial trading arms to pursue opportunities in education, research, chronic disease management, primary care, elder care and pharma life sciences.

Training and skill development: The Indian domestic system faces a shortage in its healthcare workforce, with doctors and nurses per 1,000 people falling 35 per cent and 48 per cent short of World Health Organization recommendations respectively.

There is a shortage of 6.4 million workers in the Allied Health Professionals category across segments like anaesthetists, technicians trained to run an operation theatre, dental staff, pharmacy education, optometrists and medical laboratory technicians and radiographers.[12]

India's 'exports' of medical professionals contributes to this shortfall with India being the world's largest supplier of physicians[91]

- potential therefore exists to leverage Australian materials and standards to deliver training models to upskill existing healthcare workers in geriatric care, aged care, community care, emergency medicine, wound care and infection control
- India has developed successful models of non-physician healthcare workforce development. Australia's expertise in vocational training is highly relevant
- targeted training and skill development can also increase women's workforce participation, which is currently at 38 per cent in the Indian health sector.

Medical Tourism: Cheap drugs and healthcare services will make India an attractive destination for medical tourism. The market is growing at over 20 per cent per annum[12]

- India could become a major destination for Australian medical tourism over the long term
- Australia could also become a quality medical tourism destination for a small, elite segment of the Indian market over the long term, especially if there are more hospital partnerships.

2.2 Collaboration

That India and Australia have complementary capacities in a range of healthcare segments means there is the potential for enduring collaborations and partnerships.

Sector-specific standard and regulatory harmonisation can lead to greater interoperability, supporting trade in complementary medicines, pharmaceuticals and medical devices and aligning health education and professional accreditation. As an importer of India's pharmaceutical and generic medicines, this could also increase imports and reduce the cost burden to Australia's Pharmaceutical Benefits Scheme.

Research and development: Australian institutions could pursue:

- partnerships (with major pharma companies or small tech groups) to pursue drug or technology development
- joint research, commercialisation and licencing partnerships, including for biomedical and genomic capabilities
- Indian research partners in clinical trials, leveraging India's large population and the possibility for cost effective, large-scale roll out
  - Indian Government regulations regarding the compensation rules and approval times can hamper its clinical trial market. On the other hand, research-oriented Indian pharmaceutical companies are looking to run trials overseas and could seek to partner with Australian organisations.

India as a source of skilled labour: Australia's health sector can continue to draw on Indian talent to provide needed skills such as data scientists, software developers, biotechnology workers and hospital and aged-care workers

- hospitals (5.8 per cent) and aged care services (3.8 per cent) are already the second and third most common occupations in Australia for people born in India.[xxiv, 92]

Data analytics: Australian institutions can work with India to:

- understand what data exists (and collected by whom) in both countries which is central to evolving new business systems
- develop approaches to making sense of unstructured data sources, incorporating economic analysis and tapping into new technologies to improve security
  - for example blockchain technology
- learn from India's advancements in biometric data.

Regional health security: With rapidly increasing connectivity between Australia and India (students, diaspora, tourism, business) and the broader Indo-Pacific, India will need to be increasingly front-of-mind for efforts to combat the spread of infectious diseases. Australia and India can combine competencies to pursue:

- effective policy coordination, including with third parties
- planning for health security including through implementation of the International Health Regulations in the region
- opportunities in joint research and development
  - globally, governments and venture capitalists are investing in Product Development Partnerships to tackle infectious diseases including with India's low cost pharma industry

xxiv 'Computer system design and related services' is the highest at 6.9 per cent.

    - India is the largest provider of generic pharmaceuticals and a major source of vaccine production
  - as well as translational research, for example through partnerships/consortia involving Australian and Indian research institutions
- encouraging India's engagement with the Asia-Pacific Leaders Malaria Alliance – which is funded by DFAT and Gates Foundation.

Conversion of India's traditional knowledge base into modern medical technologies

- there is renewed interest in India's Ayurvedic medicinal regimen, which is largely based on natural products
- scope for Australian companies to work with India and play an auxiliary role in applying scientific tests as India establishes leadership in this area
  - this could lead to partnerships which could benefit both our nutraceutical industries.

2.3 Investment

The Indian healthcare system is relatively open to investment in comparison to other sectors

- allows 100 per cent FDI in the hospital sector and in the manufacture of medical devices (including for-profit players)
- in the pharmaceutical sector, 100 per cent FDI is allowed in greenfield projects and 74 per cent in brownfield projects
  - to go beyond 74 per cent, brownfield projects require approval from the Foreign Investment Promotion Board.

The rate of growth in the Indian health sector presents opportunities for portfolio investment, as well as FDI

- two way investment in the health sector is currently small, but Australian investment opportunities could be supported by growing goods and services trade as companies look to get a presence in supply chains and ecosystems
- to ensure healthcare delivery through traditional methods, India requires investments of $327 billion by 2034 which includes 3.5 million additional beds[12]
  - this number could be reduced by $120 billion by shifting the point of care, introducing technology-enabled solutions, which reduce stress on hospital infrastructure, and increasing adoption of preventative care.

Others are already investing. Over the past few years many private equity firms, venture capitalists and foreign players have invested in the Indian health sector

- transaction values have increased from $125 million in 2011 to $1.7 billion in 2016
  - a slew of investments by global health players, including the Parkway group, and a host of Middle East players have been completed.[12]

3.0 CONSTRAINTS AND CHALLENGES

KEY JUDGEMENT

Opportunities notwithstanding, India's health sector is poorly regulated, highly price-sensitive and culturally different to the Australian sector. It is a complex, context-specific and conservative sector which makes it hard to determine where to engage, due in part to a difficult public sector; a fragmented and poorly regulated private sector; and low quality hospital data systems and records management. India tends to have a larger focus on curative than preventative healthcare.

Whilst Australia is typically a high-value, low-volume supplier, the Indian health system is very price-sensitive. Some segments of the Indian market are seeing an increased willingness to pay for better services, but in most instances cost remains a primary driver. The market for expensive equipment is relatively small.

3.1 The policy and regulatory environment

Indian price control policies disincentivise professional profit-motivated players

- in an effort to support affordability, the government keeps a number of drugs and equipment (such as coronary stents) under price control
- it is possible that procedures and protocols will also fall under this umbrella.

Approvals and licences become bottlenecks, even where FDI is allowed

- India is still developing regulations for complementary medicines and medical devices meaning, for example, many complementary medicine ingredients are not recognised in the Indian regulatory framework.

While the government is trying to regulate the medical devices sector, it also wants to make it less import-dependent and bring in foreign investment

- to reduce import dependence, in 2018 the government hiked the duty for the import of 78 devices[12]
- proposed policies have included interest subsidies, concessional power tariffs, seed capital, tax benefits, minimum or zero duty on raw materials and incentives for export.

Intellectual Property protection is often weak and ineffective, particularly with regard to patent protection: the sector needs stable and internationally-aligned IP protections to attract joint ventures.

Digital medical data and health records require reliable security systems and protocols. A shift to electronic medical records has not been matched with a legal framework on data collection and use, or on breaches.

CASE STUDY: SYNAPSE: A SUCCESSFUL MODEL OF INTEGRATED SERVICE DELIVERY FOR AUSTRALIA AND INDIA

Australian company Synapse Medical Services has found an opportunity to provide Australian hospitals and clinics with the services they need, making the most of what workers in both countries can offer.

Synapse provides administrative support for clinical services in Australia, with an integrated delivery centre for medical billing, clinical coding and transcriptions in India. Synapse set up an office in the southern Indian city of Chennai four years ago and now employs 100 people. It has developed Australia's first medical billing app, to save time and reduce costs associated with clinical service delivery.

Synapse services help improve the efficiency and productivity of their Australian clients. Australian staff work at the customer interface; Synapse India works at the data interface.

Having a service centre in India has boosted the company's capacity and capability to deliver services and has led to new contracts in India and overseas.

Synapse has also identified expectations and protocols of Indian business culture and sought to work within them. Margaret Faux, Synapse Medical's founder and Chief Executive Officer, visited Chennai as a backpacking teenager and formed an attachment to the city. Years later, when she was looking to establish her business in India, Chennai was the obvious choice, not only because of her familiarity with the city but because she was able to tap into a skilled workforce and the relative ease of doing business. She cites forming personal relationships with staff and clients and having close communication between Synapse's Australian and Indian offices, as central to the company's success.

"Now that India has committed to Universal Health Coverage, there are real opportunities to engage, but very few Australians are in the race. I think they are missing out."

OFFICIAL OPENING OF THE SYNAPSE OFFICE IN INDIA. [SYNAPSE MEDICAL SERVICES AUSTRALIAN PTY LTD]

3.2 Skills, infrastructure and other constraints

India lacks resources in key ministries and regulatory bodies, limiting the prospects for productive engagement

- for example, in the Ministry of Health and Family Welfare four staff manage all bilateral MoUs, World Health Organization and donor engagement.

The Indian health sector has a severe shortage of qualified practitioners

- many informal health workers have little to no training
- there are 462 medical colleges that teach 56,748 doctors and 3,123 institutions that prepare 125,764 nurses each year, but with India's population increasing annually by 26 million, the numbers are too small.[93]

Australia delivers world-class healthcare domestically but is not a big player in global markets

- Australia is not competitive with the United States and others in commercialising medical research
- Australia has a reputation for quality but represents only 1 per cent of global pharmaceutical and medical device sales
- competitors have a head start
  - the United States has over 60 officers in its Delhi Embassy who are working on the health relationship, from a range of agencies such as the Center for Disease Control, USAid and Department of Health and Human Services; Japan is making significant development-led health investments
  - the Australian High Commission does not have one dedicated full-time officer on health; this responsibility is shared across DFAT, Austrade and other government agencies.

4.0 WHERE TO FOCUS

Opportunities are most prospective for Australia by focusing on progressive states with a commitment to healthcare reform and where we can apply our relative strengths in NCDs. Indian regions with the greatest need for health sector improvement are unlikely to be where the best prospects of commercial partnership are. Wherever we do focus, as in education, our partnership with India on health cannot be seen to rest on a profit–first mode of engagement.

4.1 The Centre and the states

While the Central Government is responsible for establishing the regulatory framework and insurance policy, health is a state subject in India's federal structure and the majority of public spending on health comes from state budgets.

- State governments, in addition to spending grants received from the centre, spend directly out of their own resources
  - as a result of greater allocation of funds from the Centre in 2015, the share of state health spending has increased marginally in many states since and this is expected to continue.
- a targeted approach is therefore needed and clarity is required around the relevant decision-making authority
  - for example, to scale-up proven solutions, Central Government support is needed, but pilot projects need state backing.

URBAN VERSUS RURAL

Urban versus rural disparities also affect where to focus

- inequalities in the quality of care and access to health vary widely between urban and rural areas; these are compounded by gender inequality
  - most Indians live in rural areas which have limited access to hospitals and clinics
    - only 33 per cent of doctors work in rural areas[12]

  - the increase of lifestyle diseases and NCDs is concentrated in urban areas in more developed states
  - more accessible digital technologies and social entrepreneurship can deliver cost effective solutions and bridge the gap between providers and end-users
  - primary healthcare centres in rural areas are the main focus of the public healthcare system
  - the private sector is concentrated in metros, tier one and tier two cities
- urban areas would be the natural focus for engagement on NCDs and developing health systems – even if they are designed to deliver services to rural communities.

4.2 Key states

Australia should focus on states with demonstrated commitment to improve their health outcomes and the frameworks to use their funds effectively.

States with the most developed economies and business-friendly environments also tend to have the most progressive healthcare systems and highest NCD burden.

ANDHRA PRADESH

- State budget expenditure on health: 4.7 per cent
- Proportion of disease burden[94]:
  - Communicable, maternal and nutritional diseases (CMND): 27 per cent
  - NCD: 60 per cent
  - Injuries: 13 per cent

Andhra Pradesh has medical device zones to support domestic manufacturing, offering commercial facilities and strategic support to healthcare manufacturing. Andhra Pradesh has one of India's most expansive universal healthcare regimes.

KARNATAKA

- State budget expenditure on health: 4.1 per cent
- Proportion of disease burden:
  - CMND: 25 per cent
  - NCD: 62 per cent
  - Injuries: 13 per cent

Karnataka has a relatively advanced health sector and is home to public sector enterprises in health and pharmaceuticals. Karnataka's innovation ecosystem supports startups in biotech and healthcare.

KERALA

- State budget expenditure on health: 5.1 per cent
- Proportion of disease burden:
  - CMND: 14 per cent
  - NCD: 74 per cent
  - Injuries: 12 per cent

Kerala has a relatively strong health sector supported by state investment. Kerala is developing medical device manufacturing zones (including a possible industrial park). Kerala has a growing demand for aged care and is a source of healthcare workers.

MAHARASHTRA

- State budget expenditure on health: 3.9 per cent
- Proportion of disease burden:
  - CMND: 25 per cent
  - NCD: 63 per cent
  - Injuries: 12 per cent

Maharashtra runs the highest number of clinical trials (16 per cent[95]) in India and produces the most clinical research.

TAMIL NADU

- State budget expenditure on health: 4.5 per cent
- Proportion of disease burden:
  - CMND: 20 per cent
  - NCD: 65 per cent
  - Injuries: 14 per cent

With medical device zones to support domestic manufacturing, Tamil Nadu has some of the best health indicators in India and a universal healthcare system.

TELANGANA

- State budget expenditure on health: 4.8 per cent
- Proportion of disease burden:
  - CMND: 28 per cent
  - NCD: 59 per cent
  - Injuries: 13 per cent

Telangana has a large number of private healthcare organisations and India's largest pharmaceutical cluster.

CASE STUDY: WORLD MOSQUITO PROGRAM: AUSTRALIAN RESEARCHERS SET OUT TO STOP DENGUE FEVER

In India, it is estimated there are between 20–40 million cases of dengue fever each year. It is an enormous public health burden, among the highest in the world. Current forms of control alone are unable to stop the spread of the virus.

Australian researchers hope to have a solution. The World Mosquito Program, a not-for-profit, global initiative led from Monash University in Melbourne, is pioneering the use of a safe and naturally-occurring bacteria to reduce the ability of mosquitoes to transmit the dengue virus.

Pilot studies have shown when a high proportion of mosquitoes in an area carry the Wolbachia bacteria, there has been no evidence of local transmission of dengue. The program has projects in 12 countries so far, working on introducing the bacteria to local mosquito populations, and is expanding to 20 countries by 2020.

In 2017, the World Mosquito Program joined forces with a highly respected partner in India, the Indian Council of Medical Research (ICMR). It is conducting initial research at the Council's Vector Control Research Centre in Puducherry, South India.

Initial laboratory studies are examining the impact of Wolbachia on dengue, along with another mosquito-borne virus, chikungunya.

India needs affordable long term solutions, and the Australian team is partnering with ICMR to help find one. If successful it has the potential to significantly reduce the number of dengue cases in India and elsewhere around the world.

RECOMMENDATIONS

In the short term, sustained and targeted ministerial-led government engagement can provide the basis for broader and deeper commercial engagement. This could require some reprioritisation at home.

49. Promote regulatory convergence and standards harmonisation to improve market interoperability

49.1 Empower the TGA to play a larger role in leading and influencing the development of regulatory capability across regional markets, and with India in particular

- the TGA differs from many other regulators in that it operates on a full cost recovery model and does not receive government funding for the bulk of its work
  - there is scope for a more partnership-based approach with industry: for example, establish mechanisms to enable industry (export-oriented Australian companies) to choose to sponsor specific TGA activities
- a strategic decision by government to prioritise engagement with India should result in increased TGA interaction with India, including through the World Health Organization, International Coalition of Medicine Regulatory Authorities, International Medical Devices Regulators' Forum and the International Pharmaceuticals Regulators Programme
  - as well as continuing to align TGA processes and evidence requirements with those of international regulators.

49.2 Increase information exchange and collaboration between TGA and the Central Drugs Standard Control Organisation on medicines inspections and regulatory systems for medical devices

- providing technical support, including by offering secondments, to build the capacity of India's Central Drugs Standard Control Organisation
- consider work sharing, information sharing and regulatory convergence activities with Indian regulators and the Ministry of Health and Family Welfare
- this can be operationalised through exchanges and secondments.

49.3 Facilitate further engagement between Standards Australia and the Bureau of Indian Standards

- including on data standards and eHealth record security through the Australian Digital Health Authority.

49.4 Support India to develop its registration and accreditation standards for medical practitioners and allied health professionals through collaboration with the Australian Health Practitioner Regulation Agency and the Australian Medical Council.

50. Make health a ministerial priority and overtly align engagement with Indian needs

50.1 Maintain regular ministerial engagement at federal level and at state level with target states.

50.2 Agree a schedule of meetings in the margins of multilateral health fora.

50.3 With ministerial imprimatur, the Joint Working Group under the Australia-India Health MoU should strengthen efforts to draw together partnerships and programs in health between federal and state governments, academia and industry.

- under this framework, Australian activities would gain Indian political support by aligning efforts with Indian policy priorities
- the table below gives examples of national policies, but Australian engagement could also be with target states.

Example of Indian priority (as per NHP17)	Point of Australian collaboration
Combating NCDs	Sharing information and collaborating on management of NCDs, both domestically and in development contexts
Digital Health	The Australian Digital Health Authority working with India as it establishes a National eHealth Authority and National Digital Health Authority to digitise health information This could lay the foundation for private sector engagement Learn from India's biometric data experience An opportunity to engage with India directly on its Aadhaar experience Continue to seek Indian engagement with the Global Digital Health Partnership
Improve public hospitals management	Supporting India to establish clinical risk management systems Sharing information on Australia's Activity Based Funding Model (for example. the Independent Hospital Pricing Authority has commercially available software)
Progressively achieve Universal Health Care	Cost containment is a key consideration for India. Australia can share experience from related projects and processes, including in relation to healthcare financing and a blended healthcare model Share experiences from roll out of the National Disability Insurance Scheme
Mental healthcare programs	Australian initiatives like Black Dog Institute and products like iBobby
Develop a health card that links to a defined package of primary health services	Leverage possible synergies with Medicare
Reduce tobacco use by 30 per cent by 2025	Share experiences on tobacco control interventions
Reform medical education	Provide technical assistance to develop national competency examinations Provide more fellowship opportunities Forge partnerships with key Indian universities and research institutes
Trauma management	Work with India to apply Australia's world-leading trauma management systems

51. Consolidate engagement mechanisms (state and business level) to help unify Australian branding, improve knowledge sharing and coordinate lobby efforts

51.1 Establish an industry body to package Australian health sector offerings specifically for India

- similar to the Water Industry Alliance or the Australian Water Partnership, perhaps affiliated with an existing health sector peak body
- this initiative would support public and private partnerships for sharing Australia's health sector expertise with India, open opportunities for Australia to learn from India's approaches and seek co-investment collaborations.

51.2 Organise 'whole-of-Australia' presentations at events and conferences, rather than the current state-based presentations.

51.3 The Industry Growth Centre *MTPConnect* and Austrade should continue to provide resources and connections between companies and overseas regulators

- encourage clusters of Australian health SMEs to work with non-government organisations to establish 'social innovation hubs'.

52. Increase Australia-India medical research, development and commercialisation

52.1 Channel existing funds to support more research grants, fellowships and exchanges with India, focused on the key services and states. This would include:

- enhancing the priority on collaboration with India through existing funds
  - for example, via specific health research funding like the National Health and Medical Research Council, the Medical Research Future Fund or Australia's Biomedical Translation Fund
    - or via non-health specific funds such as CSIRO's Main Sequence Ventures
- seeking to draw on Indian venture capital or funding from large conglomerates.

52.2 Explore options for co-investment with India in health development programs in third countries to build collaboration on public health capability transfer

- for example combining our technical expertise with India's frugal innovation.

52.3 Foster formal agreements between leading health research institutions, including to tap international funding pools.

52.4 Look to increase domestic research funding and improve pathways to commercialisation.

53. Strengthen efforts to bring India into global and regional regimes on health security issues

53.1 Australia should continue to build up partnership cooperation with India on regional health security initiatives to help prevent avoidable epidemics, strengthen early detection capacity, address gender inequality in health outcomes and support rapid, effective national and international outbreak responses (for example, epidemics, anti-microbial resistance, malaria and tuberculosis).

53.2 Expand partnerships to strengthen human and animal health systems, including through improved access to vaccines, and deepen people to people linkages that build health security capability.

53.3 Facilitate exchanges in Field Epidemiology Training Programs.

53.4 Consider placing Australian health professionals in non-clinical, capacity-building roles in India under the Health Security Corps, building people-people and institutional links.

53.5 Support high quality and collaborative health systems and policy research (translational research) through consortia or partnerships with Australian institutions.

53.6 Continue to encourage India's engagement in malaria elimination and health security through the Asia Pacific Leaders Malaria Alliance.

INFRASTRUCTURE SECTOR

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SUMMARY

- Urban development and transport infrastructure are the two segments of the Indian infrastructure sector that present the best opportunities for Australia. Given the differences in the nature of the opportunities this chapter examines them separately.
- The urbanisation of the world's largest rural population brings enormous opportunities and challenges. India's urban population is expected to reach 640 million by 2035.
- The opportunities for Australia are not in building cities or roads, but rather in financing and other service areas.
- Out to 2035, improvements in city planning and growing disposable incomes could enable more user charges – such as toll roads – to increase revenue generation for infrastructure developments.
- Improving **transport infrastructure** is critical to the liveability of India's cities. It is also central to India's productivity and the competitiveness of sectors such as agriculture and manufacturing.
- Transport is expected to attract the majority of infrastructure investment in India out to 2035. The need for capital is immense. Issues around land acquisition and dispute resolution could keep the sector from reaching its potential.
- The Indian Government is actively seeking foreign investment to finance its large-scale rail and road connectivity projects, with the creation of new investment vehicles and financing models. It is also beginning to improve regulatory clarity and reduce execution risk through policy reform.
- De-risked brownfield assets in the transport sector represent the clearest investment opportunities for Australia. There are also export opportunities for Australian expertise in areas such as port logistics, infrastructure financing, road safety, heavy haul transportation, multimodal logistics and architectural design and engineering.
- **Urban development** and associated infrastructure investment is a major source of growth for India. Urbanisation drives demand for inputs across sectors (such as metallurgical coal and iron ore for steel production) and shapes India's use of energy. The Indian Government is focusing on improving basic services such as sanitation and housing. Water management is a serious challenge, with most of India's large cities already facing water shortages on a daily basis.
- Australia can provide expertise in niche services for smart cities development including urban planning, transport management, road safety, water and sanitation and waste management.

Part A: Transport Infrastructure

1.0 THE MACRO STORY

KEY JUDGEMENT

India's transport infrastructure is inadequate to meet current needs, and the needs of 2035 will be much greater. It has a corresponding appetite for investment and services to improve the sector. The Indian Government is prioritising regulatory reforms to attract more foreign investment. Out to 2035, there are potential opportunities for Australian investors and Australian suppliers of niche services and technology in transport.

1.1 The scale and key structural drivers of the sector

India's population growth and economic development requires improved transport infrastructure, including through investments in roads, railways, and aviation, shipping and inland waterways.

Capital is the key to advancing India's transport infrastructure

- India will require investments of over USD4.5 trillion by 2040 for the development of its infrastructure, according to the Economic Survey 2017–18
  - of this, India will be able to meet about USD3.9 trillion, leaving a $526 billion deficit
- a key goal of India's suite of regulatory reforms is to attract more foreign investment into the sector, including through new investment vehicles and innovative financial instruments
- by 2030, transport is expected to attract over 60 per cent of infrastructure investment in India.[12]

In some parts of India, developers are also employing user charges and value capture mechanisms such as taxes and betterment levies to finance infrastructure projects

- while these mechanisms have not gained ground as systematic instruments of revenue generation, there appears to be a growing confidence in investor markets that these mechanisms will bear fruit as the sector develops
- for instance, the Macquarie Group deal in March 2018 utilises a toll-operate-transfer model under the National Highway Authority of India investment vehicle.

A breakdown of the scale of the infrastructure capacity and demand for segments of transport infrastructure follows.

ROADS

India's road quality is generally low, despite India's roads carrying 90 per cent of passenger traffic and 65 per cent of freight

- road density is high but the length of surfaced roads is low at 61 per cent (compared to Russia at 70 per cent or China at 67 per cent)
- most highways are narrow, congested, and poorly surfaced
- there is poor access to rural areas; 40 per cent of India's villages do not have access to all weather roads.

The Government of India has a range of projects to improve road infrastructure

- the National Highways Development Projects, which require investments of up to USD170 billion
- the Bharatmala project, stretching from India's western to eastern land borders
- the Northeast Express Highway (1,300 km express highway in northeast India).

AVIATION

Air traffic is expected to experience double digit growth well beyond 2020, at which point India will become the world's third largest aviation market (behind China and the United States)

- passenger traffic is forecast to multiply by four times and cargo traffic by six times in the next twenty years; India's existing airport infrastructure is underutilised
  - of the 449 airports or airstrips in India, commercial airlines are operating at just 61, with the remaining unused or only occasionally used[65]
    - but of those 61, several are under strain and at capacity
- many Indian airports have widely recognised deficiencies in areas such as ground handling, night landing systems and cargo handling
- the maintenance and repair operations market is expected to grow at 6.7 per cent per annum to reach $5.7 billion in the next 10 years from the current size of $3.1 billion[66]
- growth of India's aviation industry would have cross-cutting benefits for tourism
  - around 97 per cent of tourists arrive in India by air.

SHIPPING

India has unrealised potential in shipping, with 7,500 km of coastline and 14,500 km of navigable or potentially navigable waterways.

More than one billion tonnes of cargo was handled across over 200 ports in India in 2015 with maritime logistics accounting for 90 per cent of international trade by volume and 72 per cent by value.[67]

Despite the cost-efficiency of coastal and inland water transportation, India's ports tend to be small, lack draft for larger vessels, and are inefficient

- with an average 4.5 day turn-around time, versus one day in China and 1.2 in the United States.

Port links to road and rail connections are poor

- between 2015 and 2025 the Indian Government's SagarMala project is set to provide over $80 billion to infrastructure for ports and coastal shipping in India
  - the focus will be on enhanced connectivity through road, rail and inland waterways, and port development and modernisation.

RAIL

India's railways play a major role in affordable transport of passengers and cargo across the country

- it is one of the largest networks in the world with 7,216 stations; 92,000 km of track and 1.3 million employees
- Indian railways carried eight billion passengers and transported over one billion tonnes of freight in 2017–18
- however, most major corridors are facing severe capacity constraints and there are safety issues.

The Ministry of Railways plans to improve and expand the rail network, renew the train fleet, and improve passenger safety. It plans to invest up to $170 billion over the next five years, with the largest proportion aimed at network expansion and decongestion, and safety.[64] Investments are also planned for station redevelopment and the dedicated freight corridor between Delhi and Mumbai.

The Government of India is seeking greater private investment through:

- allowing 100 per cent FDI in railways for construction, operation and maintenance of suburban corridor projects, high-speed train projects, railway electrification and signalling, among others
- encouraging the development of new investment vehicles such as the Railways of India Development Fund to attract long term investment from global institutional investors.

MULTIMODAL LOGISTICS

Intermodal freight planning and optimisation in the transport infrastructure sector is lagging and inefficient transport logistics constrain the competitiveness and productivity of the Indian economy

- cold-chain logistics are underdeveloped, affecting trade in perishable food and vegetables and other agriculture commodities and impacting farmer income[xxv]
- as part of its Logistics Efficiency Enhancement Programme, the Ministry of Road Transport and Highways plans to build 35 multimodal logistics parks (logistics hubs aimed at reducing costs and aggregating distribution and storage) funded through special purpose vehicles formed by state and central governments and the private sector
- the Ministry of Road Transport and Highways also proposes the formation of a multimodal company that will bring together disparate ministries to jointly plan and coordinate on logistics
- the implementation of GST should simplify and quicken transportation across borders and stimulate supply chain segments.

AUSTRALIA'S COMPETITIVE ADVANTAGE

Australia has world class transport infrastructure services with one of the world's most developed logistics networks.

Australian businesses have specialised expertise and regulatory models in niche areas of design and construction, port logistics, maintenance efficiency services in heavy haul rail, multimodal freight logistics, road safety and design and engineering.

We have a large pool of investable capital, a demonstrated history of leveraging public private partnership models and expertise in developing value capture mechanisms and user charges

- Australian companies Macquarie, CIMIC and Linfox have experience working in India on infrastructure and logistics projects that other Australian companies can draw on.

1.2 How the sector will likely evolve out to 2035

If implemented effectively, India's suite of ambitious policy changes could spur growth and opportunity in the sector as foreign investment increases. Innovations in transportation technology – including autonomous driving technologies, high-speed trains, and the rising popularity of shared transport options – could fundamentally change India's infrastructure needs out to 2035 in ways that are currently difficult to predict.

Four general trends will shape the sector out to 2035.

DEMOGRAPHICS

Rural to urban migration and a growing middle class will drive up infrastructure needs as more pressure is placed on public transport infrastructure and more cars go on the road.

GOVERNMENT FOCUS ON SECURING FUNDING

Policy changes in recent years, such as user charges, the advent of Invest India and new types of investment vehicles to attract investment and facilitate infrastructure will stimulate growth across transport modes, potentially improve capacity and efficiency, and contribute to economic growth [*see Chapter 2: The Investment Story*].

[xxv] India has fewer than 10,000 refrigerated vehicles, while it needs 62,000 vehicles. India also needs 70,000 pack houses with pre-cooling and dispatch for onward transportation; as at 2015 there were only 250.

CASE STUDY: MACQUARIE: THE LARGEST FOREIGN INVESTOR IN INDIA'S NATIONAL HIGHWAYS

India is seeking trillions of dollars of capital investment to build the transport infrastructure vital to its economic growth. Roads carry most passenger traffic and two-thirds of freight, but highways are in need of further investment. India is focused on improved connectivity and an Australian firm is a partner on the journey.

Australia's Macquarie Group brings capital and world-leading expertise in managing infrastructure partnerships. It was the first foreign investor to acquire controlling stakes in Indian roads and is now the largest foreign investor in the road sector in India.

Since 2008, the group's infrastructure asset management division has committed more than $3.2 billion in India. This includes winning the bid for concession agreements worth approximately $2 billion to manage almost 700 km of Indian national highways over the next 30 years, under India's new asset recycling financing model.

Macquarie started in India by acquiring a minority stake in a holding company for seven operating toll roads, and has grown to have majority control in 13 roads. In managing these roads, Macquarie has implemented many sector firsts, including:

- rigorous focus on health and safety practices leading to reduced workplace accidents
- optimal capital structure and lower interest rates through refinancing initiatives
- engaging with all stakeholders, especially with the National Highways Authority of India and local communities, in continued evolution of road concession frameworks.

Macquarie is also investing in a series of community road safety initiatives designed to educate and raise awareness among Indian drivers to reduce accidents, injuries and fatalities. This is one of many community initiatives supported by Macquarie.

TECHNOLOGICAL ADVANCES IN TRANSPORTATION

Technological advances in transportation such as autonomous vehicles will have an impact on infrastructure requirements and might divert investment from traditional infrastructure

- fast train technology projects which could potentially capture traffic that would otherwise go to the aviation sector
- better asset management technologies
- innovation in road construction technology and materials.

INCREASED FOCUS ON SAFETY AND SUSTAINABLE DEVELOPMENT

Increased focus on safety and sustainable development including in India, will drive demand for safer traffic management technology, research, and know-how. Green and sustainable investment and financing parameters are of increasing importance to overseas investors. This will likely place pressure on quality, performance and assessment of Indian infrastructure projects.

2.0 OPPORTUNITIES FOR PARTNERSHIP

KEY JUDGEMENT

There are opportunities for investment in India's large-scale transport infrastructure developments. There will also be export opportunities for Australia's expertise in transport infrastructure services and technology as well as projects adjacent to the development of India's transport infrastructure, including railway station modernisation. Australia can learn from Indian investment in experimental transport technologies.

2.1 Export opportunities

Table 6 highlights Australia transport infrastructure export opportunities out to 2035.

TABLE 6: TRANSPORT INFRASTRUCTURE EXPORT OPPORTUNITIES OUT TO 2035

		Australia's strengths	Opportunity in India
Investment	Capital	Australia's funds management sector has over $2.7 trillion under management Experience with municipal bonds, infrastructure financing, PPP models, asset recycling and infrastructure privatisation	Explore de-risked brownfield investment opportunities, for example in road toll-operate-transfer models
Services and solutions	Development	A leader in technologies in rolling stock and train brakes Expertise in road safety, driver education and regulation including vehicle registration and driver licensing Expertise in design and engineering services and network design Experienced and internationally focused consultancies	Development of PPP models that de-risk investments and recycle assets Provide specialised services and solutions to Indian infrastructure developers and operators: 'Below-rail' services such as planning and design, infrastructure construction, facilities, systems and technologies 'Above-rail' services such as operation, maintenance and training (technical, safety and environment), inspection, fault detection, train loading, and in-motion weighing solutions India Railways project to redesign 400 train stations Road safety consultancy to highways, railway and smart city projects Design and engineering services for complex projects in railways, dams, bridges, and major pipelines Business services in setting up modal logistics parks in India Port development and multimodal logistics
	Operation and maintenance	A record of innovation in heavy haul transportation projects Established services in infrastructure maintenance and operation in sectors such as toll roads operation, airport operations and transport logistics Award-winning architectural expertise in redesigning train stations and maintenance facilities Technology in specification, development and optimisation of traffic signal systems; development of standards; noise and environmental monitoring systems; automated check-in solutions; road, bridge and pavement asset management systems A world leader in port logistics and planning; easily exportable expertise covering messaging and message brokering, port logistics and operations Expertise on Indian Ocean research with a focus on ports and coastal sustainability	

2.2 Collaboration

Investing in India presents a range of challenges [*see Chapter 2: The Investment Story*]. As with other sectors, investment risks in the transport infrastructure sector can be mitigated by collaborations and local partnerships

- partnering with state governments or construction companies to develop public private partnership models
- engagement with early-stage investment funds, such as InfraCo Asia, to develop projects through the early, high-risk stage
- collaboration between Australian and Indian public and private sectors can help develop mutual understanding of capabilities
  - for example, Australian expertise in regulatory development resides in the public sector while the private sector controls assets under management
- service and technology providers could look to join transport infrastructure projects through partnership with the Indian Government, third country providers or private sector developers.

2.3 Investment

Investment in Indian transport provides a diversified asset class and geography for Australian investors, especially for those seeking higher returns than those available in more developed markets

- India's road, rail and aviation sectors are widely projected to be the fastest growing components of Indian infrastructure in the short to medium term
- the Government of India's desire to attract investment into the transport infrastructure sector has seen the development of new investment vehicles
  - Macquarie is the first investor to take up the National Highway Authority of India's introduction of a toll-operate-transfer asset-recycling model for infrastructure financing
  - India's quasi-sovereign National Investment and Infrastructure Fund is establishing itself as one of the main channels of investment into Indian infrastructure, as is the Railway Infrastructure Development Fund.

There are also opportunities for India to invest in Australia's large and growing pipeline of big infrastructure projects

- this requires ongoing promotion of Australia's investment strengths: security, low insurance premiums and high productivity due to supporting technology and infrastructure
- greater foreign infrastructure investment brings in a broader base of technical skills and lowers the cost of tenders for the Australian Government.

3.0 CONSTRAINTS AND CHALLENGES

KEY JUDGEMENT

Despite gradual improvements, the sector remains fragmented. This creates inefficiencies from planning and funding to construction and maintenance. The Government of India is particularly focused on funding for greenfield investments whereas Australian institutional investors prefer de-risked brownfield investments in traditional infrastructure, such as road and rail.

3.1 The policy and regulatory environment

CHALLENGES COORDINATING POLICY

India's transport policy environment is fragmented between modes (roads, railways, shipping, airways) and levels (central and state) of government, with responsibility for infrastructure investment planning, policy making, regulatory supervision and financing strategies sitting with various departments and agencies. This can create complications for intermodal linkages between roads, railways, ports and airports.

LAND ACQUISITION ISSUES

Land acquisition issues are a roadblock to infrastructure development, with potential disputes and resistance from local communities on land value leading to project delays, cost escalations, disputes and litigation. Successful land acquisition reform would stimulate infrastructure investment and increase opportunities.

DISPUTE RESOLUTION

Disputes in land acquisition and contract implementation are often protracted with unfavourable outcomes for investors. The government is seeking to institutionalise dispute resolution mechanisms in infrastructure projects.

3.2 Skills, infrastructure and other constraints

Few Australian companies have experience delivering infrastructure projects offshore.

THE RISK/RETURN RATIO

Due to relatively higher rates of risk compared with other markets, investors in India require a high rate of return. This reduces the number of commercially feasible projects.

LACK OF AUSTRALIAN INTEREST

Australian investors have historically enjoyed good returns domestically and, with a few exceptions, have shown limited appetite for foreign investment in general and Indian investment in particular.[xxvi]

[xxvi] But this trend is starting to shift as the economic outlook changes towards more direct investment in Australia. More than 40 per cent of superfund investments are in equities (second highest among OECD pension markets), with returns expected to decline. These funds may eventually seek alternate investment options, including in India, as Indian investment options build a stable track record.

INTERNATIONAL COMPETITORS

Major economies, with large funds at their disposal, are operating in the Indian infrastructure sector

- Japan is providing long term concessional loans for greenfield investments
  - including through a 2017 proposal for a USD19 billion fast train linking Ahmedabad and Mumbai
- Singaporean companies are developing an IT park, and planning the new Andhra Pradesh capital, Amaravati.

LOW INTEREST RATES AND HIGH LIQUIDITY PUSHING UP PRICES

In the near term, low interest rates and high liquidity have pushed up the price for high quality brownfield assets and pushed down yields.

4.0 WHERE TO FOCUS

While there is a demand for investment and transport infrastructure services across India, Australia's focus is best placed on states and cities where local governance and policies are favourable to foreign investment and established Indian partners can be sought. Central ministries play an important role in planning and funding of transport infrastructure, while states play a large role in implementation, construction and maintenance of transport infrastructure.

4.1 Which states

Tamil Nadu, Rajasthan and Uttar Pradesh will see most brownfield road projects in the short term.

Maharashtra, Andhra Pradesh, Madhya Pradesh and Bihar are seeing greenfield roads development in the short term, presenting brownfield opportunities in the medium to long term.[12]

Madhya Pradesh will attract significant investment in infrastructure sectors over the next decade due to a large industrial land bank, and favourable policies.[12]

Uttar Pradesh, New Delhi, Haryana, Rajasthan, Gujarat and Maharashtra will see investment in infrastructure as part of the USD90 billion infrastructure Delhi-Mumbai Industrial Corridor (with financial and technical support from Japan).[68]

Maharashtra has proposed transport infrastructure projects worth $20 billion. The state is focusing on developing roads, rail, ports and airports, presenting opportunities for roles in design, technology, professional services and consultancy.

Part B: Urban Development

1.0 THE MACRO STORY

KEY JUDGEMENT

India's urban populations will grow substantially out to 2035. Without significant investment, India's urban infrastructure gap will continue to widen. India has major, nationwide programs underway and an appetite for investment and expertise. Australian service providers have competitive advantages in niche areas of Indian demand.

1.1 The scale and key structural drivers of the sector

DEMAND FOR URBAN DEVELOPMENT

India's urban population is growing rapidly and placing immense pressure on its cities

- each year, about 10 million people move from rural areas to towns and cities
- this rural migration, combined with urban population growth, means India adds an urban population equivalent to three Los Angeles each year[69]
- by 2025, India will have 69 cities with a population of one million or more[69]
- by 2035, India's urban population is expected to reach 640 million.

India's urban infrastructure lags behind economically comparable nations and requires significant investment to upgrade existing, and create new, infrastructure

- India's cities already face traffic congestion and pollution, infrastructure deficits, governance problems and suffer from poor connectivity to essential services
- together, these factors impede commerce, limit employment opportunities and hamper the health of citizens.

SNAPSHOT OF RESIDUAL DEMAND FOR URBAN INFRASTRUCTURE AND SERVICES

Table 7 provides a snapshot of residual demand for urban infrastructure and services.

TABLE 7: RESIDUAL DEMAND FOR URBAN INFRASTRUCTURE AND SERVICES

Infrastructure	Service Demand
Urban water supply	No Indian city receives piped water 24 hours a day, seven days a week[71] 47 per cent of households have individual water connections Average duration of water supply in urban areas is one to six hours per day Around 40 per cent of available water in India is unusable for any purpose[70]
Sanitation	No Indian city has a sewerage system covering its entire population 4,861 cities lack even partial sewerage networks 37 per cent of urban households are connected to open drainage; 18 per cent are unconnected and have no access to toilet facilities
Affordable housing	There are 65 million slum dwellers in India according to 2011 census data At current rates 38 million urban housing units will be needed by 2030
Waste	Waste collection services cover 70–90 per cent of needs in major cities, but less than 50 per cent in smaller cities Less than 30 per cent of solid waste is segregated
Road safety	Although India has about 1 per cent of the world's vehicles it accounts for more than 10 per cent of global road fatalities[72]

Of these key urban infrastructure deficits, water deserves particular consideration

- India is likely to face a water security crisis before 2030, when demand is projected to outstrip supply
- around 50 per cent of urban water demand will remain unfilled in 2030[12]
- the water in nearly half of the country's interstate rivers has been assessed as unfit for any purpose due to pollution[70]
- agricultural production already uses 80 per cent of India's water, is depleting groundwater levels and will continue to increase to feed the growing population
  - this will leave less water available for urban domestic use
- India therefore has a dire need for more efficient water use and management.

INDIAN PLANNING FOR URBAN DEVELOPMENT

The Government of India recognises the urbanisation challenges it faces and has introduced policies and campaigns in an effort to manage the development of cities. The most notable programs are discussed below.

100 SMART CITIES MISSION

India's 100 Smart Cities Mission was launched in June 2015 and has committed Central Government funding of $9–11 billion and will be matched by state governments

- the Smart Cities Mission is focused on providing core infrastructure, decent quality of life and sustainable environments in five segments – security, transportation, water, energy and solid waste
- the funding it provides is seed money to attract financing from other private and multilateral sources

  - States and local bodies will have equity stakes in projects and are expected to attract private capital
- the plans are expected to be implemented through Special Purpose Vehicles, which will be structured to be more flexible than traditional government funding mechanisms
- the Asian Development Bank is providing assistance to some Smart Cities programs in India, including in water and waste management.

ATAL MISSION FOR REJUVENATION AND URBAN TRANSFORMATION

Atal Mission for Rejuvenation and Urban Transformation is a nation-wide initiative aimed at improving provision of basic services such as water supply, sewerage systems, storm water management and urban transport

- the Central Government has allocated over $9 billion, mainly for project funding.

HOUSING FOR ALL

The Housing for All project has ambitious targets for building housing for low income groups in urban areas by 2022.

SWACHH BHARAT MISSION

Swachh Bharat Mission is the main program driving the campaign to make cities cleaner. It aims to introduce modern solid waste management, improve sanitation and enable private sector engagement.

INFRASTRUCTURE PROGRAMS

In public transport, the government has committed to expand metro lines and operationalise bus transit systems.

In road safety, the central and state governments of India have allocated a considerable budget to work with international companies to adopt new technologies and services.

For water, the Central Ministry of Water Resources, River Development and Ganga Rejuvenation has a comprehensive National Water Policy.

AUSTRALIA'S COMPETITIVE ADVANTAGE

As a highly urbanised and liveable country, Australia has significant expertise in urban infrastructure design and development

- Australian cities regularly feature at the top of world liveability
  - Melbourne ranked first in 2017 for the seventh consecutive year; five cities rank in the top 20.

Australia's capability and competitive advantages include:

- urban, precinct and building planning
- infrastructure sustainability and green building standards, policies and rating systems
- innovative water resource management, industrial and urban water recycling and treatment systems
- waste management
- intelligent transport systems and transport orientated design
- urban road design and road safety systems
- infrastructure financing expertise
- building, operating and maintaining social infrastructure.

1.2 How the sector will likely evolve out to 2035

Out to 2035, large-scale growth in urban populations will put ever greater demand on India's urban infrastructure. New technologies will enhance transport systems and improve urban management efficiencies. Water scarcity will get worse before it gets better.

Several trends will shape the sector:

- Rapidly growing urban populations will increase demand for urban development and place additional pressure on India's cities by 2035
  - urbanisation will be unevenly distributed, with four states – Gujarat, Kerala, Maharashtra and Tamil Nadu expected to be 60 per cent urbanised by 2030[12],

compared with a national average of around 40 per cent.

- New financing instruments could emerge, including those under the Smart Cities Mission, drawn from a mixture of central, state and international funding. Indian cities' fiscal and technical capacity to raise funds could also increase out to 2035. The introduction of indicators such as credit ratings for cities could help the municipal bond market develop.
- Municipalities will strengthen their ability to finance infrastructure through better uses of value capture mechanisms and land taxes.
- Water scarcity will drive up infrastructure needs and operating and maintenance expenses. New models for water resources management, water infrastructure development and waste water management will be required to meet the needs of urban consumers, agriculture and industry.
- New technologies in transport are on the verge of becoming more widely adopted including shared mobility systems (such as Uber and Ola), electric vehicles (the Indian Government has a policy to increase their adoption), and autonomous vehicles
  - these developments will likely contribute to greater transport efficiency and reduced rates of pollution as well as creating the need for new infrastructure, including parking and charging.
- Urbanisation will shape other sectors, defining the types of opportunities India will present to Australia
  - urban construction will enhance the need for commodity inputs such as coking coal and iron ore
  - India's appetite for skills development, and decisions for energy networks and agribusiness logistics will be determined by the surrounding urban environment.

2.0 OPPORTUNITIES FOR PARTNERSHIP

KEY JUDGEMENT

Australia will generally have better prospects in services exports than equipment supply, contracting or end to end project development and delivery.

2.1 Export opportunities

SERVICES EXPORT OPPORTUNITIES

Given the lower risk inherent in a services-export approach, this could be the most promising model for Australian businesses seeking exposure to India's urban development.

Unlike other sectors, the nature of prospective opportunities in urban development are unlikely to change significantly from the near to the long term.

PROSPECTIVE OPPORTUNITIES IN URBAN DEVELOPMENT IN INDIA

Table 8 provides a snapshot of prospective opportunities in urban development in India.

CASE STUDY: SYDAC: SIMULATION TRAINING TECHNOLOGY SECURING SAFETY FOR INDIAN RAILROADS

Think of trains in India and an immediate image is conjured up of overcrowding with people hanging out of doors and windows and sitting on the roof. But the Indian Government is determined to improve its vital rail networks.

South Australian technology company Sydac Pty Ltd won a $30 million contract to provide Government-owned Indian Railways with driver training simulators – the largest contract of its type in the rail industry anywhere in the world.

Sydac is a leading developer in simulation technology and software and this contract is its first foray into the Indian market.

The four-year contract includes an eight-year maintenance agreement and marked the culmination of a six-year effort to break into the Indian market and an extensive tendering process.

"Our focus will be on providing the thousands of drivers with simulated training using 12 full-cab rail simulators in 12 cities, including the main centres of Mumbai and Kolkata" Managing Director Dermot Dixon says.

Each simulator uses the latest computer visualisation technology to immerse trainees in a 'real life' driving experience that replicates their on-the-job environment. Sydac will also provide virtual modelling of the various electrical and diesel locomotives used around the country and simulate 2,100 km of tracks for training sessions.

Dixon's advice to anyone considering the Indian market is to understand that the Indian Government places a high weighting on the commercial price of a project. He also stresses the importance of understanding India's business culture and in particular the way that the hierarchical social structure is reflected in the business world. Patience and personal relationships are also key.

"There is no doubt that the rewards are there, but major projects take time to come to fruition. We factored in a long gestation period and ensured we had a strong commitment to pursue the deal, knowing there would not be any payback in the short term. This all comes back to being patient and not being too aggressive in dealing with the Indian Government – pressure doesn't work and you have to let the process play out in its own time."

Sydac is confident of continuing to be a valued partner for Indian Railways going forward, particularly as it has committed to spend 350 Crore (AUD70 million) on new simulators by 2021, with additional expenditure of equivalent value expected to follow on from this initial investment.

TABLE 8: URBAN DEVELOPMENT EXPORT OPPORTUNITIES OUT TO 2035

	Australian competitive advantage	Opportunity
Water	Water resource management	Provide services to urban local bodies to control flooding, reuse storm water, assess and clean up waste water and prevent water contamination Provide specialised technology and services to the industrial and energy sectors in water resource management, water recycling and treatment systems and desalination
Transport	Intelligent transport systems Road safety	Provide strategy, planning, design and engineering for traffic management systems to help reduce congestion and improve road safety Provide road safety training to government authorities, emergency response teams and medical care in India
Waste	Waste management services	Deliver end to end waste management to urban local bodies and industries in waste-to-energy, compost systems, carbon management and landfill management
Financing	Financing consulting	Australian banks and financial services providers can provide expertise in issuing municipal bonds or green bonds as well as asset recycling, privatisation and public-private partnerships [*see Chapter 10: Financial Services Sector*]
Planning	Master planning	Master planning, inspection, assurance and environmental impact assessment

Of these, there are three areas of particular promise for Australian business.

TECHNOLOGY AND SERVICES IN WATER MANAGEMENT

Australia is globally competitive in optimising water use through integrated water management systems and technology, water planning, recycling and desalination. The Australian Water Partnership brings together Australian water sector expertise to support collaboration with Indian entities and multilateral organisations.

EXPERTISE IN END TO END WASTE MANAGEMENT

Australian companies offer expertise in total waste management services for solid, liquid and industrial waste, including in partnership with government. Company expertise ranges from solid waste recycling, waste-to-energy techniques, managing landfill, through to nuclear waste management.

TECHNOLOGY AND SERVICES IN TRANSPORT SYSTEMS

Australia has expertise in intelligent transport systems, such as traffic signalling, noise and environmental monitoring systems, automated check-in solutions, ramp metering and managed motorways.

2.2 Collaboration

Establishing joint ventures with Indian or foreign partners can provide lower risk opportunities for Australian companies entering the Indian market.

WATER MANAGEMENT

- Engagement on water management requires government to government collaborative frameworks, some of which Australia already has in place with India, including a MoU on water cooperation between Australia's Department of Agriculture and Water Resources and India's Ministry of Water Resources, River Development and Ganga Rejuvenation.
- Australia should diversify engagement from river basin management into sectors such as urban planning to align with Indian priorities such as Clean Ganga and Smart Cities.
- Currently there are state-state[xxvii] partnerships in water resources, which could become a model for engagement in other areas of urban services at a state to state and city to city level.

CLEAN UP THE GANGES PROJECT

- Prime Minister Modi has placed a high priority on the large task of cleaning up the Ganges River.
- Australia could contribute to this project, not just in terms of its water and river management expertise but also by contributing ideas on how the Smart Cities agenda and the Ganges agenda can be brought together.
- Ideas such as public private partnerships, the sale of land adjacent to the Ganges in return for smart urban development and anti-pollution measures could draw on Australian expertise and could even be part of a broader international project.

ROAD SAFETY

- Improving urban road safety requires policy and regulatory engagement.
- There are opportunities for engagement on road safety strategies and action plans at national and state level including to develop institutional strengthening, capacity building and traffic management.
- There is scope for more collaborative research and development for crash investigations, accident analysis and prevention, behavioural and social issues, trauma and emergency care.
- There is demand for mid-level training programs for Indian police officers, executive leadership programs, road safety audit training, driver training, emergency training and heavy vehicle driver training.

2.3 Investment

- Opportunities for Australian investors lie predominantly in de-risked brownfield urban development projects.
- Australian companies may prefer to participate in projects backed by multilateral banks to mitigate contract risks.
- Australian companies could also invest in Indian developers or urban service providers, rather than specific projects, to acquire local expertise and indirect exposure to growth in this sector.

[xxvii] Such as in Rajasthan, where South Australia has established a centre of excellence in water resource management.

3.0 CONSTRAINTS AND CHALLENGES

KEY JUDGEMENT

Urban development has been constrained by governance and financing issues, as well as limited urban planning, distortions in land markets and a stringent regulatory framework for governing land use and management. Many of the challenges and constraints are common to other types of infrastructure. Indian central and state governments are implementing a range of reforms, but change will be incremental.

3.1 The policy and regulatory environment

India's Ministry of Urban Development is responsible for developing policy guidelines, legislative guidance, sectoral programs (for example, sanitation and water supply) and technical and financial assistance to the states.

A complex legal and regulatory management framework is a deterrent to private capital and constrains urban development. This is changing but is currently characterised by:

- restrictive land use and governance frameworks
- poorly structured public-private partnerships to finance projects
- fragmentation of responsibility and implementation across different agencies for service delivery and financial management.

3.2 Skills, infrastructure and other constraints

LACK OF ACCOUNTABILITY BY CITY LEADERS

Most cities in India are run by a municipal corporation. Other bodies which manage utilities and transport do not typically sit under a clear structure of accountability.

Mayors of Indian cities are elected by the municipal body, usually for only one year, and have insufficient authority to direct efforts towards a common goal.

This contributes to poor planning, governance and transparency and limits capacity to implement complex infrastructure projects.

FINANCING CHALLENGES

Funding for the Smart Cities initiative is contingent on state governments matching the funding provided by the centre. Some states are not in a position to do this and are reluctant to pay for third party consulting services.

While new value capture mechanisms will help, the limited capacity of Indian cities to issue bonds and the lack of a strong municipal bond market means it is difficult to raise large-scale infrastructure financing. International funding for projects through alternate vehicles is therefore a key aspect to generating additional large-scale infrastructure development in India.

Other countries are able to offer more attractive financing terms and use this to facilitate entry of their local businesses into large Indian urban development projects (a 'Country Inc' approach). It is not the way Australia does business and nor do we recommend that Australia change tack. However, there is considerable scope to partner with such initiatives where Australian companies have demonstrated expertise which could add value

- Singapore is partnering with the state government of Andhra Pradesh to build the new state capital, Amaravati, as a smart city
  - Singapore proactively engages in facilitating participation of its companies in Indian urban development opportunities, including providing financing and technical assistance
- France has announced an investment of $2.5 billion in three smart city projects (Chandigarh, Nagpur and Puducherry).

AS WITH OTHER SECTORS, A DIFFICULT BUSINESS ENVIRONMENT

- Infrastructure service and material procurement processes are not transparent and are vulnerable to corruption.
- Indian companies dominate civil construction projects due to their lower costs. Foreign companies typically provide consulting and technology/products, limiting opportunities for large-scale commercial engagement in the sector.
- Contract enforcement, including payment certainty and risk-sharing remains a challenge.

Foreign companies may therefore prefer to participate in projects backed by multilateral banks for greater security of payment.

4.0 WHERE TO FOCUS

The Central Government plays a coordinating and monitoring role, despite urban development being a local responsibility

- the Ministry of Urban Development is the lead agency but a multitude of other national bodies operate in this sector, including in water and road management.

For specific urban development projects, Australian companies should consider targeting states and municipalities with robust finances (for example, good credit ratings for bond issuance), a good track record of infrastructure implementation and success at attracting private funding

- states that meet these criteria include Andhra Pradesh, Maharashtra, Rajasthan and Gujarat
- cities that meet these criteria include those going through the process of creating municipal bonds and getting credit rated
  - some cities such as New Delhi Municipal Council at AA-, Vizag (Andhra Pradesh) at AA+, and Pune (Maharashtra) at AA have higher ratings than India's BBB[73] country rating
    - these cities are also taking forward substantial urban development programs.

RECOMMENDATIONS

54. Increase the priority of engaging India on urban water management

To date, most of Australia's government to government engagement has focused on delivering technical capacity building initiatives in river basin management, water accounting and hydrologic forecasting, with ad hoc funding from the regional aid program. This has served to consolidate our reputation in India as an effective water manager and trusted partner.

54.1 Diversify efforts of the Australia-India Water Partnership to align more overtly with India's policy missions and campaigns, including Smart Cities Mission and Atal Mission for Rejuvenation and Urban Transformation

- continue to explore opportunities to bring Australian expertise in water resources management to build India's volumes and quality of water for use in urban areas
- seek to partner with third countries' or multilateral development banks' smart city projects to deliver urban water management projects.

54.2 Support a partnership between Australia's Cooperative Research Centre for Water Sensitive Cities and India

- this could include exchanges, secondments and scholarships between city/state urban water planners, exploring water sensitive cities solutions linked to existing infrastructure projects and developing an urban water research cluster.

54.3 Work with the Indian Government on ideas and models for cleaning up the Ganges River, including exploring private sector driven funding models. This project would link to the Smart Cities agenda and to public private partnerships

- including a proposal from the Australian private sector which has been submitted to Prime Minister Modi on a unique private sector driven funding model to clean up the Ganges River system and which is worthy of serious consideration.

55. Build further government and business engagement on infrastructure and refine messaging about Australia's capabilities

55.1 Convene an Australia-India Infrastructure Council as a forum for collaboration between government and the private sector from both countries, including at the state level, providing:

- a platform for the exchange of expertise in infrastructure financing and guidance on how companies identify opportunities, mitigate risks, and develop appropriate entry and exit strategies to investing in India
- a mechanism for sharing regulatory expertise, potentially through the joint development of a policy roadmap
  - this could include sharing Australian expertise in infrastructure financing including value capture and user charges, in issuing municipal bonds or green bonds, and in 'Toll-Operate-Transfer' and 'Build-Operate-Transfer' models
- support for state government engagement, given a large proportion of the expertise in regulation, implementation and management of transport infrastructure sits at the state level in both Australia and India
- share Australian Governments' asset recycling and privatisation experiences
  - this represents a practical way to respond to India's infrastructure priorities and potentially open up opportunities for Australian funds seeking brownfield infrastructure investment opportunities.

55.2 Engage with Indian national and state regulatory authorities on smart infrastructure standards

- work with Indian cities to establish common standards for rating green buildings
  - Australian contractors could then seek to upgrade and retrofit buildings to more efficient standards.

55.3 Engage with target states to deliver capacity-building on development and implementation of public private partnership projects.

55.4 Use high level visits and trade events to promote Australian capabilities in the urban development and transport infrastructure sectors

- leveraging Australian cities' high 'liveability' brand
- this will also expose Australian businesses to the opportunities in India
- use sister-state or sister-city relationships and MoUs to provide a platform to generate networks and commercial opportunities for Australian companies.

55.5 Continue Austrade's approach to position Australia for strategic subcontracts in India's Smart Cities Mission that best match Australia's skillsets and are commercially viable

- including facilitation of municipality-to-municipality links
- targeting sub-sector areas of Australian strength such as waste management and smart urban transport systems.

55.6 Continue working towards liberalisation of air services arrangements between both countries to ensure they can take up commercial opportunities as they arise.

55.7 Ensure commercial opportunities presented through the development of India's aviation infrastructure are visible to Australian contractors and investors.

56. Become a lead partner on road safety for several target Indian states

56.1 Build on existing partnerships and establish further information partnerships with Indian road authorities

- supporting industry to work on government and private sector projects, including partnering with third parties and international investment agencies.

56.2 Consider sponsoring Australian providers to provide mid-level training programs

- for Indian police officers, executive leadership programs, road safety audit training, driver education and training, emergency training, capacity building and technical training and heavy vehicle driver's training.

57. Pursue trilateral partnerships for infrastructure development in India

Seek to pair Australian capabilities with third parties' capacity to deliver large projects in India

- explore joint options with Japan, Singapore and France
- Australian firms could bring services in transport systems, water and waste management and the partner brings concessional finance and contracting services
  - including for joint direct bidding for Smart City projects.

58. Pursue collaborative opportunities with India for development of ports and seaborne trade

58.1 Explore opportunities to work with India and other international partners to develop marine transport infrastructure and connectivity within the broader Indo-Pacific region

- this could include engagement on port design and development through regional forums such as Indian Ocean Rim Association, and utilise Australian research expertise through the Indian Ocean Marine Research Centre and University of Western Australia's Oceans Institute
- this could also include exploring options with the World Bank Group to collaborate on their support of Masala Bonds.

58.2 Fund a project to look at long term efficiency in sea trade between major partner container ports in India and Australia

- replicating the Asia-Pacific Model E-port Network project which exists in the APEC context
- gain a clearer understanding of the drivers of freight flows
- support supply chain connectivity – exploring options for e-port connectivity.

FINANCIAL SERVICES SECTOR

CHAPTER TEN

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SUMMARY

- India's financial services sector typifies the progress and opportunity of its economy. The sector will grow rapidly out to 2035, driven by rising incomes, heightened government focus on financial inclusion and digital adoption – India's digital payments could pass $1 trillion by 2030.
- As the Indian market matures, Australian businesses could partner with Indian financial services companies in sectors that align with our competitive strengths in asset management, general insurance and fintech.
- Partnership opportunities will be niche, targeting the economically advanced parts of India and in segments not dominated by state-owned enterprises.
- While Australian expertise may not be transferable on a large scale to an Indian context given differences in target markets and goal orientation, India's financial services sector will become more globally connected.
- Success in India will require strong local knowledge and a willingness to operate on longer time horizons than Australian financial services firms are used to, and for India to have made progress in regulatory clarity and investor protections.
- Out to 2035, technological change will have a transformational effect on this sector. India is set to benefit and could leapfrog Australia while our industry struggles with legacy systems.
- While the financial services sector and investment decisions are commercially-led, government can play a role in bridging knowledge and expectations gaps.
- Sharing Australia's regulatory experience and work on setting standards with Indian policy makers could also facilitate commercial engagement.

1.0 THE MACRO STORY

KEY JUDGEMENT

India's financial services sector is poised to grow on the back of rising incomes, significant government attention and the increasing pace of digital adoption. The long term fundamentals of the sector are sound, but the Indian Government's openness to private players and foreign participation is likely to remain patchy. Australia's competitive strengths include an efficiently regulated domestic sector, high volume of funds under management and niche sector expertise, which align with India's ambitions for improving its financial services sector. However, differences in market drivers will limit the transferability of Australian expertise to an Indian context.

1.1 The scale and key structural drivers of the sector

INDIAN DEMAND

Rising incomes will drive demand for financial services across income brackets in India, including in insurance and retail banking services

- the number of HNWIs is forecast to triple to over 1.2 million by 2030 [96]
- by 2035, India's five largest cities will have economies of comparable size to middle income countries today
  - Mumbai alone is projected to have an economy in 2030 as big as Malaysia today.[69]

High competition and many local players limit opportunities in the Indian retail banking sector

- State-owned banks represent 70 per cent of India's retail banking sector yet are responsible for only 43 per cent of profits[25]
  - privatisation is unlikely, but the need to improve provision of credit could see the Indian Government approve the entry of more private banks
- fragmentation has forced a large number of smaller private banks to compete on price and thin profit margins
- regulations in place since 1972 require at least 40 per cent of bank lending to be directed to agriculture and 'economically weaker' sectors.

India's state-owned Life Insurance Corporation holds over 75 per cent of the life insurance market while 20 other firms compete for the remaining share[12]

- industry premiums, coverage and pay-out rules are highly regulated and subject to frequent change
- Indian companies have strong distribution networks and local expertise, and foreign players may struggle to identify suitable segments of the market to target.

There is greater capacity for private sector and foreign entrants in general insurance, which is expected to grow between 13–19 per cent annually out to 2025, especially since many Indian insurance firms lack expertise in product development.[97]

CASE STUDY: FUTURE FUND: SUCCESSFUL INVESTMENT IN THE FUTURE MEANS TAKING A LONG VIEW

With its high growth economic trajectory, structural reforms aimed at lifting productivity and recent loosening of foreign investment caps, India offers genuine investment opportunities for Australian institutional investors.

Australia's sovereign wealth fund, Future Fund, has found success by pursuing a long term investment horizon and moving away from using quarterly benchmarks to define performance.

Rather than focusing primarily on equities, Future Fund has selected investments in alternative asset classes such as infrastructure, property, private equity and hedge funds. This diversification gives an edge across geographies and emerging economies.

The Future Fund approach requires a sophisticated understanding of risk – and it pays rewards. Future Fund has delivered returns of 7.7 per cent over its first 10 years of operation – a performance that has captured international attention and strengthened its brand.

Future Fund acknowledges that investing in India comes with challenges, particularly the lack of recognition of sovereign immunity for tax purposes.

Further reforms to address sovereign risks that impact on the stability of cash flows will continue to grow India's attractiveness as an investment destination. In particular, Future Fund is watching for success in combating corruption, improving regulatory quality and the rule of law surrounding investor protection.

Demand will also rise for financial services at the lower end of the income spectrum

- the Government of India has made financial inclusion a top priority by launching and expanding multiple programs, creating and strengthening transparency and digital systems, and enforcing regulatory measures to increase competition
- government efforts to persuade cash-based vendors to embrace formal banking, including through device-based and digital payments, will also accelerate financial services demand from micro and SMEs
- Australian firms, however, do not have experience or expertise in serving this market.

INDIAN SUPPLY

Fast digital adoption from consumers and skilled IT clusters, such as those in Hyderabad and Bengaluru, will continue driving the expansion of India's fintech industry, which is expected to double between 2016 and 2020 to $3.2 billion[142]

- the rate of technological change makes it difficult to forecast long term projections of the size of the fintech market in India.

The development of India's technological and entrepreneurial ecosystem will make it easier to expand the financial services market into regional and rural areas

- while financial inclusion has been a focus of Indian policy makers for decades progress is now being seen

- new technologies are now making it viable
  - for example, the rollout of the Aadhaar card, a national biometric identification system now covering over one billion people, creates a comprehensive picture of prospective customers.

Indian fintech companies are driving change by specialising in targeted services along specific parts of the value chain which were previously the domain of brick and mortar companies

- for example, aggregators like BankBazaar.com offer a range of services such as loans, credit cards, deposits and insurance, and receive payments from banks for assisting in new business generation
- India offers the highest expected return on investment on fintech projects, at 29 per cent (not risk adjusted) versus a global average of 20 per cent.[143]

India's mutual funds segment is sizeable, equivalent to approximately one-tenth of the country's GDP[144]

- growth prospects are good, given India's high savings rate and its well-developed equity market.

The equity mutual funds market, with a boost from demonetisation, saw its assets under management cross $430 billion in 2017, double what it was three years earlier

- further development in the mutual funds sector will be hampered by modest demand beyond tier one cities, a lack of asset class diversity and narrow pension coverage.

India's pension system is at a nascent stage, dealing with challenges related to customer awareness, penetration and regulation

- pension funds under management stand at 1.1 per cent of GDP – compared to 1.5 per cent of GDP in China – and its subscriber base of 8.7 million is a small fraction of the working population[99]
- India's regulatory framework limits investment avenues for money raised through pensions
- however, this is changing with the Employees' Provident Fund Organisation granted approval to invest a part of its assets into exchange traded funds.

But the demand for pensions is expected to rise considerably out to 2035 on the back of an increase in the elderly population, a higher life expectancy and a decrease in the prevalence of the extended family structure

- this creates a pressing need to create a robust pension system in India, which would raise investment prospects, including for foreign companies.

AUSTRALIA'S COMPETITIVE ADVANTAGE

Australia has a competitive advantage across three areas of the financial services sector: capital, expertise and regulation.

Australia has a financial assets sector worth $8 trillion, four and a half times our GDP

- our funds management sector, with $2.7 trillion under management, is the sixth largest pool of funds under management globally and the largest in Asia
- the balance of Australia's sovereign wealth fund, the Future Fund, is approaching $140 billion and has delivered returns of 7.7 per cent per annum since inception.

Australia's highly evolved pension system ranks second in Asia-Pacific on penetration with 70 per cent of the population contributing to a pension scheme

- on measures of adequacy, sustainability and integrity, our pension system is regarded ahead of the United Kingdom, United States and Canada
- the lack of competition in the Australian market, in which less than 5 per cent of Australian members actively switch funds, may diminish the appetite for Australia's pension funds to compete overseas.

Australia's deep capital markets and sophisticated financial services system have been built on the back of a strong regulatory system

- Australia's regulatory framework has combined a necessary oversight role with the flexibility for industry to innovate and take advantage of new technology

- this could be used more effectively as an asset to engage the Indian financial sector.

We are renowned for our financial services acumen and product development

- the 2018 Global Financial Centres Index ranked Sydney and Melbourne at 9th and 12th respectively amongst the world's financial centres.[xxviii]

Australia is a global fintech hub, ranking fifth in the world in the 2017 Ernst & Young Fintech Adoption Index

- this makes Australia an attractive market for the launch and expansion of fintech products.

1.2 How the sector will likely evolve out to 2035

GROWTH IN FOREIGN INVESTMENT

Growth in India's financial services sector out to 2035 will be driven by expected increases in FDI and FPI, particularly into Indian infrastructure [*see Chapter 2: The Investment Story and Chapter 9: Infrastructure Sector*].

Despite India's high savings rate, the country will be an importer of capital to meet its growth ambitions

- while the relaxation of some FDI limits has spurred significant capital inflow in the last 12 to 24 months, the double digit return potential across large parts of India's financial services sector, including infrastructure, has yet to spark the magnitude of foreign investor activity India's Government had hoped.

Foreign investors may be waiting for evidence that Indian policy makers are serious about introducing new financing models to facilitate greater private sector participation

- efforts already underway by the Indian Government to attract foreign investment, such as the establishment of an equity fund in the form of the National Investment and Infrastructure Fund, could help reduce some of the risk profile for foreign investors, including from Australia
- however, India's financial markets have not matured to the point where they can realistically use bonds to fund infrastructure, and there is little indication that addressing this will be a priority for Indian governments in the medium term.

NEW TECHNOLOGIES AND RISING CONSUMER EXPECTATIONS WILL RE-SHAPE THE SECTOR GLOBALLY

The financial services industry is on the cusp of substantial change

- rapidly advancing technologies, rising consumer expectations and disruptive innovations will reshape the structure of the industry across the globe.

In India, the extent to which changes are evolutionary or revolutionary will depend on whether incumbents continue to develop technologies in-house, acquire or partner with new entrants to rollout technologies, or whether the new products bypass existing intermediaries and markets.

CHANGES TO INDIA'S FINANCIAL SYSTEM

The pace of change in India's financial system has the potential to be faster than in other countries due to the rapid take up of digital devices combined with India's track record of frugal innovation.

Technology leapfrogging in telecommunications, in which India will jump past the fibre cable stage to mobile network infrastructure, will be central to the future development of India's financial services sector

- mobile phone penetration in India is set to rise to 85–90 per cent by 2020 (from the current levels of 65–75 per cent in 2017), while the smartphone user base is expected to expand to about 500 million people in the same period.[98, 100]

[xxviii] It has been jointly published twice per year by Z/Yen Group in London and the China Development Institute in Shenzhen since 2015 and is widely quoted as a source for ranking financial centres. The ranking is an aggregate of indices from five key areas: 'business environment', 'financial sector development', 'infrastructure factors', 'human capital', 'reputation and general factors'.

Other digitisation projects, such as the United Payment Interface and associated mobile application Bharat Interface for Money – a safe, instant payment system – and DigiLocker, a cloud based platform for authentication and sharing of identity documents, will be linked to customers through Aadhaar

- the result could revolutionise document processing and enable end-to-end digital credit underwriting.

By 2025, digital finance is forecast to boost India's GDP by $950 billion and create 21 million new jobs.[101]

With an assist from the demonetisation campaign, the digital payments sector in India is expected to benefit the most from rising technological adoption in India

- digital payments could grow as much as tenfold to $500 billion by 2020 [102] and pass the $1 trillion mark by 2030 [103]
- digital banking adoption will also continue its rapid ascent
- nearly 80 per cent of all customer transactions in new private banks are conducted through digital channels
  - from 2013–16, the average volume of monthly transactions at ATMs increased 1.5 times, EFTPOS by 2.7 times, mobile banking by 9.6 times and e-wallets by 11 times.

Adoption of new technologies and processes, including blockchain ledgers, could reduce the cost of managing loans and make microfinancing commercially feasible

- the NITI Aayog-led IndiaChain plans to implement a fully-fledged blockchain infrastructure that uses 'electronic Know Your Customer' and Aadhaar to reduce fraud, speed up enforcement of contracts and increase transparency of transactions
- microfinancing for commercial purposes will require a change in India's banking culture, which has traditionally preferred to lend large amounts to limited clients rather than lending small amounts at scale
- while India's incumbent players may not be agile enough to adjust, they are unlikely to hinder new firms that may look to service this market.

The need for cyber security and personal data privacy will inform how financial institutions approach off-shoring, data storage and the use of big data [*see Chapter 13: Defence and Security*].

Fintech start-ups are already encroaching on established financial services markets

- unencumbered by legacy systems, they are developing customer friendly solutions from the ground up
- consumers are showing signs of preferring non-traditional financial service providers, largely due to more targeted product offerings and a greater focus on customer choice and experience, especially in areas of payments, loans and personal finance information tools
  - the most successful Indian fintech company to date has been Paytm, an electronic payment and e-commerce giant with over 200 million users.

Big data analytics will allow financial service providers to target and tailor products and services with greater precision

- firms can anticipate needs, price offerings and risk more effectively.

In financial services, brand loyalty and effectiveness of discounts will decline as value will increasingly be derived from the degree of personalisation and adaptability of the product

- platforms may emerge to give consumers the ability to build a portfolio of financial services from many providers that meets their specific needs
- in insurance, for example, business models could shift from being a reactive claim payer to preventative risk advisor.

CASE STUDY: INSURANCE AUSTRALIA GROUP: STRONG PROSPECTS IN THE INDIAN GENERAL INSURANCE MARKET

State Bank of India General Insurance Company (SBI General), is a joint venture between Insurance Australia Group (IAG) and the State Bank of India (SBI), India's largest and oldest bank with more than 24,000 branches across India.

SBI General was established in late 2009 and commenced operations in 2010, building a portfolio in the corporate, retail and SME markets across India. SBI owns 74 per cent of SBI General and IAG 26 per cent. IAG has an option to increase its shareholding to 49 per cent, following the March 2015 insurance law amendment to the foreign direct investment limit.

SBI General has continued to grow strongly and has achieved significant growth from nil revenue in 2010 to $750 million of Gross Written Premium in 2017, reaching 14th in the market with a 2.3 per cent market share.

However, such successes have not been without challenges. The development stage of the Indian economy and the insurance industry means regulatory frameworks continue to evolve rapidly which creates some uncertainty for investors/shareholders. There is also less concern and protocol in relation to making retrospective regulatory/legal changes. An example would be retrospective changes that impacted foreign shareholders' rights in JV Agreements, forcing them to be re-written with rights removed. Cultural differences, both generally and commercially, also create different processes and benchmarks for assessing what makes good or bad sense in relation to business decisions.

Nevertheless, enormous growth and significant portions of the market remain untapped. The non-life insurance industry grew by 18.9 per cent in the opening nine months of fiscal year ending 31 March 2018, led by the new government backed agricultural insurance schemes and increased penetration in motor insurance.

The healthy growth rate is expected to continue as economic growth boosts disposable income and the insurance market expands to reach more first-time buyers. A rapidly growing middle class is also driving increased insurance penetration and density, while a strong development/growth drive in commerce needs to be balanced with profit ambitions.

2.0 OPPORTUNITIES FOR PARTNERSHIP

KEY JUDGEMENT

Australian industry can benefit from India's financial inclusion drive and economic modernisation by investing in segments of the financial services sector that are open to foreign participation, such as general insurance, or providing services to enable investment in other sectors, such as infrastructure.

Australian expertise in financial services may not be transferable on a large scale to an Indian context because of a misalignment in target markets and goal orientation. Australian industry is primarily focused on making a profit and products are geared to a sophisticated investor base, whereas India's financial ecosystem has a marked social undertone.

Niche opportunities will emerge as India's capital markets mature, including in asset management and fintech collaboration.

There is also potential for Australian financial institutions to source fintech capabilities and skills from India.

2.1 Export opportunities

Australia's engagement with India's financial services sector has been cautious

- in 2016–17, Australia exported $54 million in financial and insurance services to India and imported $31 million.

The biggest opportunities in financial services will be in joint ventures and investment rather than exports.

2.2 Collaboration

FINTECH SERVICES

Australia and India have complementary strengths in fintech

- Australia has emerged as a global fintech hub given our flexible regulatory regime, a technology-embracing banking culture and a steady flow of global funding
- there is scope for Australian capital and experience to partner with Indian talent to create world-class digital solutions
- India has a skilled entrepreneurial pipeline, low-cost infrastructure and a large but underpenetrated market
  - India can also benefit from using new technology to leapfrog the legacy systems that may hold back Australian firms.

However, differences in goal alignment may limit how this works in practice

- India's fintech ecosystem places a greater priority on social development – helping to bank the unbanked or delivering low-cost products and services to the most price-sensitive customers
- gaining an understanding of this market will be challenging for Australian fintechs, who operate with a more mature market in mind and on a for-profit first basis, with products geared to a higher-income retail and corporate market.

There will be niche collaboration opportunities where target markets overlap, such as in personal financial information tools, commodities trading, remittances, contract management and export financing

- these opportunities will be patchy in the short term and may be hindered by the lack of regulatory clarity in the fintech industry
- as fintech standards and governance become clearer and more services enter the mainstream, the potential for collaboration will increase.

Many Australian banks are ramping up their in-house fintech capabilities in an effort to provide end to end solutions

- the scarcity of specialised technology skills in Australia could lead Australian banks to consider basing their fintech innovation hubs in India, where Australian banks think highly of the quality of India's engineering and IT talent
- this would also help balance the employment drawdown in India caused by technology cannibalising employment in back office functions
- the scale and nature of this opportunity will depend in part on whether the fintech sector will turn into one that primarily competes with established players like banks or collaborates with them.

Australia is ahead of the curve on blockchain technology

- blockchain has the potential to remove layers of overhead costs dedicated to confirming authenticity or reconciling transactions between parties in the financial sector
- according to a 2016 study by IBM, roughly 65 per cent of banks globally are expecting to have blockchain solutions in production by 2020 [104]
- blockchain applications could extend beyond financial services to bring greater transparency and efficiency from energy markets to supply chain logistics.

India is attuned to the need to develop a better understanding of blockchain if the technology is to be used for economic modernisation

- while the Reserve Bank of India (RBI) is considering the regulatory aspects of the technology, Indian banks have undertaken pilot blockchain transactions with other banks
- Australia should use this window to initiate cooperation with India as the foundational rules are being set
  - this could build trust for Australia to expand bilateral cooperation and tighten interoperability as applications move beyond financial services to other sectors of the economy.

ASSET MANAGEMENT

The opportunity for Australian asset managers to partner with Indian mutual funds companies will be a medium term one

- it will depend on a steep change in financial literacy in India as well as an increase in pension fund and insurance subscription
- mutual funds are not currently the investment vehicle of choice for Indian households, making up only 3 per cent of total investment in financial assets by Indians.[105]

As the Indian market matures, Australian businesses could combine capital and expertise in using technology to develop consumer-centric products and expand distribution networks

- even as the Indian investor market becomes more sophisticated, the typical asset allocation will look vastly different to that of Australia
- investment houses with expertise in non-core assets and venture capital would be more suited to India.

As with any joint venture arrangement, particularly in India, partner selection and goal alignment is paramount

- foreign firms that have entered the asset management sector without a local partner have often exited the market
- challenges include a lack of brand awareness in smaller cities and an inability to expand distribution networks without significant upfront cost and time commitments.

Australia is world-leading in asset management, bolstered by a sophisticated investor base, strong financial institutions, innovative products and a mandatory superannuation scheme

- but Australian asset managers may see little value in expanding into challenging overseas markets like India as they benefit enormously from the flow of compulsory contributions in the domestic sector
- moreover, the relatively small size of Australia's asset management firms may make it more difficult to enter into a mutually beneficial joint partnership with a substantially larger Indian partner.

POLICY AND REGULATORY COOPERATION

We should improve institutional ties in financial services segments where both Australia is world-leading and India is reform-leaning

- government engagement could facilitate the entry of more Australian players in this space and improve growth prospects for Australian companies investing in India's financial services sector, and vice versa
- India will also have opportunities to absorb regulatory best practice through their exposure to the Basel process and Financial Stability Board.

The most prospective area for regulatory cooperation is in fintech

- India is in the early stages of developing its fintech regulatory architecture
- the Australian Securities and Investments Commission (ASIC) is well placed to work with India on fintech regulatory cooperation.

Both countries will also benefit from establishing robust international standards in the blockchain industry, which will provide market confidence and trust that proprietary information and money will remain safe

- it will help provide a common language for industry, policy makers, regulators and technology developers, and the basis for interoperability, as the use of blockchain expands.

CYBER SECURITY

Financial services organisations face some of the most challenging threats to their cybersecurity as the convenience of modern consumer banking – including ATMs, point-of-sale systems and mobile banking – has vastly increased the number of endpoints that need to be protected

- banks are also responsible for some of the most sensitive consumer and corporate data and risk serious reputational damage in case of a breach
- the banking sector is the largest user of cybersecurity products and services in Australia.

While cyber security is a nascent industry in Australia, Australia's well-functioning and effective cyber security entities can tap into the cyber security segment in India in software, services and training [*see Chapter 13: Defence and Security*].

2.3 Investment

INSTITUTIONAL INVESTMENT

There is significant attention but little knowledge in India of Australian super funds beyond headline figures of funds under management

- but Australian institutional investors are generally domestically focused, weighted towards equities and have an eye to short term results.

An average of 30 per cent of Australian super fund investments are in equities where returns are expected to decline

- these funds may eventually seek alternate investment options in higher growth markets such as India, which could emerge as a high-risk, high-return option.

Investors looking to boost returns could also consider the Future Fund's approach to India

- the Future Fund readily acknowledges the challenges of investing in India, including the legal system, ease of doing business and regulatory barriers
- but the Future Fund's footprint in India is increasing with investments across a number of asset classes
- it holds a long term outlook and is diversified across asset class and geographies, and recognises India's long term growth potential, strong economic structural reform agenda and ongoing political stability.

GENERAL INSURANCE

The projected increase in insurance take-up in India out to 2035 provides an opportunity in the medium term for Australian companies to tap into India's general insurance market

- within general insurance, health insurance is projected to experience the fastest growth
  - the health insurance premium share of total general insurance is expected to increase from 22 per cent in 2013 to up to 31 per cent by 2025.[97]

India is seeking foreign capital and expertise in digital distribution to support local firms to expand into regional and rural areas

- foreign firms that specialise in servicing a mature market have opted to acquire stakes in local companies, rather than establishing a joint venture or foreign subsidiary
- this provides access to an established brand and distribution network without the upfront costs and time involved to build a presence and on-the-ground relationships.

Opportunities for Australian companies in the insurance sector will be hindered by the ongoing market dominance of Indian state-owned enterprises

- Australian insurance firms looking to enter the Indian market may wish to consider joint ventures with Indian state-owned firms.

Joint venture arrangements in the insurance sector have worked for those prepared to invest time and align business cultures and personnel

- an increase in the FDI cap for insurance in 2015 from 26 per cent to 49 per cent has already seen foreign players invest – including Australian firms – in strong Indian general insurance companies
  - for example, Insurance Australia Group and India's SBI General Insurance
- other Australian firms may need to wait until FDI norms are relaxed further to find the right opportunity to meaningfully participate in this sector.

3.0 CONSTRAINTS AND CHALLENGES

KEY JUDGEMENT

India's financial services sector is heavily regulated and dominated by state-owned enterprises. Though foreign investment caps are likely to be relaxed out to 2035, structural inefficiencies and red tape will linger. The constraints to growth in this sector are not one sided. Australia's institutional investment industry is, by and large, preoccupied by short term wins and incentives that work against India's value proposition. Sustained improvements in India's ease of doing business, sovereign governance arrangements and in the India literacy of Australian companies and boards will help.

3.1 The policy and regulatory environment

India's financial services industry is heavily regulated by a range of authorities, many of which are averse to foreign debt and foreign players

- the RBI, SEBI, Insurance Regulatory and Development Authority of India, and Pension Fund Regulatory and Development Authority all have regulatory power in the sector
- extensive regulatory requirements for the formation of new companies in the banking, financial services and insurance sector have long posed a barrier to entry for prospective companies.

CASE STUDY: ANZ: RECOGNISING INDIA'S POTENTIAL

Recognising the long term potential and growth of India's economy, ANZ opened a branch in Mumbai in 2011 and subsequently established branches in Gurugram and Bengaluru. Through these branches ANZ provides corporate banking services to institutional customers, both local and from offshore, that allow them to conduct financial transactions across the region, and into Europe and the United States.

ANZ services include Indian Rupee and foreign currency working capital and term financing, transaction banking, foreign exchange and interest rate solutions, offshore debt capital markets and deposits.

With its local knowledge and global expertise, ANZ India aims to help clients achieve the results they want from the movement of their capital and goods across the region. It provides services to customers in the resources, energy, agriculture, financial institutions and technology sectors. As well as its branch based operations, ANZ has a shared services hub in Bengaluru supporting its businesses across Australia, New Zealand and Asia.

ANZ also provides financial and volunteering support to non-government organisations and charities in India. ANZ's flagship adult financial education program, MoneyMinded, is delivered in Mumbai and Bengaluru where it continues to help hundreds of participants improve their financial skills, knowledge and confidence.

WOMEN PARTICIPATING IN THE ANZ MONEYMINDED PROGRAM TO BUILD THEIR MONEY MANAGEMENT SKILLS, KNOWLEDGE AND CONFIDENCE' [ROBERT LOMDALH, ANZ]

The complex regulatory environment particularly impinges on India's emerging fintech sector

- new regulatory hurdles, such as protocols around 'know your customer' and anti-money laundering, as well as digital identity authentication and data storage requirements, slow the adoption of new technologies.

Like their global peers, Indian regulators are still figuring out how to recalibrate to innovative disruptions

- the treatment of new business models enabled by fintech, including peer-to-peer transactions, crypto-currencies, crowd funding, systems integrity and data security are the biggest grey areas
- the lack of a regulatory framework makes significant investment in fintech a risk for Australian businesses.

The Future Fund, Australia's biggest institutional investor in India, has also suffered from a lack of regulatory clarity

- SEBI's 2012 'clubbing' rule, which brings the Future Fund and a range of state government funds under the same banner, effectively limits Future Fund holdings to 2.5 per cent of any listed entity, whereas a single foreign portfolio investor would be able to hold 10 per cent.[xxix]

India has made notable recent progress in reducing FDI caps in some sectors

- in 2015, the FDI limit on pensions and insurance increased from 26 per cent to 49 per cent
- in 2016, the limit in 'other financial services' category, which includes fintech and asset management, increased to 100 per cent
- India will need to go much further in opening up the financial services sector to foreign investment if it wants to increase capital inflows and accelerate adoption of world-leading technology and practices in these sectors.

Opportunities in the retail banking sector are curtailed by the dominance of public sector banks and the prevalence of many local private sector banks

- some foreign banks have succeeded in India but many have exited, including Australian banks
- those Australian banks with a presence in India primarily service corporates and HNWIs from Mumbai and New Delhi or outsource back office functions
  - India would need to secure investment from big name firms in Australia, New Zealand and other parts of the Indo-Pacific for significant opportunities to emerge for Australian firms in India's retail banking sector.

3.2 Skills, infrastructure and other constraints

The financial inclusion needs of India's rural poor are unlikely to be met by Australian firms

- this cohort will be serviced almost entirely by domestic financial institutions
- the reach of private and foreign banks into rural areas and financial inclusion is very low
- of the total distribution of credit from all private sector banks in India in 2017, only 2.39 per cent was distributed to rural areas; for foreign banks that figure was 0.35 per cent.

There are also constraints on the Australian side, such as benchmark-led management and shareholder expectations which can favour shorter term thinking in the institutional investment sector

- the culture of quarterly reporting constrains firms from investing in emerging markets such as India, where bouts of heightened volatility make members and boards nervous around performance.

[xxix] The Future Fund has argued that the 'clubbing' rule should not apply to it as the Australian funds in question clearly meet SEBI's definition of no common management and no common beneficial ownership between funds.

4.0 WHERE TO FOCUS

Unlike many other industries, the financial services market in India is a national market in which businesses do not have to rely upon the business conditions set by state governments. Nevertheless, India does have well-formed financial services and fintech clusters. These cities should be the entry point for Australian companies seeking to establish a presence in the market. In the medium term, Indian cities with the greatest unmet demand for capital and insurance are unlikely to offer the best prospects for the types of financial services in which Australia specialises. Australian efforts should also focus on the Central Government to bridge knowledge and expectation gaps and share regulatory expertise.

Much like other parts of the world, India's financial services sector has a high spatial concentration in one city – Mumbai

- the city is India's financial and corporate capital, housing the headquarters of regulators, including SEBI and the RBI
- by extension, the state of Maharashtra, of which Mumbai is the capital, is the most relevant for Australian financial services firms seeking to establish a presence in India.

The clustering of IT firms in Hyderabad (Telangana) and start-up culture in Bengaluru (Karnataka) has led to the emergence of a strong fintech ecosystem in both cities

- Telangana is also home to T-Hub, India's largest start-up incubator.

Andhra Pradesh and Karnataka are key states for fintech partnerships given the development of a fintech hub in each state and the existence of a strong IT and fintech ecosystem respectively.

Recognising its wide-ranging potential to modernise the economy, New Delhi, Kerala and Rajasthan are committing to develop blockchain specialisation hubs.

RECOMMENDATIONS

59. Cooperate with India on fintech development

59.1 Expand ASIC's international network of fintech cooperation agreements to India

- ASIC has several cooperation agreements in place, including with China, Singapore, Hong Kong, Japan, Malaysia, United Arab Emirates, Canada, United Kingdom , Indonesia and Switzerland – India should be added to this list of countries
- these agreements provide frameworks for information sharing between regulators and allows ASIC to refer businesses to partner agencies overseas to receive the same level of support offered to local fintechs
  - this can include dedicated contacts in each regulator and support prior to and during the authorisation process.

59.2 Establish a referral system for accessing advice to navigate each country's financial regulatory system

- ASIC's Innovation Hub already performs this function and could help SEBI set up a similar platform.

59.3 Provide support for Australian fintech start-ups to establish themselves in India

- financial services and fintech should be a key sector for a landing pad in Bengaluru [*see Recommendation 70.2*]
- alternatively, given the funding constraints around the establishment of a physical landing pad space, the Australian Government should explore options for 'soft-landing support', including in Mumbai (India's fintech hub)
  - this would provide an opportunity for Australian fintech start-ups to travel to India (or vice versa) to access an incubator or accelerator
  - start-ups could use the exchange to explore investment/partnerships in fintech or work bilaterally on a project to create a market solution that supported India's financial services needs.

59.4 Use fintech to engage with India on development cooperation in third countries

- India is seeking to increase the profile of its development program and clean up procurement and delivery
  - Australia and India could develop a bilateral innovation challenge for Indian and Australian fintech start-ups to provide solutions to developmental issues in the Indo-Pacific.

59.5 Increase the number of Indian and Australian fintech firms under the New Colombo Plan Internship and Mentorship Network.

60. Cooperate on Blockchain standards development

60.1 Leverage Australia's position as chair of the International Organisation for Standardisation's (ISO) Technical Committee for Blockchain Standards to work more closely with India

- Australia, through Standards Australia, is leading the development of international blockchain standards under the auspices of the ISO
  - India is one of the 33 full members of this Committee
  - we should share experiences on the testing and regulation of blockchain technologies, increase regular intersessional work and conduct more frequent agency to agency contact and teleconferences.

60.2 Standards Australia could share lessons from the development of Australia's Blockchain Standards Roadmap with the Bureau of Indian Standards

- the two countries could work together to increase consistency in terminology and measures for managing privacy, security and identity issues for near term uses in digital currencies, trade finance and remittances.

60.3 Showcase Australia's pioneering use of blockchain distributed ledger technology as the ASX's primary clearing and settlement system

- although it is a private company, the ASX could share lessons on how to address risks and adhere to regulatory requirements with India's National Stock Exchange (NSE) and Bombay Stock Exchange (BSE)
  - SEBI's newly formed Committee on Financial and Regulatory Technologies is in the research phase of considering blockchain applicability to the stock market
  - this could also lead to connecting Australian fintechs servicing the ASX to the NSE and BSE, and their supporting start-up ecosystem.

61. Bridge knowledge and expectation gaps

61.1 The Future Fund should share its experiences in India with Australian investors

- the strong performance of the Future Fund has other fund managers looking to it for advice
  - this is an opportunity to leverage the 'soft power' of the Future Fund to share its experience of the challenges and rewards of the investment environment in India.

61.2 Share perspectives on the opportunities and challenges prompted by fintech, including regulatory reform

- regular policy dialogues between Treasury, Ministry of Finance and NITI Aayog present one opportunity for this to be done at an officials' level.

61.3 Advocate for India to join the Asia Region Funds Passport (ARFP)

- the ARFP is an initiative of APEC
  - currently only APEC members have joined – Australia, Japan, Thailand, New Zealand and the Republic of Korea
  - membership of the ARFP from outside of APEC is possible under the rules of the ARFP
- once implemented, the ARFP will allow fund managers to sell investment funds between participating jurisdictions through a streamlined regulatory framework
  - consumers will benefit from a wider range of investment products and managers will benefit from market access into jurisdictions they could not previously operate in without a full local presence and licence
  - fund managers in participating jurisdictions will be able to access the ARFP once they satisfy a number of threshold criteria, which will ensure only experienced managers with appropriate capital backing can enter.

62. Support development of India's pension system

The Australian Government should work with the Indian Government to develop India's retirement savings industry by sharing best practices and lessons from Australia

- the Pension Fund Regulatory and Development Authority of India and the Australian Prudential Regulatory Authority could explore opportunities to share experience, including on how to drive demand and raise public awareness, how to create a robust regulatory system, and appropriate roles for private players
  - broader policy issues relating to retirement savings could also be explored between Treasury and the Indian Ministry of Finance.

SPORT SECTOR

CHAPTER ELEVEN

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SUMMARY

- Unlike many other sectors identified in this report, India already looks to Australia as a model in sports for achieving results. Supporting India's sport agenda can help Australia entrench positive relationships with Indian governments and businesses.
- The Indian Government has made improving sports outcomes a strategic priority. Greater sports participation is critical to the future health and productivity of India's large population. This is driving demand for better sports systems, facilities and inputs.
- Demand for sports training, sporting goods and sponsorship money is also growing thanks to India's burgeoning consumer class.
- But sport is not a typical industrial sector. For Australia there are three distinct aspects.
- First, many of the obvious means of engagement are not commercial: government dialogue and policy support, or developmental and community relationship building. Such engagement is valuable and brings broader benefits.
- Second, sport also signals our values and capabilities. Our sporting profile in India benefits 'Brand Australia'. Our sportspeople achieve celebrity status and promote positive images of Australia. Sports diplomacy is a vehicle for advocacy on gender equality, women's empowerment and disability inclusion, and for engaging Australia's Indian diaspora.
- Third, genuine commercial opportunities are also emerging in India for Australian sports service providers. There is an increasing appetite in India's education sector for sports training and expertise as well as pockets of demand for sports event management cooperation, high-performance technologies and sports medicine. While the size of these commercial opportunities does not compare with those of most other sectors in this Strategy, sport can provide an entry point to India for those sectors.
- The Australian Government should seek to play a constructive role with the Indian Government and select state governments as they develop and invest in their sporting environments. This can also pave the way for Australian business.

1.0 THE MACRO STORY

KEY JUDGEMENT

Beyond cricket, India wants to improve its sports performance at the elite level, fuelling strong demand across the spectrum of the sector. Australia is well placed to support India to pursue this agenda. Sport also puts Australia on India's radar in ways we might not otherwise figure. Demand will continue to grow for sports management services, training and governance expertise. The rate of grassroots participation is low, but the scale and potential is immense.

1.1 The scale and key structural drivers of the sector

POLITICAL IMPETUS TO IMPROVE INDIA'S SPORTING PERFORMANCE

India's elite sports performance has been patchy

- while India has performed well in cricket, badminton, hockey, boxing, wrestling and shooting, its performance and participation at most international sporting events has been underwhelming
- between 1990 and 2014, India's share of medals at the Asian Games and Commonwealth Games improved 3 per cent and 1.5 per cent respectively[12]
- at the 2016 Rio Olympics India won two medals and ranked 65th in the total medal tally.

There is growing expectation to improve high performance

- Prime Minister Modi is personally invested in improving India's global sporting success
- underlying this is a belief that India's performance in sport should be commensurate with its population and growing economic and strategic heft and that this should be projected regionally and globally.

To realise its ambitions, India requires a long term strategy to systematically build a sports ecosystem

- grassroots participation and sports education, technology and infrastructure are developing from a low base (for example the sum total of current Central Government talent identification and training schemes reach just a fraction [0.0067 per cent] of Indians in the 8–25 age group[12])
- performance is hampered by a lack of a culture of community participation in sport
  - this is compounded by little physical education in schools, inadequate facilities and governance issues.

The Government of India is working to address these constraints

- under its *Khelo India* policy the government has committed to mainstreaming physical education in the school curriculum, supporting education pathways for young Indians aspiring to be elite sportspeople and providing grants for the creation of sports infrastructure and training facilities
- *Khelo India* has a budget of $350 million over three years
- the establishment of India's first National Sports University is underway and existing universities are being funded to deliver degrees in sports science and sports medicine
- Prime Minister Modi has formed a Mission Olympic Cell tasked with improving the quality of high-performance coaching and athlete training
- there are plans to remodel the sports bureaucracy to professionalise the management of elite athletes.

CASE STUDY: CATAPULT: SPORTS SCIENCE TECHNOLOGIES CATAPULTING IN INDIA

The use of sports science and technologies provides objective physical performance data to optimise athlete performance and mitigate the risk of injury.

This is a nascent industry in India but there are significant business opportunities to develop the skills and resources across India's elite sporting teams.

Catapult is an Australian company that has recognised this opportunity. Drawing on its global network of over 300 staff based across 24 locations worldwide and working with over 1500 elite teams globally, Catapult has developed a focused strategy to deliver its sports analytics products to the Indian market.

Catapult conducts workshops and training sessions in India with leading industry practitioners and sports scientists to raise awareness of how sports science analytics can benefit decision making in sports and illustrate the need for products at the elite level.

Catapult has also built relationships with its clients directly, essential in the Indian business environment. The company has recognised the highly price-sensitive Indian market and regularly highlights its product value over cheaper alternatives.

Catapult is now working with the national football and hockey teams, six out of ten Indian Super league teams, and Symbiosis International University.

Catapult is also looking to future commercial opportunities based on the increased interest of broadcasters providing athlete data analytics to engage fans as well as national sporting organisations.

HOCKEY AUSTRALIA'S HOOKIN2HOCKEY TRAINING CLINIC IN MUMBAI, UNDERTAKEN AS PART OF THE AUSTRALIA-INDIA COUNCIL 2016 INTERNATIONAL RELATIONS GRANTS PROGRAM. [TOM WINTER, HOCKEY AUSTRALIA]

THE GROWING ROLE OF THE PRIVATE SECTOR

More companies are entering the Indian sport sector

- the sport sector in India has historically been government-led with private participation limited to public-private partnerships in infrastructure development and sports academics
  - this balance has shifted in recent years
- the Indian sports market grew almost 10 per cent between 2013 and 2015, from $870 million to $950 million[12]
- this is partly being driven by India's consumer class which provides a large viewer base for professional sports and is luring greater sponsorship money.

The formalisation of Corporate Social Responsibility has led to increased spending on sport by the private sector

- companies with $100 million net worth, revenue of $200 million and/or net profit of $1 million are mandated to spend 2 per cent of average earnings on Corporate Social Responsibility and sport is one of several categories of eligibility
- Corporate Social Responsibility investment in sport remains low, just 0.7 per cent of overall spend in 2015–16,[12] but several conglomerates fund large-scale, holistic sport programs to support increased community participation while creating talent pools for professional leagues or teams in which they have a stake.

The emergence of sports leagues has also increased private sector participation in the sector. It has boosted the sports industry through improvements in performance and participation and an increase in fan base and sponsorships

- following the successful rise of the Indian Premier League which started in 2008, nine more leagues spanning sports such as football, kabaddi, badminton, tennis and hockey were established between 2013 and 2016.

AUSTRALIA'S COMPETITIVE ADVANTAGE

Australia has a well-developed sport industry and considerable expertise in several areas of priority for India

- the Australian model demonstrates the need for grassroots participation and a strong supporting structure such as workforce development, sports science and medicine as well as governance to be successful
- Australia has world-leading sports science, equipment and intellectual property
  - Australian company Catapult is a world leader in sports analytics, and Deakin University is ranked as the world's best for sports science[34]
- Australia spends over $12 billion (public and private) annually on sport and sports infrastructure.[106]

India looks to Australia as a natural partner

- the highest political levels in India have shown interest in engagement and much of Australia's cooperation to date has been government-led
- the perception in India of Australia as a strong sporting nation is underpinned by our long cricketing relationship and Olympic success relative to population size, putting us ahead of other countries.

1.2 How the sector will likely evolve out to 2035

INDIA'S SPORTS ECOSYSTEM WILL DEVELOP

To increase medal tallies in the short to medium term, the Indian Government is likely to target the development of a select list of sports in which India has demonstrated potential. These will include athletics, badminton, boxing, cycling, gymnastics, hockey, shooting, squash, swimming, table tennis, weightlifting and wrestling

- a focus on achieving success in these sports will create some positive knock-on effects across the sports system.

However, the systematic wide-scale reform required to mainstream participation and build a sports culture will be a longer term endeavour than 2035

- the scale of required reform and costs are substantial.

Out to 2035 the demand for foreign expertise and exposure to world-class training environments overseas will grow

- even as reforms gradually improve the domestic facilities and services available to support India's elite athletes
- Australian professionals will continue to occupy paid positions coaching and training Indian athletes.

While the definition of success is India increasing its competitiveness, Australian support to India is unlikely to directly undermine our own athletes or pose a serious threat to Australia's position in international competition rankings in the medium to long term

- for example, India has Australian cricket and hockey coaches at the highest levels but that does not directly affect Australian international standings.

NEW MARKETS WILL EMERGE

New sub-segments of the market have emerged as the sport sector has gained momentum over the past decade. Rising trends in participation and consumption of sport are likely to drive their continued growth out to 2035

- the recreational sports market will keep expanding on the back of positive trends such as a focus on healthy lifestyles, a growing middle class with higher disposable incomes and increased internet penetration
- India's sports goods industry (including apparel, equipment and footwear) will grow, having already risen from $2.7 billion in 2013 to $4.8 billion in 2015[12]
  - key export markets for India include the United Kingdom, United States, United Arab Emirates, Australia, South Africa and Germany
  - Indian sports goods have also been exported for rollout at global sporting events[12]
- Inbound and outbound sports tourism will increase
  - India has hosted several mega sporting events that have attracted tourists and sports enthusiasts
  - a growing number of tour operators and agents are specialising in servicing the requirements of this tourist segment
  - greater affluence in India's consumer class will see more outbound tourists, including those attracted to international sporting events.

GLOBAL TRENDS AND DISRUPTIONS WILL AFFECT HOW OUR SPORT SECTORS BEHAVE AND INTERACT

There is increasing recognition of the role of sport in maintaining a healthy population. Globally among adults, inactivity is now as big a killer as smoking.[106]

Big data, analytics and new technologies will continue to re-shape sport. Integrated athlete management systems allow coaches to capture data in real time and continually modify training programs. Concepts like wearables, e-sports and virtual reality could significantly disrupt the sector in the long-run.

The rise of digital media is changing dynamics in the sport sector globally. Consumers are increasingly using digital channels, especially social media, for sports content and updates. For example, Star India launched an online content platform for the Cricket World Cup 2015 (hosted by Australia and New Zealand) and over 49 matches drew 87 million viewers.[107]

Augmented reality and virtual reality are changing the way fans consume sports content. These technologies enable sporting entities to become more personalised and integrated into players' and fans' daily lives. Together with advanced analytics, these technologies could revolutionise sports training, giving a significant advantage to companies developing expertise in these technologies.

AUSTRALIA'S SPORTING CAPABILITIES WILL NEED TO EVOLVE TO MAINTAIN COMPETITIVENESS

If Australia is to remain a high-performing, internationally regarded sporting nation, it will require sustained funding and innovation to keep pace with increasing investment and professionalism among competitor countries

- by 2035, Australia's relative capacity in certain areas may decline without greater levels of investment
- we are not on track to still be world-leading in sports science by 2035.

To capitalise on commercial opportunities in this sector, Australia will need to continue to improve data and technology use, and ensure the quality and availability of sporting infrastructure. This will require more, and more effective, use of government funding.

WHAT WE WANT THE RELATIONSHIP TO LOOK LIKE IN 2035

- Australia has cemented its position in India as a partner of first choice for sports cooperation, having played a constructive role in developing India's national sports policy.
- Academic links are deeply entrenched.
- Sporting federation relationships and cooperation are institutionalised.
- Australian programs (such as on physical literacy) are being run in Indian schools.
- The foundations of the Australian sector have been strengthened through expanded non-government sources of revenue, including from India.
- The sector is working with even greater innovation and efficiency, with expanded sports products and expertise for export.
- Australian expertise in managing sporting events and sports governance is well entrenched in India.

2.0 OPPORTUNITIES FOR PARTNERSHIP

KEY JUDGEMENT

Government-led cooperation in the regulatory and integrity space, and with the community, can build positive relationships and support branding that can spill over into other sectors. Australia's export opportunities in the sport sector are predominately services exports. There is an interplay between sport and other sectors: education and skills, science and innovation, health, tourism and infrastructure. The strongest complementarity is in education and skills training, building on the established networks of Australian providers.

2.1 Export opportunities

India's sport sector will hold a range of opportunities for Australian companies out to 2035, though many of these will be piecemeal.

Education and skills training across sport-related fields and at all levels is in high demand in India. India's interest in what we offer could be used to pilot broader sectoral changes, such as joint degrees. Opportunities include Australian providers offering:

- joint university degrees in all sport-related fields, such as sports science, sports medicine and sports management
- professional development programs for teachers, trainers and coaches at all levels (community sport to high-performance)

- executive training and leadership development programs
- online curriculum for massive open online courses or full credit/award courses, noting that regulations still prevent the latter
- development of primary and secondary school sports and physical education curriculum.

Other opportunities include:

- The size of India's consumer class presents a significant market for sports media and advertising. Growing India's interest in domestic Australian sport (from cricket to Australian Football) can generate additional sponsorship money. Likewise, the growth of an Indian sport in Australia (such as kabbadi) can attract Indian investment. Spin-offs to this would be greater brand recognition for Australia in India and stronger people to people links.
- Consulting services and intellectual property in the fields of sports governance, coach and athlete training, sports science, sports management, major event management.
- Training camps on a commercial basis for elite Indian athletes and coaches in Australia's high-performance sports facilities, including Australian Institute of Sport and state Institutes of Sport.
- The application of data analytics and data intelligence to sports performance and technology, where Australia is likely to be a world leader.
- Sport tourism built around major international sporting events and their representatives in both Australia and India.
- The development of multi-use facilities – the design, construction and management of sporting precincts.
- The import and export of sports equipment, including new technologies such as monitoring devices, as well as sports food and dietary supplements, in some cases through joint ventures, leveraging India's lower cost manufacturing base.
- Services, consulting and program design in sports medicine, physio, biomechanics and nutrition.

2.2 Collaboration

The Australian Government, along with state governments, could play a major role in collaborating with Indian counterparts as they seek to establish national sporting frameworks and systems.

There could be circumstances where the private sector, particularly academia, also engages with Indian governments on a commercial basis or where the Australian Government works in partnership with the private sector to engage India.

While commercial outcomes may be limited in many collaborations, supporting India's sports agenda can help Australia entrench positive relationships with Indian governments and businesses, including to:

- reinforce the Australian brand in India, as an avenue to build up Australia's image as a knowledge partner, and to advocate for priorities such as gender equality and disability inclusion
  - one way to do this could be to further leverage the celebrity status and diversity of Australian and Indian sportspeople to promote Australia's economic and marketing objectives in education, health, science and innovation, tourism.

In both countries, the sport sector is spread across central and state governments, business, the media and academia. This presents an array of institutions and companies which could be an affiliate in a partnership.

KEY PARTNERS IN INDIA

Government

- Central Government (Ministry of Youth Affairs and Sports, Sports Authority of India)
- State Governments
- Sports Sector Skill Council

Private sector

- Corporate conglomerates with Corporate Social Responsibility sport interests
- Professional leagues
- Schools and universities

KEY PARTNERS IN AUSTRALIA

Government

- Australian Sports Commission (including the Australian Institute of Sport)
- State governments and institutes of sport
- Australian Sports Anti-Doping Authority (ASADA)
- National sporting organisations

Private sector

- Universities and training institutions
- Professional leagues, including the Australian Football League (AFL)
- Sports equipment, technology and service providers

TYPES OF COLLABORATION OR PARTNERSHIP

Community sport and development

- India needs a comprehensive schools sports policy and systems to increase youth participation. Australia could provide technical assistance to India with system design, including under the framework of the bilateral MoU signed in 2017, with a focus on
  - affordable sports which don't need much infrastructure
  - establishing curriculums and physical literacy programs
- an example is Australia's Asian Sports Partnerships grants which support programs promoting community health, social inclusion, and youth participation.

Sports governance

- Australian Government, academia or consultancies could work with Indian central or state governments or federations to design sporting systems and sports federation management
  - as Victoria University is doing as a 'knowledge partner' to the Government of Punjab on a commercial basis
  - as the University of Queensland is doing in partnership with Jindal University to deliver courses on sports law and governance.

Australian and Indian Governments could strengthen cooperation in the field of sports integrity and anti-doping and corruption efforts between ASADA and India's National Anti-Doping Agency.

Academic engagement, including on a commercial basis, between Australian education providers and Indian ministries, universities and other sporting institutions

- Australian providers could work with the Sports Sector Skill Council to deliver specialised training
- the MoUs in place between Australian universities and the Sports Authority of India provide a framework to work with India to establish its national sports university
- Australian personnel could be seconded or 'deputised' in Indian universities or sporting federations.

Australian education and skills providers could target commercial partnerships with private companies investing in Corporate Social Responsibility initiatives, private sports academies and private schools.

Australian universities, research centres and sports science bodies could enter into commercial research and development partnerships with India.

Australian sporting organisations and institutes could host Indian sports managers, coaches, health professionals and administrators for short courses and training camps in Australia.

Australian sporting events, teams or leagues could seek sponsorship from Indian companies, or vice versa.

CASE STUDY: VICTORIA UNIVERSITY: LEADING AUSTRALIA-INDIA COOPERATION IN SPORT

The Indian sports ecosystem is developing quickly and Australian organisations can provide expertise in sports technology, training, consultancy and education.

With support from the Australian Government, Victoria University (VU) has showcased to India its world-leading sport expertise across sports science, coaching, business and education. A leading example of the VU-India sport engagement strategy is its collaboration with the Government of Punjab.

Following comprehensive discussions with Indian sport and government stakeholders in March 2016, Victoria University signed a landmark five year agreement with the Punjab Institute of Sport with a focus on improving Punjab's sporting capability and capacity.

In 2017, this partnership expanded with the commencement of a two year project agreement to develop a sustainable sports ecosystem to identify talent, develop athlete pathways and broaden grassroots sport participation.

One year in and this project's milestones have been met, on time and within budget. The success of the program has been attributed to well-planned, mutually agreed objectives, activities and outcomes. Sustaining relationships with key stakeholders and decision makers, as well as investing in understanding the environment, context and priorities for the Indian market has also been important.

Victoria University is advancing a similar engagement with the Government of Kerala, and has recently signed an agreement with the Government of India in partnership with the University of Canberra to assist in establishing India's first national sport university.

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2.3 Investment

As in other sectors, India is looking to attract foreign investment to support the development of its sport sector, particularly in

- sports infrastructure, which was granted 'industry' status in 2016 to encourage increased investment
- India's professional leagues, which require significant investment to develop and maintain infrastructure and achieve sustainable returns
  - even in the Indian Premier League, only a few teams are profitable after a decade – largely due to management challenges
- the advent of professional leagues in India and greater public interest in international sporting events is also driving growth in sports broadcasting, another source of investment opportunity.

3.0 CONSTRAINTS AND CHALLENGES

KEY JUDGEMENT

Outcomes are likely to remain slow to eventuate and commercial engagement will continue to be modest. Indian businesses or agencies willing to pay Australian commercial rates for services or expertise are rare. Their number will increase out to 2035, but much engagement in the services sector will remain on a non-commercial basis.

3.1 The policy and regulatory environment

As with other sectors, public sector capacity to manage sport is limited at both the central and state government levels. Funding is slow to mobilise. Challenges in navigating and engaging with multiple government bodies can delay effective collaboration.

The lack of 'industry' status for sport (sports infrastructure aside), the absence of clear guidelines for business operations and the unorganised nature of the sector affects investor confidence

- this leads to inadequate information and data, compounding uncertainty.

A lack of accountability in sports federations limits their effectiveness in supporting India's elite athletes. It will also pose challenges for direct partnerships until governance models are improved.

As with the education sector, there are regulatory challenges around curriculum, certification and online delivery [*see Chapter 3: Education Sector*].

3.2 Skills, infrastructure and other constraints

CONSTRAINTS AND CHALLENGES ON THE INDIAN SIDE TO GROWING ITS SPORT SECTOR

Outside cricket, inadequate incentives for most full-time players deters youth from pursuing sports professionally

- scholarships and endowments are fraught with bureaucratic red tape or lack of process transparency
- post-career support for athletes or coaches is lacking and further limits professional participation
  - there is little or no post-retirement support in the sector such as pension

schemes or support for launching private ventures.

Skills and education gaps exist at all levels of professionalism

- at the grassroots, low integration of sports into school curriculums and a lack of proper physical education and sports training are major factors limiting school sports participation and physical literacy among children
- a nationwide shortage of professionally trained and qualified coaches limits the quality of training for aspiring athletes
- at the elite level, limited higher education and research in sports sciences (including nutrition, psychology, medicine and sports education) hinders efforts to maximise player performance
- a lack of executive-level sports management training opportunities inhibits the development of trained professionals to manage leagues and major sporting events.

A shortage of sports infrastructure, especially at the grassroots level, and asset management of existing infrastructure is poor

- there is limited investment in high-performance sport infrastructure and India has few world-class facilities at which elite athletes can train to international competition standards
- it is estimated that India spends about $670 million on youth affairs and sports through the Centre and state budgets, a third of the amount spent annually by the United Kingdom on sports infrastructure and training[12]
- some of the reasons for inadequate infrastructure development include:
  - insufficient private sector funding
  - restrictive guidelines for availing government grants for sports infrastructure; only select government entities are eligible to undertake infrastructure development projects
  - poor asset utilisation and inefficient monetisation planning lead to suboptimal returns on developed sports infrastructure assets, which deters further investment.

There are cultural barriers to grassroots participation in sport in India. There is a commonly held view that sport is an unnecessary diversion from children's studies rather than an integral part of education and development and a potential career pathway. Prime Minister Modi's priority on sport as a means of engaging youth and lifting national performance could change this, but will take time

- restrictions are compounded for women and girls, for whom participation in sport may be discouraged, particularly in more conservative states
- international research increasingly points to academic benefits for children with regular physical activity.

Sport faces the same business environment challenges as other sectors in India. For example, during the New Delhi Commonwealth Games Indian companies withheld payments from Australian companies, challenging them to litigate.

CONSTRAINTS AND CHALLENGES ON THE AUSTRALIAN SIDE

There is a misperception that supporting India develop its sports ecosystem will work against Australia's own competitiveness.

The sector lacks a unified voice, affecting its ability to create a coordinated offering of the scale required by India

- sports governance is fragmented, with complex, federated governance structures
  - there is potential for misalignment between national and state sporting organisations and between the national and state governments.

International engagement by Australian sports institutions – both government and private sector – is limited

- the sector is domestically focused

- many Australian sports institutions have limited funds at their disposal to invest in international growth opportunities, including in India
- India is a price-sensitive market and revenue models need to be adjusted compared to developed western markets.

A number of foreign players are competing in the sector, including the United Kingdom, Canada and Japan

- many of our competitor countries have recently replicated and surpassed Australia's innovation and investment in the 1980s and 1990s
- India is not a crowded market and demand will outstrip supply, however while the Central Government continues to be a key partner in progressing cooperation, Australia may have to compete for bandwidth.

4.0 WHERE TO FOCUS

For Australia, trade and investment opportunities in sport are not limited to particular Indian states as the demand is nationwide, but several states have more advanced sports systems and present themselves as more prospective targets. Sport could also be used as a supplementary point of engagement in states Australia is targeting for other reasons. The Central Government will remain an important partner.

Aside from the Central Government holding responsibility for the management of India's national teams, sport is a state subject under the constitution with sports policy frameworks varying significantly across states.

Several states have introduced initiatives to improve sports infrastructure at the grassroots level, provide financial aid to aspiring elite athletes and monetary rewards and government jobs to high achievers.

Haryana and Manipur are considered to have strong sporting cultures and have produced many prominent sports personalities, including in boxing, cricket and wrestling. Manipur will also host the main campus of India's first National Sports University.

Punjab, Kerala, Gujarat and Rajasthan are states in which Australian state governments and universities have developed sporting relationships which could be expanded.

RECOMMENDATIONS

Australia should target sports governance and academic experience as a means to build collaborative relationships. This can help prepare the scene for broader export opportunities for Australian service providers in the medium and long term.

63. Prioritise India on the Australian Government sporting agenda

63.1 Expand micro programs to support development through sport

- keep India as a priority country for engagement through the Australian Government's Sporting Partnership programs.

63.2 Explore options to establish an Austrade secondment to the Australian Sports Commission to pursue commercial engagements with India

- placing an Austrade officer in the Australian Sports Commission to work on India could bolster the Commission's capacity to secure commercial or cost-recovery contracts in a challenging overseas environment.

63.3 Implement programs under the Sports MoU, recognising that it provides a framework for long term engagement. Areas of focus could include:

- opening Australian Sports Commission programs to Indian participants, including the Post Graduate Scholars Program, and the Women in Sports Leadership program
- provide scholarships to select Indian participants to the above programs
- establish residential programs for Indian sport science scholars in national sporting organisations
- hosting Indian teams for training camps at the Australian Institute of Sport
- sharing experiences on school physical literacy programs
- sharing information on grassroots sporting programs
- providing sellable Australian Sports Commission intellectual property on a commercial basis
- packaging tools online so they can be scaled up for the Indian market.

64. Position Australia to take a leading role in supporting the Indian Government to develop its National Sports University

The Australian Government should contribute to and facilitate activities between Australian universities and the Sports Authority of India to support the establishment of India's National Sports University

- the National Sports University will be a long term (decade plus) project
- the Australia-India Sports Partnership provides a framework for engagement
  - the Australian Government should explore options for establishing a single point of coordination for Australian engagement, and for supporting the secondment of an Australian academic to advise on the development of the Sports University.

65. Promote sport to sport engagement

65.1 Support Australia's national sporting organisations to build mutually beneficial relationships with their Indian counterparts including to deliver coach and athlete training courses in India to build capacity in individual sports

- modest seed funding could be required to catalyse engagement, but the medium term goal should be engagement on an in-kind support or fee-for-service basis
- potential benefits for national sporting organisations include talent attraction, increasing global participation rates in their sports and diversifying career pathways for their athletes
- depending on the capacity and accountability of the counterpart Indian federation, Australian national sporting organisations could engage with them directly or in partnership with government bodies or education and training institutions
- this engagement would build on the success of the aid-funded Asian Sports Partnerships and Australian Sports Outreach Program, both no longer operational
  - several national sporting organisations have existing relationships in India as a result of these programs, including Boxing Australia, Cricket Australia, Football Federation of Australia, Hockey Australia and Netball Australia
  - in line with India's priority sports, of additional interest would be Athletics Australia, Basketball Australia, Swimming Australia and Tennis Australia.

65.2 Support the introduction of kabbadi to Australia by working with the Indian Pro-Kabbadi League

- this could be an opportunity to attract Indian sports media investment and promote Australian sporting companies.

66. Target Indian women's soccer as a sport to engage with and support from the ground up

Women's soccer in India is at the early stages of development, and the scope for expansion out to 2035 is immense. Australian sporting bodies should seek to coordinate efforts to support the growth of women's soccer in India, building on the pilot Indian Women's League in 2017

- supporting Indian women's soccer could involve partnering with the All India Football Federation, Football Federation Australia, universities and non-government organisations to promote women's representation at the elite level and harness their power as role models to encourage broader participation by women and girls
- such an effort would link in to positive outcomes in education, health, women's leadership and ending violence against women.

SCIENCE AND INNOVATION SECTOR

CHAPTER TWELVE

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SUMMARY

- Science and innovation cut across the whole economy and is important to every industry.
- India, like Australia, needs the outputs from science and innovation to advance productivity and maintain economic growth. Science and innovation also hold solutions to many shared challenges, ranging from managing water to delivering infrastructure, health and education services over distances.
- India is emerging as a global hub for research and development.
- While a world leader in some areas, Australia's performance internationally in innovation and commercialisation is not as strong as it could be.
- Australia has much to gain from engaging with India in science and innovation. Pairing Australia's research and development base with India's scale and record of frugal innovation could be a productive partnership. Collaboration also helps facilitate deeper engagement across all sectors of the economy.
- Scientific achievement and collaboration enhances Australia's reputation, has an important soft diplomacy role and strengthens our credentials as a quality education provider.
- Australia should build on successful research collaborations and seek to promote engagement between our start-up networks. Scaling up the AISRF should be central to these efforts.
- Government support and funding is often crucial to success, especially in a time-consuming and challenging environment like India.

1.0 OUR SCIENCE AND INNOVATION AGENDAS

KEY JUDGEMENT

Science and innovation will be crucial to India maintaining its economic growth out to 2035. Despite relatively low funding levels, India is making significant advances. It benefits from a large talent pool and several world-standard technology clusters and start-up ecosystems. India is attracting increasing rates of investment in research and development. Australia is also looking to prioritise science and innovation to stay competitive out to 2035 and has much to gain from partnerships with India.

1.1 Changes in science and innovation out to 2035

Science and innovation are fundamental to economic growth, with research and development a big determinant of total factor productivity, especially when researchers are well connected with consumers.

Many technological advances have been made in the last 20 years, including a digital communications revolution driven by exponential increases in computer power. By 2035, scientific developments and innovation will have again reshaped the technologies which help deliver economic productivity

- the science of information and data is perhaps the most fundamental research topic of the century[108]
  - advances in technologies to analyse information and data will hasten progress in physics, chemistry, biology, social science and economics
- current trends point to the advent of a suite of new digital technologies, such as machine learning, optimisation, artificial intelligence, robotics and distributed ledgers[109]
- the imperative to meet global challenges such as climate change and water scarcity will also set the direction of scientific endeavour.

Communications technologies and globalisation will continue to offer greater opportunity for collaboration in scientific research but also more competition in commercial development. For many economies, intellectual property is already the greatest economic resource.

Against this backdrop, knowledge-intensive companies that innovate and export will remain the most profitable, competitive and productive.

1.2 India's science and innovation agenda

India's public spending on research has been stagnant at around 0.8 per cent of GDP for over a decade

- in 2015, the spend was 0.9 per cent of GDP, compared to 1.9 per cent in China, 2.7 per cent in the United States and 0.6 per cent in Australia
- with some important exceptions, India has often piggybacked off the innovations of advanced economies and applied them in an Indian setting
- but despite relatively low funding, India performs well on innovation relative to its GDP per capita.[12, 110]

Encouraging trends are emerging in India

- India has become a global research and development hub for sophisticated sectors like network equipment, medical equipment, aerospace, automotive, biotechnology and computation
  - India has 25 innovation centres and has been ranked as the top innovation destination in Asia

    - the country accounts for 27 per cent of Asia's new innovation centres[111]
- in 2017, India ranked 60 on the Global Innovation Index, up from 81 in 2015, driven by increased investment from private institutions and improvements in the capture and use of data
    - the 2017 Global Innovation Index ranked India second for innovation quality for middle income countries.

India attracts foreign investment in research and development from countries around the world

- India is the third-largest destination for imported research and development and has the sixth largest (private plus public) research and development spend globally ranking ahead of France and the United Kingdom[112]
    - India receives 15 per cent of United States overseas research and development spending, as does China
- close to 800 leading companies from around the world have set up research and development centres in India
    - Google Capital (a venture capital fund financed by Alphabet Inc) has announced it will establish its first office outside the United States in India
    - in 2015 Rio Tinto established its big data Analytics Excellence Centre in Pune
- the research ecosystem in India presents a significant opportunity for multinational corporations across the globe due to
    - access to technical talent
    - low wages
    - proximity to regional markets
- internationalised Indian companies are seeking to bring new resources and technologies to markets by investing domestically in new solutions, including in data analytics and fintech.

India has a vibrant entrepreneurial scene that is producing numerous affordable innovations

- such as the world's cheapest tablet computer (Aakash) and affordable medical diagnostic devices
- India is home to nine so-called 'unicorn' start-ups valued at more than USD1 billion (including in e-commerce and online retail)
- India was home to 3,100 start-ups in 2014 and is projected to climb to more than 11,500 by 2020 [113]
- India's National Association of Software and Services Companies reported a 40 per cent increase last year in the number of active incubators and accelerators, with more than 30 new academic incubators established under the government's Startup India – Stand-up India initiative.[113]

This progress is, at least in part, the product of regulatory and policy changes by the Indian Government to accelerate innovation growth

- under Prime Minister Modi, India has placed a high priority on science and technology for economic growth and aims to push total research and development spending beyond 2 per cent of GDP
- India's budgetary allocations for science and innovation in 2017–18 included funding for the following departments:
    - Department of Science and Technology: $1 billion on topics including advanced manufacturing, waste management, biomedical devices, electric mobility, Smart Grid and energy storage[12]
    - Department of Biotechnology: $450 million for mission programs on ocean biology, bio pharma product development, agri-tech solutions, start-up innovation eco system, clean energy and epidemic preparedness[12]
    - Ministry of Earth Sciences: $350 million for topics covering water plants and the monitoring of the coastal marine systems of the Indian Ocean[12]

CASE STUDY: IITB-MONASH RESEARCH ACADEMY: AUSTRALIA-INDIA RESEARCH COLLABORATION

A growing number of corporations, governments and institutes are turning to India for effective, high impact solutions to some of the world's biggest challenges, from climate change and renewable energy to biotechnology.

Recognising India's status as an emerging research and global technological powerhouse, the Indian Institute of Technology Bombay (IITB) and Monash University collaborated to form a joint venture research academy. Opened in 2008, the IITB-Monash Research Academy enables:

- formation of multi-disciplinary research teams across Australia and India, challenging the traditional individual/discipline-oriented research agenda
- long term engagement of industry commitments structured around major research challenges
- provision of a compelling value proposition to students while simultaneously responding to talent challenges in both countries
- Monash to respond to prevailing opportunities quickly via an in-market presence.

Monash has noted the particular challenges of working across two national contexts in the higher education sector, citing the importance of aligning governance and academic expectations.

Their engagement also enabled Monash to develop a joint PhD program reflecting the research priorities of both nations and the establishment of their own multi-disciplinary purpose-built facility in India (within IITB) for up to 300 Monash students and staff.

The Academy has successfully fostered deeper collaboration across the higher education sector. It has recruited 250 students, launched 420 joint collaborative projects and produced 600 research publications and industry funded projects to the tune of $14 million in committed contracts. The collaboration has also seen a 585 per cent increase in co-publications from 2012–17.

In 2018 the first start up from the Academy, Convalesce, has been selected for the Acceleration Program of IndieBio, a world-leading life science accelerator based in Silicon Valley, San Francisco. The team will receive $250,000 in seed funding, lab and co-working space, dedicated mentorship, and becomes part of a network of IndieBio alumni, investors, biotech entrepreneurs, press and corporate partners. Founders engage with customers and partners, pitch to investors, and turn science into a real product people pay for.

This is an important milestone for the joint venture which due to its collaboration with industry heavyweights including CISCO, Orica, InfoSys, TATA, Reliance, SABIC and BHP Billiton, typically already sees graduates secure employment before graduation in industry and academia.

- the Indian Government's 'Start-up India' policy, released in January 2016, offers income tax exemptions for the first three years of a start-up's operations
  - other campaigns like 'Digital India', 'Make in India' and 'Skill India' are contributing to India's startup ecosystem
- India's financial inclusion reforms are providing support to the IT industry and helping India leapfrog technologies and processes
- government investments in space and nuclear science have led to notable achievements, such as the Mars Orbiter and a heavy lift launch vehicle for satellites ('GSLV Mk-III')
- NITI Aayog is directing efforts to ensure science and technology are harnessed to build a powerful innovation sector through incubation facilities and quality higher education
  - it launched the Atal Innovation Mission in 2016, providing a platform for the promotion of innovation hubs, grand challenges, start-up businesses and other self-employment activities, particularly in technology-driven areas
  - it also promotes innovation through a platform for innovative idea generation by setting up Atal Tinkering Labs at schools and incubation centres to nurture innovative start-up businesses.

1.3 Australia's science and innovation agenda

Like India, Australia aims to sustain a strong science and innovation agenda to remain competitive and keep pace with changes out to 2035.

Australia ranked 23rd on the Global Innovation Index in 2017

- seventh in university rankings and sixth on intensity of local competition
- but Australia is not a leader in the start-up world and has a mixed record of commercialisation.

The Australian Government's National Innovation and Science Agenda aims to harness new sources of economic growth to deliver future prosperity for Australia. The Agenda focuses government efforts on four pillars:

- Culture and capital: Initiatives are intended to encourage investment into innovative, high-risk, early-stage Australian firms. They include new tax incentives for venture capital investors investing in early-stage innovation companies and co-investment funds to commercialise research into new products and services (the $500 million Biomedical Translation Fund and the $200 million CSIRO Innovation Fund).
- Collaboration: Change funding incentives to allocate more university funding to research conducted in partnership with industry and for investment in long term research infrastructure. To maintain world-class research infrastructure, the Agenda sets out a plan to invest $2.3 billion over 10 years, funding the National Collaborative Research Infrastructure Strategy, the Australian Synchrotron (accelerator technology) and Square Kilometre Array.[109]
- Talent and skills: Promote coding and computing in schools to develop problem solving and critical reasoning skills necessary for high-wage jobs. Link to other innovative economies to attract more entrepreneurial and research talent from overseas. An initial total of $36 million over four years (2016–20) has been allocated towards a Global Innovation Strategy to improve international science and research collaboration.
- Government as an exemplar: Innovate the way government services are delivered and make it easier for small businesses to supply to the government. To drive the agenda in government, a new sub-committee of the Cabinet was formed. An independent advisory board, Innovation and Science Australia, was established in 2015.[109]

Future investments to strengthen Australia's innovation system will be informed by:

- the 2016 National Research Infrastructure Roadmap

- Innovation and Science Australia's 2030 Strategic Plan, 'Australia 2030: Prosperity through innovation'
- the Australian Government's Digital Economy Strategy, which is still being developed.

Australia's Industry Growth Centres Initiative is an industry-led approach driving innovation, productivity and competitiveness by focusing on areas of competitive strength and helping transition them to high value and export-focused industries

- Growth Centre objectives include working with industry to increase collaboration and commercialisation and improve international engagement capabilities
- Growth Centres are established across six industry sectors:
  - Advanced Manufacturing
  - Cyber Security
  - Food and Agribusiness
  - Medical Technologies and Pharmaceuticals
  - Mining, Equipment, Technology and Services
  - Oil, Gas and Energy Resources.

2.0 OPPORTUNITIES FOR PARTNERSHIP

India and Australia share research priorities because we face shared challenges in improving productivity, sustainability and the health of our citizens. Better science and innovation outcomes can be achieved by working together. Collaboration with India in research and development, and in supporting businesses and start-ups take forward new innovations, presents opportunities to:

- attract investment
  - by providing prospective Australian innovators an additional pathway to attract investment (Australian venture capital as a proportion of GDP remains less than half the OECD average), helping to grow the innovation sector in Australia
- combine complementary skills and expertise to develop new innovations
  - by leveraging Australian expertise in such areas as agri-tech, health-tech, water management, energy efficiency and renewables, with Indian expertise including in data analytics, biotech, and mobile applications
  - by combining Australian research and technology with India's record of frugal innovation to scale up innovations or create new products
- open new markets across the economy (potentially in partnership with Indian innovators)
  - by adapting innovations to the requirements of the large Indian market
  - by using India as a launching pad to other potential regional and global markets
- attract talent and skills to Australia
  - research relationships and joint projects open pathways for leading Indian scientists and researchers to participate directly in the Australian economy
  - bringing Indian start-ups to Australia has potential benefits for Australia
    - » if they succeed in finding a market in Australia for their innovation, they could bring investment capital to establish their operation in Australia, generate employment, and introduce new technologies that could contribute to productivity and economic growth
- support our education sector and education linkages
  - establishing people-to-people links in research is essential to Australia's education and training engagement with India [*see Chapter 3: Education Sector*]

CASE STUDY: AUSTRALIA-INDIA STRATEGIC RESEARCH FUND

The Australia-India Strategic Research Fund (AISRF) is Australia's largest fund dedicated to bilateral science collaboration. Since its inception in 2006, the Australian Government has committed more than $80 million which, together with the Indian Government, has helped support over 300 collaborative research projects, fellowships and workshops in a variety of areas from agricultural research to nanotechnology. It has built strong and productive research partnerships in areas of science, technology and innovation between Australian and Indian researchers and institutions. Two examples of the fund's many success stories include:

Supporting women in STEMM careers

Like many other countries, Australia and India face significant challenges in attracting women to studies in STEMM, and retaining them in STEMM careers. In 2016, the AISRF provided funding to the Australian Academy of Science (AAS) to organise a Women in STEMM workshop on the basis of their experience promoting gender equality through the Science in Australia Gender Equity (SAGE) initiative, and in recognition of the AAS' strong ties with their Indian counterparts.

Held over two days, over 70 dignitaries from India, Australia and the United Kingdom met in New Delhi to promote and increase the participation and progression of women in STEMM careers. The workshop developed practical action plans and best practice models to foster entrepreneurial cultures, capacities and access to STEMM activities, business and industry. The workshop also showed there is a clear opportunity for Australia to become a regional leader on this issue.

World-leading research for disease diagnosis

Of the two billion people in the world infected with the highly contagious bacteria that causes Tuberculosis (TB), around a quarter of them are in India. Accurate diagnosis is critical to controlling TB but the current diagnostic tests are expensive, slow and rely on access to centralised laboratories.

With AISRF funding, Australian and Indian researchers have teamed up to tackle the issue. CSIRO, Australia's scientific research agency, has been working to develop a portable point of care diagnostic tool. This tool uses chemiresistor sensors; a proven fluid analysis technology. To adapt the technology for TB diagnosis, researchers need to test large numbers of TB samples. India's Institute of Microbial Technology in Chandigarh uses CSIRO's sensors to analyse infected and healthy samples from their collection.

While it is early days, preliminary results of this partnership suggest that sensors could soon be reliably adapted to diagnose TB. CSIRO has also been working with an Australian biomedical company to design and produce a portable device to house the chemiresistor sensors for use in the field.

PROFESSOR VEENA SAHAJWALLA, A LEADING RESEARCHER AND PIONEERING INNOVATOR AND FORMER AISRF PROJECT MANAGER, IN HER LAB. [UNIVERSITY OF NEW SOUTH WALES]

- build trust and relationships
  - beyond the research and commercialisation outcomes themselves, collaboration in science and innovation can entrench working relationships with Indian governments and businesses in priority sectors and states
  - science and innovation plays an important role in building the image of Australia and its businesses
- regulatory cooperation
  - there is scope to share regulatory experience and lessons learned
    - this could focus on the technology sector and how to regulate for disruptive technologies, but could also include sharing the Australian experience of regulating more traditional sectors.

2.1 Collaboration

PARTNERSHIPS THAT CAN SUPPORT COLLABORATION

Businesses: such as Australian companies or multinationals establishing research and development operations in India

- or co-development of new products, for example designed in Australia and manufactured in India at low cost.

Start-ups and entrepreneurs: are large contributors to job creation and innovation in both countries. Matching start-ups with investors or with established businesses in their chosen sector enables start-ups to grow, reach new markets, and learn from the best

- for Australian start-ups, India is an important destination for three reasons: accessing a large market; finding talent such as co-founders, engineers, managers, scientists; and developing strategic partnerships with other multinational corporations that have a base in India.

Government: the main mechanism for government support of Australia-India collaboration in science and innovation is the AISRF, co-funded by both governments. Established in 2006, the AISRF is Australia's largest bilateral science fund. It helps link top universities and research institutions in Australia and India to deliver tangible outcomes to the end users of scientific innovation

- the AISRF is an important and highly successful element of the Australia-India bilateral partnership
  - it strengthens Australia's national research fabric by linking with Indian research skills, expertise and networks
  - it sustains Australia's engagement with India in areas where the Indian Government is seeking closer links and is willing to commit financial resources
  - it also has important symbolic value and is well known in scientific communities in both countries
- highlights of the AISRF include:
  - to date, both governments have committed a total of more than $100 million to support 300-plus collaborative activities such as research projects, workshops and fellowships
  - the AISRF promotes the development of international research expertise and skills by supporting high-performing early and mid-career researchers from Australia and India to work at leading institutions in the other country
  - it has supported key institutional and industry partnerships including the Monash and IIT Bombay Research Academy; CSIRO and Council of Scientific and Industrial Research – the leading publicly funded research agencies in both nations
  - the 'Grand Challenge Fund' component of AISRF facilitates meaningful industry engagement
- unlike Australia's scientific fund with China, the AISRF is not ongoing, meaning it provides less certainty – this must be fixed.

India has bilateral cooperation agreements with a range of other countries on science and technology. With the United Kingdom, Israel and Canada, India engages through the Global Innovation Technology Alliance (GITA), a bilateral public and private partnership model (a '2+2 model') for funding industrial research

- GITA is a not-for-profit public-private partnership company promoted jointly by India's Department of Science and Technology and the Confederation of Indian Industry
- it encourages industrial investments in innovative technology solutions and connects industrial and institutional partners for collaborative industrial research and development projects, providing funding for technology development, acquisition, customisation and deployment
- industry and governments in both countries invest in the project.

3.0 CONSTRAINTS AND CHALLENGES

There are several constraints to greater Australian collaboration with India in science and innovation.

3.1 Constraints

FUNDING

While science and innovation contribute to economic growth and business competitiveness, development requires upfront costs

- prioritising funding from either the public or private sector can be a persistent challenge
- Australia's venture capital sector continues to develop but remains small in comparison to other developed economies, making it harder to go from research to commercialisation.

DELAYS IN THE GRANTS OF PATENTS IN INDIA

According to World Intellectual Property Organisation data, the average time for a patent application to be actioned in India is six years from the date the applicant requests examination

- patent applications by residents in India doubled to 12,579 from 2007 to 2015 – but patents granted fell from 3,173 to 822 over the same period due to there being too few official patent examiners[10]
- in contrast, patents granted to residents in China rose from 31,945 to 263,436 from 2007 to 2015.

INTELLECTUAL PROPERTY PROTECTION

Although Indian law provides protection for IP rights, there are concerns over enforcement. A major source of concern is bureaucratic delay, with a backlog of cases in both civil and criminal courts, where cases can run for five years or more. There is also a lack of transparency, particularly at a local level. Damages are routinely awarded in cases involving copyright and trademark infringement, but are less common in patent cases

- the risk of IP loss may be mitigated by partnering with major Indian companies or multinationals, who have an interest in protecting IP.

COMPETITOR COUNTRIES

The United States and Europe remain top choices for collaboration for Indian scientists, although Australia has recognised areas of expertise (including around water, coal and conservation agriculture)

- several European countries and Israel are already establishing their own accelerator facilities in Bengaluru.

A FRAGMENTED SYSTEM

While some Indian states are research or start-up intensive, India lacks a well-functioning national ecosystem for start-ups

- India's education sector suffers from limited international collaborations, and a low focus on research.

LOW RATE OF AUSTRALIAN COLLABORATION

Australia's rate of collaboration between industry and researchers (at 2–3 per cent) is currently the lowest in the OECD. Australian businesses do not have as much internal research expertise as key comparator countries

- at 43 per cent, Australia's proportion of researchers employed in business is significantly lower than countries such as Germany (56 per cent), South Korea (79 per cent) and Israel (84 per cent).

INDIA CAN BE A DIFFICULT MARKET TO ENTER

Unlike more traditional technology hubs such as Silicon Valley or London, where processes are more familiar to Australian institutions

- understanding India's dynamic technology sectors is not easy, and navigating India's state and central bureaucracies can be challenging.

REGULATIONS

The reason the Indian technology sector has thrived is because it has not been stifled by over-regulation

- but many other sectors where science and technology are fundamental inputs are over-regulated [*for example, see Chapter 5: Agribusiness Sector and Chapter 8: Health Sector*].

4.0 WHERE TO FOCUS

Given the enabling nature of science and innovation across the economy, engagement should be targeted at the nexus of each of our priority sectors with priority Indian states.

At the same time, several cities stand out and should be the areas of focus of science and innovation collaboration in general, including start-up networks

- 66 per cent of start-ups are concentrated in three cities: Mumbai, Bengaluru and New Delhi
- Hyderabad, Chennai and Pune are the next biggest centres for start-up ecosystems.[113]

4.1 Key Cities

BENGALURU

- The IT sector in Bengaluru is two decades old and has a high level of maturity.
- Bengaluru hosts the largest technology cluster in India and the fourth-largest technology cluster in the world, spread across sectors including IT and IT-enabled services, pharmaceuticals and biotechnology, defence, aerospace and agri-tech.
- The number of start-ups in Bengaluru rivals those in the global top technology cities.
- The majority of Fortune 500 companies have research and development centres in Bengaluru, searching for innovative products and solutions.
- Bengaluru is also home to India's space program.

MUMBAI

- Mumbai's proximity to global capital flows and India's investors supports an emerging startup ecosystem, particularly for business to business innovations.
- As India's fintech capital, fintech is driving Mumbai's startup economy.
- The Society for Innovation and Entrepreneurship, hosted by Indian Institute of Technology, Bombay promotes entrepreneurship and industry partnership.

NEW DELHI NATIONAL CAPITAL REGION (NCR)

- New Delhi NCR captures the most startup funding of any Indian city.
- The capital region's start-up scene is strengthened by the presence of firms with easy access to foreign investors, government agencies and seed funding.
- The city has leading education, research and scientific institutions and a skilled workforce. It is a major hub for information technology enabled services, e-commerce, business process outsourcing and design work.

HYDERABAD

- Hyderabad is becoming a global destination for tech business and entrepreneurs. Telangana provides a state focus on innovation through a formal innovation policy.
- T-Hub, a state government backed start-up incubator, is bringing together Hyderabad's established start-up ecosystem, academics and corporates.
- The city's industrial, information technology and biotechnology clusters have led to a strong research and development capability and facilitated an entrepreneurial ecosystem.

RECOMMENDATIONS

Funding will be key to supporting joint research and development projects. Supporting connections among scientists, researchers and start-ups can also help combine Australian and Indian strengths in research or technology with application and development.

67. Scale up the Australia India Strategic Research Fund

67.1 Double the current total funding for the AISRF, remove funding from the Australian aid program, and make funding ongoing (that is, make Australia's contribution $10 million per annum).

67.2 Consider three possible revisions to the AISRF

- larger projects along the lines of the 'Grand Challenge Fund' which has been conducted in the past
- more direct funding to ensure all PhD students on projects spend time in the other country; this forms lifelong networks that build on and exceed the valuable institutional networks that AISRF collaboration already brings
- while maintaining a necessary focus on industry partnerships and commercialisation, increase investment in priority areas of fundamental science; for example, joint activities in gravity waves or quantum computing which could deliver long term benefits.

68. Explore a suitable model to fund industrial research and development beyond the AISRF

In addition to the fundamental research undertaken through the AISRF, there is scope to consider funding models that encourage early stage commercialisation, noting that Australian small and medium sized enterprises in particular find it difficult to collaborate with researchers in international markets.

68.1 Explore the option of collaborating with India through its GITA

- the 2+2 model for funding industrial research encourages greater industry buy-in and has a focus on commercialisation
- before such a program is conceived, the Australian Government should make a medium to long term commitment to engage with the market, test appetites and build partnerships
  - lessons could be learnt from other countries' experiences with GITA in the next two to three years.

68.2 Use global funding to support research and development initiatives with India

- work to maximise the potential of research partnerships through multinational and multilateral approaches, including international funders such as the Gates Foundation, Wellcome Trust and the World Health Organization
  - targeting either development issues important to India, or global issues important to both countries, such as climate change or water management.

68.3 Establish Joint Research Centres of Excellence across key sectors

- India and Australia could join forces to provide seed funding for Joint Research Centres of Excellence. This could be built on the Australian Program of Cooperative Research Centres. Several million dollars would be needed per centre from each side.
- In order to give these a recognisable identity and align with Australian and Indian priorities, a centre could be established for key sectors identified in this Strategy: Agribusiness, Resources and Energy, and Health (all priorities for greater investment in science and technology in NITI Aayog's Three Year Action Agenda, and also all areas of Australian excellence)
  - Universities and research institutes should be encouraged to co-invest in the centres to build long term relationships with Indian partners. This would encourage the development of sustainable and deep linkages, which are critical for collaborations to succeed in the long term.
  - The TERI University-Deakin University Nanobiotechnology research and development centre is a good model to replicate. A good international example to consider is the China-University of New South Wales Torch Precinct.

69. Use Australia's Industry Growth Centres to support links in Science and Innovation

Put India in the top tier of target countries for each of Australia's six Industry Growth Centres

- the Industry Growth Centres seek to boost sector productivity by:
  - increasing collaboration and commercialisation
  - improving access to global supply chains and international opportunities
  - enhancing management and workforce skills
  - optimising the regulatory environment
- as part of their focus on international opportunities, engagement with India should be given priority.

70. Provide support to start-ups

70.1 Establish an 'Innovation Bridge' of reciprocal exchanges of delegations comprising 10 or so market-ready start-ups to explore partnerships and investment opportunities

- this is an extant, proven model in India
- delegations would be selected by a panel, including representatives from both countries to ensure good prospects in each market
- governments would provide soft landing support following the visit (work space in an appropriate government-funded incubator/accelerator and access to all of its support programs)
- this recommendation would lend itself to funding from the Australia-India Council and to partnership with state governments and Industry Growth Centres.

70.2 Establish an Australian 'landing pad' in India

- add India to the five existing landing pads under Australia's National Innovation and Science Agenda which offer 90-day residencies in a co-working space and introductions to investors, business networks and strategic partners
- Bengaluru presents itself as the obvious city to host an Australian landing pad and options should be explored to co-locate with an existing Indian start-up warehouse
- unlike more traditional technology hubs, understanding and navigating India's business environment and bureaucracies can be challenging
  - this is precisely why the presence of an Australian start-up landing pad accessing the best advice available and with the assistance of an Australian coordinator is important
- there is an appetite among the Indian accelerators and incubators to host Australian start-ups
  - for these start-ups, it would be an opportunity to validate their product or idea in the Indian market, build partnerships and linkages with mentors, other start-ups and investors, with the goal of entering the Indian market or scaling business globally.

70.3 Establish a start-up landing pad in Australia specifically for Indian companies

- supporting Indian start-ups to establish themselves in Australia can nurture joint ventures and bring ideas, technology and investment capital from India
- the objective is to find an Australian partner or collaborator
- the landing pad could be co-located with an existing Australian incubator or accelerator, ideally in partnership with a state government and a business organisation, such as the AIBC or The IndUS Entrepreneurs (TiE)
- access to the landing pad would be subject to normal visa requirements
- globally focused Indian start-ups (for example ride-sharing company Ola) will look to come to Australia regardless so this landing pad would focus on start-ups at an earlier stage of development.

70.4 Promote opportunities for Australian and Indian incubators to share knowledge and expertise through the Expert-in-Residence component of the National Innovation and Science Agenda's Incubator Support program

- this program provides funding for an exchange of experts between Australian and international incubators
- Austrade could build connections with Indian incubators and help facilitate introductions to interested Australian incubators
- these partners could then apply for funding through the Expert-in-Residence program to deliver projects that build collaboration between Australian and Indian start-ups.

71. Support people to people links in Science and Innovation

71.1 Promote Australia's science diplomacy in India

- the Australian Minister for Science, the Chief Scientist, CSIRO and Questacon, as well as university leaders, should be encouraged to visit India to promote Australian strengths and build relationships with counterparts.

71.2 Successful AISRF case studies (including Indian diaspora researchers) should continue to be promoted in both Indian and Australian media.

71.3 Sponsor exchanges in science and innovation and between research institutes using AISRF funding.

71.4 Continue support for the Women in STEMM program

- building on its successful workshop funded by the AISRF, the Australian Academy of Science could be supported to assist Indian science academies in implementing the Athena SWAN Charter (an evaluation and accreditation program to enhance gender equity in STEMM).

72. A joint India-Australia institute for regenerative and sustainable agriculture

Establish a joint cooperative research centre between Australia and India to support a multi-disciplinary approach to grow and apply knowledge on soil health and the impact of soil on the environment

- this could include the combination of:
  - expertise in soil nutrients, fertilisers and greenhouse gases from agriculture
  - soil biome and soil molecular biology
  - agronomy
  - plant-soil interaction and nutrient efficiency
  - smart fertilisers
  - integrated approach to soil modifiers
  - sensors and automation of monitoring
  - new distribution techniques
- this centre should be co-funded by Australia and India to ensure outcomes are accessible, widely beneficial and given the best chance of commercialisation
- this centre should be co-funded between the Commonwealth and state governments and industry.

DEFENCE AND SECURITY

CHAPTER THIRTEEN

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SUMMARY

- India has an ambitious policy to shift from being the world's largest importer of defence equipment to meeting the majority of its needs through domestic production. This could include joint ventures with foreign firms.
- This policy imperative means that despite India's expanding defence budget, the opportunities for Australian defence exports or joint manufacturing are likely to be limited to some specialist equipment, joint research and development in niche areas and the provision of some services and training in cyber security.
- Accordingly, Defence is not identified as a priority sector in this Strategy.
- This chapter nevertheless sets out an analysis of the opportunities in this sector given the priority defence exports have in the Australian Government's policies.
- Likewise, this chapter also sets out an analysis of the opportunities in cyber security given the rapid change in the sector and its role in underpinning economic growth and business confidence.

1.0 THE MACRO STORY

KEY JUDGEMENT

As regional security partners with a growing strategic convergence, there is value in Australia and India exploring opportunities for enhanced defence industry cooperation. A positive strategic trajectory might also increase the appetite to share technologies over the period of this Strategy.

Both countries are undertaking a significant modernisation of their military. India is one of the world's largest spenders on military equipment and its procurement needs are met primarily through imports. But India's shift towards 'Make in India' in the defence sector and Australia's still nascent export-oriented defence manufacturing sector means export opportunities will be limited. India's currently limited skill sets for high tech defence manufacturing are likely to improve as domestic production ramps up and more joint ventures are concluded. Weak intellectual property laws will need to be addressed to enable joint ventures. Opportunities are most evident in niche manufacturing collaboration, direct sales, joint research and development, and the provision of commercial services and training in cyber security.

1.1 The scale and structural drivers of the sector

INDIAN DEMAND: DEFENCE

India is the fifth largest military spender in the world

- it has the second largest standing army in the world (1.3 million active service personnel)
- since 2011–12, India's defence spending has consistently accounted for 16–17 per cent of the Central Government's budget
  - the highest of any sector.

While India's defence spending has declined as a proportion of GDP, in nominal terms it almost doubled between 2009 and 2016, and is expected to grow at 7–8 per cent per annum over the next five years

- India plans to spend USD250 billion on defence procurement over the next 15 years to modernise its defence arsenal in response to changing geopolitical and regional scenarios.

Unlike most other countries with large defence industries, India's defence procurement requirements have been traditionally met primarily through imports

- more than 60 per cent of India's defence equipment needs are still met through imports
  - compared to the United Kingdom (32 per cent) and the United States (9 per cent)
- Russia, the United States and Israel – in that order – are the top three suppliers to India.

Domestic production has been dominated by large public sector companies, including state owned enterprises

- private companies have only been allowed to compete in the sector since 2001
- domestic production has slowly been increasing over the past 15 years, during which time India has developed indigenous capabilities in some segments, such as combat aircraft, missiles, naval vessels, heavy trucks
  - but these segments have struggled to compete with the performance of imports.

India has relaxed limits on foreign investment in the defence sector, allowing up to 49 per cent FDI automatically and 100 per cent FDI with government approval

- other initiatives to entice foreign capital into the sector include:
  - the abolition of the foreign investment promotion board, which had been required to approve foreign investments in the defence sector
  - tax deductions, state incentives, export incentives and area based incentives for Special Economic Zones
- despite these efforts, only USD180,000 of FDI has flowed to India's defence sector between April 2014 and December 2017, according to India's Junior Defence Minister[114]
  - in the same timeframe, India has inked contracts worth close to USD20 billion for arms imports.

AUSTRALIAN SUPPLY AND COMPETITIVE ADVANTAGE: DEFENCE

Australia is overwhelmingly a net importer of defence equipment

- much like India, Australia's defence sector is undergoing indigenisation enabled by government backing
- in May 2017, the Australian Government announced it would spend $200 billion over the next decade to invest in an enhanced defence capability.

The Australian Government's *Defence Export Strategy*, released in January 2018, says the Australian Defence Force (ADF) alone is not enough to sustain Australia's defence industry

- the *Defence Export Strategy* says new markets are required to realise the full potential of Australian industry to support the ADF's future needs.

Most major Australian defence contractors are subsidiaries of global original equipment manufacturers

- in many cases, licences are held by parent entities who may already sell defence equipment to India through other markets
- over 3,000 SMEs operate in the Australian defence industry, mostly as subcontractors to prime companies
- this limits opportunities for export.

But Australian companies do have some distinctive capabilities, both products and services, which could be offered to India

- for example, Thales Australia is bidding to provide mine sweeping systems to the Indian Navy and rifles to the Indian Army.

According to the 2016 Defence Industry Policy Statement[115], Australia has a number of world-leading success stories in the development of innovative defence capability

- although not all of them may be available to international partners
- the *Defence Export Strategy* sets out a policy framework for considering export support on a case-by-case basis (particularly for sensitive technologies)
  - it identifies close allies (which does not include India) as the highest priority export markets, in part because this is where export of sensitive technologies will be most successful
  - export support for sensitive technologies to other markets may be considered in line with Australia's strategic interests, defence capability considerations, foreign policy, and economic interests but will remain subject to Australia's export control protocols.

According to Australia's *Defence Export Strategy*, India's modernisation demands will outstrip domestic supply, which could present opportunities for Australian defence industry

- sub-sectors where Australian expertise intersects with Indian demand include maritime security, disaster relief and research and development.

Specialist product offerings could include: command and control systems; multi-sensor data fusion; signal processing; underwater systems; navigation and positioning aids; logistics support systems; and self-monitoring propulsion systems.

Specialist services could include: expertise in shipbuilding services (not platforms), engine design (5–10 megawatts), ship shafting and transmission expertise, construction and repair of major weapons, and propulsion system integration.

INDIAN DEMAND: CYBER SECURITY

Cyber security is a rapidly expanding global industry. For India, the pace of digitisation throughout the economy has made cyber security and data security an increasingly important issue.

As in other countries, India's government and private sector are expanding efforts to protect themselves from malicious cyber activities

- a joint report by National Association of Software and Services Companies (NASSCOM) and Data Security Council of India estimated the Indian cyber security industry will be worth USD35 billion by 2025
- India aspires to create a 'Cyber Command' – an integrated cyber security agency responsible for tasks ranging from policy formulation to implementation at the national level
- despite having the largest information technology talent pool in the world, India is unlikely to produce the number of professionals it needs to close the cyber security skills gap
- NASSCOM estimated that India will need one million cybersecurity professionals by 2020 to meet the demands of its rapidly growing economy[116]
- demand for cyber security professionals in India will continue to increase due to the unprecedented rise in the number of cyber attacks
  - India's rapid digital transformation – by one measure India has surpassed the United States as the second largest smartphone market in the world – means the country is a major target for cyber attacks[117]
  - the Indian Computer Emergency Response Team (CERT) stated that in June 2017 alone, India witnessed more than 27,000 cyber security threats.[117]

Indian IT companies will therefore need to look abroad, including to Australia, to integrate cyber security solutions into their supply chain.

AUSTRALIAN SUPPLY AND COMPETITIVE ADVANTAGE: CYBER SECURITY

According to the Australian Cyber Security Growth Network, Australia is well placed to become a global cyber security powerhouse

- our strengths lie in core research areas like quantum computation and secure third-generation microkernel, a well-developed services economy and a high quality education system
- in 2016, the Australian Government launched its national *Cyber Security Strategy*, which elevated cyber security as an issue of national importance
  - the *Cyber Security Strategy* made strengthening the local cyber security industry one of five areas of priority action enabling Australia to take advantage of the significant economic opportunities in the global cyber security market.

Australia's competitive advantages in the cyber security domain range across government, academia and business

- Australia is among the top 10 countries in the Global Cyber Security Index developed by the UN's International Telecommunications Union
- Australia's CERT chairs the steering committee of the Asia-Pacific CERT, comprising 28 teams from 20 economies throughout the region – including India
- Australia is at the forefront of developing a safe online environment, enabled by robust legislation, advanced law enforcement capabilities, rigorous policy developments and strong technical defence systems

- voluntary codes of conduct have been laid out for federal government agencies, financial services industry, internet service providers and telecommunications providers to help industry members improve business practices and meet their regulatory obligations
- Australia has a pronounced advantage in hardware and software security services
  - several Australian institutions offer a wide range of cyber security solutions domestically and internationally, led by the Australian Cyber Security Growth Network.

1.2 How the sector will likely evolve out to 2035

DEFENCE

India will focus on indigenisation by aiming to reduce imports of defence equipment – it has set a target to reduce imports to 30 per cent by 2027

- the Government of India has taken several steps to promote its domestic defence sector, specifically with an aim to increase indigenisation and import substitution
  - in January 2018, India announced a simplified 'Make In India' procedure which aims to reduce the approval time for Indian domestic private industry to win defence contracts and to reserve projects for Indian SMEs.

In areas where India is less confident in the capabilities of its domestic industry it will encourage joint development

- India's Defence Procurement Policy 2016 (DPP 16) encourages joint development, design and production with foreign original equipment managers
- DPP 16 introduced a new category for capital acquisition (Buy Indigenously Designed, Developed and Manufactured) as the preferred route of capital acquisition
  - the new category requires purchasing from an Indian vendor products that are either a) indigenously designed, developed and manufactured with at least 40 per cent indigenous content; or b) not indigenously designed or developed but have at least 60 per cent indigenous content.

Encouraging joint development is also the motive behind Indian Ministry of Defence's 'Strategic Partnership' model for the Indian private sector (announced May 2017)

- the model seeks to identify a few Indian private companies as strategic partners who would initially link with shortlisted foreign original equipment managers to manufacture major military platforms
- these strategic partners would presumably lay a strong foundation for the Indian defence industry by making a long term investment in production and research and development infrastructure, creating a wider vendor base, nurturing a pool of skilled workforce, and committing to indigenisation and technology absorption.

Segments of India's defence industry which are likely to see rapid growth out to 2035, potentially with international participation, include:

- electronic systems (within avionics)
- precision machining
- composite materials.

India will continue to aspire to become an exporter of defence equipment

- its Ministry of Defence has developed a *Defence Exports Strategy* to promote exports, which includes:
  - the creation of an Export Promotion Body
  - engaging Indian diplomatic missions in export promotion
  - export financing through Lines of Credit
  - strategic use of offset policy
  - export of indigenously developed defence systems
  - streamlining of export regulation processes

- progress has been made but India must continue to improve its domestic capabilities, efficiency and productivity in research and development in order to meet its aspirations.

A global shortage of relevant industrial and engineering talent is one of the biggest challenges to 'Make In India' achieving its goals for the defence sector

- in aerospace alone, 100,000 new skilled workers are required in India every year over the next decade for manufacturing, maintenance, repair, overhaul, operations and research and development.

CYBER SECURITY

Cyber security will increase dramatically in coming years as cyber criminals turn to a growing number of electronic devices to target in an ever-more connected world.

As a result, the cyber security industry will become broader and more sophisticated, driven by:

- increased government and business exposure to cyber risk through new digital technologies, greater internet penetration, the uptake of the Internet of Things and cloud computing and the convergence of information and operational technologies
- increased cyber risk awareness and regulation
- the take up of technology is a critical plank of the Indian Government's improved governance and service delivery objectives
- India's Aadhaar card is the world's largest identification project
  - utilising biometric authentication, over one billion people are now enrolled
  - protecting this scale of stored private information will be critical to the platform's integrity.

2.0 OPPORTUNITIES FOR PARTNERSHIP

KEY JUDGEMENT

Opportunities will be limited. Australian defence manufacturers, especially SMEs, can tap into the large and growing Indian defence procurement market through partnerships with Indian SMEs to manufacture components for global companies with offset obligations in India. Australian firms can also provide commercial services and training in cyber security to India. Ongoing defence cooperation will enhance opportunities for partnership.

2.1 Export opportunities

We should primarily pursue export opportunities in the service and advice sectors where there is less risk.

These opportunities will be predominantly in cyber security

- defence exports will likely be limited to joint ventures.

DEFENCE SCIENCE AND TECHNOLOGY

Australia's Defence Science and Technology Group, which resides in the Department of Defence, is seeking to develop an appropriate governance framework with its Indian counterpart, the Defence Research and Development Agency

- this is likely to be in the form of a MoU on defence science and technology
- bilateral cooperation in this area will focus on concepts in non-sensitive technology areas, rather than high-end capability or potentially sovereign technologies.

Topics that both agencies could explore for future collaboration include an operations analysis course, composite structures testing in aircraft, battery technologies, maritime structure corrosion, and blast resistant material modelling.

CYBER SECURITY

Government collaboration on cyber security could build on existing channels between the two nations, such as the annual Australia-India Cyber Policy Dialogue.

Australian agencies and companies can tap into the cyber security segment in India in three categories: software, services and training

- provide software solutions for security operations and protection stack (basic infrastructure that protects an organisation's IT networks), specifically in data analytics and cryptography
  - developments in artificial intelligence and advanced machine learning are likely to see cyber security efforts shift towards software over services
- provide services in the protection stack segment of security needs
  - specific segments include network security architecture, firewall configuration and management, penetration testing, vulnerability assessment and patch and configuration management
  - while more challenging to export than software, services for protection stack do not always require in-country technical teams
- Australian companies and institutions could also enter the training domain, using their expertise and experience for capability building in India
  - this could happen through the delivery of formal cyber security education programmes, especially Master's programs in Australia or through train-the-trainer modules in India.

2.2 Partnerships (Joint Ventures)

Australian and Indian defence manufacturers and researchers could collaborate on joint research and development in areas of mutual interest: cyber security; space technologies; integrated intelligence; surveillance and reconnaissance; marine warfare and armed unmanned aerial vehicles

- joint ventures in manufacturing are less likely except in niche areas where India's low cost structure may make joint production attractive.

The Indian Defence Research and Development Organisation is keen to work on new generation technology areas such as surveillance systems, detection sonar, information and communication technologies, directed energy systems, and detectors

- there is an opportunity for India and Australia to collaborate and work on joint projects in some of these areas, with the involvement of academia, industry and the startup community forming an ecosystem for enhanced engagement
- collaboration on research and development can benefit from the strengthening of defence ties between Australia and India, boosted by the signing of a bilateral Framework for Security Cooperation in 2014 and more frequent bilateral and multilateral training exercises.

Australian industry can tap into the growing Indian market through partnerships with Indian SMEs looking to enter the defence manufacturing space

- such partnerships can also help global defence companies fulfil their offset obligations in India.

Australian manufacturers can provide licenses and technology to Indian partners which have local manufacturing capabilities

- relationships developed by Australian partners with global defence companies can help earn credibility for the partnership in India
- segments could include electronics, precision machining and composite materials.

3.0 CONSTRAINTS AND CHALLENGES

KEY JUDGEMENT

Australian defence firms operating in India report the usual challenges to doing business in India: skills shortages, getting bills paid and signed contracts not honoured. The more significant constraint is India's indigenisation push in the defence sector and the lack of a sizeable Australian defence export industry to operate in India at volume.

3.1 The policy and regulatory environment

DEFENCE

Foreign companies have expressed concerns on transfer of intellectual property rights to Indian partners as part of Transfer-of-Technology agreements under India's DPP.

Realising any opportunities – export, manufacturing or research and development partnerships – will require factoring in various Australian export control considerations, which reflect Australia's international obligations and commitment to global security and counter-proliferation efforts

- all exports of 'Defence and Strategic Goods' require an export permit applications for export permits are considered on a case by case basis.

The army consumes the bulk of India's defence spending manpower and is a massive drain on India's defence budget, leaving fewer resources for equipment modernisation.

As India seeks to increase its defence manufacturing capabilities – with an eye to eventual exports of sensitive defence technologies – it will increasingly seek only imports of high-end defence technologies (often with an expectation of full technology transfer) to meet its 'Make In India' indigenisation push

- Australia, like other close security partners of India, may not be prepared to transfer high end defence technology.

Australia's defence manufacturing sector currently lacks the scale to meet the volume of India's procurement needs.

CYBER SECURITY

Australia's cyber security businesses face a number of constraints

- scattered funding and limited collaboration between the research community and the private sector hinders commercialisation of Australian research
- lack of scale and business acumen can impede the ability of Australian cyber companies to win large industry or government customers – both in Australia and overseas
- a skills shortage of job-ready cyber security professionals
  - according to the Australian Cyber Security Growth Network's *Cyber Security Sector Competitiveness Plan*, the domestic cyber security industry will need to employ at least 11,000 additional workers over the next decade.

4.0 WHERE TO FOCUS

Australian efforts should focus on the Central Government in New Delhi, which is responsible for policy and procurement. Should proposals for collaboration proceed beyond feasibility studies to tangible areas of co-production, consideration should be given to locating in cities/states which already host defence industry clusters, such as Bengaluru and Hyderabad.

A COLLECTION OF STATES

CHAPTER FOURTEEN

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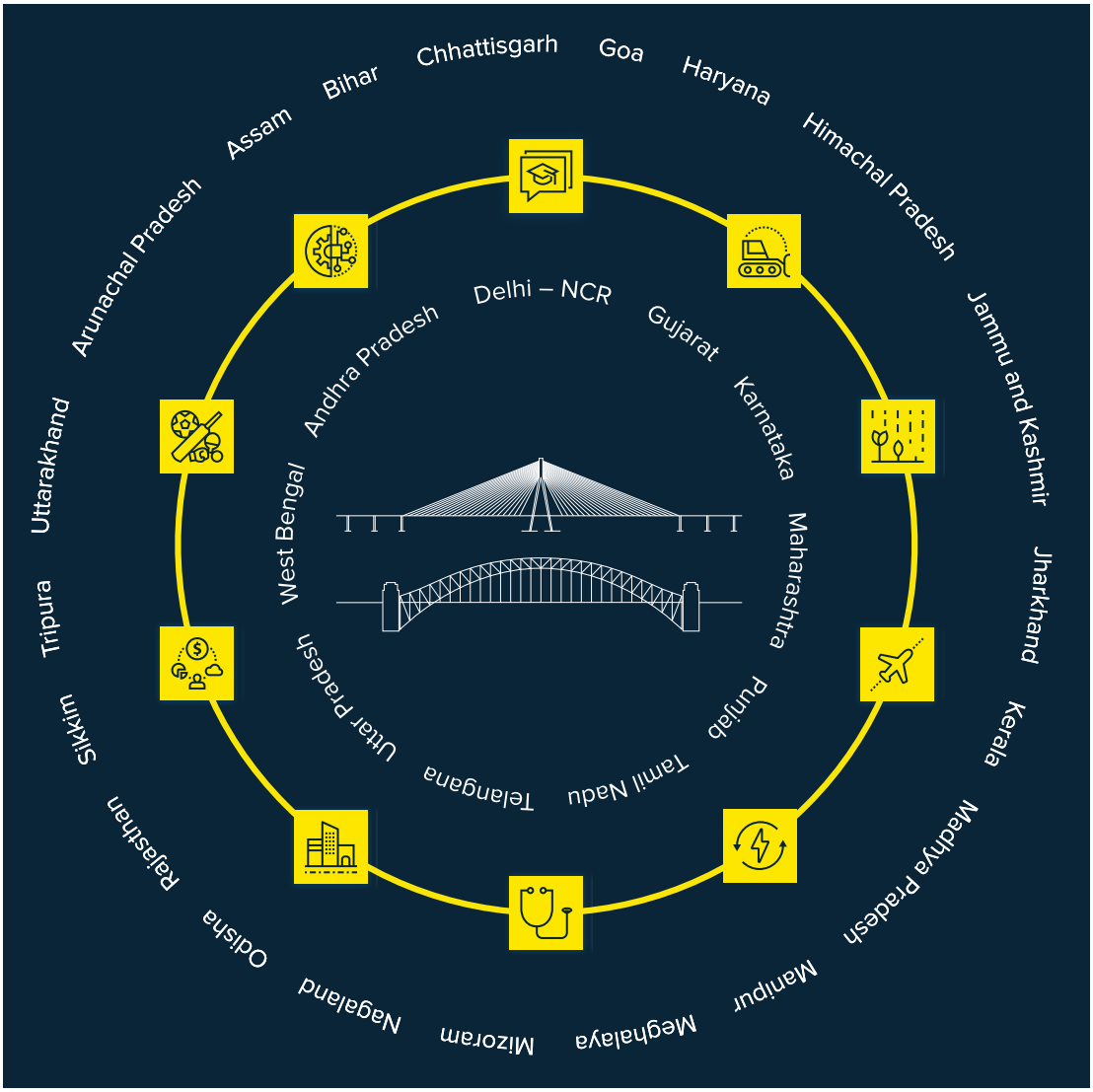
SUMMARY

- Australia needs to approach India both as a national economy and as a series of sub-national economies, each with distinct growth trajectories and regulatory regimes. Given that states control critical elements of the business environment, the settings of state governments will continue to impact Australian businesses in India deeply.
- As more economic decision-making responsibility is devolved to the states, they are being encouraged by the Central Government to take on the onus of reform, including for contentious issues such as land acquisition and labour. States are also being exposed to increasing competition, as the dynamic of both cooperative and competitive federalism gains traction. This dynamic will be an integral part of India's economic future.
- It will be important for Australian Commonwealth and state governments to project a joined-up approach given the challenges of getting noticed in a crowded market and that most Indian interlocutors will make little distinction between Australian states.
- This chapter examines how the sectors identified in this report intersect with particular Indian states. It seeks to provide a figurative heat map of opportunities, based on states' economic profile, growth trajectory and reform prospects.

FIGURE 27: ECONOMIC OPPORTUNITIES OF INDIA'S KEY SECTORS AND STATES



The inner circle identifies the 10 priority states where Australia should focus. The yellow icons symbolise the 10 key sectors where Australia has competitive advantages.

THE CONTEXT OF INDIA'S STATES

India's federated political system means it operates as a series of distinct sub-national economies each with its own growth drivers and investment climates and each requiring its own strategy. India's 29 states and seven union territories vary widely in terms of their population, economic growth, rate of urbanisation, natural resources, climate, access to ports, regulatory environment and the quality of leadership.

While Australia needs to continue to engage with India as a national economy including on its macro settings, India's federal structure means that states hold many of the levers controlling the investment climate. The progress of their reform agendas will combine to have a greater effect on India's economic future than that of the Central Government.

A number of states dominate India's economic output and international economic engagement, based on figures from the Indian Government's Economic Survey of 2016–17 and 2017–18:

- Eight states account for more than 60 per cent of the nation's economic activity
  - Andhra Pradesh, the capital New Delhi and surrounding region, Gujarat, Karnataka, Kerala, Maharashtra, Tamil Nadu and Uttar Pradesh.
- Five states account for 70 per cent of India's exports
  - Maharashtra, Gujarat, Karnataka, Tamil Nadu and Telangana – in that order.
- Five states attracted 71 per cent of all FDI inflows into India from April 2000 to December 2017
  - Maharashtra, Karnataka, Tamil Nadu, Gujarat and New Delhi.
- Five states account for half of all tax collected by the GST
  - Maharashtra, Tamil Nadu, Karnataka, Uttar Pradesh and Gujarat.
- India's consuming class across the eight prosperous states above have a higher share of household spending on travel, recreation, consumer goods, health and education.

Drawing from his experience as Chief Minister of Gujarat for over a decade (during which time he built a business-friendly, outward-looking economic base for the state), Prime Minister Modi has pressed for an Indian federalism that is both cooperative and competitive; cooperative, in terms of better state-federal relations revolving around more fiscal devolution to the states and building consensus on the reform agenda; and competitive, in terms of heightened incentives for states to compete for capital and press ahead with reform. Prime Minister Modi sees this as a core element of India's economic re-invigoration.

A competitive dynamic is not only driving progress among states, but also at the level of cities, known as 'competitive sub-federalism'. Competition is a critical element of Prime Minister Modi's signature Smart Cities initiative, which involves cities bidding for funding grants for urban projects.

The dynamics of competitive federalism and competitive sub-federalism are being embedded into India's economic future and these dynamics will remain a key feature of the Indian economy out to 2035. Australian Government and business should therefore take a sub-national approach to engagement with India to target resources in India's most competitive and complementary regions.

The nature of commercial markets in India, as elsewhere, is that they do not strictly coincide with state boundaries. Depending on the particular sectoral opportunity, the customer base involved and the presence of any local partners, the most appropriate market may cross state boundaries. The National Capital Region of Delhi, comprising not only the seat of Central Government in New Delhi, but also segments of three neighbouring northern Indian states, and several of their key satellite cities, is a prime example of a key market that will strongly engage Australian interests in north India.

Alternatively, the most serviceable market for a particular opportunity might consist of a metropolitan city at the nucleus surrounded by its urban and rural hinterland. For example, the

Mumbai Metropolitan Region consists of India's financial capital and surrounding satellite towns. A hub and spoke model will often be useful to reach into the market in question.

Regardless of whether the most appropriate market for Australian commercial engagement crosses state boundaries, state governments set many of the conditions which determine the business environment. Accordingly, the intersection of states and sectors lies at the heart of this Strategy. It recommends a strategic investment by government in 10 priority states.

Why focus on states?

INDIA'S POLITICAL STRUCTURE

India's federal division of powers means the states are integral to its economic future. Constitutionally, the Central Government's responsibility includes inter-state relations, national security, foreign affairs, trade and commerce, national highways, ports and railways. The Central Government controls rule-setting over market access, trade, investment, as well as some of India's most heavily regulated sectors (including defence and financial services).

State governments, on the other hand, have competence over law and order, police, health, education, water and electricity. In effect, states oversee key inputs to business including physical infrastructure (roads, electricity, water, and sanitation), a majority of business licences, as well as social infrastructure, such as schools and healthcare facilities.

Competence is shared over concurrent subjects including land acquisition and labour, with the Central Government having precedence in the event of a conflict.

GREATER DECENTRALISATION

India's states are assuming more economic decision-making power from the Central Government. The historic distribution of economic decision-making power between the Centre and the states overwhelmingly favoured the Central Government. But liberalisation of the economy in the 1990s saw the start of a shift away from centralised economic policy-making.

The Central Government retains a greater role relative to the states in influencing public spending priorities. While the Centre has superior financial powers and a greater share of the power to tax, including import or export duties and corporate taxes, the states have a larger share of responsibility for the delivery of public services such as policing, education, health and utilities.

Increased fiscal devolution is providing states with more autonomy on public spending decisions. The share of untied tax resources transferred by the Central Government to the states was radically increased in 2015, from 32 to 42 per cent (as recommended by the Finance Commission in a constitutionally-mandated process occurring every five years). The Central Government has also cut down on tied social policy funding to states (known as Centrally Sponsored Schemes), which had seen the Centre re-appropriate some of the responsibility over social policy. States therefore have more flexibility in catering to the significant diversity in local requirements and their own priorities.

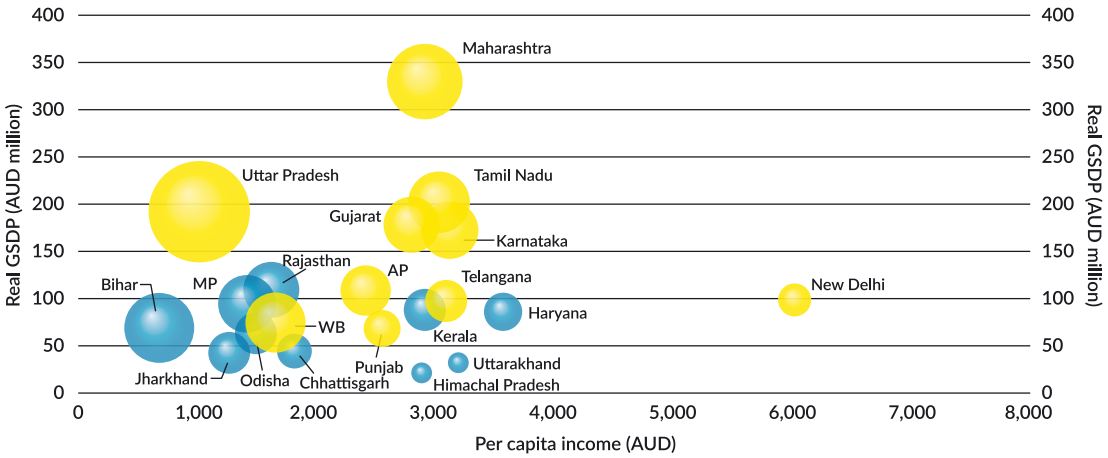
The collective fiscal size of states is also increasing. Over the last few years, states have been collectively spending more than the Central Government, at a rapidly increasing rate. In 2016–17, combined state expenditure was approximately 70 per cent more than Central expenditure (Central expenditure here excludes grants to the states). This was only 6 per cent more in 2011–12.

The GST is contributing to the reconfiguration of Centre-State fiscal relations. The GST Council, which has representation from all states and the Centre, gives states a major role in the way the GST is administered. At the same time, the states now have a diminished ability to use tax policy as a vehicle to attract investment. They will need to find more innovative ways to shape the investment climate to lure investors.

ECONOMIC DIVERGENCE

There are wide variations in the wealth, demography, investment climate and the priorities of states, demanding a granular approach for Australia. Figure 28 demonstrates the variation in per capita income, gross state domestic product and state population of 20 major Indian states.

FIGURE 28: GROSS STATE DOMESTIC PRODUCT AND PER CAPITA INCOME (2016–17)



Source: Ministry of Finance (IN). Economic Survey 2017–18. New Delhi IN: Government of India; 2018.
Note: Per capita income as measured by per capita net state domestic product at current prices (2011–12 series), real GSDP at constant prices (2011–12 series). Delhi refers to the National Capital Territory (and not the National Capital Region). Bubble size represents state population.

India's current level of regional economic divergence is unparalleled. By 2014, the average person in the three richest states (Kerala, Tamil Nadu and Maharashtra) was three times as rich as the average person in the three poorest states (Bihar, Uttar Pradesh and Madhya Pradesh). As outlined in the 2016–17 Indian Economic Survey, 'India stands out as an exception… Poorer countries are catching up with richer countries, the poorer Chinese provinces are catching up with the richer ones, but in India, the less developed states are not catching up; instead they are, on average, falling behind the richer states'.

The divergence across the states demands a focused approach—what works federally, or in one state, does not necessarily work in another. Take demography as an example. Although it is often said that India is young, the mean age in the more prosperous southern states of Kerala and Tamil Nadu is 30 years old, while in the northern hinterland states of Bihar and Uttar Pradesh it is only 19, approaching a generation apart. Whereas fertility rates in Kerala and Tamil Nadu are lower than the replacement rate, Uttar Pradesh and Bihar still record high fertility rates[xxx] of 3.1 and 3.3 respectively (based on 2016 figures).[118] And while life expectancy in Kerala and Tamil Nadu is similar to that in middle-income countries, in Uttar Pradesh and Bihar it compares to low-income countries.

Political alignments or differences between the Centre and state governments have undoubtedly played a part in the variation of state responses to the national reform agenda. Some states ruled by BJP governments have demonstrated better reformist credentials under the ruling BJP at the Centre.

[xxx] Total fertility rate (TFR) in simple terms refers to total number of children born or likely to be born to a woman in her lifetime if she were subject to the prevailing rate of age-specific fertility in the population. TFR of about 2.1 children per woman is called Replacement-level fertility.

COMPETITION AND COOPERATION BETWEEN STATES

Competitive and cooperative federalism has become a powerful dynamic of change, which is seeing states compete to improve their business environments [*see Chapter 15: Understanding the Business Environment*]. For example, a number of states have taken difficult steps on land acquisition and labour reform after the federal politics of reform stifled national legislation on these matters.

There are recent examples of cooperation on national reforms. As of April 2018, 27 of India's 29 states have joined the power sector bailout program, the Ujwal Discom Assurance Yojana (UDAY), to revive insolvent power distribution companies as a result of uneconomic pricing in the electricity sector. The passage of the historic GST, despite its less than optimal structure and implementation challenges, is a game-changing reform achieved through consensus between the federal government, all 29 states and seven union territories.

How this will likely evolve out to 2035

KEY JUDGEMENT

Cooperative and competitive federalism is being hard-wired into India's economic future and this will continue out to 2035, amplifying the importance of states.

INDIA'S POLITICAL STRUCTURE

The link between tangible development and electoral success will strengthen out to 2035. Considerations of caste and community will remain important electoral drivers, but will continue to decline relative to the currency of tangible economic development, including job creation. This will fuel competition between states. So long as market forces are in play, states will continue to compete to bolster their electoral prospects.

CONTINUING DECENTRALISATION

India's federal balance is likely to continue to move towards delegating decision-making power to the states. Despite the state-level consolidation of the BJP, regional parties will continue to be a salient feature of Indian politics, reiterating demands for regional autonomy.

Widening inequality between states will also feed demands for increased regional autonomy. Although richer states including Haryana, Maharashtra, Tamil Nadu and Karnataka raise around 70 per cent of revenue from their own taxes, contributing more to the Centre's finances per capita, they receive fewer funds from the Centre. By contrast, poorer states, such as Assam, Jammu and Kashmir and Bihar raise only around 20 per cent from their own taxes, making them more dependent on transfers from the Centre.

As economic inequality continues to widen, and as richer states continue to age, the political acceptance of this redistribution will likely be strained, adding to pressures on social cohesion and demands for regional autonomy.

INSTITUTIONAL LONGEVITY

The dynamic of cooperative and competitive federalism has been institutionally enshrined in the form of NITI Aayog, which replaced the former Planning Commission. NITI Aayog is directly engaging chief ministers, nudging states to reform with new policy tools, building capacity, encouraging policies in the collective interest and highlighting best practice.

ENABLING ENVIRONMENT

The enabling tools encouraging competition between states are expanding. The Department of Industrial Policy and Promotion's (DIPP) 98-point Assessment of State Implementation of Business Reforms ranking states' relative competitiveness is driving the incentives for states to reform. Cementing and sustaining these incentives is a key priority for the DIPP, including through greater awareness raising of the rankings, transitioning from self-assessment to assessments by business to build greater public confidence in them and privileging newly reformed processes that are enshrined in legislation or completed online, rather than manually.

The number of indices ranking the performance of states, including on health, gender, education, governance and other indicators, is continuing to grow. Similarly, indices comparing cities and districts are also emerging. In March 2018, NITI Aayog released a ranking of 115 districts as part of the Transformation of Aspirational Districts program.

DECENTRALISED FOREIGN ENGAGEMENT

A greater share of India's foreign engagement will shift from national capitals to state capitals out to 2035.

Prime Minister Modi has encouraged this decentralisation since he took office. In 2015, the India-China Forum of State/Provincial Leaders was formed, the first bilateral forum of its kind for India. In 2017, Prime Minister Modi attended the first collective meeting of 16 Russian regional governors. In April that year, financially sound state governments were empowered to borrow directly from ODA partners. More broadly, there has been an increasing emphasis on sister city and sister state agreements in India's East Asian relationships, in particular. And there is great symbolism in Prime Minister Modi's hosting of foreign leaders in Indian states.

In parallel, Australian state governments will also continue to expand the breadth and resourcing of their foreign engagement and economic diplomacy out to 2035.

OPPORTUNITIES FOR PARTNERSHIP

The need for business to develop state and city based strategies

India is far too large and too diverse to approach as a national market. Commercial success in India will increasingly require businesses to recognise the pivotal role of states and the importance of focusing on key markets at the sub-national level. This will demand that businesses dedicate resources to:

- looking for the appropriate beachhead market
- assessing the economic potential, market size, and operating environments of states and cities
- evaluating the risk-adjusted opportunities for the business
- developing targeted strategies for the most attractive market segments [*see Chapter 15: Understanding the Business Environment*].

When considering market entry, the kind of considerations business should examine also include:

- determining the best partners and customer bases
- adopting an appropriate legal and tax structure
- conducting legal, financial and technical due diligence on any potential partner or transaction to minimise risk.

Assessing sub-national markets will necessarily involve an analysis of leading indicators that measure the competitiveness of states. To this end, aggregated Indian statistics on the national economy as a whole are less useful in comparing markets. As a starting point to investigate markets, a snapshot of each of India's 29 states is annexed, and given its significance, the National Capital Region of Delhi is also included.

These snapshots are designed to introduce major features of each state economy and some of the most significant sectoral opportunities for Australia. They provide an evidence base for the competitiveness of states and offer a starting point to assess the risks and opportunities in each state, including quantitative and qualitative indicators of:

- market size (population, gross state domestic product, area)
- growth drivers (growth rates, urbanisation, the number of million plus cities)
- infrastructure (road density, rail density, power deficit)

- the regulatory environment (ease of doing business ranking, quality of governance ranking)
- human development (literacy rate, male-female literacy gap, ranking on gender performance)
- the state of public finances (fiscal deficit to GSDP ratios, health and education expenditure)
- openness (FDI inflows and major foreign engagement)
- industry clusters and sectoral composition of the economy
- track record on reform and future priorities
- political leadership and stability.

The snapshots are not designed to be exhaustive or to be solely relied on for commercial considerations – they are necessarily selective and general in their scope and capture the current picture as at April 2018. There is also an increasing array of products profiling state economies, including subscription-based services, to help business tailor their investment decisions.

The role of the Australian Government in driving a state or city focus for India

While the shape of resourcing will ultimately be defined by a range of objectives for the bilateral relationship, the Australian Government should align its resources across government to the priority states, including by:

- sharpening the focus on priority states in existing initiatives
  - regional aid funding (Australia does not have a bilateral aid program with India but India is included in some regional aid programs)
  - the Direct Aid Program (modest programs administered by the Australian High Commission in New Delhi, the Consulate-Generals in Mumbai and Chennai, currently valued at around $1.2 million)
  - Special Visit Programs
  - Public diplomacy programs
  - Australia-India Council funding
  - Australia India Leadership Dialogue participants
- establishing or strengthening the Australian Government network in relevant regions, including with respect to DFAT, Austrade and other government agencies
- supporting ministerial and senior official engagement with key cities and states
- establishing formal government to government mechanisms
- facilitating sister-city and sister-state partnerships, based on complementarity
- developing sector or state specific sub-national dialogues
- engaging closely the relevant state cadre of the Indian Administrative Services, such as the Chief Secretaries of States and other senior officials, including outreach to expose them to Australian capabilities
- increasing the outreach to alumni of Australian universities in key states and the diaspora communities of key states
- conducting awareness-raising public diplomacy events or nominating champions in key states.

The role of Australian State Governments

The Australian Government must foster a coordinated and coherent approach while supporting state and territory engagement in India. For many Indian interlocutors, there is little distinction between Australian states. To avoid diluting Australia's brand in what is already a crowded market, there is a case for more cohesion on the respective strategies of states and the Commonwealth, and joined-up approaches across sectors where several states are active (including education and training, agribusiness, tourism, resources and energy). State offices in India should also work closely with Austrade to ensure a national approach. What follows is a summary of current engagement by Australian states.

NEW SOUTH WALES

The New South Wales (NSW) Trade and Investment Action Plan 2017–18 identifies India as one of 10 priority international markets. The state's representative is based in Mumbai and the NSW Government has appointed a Special Envoy to India (currently former Premier Barry O'Farrell), who travels representing the Premier of NSW. NSW has sister-state relationships with Maharashtra (2012) and Gujarat (2015), encompassing collaboration on vocational skills training, agriculture, water management and waste treatment technology, and NSW capability in smart cities and infrastructure. Key outcomes in Maharashtra include a partnership to enhance collaboration in the start-up and technology sectors, a government to government contract for water resource management projects, a TAFE NSW contract with the Maharashtra State Board of Technical Education for teacher training and course development, and cultural exchanges between state galleries. There has been little progress in Gujarat to this point, with delays on both sides.

VICTORIA

In January 2018, the Victorian Government launched a 10-year India engagement strategy focusing on education, health and liveable cities. The strategy highlights the important personal and economic connections Victoria shares with India and identifies opportunities for Victoria and India in education, health and liveable cities and places, as well as other emerging sectors. Victoria is building relationships with India's southern states and Delhi NCR, including Andhra Pradesh, Karnataka, Kerala, Maharashtra, Tamil Nadu and Telangana. Victoria has the largest footprint in India of all Australian states, with offices in Bengaluru and Mumbai that are led by the Victorian Government Commissioner to South Asia.

QUEENSLAND

The Queensland Government's Trade and Investment Strategy identifies India as a target market and India was one of seven markets featured in the trade and investment program of the 2018 Commonwealth Games. Trade and Investment Queensland has an office in Bengaluru. Queensland's sectoral interests in India are agribusiness, resources and energy (including METS), education and training and tourism.

WESTERN AUSTRALIA

Western Australia was the first Australian state to open a trade and investment office in India in 1996. It maintains representation in Mumbai. In December 2016, Western Australia established a sister-state relationship with Andhra Pradesh, with a focus on collaboration and business to business support in its key sectoral focus areas of mining and mining services, education, dryland agriculture, energy production and distribution, water, road safety and medical technology.

SOUTH AUSTRALIA

South Australia launched a 10-year India Engagement Strategy in October 2012. South Australia has used annual business missions to improve India literacy, develop exposure, and facilitate collaborative opportunities for South Australian businesses. The state's engagement activities are supported by a representative who is embedded in Austrade, Mumbai. An updated Strategy released in March 2016, sharpens the focus of the strategy by promoting sub-national engagement. South Australia established a sister-state relationship with Rajasthan, given Rajasthan's priority needs and its complementarity with South Australia's expertise, specifically in water and environment management. The Rajasthan Centre of Excellence in Water Resources Management is a major outcome from this relationship and work is underway to establish it. Various projects are in the pipeline to assist in building capacities, showcase South Australian water technologies, and to create commercial opportunities. South Australia will continue to focus on water and environment, premium food, beverage and agribusiness, and education as priority sectors for ongoing engagement with India.

TASMANIA, NORTHERN TERRITORY AND THE AUSTRALIAN CAPITAL TERRITORY

Engagement by Tasmania, the Australian Capital Territory and the Northern Territory in India is currently limited, although there is growing consensus about India's importance among business and government, and high-level visits have taken place.

SUCCESS TO DATE

Australian states operating in India have variously found that:

- Successes have been slow to eventuate and one of the key sources of frustration for states is a perception their efforts are not reciprocated.
- Given global competition, relationships have been overwhelmingly driven from the Australian side.
- Regularly visiting India is important to build relationships especially in the early stages of the relationship.
- Indian states often expect relationships to begin with inward investment from Australia in small projects.
- Indian states often expect to advance discussion in the context of government-hosted trade events so managing their expectations about the representation that can be offered is important.
- Changes in political and bureaucratic leadership on both sides can affect progress.
- Having a representative on the ground can help to advocate for the relationship, expedite processes, bridge cultural differences and help with coordination/communication.
- Signing government-to-government MoUs can be a credible pathway to engagement with commercial operators or chambers of commerce in Indian states, acting as a seal of endorsement from the relevant Indian state government, but establishing a project plan to give practical effect to MoUs is crucial.
- Executing projects and receiving payment from Indian states can take a long time due to the number of approvals required, often right up to the Chief Minister's Office.
- There are advantages to targeting dynamic and influential leaders in Indian states or developing high-level champions for the relationship on both sides.
- Australian Government support for state and territory engagement can often be required to show endorsement, secure access and lend credibility.
- The appointment by Australian states of a special envoy to India can help drive state strategies and build personal relationships.

CONSTRAINTS AND CHALLENGES

Some of the risks to a strategy based on states and cities include tight fiscal conditions and capacity constraints within the states. The capacity of Indian Governments at all levels is low – this is more pronounced at the state level.

The small size of well-trained personnel and administrative resources undermine state capacity, and state governments display particular weaknesses in annual and mid-range planning, coordination, financial and budget processes. Besides weaknesses stemming from the structure of state bureaucracies, political processes contribute to capacity concerns. For example, many state legislative assemblies sit for only 30 to 40 days a year, without adequate time for legislators to scrutinise bills and without the rigour of permanent standing committees.

Compared to international standards, Indian states rely much more on devolved resources and much less on their own tax resources. The RBI has expressed concerns about the deterioration in the state finances in recent years – the Gross Fiscal Deficit to GSDP ratio of states averaged 2.5 per cent in the five years to 2015–16, as compared to 2.1 per cent in the five years previous. But the RBI has described the current fiscal policies of states as broadly sustainable in the long run.

This all points to weak capacity among states to manage resources efficiently, relatively tight fiscal environments, at least in the short term, and limited ability to back up aspirations to foreign economic engagement with the bandwidth to engage, access to capital or an ability to pay.

The prospects of Indian states and cities can be closely linked to political leadership rather than enduring institutions. Political churn can result in rapid change in the competitiveness of states. And intense political competition is part of the DNA of the Indian system (state governments are elected for five year terms).

Governance of cities, in particular, remains weak. The political empowerment of cities is impeded by the limited tenures of mayors and the fact that a significant share of executive power is vested in Municipal Commissioners who are appointed by state governments. The overlapping responsibilities of urban bodies can mean it is unclear which body to target as a partner for engagement.

Urban interests are systemically under-served. Urban and rural electoral constituencies are still distributed on the basis of the 2001 census, with electoral boundaries and the number of seats frozen by law until 2026 – in effect, until after the 2031 census. While the 2001 census reflected an urbanisation rate of 28 per cent, the 2011 census reflected an urbanisation rate of 31 per cent and this is forecast to increase to over 40 per cent by 2035. The upshot is that until 2035, towns and cities will continue to be under-represented politically; so rural interests will continue to distort policy priorities of the state and federal government.

Low 'India literacy' among Australian state and federal governments will also pose a challenge. By necessity, a granular approach demands deeper understanding, but in a number of the states identified as priority states, there is no current presence of any Australian Government agency or any significant Australian business presence. While English is widely spoken across government and business regional languages become more important when directly engaging states and cities.

WHERE TO FOCUS

Of India's 29 states, 10 emerge as priorities for Australia. The selection of 10 priority states takes into account their current and future economic potential, growth trajectory, regulatory environment, ease of doing business, openness, human development and reform prospects. It also takes into account the risks and opportunities in each state for Australia, given our competitive strengths.

These 10 priority states represent those where the returns from strategic investment by government will be the greatest. But this does not suggest that the most logical commercial marketplace for a business will coincide with state boundaries – although state governments remain primary actors in determining the business environment.

This also does not imply that existing or future engagement should cease in other states, or that they do not offer opportunities. For example, South Australia's focus on Rajasthan makes sense given the spread of South Australia's interests.

The dynamic of competitive federalism means that the relative competitiveness of states will not remain static. The selection of these 10 priority states is based on the current evidence. Consideration must be given to the level of market saturation or crowding by other players.

Ten Priority States

First, there are the states with the greatest economic heft – Maharashtra, Gujarat, Karnataka and Tamil Nadu – and among the fastest growing – Andhra Pradesh and Telangana. The four economic powerhouses of Gujarat, Maharashtra, Karnataka and Tamil Nadu are large contributors to GDP, focused on the 'investment climate' with relatively high rates of urbanisation and increasingly sophisticated consuming classes. Andhra Pradesh and Telangana have strong economic momentum driven by a focus on the ease of doing business, infrastructure development, and abundant natural resources. There is strong competition from foreign players in these six states.

Second, there are the states with compelling sectoral opportunities – West Bengal for resources and METS and Punjab for agribusiness and water.

Besides states with immediate and medium term opportunities, there is also value in early investments in states with long term commercial prospects; foremost among these is India's most populous state – Uttar Pradesh. While other states present clearer commercial opportunities in the short to medium term, this is a decidedly long term play, with a higher risk/higher reward profile, for which a targeted, phased approach is appropriate. And given the state's political importance, there are also flow-on benefits for the broader bilateral relationship.

In a category of its own is the National Capital Region, which is not a state, but an inter-state region comprising the city of New Delhi and surrounding districts. It is important both as one of India's most dynamic economic hubs, but also as the seat of the Central Government.

The priority states are profiled below.

MAHARASHTRA

India's most economically advanced and second most populous state, Maharashtra offers diverse opportunities encompassing education, training and skill development, urban infrastructure, financial services, agribusiness, transport and energy sectors. The state capital Mumbai, the wealthiest city in South Asia, serves as India's financial and film capital, akin to combining New York and Los Angeles in one city. Mumbai is the fulcrum of India's prosperous western region, housing the headquarters of India's national financial institutions, regulators, major banks and leading corporates as well as the gateway for imports into western India. Maharashtra's second (Pune) and third (Nagpur) largest cities are industrial powerhouses in their own right. Maharashtra's GSDP has grown at 7.3 per cent per annum over the five years to 2017 and the state accounted for 31 per cent of FDI inflows from 2000–2017.

GUJARAT

As India's fifth largest state economy, Gujarat holds promise for Australian capabilities in education, training and skill development, renewable energy (solar, wind and water technologies), transport and urban infrastructure. The state is an industrial centre closely integrated with seaborne export markets. Its per capita income is 40 per cent higher than the national average and as home to Prime Minister Modi, receives significant national attention. Its strong economic performance has been driven primarily by infrastructure development, public service accountability, fiscal consolidation and streamlining regulations for business. Much of Gujarat's heavy industry is better suited to the large foreign players already engaged in the market, but opportunities for Australian business lie in supplying services as adjuncts to these larger projects.

KARNATAKA

Karnataka is a significant technology-enabled growth engine in India's south, complementing Australian strengths in innovation (nanotech, ICT, healthcare, start-ups, and niche agribusiness technology), best practice water management, life sciences and urban infrastructure. The state capital Bengaluru is the Silicon Valley of India, home to the fourth-largest technology cluster in the world. Bengaluru is the epicentre not only of India's IT, IT-enabled services, pharmaceuticals and biotechnology sectors, but also India's successful space program and India's start-up ecosystem. There are also opportunities for industrial investment in the state's second largest city Mysuru (in food processing and engineering) and the state's major port in Mangalore (in the resources sector).

TAMIL NADU

Tamil Nadu is India's second largest economy and a highly urbanised, leading manufacturing state, offering opportunities in advanced manufacturing, urban infrastructure and water management. The state capital Chennai, the 'Detroit of India', is the centre of Indian automobile and component manufacturing and one of the world's top 10 automotive hubs. The state is a major agricultural producer and a major importer of Australian pulses and grains. Tamil Nadu's wind energy potential is world class. The state has among the highest per capita incomes and best health indicators in India.

ANDHRA PRADESH

Andhra Pradesh leads on the ease of doing business rankings and the state's GSDP has been growing at 11 per cent per annum over three years to 2017. The construction of a greenfield capital city has attracted major foreign players and offers opportunities for Australian infrastructure and urban development providers. The state's resources and energy sector matches Australian capabilities in mining, METS and renewable energy technology. Following the state's bifurcation in 2014, when the state's former north-western region was carved out to become a separate state, Chief Minister Chandrababu Naidu embarked on an ambitious plan to rebuild the state economy, attract investment, pilot policy reforms and drive innovation. Naidu spearheaded Hyderabad's development from 1994 to 2004 and is bringing a similar zeal to major state-building projects. The port city of Vishakhapatnam, with the state's highest per capita income, is being developed as a new fintech hub.

TELANGANA

Telangana, India's newest state and one of India's fastest growing economies (experiencing 9.5 per cent per annum growth over three years to 2017), holds potential for Australia across its biotech, health, energy, fintech, innovation and start-up eco-system. In 2016, only three years since its formation, Telangana ranked equal first (with Andhra Pradesh) on the ease of doing business. Telangana's capital and economic epicentre is the IT, pharmaceuticals and Telugu-language film hub of Hyderabad. The city is India's sixth largest metropolis and a home to major corporates including Facebook, Google, Apple and Microsoft.

WEST BENGAL

West Bengal, India's third most populous state, is positioned as a regional hub for Australian engagement on mining and METS, including as the gateway to the mineral-rich states of Jharkhand, Chhattisgarh and Odisha. West Bengal is the centre of India's mining and resources sector. West Bengal has been the most significant METS market for Australian companies in India. West Bengal is also a significant healthcare hub for eastern India, a gateway to the northeast and a strong agricultural producer. The state capital of Kolkata is India's third largest metropolis, re-emerging as a growth centre and is home to Coal India. Kolkata is projected to be in the top 10 fastest growing cities in Asia out to 2021.

PUNJAB

Punjab offers opportunities in agribusiness, as an agricultural powerhouse producing 16 per cent of India's wheat, 11 per cent of rice, and a major share of diary. Over 80 per cent of the state is under intensive agriculture and agricultural yields per hectare are around double the national average. There are also sectoral opportunities in water management, given irrigation and groundwater quality challenges, as well as in sports. Punjab remains among the largest sources of Indian migrants and students in Australia, yielding strong diaspora connections. Although Punjab's economy is currently sluggish, exacerbated by governance challenges, it remains a relatively prosperous state and a breadbasket, accounting for 20 per cent of national food production. Pressures on productivity and sustainability have started to affect the agricultural sector, but this holds promise for Australian expertise in conservation agriculture and water management.

UTTAR PRADESH

Uttar Pradesh is India's largest state of over 220 million, a bellwether for national politics and India's third largest state economy driven largely by agriculture. It remains one of India's less developed states. The landlocked state has struggled with poor natural resource endowments and Australian commercial engagement has been limited to date due to poor perceptions of the ease of doing business and infrastructure gaps. But the state has unparalleled scale, untapped markets and out to 2035, the significance of its size and national political clout will only increase. Although per capita incomes are low across the state as a whole, there are pockets of economic potential with relatively higher income segments, particularly in the state's west. Development in western Uttar Pradesh is driven by its proximity to New Delhi, including in the cities of Ghaziabad, Meerut, Mathura as well as Noida, north India's

emerging IT and business process outsourcing hub. Lucknow, the state capital, is the base of India's largest tanneries, a centre of wheat, rice and sugarcane production, and emerging centre for aeronautical engineering. And Agra is a major agricultural processing centre, including of cotton, dairy and flour milling.

For Australia there are long term commercial opportunities in transport infrastructure, agribusiness and dairy, and skill development. While these opportunities will not be conducive to commercial engagement in the short term, they warrant early government investment to position Australia well into the long term. This Strategy recommends a targeted, phased approach.

Phase 1: As the state rolls out a large number of brownfield road projects, Australia should invest in a transport infrastructure partnership to assist in assessing the feasibility of road projects in the pipeline, including their financial viability. In agribusiness, the state will have long term demand for capital investment in food processing, accounting for about a fifth of India's total food production, including a major share of pulses, dairy, wheat, sugarcane, maize, potatoes and mangoes. Australia should ramp up engagement on specialised agricultural services using ACIAR expertise.

Phase 2: As discussed in *Chapter 3: Education Sector*, the skills challenge facing India cannot be entirely met through bricks and mortar. We need to develop digital delivery with workable revenue models. These should be developed and trialled elsewhere. Once proven, their deployment in Uttar Pradesh could be transformative.

DELHI – NATIONAL CAPITAL REGION

Delhi NCR comprises not only the seat of Central Government in New Delhi, but also segments of three neighbouring north Indian states: Haryana, Rajasthan and Uttar Pradesh. It is a major economic hub, comprising multiple special economic zones and industrial clusters, such as the IT services centres of Gurugram and Noida and the manufacturing hubs in Faridabad and Alwar. NCR has a prosperous consumer base – the per capita income of New Delhi is almost three times the national average. It accounts for a fifth of FDI inflows into India. Australia's sectoral interests in NCR span financial and other services (particularly in Delhi proper and the Haryana sub-region), infrastructure, tourism, science and innovation, health and agribusiness (in the Rajasthan and Uttar Pradesh sub-regions). A large number of Australian companies see NCR as an entry point and base for doing business in India. Governance of the NCR is split between the Central Government, three states and one union territory government, as well as an array of municipal bodies. So the relevant government counterpart depends on the particular sectoral opportunity and sub-region involved.

RECOMMENDATIONS

73. Ten priority states

Focus on 10 priority Indian states for strategic investment by government, namely Maharashtra, Gujarat, Karnataka, Tamil Nadu, Andhra Pradesh, Telangana, West Bengal, Punjab, Uttar Pradesh and Delhi NCR

- over time, Austrade should realign its priorities and presence in line with the states, cities and sectors identified in this report.

74. Increase the Australian Government's footprint in India

74.1 Upgrade the small Austrade presence in Kolkata into a full Consulate-General

- focusing on economic diplomacy in mining and resources in India's eastern mineral-rich states of West Bengal, Chhattisgarh, Jharkhand and Odisha
- a mission in Kolkata would represent a strategic investment in Australia's ability to access opportunities in India's resource-rich eastern states and the emerging north-eastern states
- this could build closer relationships with state governments, including on shared policy experiences and advocacy for reforms in the Indian mining sector and to service the expanding METS sector in Kolkata, other mining-related activity and attract inward investment.

74.2 When resources permit, establish a Consulate-General in Bengaluru to focus on economic diplomacy in technology and innovation

- a post in Bengaluru would represent a strategic investment in Australia's ability to access opportunities in the world's fourth largest, and second fastest growing, technology cluster.

UNDERSTANDING THE BUSINESS ENVIRONMENT

CHAPTER FIFTEEN

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SUMMARY

- Opportunities exceed difficulties in the Indian market for Australian business. But success in this market requires a clear-eyed understanding of the business environment and differences in business culture.
- This chapter outlines some of the key differences between the Australian and Indian commercial environments that business has raised throughout the consultations for this Strategy. For Australian companies seeking to do business in India, these include the challenges posed by the regulatory environment, limited state capacity, corruption and differences in business culture, in particular, the prevalence of family-owned businesses.
- Ultimately, it is also a challenge getting noticed in a crowded market. The costs of doing business weigh heavily on Australian SMEs that lack the resources to engage in a complex marketplace with a large bureaucracy.

EASE OF DOING BUSINESS

Key judgement

India is committed to improving the ease of doing business. But domestic and foreign businesses continue to struggle to navigate India's complex regulatory environment, which varies significantly across India's states.

India improved 30 places in one year to a ranking of 100 in the World Bank's 2018 global assessment on the ease of doing business. This reflected a series of business-friendly reforms and the streamlining of regulatory procedures. For example, India recently introduced a GST, which provides a common indirect tax structure and unified common market. It may appear complex to firms in the short term, with the multiple layers currently in place, but is expected to improve the ease of doing business in the long term.

Despite this progress, many Australian and other foreign companies operating in India face bureaucratic inefficiencies, inadequate infrastructure, difficult regulatory procedures, inconsistently applied and frequently shifting regulation, retrospective and seemingly arbitrary tax liabilities, as well as restrictive land acquisition and labour laws. A ranking of 100 in the World Bank's 2018 assessment means India is still in the bottom half and impediments remain widespread and ingrained. In practical terms, the most difficult areas relate to starting a business, obtaining permits and enforcing contracts.

There is wide variation in the ease of doing business across states and sectors. The individual state assessments annexed to the Strategy provide a snapshot of the performance of India's 29 states and the National Capital Region of Delhi. As the dynamic of cooperative and competitive federalism takes root, states are being exposed to more competition, driving them to progress reforms to attract investment.

Key takeaway

Australian businesses need to identify the right local sources of expert market advice, understand how legislation and regulations are practically applied, recognise the value of a targeted approach to the most competitive states or sub-national markets and tailor their business and investment decisions accordingly [*this is expanded in Chapter 14: A Collection of States, which outlines priority states*].

TRANSPARENCY AND CORRUPTION

Key judgement

While India has been making progress, the lived experience of many businesses remains one of pervasive corruption.

Combating corruption remains a high political priority of the Modi government and voter tolerance of corruption is wearing thin. In August 2017, marking the 70th anniversary of the country's independence, Prime Minister Modi said 'We are fighting corruption – for the bright future of India and the wellbeing of our people…With the help of technology, we are trying to promote honesty and transparency in the country. Our fight against black money will continue; our fight against corruption will continue'.

A range of recent policy initiatives of the Indian Government have been aimed at reducing the opportunities for corruption and crony capitalism, including: the demonetisation of 500 and 1,000 rupee notes in November 2016; the push for digital payments to formalise one of the world's most cash-intensive economies; the transition to directly transferring welfare to beneficiaries' bank accounts; the new bankruptcy code passed in 2016; and incremental political finance reforms.

The legal framework for combating both public sector and private sector corruption is making progress. The *Companies Act 2013* has introduced higher standards of corporate governance. The courts have acted to correct irregularities, as in the high-profile Supreme

Court cases quashing the irregular allocation of India's 2G telecommunications spectrum and coal mining blocks. There are also high-profile cases of India pursuing private sector firms and individuals abroad.

The indications are that high-level political corruption at the Centre has declined since Modi's election in 2014, although this is less evident at the official-level and in the states.

There are also signs that the extent of crony capitalism has declined, although it remains a concern. According to the 2016 crony capitalism index of *The Economist*, India's crony sector wealth was estimated to account for 3.4 per cent of GDP, a level similar to Australia.[xxxi] This was a significant improvement on India's performance in 2008 when crony wealth reached 18 per cent of GDP.

However, this changing sentiment is yet to affect the lived experience for most businesses. In particular, corruption is seen to pervade the police, judiciary and public service, at every level of government. The worst-affected sectors include infrastructure, real estate, mining, aerospace, defence, power and utilities. Processes with elevated corruption risk include public procurement processes, land acquisition and natural resource allocation.

India still features prominently in various indices of corruption in business. The National Council for Applied Economic Research's surveys of Indian business conducted in 2016 and 2017 find that corruption remains the number one constraint faced by business. This is echoed by the Global Competitiveness Report of 2017 which ranks corruption as the most problematic factor of doing business in India. More broadly, Transparency International finds that India has the highest bribery rate in the Asia-Pacific region, with nearly 7 in 10 Indians who had accessed public services reporting paying a bribe. In Transparency International's *Corruption Perception Index 2017*, India ranks 81 in the world (first being least corrupt).

A key driver of corruption is the opaque and discretionary power of officials and politicians. The fact that many officials are underpaid and subject to arbitrary political interference exacerbates the situation. Expectations of bribery, gifts and facilitation payments to expedite public services or applications for industrial licences are not uncommon. In general, enforcement and monitoring is weak, and impunity for public officials is perceived as widespread.

The lack of transparency in India's political finance regime adds to perceptions about an uneven playing field. Vast amounts of undisclosed donations are deployed to finance political campaigns in both state and federal elections, shielding the relationship between India's largest business groups and political parties.

Key takeaway

Australian companies need to prioritise an in-depth, forensic approach to due diligence before embarking on new business relationships in India. Australian companies can minimise the risks by being careful about their choice of local partner, by taking steps to ensure they have the appropriate market entry strategies and maintaining clear policies on corporate conduct including a strict 'no corrupt payments' policy. It is essential that Australian businesses seek their own legal advice in relation to these issues.

BUSINESS CULTURE AND STRUCTURE

Key judgement

Differences in Australian and Indian business culture present challenges for commercial relationships, especially contract negotiation, interpretation, and dispute resolution. Large, diversified company groups owned by families dominate India's corporate landscape. These firms can operate on longer time horizons and

[xxxi] Crony capitalism here refers to nominally free-market economic systems where businesses succeed due to close relationships between with the political class, including government officials.

with greater levels of risk compared to Australia's listed companies.

There is a deceptive familiarity between Australia and India. The similarities in federal, legal and parliamentary systems and a shared use of the English language can often assist relationships, but also catch companies unprepared for divergent business norms that sit behind these formal structures.

The business cultures of Australia and India differ with respect to the levels of comfort with uncertainty, the process and length of decision-making and the relative importance of hierarchy and seniority. Differences in business culture extend to different approaches to contract negotiation and enforcement, dispute resolution and the expected role of government in securing commercial outcomes.

Australian firms must also be aware of the dynamics of family-owned Indian businesses. They exercise significant market power and political influence; in 2016, 15 of the top 20 business groups are family-owned and over 60 per cent of Indian listed companies are majority family-owned. Many are highly diversified conglomerates, structured in complex chains of holding companies and subsidiaries, allowing outside capital to be brought in without diluting family control.

The performance of individual elements of family-owned businesses can vary significantly. Due diligence on partners should reflect not only the operations of the overall firm, the family group, and the overall management, but also the commercial performance of the specific arm being considered for partnership.

Family-owned businesses are generally more capable of developing relationships over a long term strategic timeframe, including because they have more freedom to pursue long term growth strategies and acquisitions which might incur short to medium term losses. This can bring about a mismatch of time horizons with their international commercial partners.

Succession planning within family-owned businesses can also complicate external engagement. Newer generations of family-owned businesses tend to be less wedded to the business and more likely to import the management practices of major global companies. Mooted changes to corporate governance within India, such as a proposal to separate the roles of chairperson, CEO and managing director in listed companies with over 40 per cent public shareholders, could have a significant effect on the dynamics of family-owned businesses.

In contrast to India, the Australian corporate landscape is dominated by companies listed on the ASX, driven squarely by the interests of shareholders, including a focus on short term results.

Whereas Australian companies generally determine business planning on the terms and conditions set out in tender documents and contracts, Indian governments and firms may be more likely to expect that agreements are open to reinterpretation or renegotiation, and that building strong business relationships will create flexibility in commercial terms and conditions.

The experience of Indian investors in the Australian mining sector is indicative of these differences, for example, around the inability to renegotiate water rights, and government's inability to curtail legal disputes by affected stakeholders. The experience of Australian companies involved in the New Delhi Commonwealth Games in 2010 also reflects differences in the approach to resolving conflicts, including the withholding of contract payments and the litigation of disputes.

Key takeaway

Australian companies need to inform themselves about the differences between Australian and Indian business culture and values and adopt corresponding strategies to market entry, strategic planning, contract negotiation and dispute resolution. Business planning will need to manage the different time horizons Australian shareholders and Indian partners may expect.

STATE CAPACITY

Key judgement

All levels of government in India remain stretched on resourcing but still heavy on bureaucratic processes. This puts a strain on service delivery and perpetuates regulatory uncertainty, exacerbating concerns regarding the inconsistent application of regulations, the independence and competence of regulatory agencies, and the delineation between regulators and the government.

Prime Minister Modi needs an empowered bureaucracy to support his government's broader agenda. Recent public sector reform initiatives have included technology-enabled monitoring of the attendance of public servants, e-governance to streamline public service delivery and reduce corruption, as well as tentative moves to adopt lateral recruitment at lower levels of the bureaucracy.

The paradox of the Indian public service is not that there are too many bureaucrats but that there are too few at the levels that matter. It is a top-light and bottom-heavy system. Impediments to a more empowered bureaucracy include this thin layer of decision makers, staffing shortfalls, rigid bureaucratic norms, recruitment policy, performance management systems, and a prevailing culture of deference and inertia which discourages innovation. According to a 2014 measure of government effectiveness by the World Bank, capturing the quality of the public service, independence from political pressure, and the quality of policy formulation and implementation, India ranks in the 45th percentile globally.

Given India's size, there is a paucity of Indian Administrative Service (IAS) officers who hold the key management positions in the Central and state governments and statutory bodies across the country. The current number of IAS officers is only around 5,000. This is an astonishingly low number even for Australia, let alone a country of 1.3 billion people. This is in addition to 2,600 Indian Forest Service officers and 3,900 Indian Police Service officers; which together comprise the three elite All India Services (despite the several million officers of the Central Civil Services and State Civil Services, they have only limited discretion or capability to make decisions independent of guidance from an IAS officer).

The result is significant capacity constraints at federal, state and local government levels in India, with government often failing to effectively deliver routine public services, including access to basic infrastructure, power, water and sanitation. These constraints are exacerbated by the amount of red tape officials need to navigate in doing their jobs. India cannot deliver on its potential without stronger institutions and wide ranging public sector reforms. Policy implementation and service delivery are perhaps the two largest governance challenges India faces.

Australian business should be aware of the weaknesses of Indian public institutions, which manifest in a divide between the rule of law in practice and the rule of law on paper. Many Indian public institutions struggle with managing human resources, the pressures of political interference and public accountability.

Key takeaway

Australian business needs to consider the impact of limited state capacity in India on their investments. In some cases, local advocates, agents or business partners can be powerful in helping to understand and shape regulatory processes. Limited state capacity also means that Australian companies need to be prepared to dedicate resources to India for the long haul and demonstrate commitment to the market.

GETTING NOTICED AND IMPROVING 'INDIA LITERACY'

Key judgement

Given the complexities of the Indian business environment, one of the foremost challenges for Australian firms is getting noticed. This affects commercial prospects, the ability to attract the right partners as well as the ability to gain the attention and focus of Indian Government decision-makers.

Australia is competing in an increasingly crowded marketplace. India more naturally looks to the United States, Japan and Europe as market leaders. And it is even harder for Australian companies to cut through in sectors dominated by state-owned enterprises, as in the resources sector.

Part of the solution is for Australia to target the areas in which Australia is genuinely globally competitive. The sectoral chapters of this Strategy set out where these are strongest. Complementing this effort, as part of their market strategies, individual businesses need to consider how best to explain the way their product contributes to India's own policy goals. Partnering with successful companies in India from Australia's major regional partners, including Japan and Singapore, might offer an avenue for Australian businesses to get traction.

Improving literacy of India's business environment within corporate Australia should be a first-order priority. The boards and senior leadership of Australia's biggest companies, particularly those listed on the ASX, have persistently low levels of 'Asia literacy'. This is not conducive to supporting long term strategic investments in Asian countries, especially those with relatively challenging business environments such as India. Asialink Business has found that 67 per cent of ASX 200 board members show no evidence of extensive experience operating in Asia while 55 per cent demonstrate little to no knowledge of Asian markets.[119] This is despite Australia's domestic consumer base increasingly reflecting a multicultural Asia.[xxxii]

Key takeaway

A local presence in India is important to getting noticed. Having a local office, credible local partners with established networks or high-profile champions can all play a critical role in explaining the environment and bringing products to the attention of customers or challenges to the attention of officials and politicians. Even with a greater focus on India, the Australian Government will have relatively constrained resources to deploy to facilitate outcomes as compared to some other foreign governments.

[xxxii] 12.2 per cent of Australians declared their Asian ancestral background from the top 30 countries in the 2016 Census.

RECOMMENDATIONS

75. Improve India literacy in Australian firms

75.1 The Australian Government and business should work together to strengthen the 'India literacy' of Australian firms.

- Australian Business Week in India should be held every two years, with a focus on sectoral streams and the priority states. Consideration should be given to how to bring together the full ecosystem that supports exporters, ranging from financiers, investors, consultants, training institutions and tech start-ups.
- The CEO Forum could play a greater role, for example, commissioning policy papers from members outlining ways to overcome constraints businesses face working in either jurisdiction.

75.2 To improve India literacy in Australian companies, the Australian Government should encourage company boards to strengthen their diversity, including expertise in Indian and other Asian markets

- the Australia-India Council board members along with Boards of other Foundations, Councils and Institutions (covering China, Japan, Korea, Indonesia and ASEAN), should meet with CEOs of large companies to champion the benefits of Asia expertise on Australian boards.

76. Expand institutional engagement with the Indian bureaucracy

Australia should increase institutional engagement to build capacity and networks within the Indian bureaucracy

- increase engagement between the Australia New Zealand School of Government (ANZSOG) and India, building on its international programs which have been delivered to Indian officials in the past
  - this would also enable us to collaboratively work on policy challenges, and build networks of influence within each other's bureaucracy
  - establish scholarships to sponsor Indian participation and look to establish a reciprocal scheme with the Indian Government
  - establish outbound ANZSOG programs to increase the India literacy of Australian state and federal public servants, including through engagement with counterparts in key Indian states
- expand existing secondments between the Australian Treasury and NITI Aayog, and establish secondments between Austrade and Invest India, Infrastructure Australia and an appropriate Indian organisation, between the ASX and Bombay Stock Exchange and between our central banks.

77. A Public Sector Dialogue

Re-initiate efforts to hold a regular public sector dialogue led by the Secretary of the Department of Prime Minister and Cabinet and Indian counterpart(s) to share Australian and Indian public policy reform experiences.

TRADE POLICY SETTINGS

CHAPTER SIXTEEN

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SUMMARY

- Since the 1991 economic crisis, India has been incrementally integrating into the global economy and liberalising its trade settings. For example, trade in goods and services as a percentage of GDP has risen from 15.7 per cent in 1990 to 39.8 per cent in 2016 – around the same level as Australia – and India's simple average most favoured nation applied tariff in 2016 was one-tenth of what it was in 1990–91.
- While this progress is positive, India's approach to trade policy remains challenging.
- The Indian Government is focused on driving economic growth through greater foreign investment and to a lesser extent trade. But it also retains deeply protectionist instincts, wanting to keep the government's capacity to intervene in the economy and shield domestic firms and rural communities from competition.
- A high quality Comprehensive Economic Cooperation Agreement (CECA) with India would provide legal certainty for Australian exporters and investors in a market where unpredictable policy changes make doing business difficult.
- However, our negotiating positions on CECA are too far apart for the conclusion of a CECA to be a realistic objective in the near term.
- Australia should focus instead on securing some of the objectives of a CECA through the Regional Comprehensive Economic Partnership (RCEP) and return to CECA negotiations only once RCEP is concluded.
- India's openness to foreign trade is likely to increase out to 2035, albeit incrementally. Domestic pressure for change, from Indian consumers as well as business and state governments, is likely to build. Despite India's desire to be self-sufficient and its traditional reliance on import substitution, the gap between what India consumes and what it can produce will continue to widen, even if Indian productivity improves.
- These forces could create entry points to work with Indian partners to improve trade policy settings.
- Success in India will require greater engagement and more creativity from Australian Governments and business than we have needed elsewhere in Asia.

INDIA'S TRADE POLICY SETTINGS – A HISTORY OF INCREMENTAL REFORM

Many senior Indian policy makers retain a historical distrust of the market economy and an understandable concern about the effect on the poor of unmanaged economic growth.

This is particularly apparent in India's rhetoric in the World Trade Organization (WTO), which tends towards a managed trade and industrial policy agenda rather than a trade liberalisation agenda.

Weak economic conditions in the 1970s and 1980s, followed by an economic crisis in 1991, prompted India to begin gradually opening its economy to foreign goods and services. The 1991–93 Tax Reform Committee, led by Raja Chelliah, identified the reforms necessary for a well-functioning trade policy. For example, Chelliah's Committee noted the extreme complexity of India's tariff schedule as a brake on growth and recommended drastic reform of India's tariff system.

Since then, nearly three decades of cautious economic reform have resulted in the Indian Government steadily reducing tariffs and becoming more integrated into the global economy:

- India's average applied tariff in 2016 was about one tenth of what it was in 1990–91 (125 per cent in 1990–91; 13.4 per cent in 2016)[49]
- India's total goods and services trade as a percentage of GDP[120] has risen from 15.7 per cent in 1990 to 39.8 per cent in 2016 (Australia's ratio was nearly identical at 40 per cent in 2016; China at 37.1 per cent; United States at 26.6 per cent). Importantly India's trade growth has been driven as much by imports as exports
- prior to this period of liberalisation, India's goods and services exports as a share of gross domestic product was the same in 1990–91 (6.9 per cent) to what it had been in 1950–51 (6.8 per cent).

India has made concerted efforts to facilitate trade through improving customs procedures. The 2005 introduction of a Risk Based Management System removed the routine (and inefficient) requirement to examine all imported goods. The 2011 introduction of self-assessment processes further improved the efficiency of India's customs procedures.

However this positive trend is tempered by deep-set protectionist sentiments.

An important part of India's trade policy narrative is that reform has been managed without major disruptive consequences. India views the policy settings that we see as 'protectionist' as important tools for managing its economy, particularly minimising social disruption. It considers these tools give it the political space to slowly, and successfully, introduce international competition to parts of the domestic economy.

India's approach is unlikely to change until the people affected by trade liberalisation have educational, job and income prospects strong enough to withstand any perceived disadvantage. India's high levels of tariff protection, and especially the unpredictable nature in which it is often applied in sensitive sectors like agriculture, will remain a persistent obstacle to our trade interests.

The competing forces in India's trade policy mean its liberalisation efforts will lag behind other major economies and will fluctuate with the political environment. It is important to acknowledge that India is at a different point in its economic journey than North Asia and even ASEAN members and is more constrained by the demands of its democracy.

But the size of the Indian economy, its demographic profile and Australia's competitive advantage in key sectors of Indian demand (for example agriculture, resources, education, health) means we cannot afford to neglect our trading relationship with India even though it will be hard work.

Intensifying the India trade relationship also presents opportunities beyond the Indian market itself. It is good risk management and an important hedge against overreliance on markets in North Asia. Working collaboratively with India on technology and innovation could also result in new products and better services for the Australian economy.

DRIVERS OF INDIA'S TRADE POLICY SETTINGS

India's trading model is shaped by the central role of government in deciding what India does and does not need. Policymakers resist the notion that access to competitive imports will strengthen India's export capacity and productivity – even though the Indian states that are the most open have higher productivity, growth rates and income levels.

India's desire to protect and generate employment drives its trade policy. India remains concerned that its domestic agricultural and industrial sectors would be uncompetitive with more open trade settings. This is particularly evident in India's sensitivity about its bilateral trade deficit with China.

India's concern about employment also explains India's focus in trade negotiations on access to foreign labour markets for its growing labour force. After all, India receives more remittances than any other country, with USD65 billion in 2017.[121]

So it restricts the flow of goods and expertise into India and discourages competition from outside firms. And, by default, it deters Indian companies from using the best possible inputs (goods and expertise) into India's own manufactured exports – about one-quarter of India's exports are contingent on imports.

India's trade policy settings are also driven by revenue considerations. Unlike India's large domestic cash economy, legal border transactions are easily observable and taxable. The introduction of the GST should, over time, enable the government to reduce its reliance on tariffs. In the interim, tariffs provide a steady income stream for the government in a low taxation economy

- India's tax to GDP ratio is around 11 per cent according to the World Bank[122], far lower than the OECD average of 34 per cent[123]
- customs and other import duties comprise around 15 per cent of India's tax revenue[124] (for Australia it was around 2.5–3 per cent in five years to 2017).

The size and potential of the Indian domestic market is compelling but policy settings will continue to be important to shape India's future economic growth. India's attitude to trade is influenced by its judgement that growing domestic consumption will drive growth, that it won't adopt the export led model of East Asia. The level of interest in servicing its large and growing domestic market means India's shortcomings on liberalisation will be endured by foreign firms. India also believes it can entice foreign markets to accept Indian exports without commensurate domestic compromises.

The international investors India seeks are frustrated with the ways India's trade policy settings restrict business success. India will not maximise its economic potential without improving the productivity of its land, labour and capital – this cannot be done by relying solely on the domestic market.

GOODS, TARIFFS AND NON-TARIFF MEASURES

India's tariff system is complex and rates are high. India's simple average tariff[xxxiii] (what is applied at the border) is 13.4 per cent compared to China at 9.9 per cent and Australia at 2.5 per cent.[49] India also applies a number of additional charges to the basic duty that can push average tariffs up to around 28 per cent (though some deductions are available if the goods are inputs to manufacturing or services).[125]

India retains a significant gap between the tariff levels they have bound in the WTO and other trade agreements, and the rates they apply at the border. This maximises India's policy flexibility in managing its economy, and enables the frequent and unpredictable changes it makes to tariffs. Compounding this challenge, exporters are given no advance notice of tariff changes, with no transition periods or grandfathering arrangements

[xxxiii] Using the Trade Weighted Average measure reveals a similar result: India's tariffs are considerably higher than Australia's.

for exports already under contract or even in transit.

Non-tariff measures also contribute significantly to market access challenges. Customs duties along with import licenses, standards and certification requirements add further cost and complexity to trading. Many of the permits and approvals required to do business in India are in the hands of state or local authorities, where delays and setbacks remain common [*sectoral chapters outline non-tariff measures constraints in further detail*].

Access to India's agricultural market for Australian exporters is particularly contentious. The sector is politically sensitive with close to half of India's workforce employed in agriculture. India regularly raises and lowers its tariffs on agriculture – within its international commitments – depending on domestic demand and production. It does this with the conflicting aims of seeking to protect farmers' incomes on the one hand while avoiding inflationary pressures for consumers on the other. The end result is high average tariffs on agriculture: India = 32.7 per cent; China = 15.5 per cent; Australia = 1.2 per cent.[49]

These challenges extend across the economy. Foreign investors who use India as a link in their global supply chains (for example car manufacturers) need the prices of their globally sourced inputs to remain stable. But short term political demands (for example changes to tariffs without notice) regularly outweigh the need to provide certainty to foreign investors. This also manifests in arbitrary, and often backdated, imposition of tax liabilities.

The key aim for Australian policy should therefore be to make India's tariff regime more predictable for Australian exporters. Our experience in North Asia is illustrative – Australian exporters succeed despite facing high tariff rates because they are applied with consistency.

SERVICES, RULES AND PEOPLE

India has an export focused approach to services, many of which are able to compete on price and quality in world markets. Services contribute more than 35 per cent of Indian exports and more than half of its GDP, while in Australia the services sector accounts for around 22 per cent of total export value.[126] India energetically pursues access to foreign labour markets through its trade agreements, including with Australia.

To date India has not shown much flexibility on allowing foreign access to its services markets. Burdensome domestic regulations deter services imports, just as high tariffs deter the importation of goods. And foreign participation is significantly restricted by vested interests that control professional standards and qualifications.

India's restrictive policies on services imports means it misses out on accessing Australian expertise and experience in areas that are a priority for India's economic development. India has been unwilling to recognise some Australian education qualifications, including for online and distance courses [*see Chapter 3: Education Sector*], and access to the Indian market for foreign professionals in some sectors is prohibited entirely, such as the legal sector, although commercial arbitration proceedings are open to Australian practitioners on a 'fly in/fly out' basis, provided it is undertaken on a casual and not regular basis. Weak IP protection laws, approval and license bottlenecks and price controls are disincentives in the health sector [*see Chapter 8: Health Sector*]. Extensive regulatory requirements for the formation of new companies in the banking, financial services and insurance sector have long posed a barrier to entry for prospective companies [*see Chapter 10: Financial Services Sector*].

However, there is the potential for change, and over time the services sectors could be an area where our trade agendas better align.

Technological advances in digital connectivity and automation will change how services are provided and traded. This will lead to more digitally-enabled services trade, new markets for exporters and potentially cheaper inputs to Australian companies [*see Chapter 1: The Macro Story*].

The diverse nature of services trade, in contrast to trade in goods, requires the setting of common rules to promote transparency of laws and

regulations, including issues around IP protection. Increased Indian engagement in rule setting to be consistent with international standards will provide greater certainty to business in both countries looking to expand into the other's market. This will become increasingly important to support e-commerce and digital trade.

WHERE DO CECA AND RCEP FIT IN?

Australia and India have been negotiating a bilateral free trade agreement (FTA) – the Comprehensive Economic Cooperation Agreement – since 2011. The purpose of a CECA is to boost the two way trading and investment relationship by reducing barriers, increasing transparency and enhancing investment protections.

In a report with a 20 year time horizon, I have not sought to go into the details of what is holding up the conclusion of a CECA. Suffice to note that our negotiating positions are too far apart to make the conclusion of a CECA a realistic objective in the near term.

Australia is also negotiating with India in the Regional Comprehensive Economic Partnership. RCEP brings together the collective economic weight of India, China, ASEAN, Japan, Korea, Australia and New Zealand. The broader bargain involved in RCEP may prompt greater and earlier concessions from India, and is a higher priority for India than concluding CECA.

India's ability to make sufficiently credible market access commitments in RCEP is constrained by its sensitivities in goods, particularly agriculture, but also by its desire to lower its trade deficit with China. A low-ambition agreement, that does not deliver commercially meaningful outcomes, would be a missed opportunity for the region.

Despite these challenges, the RCEP negotiations potentially offer an earlier prospect of achieving market access and investment facilitation and protection than the CECA negotiations currently offer. Australia should prioritise trade negotiations with India in RCEP and return to bilateral trade negotiations once an RCEP deal is concluded.

A CECA with India remains a worthwhile objective. Should India recalibrate its approach to trade liberalisation, Australia should resume CECA negotiations as a priority.

Australia would make a natural test case as a partner for India to conclude a high quality FTA, given our economic complementarities and our limited scale to affect Indian producers, particularly in the agriculture sector, unlike major economies such as the European Union or United States. Many Australian agriculture exports are aimed at the premium end of the Indian market and would not displace the production of India's smallholder farmers.

WHAT FORCES WILL LEAD INDIA TO ADOPT A MORE OPEN APPROACH TO FOREIGN TRADE?

Internal political drivers are more important to India than international ones. Protecting jobs and revenue streams, and vested local interests, will continue to constrain reforms.

In the longer term, India's economic philosophy will need to change for it to adopt a more open approach to foreign trade. Most importantly Indian policymakers would need to view trade liberalisation as a source of economic growth that creates national and personal wealth. There are emerging forces that could drive such a shift.

Consumer demands

The gap between what India consumes and what it can produce domestically will continue to widen out to 2035, necessitating an ever-growing need for imports.

Although India prefers import substitution to imports, domestic production gaps in goods and services, now and in the future, will oblige it to import goods and services. For example, by 2030 over 90 per cent of India's metallurgical

coal demand will be met by imports[12], and the structural gap between the amount of food India can produce and its demand for agricultural commodities will grow, even if Indian productivity improves.

Indian consumers will become increasingly aspirational and sophisticated, demanding more and better products than its domestic market can provide.

As incomes rise, consumer demand will be a key driver for change as Indians seek a broader range of goods and services, of higher quality, at competitive prices. Consumers will want the option of purchasing premium domestic products or foreign sourced goods in the same way as their global peers. This includes through online channels where India's IT sector has the capacity to facilitate this growth in e-commerce.

Agricultural productivity

If farm incomes rise and the proportion of employment in agriculture falls over time, the agriculture sector could become relatively less politically sensitive, paving the way for more constructive trade policies.

India's agriculture sector employs 43 per cent of the total workforce but contributes only 17 per cent of GDP. This labour share will need to change dramatically in order for India to improve agricultural productivity. This political sensitivity hinders progress in trade negotiations.

The sector is inefficient but receives enormous political attention. India is taking steps to improve agriculture productivity through enhanced irrigation, faster seed replacement, precision agriculture and by seeking to facilitate better links between sellers and buyers.

Budget pressures

In the meantime, budget pressures might force reform in India's approach to protecting its agriculture sector.

India's competing regulatory regimes of suppressing domestic food prices while also supporting producers already account for 20 per cent of India's budgetary expenditure. Despite the quantum of spending, India's agricultural incomes remain under stress. This distorts prices, making it harder for exporters to enter the market.

But Indian governments may be unwilling to allocate such a large proportion of their budgets out to 2035 to sustain this level of support to farmers, especially given the levels of underinvestment in critical sectors such as education.

A globally connected economy

The contribution to India's economy of its highly productive and globally competitive services industry may lead India to seek greater access for its services exports into foreign countries. This could create space in trade negotiations for more ambitious outcomes if India's offensive interests in services expand beyond their current narrow focus on the movement of natural people.

State-led pressure for change

As competitive federalism takes hold and more power, including over budgets, is devolved from the Centre to the states, India's more economically advanced states might play an increasingly important and positive role in India's trade reform debate.

As states increasingly recognise the link between openness, productivity and growth, they could demand more open and consistent trade policy settings from the central government. Four of India's wealthiest states (Maharashtra, Gujarat, Tamil Nadu and Karnataka) are also the four highest exporting states, collectively accounting for nearly 64 per cent of India's total exports.[127]

Increased formalisation of the economy, starting with the GST

India's GST is bringing more businesses into the formal sector. From 1 April 2018, all goods transported interstate above Rs50,000 (approximately AUD1,000) must have an e-way bill that tracks the movement of goods. The GST system is generating paperwork that will allow goods to be captured and tracked in the tax system. Better tax revenue may give India the fiscal space to consider a more predictable and eventually more liberal tariff regime in the future.

WHAT CAN BE DONE TO EXPAND THE TRADING RELATIONSHIP ALONGSIDE TRADE NEGOTIATIONS?

With creativity, patience and perseverance, Australia can make progress with India on greater market access and two-way trade. We must recognise that India is far more open to foreign capital than it is to foreign goods and services and be realistic about the pace and scale of change.

Austrade and Australia's export credit agency, the Export Finance and Insurance Corporation (Efic) will continue to play important roles. Austrade provides a range of support, from business introductions to market information. Efic assists Australian businesses to secure finance for export and to invest overseas.

The 10 sectoral chapters of this report have provided recommendations on how government and businesses can grow the trading relationship. The rationale and structures for enhanced government and business engagement in the Indian economy are also discussed in detail in *Chapter 17: Bilateral Architecture*.

Beyond these sector specific measures, Australia should

- sustain high levels of government engagement and business advocacy
- seek to promote greater levels of standards harmonisation and qualifications recognition
- demonstrate to India that we can offer what it needs, and to Australians how India can contribute to domestic prosperity.

Government engagement and business advocacy

We need to be clear-eyed about India's views on open markets and trade liberalisation but should persevere with our advocacy and efforts to draw India into being a constructive player in international trading regimes.

The role of government in the India relationship, at both federal and state level, will need to be greater than what Australian Governments have been used to with many of its other major economic partners because India's economy will remain relatively controlled by government.

This supports the need for a greater policy dialogue with India, to better understand India's instincts for government intervention and its cautious approach to free markets [*see Chapter 17: Bilateral Architecture*]. Government involvement will be necessary to help address tariff and non-tariff measures while building understanding, confidence, commercial linkages, relationships and business conditions along the way.

Capacity building – including an exchange of officials from Australian Treasury and Finance with their counterpart Indian Government agencies – could facilitate collaborative work in areas such as

- modelling the revenue and growth effects of removing minimum price supports for certain commodities in exchange for a single welfare payment and removing tariffs
- modelling how future tax take from loss of customs revenue is likely to be offset by tax take in other parts of the supply chain (for example GST, income taxes, corporate tax)
- options to fund the revenue foregone from tariffs if there is a shortfall.

Customs procedures and trade facilitation are also areas where we should continue to work together to ease trade barriers for business.

But Australian business will also have to play a stronger role than it is used to in other countries in working with its Indian partners to advocate for policy settings. As other countries' businesses already do, Australian companies could work with Indian partners to lay out for government the kind of reforms they seek. Articulating these in the context of how such reforms will help the Indian Government achieve its own policy objectives will increase the chances of success [*see Chapter 17: Bilateral Architecture*].

Sharing best practice on standards harmonisation and trade facilitation

We can work closely with India on trade facilitation and standards harmonisation, both bilaterally and regionally.

The Australian Government should invest in policy and technical support that helps India achieve its objectives and creates greater transparency and predictability for Australian business. It is important for Australia to focus policy and technical efforts in India in areas where we have expertise and where structural forces could push India to liberalise.

Enhanced standards cooperation, coordination and information sharing can boost trade by addressing behind the border issues. A strategic investment to enable the development and implementation of a specific Australia-India Standards Trade Enabling Program would support these efforts. A first step would be commissioning Standards Australia to produce a Standards Market Potential Report to outline the opportunities, technical gaps and challenges for further collaboration on a sector by sector basis. Such a sector specific standards harmonisation, technical alignment and regulatory convergence program would provide the basis for an annual rolling work plan. Competitors, including the United States and Europe, are already funding such programs.

India is not currently a member of a regional organisation in which it can work on practical trade facilitation and standards harmonisation measures. The South Asian Association for Regional Cooperation does not function effectively due to the geopolitical rivalry between India and Pakistan, while India's size relative to other members of the Bay of Bengal Initiative for Multi-Sectoral Technical and Economic Cooperation means it can dominate that grouping.

When APEC was established India's economic integration with the APEC region was more limited than it is now. Today, India's exclusion from APEC is an anomaly. Australia has already signalled its support for Indian membership of APEC and the government should work with other APEC members to bring this to fruition. APEC membership offers an opportunity for India to engage on best practice trade facilitation and customs procedures without needing to commit to binding targets. APEC membership would also complement efforts to work with India and other likeminded countries through the G20.

Aligning policy objectives to contribute to mutual prosperity

Australia should also demonstrate to India that it can benefit from our goods, services, capital and regulatory know-how.

The sectoral chapters of this report outline opportunities for Australia to pursue collaborative partnerships with India and provide the basis for better market access. Australia has expertise to offer India, in addition to the promise of future substantive investments, should the partnership yield commercial opportunities. These partnerships can work to mutual advantage, while addressing India's many sensitivities.

Australian investment into India will need to play a much bigger role, and at an earlier stage in the economic relationship, than it did into North Asia. This will require a change in how Australian businesses and governments approach economic engagement with India. Australia's model in Asia of an export-led relationship – primarily in commodities – won't be sufficient to take the economic relationship with India into the top tier.

Specific demonstration projects (partnerships, either public or private sector-led) can pave the way for greater market access by demonstrating how Australian goods and expertise can contribute to achieving India's policy goals. Choosing projects requires consensus with India as well as a focus on tangible (sometimes narrow) commercial issues.

Examples of the kinds of projects with this impact are set out in the sectoral chapters, such as

- ACIAR trialling water-efficient farming technologies and practices in two Indian states
- the Australia-India Mining Partnership at the Indian School of Mines at IIT Dhanbad provides a platform for training, research and development engagement and includes a Centre of Excellence in Mining Technology and Training.

Partnerships will require time, patience, and sustained funding commitments but the long-run

gains of greater market access into India for our exporters outweigh the short-run resource commitments. This will require commercial buy-in and political support. Australian Governments and companies will need to carefully weigh the relationship of providing intellectual property and technical assistance versus when this should only be done in the expectation of specific commercial benefit.

We should avoid rehashing larger trade sensitivities and government policy settings that need to be resolved within trade negotiations.

Visa settings

Indian students, tourists and skilled workers make an important and growing contribution to Australian jobs and growth and our visa settings need to ensure Australia remains an appealing destination for Indians.

While visa processing times are a point of frustration for Indian tourists, affecting Australia's attractiveness in a market where word of mouth counts, significant reforms in Australia's visa systems are underway and will help address this [*see Chapter 6: Tourism Sector*].

Work rights for students influence where they choose to study, and work rights in Australia compare favourably with those in other major host countries [*see Chapter 3: Education Sector*]. Highly skilled Indians, particularly in the fields of science, technology, engineering, mathematics and medicine, can make a significant contribution to technology development which creates jobs in Australia.

Finding the right balance between facilitation and control in our visa settings will also help.

Recent changes to the 457 visa announced by the Australian Government include a short term visa (available for an initial period of two years with no pathway to permanent residency) and a medium term visa, which allows for an initial stay of four years and provides a pathway to permanent residency. These changes are designed to allow businesses to access foreign labour in a manner that differentiates between short term and persistent skill shortages.

In addition, the forthcoming (July 2018) trial of the Global Talent Scheme, as a partial replacement for 457 visas, is to be commended.

If the Scheme becomes permanent, foreign workers will be allowed to apply for Australian residency after three years. This would present a strong incentive to attract global talent and could increase the attractiveness of Australia as a destination of choice for skilled Indian migrants, especially given increasing uncertainty around visa settings in the United States and United Kingdom. The Scheme allows Australian companies to identify workers they need to fill gaps in areas of high demand, such as for programmers and data scientists. Bringing these skills from India into the Australian economy lets us tap into highly sought after expertise, enables knowledge and skills to be shared with Australian workers and contributes to improvements in Australian productivity.

It will remain important to communicate to India in advance of changes to our visa settings.

Although Australia has a global visa system, in which visa frameworks are not developed for a specific country, changes to our visa settings are closely followed in India. Misunderstandings on the intent or impact of changes can disproportionately undermine the economic partnership. Our international reputation as a place to do business can be damaged if other countries are surprised at visa changes which affect their interests.

Simplifying visa processes, speeding up visa processing times and reducing visa costs will also help. Australia has made good progress in recent years in adopting technology to streamline visa processes, including the introduction of online lodgement for Indian applicants.

Despite these investments, companies operating in Australia report the length of time to process visas has risen from 6–8 weeks to 4–7 months. Visa costs, already high by international standards, have also gone up.

Reforms to our visa processes currently under consideration would have a beneficial effect on the speed and simplicity of visa processing. Any changes in the opposite direction have the potential to affect the broader bilateral relationship.

RECOMMENDATIONS

Openness to investment and trade varies across the Indian economy and engagement is best targeted to the particular circumstances. With this in mind, Australia should:

78. Work with India on ways to harmonise approaches to trade enabling policies, procedures and processes

78.1 Establish an Australia-India Standards Trade Enabling Program to facilitate and promote standards harmonisation, technical alignment and regulatory coherence.

- This should be a multi-year initiative to promote common standardisation and would build on Standards Australia's existing relationship with the Bureau of Indian Standards.
- In the first instance, the Australian Government should commission Standards Australia to produce a Standards Market Potential Report to inform the development of this program. This would identify the opportunities, technical gaps and challenges for further Australia-India collaboration on a sector by sector basis, including digital trade.

78.2 Australia should take the lead in working with other countries to bring India into APEC

- India is interested in joining APEC but only if there is a consensus to admit it. Taking the lead on this would serve the bilateral relationship well and would be consistent with Australia's Indo-Pacific Strategy
- it would bring India into the circle of APEC's important trade facilitation work
- it would also ensure that if APEC were eventually to negotiate an APEC wide FTA, India would be a party to it.

78.3 Work with India to shape an enabling environment for digital trade

- including sharing best practices with India and advocating for practical steps that support digital trade through international fora such as the WTO, G20 and international standard setting bodies.

79. Seek improvements to visa processing

79.1 Prioritise work already underway to use technology to ensure the provision of more easily accessible longer duration visas for Indian business and tourist travellers consistent with Australia's global visa policy and effective risk management.

79.2 In the short term, strengthen efforts to improve the timeliness and simplicity of issuing visas

- Australia has a global visa system and developing specialised visa frameworks specifically for India is not in prospect
- Australia's visa reform agenda is underway and over time the simplification and streamlining of processes will benefit visitors to Australia, including Indian applicants
- in the short term, the Department of Home Affairs should ensure sufficient resources are available to process high Indian lodgement rates of tourism and other visa applications in a timeframe that improves the attractiveness of our market.

80. Work with India to support domestic drivers to policy change and improve the predictability of its tariff regime

80.1 The Treasury should collaborate with NITI Aayog and India's Ministry of Finance to develop options to strengthen India's social safety nets, including payments to farmers.

80.2 Work with India, including through the G20, to support accessible and affordable remittance flows.

81. A Comprehensive Economic Cooperation Agreement and a Regional Comprehensive Economic Partnership

81.1 The negotiating positions in CECA are currently too far apart for agreement to be reached in the near term. Australia should instead prioritise negotiations with India in the RCEP agreement and return to bilateral trade negotiations once an RCEP deal is concluded.

BILATERAL ARCHITECTURE

CHAPTER SEVENTEEN

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SUMMARY

- Translating sectoral opportunities into increased bilateral trade and investment will require stronger and more committed government, business and people-to-people relationships. This necessitates greater investment in institutionalised links that can resolve problems when they occur, build joint solutions to shared challenges, and develop the confidence to cooperate and compromise along the way.
- There are helpful foundations to build upon. But to elevate the economic partnership to its full potential, the 'architecture' of the bilateral relationship needs to mature into a pattern of engagement characterised by clear and sustained focus, mutual benefit and innovation. The growth of the strategic and security partnership in a relatively short period shows success is possible where both sides see benefit.
- Strong political leadership will be essential, including regular prime ministerial and ministerial engagement. Instituting a new Strategic Economic Dialogue and more comprehensive sector-specific ministerial engagement will send important signals to the bureaucracy and business about the level of government commitment. This will need to be backed by appropriate public sector resources in both Australia and India, at the federal and state level, to follow through on political commitments. Ideally India would have a reciprocal policy framework in response to this Strategy which could form the basis for determining shared priorities.
- The framework for business to business engagement is markedly undeveloped. Closer relationships and sustained interaction between business councils and industry groups provide a powerful platform for business to advocate for standards and policy settings important to commercial success. Through the consultation process, I have been struck by the relative success of some foreign businesses working with Indian businesses and associations to advise the Indian Government on changes to its policy and regulatory settings. Australia's business architecture needs to find a similar path.
- More systematic people to people links can enhance understanding of the political economy each country faces and facilitate business links. While much of this will happen informally, there is benefit in creating the right institutional support for the key messages to be fed through to government and industry.

THE CURRENT STATE OF PLAY

The intensity of Australian Government engagement with India has been cyclical. Australian Governments have tended to see India as a challenging business partner and have often deferred prioritising the business relationship. Meanwhile, India has many countries competing for its attention and lacks bureaucratic capacity to commit time and resources to them all. In addition, there are restrictions on Indian ministers and officials travelling, which limits opportunities to schedule meetings.

Both governments have sought to make bilateral engagement more consistent and substantial in recent years. We now have a suite of existing government mechanisms in place to encourage cooperation and dialogue, including regular meetings by leaders and ministers. Prime Ministers Modi and Turnbull have met at least once every year since Prime Minister Turnbull assumed office.

The strategic and security elements of the bilateral architecture have come a long way over the past three years, reflecting growing strategic convergence. The first '2+2' meeting of foreign and defence secretaries was held in December 2017, and the Quadrilateral meeting of Australia, India, Japan and the United States recommenced in November 2017. A trilateral dialogue with Japan has taken place at foreign secretary-level annually, since 2015, while 1.5-track government and non-government trilateral discussions have commenced with Indonesia (November 2017) and with France (January 2018). A bilateral maritime dialogue also commenced in 2015 and is held annually to deepen cooperation on maritime security, safety and research.

But the architecture that supports our increasingly ambitious trade and investment activity has not matured at the same rate. It also remains less developed than Australia's relationships with other major Indo-Pacific partners such as China, Japan and Indonesia.

While there are established channels for ministerial engagement, better outcomes can be achieved. For several years our bilateral economic engagement had been primarily focused on advancing a bilateral free trade agreement. This contributed to the annual bilateral meeting between trade ministers, referred to as the Joint Ministerial Commission, not being held since 2013.

Ministerial engagement on our priority sectors, such as the Australia India Education Council and the Australia India Energy Dialogue, are sporadic rather than annual. There is no forum for regular ministerial engagement in our other lead sectors although agriculture ministers do meet on an ad hoc basis. This reflects the realities of scheduling high-level meetings. However, the more benefit participants garner from such meetings the more frequently they will occur.

The framework for business to business engagement also remains underdone. Australia's peak business councils, such as the Business Council of Australia, do not have a close relationship with their Indian counterparts, including the Confederation of Indian Industry or the Federation of Indian Chambers of Commerce and Industry – despite both of these having a presence in Australia. This partly reflects the lack of attention paid to India by corporate Australia, which has tended to prioritise the United States, Europe, North Asia and Southeast Asia for international investment and trade opportunities over India.

THE CASE FOR RECALIBRATING BILATERAL ARCHITECTURE

The elements of the Australia-India economic architecture rest on three pillars: government, business and people to people links.

Proposed elements of Australia-India economic bilateral architecture		
Government-led	**Business-led**	**People to people**
Prime Ministerial engagement	CEO Forum	Australia-India Council
A Strategic Economic Dialogue	Australia India Business Council	Australia India Institute
Ministerial meetings	Relationships between major business bodies (BCA and Indian counterparts)	Alumni networks
Parliamentary engagement	Institutionalised relationships between industry bodies	New Colombo Plan
Officials-level dialogues	India Australia Chamber of Commerce	Endeavour awards
State to State engagement		Australia India Leadership Dialogue
		Australia India Youth Dialogue
Underpinned by: the diaspora, business partnerships, academic and research partnerships, tourism and cultural connections.		

Government-led architecture

What does 'success' look like?

- Open and trusted avenues of communication.
- A unified approach, with public commitment, to the strategic direction of the relationship.
- The ability to quickly identify and address political issues which constrain the economic relationship.
- Closer alignment of specific policies, regulations and standards that support better commercial outcomes.
- Agreed agendas for practical joint activities.
- Sufficient government engagement to allow for effective working relationships and mutual understanding of each other's priorities and capabilities.

Proposed initiatives to build on status quo

- Establish a Strategic Economic Dialogue.
- In doing so, discontinue the Joint Ministerial Commission, but continue regular trade ministers' meetings.
- Aim for annual ministerial engagement in the education, agribusiness and resource sectors (tourism can be covered by the annual trade ministers meeting).
- Aim for biennial ministerial engagement in the six promising sectors identified in the report, either through ministerial visits or in the margins of other international fora.

Prime Ministers should continue to meet at least once every year, either at home or in the margins of international fora. Every second year, Australia should aim for this to take the form of a prime ministerial visit, with an accompanying business delegation, helping to further cut through bureaucratic inertia and create a head-turning effect for business.

A new initiative, a Strategic Economic Dialogue, should be established to bring together senior economic policymakers from both governments every two years. This would provide the necessary

platform for ministerial focus on the breadth of bilateral economic activity and the policy settings which enable it. A Strategic Economic Dialogue should target Indian Ministers for Finance and Commerce and the Vice Chair of NITI Aayog and partner them with the Australian Treasurer, Trade Minister and Productivity Commissioner. Depending on the proposed focus of each meeting, ministers of priority sectors could be invited to attend.

Such a dialogue would take the place of the Joint Ministerial Commission to elevate the conversation to include supporting two-way trade, investment attraction and sharing policy and regulatory experience to enhance productivity. Australia's Trade Minister and the Indian Commerce Minister should seek to meet annually to address individual trade and market access issues.

Regular ministerial engagement on the sectors identified in this Strategy will be essential to developing compatible policies and standards and for providing avenues for advocacy on matters of concern to business. Ministerial oversight of sectoral engagement can set the agenda for practical joint activities which can demonstrate to the Indian Government the benefits of greater economic engagement with Australia.

The priority 10 sectors of this Strategy should each have an Australian ministerial champion at the federal level. For the flagship and lead sectors, bilateral ministerial engagement should continue to occur each year.

With respect to education and training, and energy and resources, this means continuing the existing structures that are already in place: the Australia India Education Council and the Australia India Energy Dialogue. Every effort should be made to continually improve these meetings. For agribusiness, annual ministerial meetings should be institutionalised. Issues related to tourism should be covered by the trade minister meetings and as part of the Strategic Economic Dialogue.

Parliamentary linkages – including through exchanges and visits between members of parliament and future leaders – go a long way to raising consciousness and understanding of each other in the political sphere. These should include state parliamentarians from both countries.

In each sector, the Australian Government can play an important role by working with Indian policymakers to align regulatory standards or adopt technology solutions in which Australia and India have expertise. Following ministerial leadership, government officials and industry bodies must follow through on implementation through both recurring joint working groups (such as health) and ad hoc collaboration. As set out in the sectoral chapters, Australia should also pursue greater engagement between regulatory bodies (such as Standards Australia and the Therapeutic Goods Administration) and their Indian counterparts.

The similarities in our systems of federal government and public administration make Australia well-placed to work closely with India on matters of economic reform. We should seek to identify reforms which are priorities for India and which can make the greatest difference for Australian commercial interests. For example, an Australia–India Infrastructure Council could provide a forum for collaboration between government and private sector from both countries, including at the state level [*see Chapter 9: Infrastructure Sector*].

The regulatory settings of India's state governments will cumulatively have a greater impact on the business environment than the central government. Embedding sub-national engagement in the bilateral architecture will provide opportunities for the Australian Commonwealth and state governments to engage with India's increasingly influential states on their business enabling environments.

The Commonwealth and state governments should make every effort to coordinate and mutually reinforce their connections with India. The Strategic Economic Dialogue could include Australian state representatives when meeting in Australia and Indian state representatives when meeting in India. This will complement our emerging network of state to state relationships [*see Chapter 14: A Collection of States*].

Business-led architecture

What does 'success' look like?

- Australian and Indian businesses have the right platforms to advocate with governments for policy settings and regulatory standards.
- Australian business has the right frameworks to work more collaboratively in India.
- Australian and Indian businesses work together in key sectors to identify practical solutions to regulatory constraints and jointly advocate to governments.
- Australian and Indian businesses better understand each other's business culture.

Proposed initiatives to build on the status quo

- Bring the CEO Forum into a regular annual cycle with a practical intersessional agenda.
- Establish an Australian secretariat for the CEO Forum in the BCA.
- Broaden membership of the AIBC to include more large corporates to complement SME membership and broaden membership beyond the Indian diaspora community.
- Seek a closer relationship between the BCA, Australian Industry Group and Australian Chamber of Commerce and Industry and peak Indian industry groups.

The current structures underpinning business to business engagement are inadequate to support an expansion in the trade and investment relationship.

Specifically, there is a lack of effective platforms for Australian business to advocate directly for the policy settings and regulatory standards that are key to commercial success.

Experience from overseas is that, to be heard in the Indian system, Australian businesses need to collaborate with each other to identify practical solutions to regulatory constraints. Working with India's business community enables industry groups in both countries to advocate for those reforms to their own governments. A lesson observed from overseas is that if there are issues in a sector that is a political priority for India, and if the foreign country is viewed by India as having best practice, progress is possible.

Business-led architecture also needs to do more to assist Australian businesses better understand unique aspects of Indian business culture. A more active role by peak Australian business groups in educating their members would help increase confidence.

The Australia-India CEO Forum is a useful vehicle. But its meetings should be brought into a regular annual cycle and it needs an intersessional agenda. It should have a secretariat based in the BCA, giving it some institutional heft. At present there is little visibility of the CEO Forum among the BCA's heavyweight member base.

The secretariat should be responsible for organising the annual CEO Forum as well as coordinating its ongoing agenda. As secretariat, the BCA could seek guidance from its members on issues to prioritise and outreach activities to initiate. Building on the existing partnership with the CII will be important, including as a means to convene the Indian side.

Similarly, the Australia-India Business Council needs substantially more clout. It should include more large corporates who do business in India to complement the SME membership which is its current focus. The AIBC also needs to broaden beyond the Indian diaspora community which is its base. In doing so, the AIBC could take forward a bigger agenda. SMEs should consider organising themselves along sectoral lines to form clusters which can lobby for sectoral-wide outcomes and look to partner with Indian industry groups.

There should be a much closer relationship between the BCA, the Australian Industry Group and the Australian Chamber of Commerce and Industry with the peak Indian industry groups – CII, FICCI and the Associated Chambers of Commerce and Industry of India – which play a key role in promoting India's business links with its major trading partners. The National Association of Software and Services Companies should also be prioritised given the reach of its networks and talent pool. India has an entrenched culture of engagement through chambers of commerce, not just nationally but at the state level, and Australian businesses and industry groups should look to

work more closely with these counterparts. CII and FICCI have a presence in Australia, which should be nurtured and supported. There are also opportunities to engage Indian business during trade missions organised by CII, FICCI and others in third countries.

People to people links

What does 'success' look like?

- Greater familiarity with each other's economies and societies and higher levels of 'India literacy' in Australia.
- Indian alumni of Australia's education system contributing to stronger business connections.
- A higher profile of the Australian market in India.
- An even greater take up of the New Colombo Plan in India.

Proposed initiatives to build on the status quo

- A strengthened Australia India Leadership Dialogue with higher levels of Indian engagement and stronger business participation.
- Support for the Australia India Youth Dialogue including to implement some of its ideas.
- Greater mobilisation of the Indian diaspora [*see Chapter 18: The Role of the Diaspora*].

People to people links can enhance the understanding of the political economy each country faces, provide windows into the technologies and trends of the future that can shape the relationship, and provide business links and market knowledge.

Australia's fast growing Indian diaspora, joint research and development, and certain sectors such as education, training and tourism all contribute to developing strong people to people links.

Although most of this engagement will take place in an organic fashion, investing in mechanisms to enable interactions in a focused way can lead to better outcomes, and the possibility of shaping the government and business environment.

The Australia India Leadership Dialogue (AILD), which has met annually since 2015, has attracted bipartisan representation from government as well as participation from the business community, media, academia and civil society. The AILD has considerable potential but needs to attract higher level Indian political involvement and stronger business representation on both sides. Its Australian organisers have had to do the heavy lifting and it would benefit from a strong lead Indian partner with reach into the Indian system.

The Australia India Youth Dialogue, as a platform for driving engagement between Australian and Indian young leaders and influencers, is already an influential network of young leaders who will become custodians of bilateral collaboration. While youthful energy and volunteerism has carried it this far, greater institutional support would ensure its sustainability.

Australia's Alumni Engagement Strategy is a valuable means of connecting and convening the talented and diverse Indian community that has studied in Australia. It provides opportunities for professional development, shared research and strengthened business connections.

The Australia-India Council has a mandate to build connections between our two countries. The Council should be commended for increasingly focusing on building sustainable relationships and has been a strong supporter of this strategy.

The Australia India Institute plays an important role in expanding Australian understanding of contemporary India, including through a program of research and events. A sharper focus on the key issues animating the bilateral relationship would enhance the Institute's effectiveness to shape discussion about the future direction of the relationship.

RECOMMENDATIONS

In taking forward the meetings to support our bilateral architecture, the reality is that Australian Government and business representatives will need to be prepared to do more travelling, on balance, than the Indian side.

82. A Strategic Economic Dialogue

82.1 Establish a Strategic Economic Dialogue with India to facilitate a broader and deeper discussion of the economic relationship and reform priorities

- it should convene every two years with the Australian Treasurer, Trade Minister and the chair of the Productivity Commission alongside the Indian Ministers for Finance and Commerce and the Vice Chair of NITI Aayog
- this would take the place of the Joint Ministerial Commission
- the Dialogue could include Australian state representatives when meeting in Australia and Indian state representatives when meeting in India.

83. Ensure strong ministerial leadership in the 10 sectors identified in this strategy

83.1 The Australia India Education Council and the Australia India Energy Dialogue should be maintained while expanding their practical focus.

83.2 Ministers for Trade, Resources and Agriculture should meet their Indian counterparts annually.

83.3 Ministers responsible for the six promising sectors identified in this strategy should meet biennially with their Indian counterparts.

84. Strengthen the Australia-India CEO Forum

84.1 The BCA should take on the secretariat duties of the Australia-India CEO Forum. In doing so, it should work closely with the relevant Indian chamber to convene participation on the Indian side.

84.2 The BCA should also draw on guidance from its members and advice from government to take forward an intersessional policy agenda for the CEO Forum.

85. Expand the Australia India Leadership Dialogue

85.1 The Australia India Leadership Dialogue should continue on an annual basis.

85.2 This will require the Australia India Institute to secure sufficient sponsorship money once the pool of current funding runs out.

85.3 Secure a strong Indian partner to bolster Indian participation, especially from political and business circles.

85.4 The Australian Government should continue to provide high-level bipartisan participation in the AILD and should promote its value to the Indian Government.

86. Strengthen bilateral business organisations

86.1 The Australia India Business Council should seek to broaden its member base beyond SMEs, targeting large corporations and working closely with Indian industry bodies

- this will shift the AIBC focus beyond diaspora business representatives.

86.2 Encourage the merger and strengthening of existing Indian-based Australian business chambers to a national level body.

87. Explore options to hold a meeting of Australian premiers with Indian chief ministers

This will help build state to state engagement and would send a powerful signal of the priority of the bilateral relationship.

Scheduling such a meeting would be a challenge, but prime ministerial support would help and seeking to align such a meeting with a Prime Minister's visit to India could be the most practical option in the first instance.

THE ROLE OF THE DIASPORA

CHAPTER EIGHTEEN

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SUMMARY

- The Australian Indian diaspora is a national economic asset, and should be engaged and deployed as such. The Indian Government puts a large effort into working with this diaspora. The Australian Government must also do so.
- Harnessing the entrepreneurial spirit of this rapidly growing community, particularly its willingness to innovate and take risks, and its knowledge of the Indian market, will enhance the future productivity and resilience of the Australian business sector.
- At almost 700,000 strong, Australia's Indian diaspora, comprising both Australians of Indian origin and Indians resident in Australia, makes a significant contribution to Australia's society and economy
  - they are the second highest taxpaying diaspora, behind the British
  - Indian-born Australians are expected to outnumber Chinese-born Australians by 2031, reaching 1.4 million.[128]
- Migration from India to Australia increased dramatically between 2006 and 2016, more than doubling the numbers of the India-born population[92]
  - this surge in education-related and skilled migration coincided with a period of significant labour shortages across the economy during Australia's mining boom.
- As we leave the mining boom behind, we can do better in targeting and supporting the highly qualified professionals and high calibre students who will help drive future economic growth in Australia and integration with India.
- There are good examples, globally, on how to engage the diaspora more effectively. Similar surges in the Indian diaspora in the United States, United Kingdom, Canada and Singapore commenced earlier than Australia's and were focused around the rapid expansion of the IT industry.
- Compared to the professional Indian diaspora in the United States, United Kingdom, Canada, and Singapore, the Indian diaspora in Australia are yet to achieve a similar level of influence in higher levels of state and federal politics, academia and business.[129]
- As our Indian diaspora become more politically active, both within the electorate and in the political class, the impetus of Australian state and federal governments to promote the bilateral relationship will only increase.
- Embracing the contributions of our Indian diaspora, and giving them prominence in bilateral relations; strengthening diaspora organisations; attracting talent in sectors that will drive Australia's growth; and ensuring this talent is mentored and supported can result in an Australian Indian diaspora who:
  - validates Australia as an innovative, diverse, safe and prosperous society and improves Australia's standing and influence in India
  - crystallises the potential of the Indian economy as a driver of Australian growth
  - helps to interpret India for the broader Australian community.

LEVERAGING THE INDIAN DIASPORA

In my consultations with state governments, I was struck by how the Indian diaspora is already clearly on their political radar. This will only grow as the diaspora itself becomes more politically active. In this, Australia over the next 20 years may well move along a Canadian path where Indo-Canadians are prominent in all political parties and hold high ministerial positions. A politically active Indian diaspora will inevitably create an additional incentive for Australian state and federal governments to be seen as active in promoting the bilateral relationship.

It is important to acknowledge that the Australian Indian diaspora is not one cohesive whole. Much like India's complex society, it is made up of diverse sub-groups, state and community associations. It may not naturally self-organise in a way that maximises its political or economic leverage, complicating engagement.

This chapter sets out the current disposition of Australia's Indian diaspora, how this relates to international experience, and what more Australia could do. There are four themes that emerge around which to focus efforts on leveraging the diaspora.

Improving India literacy of Australia's corporate sector

The Indian diaspora in Australia is not yet sufficiently prominent in our leading industry sectors or business associations. It can't yet play a significant role in mobilising confidence to expand trade and investment with India.

Over 8 per cent of Australia's population is born in Asia – a much higher percentage than in other Anglophone countries – yet only around 4 per cent of Australia's top 200 publicly listed companies have board directors of Asian heritage.[130]

Australian companies with 'Asia capable' workforces, including migrant representation at all levels of the organisation, are rare. Indeed, 67 per cent of ASX 200 board members show no evidence of extensive experience operating in Asia, while 55 per cent demonstrate little to no knowledge of Asian markets. Those that do claim immersive experience in Asia overwhelmingly rely on time spent in Singapore and Hong Kong, two markets consistently ranked at the top of the World Bank's Ease of Doing Business index.[119]

But this is not to presuppose that only large listed companies have a role to play. Most Indian diaspora businesses in Australia are SMEs, and they too have the capacity to be meaningful drivers of economic integration with India. It has been estimated that within three years, around 66 per cent of SMEs in countries like Australia could derive at least 40 per cent of their revenue from outside their country of operation[131] – so the key is to ensure that SME growth occurs in exportable sectors of the economy.[130]

Encourage greater Indian postgraduate student enrolment in cutting edge fields, technologies and economic sectors where Australia is competitive

Indian postgraduate student numbers are on the rise in Australia, but most are enrolled in masters by research courses in oversupplied fields. Indeed, we may be seeing Indian students leaving their undergraduate STEMM qualifications. Australia needs to do more to promote its academic excellence.

There is a positive feedback loop between greater bilateral research collaboration and Indian perceptions of the quality of Australian

educational institutions. Between 1993 and 2013, India was one of the top three source countries for Australian academics (the other two being the United Kingdom and China). Indian diaspora researchers play a disproportionately large role in Australia's collaborative efforts with India – 60 per cent of the Australia-based authors of scientific publications co-authored by researchers in India and Australia were of Indian descent. So the current enrolment bias among Indian students towards masters by coursework degrees is likely to limit the future of research collaboration between Australia and India.

Place diaspora achievement and entrepreneurial ventures at the forefront of our bilateral engagement

India puts a large effort into working with its diaspora. It no longer considers overseas migration of Indian skilled professionals as 'brain drain', but rather as a 'brain circulation' that enhances India's global image and contributes to 'brain gain' in India through innovation, investment, and business expansion. India's professional diaspora is regarded as innovative 'opportunity entrepreneurs'[132], who forge links, invest in, and mentor high value technology ventures between their countries of residence and origin. The diaspora are now seen as integral to India's growth story and there is strong receptivity within India to a 'diaspora forward' engagement strategy.

The AIBC, the leading current diaspora business organisation, has limited presence among peak industry bodies in India and Australia. While it serves as a representative body for the Indian business diaspora and participates in bilateral trade delegations, it does not have an explicit advocacy strategy to promote diaspora presence and leadership in the key chambers of Australian commerce and industry. It has not yet developed a profile of diaspora entrepreneurship in Australia's competitive industry sectors or coordinated with Indian counterparts to attract Indian mid-size enterprises to invest in tie-ups in these sectors. The 2018 AIBC constitutional amendments should help drive change over time.

More could be done in Australia to incubate and mentor diaspora entrepreneurs in fields where Australia has a competitive edge. The IndUS Entrepreneurs (TiE) group has a proven track record assisting entrepreneurs of Indian origin in the United States with mentoring, incubating, networking and venture capital financing. TiE chapters exist in Australia, but they maintain a low profile. Another useful focus for engagement will be diaspora professional groups, including a number that already exist in the professional services.

Encouraging greater participation in politics and civil society

The Indian diaspora in Australia lacks presence and influence in higher levels of state and federal politics, policymaking, universities, large corporations and peak industry bodies.[129] Australia needs to do more to encourage diversity in these areas. Increasing political representation in Australia on the part of the Indian diaspora will be a potent driver of the bilateral relationship.

What can we learn from the evolution of Indian diaspora communities globally?

India has the largest diaspora population in the world, with over 13 million Indians living outside the country and 17 million people of Indian origin spread across 146 countries.[98] They range from long-standing populations in places like the Caribbean, Fiji, South and East Africa and Malaysia, to the very large numbers now building the Gulf States.

The Indian diaspora of the United States, United Kingdom and Canada comprise a relatively small proportion of total population, but they have emerged as powerful economic players in their own right and in their ability to strengthen economic ties with India.

Each of these countries has experienced a surge in the migration of highly skilled Indian professionals and students with tertiary and higher educational qualifications since the 1990s, and has nurtured this talent and its potent advocacy for enhanced economic ties with India.

In general, the Indian diaspora in these countries are recognised for contributing to innovation and entrepreneurship, competition, economic growth and job creation.

In particular, their prominence in leading industry sectors and establishment of dynamic professional and business associations has helped build trust and understanding to expand trade and investment with India. They provide insights into India's business norms, cultural landscape and language diversity, and facilitate connections with state governments and industry bodies. They lobby their governments for stronger political and business alliances with India and promote frequent visits, delegations and conferences across government and industry. And their diverse perspectives help support the uptake of new technologies and processes.

There are common factors that contributed to the emergence of Indian diaspora as powerful economic players in the United States, United Kingdom, Canada and Singapore:

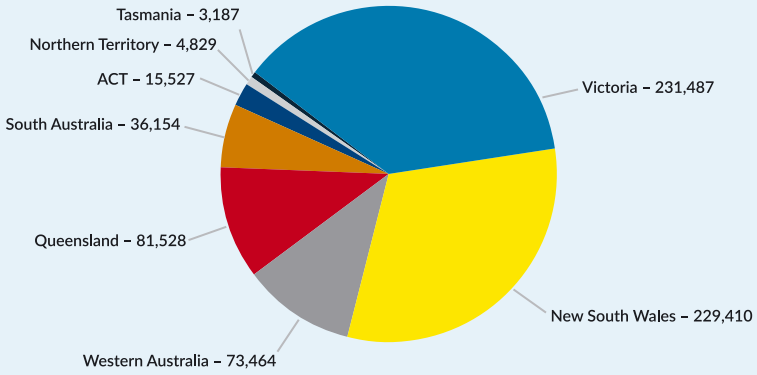
- each had strong reputations in India as countries offering good career, not just migration, opportunities
- their success in attracting talent, with high numbers of international students enrolled in STEMM majors and professionals employed in STEMM, using targeted visa categories
- top universities offering scholarships that set a high quality benchmark for the reputation of the receiving country and set the trend for subsequent generations of high-achieving Indian students
- the success of these high-achieving students establishing the reputation of Indians as highly-skilled researchers and hardworking professionals
- the visible presence of diaspora achievement in technology, innovation, business, senior corporate roles and in government
- the dynamism of the Indian diaspora in entrepreneurship
- Indian diaspora professional associations active in building networks with industry and mentoring Indian students
- the increasing influence of the diaspora in domestic politics.

AUSTRALIA'S INDIAN DIASPORA AT A GLANCE[xxxiv]

- 675,658 claimed Indian ancestry in 2016, constituting 2.8 per cent of the Australian population.
- Indian-born population amounts to 455,389 or 1.9 per cent of the Australian population.
- It is the fourth largest, and one of the fastest growing, migrant communities in Australia, growing at 10.7 per cent per annum on average between 2006 and 2016. Indian-born population is expected to overtake the Chinese-born population by 2031, reaching 1.4 million.[128]
- 48 per cent of the Indian-born population are Australian citizens – students form one-third of the India-born, non-citizen resident population.
- Indian-born population is almost three times as likely as the wider Australian community to hold a bachelor's or higher degree (58 per cent of the Indian-born population as compared to 22 per cent of the wider community).[123]
- Around 88 per cent of the working age, Indian-born population are employed, 61 per cent in full-time work, 27 per cent in part-time work.[123]
- The personal, family, and household median incomes of the Indian-born population are higher than that of overseas-born, Australian-born, and national populations
  - Indian-born migrants are the second-highest tax-paying diaspora after UK-born migrants
    - they contributed $7.9 billion in 2011–2012 and $11.9 billion in 2013–2014 in taxation revenue.
- Predictably, Australia's Indian dispora population is concentrated in the larger states of Victoria and New South Wales, as illustrated by Figure 29. Indian-born residents account for around 3 to 4 per cent of the population in Perth, Sydney and Melbourne, and around 2 per cent in Brisbane and Adelaide.
- Figure 30 outlines the number of speakers of a number of Indian languages in Australia, providing an indicative picture of the diaspora's Indian states of origin. What is immediately obvious is the large number hailing from Punjab, Gujarat and Kerala.

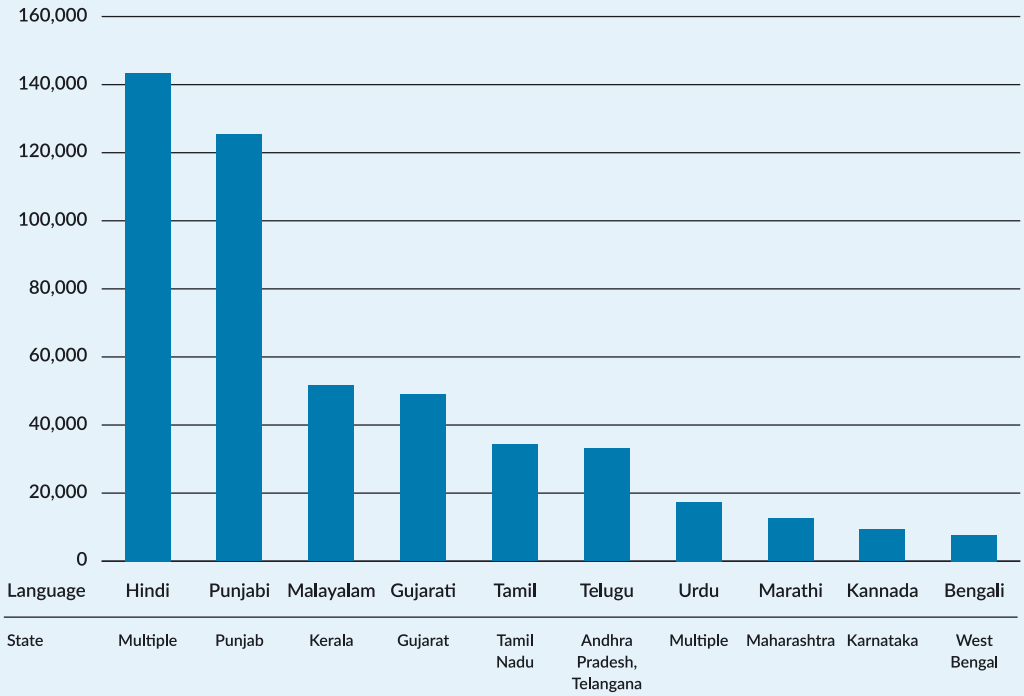
[xxxiv] Based on the 2016 Census data unless otherwise specified.

FIGURE 29: PEOPLE CLAIMING INDIAN ANCESTRY BY AUSTRALIAN STATE



Source: Australian Bureau of Statistics (AU). 2016 Census. Canberra AU: The Commonwealth of Australia; 2016.

FIGURE 30: INDIAN LANGUAGES SPOKEN IN AUSTRALIA



Source: Australian Bureau of Statistics (AU). 2016 Census. Canberra AU: The Commonwealth of Australia; 2016.

BY COMPARISON...

The United States

- There are around 4 million people of Indian origin in the United States[133], representing 1.2 per cent of the total population.
- Indian-Americans have higher levels of education overall than both foreign and US-born populations
  - 77 per cent of Indian-Americans aged above 25 years have bachelor's degree or a higher qualification compared to 29 per cent of all immigrants and 31 per cent of US-born adults (2015)
  - more than half of these have masters or doctoral degrees in STEM-related disciplines and professional fields.[133]
- It is estimated that 68 per cent of Indian-Americans participate in the labour force (2015 estimates), slightly higher than the overall foreign (66 per cent) and the US-born populations (62 per cent)
  - 73 per cent of Indian-Americans are employed in high-skilled STEMM occupations and management, business, finance, law, and higher education, compared to 31 per cent of both foreign-born and US-born populations.
- One-third of all immigrant-founded companies were founded by the Indian diaspora with one-quarter of immigrant-founded transnational engineering and scientific companies were established by Indian diaspora, most notably in Silicon Valley.[130]
- Indian-Americans are among the highest-earning ethnic groups per capita in the United States, with more than 66 per cent earning over USD100,000 per annum
  - median annual household income for Indian-Americans is much higher (USD107,000) than the overall foreign (USD51,000) and US-born populations (USD56,000).[133]

The United Kingdom

- In 2011, there were 1.45 million British Indians, constituting 2.3 per cent of the total population, an increase of over 400,000 from 2001
- India and Poland are the most common countries of birth outside the United Kingdom.[123]
- More than 25 per cent of people of Indian origin in the United Kingdom attend elite universities, and enter professions such as medicine, law, pharmacy and accountancy.
- The unemployment rate for Indian migrants is lower than for other ethnic groups in the United Kingdom[134]
  - in 2011, the Indian-born population was among the leading diaspora communities in highly skilled occupations such as doctors, engineers, solicitors, chartered accountants, academics, and ICT experts (199,000)
  - Indian IT professionals comprise 60 per cent of all foreign IT professionals arriving in the United Kingdom

- around 6 per cent of all doctors in the National Health Service are Indian[135] and Indians account for 40 per cent of health-related retail sector and small and medium-scale businesses.

Canada

- In 2016, there were 1.4 million Indo-Canadians, constituting around 4 per cent of the population.
- Around 45 per cent of Indo-Canadians hold university degrees compared to 26 per cent for the overall population.
- The employment levels of Indo-Canadians are higher than the overall population. Over 75 per cent of Indian migrants to Canada are highly educated professionals, skilled workers, businessmen and entrepreneurs.
- However, there are disparities between employment match rates for professionals born and educated overseas as opposed to born and educated in Canada
  - for physicians born and educated abroad, the employment match rate is 42 per cent, but that increases to 80 per cent for Canadian-born and educated physicians
  - there are similar gaps for nurses, engineers, accountants and teachers.[136]
- Indo-Canadians tend to receive lower incomes than the national average.[137] However, most of the post–1990 Indian migrants also show significant economic mobility over three to five tax years of their arrival[138]
  - almost 20 per cent of all high income Indo-Canadians over the past decade (to 2017) have gained their wealth by becoming entrepreneurs, including in mining, software, health care technology, real estate and hotel industries.

Singapore

- Indians are the third largest ethnic group in Singapore after Chinese and Malays and constitute approximately 7.4 per cent of Singapore's resident population[139]
  - of the 1.65 million foreigners in Singapore, 21 per cent are Indian expatriates holding Indian passports
  - Singapore has longstanding diaspora ties with southern Indian states in particular, with regular mobility and circulation of businessmen between the two countries.
- Around 60 per cent of Indian migrants to Singapore are professionals in financial services, IT, construction and marine sectors, owners of small and medium businesses, and students
  - from the 1990s, Indian professionals were offered permanent residency in Singapore and full rights (excluding the vote) to work, start businesses, and access government housing
  - Singapore attracts talented Indian students with postgraduate and doctoral scholarships for its leading universities.
- Many graduates of India's prestigious IITs and IIMs have gone on to establish businesses in Singapore in IT, commodities trading, shipping, agribusiness and start-ups in new service industries like multimedia marketing and e-commerce.

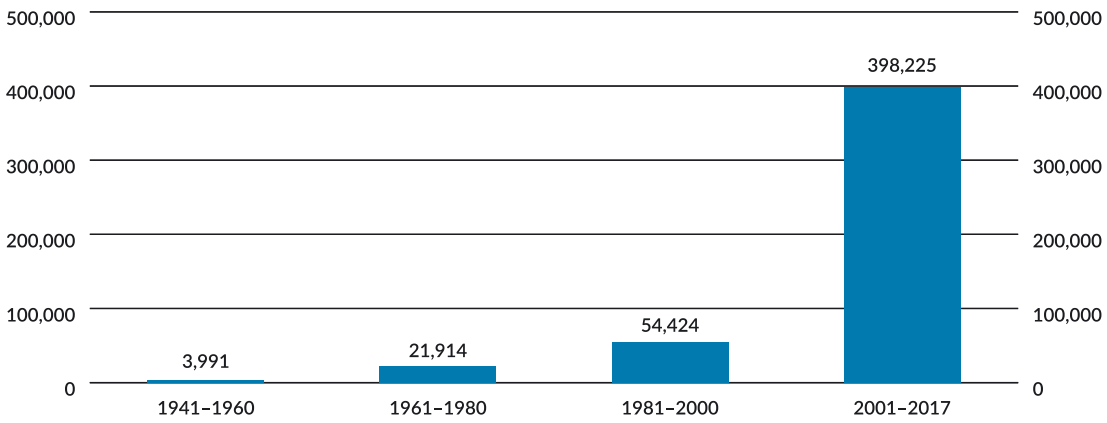
So how is Australia's Indian diaspora experience different?

As with experience in comparable countries, the Indian diaspora in Australia is highly educated, employable and wealthy. The initial track of Australia's Indian diaspora story mirrored the experience in other countries, but the employment of Indian migrants over the past decade has charted a different course.

The introduction of the Migration Act in 1966 enabled larger numbers of Indians to migrate to Australia.[128] As elsewhere, Indian immigrants to Australia in the 1960s and 1970s were mainly highly-qualified professionals in well-paying jobs in medicine, engineering and business. Many who came on Colombo Plan scholarships to study in Australian universities subsequently returned to settle in Australia and pursued successful careers.

During the 1980s and 1990s, Indian engineers and IT specialists arrived under the skilled-migrant program and settled to pursue careers in the country's emerging knowledge-based economy.

FIGURE 31: INDIAN MIGRATION TO AUSTRALIA



Source: Australian Bureau of Statistics (AU). 2016 Census. Canberra AU: The Commonwealth of Australia; 2016.

In Australia, skilled migration and education-related migration from India increased dramatically between 2006 and 2016, more than doubling the numbers of the India-born population[123], making the Indian diaspora a relatively young community compared to the United Kingdom, Canada, Singapore and the United States. It's clearly no coincidence that this expansion mirrored the period of significant labour shortages during the mining construction boom – spread roughly equally between professional and non-professional sectors.

An analysis of where the Indian-born population was employed, and in which sectors they are building businesses, provides an indication as to whether we are truly maximising the potential of this community as a driver of Australian growth and innovation.

As we would expect, employees of Indian origin were broadly distributed across the economy during the period of low unemployment generated by the mining boom.

CASE STUDY: INDIAN DIASPORA SUCCESS IN THE UNITED STATES INFORMATION TECHNOLOGY INDUSTRY

The success of the Indian diaspora in Silicon Valley and their contribution to the successful growth of the Indian IT industry has been globally recognised by scholars and policymakers. They are regarded as the exemplar for industry and diaspora-induced economic development that mutually reinforces growth in trade, investment and knowledge-exchange between the two countries.

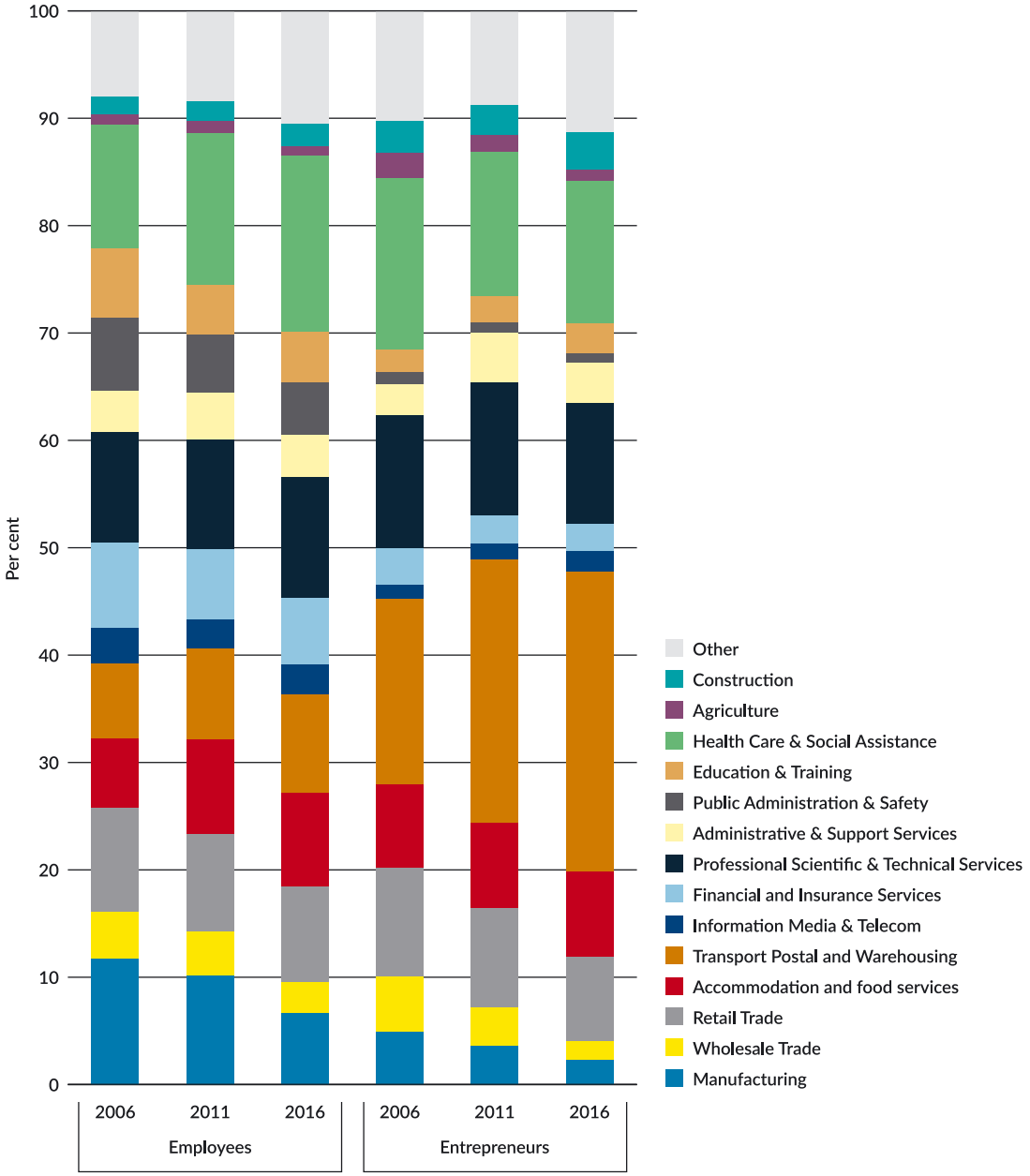
Silicon Valley and Bengaluru rose synergistically. From the onset of Silicon Valley's rapid growth, it became a destination of choice for Indian technology graduates, many of whom remained in the United States after obtaining their degrees and rose to senior positions in leading Silicon Valley technology firms. In 1986, the Indian Government introduced the Computer Software Development and Training Policy which liberalised access to technology and software tools, invited foreign investment, and supported access to venture capital. It invited leading industry professionals of the United States Indian diaspora to advise the Department of Electronics and to invest in the development of the Indian software industry. The diaspora professionals actively contributed to policy reform in areas of Indian telecommunication regulation, science and technology policy, reform of educational institutions and capital markets. This led to the growth of Indian software solution companies such as TCS, Infosys and Wipro.

Diaspora professional associations such as the Silicon Valley Indian Professional Association and The Indus Entrepreneurs played, and continue to play, a significant role in this. They helped forge a common, pan-Indian identity in the United States. They served as mentors for Indian engineers studying and working in the United States and played a key role in ensuring international quality and performance standards, including providing new business contacts and new markets in both countries. They collaborated with Indian industry organisations like CII, NASSCOM and IIT Alumni Associations to celebrate technology entrepreneurship in the United States and India. They played an important role in mobilising their networks to raise venture capital and functioned as angel investors for start-ups and social enterprises. And the dynamism of the United States Indian diaspora in founding engineering and technology companies in turn proved a major attraction for Indian investors in United States industry.

About 30 per cent of India-born employees were in food and accommodation services, retail and wholesale trade, and transport services; roughly 10 per cent work in manufacturing, agriculture and construction sectors. Just over 50 per cent were employed in professional, managerial, and technical service occupations, with the main industry categories for India-born employees being IT systems design and enabled services, accountancy, medicine and health services (Figure 32).

The major change between 2006 and 2016 in sectors of employment for Indian-born employees was a decrease in those employed in manufacturing and an increase in those employed in health care and social assistance.

FIGURE 32: INDIAN-BORN EMPLOYEES AND ENTREPRENEURS BY INDUSTRY



Source: 1) Australian Bureau of Statistics (AU). 2016 Census. Canberra AU: The Commonwealth of Australia; 2016. 2) Australian Bureau of Statistics (AU). 2011 Census. Canberra AU: The Commonwealth of Australia; 2011. 3) Australian Bureau of Statistics (AU). 2006 Census. Canberra AU: The Commonwealth of Australia; 2006.

DRIVING AUSTRALIAN ENTREPRENEURSHIP?

The story of missed opportunity is more stark in the Australian diaspora's entrepreneurial journey. Australia's Indian diaspora shows the same entrepreneurial spirit demonstrated elsewhere. Between 2006 and 2011, businesses owned by Australia's India-born population rose by 72 per cent, compared with a 40 per cent increase for those born in China. However, as Figure 32 shows, the sector experiencing the most significant growth in Indian diaspora entrepreneurship between 2006 and 2016 was the transport, postal and warehousing sector. While embracing the entrepreneurship and personal drive that has seen the surge in self-employment in this sector – this is clearly not going to drive Australia-India economic integration.

STUDENTS – A MISSED OPPORTUNITY

The trends in Australia's student intake from India show a similar missed opportunity. Indian students form the second largest international cohort (15 per cent) in Australian universities, following students from China (34 per cent). The numbers of Indian international students in postgraduate courses in Australian universities have been growing rapidly since 2014. However, masters by coursework is by far the most popular option for Indian students (70 per cent), followed by bachelor degrees (22 per cent), and has been growing rapidly since 2014. Only 2 per cent of Indian students in Australia pursue doctoral degrees.

Most of those enrolled in masters courses graduate in oversupplied fields[140], rather than in programs focused on advanced fields, technologies and economic sectors where Australia has a global edge. The top four preferred fields of higher education for Indian students are: Management and Commerce (48 per cent), IT (24 per cent), Engineering and Related Technologies (11 per cent), and Health (6 per cent).

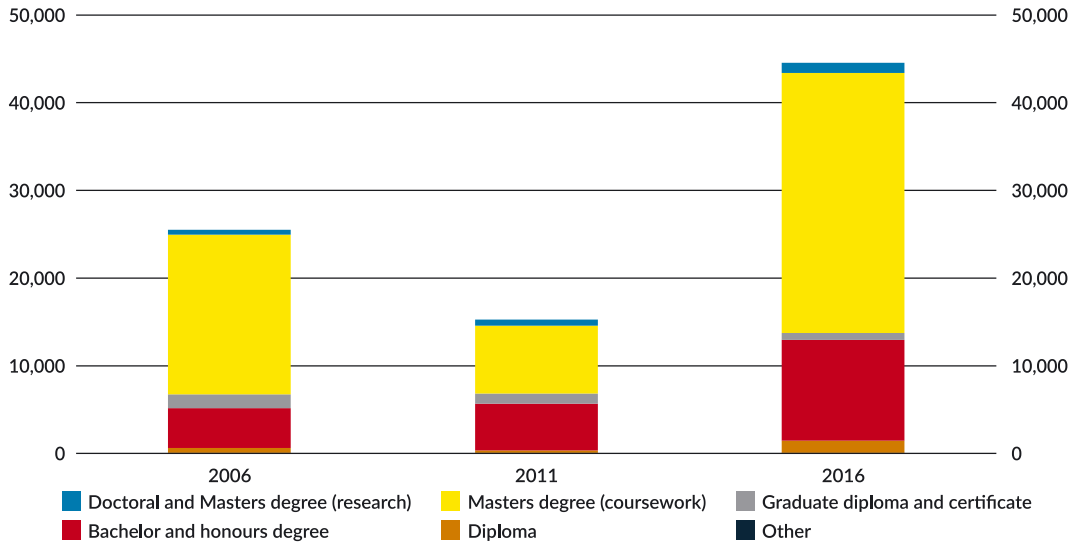
Indian students comprised a similar proportion of global international students in the United States (13.6 per cent), but this is maintained at doctoral level (14 per cent of all temporary student visa [F–1] holders pursuing doctoral degrees) and about 80 per cent were enrolled in STEMM majors (MPI, 2017). According to the Survey of Earned Doctorates, 85 per cent indicated their intention to stay in the United States upon completion of their studies – a significant injection of intellectual firepower.

Significantly, 70 per cent of a representative sample of Indian students enrolled in post-graduate study in Australia in 2016 and 2017 had undergraduate qualifications in STEMM. We need further research to determine whether these students ultimately return to STEMM careers, or whether these skills are lost to the Australian economy.

Current enrolment biases among Indian students towards masters by coursework degrees present a risk also to the future of research collaboration between Australia and India.

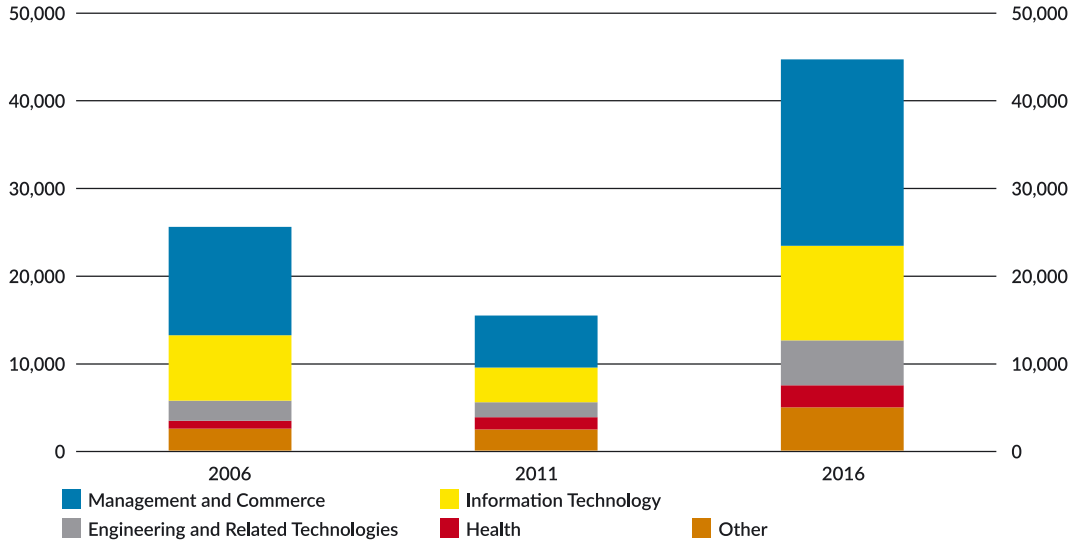
Between 1993 and 2013, India was one of the top three source countries for Australian academics (the other two being the United Kingdom and China). In 2014, 30 per cent of all postgraduate researchers were international students, with the figure higher in the STEMM disciplines of engineering (54.2 per cent), information technology (51.5 per cent), agriculture and environment (45.6 per cent) and natural and physical sciences (36 per cent).

FIGURE 33: INDIAN STUDENT ENROLMENTS IN HIGHER EDUCATION BY LEVEL OF STUDY



Source: Australia India Institute. Working Paper Commissioned for the India Economic Strategy.

FIGURE 34: INDIAN STUDENT ENROLMENTS IN HIGHER EDUCATION BY BROAD FIELD OF EDUCATION



Source: Australia India Institute. Working Paper Commissioned for the India Economic Strategy.

In the decade to 2017, joint research papers between Indian and Australian researchers have doubled, indicating increased collaborations. Unsurprisingly, Indian diaspora researchers play a disproportionately large role in Australia's collaborative efforts with India. Of all scientific publications co-authored by researchers in India and Australia, a large majority of the Australia-based authors (60 per cent) were of Indian descent. Enhancing the reputation of our education system and building collaborative research and innovation ecosystems between Australia and India depends on a pipeline of high-performing students and academics.

AUSTRALIA'S INDIAN DIASPORA – A TRADING EDGE?

There is no noticeable correlation between the overall growth in trade with India and increase in migrants from 2006 to 2016 (Figure 35).

Certainly, there appears to be no direct relationship between Australia's major exports to India and the industry categories in which Indian migrants have been employed during this period.

There may be some correlation between India's exports to Australia and the movement of professional staff generating these exports. Around 30 per cent of Indian exports to Australia comprise services, of which 'professional, technical and other business' make up one-third. This services export category most likely correlates with the rising numbers of Indian migrant employees and entrepreneurs, particularly between 2011 and 2016, categorised under professional, scientific, and technical services (see Figure 32; mostly in IT and business solutions).

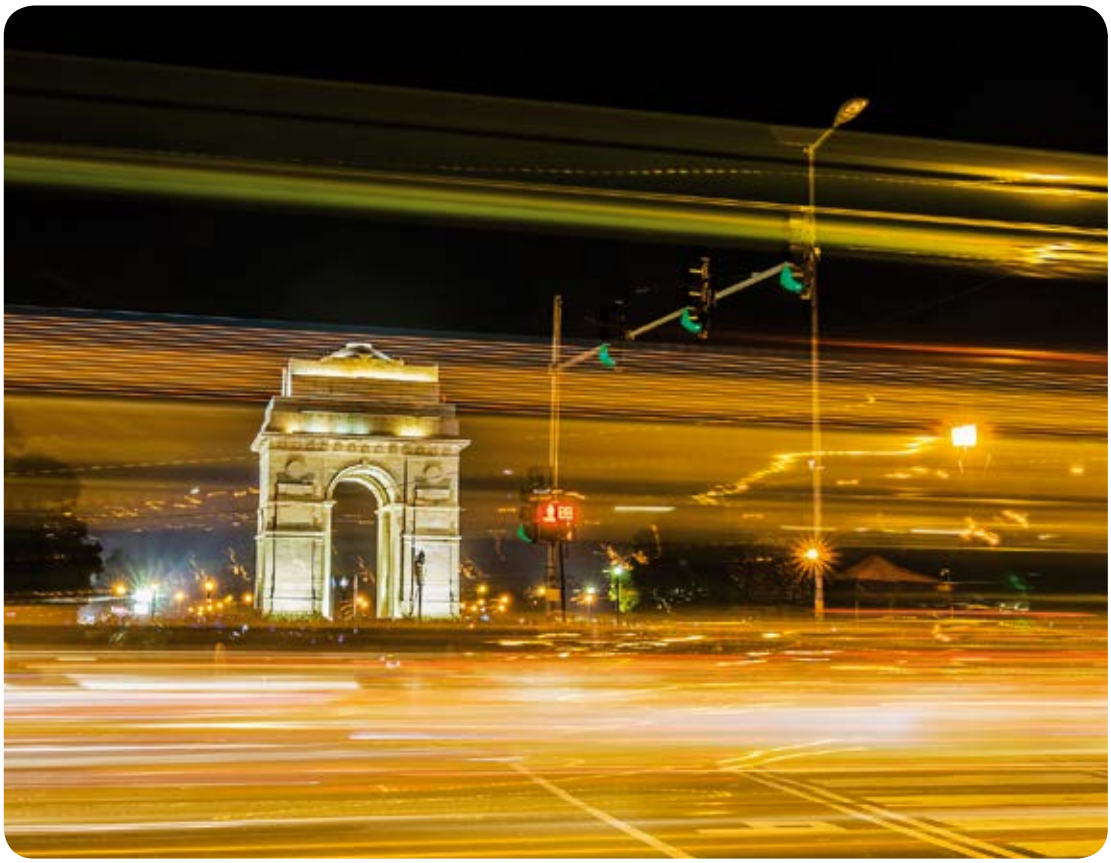
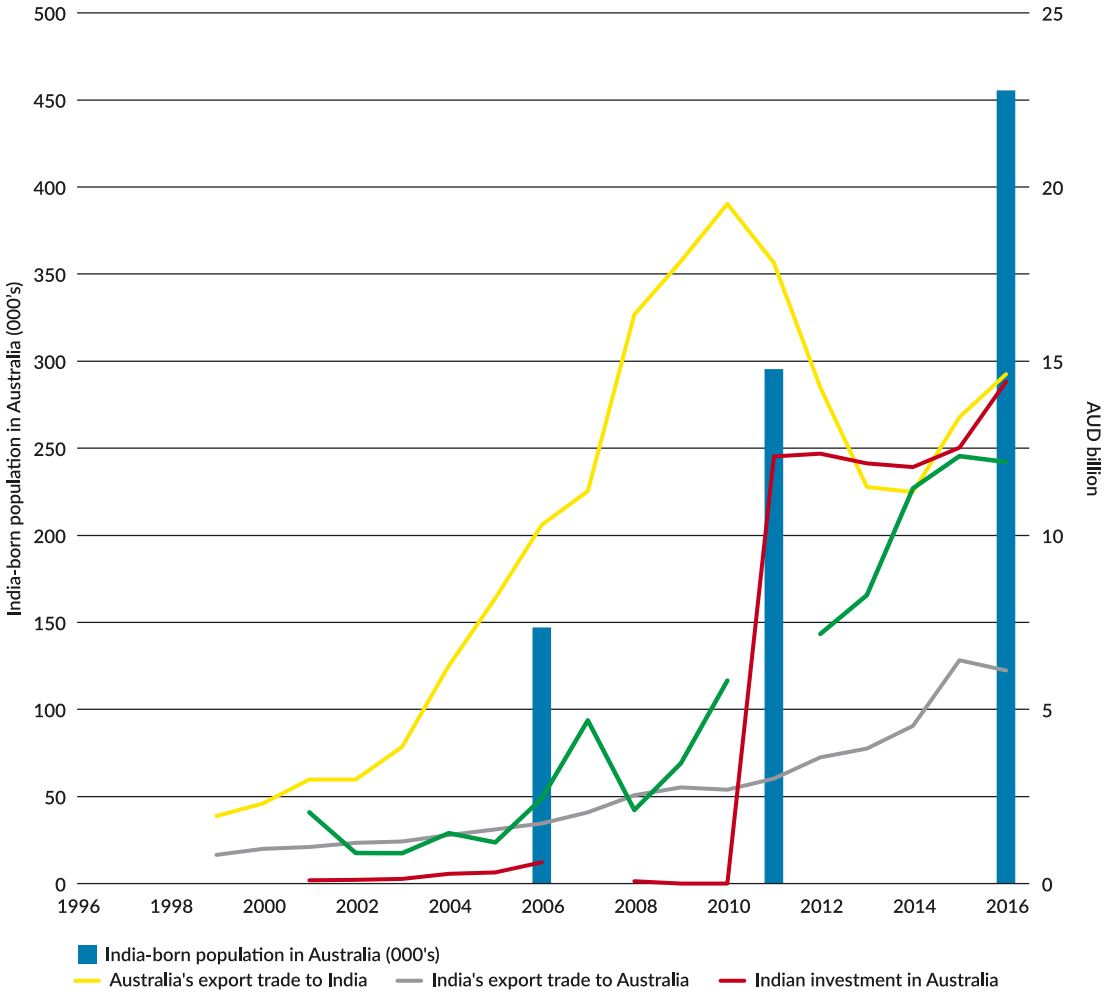


FIGURE 35: CHANGES IN BILATERAL TRADE AND INVESTMENT AND INDIAN-AUSTRALIAN DIASPORA POPULATION



Source: 1) Australian Bureau of Statistics (AU). 2016 Census. Canberra AU: The Commonwealth of Australia; 2016. 2) Department of Foreign Affairs and Trade (AU). Services Trade Access Requirements Database. Canberra AU: The Commonwealth of Australia; 2017

RECOMMENDATIONS

Australia tends not to use its domestic diaspora groups strategically to advance its foreign policy and trade interests. This must change. The opportunity is ripe for Australia to capitalise on its Indian diaspora, which should be seen as a national asset in the bilateral relationship and deployed accordingly.

The challenge for the Australian Government is fine-tuning the settings across immigration, education, foreign and trade policy to leverage the Indian diaspora. In a broad sense, the settings are performing well. Australia ranks 6 out of 100 countries on the ability to grow, attract and retain talent.[141] The fact that migration has delivered an economic dividend for Australia is in large part due to policy settings which favour migrants of working age who have the necessary skills to contribute to the economy. In any case, there are limits to what government can do to some of the settings that are inherently demand-driven, for example, the temporary skilled migration program.

However, the government should deepen its engagement with Australia's Indian diaspora as a resource to advance economic links and build transnational networks for trade, investment and innovation.

We need to shift our thinking about the diaspora away from the multicultural narrative, important as that is, and towards seeing the Indian diaspora as a network which can open doors, help navigate Indian business culture, enhance the community's understanding of contemporary India and contribute to Australian public diplomacy in India.

88. Attracting the right student and professional talent, including in the STEMM fields, that will drive Australian economic growth

88.1 Attract talented and highly competitive graduates from top-level Indian higher education institutions with scholarships and other incentives linked to career advancement and entrepreneurship opportunities in such sectors [*see Chapter 3: Education Sector*].

88.2 Maintain skilled immigration categories for attracting highly talented professionals, such as the Global Talent Scheme [*see Chapter 16: Trade Policy Settings*].

88.3 Sharpen the focus of both migration and education visa streams towards long term growth drivers in the Australian economy, in particular STEMM.

89. Building diaspora-focused connections between Australia and India

89.1 Support diaspora and student peer-to-peer networks, institutional linkages and business to business organisations.

89.2 Develop networks with diaspora professionals and companies who mentor students and create internship opportunities in key sectors, including alumni associations in India

- a pilot initiative could be a 12 month mentoring program under the CEO Forum
- diaspora and India-focused innovation ecosystems such as TiES should also be encouraged.

89.3 Conduct an Indian diaspora industry and research mapping exercise in collaboration with university partners, diaspora alumni associations and business organisations to further quantify the reach of the Indian diaspora into the bilateral economic relationship.

89.4 Encourage and leverage IIT/IIM Alumni organisations in Australia, in addition to Australian university alumni in India.

89.5 Establish diaspora-led roundtables/consultative groups in each of this strategy's priority sectors and states

- this could be led by DFAT in conjunction with relevant line agencies and Australia-India business chambers.

89.6 Improve mechanisms for linking the research and business diaspora for the commercialisation of research and development.

90. Giving prominence in the bilateral relationship to achievements and innovation in the diaspora

90.1 Leverage India's 'brain circulation' narrative of the diaspora by ensuring Indian diaspora participation is prominent in bilateral engagement.

90.2 Increase the visible presence of diaspora achievement and leadership in Australia's competitive growth sectors.

90.3 Engage CEOs of successful Indian diaspora businesses, Indian diaspora professionals in high-level executive positions in Australian companies, and leading Indian diaspora researchers at Australian universities more closely

- including by encouraging their participation in bilateral dialogues, delegations, and business to business engagement between India and Australia

90.4 Support efforts by Asialink, the Diversity Council Australia and others for greater Indian diaspora representation in organisational structures and on boards.

90.5 Ensure visiting Indian delegations spend time both with the broad Indian diaspora community and with Indians of notable achievement.

90.6 Celebrate and showcase achievement and entrepreneurship within the diaspora community, through the India Australia Business and Community Awards and similar initiatives.

90.7 Lobby the Indian Government to regularly host the regional biennial Pravasi Bharatiya Divas (Overseas Indian Day) convention and awards ceremony in Australia.

THE GEOPOLITICAL PILLAR

CHAPTER NINETEEN

An India economic strategy cannot exist in isolation. It is part of the broader relationship between Australia and India and the stronger that broader relationship the better the prospects of an economic strategy.

India should be seen not only as an economic partner but also as a geopolitical partner. Just as the structural complementarity of our two economies lies at the heart of the economic relationship, so also are we seeing a growing geopolitical complementarity between Australia and India.

This chapter examines the basis and prospects of Australia's strategic partnership with India. It does not make recommendations since it is beyond the scope of this report. It is intended to locate the economic strategy within the broader context of the shared geopolitical interests of Australia and India. The views expressed in this chapter are mine alone and should not be seen in any way as reflecting an Australian Government perspective.

India is today in the midst of a major geopolitical repositioning, as it discards its old non-aligned movement rhetoric, pursues a hard headed national interests based policy and builds stronger strategic ties with a wide range of countries including the United States and its allies in the region, especially Japan.

The starting point of a strategic partnership with India should be to understand the drivers of Indian strategic policy over the next several decades.

Indian strategic thinking is likely to be shaped by six key factors.

First, a firm attachment to strategic autonomy and to preserving maximum freedom of action. India will be guided by its own interests as it builds strategic ties with a range of countries, including many with which Australia and other western countries have limited strategic congruence.

Second, deep strategic competition with China, not just as a neighbouring state but also in relation to China's broader regional ambitions and influence.

Third, India is showing a growing level of comfort in increasing strategic cooperation with the United States and its allies in the region such as Japan and Australia. India is not about to become an ally of the United States or anyone else, but the combination of strategic congruence and shedding the straitjacket of non-alignment has created the space for deeper collaboration.

Fourth, India is likely to continue to support a liberal international order, although that will not extend to support for United States exceptionalism. Also, India will want the international order to better reflect the power distribution of the contemporary world. India will not be bound by rules in which it had no say in establishing.

Fifth, India is committed to increase significantly its defence capability to buttress its strategic autonomy. This will add to its strategic weight. It wants to import less defence equipment and produce more domestically, including through joint ventures.

And sixth, India is likely to be cautious about pressing a human rights agenda in its bilateral relations nor is it much interested in an international policy of promoting democracy. Moreover, it will hold to this caution notwithstanding its own considerable domestic credentials in relation to human rights and democracy.

How will these drivers play into the agenda of strategic cooperation between Australia and India?

The Australia-India strategic relationship stands on its own merits. It is however closely linked to the broader security of the region and therefore inevitably also brings in China, if only because China, like the United States, looms large in the strategic calculations of both countries.

The India-China relationship will have elements of both economic cooperation and strategic competition, not unlike the way in which those two elements thread their way through China's relationships with the United States, Japan and others.

India will want to maximise its economic relationship with China. But it will also be opposed to any move by China to become the predominant power in the Indo-Pacific. And it will be particularly concerned to ensure that China's expanding interest in the Indian Ocean is not given free reign.

While China is a factor in the strategic partnership between Australia and India, it is important to understand that Australia and India do not approach China from identical perspectives. Indeed, there are some large differences in our respective relations with China.

When India looks at China it sees a great power with which it shares a long and disputed land border and against which it has gone to war. The Indian perspective is shaped by its desire to preserve its freedom of manoeuvre and a concern that China's rising power could narrow India's strategic choices and flexibility.

Australia, on the other hand, approaches China from a different perspective. Ours is not a great power's view of China. Nor does Australia see China as an enemy or a hostile power.

Unlike India, Australia is an ally of the United States. China looms much larger in the Australian economy than it does in India's economy. We have in Australia a large Chinese diaspora who are a valued part of Australia's multicultural character. Also, Australia has no border dispute with China and nor have we ever gone to war with China, unless you count the participation of Australians in putting down the Boxer rebellion.

The international behaviour of a state is shaped by many factors, including its geography, history and culture. It is also however linked to the character of its political system.

China's political system is of course a matter entirely for China. Australia has neither the capacity nor the right to demand China pursue a particular system of government.

But China aspires to be the predominant power in the Indo-Pacific and that, by definition, would make it the single most important shaper of the region's strategic culture and norms. So whether it is a democracy or a one party state matters.

India shares our democratic bias but the political character of the Chinese state is not its primary strategic concern. For Australia a democratic China becoming the predominant power in the Indo-Pacific is a very different proposition to an authoritarian China occupying this position. India's concerns about a powerful China would exist irrespective of whether China were a democracy.

Australia wants to see China succeed in its economic reforms and to play a constructive role in the region and the world. But we also want to see a strategic system in the Indo-Pacific which is anchored in the rule of law and which recognises the stability which United States strategic engagement brings to the region.

In this our views are broadly shared by India as well as by the United States and Japan. It is this shared perspective which underpins groupings such as the Quad (United States, Japan, India and Australia) and also trilateral arrangements such as Australia, India and Japan.

These fledging groupings reflect the emerging reality that United States strategic predominance in the region is weakening and that, as China becomes indisputably the largest economy in the world with corresponding strategic heft, the region will look for balancing mechanisms which can help ensure that regional stability holds as profound shifts in economic weight rearrange strategic relativities.

None of this should be seen as an inherently anti-China move. Rather they are efforts to find a new strategic equilibrium in the Indo-Pacific which accepts the growing strategic weight of China but also seeks to ensure that the interests of open democratic states committed to a rules based order are protected. How quickly such a new equilibrium can be established will depend in part on how forcefully the rules based system in the Indo-Pacific is challenged. Should that challenge further sharpen, the need for defenders of the system to work more closely together to meet the challenge will grow.

Balancing China however is not the sole basis for a strategic partnership between Australia and India. There are two other important issues which bring us closer together.

First, India is for the most part a supporter of the liberal international order. This matters because the defence of that order is crucial for a country like Australia which can neither buy nor bully its way in the world. International law, a rules based system, the promotion of public goods, all these are important to Australia. They provide a measure of protection against the law of the jungle prevailing in international relations.

Second, Australia and India share an interest in developing regional institutions in the Indo-Pacific, especially the EAS, which promote economic integration and strategic stability.

Beyond ASEAN, regional institutions in the Indo-Pacific are still weak. Strengthening them is a high priority for Australia and India. Strong institutions cannot stop conflict but they can help at the margins to ensure that strategic competition does not spill over into confrontation. They also have an important role to play in pushing out the boundaries of trade and investment integration in a way which both expands prosperity and raises the cost of conflict.

Very importantly, the EAS and other regional institutions offer a framework for engaging China, giving it more space to match its economic weight and signaling that containment of China is a policy dead end.

Another area through which Australia's strategic partnership with India could be strengthened would be to work more closely with India on some of the broader global multilateral challenges that we face.

In the past Australia and India had limited common ground in relation to much of the global multilateral agenda. But that too is changing. Our perspectives on nuclear non-proliferation are now closer. Like India, Australia wishes to see reform of the United Nations Security Council. We may not yet agree on the complicated details of those reforms but we do support India taking a seat on an expanded Security Council.

There are also opportunities for Australia and India to work more closely on the large challenge of climate change. Again, our respective positions may not be identical but we both recognise the need for the effective implementation of the Paris accords on climate change and the need for all countries to play their part in a global effort.

Working more closely with India on the multilateral agenda where our interests are similar will send a positive signal about the Australia India partnership and our shared commitment to an international order which seeks to accommodate the interests of all states.

The extent to which Australia recognises a growing strategic convergence with India is best reflected in the way our own strategic focus has shifted from the Asia-Pacific to the Indo-Pacific.

It is not often that a country changes the geographic definition of its primary strategic environment. But that is precisely what Australia has done in recent years by replacing the Asia-Pacific with the Indo-Pacific.

The Asia-Pacific, with Northeast Asia at its strategic centre, has been the conceptual foundation of Australian strategic thinking for most of the post-Second World War period. The Asia-Pacific was seen as a coherent strategic system bringing in the major powers and also reflecting a long period of trade and investment integration, best captured by APEC.

Australia saw this economic integration as giving the Asia-Pacific added coherence. The Asia-Pacific construct provided a framework for thinking about the management of major power relationships, especially the vital United States-China relationship. It was our frame of reference for charting the strategic impact of shifting economic weight, most notably the extraordinary expansion of the Chinese economy.

In more recent years, however, we have moved from Asia-Pacific to Indo-Pacific to describe the crucible of our strategic environment. And a large part of that shift is driven by how we see India.

The concept of the Indo-Pacific as a single strategic system is very much a work in progress. It is both an act of imagination and a recognition of an emerging structural shift in our strategic environment.

At its heart, the Indo-Pacific reflects two propositions.

First, that the maritime environment is likely to be the primary focus of strategic planning and strategic competition over the next several decades.

Secondly, that India's strategic focus will, over this period, shift well beyond India's immediate neighbourhood and embed India in the strategic dynamics of the region in a way it has not in the post-war period.

These two propositions do not, in themselves, create a coherent Indo-Pacific strategic system. But they do suggest that the idea of the Asia-Pacific needs to adapt to accommodate them.

In this sense, the idea of the Indo-Pacific is best understood as an evolution of Australia's Asia-Pacific bearings, not a rejection of the Asia-Pacific.

It is also important to understand what the Indo-Pacific is NOT.

It does not, for example, treat the Indian and Pacific oceans as a single strategic system. Nor does it seek to bring all of South Asia into the old Asia-Pacific strategic system.

For now the Indo side of the Indo-Pacific is really just India and it is more about bringing India to the Asia-Pacific than stretching the footprint of Australia's primary strategic focus all the way to the western reaches of the Indian Ocean.

Over time, more structure and integration may evolve in the Indian Ocean such that it might become a coherent strategic system akin to its counterpart in the western Pacific. But that is a long way off, so for the foreseeable future when we think about the Indo-Pacific we are thinking of an Asia-Pacific which finds room to accommodate India as a strategic player, and an India whose strategic and economic interests will increasingly draw her into acting as such a player.

The Indian Ocean provides a meeting point for Australian and Indian interests. It extends the scope of our growing strategic congruence.

India has always seen itself as an Indian Ocean power whereas Australia has traditionally placed a greater emphasis on the Pacific as the ultimate arbiter of our strategic stability. Now we have an opportunity to better align these perspectives and to build a partnership which bridges both oceans. It is a neat symmetry for an Australian continent which faces both the Pacific and Indian oceans and an India which has always been strategically anchored in its namesake ocean.

APPENDIX 1: STATE SNAPSHOTS

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STATE SNAPSHOTS – EXPLANATORY NOTE

A snapshot of each of India's 29 state economies is annexed. Given its significance, the National Capital Region of Delhi is also included, although not a state. These snapshots are designed to introduce major features of each state economy and some of the most significant sectoral opportunities for Australia. They provide an evidence base for the competitiveness of states and offer a starting point to assess the risks and opportunities across states.

The snapshots are not designed to be exhaustive or to be solely relied on for commercial considerations – they are necessarily selective and general in scope and are current as at April 2018.

The snapshots provide information about the growth trajectory of the state economy, the main industry clusters, chief economic priorities, political leadership, the regulatory environment, the state's recent track record of reform and the key challenges.

Each snapshot also provides a table of key indicators for the relevant state, including measures of:

- market size – population, geographic area and GSDP (in particular, real GSDP at constant prices, base year 2011–12)
- the state's rate of urbanisation and the number of cities with a population of a million or more
- income and growth – average growth in GSDP over the period from 2012 to 2017 and per capita income (in particular, per capita net state domestic product at current prices, 2011–12 series)
- sectoral composition of the state economy and the state's contribution to national GDP
- infrastructure – power deficit, road density and rail density
- human development – literacy rate and the gender literacy gap
- the state of public finances – the fiscal deficit to GSDP ratio, debt to GSDP ratio, and health and education expenditure (as a percentage of total public expenditure)
- FDI inflow data from 2000 to 2017 from the Department of Industrial Policy and Promotion.

The snapshots reference a number of state-level rankings:

- The annual ease of doing business rankings released by the Department of Industrial Policy and Promotion ranks states on the degree of implementation of the **Business Reform Action Plan** using the responses of state governments themselves and technical experts. The 2016 ranking covered all 29 states and seven union territories.
- The **Investment Potential Index** developed by the National Council of Applied Economic Research ranks states on the potential for investment and job creation and business perceptions on the ease of doing business. The 2017 Index included 20 major states and Delhi (excluding Sikkim, Goa, Jammu and Kashmir, Arunachal Pradesh, Manipur, Meghalaya, Mizoram, Nagaland and Tripura).
- The **Public Affairs Index** developed by Public Affairs India ranks states on the quality of governance, including economic freedom, fiscal management, transparency and accountability, environmental management, delivery of justice, law and order, women and children, social protection and education. The 2017 Index ranked all 29 states and Delhi.
- The **Gender Vulnerability Index** developed by Plan India is a composite index of all 29 states and Delhi, comprised of over 170 indicators ranking states across dimensions of gender equality.

In each of these, a higher ranking corresponds to better performance.

ANDHRA PRADESH

Andhra Pradesh, on India's southeast coast, ranks among India's most business-friendly states. The Telugu Desam Party government led by Chief Minister Chandrababu Naidu was elected in 2014 after the state's north-western region was carved out to become the separate inland state of Telangana, taking with it the economic base of Hyderabad (it will be the joint capital until 2024). Naidu is leading an ambitious reform agenda to rebuild Andhra Pradesh's economy, attract investment, pilot policy reforms and drive innovation. Naidu led Hyderabad's development as Chief Minister of undivided Andhra Pradesh from 1994–2004 and is hoping to achieve similar outcomes for the new state. The plans for major state-building projects include a greenfield capital city in Amravati, large-scale solar capacity, a new fintech hub in Visakhapatnam (already boasting the state's highest per capita income) and the Polavaram river-linking irrigation project to drought-proof the state. However, the pace of major infrastructure projects is disappointing expectations and the state is running a fiscal deficit of around $4.5 billion.

Rankings	Rank
Business Reforms Action Plan 2016	1
State Investment Potential Index 2017	3
Public Affairs Index 2017	14
Gender Vulnerability Index 2017	12

Key statistics	Andhra Pradesh	India
Area (square km)	160 205	
Real GSDP 2016–17 (AUD billion)	109	1 972
Population (million)	49.7 (≈ROK)	1 300
Urbanisation rate (%)	29.6	31.2
Number of million plus cities	3 (Hyderabad, Visakhapatnam, Vijaywada)	63
Income and growth		
Per capita income (AUD)	2 433	2 052
NSVA by sector 2015–16 (%)		
Agriculture	34	17
Industry	21	31
Services	45	52
Average GSDP growth 2015–17 (%)	11.3	6.9
State contribution to GDP (%)	4.5	

Key statistics	Andhra Pradesh	India
Infrastructure		
Power deficit 2016–17 (%)	–0.1	–0.7
Road density 2014–15 (km/100 km^2)	111.7	139.1
Rail density 2014–15 (km/1,000 km^2)	16.6	20.1
Human development		
Literacy rate (%)	67	73
Gender literacy gap (pp)	15.8	16.7
Public finances 2016–17		
Proportion of fiscal deficit to GSDP	2.9	2.9
Debt to GSDP ratio (%)	23	23.9
Health spend (% of total spend)	4.7	5.6
Education spend (% of total spend)	15.3	9.7
Investment		
Share of FDI inflows 2000–2017 (%)	4	

Economic fundamentals

Andhra Pradesh is one of India's fastest growing states. Although it has achieved double-digit growth over the past three years, this has come off a low base. Chief Minister Naidu is keen to emphasise the Telugu Desam Party government's success in attracting substantial private investment, both domestic and foreign, including 22 per cent of new FDI projects announced in 2016–17. The state's single window clearance system has been regarded a model for other states.

The State Government is aggressively promoting a range of sectors, including agriculture (employing 62 per cent of the state's population), horticulture, aquaculture, food processing, life sciences, textiles, electronics and IT, aerospace and defence, automobiles and auto-components, petroleum, chemicals, energy and mining. Across these sectors, Chief Minister Naidu has emphasised the transformative impact of technological innovation.

Chief Minister Naidu is leading plans for an array of major infrastructure projects. However, a number of firms have expressed frustration at the rate of progress. High-profile foreign investments recently announced include those by major auto manufacturers such as Kia Motors, Isuzu and Hero MotoCorp, and by Taiwanese mobile phone giant Foxconn at the multi-product 7,000 acre Sri City industrial park home to 80 companies.

Bifurcation in 2014 put the public finances of Andhra Pradesh in a precarious position – the state not only inherited a large fiscal deficit (of around $4.4 billion in 2015–16), but has struggled with a revenue deficit (estimated at $82.7 million in 2017–18), after the state lost the substantial revenue-producing city of Hyderabad (which contributed 70 per cent of the undivided state's revenue). There are indications that revenue collection is picking up (without substantial tax increases), but there have been concerns raised, including by the RBI, that the state's debt levels are overstretched.

The state's finances are a source of contention with the ruling BJP. Central assistance promised as part of the bifurcation to bridge Andhra Pradesh's revenue deficit and fund the new capital city has been piecemeal. Chief Minister Naidu has repeatedly lobbied the Central Government for Special Category Status (entailing special financial assistance) as well as to argue for the raising of the state's borrowing limits under the *Fiscal Responsibility and Budget Management Act*.

Current strengths

- India's best state (tied with Telangana) in ease of doing business rankings in 2016.
- Second longest coastline of any Indian state at 974 km.
- Focus on innovation and technology, including India's highest installed solar capacity, a moratorium on new thermal power plants until 2022, adoption of e-governance portals, the digitisation of land records using blockchain technology, and the roll out of a fibre-optic broadband network.
- India's largest exporter of fish and aquaculture produce, a major producer of mangoes, papaya, tomatoes, meat, milk and eggs.
- World's largest deposit of baryte, India's largest bauxite deposit and major ilmenite deposits; India's largest off shore gas field (operational).

Sectoral opportunities for Australia

- Resources and Energy – mining, mineral processing (particularly for iron ore, gold, base metals and mineral sands) and METS, renewable energy technology (strong potential in solar and wind).
- Infrastructure and urban development – power transmission investment, architectural services, road safety and transport technology solutions; in the short term there will be greenfield roads investment opportunities.
- Fintech – Visakhapatnam is being developed as a fintech hub, including through strengthening fintech capabilities of existing academic institutions.

Potentially transformative factors

- Enhanced inter-state connectivity – the planned Visakhapatnam-Chennai and Chennai-Bengaluru industrial corridors will bring further growth stimuli and infrastructure investment to the state, including to the state's Rayalaseema region which is relatively less developed than the coastal region.
- Coastal development – two coastal economic zones, two new ports, and an LNG terminal project expected to be developed could considerably expand port traffic.

ARUNACHAL PRADESH

Arunachal Pradesh is the largest of India's north-eastern states and India's most sparsely populated state. The state is strategically sensitive – it borders Bhutan and Myanmar and is the subject of an ongoing territorial dispute with China. Arunachal Pradesh is predominantly agrarian, but its economic potential lies in its capacity for hydropower. Much of the state is remote, with difficult terrain.

Rankings	Rank
Business Reforms Action Plan 2016	31
State Investment Potential Index 2017	NA
Public Affairs Index 2017	25
Gender Vulnerability Index 2017	26

Key statistics	Arunachal Pradesh	India
Real GSDP 2015–16 (AUD billion)	3.3	1 972
Population (million)	1.4 (≈Estonia)	1 300
Urbanisation rate (%)	22.9	31.2
Number of million plus cities	0	63
Income and growth		
Per capita income (AUD)	2 434	2 052
NSVA by sector 2015–16 (%)		
Agriculture	41	17
Industry	27	31
Services	32	52
Average GSDP growth 2015–16 (%)	16.5	6.6
State contribution to GDP (%)	0.2	
Infrastructure		
Power deficit 2016–17 (%)	–2.1	–0.7
Road density 2014–15 (km/100 km^2)	30.3	139.1
Rail density 2014–15 (km/1,000 km^2)	0.1	20.1
Human development		
Literacy rate (%)	65.4	73
Gender literacy gap (pp)	14.1	16.7

Key statistics	Arunachal Pradesh	India
Public finances 2016–17		
Proportion of fiscal deficit to GSDP	2.5	2.9
Debt to GSDP ratio (%)	23.9	23.9
Health spend (% of total spend)	6.3	5.6
Education spend (% of total spend)	15.3	9.7
Investment		
Share of FDI inflows 2000–2017 (%) (includes that of all north-east states)	0.03	

Economic fundamentals

Arunachal Pradesh remains largely agrarian, producing tea, fruit, plywood, cane and silk. The state recorded one of India's fastest growth rates with GSDP of 16.5 per cent in 2015–16, but this comes off a very low base. The state's strategic sensitivities can overshadow economic progress.

The state has a poor stock of infrastructure – there are no commercial airports in operation, poor roads and limited railway connections. Nonetheless, the state's potential for hydropower generation is among the best in India, due to its large river valleys. The potential hydropower capacity of these river valleys is estimated at around 60,000 MW, or approximately 22 per cent of India's total capacity. As of June 2016, the installed hydropower capacity in Arunachal Pradesh was 97.6 MW. The state is developing some of this potential – projects in the pipeline include Subansiri Lower (estimated 2,000 MW capacity), the Demwa Lower (estimated 1,750 MW capacity) and the 2,880 MW Dibag Multipurpose Project, one of India's largest multi-purpose dam projects.

Current strengths

- Arunachal Pradesh's tourism industry is developing – the state attracts a small number of eco and adventure tourists. In 2015–16, foreign tourist arrivals in the state stood at 5,700 tourists.

Potentially transformative factors

- Increased road and rail connectivity – the proposed East-West Industrial Corridor aims to improve connectivity of north-eastern states with the rest of India.
- A slated revival of the bamboo economy could benefit the state in terms of increased farmer income.

ASSAM

Assam is the most populous and largest economy of India's north-eastern states. There is a renewed drive to develop this historically underdeveloped and insurgency-affected collection of states, which are also a priority under India's 'Act East' policy as they directly interface with India's eastern neighbours. Assam represents a gateway to the north-east. The state's economy is primarily agricultural, with fertile land running along the Brahmaputra River. Both rural and urban poverty remain higher than the national average. Although the state has yet to develop large-scale industries, it accounts for half of India's tea production and has minor oil reserves, as well as India's highest production of onshore natural gas. Attempts to raise the state's economic prospects included its first global investor summit in February 2018. For decades, anxiety about illegal immigration from Bangladesh has driven social conflict in Assam. Security concerns remain, including in remote areas such as the Barak Valley. Assam experiences annual flooding.

Rankings	Rank
Business Reforms Action Plan 2016	24
State Investment Potential Index 2017	17
Public Affairs Index 2017	26
Gender Vulnerability Index 2017	24

Key statistics	Assam	India
Area (square km)	78 438	
Real GSDP 2015–16 (AUD billion)	36	1 972
Population (million)	31.2 (≈Malaysia)	1 300
Urbanisation rate (%)	14.1	31.2
Number of million plus cities	1 (Guwahati)	63
Income and growth		
Per capita income	1 203	2 052
NSVA by sector 2015–16 (%)		
Agriculture	20	17
Industry	32	31
Services	48	52
Average GSDP growth 2012–16 (%)	6.8	6.9
State contribution to GDP (%)	1.6	

Key statistics	Assam	India
Infrastructure		
Power deficit 2016–17 (%)	–3.6	–0.7
Road density 2014–15 (km/100 km^2)	416.3	139.1
Rail density 2014–15 (km/1,000 km^2)	31.5	20.1
Human development		
Literacy rate (%)	72.2	73
Gender literacy gap (pp)	11.5	16.7
Public finances 2016–17		
Proportion of fiscal deficit to GSDP	2.6	2.9
Debt to GSDP ratio (%)	18.8	23.9
Health spend (% of total spend)	5.3	5.6
Education spend (% of total spend)	21	9.7
Investment		
Share of FDI inflows 2000–2017 (%) (includes that of all north-east states)	0.03	

Economic fundamentals

Assam's economy is predominantly agrarian with 85 per cent of the state's population living in rural areas and around 70 per cent dependent on agriculture for their livelihood. Low agricultural productivity is driven by inadequate irrigation, perennial floods, and the persistence of traditional agricultural practices. The state's urbanisation rate is well below the national average at 14.1 per cent. Assam also lags the national average in terms of employment, with over 1.5 million unemployed youth in 2017–18. Assam has the highest maternal mortality rate of all Indian states, almost double the national average, with around 328 deaths per 100,000 live births (three quarters of these deaths are in tea plantations).

Assam's agriculture sector's growth declined from 16.5 per cent to 0.3 per cent between 2012–13 to 2014–15, while industrial growth increased from –5.5 to 5.1 per cent and services growth increased from 2.1 to 12.2 per cent over the same period.

Assam's industrial output is concentrated on petroleum, natural gas, food production, forestry and textiles. The state produces around half of India's tea production and over 10 per cent of world production (the tea industry employs almost a million plantation workers). Small scale industries include sugar, jute, silk, paper, handloom, sericulture and a range of traditional handicrafts, such as bamboo and cane products.

Assam has not attracted much private investment, but a renewed push to attract investment has identified a number of focus sectors, including agriculture and food processing, organic food, bamboo, textiles and handicrafts, inland water transport, river front development and logistics, as well as IT, pharmaceuticals, plastics, petroleum and natural gas.

State finances have been problematic in recent years. While the state's special category status entitles it to grants from the Central Government, internal revenue generation has stagnated, with

the state managing to collect only 25–35 per cent of the revenues collected by states of similar size. The World Bank is supporting the digitisation of systems, rationalisation of revenue collection, and improved finance management practices.

Current strengths

- Reserves of oil, natural gas, coal, granite and limestone; one of Assam's major petroleum refineries is the Numaligarh Refinery Project and India's oldest oil refinery is at Digboi.
- Major producer of tea and third in India for raw silk production.
- Good rail connectivity with a rail density above the national average.
- Ample water resources.

Sectoral opportunities for Australia

- Water – inland water ways (as part of a broader push for greater connectivity, the Assam Government, with World Bank support, is investing in infrastructure for inland water transport; the Australian Government has contributed to this objective through the regional aid program).

Potentially transformative factors

- Assam's first global investor summit in February 2018 concentrated resources on the state's investment climate, including the introduction of a slew of new policies, including on pharmaceuticals, tech start-ups, the sugar sector, solar energy and biotechnology.
- Infrastructure upgrade – infrastructure is widely acknowledged to be inadequate in Assam. A number of new bridges over the Brahmaputra River, a significant expansion of the rail network and industrial corridors alongside the Brahmaputra River have been proposed.

BIHAR

The northern hinterland state of Bihar, India's third most populous, has demonstrated one of the most dramatic turnarounds in economic performance of all states, consistently recording high rates of growth from a very low base. Much of this has occurred under the leadership of Chief Minister Nitish Kumar, who re-joined the ruling BJP in 2017. But Bihar remains one of India's most impoverished states; its per capita income, literacy rate and gender equality indicators are India's lowest. The state has done well to improve law and order and target welfare to the poor. But in spite of the potential of its young demographics, Bihar remains uncompetitive across the spectrum of economic and human development indicators. Its political culture is undergoing a shift to a focus on governance, but recent improvements have been diluted by bureaucratic blockages and persistent caste-based politics.

Rankings	Rank
Business Reforms Action Plan 2016	16
State Investment Potential Index 2017	19
Public Affairs Index 2017	30
Gender Vulnerability Index 2017	30

Key statistics	Bihar	India
Area (square km)	94 163	
Real GSDP 2016–17 (AUD billion)	65.9	1 972
Population (million)	104.1 (≈Ethiopia)	1 300
Urbanisation rate (%)	11.3	31.2
Number of million plus cities	1 (Patna)	63
Income and growth		
Per capita income	708	2 052
NSVA by sector 2015–16 (%)		
Agriculture	22	17
Industry	20	31
Services	58	52
Average GSDP growth 2012–17 (%)	8.4	6.9
State contribution to GDP (%)	2.7	

Key statistics	Bihar	India
Infrastructure		
Power deficit 2016–17 (%)	–2.3	–0.7
Road density 2014–15 (km/100 km^2)	218.8	139.1
Rail density 2014–15 (km/1,000 km^2)	38.8	20.1
Human development		
Literacy rate (%)	61.8	73
Gender literacy gap (pp)	20.1	16.7
Public finances 2016–17		
Proportion of fiscal deficit to GSDP	3.7	2.9
Debt to GSDP ratio (%)	28	23.9
Health spend (% of total spend)	5.3	5.6
Education spend (% of total spend)	15.8	9.7
Investment		
Share of FDI inflows 2000–2017 (%) (includes that of Jharkhand)	0.03	

Economic fundamentals

Although the most densely populated, Bihar ranks among India's least urbanised states; 89 per cent of the population is rural and 76 per cent dependent on agriculture for their livelihood. Bihar's economy is heavily dominated by agriculture and associated sectors, which account for over 22 per cent of GSDP. Agriculture was firmly entrenched after the division of the state in 2000 saw most mineral resources go to the newly created state of Jharkhand. But very poor agricultural productivity and some of the smallest landholdings means any growth in Bihar's economy is largely driven by the services sector, which comprises 59 per cent of GSDP, including hospitality, transport, construction and telecommunication services.

Bihar has the highest share of any state of people without power and the lowest teledensity. But it is on the way to rapidly expand electrification; the availability of energy has grown by 120 per cent from 2011–12 to 2016–17. Although the state's finances are heavily dependent on support from the federal government, the debt to GSDP ratio is well below 25 per cent and tax revenue has steadily increased by around 20 per cent annually since 2011–12. Bihar has among the highest rates of unemployment and outward labour migration – millions of Biharis leave the state for temporary and informal low-wage construction and agricultural work across India as well as in Nepal, Bhutan and in the Gulf.

Current strengths

- High rail density.
- Eighth largest producer of fruits and vegetables; largest producer of lychees and major producer of wheat, sugarcane, sesame, milk and tobacco.
- Ample groundwater, particularly in northern Bihar.
- Second fastest growth in the number of registered vehicles.
- A long border with Nepal, including multiple trade transit points for Indo-Nepal trade.
- Tourism potential, including major Buddhist and other tourist circuits of historical and religious significance.

Sectoral opportunities for Australia

- Agriculture – food processing, bovine genetics, cold chain logistics, and other specialised services related to precision farming, post-harvest solutions, logistics, seed treatment and soil health.
- Education (vocational) – large scale demand for skill development, but strained capacity to pay.

Potentially transformative factors

- Progress on land acquisition and power reform – two issues which are seen as the greatest obstacles to investment.
- Urbanisation – continued outward labour migration of rural Biharis may result in persistently slow urbanisation, but if the state's capital and chief economic centre, Patna, continues to rapidly expand, it could provide a growth stimulus; Central and State Government funding is being deployed to develop Patna as a smart city.
- Demographic dividend – Bihar has one of India's youngest populations which could offer a greater dividend in the long term than relatively older peninsular Indian states.
- Institutional overhaul – improved transparency, public administration and the decline of clientelist identity politics would help to lift the state's persistent economic underperformance; these are persistent features and unlikely to shift in the short term.

CHHATTISGARH

Located in central India, landlocked Chhattisgarh is one of India's poorest states, despite its mineral wealth of coal and iron ore resources. Chhattisgarh is a leading state in mining production. But to avoid an overreliance on the mining industry for growth, Chhattisgarh's government is attempting to diversify the state's economy. The state hopes the low cost of doing business, cheap power and inexpensive land will help attract foreign investment. The state continues to be affected by persistent Maoist insurgency.

Rankings	Rank
Business Reforms Action Plan 2016	4
State Investment Potential Index 2017	14
Public Affairs Index 2017	13
Gender Vulnerability Index 2017	15

Key statistics	Chhattisgarh	India
Area (square km)	135 192	
Real GSDP 2016–17 (AUD billion)	45	1 972
Population (million)	25.5 (≈Australia)	1 300
Urbanisation rate (%)	23.2	31.2
Number of million plus cities	2 (Raipur, Durg-Bhilainagar)	63
Income and growth		
Per capita income	1 824	2 052
NSVA by sector 2015–16 (%)		
Agriculture	19	17
Industry	44	31
Services	37	52
Average GSDP growth 2012–17 (%)	7.1	6.9
State contribution to GDP (%)	1.8	
Infrastructure		
Power deficit 2016–17 (%)	–0.2	–0.7
Road density 2014–15 (km/100 km^2)	72.1	139.1
Rail density 2014–15 (km/1,000 km^2)	8.8	20.1

Key statistics	Chhattisgarh	India
Human development		
Literacy rate (%)	70.3	73
Gender literacy gap (pp)	20.9	16.7
Public finances 2016–17		
Proportion of fiscal deficit to GSDP	2.8	2.9
Debt to GSDP ratio (%)	15.8	23.9
Health spend (% of total spend)	5.7	5.6
Education spend (% of total spend)	19.7	9.7
Investment		
Share of FDI inflows 2000–2017 (%)	4	

Economic fundamentals

Chhattisgarh is an underdeveloped but resource-rich state of 25.5 million people. Even though the state has the lowest share of non-farm employment in India, Chhattisgarh produces 27 per cent of India's iron and steel, 20 per cent of iron ore and 15 per cent of aluminium. Some of the best quality iron ore deposits in the world are located in the south of Chhattisgarh. The state is also endowed with considerable reserves of bauxite, limestone and quartzite, and is the only state in India that produces tin concentrates. The abundant limestone reserves support a strong cement sector. Disputes between mining interests and tribal/Indigenous communities is a concern in Chhattisgarh.

Non-mining industries include power, IT and IT-enabling services, and biotechnology. Chhattisgarh is primarily dependent on industry, which contributes 44 per cent to GSDP.

Chhattisgarh is one of the greenest states in India, with 44 per cent of its landmass under lush forests. Chhattisgarh is endowed with 312 species of commercially traded medicinal plants, helping the state contribute 17 per cent of India's total exports of herbs and medicinal plants.

Chhattisgarh, with its budget surplus and low interest burden leading, stands out as one of India's better managed states fiscally. It ranked fourth in 2016 among Indian states on the ease of doing business.

Chhattisgarh is a power hub, with a significant power surplus. This has helped Chhattisgarh achieve an annual growth rate of 7.23 per cent over the five years to 2017, higher than the national average.

Chhattisgarh is making significant investments in industrial infrastructure. The Chhattisgarh State Industrial Development Corporation has set up industrial growth centres, five industrial parks and three integrated infrastructure development centres.

About one third of Chhattisgarh's population lives below the extreme poverty line and 93 per cent of the state's population are considered to be poor.

Current strengths

- Strong public finances.
- Ease of doing business – approvals for clearances for new business are considerably faster than average, as is the time taken to connect to water supply.
- Stable power supply – Chhattisgarh is one of the few states that has surplus power; the Korba district in Chhattisgarh is known as the power capital of India.

Sectoral opportunities for Australia

- Mining, including METS, and mining-related education/skills.

Potentially transformative factors

- Infrastructure development – Chhattisgarh is embarking on a series of roads, bridges and rail infrastructure investments, allocating billions of dollars to improving connectivity for industry.
- Solar panel hub – as one of India's leading producers of metals such as iron and tin, Chhattisgarh is a viable destination for setting up manufacturing industries for solar panels and solar modules; the state approved in 2017 a new Solar Energy Policy, which offers grid connectivity to rooftop and small scale solar power plants up to 10 kilowatts and exempts captive solar power producers from electricity taxes.

DELHI – NATIONAL CAPITAL REGION

Delhi NCR is a planning region consisting the seat of Central Government in New Delhi and the surrounding districts of three north Indian states – Rajasthan, Haryana and Uttar Pradesh. The NCR ranks as one of the world's largest urban agglomerations stretching over 58,000 square km with over 46 million people. It accounts for 8 per cent of India's GDP, over a fifth of India's FDI inflows and attracts a vast number of workers from across India. The region has multiple special economic zones and industrial clusters, including Noida and Gurugram, known for their IT services sectors, Faridabad, an industrial centre, Meerut, an education hub, as well as Ghaziabad, Alwar and Sonepat. The consumer base in the region is sophisticated; New Delhi's per capita income is almost three times the national average. Despite improvements in physical infrastructure and India's most extensive road network, congestion, air pollution, water and power shortages remain major concerns. The region's poor record on violence against women continues to generate national debate. The NCR is a common base for Australian business in India.

Note the table below relates to the National Capital Territory of Delhi, not the wider National Capital Region.

Rankings	Rank
Business Reforms Action Plan 2016	19
State Investment Potential Index 2017	2
Public Affairs Index 2017	22
Gender Vulnerability Index 2017	28

Key statistics	Delhi	India
Area (square km)	1 483	
Real GSDP 2016–17 (AUD billion)	99	1 972
Population (million)	20 (≈Romania)	1 300
Urbanisation rate (%)	97.5	31.2
Income and growth		
Per capita income	6 025	2 052
NSVA by sector 2015–16 (%)		
Agriculture	1	17
Industry	17	31
Services	82	52
Average GSDP growth 2015–17 (%)	8.5	6.9
State contribution to GDP (%)	4.1	

Key statistics	Delhi	India
Infrastructure		
Power deficit 2016–17 (%)	–0.1	–0.7
Road density 2014–15 (km/100 km^2)	2 166.7	139.1
Rail density 2014–15 (km/1,000 km^2)	123.6	20.1
Human development		
Literacy rate (%)	80.8	73
Gender literacy gap (pp)	10.1	16.7
Public finances 2016–17		
Proportion of fiscal deficit to GSDP	0.5	2.9
Debt to GSDP ratio (%)	5.9	23.9
Health spend (% of total spend)	11*	5.6
Education spend (% of total spend)	25*	9.7
Investment		
Share of FDI inflows 2000–2017 (%)	20	

**New Delhi is an outlier in its expenditure on education and health as most of its police and rural development are funded by the Central Government.*

Economic fundamentals

The NCR derives the greatest share of its GDP from New Delhi, followed by the Haryana, Uttar Pradesh and Rajasthan sub-regions in that order. There is wide variation in economic conditions across these sub-regions. While New Delhi has an urbanisation rate of 97.5 per cent, the Rajasthan sub-region is as low as 18 per cent. As a whole, the NCR's urbanisation rate is twice the national average, at 62.5 per cent, and each sub-region is expected to continue to rapidly urbanise in the future.

At the centre of NCR's economy is New Delhi's services sectors, including communications, transport, construction, real estate, financial services, insurance and tourism. Many firms in the IT-enabled services, e-commerce, business process outsourcing, and design fields are concentrated in the cities of Gurugram and Noida.

The NCR is also a hub of automotive manufacturing, including major Japanese manufacturers in Gurugram and Alwar. New Delhi has a presence of garment and furniture manufacturers, as well as electrical machinery production and repair services. Faridabad is a manufacturing centre for small-scale mechanical and engineering units. The NCR's economy also includes agriculture (predominantly in the Rajasthan and Uttar Pradesh sub-regions).

Governance of the NCR is complicated by the fact that it is split between the Central Government, four sub-national governments (that of Delhi, Haryana, Rajasthan and Uttar Pradesh) as well as an array of urban bodies. The NCR Planning Body, formed in 1985, is the institution charged with formulating long term strategy to promote growth and balanced development of the region.

Current strengths

- Proximity to the seat of Central Government and policy-making.
- Strong connectivity – Delhi international airport is among the busiest airports in Asia; the NCR has an excellent network of railways, roadways, and metro rail, including good connections between New Delhi and its satellite cities; the density of state and national highways is almost double the national average.
- The NCR is India's retail capital, with the largest number of shopping malls and luxury retailers.
- The NCR is home to leading education, research and scientific institutions.

Sectoral opportunities for Australia

- Roads, urban infrastructure, energy, architecture and design, green building technology.
- Water management.
- Education, training and skill development.
- Hospitals, including consultancy and fit-outs.
- Research partnerships with industry and educational institutions.
- ICT and IT-enabled services consulting.
- Agriculture, horticulture and dairy.
- Sport.

Potentially transformative factors

- The Delhi Mumbai Industrial Corridor is designed to facilitate large-scale industrial activity in the region and is anticipated to generate substantial employment and growth opportunities.

GOA

Goa on India's western coast is the smallest state by area, home to just 1.5 million people, but the wealthiest state in per capita terms. The cultural legacy of Portuguese colonialism and the state's pristine coastline along the Arabian Sea make Goa one of India's major tourist drawcards, attracting almost six million visitors annually. Other major industries include mining and pharmaceuticals.

Goa also stands out for its high literacy rate. Goa's economic success has perhaps kept the state from pursuing vigorously the same level of foreign investment as other states. Despite efforts to improve its ease of doing business ranking, Goa ranked 21 in 2016. Businesses report difficulties in the availability of land, power, raw materials and skilled labour.

Rankings	Rank
Business Reforms Action Plan 2016	21
State Investment Potential Index 2017	NA
Public Affairs Index 2017	8
Gender Vulnerability Index 2017	1

Key statistics	Goa	India
Area (square km)	3 702	
Real GSDP 2015–16 (AUD billion)	8.9	1 972
Population (million)	1.5 (≈Bahrain)	1 300
Urbanisation rate (%)	62.1	31.2
Number of million plus cities	0	63
Income and growth		
Per capita income	6 502	2 052
NSVA by sector 2015–16 (%)		
Agriculture	8	17
Industry	55	31
Services	37	52
GSDP growth 2015–16 (%)	11.5	6.9
State contribution to GDP (%)	0.4	
Infrastructure		
Power deficit 2016–17 (%)	0	–0.7
Road density 2014–15 (km/100 km^2)	395.2	139.1
Rail density 2014–15 (km/1,000 km^2)	18.6	20.1

Key statistics	Goa	India
Human development		
Literacy rate (%)	88.7	73
Gender literacy gap (pp)	11	16.7
Public finances 2016–17		
Proportion of fiscal deficit to GSDP	5	2.9
Debt to GSDP ratio (%)	23.9	23.9
Health spend (% of total spend)	6	5.6
Education spend (% of total spend)	14.2	9.7
Investment		
Share of FDI inflows 2000–2017 (%)	0.3	

Economic fundamentals

Goa is India's wealthiest state in terms of per capita GSDP and also one of the fastest growing. Goa grew by 9.75 per cent annually between 2005–06 and 2015–16. Goa's economic growth is driven by the strong performance of tourism, mining and pharmaceuticals sectors. Goa's high literacy rate – at 88.7 per cent, making it the third highest in India – supports the state's knowledge-based industries such as biotechnology and IT.

Tourism is the highest contributor to GSDP in the service sector. Goa received about six million tourist arrivals in 2016, with foreign tourists – predominantly from Europe – comprising 10 per cent of the total.

Major minerals produced in Goa include manganese, ferro-manganese, bauxite and silica sand. Goa is also one of India's top producers of iron ore.

Navigating environmental interests is a key economic challenge for the state. Mining ventures face pressure from environmental groups which have succeeded in having the courts intervene to halt or limit production from time to time.

Goa's strong social development indicators reflect the state's wealth. Goa is one of the few states in India to be recognised as achieving full rural electrification. Goa was rated the safest state in India for women in 2017 according to the Plan India Gender Vulnerability Index.

Current strengths

- Third highest literacy rate in India.
- Wealthiest state in India by per capita GSDP.
- Major tourist destination.

Sectoral opportunities for Australia

- VET, including skills training in the tourism sector.
- Mining and METS.

Potentially transformative factors

- Despite its high performance across social and economic indicators, Goa is not rated among the 20 easiest states in which to do business in India; attracting foreign capital, particularly if Goa plans to improve the productivity of its mining sector and increase other areas of industrial production, will depend on Goa transforming its business culture and approvals processes.

GUJARAT

Strategically located on India's west coast as a gateway to both India's landlocked northern states and to seaborne export markets, Gujarat is India's fifth largest state economy. Its above average per capita income, mercantile culture and wide diaspora plugged into global trading networks make Gujarat a major drawcard for foreign investors. However the nature of the economy in this large industrial centre does not lend itself to many Australian companies that are outgunned by major foreign direct investments from global multinationals. Gujarat receives significant political and economic attention. During Prime Minister Modi's time as Chief Minister of the state from 2001–2014, Gujarat's strong economic performance – driven primarily by infrastructure development, public service accountability, fiscal consolidation and streamlining regulations for business – became known as the 'Gujarat Model.' Foreign investment has come off the peak seen during Modi's tenure as Chief Minister – but remains relatively high – and job creation, particularly for young people, is slow.

Rankings	Rank
Business Reforms Action Plan 2016	3
State Investment Potential Index 2017	1
Public Affairs Index 2017	3
Gender Vulnerability Index 2017	16

Key statistics	Gujarat	India
Area (square km)	196 244	
Real GSDP 2015–16 (AUD billion)	179	1 972
Population (million)	60.4 (≈Italy)	1 300
Urbanisation rate (%)	42.6	31.2
Number of million plus cities	4 (Ahmedabad, Surat, Vadodara, Rajkot)	63
Income and growth		
Per capita income	2 491	2 052
NSVA by sector 2015–16 (%)		
Agriculture	18	17
Industry	45	31
Services	37	52
Average GSDP growth 2012–16 (%)	9.9	6.9
State contribution to GDP (%)	9.6	

Key statistics	Gujarat	India
Infrastructure		
Power deficit 2016–17 (%)	0	–0.7
Road density 2014–15 (km/100 km^2)	93	139.1
Rail density 2014–15 (km/1,000 km^2)	26.8	20.1
Human development		
Literacy rate (%)	78	73
Gender literacy gap (pp)	16.5	16.7
Public finances 2016–17		
Proportion of fiscal deficit to GSDP	2.2	2.9
Debt to GSDP ratio (%)	22.5	23.9
Health spend (% of total spend)	5.4	5.6
Education spend (% of total spend)	14.1	9.7
Investment		
Share of FDI inflows 2000–2017 (%)	5	

Economic fundamentals

Gujarat is one of India's most prosperous states and its per capita income is 40 per cent higher than the national average. With just 5 per cent of India's population and 6 per cent of its land mass, Gujarat accounts for 9 per cent of India's GDP, almost a tenth of its workforce and 22 per cent of its exports. Nearly two-thirds of Gujarat's population of 60.4 million lies in the working age cohort of 15–59 years.

From 2012 to 2016, Gujarat's GSDP growth averaged nearly 10 per cent, far outpacing the national average. Gujarat's industrial strengths include engineering and automotive manufacturing, food and agribusiness, textiles, gems, diamonds and jewellery, minerals and mining, port and shipbuilding, chemicals, petrochemicals, ceramics and pharmaceuticals. Gujarat accounts for 62 per cent of India's petrochemical production and 72 per cent of the world's share of processed diamonds. Gujarat is also a mineral rich state with large reserves of oil and gas. It produces the highest amount of crude oil in India.

Alongside a stable electricity supply, the airports, ports and roads in Gujarat are high quality. Firms in Gujarat report that gaining and renewing regulatory approvals takes considerably less time than elsewhere in India. The state is an attractive destination for foreign investment and has often made big concessions for major projects.

Despite a lean bureaucracy, in 2016–17 Gujarat's debt stood at 22.5 per cent of GSDP, higher than comparable major coastal states. Gujarat's tax-to-GDP ratio, estimated at 6.5 per cent in 2016–17, is lower than most states, highlighting both a relatively inefficient tax collection system and the provision of tax incentives for manufacturing, boosting GSDP.

For all its success in facilitating foreign investment, developing world-class infrastructure and ushering in a long period of strong economic growth, the 'Gujarat model' has been criticised for failing to improve the lives of the state's poor.

The state's nutritional outcomes place it nearly at the bottom of league tables of Indian states. It is also among the slowest states to improve educational attainment.

Lagging social indices, wide disparity of growth within the state, and perceptions of communal tensions point to deeper cultural, social and political factors unique to Gujarat – Gujarat is a major base for the Hindu nationalist agenda.

Like other Indian states, many in Gujarat's minority Muslim population do not perceive the same improvement in economic conditions as the Hindu majority. The communal violence that swept through Gujarat in 2002 killed thousands and displaced many.

Gujarat is largely a heavy-industrial state with much of the economic activity occurring in chemicals, ports, and manufacturing; sectors that are often more suited to heavyweight foreign companies, such as those already engaged in market. These industry sectors do not map particularly well to the capability of Australian business looking to do business with India. Australian businesses need to engage through education, skilling and services as an adjunct to these larger projects if they are to be successful.

Current strengths

- Regularly ranked at the top of World Bank's Ease of Doing Business surveys – ranked third in 2016 and first in 2015. Particularly strong in regulatory processes.
- Gujarat accounts for about a fifth of India's coastline and is well situated for trade routes to the Persian Gulf, Africa and South-East Asia; Gujarat is a major landing port for Australian commodities and coal in western India.
- Vibrant Gujarat, a biennial economic and investment conference, has been dubbed 'India's Davos' and regularly attracts corporate leaders, senior government officials, large foreign investors and international dignitaries.
- A strong and successful diaspora network, including sizeable numbers in the United Kingdom, United States and Australia, with a long history of entrepreneurship.

Sectoral opportunities for Australia

- Education, training and skill development.
- Photovoltaic technologies.
- Waste water treatment and water technologies.
- Renewable energy, bioenergy (waste to energy, landfill gas).
- Food processing, logistics.
- Agriculture commodities, horticulture, agriculture business technology and services, dairy technology.
- Roads, ports, urban infrastructure, energy, architecture and design services, green buildings.

Potentially transformative factors

- Enhanced inter-state and intra-state connectivity – the planned Mumbai-Ahmedabad high-speed rail corridor, is under development with Japanese expertise and capital and set for completion in 2022, though delays cannot be ruled out. It would cut travel time from six hours to two. The government is also undertaking significant infrastructure upgrades within the state, including the Ahmedabad metro and several new projects connecting far reaches of the state.
- Development of financial industry – the Gujarat International Finance Tec-City, a brainchild of Modi, is intended to bring back trading volumes in financial markets that India lost to off-shore destinations or tax havens. It is touted as India's answer to Singapore and Dubai for derivatives trading but has yet to gain traction.
- Development of domestic tourism – Gujarat is investing heavily in attracting domestic tourists and drawing back diaspora to the state. Success here would diversify the concentrated growth centres in the economy, potentially boost wages and increase investments in services and human capital formation.

HARYANA

Surrounding New Delhi on three sides, Haryana has benefited from its proximity to India's capital. The state remains primarily agricultural, with 65 to 70 per cent of the population relying on the sector. It is India's largest basmati rice exporter. However, Haryana is also a major and growing industrial centre with a high per capita income. The state has emerged as a key hub for the automobile industry and a preferred destination for IT and IT-enabled services in Gurugram. The state has demonstrated a strong appetite for reform and it is attempting to capitalise on its manufacturing capacity and micro, small and medium enterprises. Comprising 1.3 per cent of India's territory, 2 per cent of its population and contributing 3.6 per cent of the nation's GDP, Haryana is a dynamic state punching above its weight.

Rankings	Rank
Business Reforms Action Plan 2016	6
State Investment Potential Index 2017	4
Public Affairs Index 2017	15
Gender Vulnerability Index 2017	19

Key statistics	Haryana	India
Area (square km)	44 212	
Real GSDP 2016–17 (AUD billion)	86	1 972
Population (million)	25.3 (≈Australia)	1 300
Urbanisation rate (%)	34.9	31.2
Number of million plus cities	2 (Faridabad, Gurugram)	63
Income and growth		
Per capita income	3 582	2 052
NSVA by sector 2015–16 (%)		
Agriculture	20	17
Industry	30	31
Services	50	52
Average GSDP growth 2012–17 (%)	8.3	6.9
State contribution to GDP (%)	3.6	

Key statistics	Haryana	India
Infrastructure		
Power deficit 2016–17 (%)	0	–0.7
Road density 2014–15 (km/100 km^2)	104.7	139.1
Rail density 2014–15 (km/1,000 km^2)	36.9	20.1
Human development		
Literacy rate (%)	75.6	73
Gender literacy gap (pp)	18.6	16.7
Public finances 2016–17		
Proportion of fiscal deficit to GSDP	4.6	2.9
Debt to GSDP ratio (%)	26.3	23.9
Health spend (% of total spend)	4.3	5.6
Education spend (% of total spend)	15.3	9.7
Investment		
Share of FDI inflows 2000–2017 (%) (includes that of Punjab)	0.4	

Economic fundamentals

Haryana has a strong agricultural sector, with wheat, rice, sugarcane, cotton and oilseeds its principal crops. It is also known for its high-yield Murrah buffalo.

Haryana also has a well-established industrial base with a large pool of skilled labour. The state has pursued a strategy of infrastructure-led development, leveraging its significant advantage of surrounding New Delhi on three sides. Large manufacturing firms in the state have access to good power, roads and railways. The state's physical infrastructure includes two international airports, five civil airports, and above average rail and road density, including 21 national highways. There is very good road connectivity to rural areas.

Despite the state's relatively lower literacy rate, Haryana hosts a large number of technical colleges (159 engineering colleges, 123 industrial training institutes, 187 polytechnic institutes) as well as 171 management colleges and a combined total of 37 universities. Employment opportunities for educated urban youth are generally positive.

Outside developed city centres, however, social structures remain intensely conservative and women face significant barriers to economic participation. The state's sex ratio is particularly poor (834 girls to 1,000 boys aged 0–6) due to sex selection and female infanticide.

Current strengths

- Proximity to key markets in the National Capital Region.
- Haryana dominates the automobile and light engineering space in India, manufacturing 80 per cent of excavators, 52 per cent of cranes, 50 per cent of cars and 33 per cent of two-wheeled vehicles in India; 50 of the 250 largest Original Equipment Manufacturers in India are located in Haryana.
- Haryana is the third largest exporter of software from India.
- India's fourth largest producer of cotton, Haryana exports readymade garments internationally and its textile sector employs around one million workers.

Sectoral opportunities for Australia

- Agriculture – specialised agribusiness opportunities given Haryana's strengths in food grains and dairy.
- Education and VET – Haryana is a major source of Australian students.
- Advanced manufacturing – Haryana is a major automotive hub.

Potentially transformative factors

- The Delhi Mumbai Industrial Corridor, a part of which will run through Haryana, is expected to provide a growth stimulus to the region.

HIMACHAL PRADESH

Himachal Pradesh, a small mountainous state in the Indian Himalayas, has demonstrated a strong record of poverty reduction and human development over the past decade, but remains a slower-growth economy. It is one of India's least urbanised states, with 90 per cent of the population in rural areas. Less than 20 per cent of the state is arable and much of it is inaccessible.

The state economy is driven by hydropower generation, agriculture, horticulture, and tourism. Difficult terrain, remoteness and severe climate have hindered large-scale industrial development. But the state stands apart from others in north India for its reputation for stability, inclusivity and good governance.

Rankings	Rank
Business Reforms Action Plan 2016	17
State Investment Potential Index 2017	15
Public Affairs Index 2017	4
Gender Vulnerability Index 2017	6

Key statistics	Himachal Pradesh	India
Real GSDP 2015–16 (AUD billion)	21	1 972
Population (million)	6.9 (≈Bulgaria)	1 300
Urbanisation rate (%)	10	31.2
Number of million plus cities	0	63
Income and growth		
Per capita income	2 904	2 052
NSVA by sector 2015–16 (%)		
Agriculture	14	17
Industry	39	31
Services	47	52
Average GSDP growth 2012–17 (%)	7.7	6.9
State contribution to GDP (%)	0.9	
Infrastructure		
Power deficit 2016–17 (%)	–0.6	–0.7
Road density 2014–15 (km/100 km^2)	99.9	139.1
Rail density 2014–15 (km/1,000 km^2)	5.3	20.1

Key statistics	Himachal Pradesh	India
Human development		
Literacy rate (%)	82.8	73
Gender literacy gap (pp)	14.2	16.7
Public finances 2016–17		
Proportion of fiscal deficit to GSDP	3.3	2.9
Debt to GSDP ratio (%)	34.4	23.9
Health spend (% of total spend)	5.9	5.6
Education spend (% of total spend)	19.1	9.7
Investment		
Share of FDI inflows 2000–2017 (%) (includes Punjab and Haryana)	0.4	

Economic fundamentals

Agriculture is the mainstay of Himachal Pradesh's largely rural economy. The state's topography, altitude and fertile soils make it well suited to horticulture and it is India's second largest producer of apples.

Tourism, including pilgrimage and adventure tourism, contributes 7.2 per cent to GSDP. Known for its scenic beauty, the state attracted 17.9 million domestic tourists and 450,000 foreign tourists in 2016.

The state has tapped around 38 per cent of its hydropower potential of over 27,400 MW, which is around a quarter of India's total potential. Around 16.5 per cent of the state's industrial output comes from the manufacture of pharmaceuticals, medicinal chemical and botanical products.

Himachal Pradesh outperforms most Indian states on human development indicators. Between 1993 and 2011, poverty in rural areas, where 90 per cent of the state's population lives, decreased fourfold. Life expectancy and workforce participation rates, particularly for women, are among India's best. Much of this is as a result of government investment in public services, enabled by the greater fiscal space the state has enjoyed from its special category status (entitling states to greater assistance from the Central Government).

The state's recent performance on educational outcomes is exceptional by north Indian standards. Over the five years to 2017, the state has opened 193 primary schools, commenced vocational education in 873 secondary schools, opened 65 degree colleges, and established three medical colleges, three engineering colleges, a pharmacy college and 40 training institutes. Solid public investment in education has culminated in a 15–30 per cent increase in the learning outcomes of primary students in 2016–17.

Current strengths

- A reputation for stable government and sound institutions.
- Major producer of hydroelectric energy, and strong potential in wind energy.
- Major producer of horticulture, including apples, and floriculture.
- One of India's largest pharmaceuticals hubs in Nalagarh.
- Innovative in sustainability practices – first state in India to have banned plastic bags, aims to become carbon neutral by 2020.
- Strongly marketed state tourism branding and tourism potential.

Sectoral opportunities for Australia

- Education and VET opportunities.
- Resources – given the state's hydropower and wind energy potential.
- Niche agribusiness opportunities.

Potentially transformative factors

- Greater urbanisation in one of India's least urbanised states could help push the state to a higher growth trajectory.

JAMMU AND KASHMIR

Jammu and Kashmir is India's northern-most state and the only state with a Muslim-majority population. Parts of the state are the subject of longstanding territorial disputes between India, Pakistan and China. Militant insurgency in the Kashmir Valley since the 1990s has included competing claims for autonomy, independence and reunification. The state retains a unique legal identity within India, stemming from its special autonomy under Article 370 of India's Constitution, which requires the state to approve some categories of central legislation before it comes into effect in the state. The state continues to attract a significant number of tourists. But security concerns are dampening economic opportunity, with little external investment and employment growth, particularly in the Kashmir Valley. The Jammu region has had better industrial prospects. The state economy is primarily dependent on agriculture and pockets of industry and services.

Rankings	Rank
Business Reforms Action Plan 2016	31
State Investment Potential Index 2017	NA
Public Affairs Index 2017	24
Gender Vulnerability Index 2017	20

Key statistics	Jammu & Kashmir	India
Real GSDP 2015–16 (AUD billion)	19.3	1 972
Population (million)	12.5 (≈Belgium)	1 300
Urbanisation rate (%)	27.4	31.2
Number of million plus cities	1 (Srinagar)	63
Income and growth		
Per capita income	1 484	2 052
NSVA by sector 2015–16 (%)		
Agriculture	20	17
Industry	23	31
Services	57	52
Average GSDP growth 2012–16 (%)	8.8	6.9
State contribution to GDP (%)	0.9	

Key statistics	Jammu & Kashmir	India
Infrastructure		
Power deficit 2016–17 (%)	–18.4	–0.7
Road density 2014–15 (km/100 km^2)	17.6	139.1
Rail density 2014–15 (km/1,000 km^2)	1.3	20.1
Human development		
Literacy rate (%)	67.2	73
Gender literacy gap (pp)	20.3	16.7
Public finances 2016–17		
Proportion of fiscal deficit to GSDP	5.6	2.9
Debt to GSDP ratio (%)	48.8	23.9
Health spend (% of total spend)	4.7	5.6
Education spend (% of total spend)	13.5	9.7
Investment		
Share of FDI inflows 2000–2017 (%)	neg	

Economic fundamentals

Jammu and Kashmir's GSDP grew by 14.7 per cent in 2017–18, making it one of India's fastest growing states, but this comes off a very low base, and follows a drop in growth to less than 1 per cent when unrest broke out in 2016. Security concerns affecting Jammu and Kashmir have eroded the state's economy. It is among the worst states on the ease of doing business.

Economic prospects in the state, as well as development, are unevenly split between the Hindu-majority Jammu (the winter capital) and the Muslim-majority Kashmir Valley (including Srinagar, the summer capital). Jammu has better prospects for industrial growth, including better connectivity to the neighbouring states of Punjab and Himachal Pradesh. Construction and services sectors there are growing. In contrast, Kashmir depends on seasonal agriculture, handicrafts and tourism. Kashmir's connectivity within the state and with neighbouring states remains a long term challenge, constrained by mountainous terrain.

Horticulture is a mainstay of Jammu and Kashmir's economy, and the state held a 74 per cent share in India's apple production in 2016–17. It is also a major exporter of walnuts to international markets, producing 98 per cent of India's total walnuts. Floriculture is another key sector concentrated in Jammu. Handicrafts and small-scale cottage industries, including carpet weaving, basketry, and silks, are significant employers in the state.

The provision of electricity is a first-order priority of government, given the large power deficit. Land acquisition in Jammu and Kashmir is structured differently from other states, which can make establishment costs comparatively lower. Land is leased for 90 years at concessional rates in industrial areas, and the state government offers attractive incentives along with a single-window clearance mechanism. There are restrictions on the purchase of property by residents from other states.

Current strengths

- Producer of saffron, apples, walnuts, cherries, strawberries and apricots.
- Exporter of handicrafts, carpets and woollen shawls.
- Jammu and Kashmir is a globally recognised tourist destination. During January to October 2017, the total number of tourist visits was 7.31 million; the state anticipates 22.7 million tourist arrivals in 2020.

Potentially transformative factors

- In the short term, there are few indications of a significant easing of the security concerns which have marred the state's prospects for development.

JHARKHAND

The landlocked state of Jharkhand in eastern India has 40 per cent of India's mineral wealth. Jharkhand is a major steel producer and leverages the logistical advantage of its proximity to significant ports such as Kolkata and Paradip. The state is home to the Indian School of Mines in Dhanbad, the site of an Australia-India mining partnership. Perceptions about political instability and corruption have plagued Jharkhand's economic performance and prevented it from reaching its considerable potential. The state has had six chief ministers in 13 different regimes since 2000 – by comparison, neighbouring Chhattisgarh has had two chief ministers in that time. Jharkhand's growth has been slow and volatile, consistently lagging behind the national average. Despite its resource wealth, poverty in Jharkhand remains among the highest in India, particularly when compared to neighbouring southern and eastern states. Only a tenth of working adults have salaried jobs, which is among the lowest in the country. Economic problems are compounded by sporadic outbursts of Maoist terrorism.

Rankings	Rank
Business Reforms Action Plan 2016	7
State Investment Potential Index 2017	18
Public Affairs Index 2017	28
Gender Vulnerability Index 2017	27

Key statistics	Jharkhand	India
Area (square km)	79 716	
Real GSDP 2016–17 (AUD billion)	42	1 972
Population (million)	33 (≈Canada)	1 300
Urbanisation rate (%)	24.1	31.2
Number of million plus cities	3 (Ranchi, Dhanbad, Jamshedpur)	63
Income and growth		
Per capita income	1 289	2 052
NSVA by sector 2015–16 (%)		
Agriculture	16	17
Industry	39	31
Services	45	52
Average GSDP growth 2012–17 (%)	7	6.9
State contribution to GDP (%)	1.8	

Key statistics	Jharkhand	India
Infrastructure		
Power deficit 2016–17 (%)	–0.7	–0.7
Road density 2014–15 (km/100 km^2)	53.6	139.1
Rail density 2014–15 (km/1,000 km^2)	28.8	20.1
Human development		
Literacy rate (%)	66.4	73
Gender literacy gap (pp)	22.2	16.7
Public finances 2016–17		
Proportion of fiscal deficit to GSDP	2.1	2.9
Debt to GSDP ratio (%)	23.7	23.9
Health spend (% of total spend)	4.8	5.6
Education spend (% of total spend)	15.3	9.7
Investment		
Share of FDI inflows 2000–2017 (%) (includes that of Bihar)	0.03	

Economic fundamentals

Jharkhand is a mineral rich state of 33 million people. It possesses 27 per cent of India's coal reserves, 26 per cent of India's iron ore reserves and 18 per cent of India's copper ore reserves. Its key industries include mining and mineral extraction, engineering, iron and steel production and chemicals.

Around one-quarter of India's total steel production emanates from Jharkhand. With the proposed expansion of a number of integrated steel plants, Jharkhand could emerge as a steel hub of India. The state is the sole Indian producer of coking coal, uranium and pyrite, and ranks first in the production of mica, kyanite and copper.

The sectoral landscape in Jharkhand has changed markedly in the last decade. While the share of mining has remained steady, the share of services such as insurance, telecommunications and hospitality has increased dramatically. The respective shares of agriculture, services and manufacturing are moving to the national average.

Jharkhand's main agricultural products are cauliflower and cabbage. The state has high yields in paddy and pulses and offers opportunities in cashews, medicinal plants, honey, milk and meat products.

Jharkhand has one of the highest poverty rates in the country, with half of the population still on the farm. Job opportunities for women are few and declining – the female labour force participation rate halved from 49.1 per cent in 2004–05 to 23.5 per cent in 2009–10.

Current strengths

- Investment-friendly climate – the state government is committed to attracting foreign investment. Jharkhand was ranked seventh in annual ease of doing business rankings in 2016.
- Jharkhand's economic strengths, notably its large endowment of natural resources, matches Australia's world class expertise in mining and related services.
- Despite being landlocked, Jharkhand is situated close to eastern ports like Kolkata, providing efficient access to export opportunities.
- Jamshedpur is home to the largest plant of Tata Steel.

Sectoral opportunities for Australia

- Mining, METS, contract mining and associated infrastructure, including in relation to Jharkhand's steel production.
- Education and VET – mining-related education, skills and research, including under the Australia-India mining partnership at the Indian School of Mines, Dhanbad.

Potentially transformative factors

- Reliable electricity supply – the state government has set a target of 20,000 MW installed capacity by 2020.
- Improving prospects for women and girls – currently, six in 10 girls in Jharkhand marry as children and thousands are trafficked every year; poverty, weak law enforcement and low education levels are contributing factors; enhancing the opportunities for girls to complete their schooling and enter the workforce could have a substantial effect on Jharkhand's long term economic growth.

KARNATAKA

Karnataka is a significant growth engine of the national economy, growing at 8 per cent (in terms of GSDP) and contributing 7 per cent to India's GDP. The state's capital Bengaluru dominates the state economy. Bengaluru is the fourth-largest, and the second-fastest growing, technology cluster in world. The city is the epicentre of India's IT, IT-enabled services, pharmaceuticals and biotechnology sectors, the home of India's highly successful space program, and India's largest start-up ecosystem, with around 5,000 start-ups. Strains on Bengaluru's congested infrastructure run the risk of detracting from the city's investment potential.

Rankings	Rank
Business Reforms Action Plan 2016	13
State Investment Potential Index 2017	9
Public Affairs Index 2017	5
Gender Vulnerability Index 2017	7

Key statistics	Karnataka	India
Area (square km)	191 791	
Real GSDP 2016–17 (AUD billion)	174	1 972
Population (million)	61.1 (≈Italy)	1 300
Urbanisation rate (%)	38.7	31.2
Number of million plus cities	3 (Bengaluru, Hubli-Dharwad, Mysuru)	63
Income and growth		
Per capita income	3 131	2 052
NSVA by sector 2015–16 (%)		
Agriculture	12	17
Industry	22	31
Services	66	52
Average GSDP growth 2012–17 (%)	7.9	6.9
State contribution to GDP (%)	7.2	

Key statistics	Karnataka	India
Infrastructure		
Power deficit 2016–17 (%)	–0.5	–0.7
Road density 2014–15 (km/100 km^2)	167.8	139.1
Rail density 2014–15 (km/1,000 km^2)	17.1	20.1
Human development		
Literacy rate (%)	75.4	73
Gender literacy gap (pp)	14.7	16.7
Public finances 2016–17		
Proportion of fiscal deficit to GSDP	2.2	2.9
Debt to GSDP ratio (%)	16.9	23.9
Health spend (% of total spend)	4.1	5.6
Education spend (% of total spend)	12.7	9.7
Investment		
Share of FDI inflows 2000–2017 (%)	8	

Economic fundamentals

The capital Bengaluru is the pillar of the state's economy, accounting for a third of GSDP. It is the global centre for business processing operations, employs about 35 per cent of India's IT professionals and accounts for 40 per cent of software exports. Services dominate GSDP, contributing 66 per cent and growing at 8 per cent in 2015–16. Besides IT, major services include financial services, insurance and real estate.

Bengaluru is home to around 400 research and development centres (44 per cent of India's total), including over 300 belonging to Fortune 500 companies. The state ranked fourth in terms of FDI inflows over the period from 2000 to 2017, with 8 per cent of total inbound investment over that period.

The state also has a conducive policy environment for innovation – global rankings have placed Bengaluru among the top 20 start-up ecosystems in the world. The Karnataka Government's 2015 Information Technology, IT-enabled Services, Innovation, Incentives Policy (I–4 Policy) offers space for start-ups at highly subsidised rates, aiming to stimulate the growth of 20,000 start-ups and generate 600,000 direct jobs. The Knowledge Commission is an expert panel of advisers set up by the Karnataka Government to provide specialist advice to government with an over-arching aim of transforming Karnataka into a vibrant knowledge society. The state also pioneered the formation of the Bengaluru Bio Innovation Centre and the NASSCOM 10,000 Start-ups Warehouse, which provides incubation and acceleration support to around 2,300 start-ups.

Agriculture contributes only 12 per cent to GSDP, but half the state's workforce is engaged in farming. Karnataka's farmers face significant challenges in maintaining their economic viability: around 80 per cent of farmers have land holdings of less than two acres, soil health is deteriorating, irrigation coverage is limited (to about a quarter of arable land) and the cost of technology is prohibitive. Karnataka is India's largest producer

of coffee, areca nut, pomegranate, rose-onions, various spices and the producer of 10 per cent of India's sugar.

The state has significant mineral resources, including reserves of gold, iron ore, limestone, manganese ore, bauxite, granite and felsite (with Karnataka being India's sole producer).

Karnataka faces considerable sustainability challenges, particularly with respect to water resources. The long-standing dispute between Karnataka and the neighbouring state of Tamil Nadu continues over the division of the water of the Cauvery River, an 800 km long river that supplies southern Karnataka, including Bengaluru, before flowing into Tamil Nadu downstream.

Current strengths

- Bengaluru can lay claim to being India's Silicon Valley although there is increased competition for that title.
- Ready flow of venture capital – Bengaluru has seen tremendous growth (up to 400 per cent) in venture capital funding and around 40 per cent of all start-up venture capital in India is invested in the city.
- The presence of science and engineering institutions such as the Indian Institute of Science, National Institute of Technology and National Institute of Engineering support innovation.
- Karnataka is home to public sector enterprises in heavy industry, aeronautics, precision engineering, telecommunications, health and pharma and software development. Space research organisations such as the Indian Space Research Organisation and National Aerospace Laboratory are also based in the state.
- Karnataka is a leading producer of auto components, machine tools and heavy electrical machinery.
- Besides Bengaluru, there are opportunities for industrial investment in the second largest city of Mysuru (in food processing and engineering) and Mangalore, the state's major port on India's west coast (in petrochemicals and mining).
- Good connectivity to major national and international markets via air and sea.

Sectoral opportunities for Australia

- Innovation – nanotech, ICT, healthcare, and start-ups, given Bengaluru's leading start-up ecosystem.
- Tourism – direct flights between Bengaluru and Australia would stimulate people-to-people links particularly beneficial to Australia's tourism and education sectors; it would also develop a range of business and investment opportunities.
- Resources and Energy – mining, mineral processing (particularly for iron ore, gold, copper, manganese and chromite), METS and renewable energy (solar, mini-hydel, wind, river rejuvenation, waste management).
- Infrastructure and urban development – road safety expertise, road and transport infrastructure investment opportunities.
- Agriculture – opportunities in applying niche Australian agribusiness technologies (such as those related to seed and fodder and small-scale sugar cane harvesters), honey, food processing, dairy technology and horticulture.
- Defence and space – surveillance systems, airport infrastructure and security.
- Education (higher and vocational) – research collaboration, including in biomedical research, skill development.

Potentially transformative factors

- Wise water resources and environmental management – stronger environmental management could bolster growth prospects in the medium to long term; managing the water needs of Bengaluru is important for future growth prospects.

KERALA

The small state of Kerala on India's south-western tip outperforms most states on human development, with India's highest literacy rate of 94 per cent, leading gender equality indicators and an infant mortality rate akin to that of the United States. Consistently high levels of health and education spending have earned the state its reputation as India's most socially progressive. The state also attracts large numbers of domestic and foreign tourists, with its 580 km coastline, vast network of backwaters and several hill stations. However, major sectors of the state economy are currently sluggish. Successive communist and left-wing coalition governments (alternating between the ruling Left Democratic Front and the opposition United Democratic Front) have supported obstructionist trade unionism and privileged human development over industrial growth. Unemployment is India's highest at 10.6 per cent. The economy is heavily reliant on the remittances of around two million Keralite workers in the Gulf, accounting for over a third of GSDP.

Rankings	Rank
Business Reforms Action Plan 2016	20
State Investment Potential Index 2017	7
Public Affairs Index 2017	1
Gender Vulnerability Index 2017	2

Key statistics	Kerala	India
Area (square km)	38 852	
Real GSDP 2015–16 (AUD billion)	88.9	1 972
Population (million)	33.4 (≈Morocco)	1 300
Urbanisation rate (%)	47.7	31.2
Number of million plus cities	7 (Kochi, Kozhikode, Thrissur, Kollam, Malappuram, Kannur, Thiruvanathapuram)	63
Income and growth		
Per capita income	2 926	2 052
NSVA by sector 2015–16 (%)		
Agriculture	11	17
Industry	25	31
Services	64	52
Average GSDP growth 2012–16 (%)	6.3	6.9
State contribution to GDP (%)	3.9	

Key statistics	Kerala	India
Infrastructure		
Power deficit 2016–17 (%)	–0.1	–0.7
Road density 2014–15 (km/100 km^2)	501.4	139.1
Rail density 2014–15 (km/1,000 km^2)	27	20.1
Human development		
Literacy rate (%)	94	73
Gender literacy gap (pp)	4	16.7
Public finances 2016–17		
Proportion of fiscal deficit to GSDP	3.5	2.9
Debt to GSDP ratio (%)	27.7	23.9
Health spend (% of total spend)	5.1	5.6
Education spend (% of total spend)	15.3	9.7
Investment		
Share of FDI inflows 2000–2017 (%)	1	

Economic fundamentals

Kerala's narrow industrial base, frequent industrial action and political strikes, as well as heavy reliance on foreign remittances continue to impede economic growth. The singular focus by successive governments on human development over economic growth means that Kerala has not only the highest per capita income (1.5 times the national average), but also the highest unemployment rate (three times the national average), which has led to millions of Keralites seeking work in the Gulf over the past generation (since the 1970s and 80s).

Kerala's economy is dominated by the services sector, which constitutes 64 per cent of GSDP. The real estate, tourism, health and transport sectors are among the most buoyant. The hospitality and tourism industries were hit by a policy of alcohol prohibition in 2016, but it was partially reversed in 2017 (before the ban, Kerala had India's highest per capita alcohol consumption). Growth in construction and manufacturing is steady, at 8.6 per cent in 2015–16.

But agriculture is stagnating. The production of some of the major spices cultivated in the state, including pepper, cardamom and ginger has declined. Rapid urbanisation is putting pressure on transportation, housing, drinking water and solid waste management.

Foreign remittances constitute the single largest contributor to GSDP (around one-third), exposing the economy to volatility in economic conditions in the Gulf. Emigration from Kerala shows signs of decline, due in part to lower wages in the Gulf and Kerala's low birth rate.

Public finances are significantly overstretched – ambitious social spending, sluggish growth in revenue, a poor record of industrial investment and declining rates of tax collection are contributing to expanding fiscal and revenue deficits.

Current strengths

- A political environment relatively less affected by inter-religious tensions.
- Ready access to senior officials and ministers.
- Strong state investment in education and health.
- A wide network of fibre-optic cable, including high speed rural broadband in several areas, and high financial inclusion rates.
- Major producer of rubber, spices, coconut, rice, coffee, pickles, chemicals and chemical products.
- Direct air connectivity to the Gulf and Southeast Asia (from Kerala's busiest airport in Kochi); major port at Kochi and 16 smaller ports.
- Kerala is the only state in India to have 1 per cent of its budget earmarked for entrepreneurship activities.

Sectoral opportunities for Australia

- Resources and Energy – Petronet's LNG terminal in Kochi has generated interest by Australian exporters (Kerala currently imports the majority of its power). There are niche opportunities in hydroelectric energy, cloud seeding and 'micro' hydro projects (Kerala's experience of water management includes its long-standing dispute with neighbouring Tamil Nadu over the Mullaperiyar dam which it claims poses environmental and safety risks).
- Education (vocational) – skill development has good potential given Kerala's demand for skilled labour exports as well as the state's practical approaches, including the Additional Skills Acquisition Programme, Kerala Academy for Skills Excellence and Asian Development Bank-funded Community Skills Parks.
- Agriculture – fisheries research, deep sea fishing, aquaculture and sustainable fisheries management all offer potential for Australian businesses to offer their expertise.

Potentially transformative factors

- Industrial access – Kochi is emerging as Kerala's commercial and industrial hub. It already has close proximity to international shipping centres, an all-weather seaport, with a cruise terminal, good connectivity through inland waterways, and a metro transport system. Kochi has India's largest shipbuilding facility. It hosts the international Kochi-Muziris Biennale. The city is emerging as a petrochemical hub, with an industrial park being planned to utilise niche petrochemical products from the recently expanded Kochi Refinery.
- Alternative political culture – A slew of legislative measures to expedite government approvals and ease of doing business were passed in 2017. But in a state that has routinely voted communist and leftist parties into power, perceptions about the state's apathy to the investment climate will require consistent effort to overcome. Disruptive strike action and violence between rival political party workers is not uncommon.

MADHYA PRADESH

Madhya Pradesh, India's second largest state by area located in the country's centre, is attempting to transform its agriculture-based economy into a front-ranking industrial state. The state government has overseen a number of major reforms, including to ease restrictions on labour. Madhya Pradesh is one of the faster growing major states, standing out from its landlocked peers in northern India, but has performed poorly on human development. Madhya Pradesh has become an agricultural powerhouse, with India's highest agricultural growth rate and output. From 2012–13 to 2016–17, growth in agriculture averaged 21.5 per cent, leagues ahead of the national average of less than 4 per cent. Some of the contributing factors to this include massive expansions in irrigation, power supply and road networks, providing better access to markets. However, the sustainability of the state's breakneck agricultural growth is coming into question. The oversupply of certain commodities has brought about price shocks, resulting in insolvency and recurrent unrest among rural communities. The state government announced a populist agricultural loan waiver scheme worth up to $1.2 billion in 2017, alongside similar announcements in other states.

Rankings	Rank
Business Reforms Action Plan 2016	5
State Investment Potential Index 2017	10
Public Affairs Index 2017	19
Gender Vulnerability Index 2017	25

Key statistics	Madhya Pradesh	India
Area (square km)	308 252	
Real GSDP 2016–17 (AUD billion)	93	1 972
Population (million)	72.6 (≈Thailand)	1 300
Urbanisation rate (%)	27.6	31.2
Number of million plus cities	4 (Indore, Bhopal, Jabalpur, Gwalior)	63
Income and growth		
Per capita income	1 443	2 052
NSVA by sector 2015–16 (%)		
Agriculture	41	17
Industry	21	31
Services	38	52
Average GSDP growth 2012–17 (%)	9	6.9
State contribution to GDP (%)	3.8	

Key statistics	Madhya Pradesh	India
Infrastructure		
Power deficit 2016–17 (%)	0	–0.7
Road density 2014–15 (km/100 km^2)	93.7	139.1
Rail density 2014–15 (km/1,000 km^2)	16.2	20.1
Human development		
Literacy rate (%)	69.3	73
Gender literacy gap (pp)	20.5	16.7
Public finances 2016–17		
Proportion of fiscal deficit to GSDP	3.9	2.9
Debt to GSDP ratio (%)	23.1	23.9
Health spend (% of total spend)	4.4	5.6
Education spend (% of total spend)	17	9.7
Investment		
Share of FDI inflows 2000–2017 (%)	0.4	

Economic fundamentals

Agriculture's share in GSDP has increased markedly as the sector has experienced double-digit growth. Its share in the state's economy is more than double agriculture's share in national GDP and agriculture employs 62 per cent of the state's workers. But increased agricultural production has not necessarily driven greater productivity – the state accounts for 10.4 per cent of India's cropped area but only 8.6 per cent of value addition in agriculture.

Madhya Pradesh has not been able to replicate its successes in agriculture within its industrial or services sectors. In the five years to 2010, growth in manufacturing fell from an average of 9.5 per cent to 2.9 per cent in the following five year period, while services saw a corresponding drop from 7.6 per cent to 6.3 per cent.

Industry in the state's east is driven by the region's rich mineral reserves, including limestone, coal, bauxite, iron ore, copper, manganese and silica. Madhya Pradesh is India's sole producer of diamonds.

The lack of a clear commercial hub makes engagement a challenge. The state capital of Bhopal is known for its small and medium scale industries; Ujjain in the east is one of the largest producers of oilseeds; Indore is a trading hub; Neemuch an agricultural trade hub; and Gwalior in the north, the tourism capital of the state.

Current strengths

- Largest producer of pulses and oilseeds, second largest producer of food grains (including wheat), and major producer of dairy.
- Singrauli is home to a number of thermal power stations, and Asia's thickest coal seam; the state is the third largest producer of cement.
- Seven cities under the Smart Cities project – Bhopal, Indore Jabalpur, Ujjain, Gwalior, Sagar and Satna.
- One of India's largest proposed 750 MW solar park project at Rewa.
- Connectivity to industrial centres through the state's five airports and five inland container depots; and connectivity with the national capital, New Delhi and financial centre of Mumbai.
- Single window investment facilitation through the Madhya Pradesh Trade and Investment Facilitation Corporation.

Sectoral opportunities for Australia

- Energy and resources – Madhya Pradesh is India's only diamond producing state, and a leading producer of copper and manganese. On renewables, Madhya Pradesh is among states with the most sunshine and available wastelands for solar parks, including the IFC-backed 750 MW Rewa solar park.
- Power – high capacity power transmission corridors are panned in Madhya Pradesh.
- Transport infrastructure – brownfield opportunities in the medium to long term given the number of planned projects (road density in the state still lags the national average).
- Agriculture, specialised services and food processing – opportunities given Madhya Pradesh's leading production of pulses, oilseeds and dairy.

Potentially transformative factors

- Madhya Pradesh has partnered with NITI Aayog to radically transform is education sector, including targeted improvements to the efficiency of governance structures and service delivery.
- The Delhi Mumbai Industrial Corridor has the potential to attract investment to Gwalior, Indore and Ujjain.

MAHARASHTRA

Maharashtra is India's second most populous state and its most economically advanced. The state alone contributes 40 per cent of India's total income tax. Its capital Mumbai serves as India's premier commercial and film hub, akin to combining New York and Los Angeles in one city. But Maharashtra's second (Pune) and third (Nagpur) largest cities are industrial powerhouses in their own right, and there is an array of rapidly growing third tier cities. Mumbai is the fulcrum of India's prosperous western region, headquarters for national financial institutions and regulators as well as the gateway for imports into western India. It is the wealthiest city in South Asia, home to more than 46,000 millionaires. Maharashtra remains a good place to do business, although it has fallen outside the top five states in annual rankings. As elsewhere in India, the state has stark inequalities; its relatively prosperous urban centres include slums lacking basic amenities and contrast with the state's vulnerable rural communities.

Rankings	Rank
Business Reforms Action Plan 2016	10
State Investment Potential Index 2017	8
Public Affairs Index 2017	6
Gender Vulnerability Index 2017	9

Key statistics	Maharashtra	India
Area (square km)	307 713	
Real GSDP 2015–16 (AUD billion)	330	1 972
Population (million)	112.3 (≈Philippines)	1 300
Urbanisation rate (%)	45.2	31.2
Number of million plus cities	6	63
	(Mumbai, Pune, Nagpur, Nashik, Aurangabad, Vasai Virar)	
Income and growth		
Per capita income	2 930	2 052
NSVA by sector 2015–16 (%)		
Agriculture	11	17
Industry	33	31
Services	56	52
Average GSDP growth 2012–16 (%)	7.3	6.9
State contribution to GDP (%)	7.2	

Key statistics	Maharashtra	India
Infrastructure		
Power deficit 2016–17 (%)	0	–0.7
Road density 2014–15 (km/100 km^2)	197.6	139.1
Rail density 2014–15 (km/1,000 km^2)	18.6	20.1
Human development		
Literacy rate (%)	82.3	73
Gender literacy gap (pp)	14.3	16.7
Public finances 2016–17		
Proportion of fiscal deficit to GSDP	1.6	2.9
Debt to GSDP ratio (%)	17.6	23.9
Health spend (% of total spend)	3.9	5.6
Education spend (% of total spend)	18.2	9.7
Investment		
Share of FDI inflows 2000–2017 (%)	31	

Economic fundamentals

Maharashtra's economy, with a GSDP of $330 billion, is India's wealthiest state and roughly equivalent in size to Hong Kong. Home to over 112 million people, of which nearly two thirds are of working age, Maharashtra contributes 15 per cent of India's industrial output and over 40 per cent of national revenue. The state economy shows no sign of slowing down. It grew at 7.3 per cent annually from 2012–16, higher than the national average and from a higher base.

Services account for nearly two-thirds of the state economy, followed by industry (33 per cent) and agriculture (11 per cent). Major sectors include petrochemicals, automotive, pharmaceuticals, financial services, media and entertainment, information technology and textiles.

Maharashtra's port and road infrastructure enables the state to capitalise on its favourable location on India's western coast. Jawaharlal Nehru Port Trust is the largest container port in the country, and Mumbai alone contributes a third of India's customs duties.

Maharashtra ranked 10 in annual ease of doing business rankings in 2016, slipping two spots from 2015. The sticky problems of land and labour reform remain a barrier to further boosting the state's investment potential.

Managing the state's water and urban problems is of high priority for Maharashtra. Like much of western India, Maharashtra is prone to severe droughts, which have had a devastating effect on farmers, who comprise half the state's workforce. The state is also confronting severe urban and transport infrastructure constraints, which have made asset recycling programs and attracting foreign infrastructure investments high order priorities.

Mumbai houses the headquarters of all major banks, financial institutions, insurance companies and many of the leading corporate houses in India. As such, it has been affected by slow progress on the stock of large non-performing assets, mostly held by public sector banks, which are inhibiting lending and diminishing economic growth. Mumbai is also the top source city for Indian FDI into Australia, accounting for 28 per cent of projects and the highest number of jobs created. India's corporates view Australia favourably but Brand Australia is competing in an increasingly crowded field.

Current strengths

- Home to India's leading corporations and a key source and destination for FDI.
- Business-friendly environment that can be used as launching pad to the rest of the country.
- An increasingly sophisticated urban political class demanding more transparency and better service delivery.
- Highest number of internet users in India and a growing start-up scene.
- An early adopter of GST-related reforms and bringing more taxpayers to the revenue net.

Sectoral opportunities for Australia

- Education, training and skill development.
- Infrastructure – metro rail build, development of townships, ports and water front.
- Water – waste water management.
- Research – collaboration and commercialisation.
- Agribusiness – food and beverage products, dairy technology and services.
- Financial services.

Potentially transformative factors

- Water conservation reform – Maharashtra's rural economy, roughly 10 per cent of GSDP but over half the state population, is highly dependent on monsoons. Maharashtra only has 22 per cent irrigation potential, but aims to lift this with significant dam projects. Improving water use, conservation and decreasing climate vulnerability would potentially lift agricultural productivity and resilience.
- Infrastructure development – Maharashtra has proposed over $20 billion worth of transport infrastructure and port projects, including a new expressway linking the east with the west, 21 new airports across the state and a second $3 billion airport in Mumbai.
- Smart Cities – Maharashtra and the Central Government are investing in 10 smart cities. Urban renewal in existing large cities and development of new hubs will potentially act as economic multipliers as the state continues to urbanise. However, there are steep challenges to realising this vision.
- Delhi Mumbai Industrial Corridor – the planned industrial development linking the political capital to the financial hub, one of the world's largest infrastructure projects, involves a high-tech industrial zone spread across six states along the 1,500 km Western Freight Corridor. The dedicated freight corridor is expected to be completed by 2020. The project could have immense economic potential and boost connectivity between economic hubs and smaller industrial areas.

MANIPUR

Manipur, a remote north-eastern state bordering Myanmar, is a strategic state for India's ambitions to improve connectivity to Southeast Asia, but progress on the ground is slow. The landlocked state remains largely dependent on agriculture, with about 70 per cent of its population relying on the sector. Ethnic tensions dominate state politics, with a long-running split between ethnically diverse tribal (Indigenous) groups in the hills and those in the central valley. Despite its long history of insurgency, fatal armed conflict has drastically declined since 2009. But security concerns remain. And the Armed Forces Special Powers Act, granting the military emergency powers, remains in force in parts of the state. Cooperation in sports is a prospective sectoral opportunity for Australia, including the establishment of the National Sports University in the state.

Rankings	Rank
Business Reforms Action Plan 2016	28
State Investment Potential Index 2017	NA
Public Affairs Index 2017	21
Gender Vulnerability Index 2017	5

Key statistics	Manipur	India
Area (square km)	22 327	
Real GSDP 2015–16 (AUD billion)	3.2	1 972
Population (million)	2.7 (≈Qatar)	1 300
Urbanisation rate (%)	32.5	31.2
Number of million plus cities	0	63
Income and growth		
Per capita income	1 105	2 052
NSVA by sector 2015–16 (%)		
Agriculture	21	17
Industry	14	31
Services	65	52
GSDP growth 2015–16 (%)	5	6.9
State contribution to GDP (%)	0.1	
Infrastructure		
Power deficit 2016–17 (%)	–3.1	–0.7
Road density 2014–15 (km/100 km^2)	108.6	139.1
Rail density 2014–15 (km/1,000 km^2)	0	20.1

Key statistics	Manipur	India
Human development		
Literacy rate (%)	79.2	73
Gender literacy gap (pp)	13.3	16.7
Public finances 2016–17		
Proportion of fiscal deficit to GSDP	3	2.9
Debt to GSDP ratio (%)	38.2	23.9
Health spend (% of total spend)	5.1	5.6
Education spend (% of total spend)	13.2	9.7
Investment		
Share of FDI inflows 2000–2017 (%) (includes that of all north-east states)	0.03	

Economic fundamentals

Some of Manipur's small-scale industries include handlooms, handicrafts and sericulture. Manipur has the highest number of skilled and semi-skilled artisans in the north-eastern region. The state ranks in the top five for its number of looms.

Agricultural activities include cultivation of food grains and fruit. Manipur is the largest producer of passionfruit in India and has the potential to diversify into crops such as olives, figs and mandarins. About 70 per cent of the state is densely forested, providing timber, firewood and bamboo.

Connectivity is a significant obstacle to trade. Despite statements of priority under the 'Act East' policy, local businesses report they have not seen any improvements on the ground in terms of trade. Manipur's capital, Imphal, hosts India's second largest airport in the north-east. Four national highways run through the state and its road network of 7,170 km connects the major towns and villages, although the quality of roads is poor. The railway line on the Manipur-Assam border is being constructed on a priority basis.

Foreign tourist arrivals to the state were a mere 3,260 in 2015. As security concerns continue to improve, the potential for tourism may steadily increase.

Current strengths

- A National Sports University is being established in Manipur, under the direction of the Prime Minister's Office.
- Bamboo-based industries – the state is primed to benefit from a push from the Central Government to reinvigorate a range of bamboo-based industries, from food processing to construction.
- Significant hydropower potential, with some estimates placing it at about 2,200 MW. As of October 2017, Manipur had an installed capacity of 235 MW.

Sectoral opportunities for Australia

- Sports governance – the National Sports University is to be established in Manipur.
- Sports consulting and performance management – including in football, boxing, gymnastics and archery in Manipur.

Potentially transformative factors

- India-Myanmar-Thailand Trilateral Highway, originating from Moreh in Manipur, is under construction as part of India's 'Act East' policy.
- Work to explore the presence of hydrocarbons in Manipur has begun.

MEGHALAYA

Bordering Bangladesh in India's northeast, the majority Christian state of Meghalaya receives the highest rainfall in India and is among the wettest places on Earth. Despite its natural resources, Meghalaya is predominantly an agrarian economy. It has a significant commercial forestry industry.

Its industrial potential, including in hydropower, is considerable but untapped. Road and rail infrastructure is poor. Political instability has constrained Meghalaya's economic growth in the past with the state having 23 governments since 1972 – an average term of less than 18 months.

Rankings	Rank
Business Reforms Action Plan 2016	31
State Investment Potential Index 2017	NA
Public Affairs Index 2017	29
Gender Vulnerability Index 2017	21

Key statistics	Meghalaya	India
Area (square km)	22 720	
Real GSDP 2015–16 (AUD billion)	4.4	1 972
Population (million)	3 (≈Mongolia)	1 300
Urbanisation rate (%)	20	31.2
Number of million plus cities	0	63
Income and growth		
Per capita income	1 405	2 052
NSVA by sector 2015–16 (%)		
Agriculture	16	17
Industry	31	31
Services	53	52
GSDP growth 2015–16 (%)	8.7	6.9
State contribution to GDP (%)	0.2	
Infrastructure		
Power deficit 2016–17 (%)	0	–0.7
Road density 2014–15 (km/100 km^2)	59.6	139.1
Rail density 2014–15 (km/1,000 km^2)	0.4	20.1

Key statistics	Meghalaya	India
Human development		
Literacy rate (%)	74.4	73
Gender literacy gap (pp)	3.4	16.7
Public finances 2016–17		
Proportion of fiscal deficit to GSDP	3.2	2.9
Debt to GSDP ratio (%)	29.1	23.9
Health spend (% of total spend)	6.9	5.6
Education spend (% of total spend)	15.3	9.7
Investment		
Share of FDI inflows 2000–2017 (%) (includes that of all north-east states)	0.03	

Economic fundamentals

One of India's smallest states, Meghalaya's population of three million depends primarily on agriculture, which accounts for 81 per cent of the state economy. Besides rice and maize, the diverse range of soil types in Meghalaya supports pulses, oilseeds and cotton. The state also produces potatoes, pineapples, bananas, papayas and spices; Meghalaya's turmeric is considered among the best in the world.

Meghalaya has a strong floriculture sector and is one of the leading states in the north-east in the supply of cut flowers to mainland consumer markets. About 14 per cent of Meghalaya is covered by bamboo forests and the state is a leading bamboo producer.

Alongside agriculture and food processing, key industries in Meghalaya include mining, cement, tourism, hydroelectric power, handlooms, handicrafts and sericulture.

The state has a range of mineral deposits – including coal, limestone, kaolin feldspar, quartz, granite, industrial clay and uranium and a small deposit base of sillimanite, bauxite, base metals and apatite – but has no significant extractive industries.

Meghalaya, like other north-eastern states, is heavily dependent on Central Government funds. There are widespread concerns that successive governments in the state have been complicit in graft and the mismanagement of public finances; the execution of some public projects have been marred by delays and cost overruns.

Current strengths

- English is widely spoken and the official language of the state.
- Abundance of water resources.
- Conducive climate for agriculture.
- Untapped resource base, including hydropower potential.

Potentially transformative factors

- Hydroelectric power development – the abundance of water resources makes Meghalaya an important location for hydroelectric power development. Total hydropower potential is estimated to be around 3,000 MW. Projects with a total capacity of 687 MW have been proposed, adding to the installed capacity of 356 MW.
- Improved connectivity – enhanced infrastructure to establish trade corridors between Meghalaya and the Indian mainland, as well as to neighbouring Bangladesh, more efficient could make Meghalaya a logistical centre for regional trade.

MIZORAM

Wedged between Bangladesh and Myanmar, with 91 per cent of its land heavily forested, Mizoram is a small mountainous state and just about India's most isolated. It boasts a highly literate, agrarian economy. Slash and burn farming practices are slowly giving way to horticulture and bamboo production. Mizoram has the potential to become a transit point for trade with Myanmar and Bangladesh, which could bring significant economic benefits if it continues to develop. While 20 per cent of the majority Christian state's population falls below the poverty line, increasing to 35 per cent poverty in rural areas, Mizoram's natural resources and a sizeable Central Government-funded investment in its tourism industry present some positive opportunities for growth and development.

Rankings	Rank
Business Reforms Action Plan 2016	29
State Investment Potential Index 2017	NA
Public Affairs Index 2017	9
Gender Vulnerability Index 2017	3

Key statistics	Mizoram	India
Area (square km)	21 081	
Real GSDP 2015–16 (AUD billion)	2.5	1 972
Population (million)	1.1 (≈Mauritius)	1 300
Urbanisation rate (%)	52.1	31.2
Number of million plus cities	0	63
Income and growth		
Per capita income	2 277	2 052
NSVA by sector 2015–16 (%)		
Agriculture	34	17
Industry	22	31
Services	44	52
GSDP growth 2015–16 (%)	10.9	6.9
State contribution to GDP (%)	0.1	
Infrastructure		
Power deficit 2016–17 (%)	–2.5	–0.7
Road density 2014–15 (km/100 km^2)	46.6	139.1
Rail density 2014–15 (km/1,000 km^2)	0.1	20.1

Key statistics	Mizoram	India
Human development		
Literacy rate (%)	91.3	73
Gender literacy gap (pp)	4.3	16.7
Public finances 2016–17		
Proportion of fiscal deficit to GSDP	0.7	2.9
Debt to GSDP ratio (%)	48.5	23.9
Health spend (% of total spend)	5.2	5.6
Education spend (% of total spend)	14.6	9.7
Investment		
Share of FDI inflows 2000–2017 (%) (includes that of all north-east states)	0.03	

Economic fundamentals

Small-scale industries in Mizoram include handloom and handicraft workshops, sawmills and furniture manufacturing, grain milling, ginger processing and sericulture. Mizoram is focussed on a few key crops, including turmeric (largest producer in north-east India) and bamboo (occupying 31 per cent of land and producing 3.2 million tonnes per year, or 14 per cent of India's stock). In 2015–16, the state's total milk production amounted to 22,000 tonnes and meat production stood at 14,000 tonnes. Mizoram has underutilised fishing resources, with only 4,790 hectares for fish farming developed of the 24,000 hectares of potential area (as of 2015–16).

Mizoram was the third north-eastern state to become energy surplus (after Sikkim and Tripura). Major rivers flowing through Mizoram, such as Tlawng and Tiau, provide an estimated hydroelectric power potential of 4,500 MW. As at October 2017, the installed capacity was 167 MW.

Mizoram's road network is underdeveloped and among the lowest density anywhere in India. Prices for basic staples can cost as much as three times more in Mizoram when compared with most Indian cities.

Around 44,702 (domestic and foreign) tourists visited Mizoram during 2015–16. Mizoram has successfully sought large investments from the Central Government to develop its tourism sector.

Current strengths

- Bamboo production and the potential to develop bamboo into export-oriented products.
- English widely spoken at a high level.
- Tourist numbers higher than other north-eastern states.
- Development of the Zoram Mega Food Park in the capital Aizawl, which seeks to create food-processing opportunities across the north-eastern region.

Potentially transformative factors

- Increased physical connectivity – a number of connectivity projects were launched in 2017 to accelerate growth in north-eastern states. The establishment of rural 'haat' markets along the Mizoram-Myanmar border could increase trade volumes in the state.

NAGALAND

Nagaland is a small agrarian north-eastern state that borders Myanmar. Home to 16 distinct ethnic groups, the state had a history of violent insurgency until a landmark ceasefire agreement was signed in 2015. Economic development has not been a high priority given the long-running insurgency. The state has natural resources including crude oil and limestone, but there are limited investment opportunities to develop these resources.

Rankings	Rank
Business Reforms Action Plan 2016	26
State Investment Potential Index 2017	NA
Public Affairs Index 2017	16
Gender Vulnerability Index 2017	14

Key statistics	Nagaland	India
Area (square km)	16 579	
Real GSDP 2015–16 (AUD billion)	3	1 972
Population (million)	2.3 (≈Qatar)	1 300
Urbanisation rate (%)	28.9	31.2
Number of million plus cities	0	63
Income and growth		
Per capita income	1 662	2 052
NSVA by sector 2015–16 (%)		
Agriculture	31	17
Industry	12	31
Services	57	52
GSDP growth 2015–16 (%)	3.1	6.9
State contribution to GDP (%)	0.1	
Infrastructure		
Power deficit 2016–17 (%)	–1.7	–0.7
Road density 2014–15 (km/100 km^2)	224.2	139.1
Rail density 2014–15 (km/1,000 km^2)	0.8	20.1
Human development		
Literacy rate (%)	79.6	73
Gender literacy gap (pp)	6.6	16.7

Key statistics	Nagaland	India
Public finances 2016–17		
Proportion of fiscal deficit to GSDP	5.9	2.9
Debt to GSDP ratio (%)	34.6	23.9
Health spend (% of total spend)	5.1	5.6
Education spend (% of total spend)	14.8	9.7
Investment		
Share of FDI inflows 2000–2017 (%) (includes that of all north-east states)	0.03	

Economic fundamentals

Agriculture contributes around 30 per cent to Nagaland's GSDP and employs 71 per cent of the state's population. During 2015–16, fruit production (including kiwi and passionfruit) was over 436,000 MT and vegetable production was 701,000 MT. Nagaland is the largest producer of coarse cereals, especially maize, beans and tapioca in the north-east. It is the second highest producer of pulses in the region. Sericulture and bamboo are also mainstays of the state's agricultural output. A small but flourishing apiculture sector has the potential to produce 15,000 MT of honey and 100 MT of wax per year.

Nagaland's industrial output is limited to the construction sector, wood and wood products. Cottage industries include weaving, woodwork, and pottery.

The state's tourism potential has been limited by insurgencies spanning five decades. But the state's natural topology and cultural diversity provide a competitive advantage in attracting tourists. The Hornbill Festival, launched by the state government in 2000, attracts thousands of domestic and foreign tourists annually.

Current strengths

- Relatively wide road network and airport at Dimapur.
- Estimated hydropower potential of 1,574 MW, with an installed capacity of 53 MW as of March 2017.
- Nagaland has more than 1,000 MT of high chemical grade limestone reserves, 600 million MT of crude oil, and more than 20 MT of hydrocarbon reserves underneath seven oil belts; the state is rich in mineral resources such as coal, limestone, iron, nickel, cobalt, chromium, and marble.
- However, there are limited investment opportunities to develop these resources.

Potentially transformative factors

- Export Promotion Industrial Park in Dimapur for the food processing sector.
- Connectivity – enhanced road and rail connectivity, including for the capital Kohima, and improved air connectivity.
- The promotion of bamboo cultivation and bamboo-based industries with renewed support from the Central Government.

ODISHA

Despite being richly endowed with water, forest and mineral resources, the state of Odisha on India's east coast remains one of India's most underdeveloped. Odisha has almost 20 per cent of India's mineral wealth, but despite strong growth during the past decade, economic output remains well below the state's potential. Poverty in Odisha is higher than in most states, with a large proportion of the population consisting of India's most oppressed social groups, including Scheduled Castes (the least privileged castes) and Scheduled Tribes (indigenous groups). There is a sharp divide between the relatively more developed coastal areas and the poorer interior. The Biju Janata Dal government led by Chief Minister Naveen Patnaik has overseen a long period of political stability throughout its consecutive terms since 2000, but governance challenges persist. Odisha also struggles with persistent left-wing violence as well as recurrent natural disasters; the latter has prompted innovative disaster management strategies.

Rankings	Rank
Business Reforms Action Plan 2016	11
State Investment Potential Index 2017	11
Public Affairs Index 2017	27
Gender Vulnerability Index 2017	23

Key statistics	Odisha	India
Area (square km)	155 707	
Real GSDP 2016–17 (AUD billion)	62.5	1 972
Population (million)	41.9 (≈Argentina)	1 300
Urbanisation rate (%)	16.7	31.2
Number of million plus cities	1 (Bhubaneshwar)	63
Income and growth		
Per capita income	1 495	2 052
NSVA by sector 2015–16 (%)		
Agriculture	21	17
Industry	34	31
Services	45	52
Average GSDP growth 2012–17 (%)	6.8	6.9
State contribution to GDP (%)	2.6	

Key statistics	Odisha	India
Infrastructure		
Power deficit 2016–17 (%)	0	–0.7
Road density 2014–15 (km/100 km^2)	182.2	139.1
Rail density 2014–15 (km/1,000 km^2)	16.2	20.1
Human development		
Literacy rate (%)	72.9	73
Gender literacy gap (pp)	18	16.7
Public finances 2016–17		
Proportion of fiscal deficit to GSDP	3.8	2.9
Debt to GSDP ratio (%)	17.9	23.9
Health spend (% of total spend)	5.0	5.6
Education spend (% of total spend)	14.7	9.7
Investment		
Share of FDI inflows 2000–2017 (%)	0.1	

Economic fundamentals

Odisha's economic underperformance stems from the state's subsistence agricultural base, its vulnerability to natural disasters, weak industrial sector and high levels of unemployment. Industrialisation and mining have steadily increased in recent years and Odisha has generated among the highest shares of India's mineral production. Odisha accounted for 21.6 per cent of India's coal production in 2015–16, and the state leads the production of chromite, manganese, iron ore and bauxite.

Iron ore exports to China provided a boom to the state economy in the 2000s. But the iron ore mining boom was short-lived and did not significantly reduce poverty in Odisha. The state government captured little value from the boom; due in part to illegal mining and in part to mismanagement and regulatory failure (the 2014 Shah Commission, set up to enquire into irregularities in Odisha's mining sector recommended a Mineral Resource Rent Tax, among other things). The sector's expansion is being contested, including through popular resistance to land acquisition, mineral licensing and environmental clearances.

Although 65 per cent of the state relies on agriculture for its livelihood, the agriculture sector suffers from the small size of land holdings, a high incidence of indebtedness on the part of farmers, inadequate irrigation and limited access to credit and other inputs. The state's infrastructure also remains inadequate – the railway network is severely lacking in remote areas, rural electrification is a work in progress and transmission and distribution inefficiencies persist.

Current strengths

- Rich mineral resources – particularly in western and north-western Odisha; the state accounts for a third of India's iron ore reserves, a quarter of coal reserves, half of bauxite reserves, and almost all chromite and nickel reserves; coal, sillimanite,

quartzite, pyroxenite, dolomite, fire clay, graphite, manganese ore and garnet are also found in the state; Odisha has around 50 per cent of India's aluminium smelting capacity and around 20 per cent of India's steelmaking capacity.

- Besides accounting for 20 per cent of India's mineral resources, Odisha has 7 per cent of India's forest coverage, 10 per cent of water resources, a coastline of 482 km and three ports (of which, Paradip is India's second largest in terms of capacity).
- An empowered state bureaucracy and political stability.

Sectoral opportunities for Australia

- Resources and Energy – METS, renewable energy technology.
- Education (vocational) – skill development in areas such as mining and metals.
- Education (other) – Odisha's capital Bhubaneswar has in the past few years become a regional education hub for higher education.

Potentially transformative factors

- A revival of the mining sector, including new large scale steel investments – in 2015–16 mining accounted for 13 per cent of the state economy, delivering over 10 per cent of government revenue.
- Establishment of an aluminium industrial park, based on hot metal, as the state has a globally competitive position for the aluminium industry.
- An agricultural revolution to assist poverty alleviation in Odisha's rural interior – this would require diversification into a wider range of crops, livestock and fishery (the state is India's fourth largest producer of prawns).
- Development of large scale tourism, including ecotourism (building on the current sector which consists a tenth of GSDP); the 2017 Hockey World League Final and Asian Athletics Championships were held in the capital Bhubaneswar.

PUNJAB

The northern Sikh-majority state of Punjab has been India's breadbasket since the introduction of high yielding grains during the 1970s Green Revolution. Punjab continues to play an important role in national grain production, producing 16 per cent of the nation's wheat and 11 per cent of its rice. More than 83 per cent of Punjab is under intensive agriculture. The landlocked state remains among India's more prosperous states. But its economy is currently sluggish, having failed to diversify away from wheat and paddy agriculture, build industry and generate jobs (youth unemployment is 16.6 per cent, above the national average of 10.2 per cent). Populist agricultural policy, including heavily subsidised electricity, fertiliser and pesticides for farmers, have resulted in their overuse and over-irrigation, leading to falling water tables and poor soil quality. Punjab has also become one of India's most indebted states. Punjab has strategic significance given its long border with Pakistan. It remains among the largest sources of Indian migrants to Australia (and there are also sizeable diaspora communities in the United States, United Kingdom and Canada).

Rankings	Rank
Business Reforms Action Plan 2016	12
State Investment Potential Index 2017	16
Public Affairs Index 2017	7
Gender Vulnerability Index 2017	8

Key statistics	Punjab	India
Area (square km)	50 362	
Real GSDP 2016–17 (AUD billion)	69	1 972
Population (million)	27.7 (≈Nepal)	1 300
Urbanisation rate (%)	37.5	31.2
Number of million plus cities	2 (Amritsar, Ludhiana)	63
Income and growth		
Per capita income	2 561	2 052
NSVA by sector 2015–16 (%)		
Agriculture	31	17
Industry	23	31
Services	46	52
Average GSDP growth 2012–17 (%)	5.6	6.9
State contribution to GDP (%)	2.8	

Key statistics	Punjab	India
Infrastructure		
Power deficit 2016–17 (%)	0	–0.7
Road density 2014–15 (km/100 km^2)	209.2	139.1
Rail density 2014–15 (km/1,000 km^2)	45.1	20.1
Human development		
Literacy rate (%)	75.8	73
Gender literacy gap (pp)	10.1	16.7
Public finances 2016–17		
Proportion of fiscal deficit to GSDP	2.9	2.9
Debt to GSDP ratio (%)	32.6	23.9
Health spend (% of total spend)	4.9	5.6
Education spend (% of total spend)	15.1	9.7
Investment		
Share of FDI inflows 2000–2017 (%) (includes that of Haryana)	0.4	

Economic fundamentals

Punjab is a major agricultural producer, contributing over 20 per cent of India's food production. Even as its share of GSDP has sharply declined, agriculture continues to play a pivotal role in Punjab, with more than 83 per cent of the state under intensive agriculture. The yield of food grains per hectare is among the highest in India, around double the average. But the rate of agricultural growth has contracted sharply over the past decade, from 0.95 per cent in 2005–06 to a low of –3.4 per cent in 2014–15. And the distortionary effect of heavily subsidised agricultural inputs is marked. For example, the state consumes almost 10 per cent of India's fertiliser (despite covering only 1.5 per cent of India's land mass).

Punjab has a number of small scale industries, including textiles – cotton and blended yarn – machine and hand tools, bicycle components and sports goods. The state is also home to a petrochemical refinery in Bhatinda. But other modern industries have not taken root.

To revive the economy, the government is focussed on enhancing agricultural productivity, diversifying industry and addressing youth unemployment through skills training. Punjab's lack of industrial development and employment opportunities has led to a 'brain drain'. Retaining the state's highly educated and enterprising talent pool is a key challenge for the government.

Another key priority will be to reduce Punjab's high fiscal deficit, which has been impeding investments in education, health and infrastructure. Debt doubled between 2007 and 2014, soaring to around a third of GSDP.

Current strengths

- Major producer of wheat (16.4 per cent of national production), rice (around 11 per cent nationally), barley, cotton, sugarcane and fruit.
- Major producer of dairy.
- Ludhiana, one of four Punjabi cities being developed as a Smart City, leads business-friendliness rankings of major Indian cities. Ludhiana is Punjab's industrial capital with strengths in textiles and engineering, while also being a major importer of Australian wool.
- High road density and five airports, including a newly-developed international terminal in Chandigarh, a services and tourist hub and the shared capital of the states of Punjab and Haryana.
- Largest producer of machine and hand tools and bicycle components.

Sectoral opportunities for Australia

- Agriculture – conservation agriculture, food processing, dairy, logistics and warehousing, farming equipment, farm management, irrigation, post-harvest and technological applications.
- Water management – given Punjab's groundwater quality issues and irrigation network.
- Education – partnership opportunities for Australian VET providers, including for healthcare education.
- Sports – sports science consulting sports training, and development of physical literacy in schools, given the state's forward-leaning stance on sports, particularly in boxing and wrestling; the Netaji Subhas National Institute of Sports is located in Patiala.

Potentially transformative factors

- Economic diversification – as the environmental sustainability of Punjab's agriculture sector comes into question, reducing the state's overdependence on low value-added agriculture would underpin a transition to greater industrial investment.
- Return to fiscal stability – fiscal consolidation would bolster the investable public resources for the state's basic social services.

RAJASTHAN

Rajasthan is India's largest state by area, comprising the sparsely populated arid Thar Desert in the west and more fertile lands to the east of the Aravalli mountain range. Although the landlocked state has experienced a decade of strong economic growth with rapid poverty reduction, it remains underdeveloped industrially and lags in human development indicators. Rajasthan faces severe water scarcity, with large areas of desert and extensive dry land farming. The state has supported a series of reforms to diversity the state's economic base and attract investment, including robust labour reforms, reforms in solar, agriculture, the start-up ecosystem, minerals, tourism, land allotment and financial inclusion. But there has been a measure of political churn; no state government has been able to secure consecutive terms in Rajasthan since 1993, a period during which BJP and Congress governments have alternated.

Rankings	Rank
Business Reforms Action Plan 2016	8
State Investment Potential Index 2017	13
Public Affairs Index 2017	12
Gender Vulnerability Index 2017	22

Key statistics	Rajasthan	India
Area (square km)	342 239	
Real GSDP 2015–16 (AUD billion)	109	1 972
Population (million)	68.6 (≈Thailand)	1 300
Urbanisation rate (%)	24.9	31.2
Number of million plus cities	3 (Jaipur, Jodhpur, Kota)	63
Income and growth		
Per capita income	1 637	2 052
NSVA by sector 2015–16 (%)		
Agriculture	28	17
Industry	26	31
Services	46	52
Average GSDP growth 2012–15 (%)	6.1	6.9
State contribution to GDP (%)	4.8	

Key statistics	Rajasthan	India
Infrastructure		
Power deficit 2016–17 (%)	–0.6	–0.7
Road density 2014–15 (km/100 km^2)	72.5	139.1
Rail density 2014–15 (km/1,000 km^2)	17.2	20.1
Human development		
Literacy rate (%)	66.1	73
Gender literacy gap (pp)	27.9	16.7
Public finances 2016–17		
Proportion of fiscal deficit to GSDP	3.1	2.9
Debt to GSDP ratio (%)	30.4	23.9
Health spend (% of total spend)	5.6	5.6
Education spend (% of total spend)	14.9	9.7
Investment		
Share of FDI inflows 2000–2017 (%)	0.4	

Economic fundamentals

Rajasthan's economy is dominated by agriculture, which employs more than half the workforce and accounts for 26 per cent of the state economy, a greater share than most large Indian states. The state has severe water scarcity, with just 1.2 per cent of the country's surface water and 1.7 per cent of ground water. Industry accounts for less than a third of GSDP, including cement, minerals, marble, slate and sandstone industries, as well as crude oil production.

Rajasthan enjoys competitive advantages in the mining, textiles, gems, jewellery and tourism sectors. In recent years, Rajasthan has become one of the most indebted states in India, exacerbated by efforts to turnaround debt-saddled electricity distribution companies. There is an urgent need to generate more revenue and curb electricity distribution losses. Rajasthan is a major nuclear power generating state – one plant is operational and another has been approved – and is emerging as a strong adopter of solar technology.

The state's north-eastern cities of Jaipur, Ajmer and Alwar are the main drivers of industrial growth, including an expanding industrial park in Neemrana for over 45 Japanese firms focusing on automotive, auto ancillaries, engineering and chemicals, as well as an emerging IT industry in Jaipur.

Current strengths

- Reformist state government that has boosted investor sentiment.
- India's second largest producer of oilseeds; including a large producer of coriander, seed spices, guar gum.
- Major producer of wool, milk, cereals, pulses and polyester.
- Proximity to the Delhi NCR supports Rajasthan's economic growth.

- Sizeable mineral deposits and mining sector; India's second-largest crude oil producer, and a major producer of lead concentrate, zinc concentrate, calcite, silver and mineral gypsum.
- A leading tourist hub of north India, including six United Nations Educational, Scientific and Cultural Organisation (UNESCO) world heritage sites.
- Rapid poverty reduction – urban poverty has reduced by two thirds while rural poverty has halved.
- An online single-window industrial clearance system.

Sectoral opportunities for Australia

- Water management, given the large areas of desert and extensive dry land farming in addition to the ambitious river interlinking project being undertaken by the state.
- Resources and Energy – METS, renewable energy technology.
- Transport – road safety expertise and technology; Rajasthan will offer a large number of brownfield transport projects as the state's poor rail and road connectivity improves.
- Education (vocational) – skill development in areas such as mining, renewable energy, oil and gas, hospitality and tourism.

Potentially transformative factors

- The Delhi Mumbai Industrial Corridor – almost 40 per cent of the planned freight corridor and associated industrial development will run through Rajasthan, transforming the surrounding region's infrastructure. Improved roads, energy, public transport and water infrastructure would have far-reaching effects. The Rajasthan Government is implementing major infrastructure projects in roads, energy, public transport and water sectors through support from international agencies.
- Urbanisation – at 25 per cent, Rajasthan is one of India's least urbanised states. As in other Indian states, urbanisation could drive greater shares for industry and services in the state economy. Four cities in Rajasthan – Jaipur, Udaipur, Kota and Ajmer are being developed as smart cities under the Smart Cities Mission.
- The discovery of oil and gas in Rajasthan is expected to lead to the development of numerous upstream and downstream industries in petroleum and chemicals including an oil refinery in Barmer.

SIKKIM

Sikkim is a northern hill state bordered by China, Bhutan and Nepal. It is India's least populous and second smallest state. Known for its biodiversity, floriculture and mountainous terrain, its economy is largely comprised of agriculture and tourism. The state's transport infrastructure is developing, backed by Central Government investments. Sustainability is a key state government priority – as of 2016, Sikkim was the first state to transition its agricultural sector to completely organic production.

Rankings	Rank
Business Reforms Action Plan 2016	30
State Investment Potential Index 2017	NA
Public Affairs Index 2017	10
Gender Vulnerability Index 2017	4

Key statistics	Sikkim	India
Real GSDP 2016–17 (AUD billion)	3	1 972
Population (million)	0.61 (≈Macau)	1 300
Urbanisation rate (%)	25.2	31.2
Number of million plus cities	0	63
Income and growth		
Per capita income	5 113	2 052
NSVA by sector 2015–16 (%)		
Agriculture	9	17
Industry	60	31
Services	31	52
Average GSDP growth 2008–13 (%)	23.4	6.9
State contribution to GDP (%)	0.1	
Infrastructure		
Power deficit 2016–17 (%)	0	–0.7
Road density 2014–15 (km/100 km^2)	104.9	139.1
Human development		
Literacy rate (%)	81.4	73
Gender literacy gap (pp)	10.9	16.7

Key statistics	Sikkim	India
Public finances 2016–17		
Proportion of fiscal deficit to GSDP	3.2	2.9
Debt to GSDP ratio (%)	25	23.9
Health spend (% of total spend)	4.9	5.6
Education spend (% of total spend)	17	9.7
Investment		
Share of FDI inflows 2000–2017 (%) (includes that of all north-east states)	0.03	

Economic fundamentals

Sikkim's economy is rapidly growing, although it had the third smallest GSDP in 2014. With no operational airport, a lack of railway infrastructure, limited road connectivity, and difficult terrain, Sikkim is one of India's most isolated states.

More than 64 per cent of the state's population depends on agriculture for their livelihood. Floriculture is a mainstay – Sikkim leads the production and supply of cut flowers, and has collaborated with international technical experts to develop the potential for floriculture further.

The state also produces spices, such as cardamom, ginger, turmeric, and food grains such as millet, ragi, maize and rice.

With attractive tax incentives, low labour costs, and a variety of botanical products available, pharmaceuticals are an emerging industry in Sikkim, attracting major pharma companies.

It is estimated that Sikkim has a potential capacity of 8,000 MW of hydroelectric power. Over 20 hydropower projects are in the pipeline, including as public-private partnerships.

The Indian Army maintains a presence in large parts of the state, concentrated around the sensitive border area with China. Some areas require official permits to visit and are restricted to foreigners.

Current strengths

- Sikkim's Tourism Policy of 2017 aims to promote low impact sustainable tourism. Sikkim is home to the world's third highest peak, a large tourist drawcard. The state government is seeking to promote itself as a destination for adventure tourism and ecotourism.
- Sikkim is India's leading producer of large cardamom, contributing over 80 per cent to total production.
- Sikkim was certified the first fully organic state in India by the Central Ministry of Agriculture and Farmers' Welfare in 2016. Sustainability and environmental awareness are increasingly connected to Sikkim's projected tourist identity.
- Female work participation rate in Sikkim is 40 per cent, higher than the national average of 26 per cent.

Potentially transformative factors

- The expansion of road and rail networks and the development of air connectivity in Sikkim, including the proposed industrial corridors at Rangpo-Gangtok, Melli-Jorethang, Jorethang-Rishi, and Ranipool-Gangtok.

TAMIL NADU

Tamil Nadu is India's second largest economy and a leading industrialised state. The state, through a sound agricultural base, rapid industrial growth and a robust welfare system, has risen to the top of India's economic and human development rankings. It has delivered among the highest per capita incomes, the best health indicators and lowest poverty rates in India. Its capital Chennai, the 'Detroit of India' is the centre of Indian automobile and component manufacturing and one of the world's top 10 automotive hubs. The state has achieved stable law and order, a high-quality and free universal healthcare system, tourism appeal and a well-functioning public service. But there are early indications of an economic slowdown, including fewer investments, slowing jobs and manufacturing growth, declining ease of doing business and water scarcity.

Rankings	Rank
Business Reforms Action Plan 2016	16
State Investment Potential Index 2017	6
Public Affairs Index 2017	2
Gender Vulnerability Index 2017	10

Key statistics	Tamil Nadu	India
Area (square km)	130 060	
Real GSDP 2016–17 (AUD billion)	203	1 972
Population (million)	72.1 (≈Thailand)	1 300
Urbanisation rate (%)	48.4	31.2
Number of million plus cities	6 (Chennai, Coimbatore, Madurai, Tiruchirappali, Salem, Tiruppur)	63
Income and growth		
Per capita income	3 047	2 052
NSVA by sector 2015–16 (%)		
Agriculture	13	17
Industry	31	31
Services	56	52
Average GSDP growth 2012–17 (%)	6.6	6.9
State contribution to GDP (%)	8.4	

Key statistics	Tamil Nadu	India
Infrastructure		
Power deficit 2016–17 (%)	0	–0.7
Road density 2014–15 (km/100 km^2)	200.8	139.1
Rail density 2014–15 (km/1,000 km^2)	31	20.1
Human development		
Literacy rate (%)	80	73
Gender literacy gap (pp)	13	16.7
Public finances 2016–17		
Proportion of fiscal deficit to GSDP	3	2.9
Debt to GSDP ratio (%)	19.1	23.9
Health spend (% of total spend)	4.5	5.6
Education spend (% of total spend)	14.7	9.7
Investment		
Share of FDI inflows 2000–2017 (%)	7	

Economic fundamentals

Tamil Nadu is India's most urbanised state. It has a well-developed manufacturing sector, with the largest number of factories in operation in India and the country's largest pool of skilled labour. The state leads in automotive, engineering, research and development, health care, IT and IT-enabled services, textiles, cotton, financial, and leather industries.

The state is also among India's top FDI destinations, accounting for 7 per cent of total inflows into India from 2000–2017. The state hosts manufacturing facilities over 50 Fortune 500 companies and is home to the largest Japanese and Korean investments in India. Its capital Chennai is a premier automotive hub.

Although Tamil Nadu has experienced rapid industrial growth over decades, there are signs of a period of economic slowdown. An increasing proportion of proposed investments over the decade to 2017 have been falling through, the SME sector is stagnating, the state's rankings on ease of doing business are falling and the state's schools lag national averages for educational outcomes. Manufacturing growth slowed to 1.65 per cent in 2015–16. As wages in the state rise and other states improve on ease of doing business, automotive companies are increasingly investing elsewhere in India.

Tamil Nadu's fiscal position is stable, but its welfare system remains a burden on finances and declining manufacturing growth is also impacting revenue. As a manufacturing state, Tamil Nadu fared better than expected from the implementation of the GST (which shifted levies from the point of origin to the point of consumption). The state's debt has grown in double digits over the decade to 2017. But this has not corresponded with commensurate GSDP growth; GSDP grew at 6.5 per cent from 2012–17.

Current strengths

- Robust public institutions.
- Solid infrastructure in road and rail; three major ports, and seven airports.
- Largest producer of eggs, banana, tapioca, coconut, turmeric and flowers.
- Major producer of sugar, maize, horticulture, chemicals, fertilisers, cement, paper and steel.
- Chennai is a major port for agricultural imports and exports (particularly cotton and seafood) and India's second largest source of software exports.
- A leading solar and wind energy producer, with among the highest installed capacity in India and the world's largest solar plant.
- India's largest number of special economic zones in operation.
- Tourism potential, with five UNESCO Heritage sites, the highest of any Indian state.

Sectoral opportunities for Australia

- Advanced manufacturing, automotive technology and aftermarket products.
- Energy – development of LNG terminals in Tamil Nadu, world class wind and solar energy potential, complemented by a growing gas pipeline network and high capacity power transmission corridors.
- Roads, ports, urban infrastructure, architecture and design services – Tamil Nadu will see many brownfield road projects and has a track record of toll projects with good collection history.
- Education, training and skill development; research partnerships.
- Fisheries, aquaculture, agri-technology – given Tamil Nadu is a major agricultural producer and a major importer of Australian pulses and grains.

Potentially transformative factors

- Innovative approaches to water – Tamil Nadu faces long term challenges in water management. It has long-running disputes with Kerala regarding the Mullaperiyar Dam and with Karnataka over water sharing of the Cauvery River.

TELANGANA

The southern landlocked state of Telangana is India's newest state, having been carved out from Andhra Pradesh in 2014. It is also one of India's fastest growing, with an average GSDP growth rate of 9.5 per cent in the three years following the state's formation. The state ranked equal first in 2016 on ease of doing business. This is credited to the single-window system for industrial approvals established in 2015 by the Telangana Rashtra Samithi Party government led by Chief Minister K Chandrashekar Rao, as well as to the expansion of installed power capacity, shoring up the state's power supply. Telangana's capital and economic epicentre is the IT, pharmaceuticals and Telugu-language film hub of Hyderabad, India's sixth largest metropolis and a home to major corporates including Facebook, Google, Apple and Microsoft. The city will remain the joint capital with Andhra Pradesh until 2024.

Rankings	Rank
Business Reforms Action Plan 2016	1
State Investment Potential Index 2017	5
Public Affairs Index 2017	20
Gender Vulnerability Index 2017	11

Key statistics	Telangana	India
Area (square km)	112 077	
Real GSDP 2016–17 (AUD billion)	99	1 972
Population (million)	35.2 (≈Canada)	1 300
Urbanisation rate (%)	38.7	31.2
Number of million plus cities	1 (Hyderabad)	63
Income and growth		
Per capita income	3 094	2 052
NSVA by sector 2015–16 (%)		
Agriculture	17	17
Industry	19	31
Services	64	52
Average GSDP growth 2015–17 (%)	9.5	6.9
State contribution to GDP (%)	4.09	

Key statistics	Telangana	India
Infrastructure		
Power deficit 2016–17 (%)	0	–0.7
Road density 2014–15 (km/100 km^2)	87.3	139.1
Rail density 2015–16 (km/1,000 km^2)	15.5	20.1
Human development		
Literacy rate (%)	66.5	73
Gender literacy gap (pp)	17.1	16.7
Public finances 2016–17		
Proportion of fiscal deficit to GSDP	3.6	2.9
Debt to GSDP ratio (%)	17.2	23.9
Health spend (% of total spend)	4.8	5.6
Education spend (% of total spend)	8.1	9.7
Investment		
Share of FDI inflows 2000–2017 (%)	4	

Economic fundamentals

Telangana is dominated by its services sector, which constitutes 64 per cent of the economy, driven by Hyderabad's IT and pharmaceuticals hubs. Services steadily grew by 11.4 per cent in 2015–16, including real estate, professional services (including IT-enabled services), hospitality and financial services. Growth in agriculture has fluctuated – it constitutes 17 per cent of the economy but this share is declining.

Telangana outperformed all southern states in attracting investment in 2016–17, accounting for 3.3 per cent of total investment in India's largest states. This is credited to its robust growth and infrastructure, including uninterrupted power, water and an improving road network.

The Telangana State Government's fiscal prudence means it is one of few states able to borrow up to 3.5 per cent of GSDP under the *Fiscal Responsibility and Budget Management Act*. Growth in tax revenue of 17.81 per cent in 2016–17 was India's highest.

Disputes with Andhra Pradesh over water sharing arrangements relating to two rivers – the Krishna and Godavari rivers – show no signs of resolution. Parts of Telangana suffer drought-like conditions each year and several irrigation projects remain mired in inter-state disagreements being litigated in the court system.

Current strengths

- India's best state (tied with Andhra Pradesh) in ease of doing business in 2016.
- Hyderabad's established position as a centre for IT-enabled services, business process outsourcing, and financial services.
- Key pharmaceutical and biotechnology hub, including Genome Valley in Hyderabad dedicated to life sciences, biomedical research, training and manufacturing; producer of a third of India's pharmaceuticals.
- A focus on innovation through a formal innovation policy.

- India's largest generator of solar energy, with plans for further expansion.
- The largest thermal plant in south India – the Ramagundam thermal power station.
- Large reserves of granite, coal, limestone, bauxite and mica.

Sectoral opportunities for Australia

- Biotechnology – alliances to commercialise Australian research and development.
- Resources and Energy – mining, mineral processing and METS and renewable energy technology, given the strong potential in solar and wind.
- Education (vocational) – skill development.

Potentially transformative factors

- Telangana is developing a long term strategy to expand its IT and innovation sector; Hyderabad is developing a reputation as a hub for start-ups and incubators. T-Hub, a state government backed start-up incubator, is designed to give Hyderabad's already established start-up ecosystem an edge by bringing together start-ups, academics and corporates.

TRIPURA

Tripura borders Bangladesh and is the second most populous state in the north-east region. The state economy is largely dominated by agriculture and forestry, with little developed industry. Although the state's natural resources include natural gas, tea, medicinal plants, limestone and rubber, processing of these resources is limited. Tripura performs well overall on human development indices, including high literacy rates, but the state's economic potential remains largely untapped. Tripura has been one of the Communist Party of India's last strongholds, but the party was defeated by the BJP in state elections in March 2018 after having held power in the state for five terms.

Rankings	Rank
Business Reforms Action Plan 2016	22
State Investment Potential Index 2017	NA
Public Affairs Index 2017	18
Gender Vulnerability Index 2017	17

Key statistics	Tripura	India
Area (square km)	10 492	
Real GSDP 2014–15 (AUD billion)	5	1 972
Population (million)	3.7 (≈Puerto Rico)	1 300
Urbanisation rate (%)	26.1	31.2
Number of million plus cities	0	63
Income and growth		
Per capita income	1 424	2 052
NSVA by sector 2015–16 (%)		
Agriculture	28	17
Industry	21	31
Services	51	52
GSDP growth 2014–15 (%)	9.2	6.85
Infrastructure		
Power deficit 2016–17 (%)	–1.4	–0.7
Road density 2014–15 (km/100 km^2)	356.4	139.1
Rail density 2014–15 (km/1,000 km^2)	14.4	20.1

Key statistics	Tripura	India
Human development		
Literacy rate (%)	87.2	73
Gender literacy gap (pp)	9.03	16.7
Public finances 2016–17		
Proportion of fiscal deficit to GSDP	4	2.9
Debt to GSDP ratio (%)	29	23.9
Health spend (% of total spend)	4.4	5.6
Education spend (% of total spend)	14.5	9.7
Investment		
Share of FDI inflows 2000–2017 (%) (includes that of all north-east states)	0.03	

Economic fundamentals

Tripura is a strong primary producer, with large yields of bamboo, coffee, pineapple, cashew and tea. The state is also the largest producer of jackfruit and second-largest producer of rubber in India. While conventional agriculture is dominant in the plains, slash and burn farming practices are still prevalent in the hills.

Tripura is a power-surplus state and exports power to neighbouring Bangladesh. The Tripura Power Project is one of the largest clean development mechanisms in the world. As of March 2017, the state had an installed power generation capacity of 727 MW.

Despite recent developments in cement and steel, rubber and tea constitute the lion's share of the industrial base. Tripura has several industrial estates and food processing parks, although the secondary sector contributes only about 5 per cent of total employment.

Current strengths

- Natural resources and capacity for agricultural output. However, secondary processing of these stocks is lacking and the economic potential of these sectors remains hampered by insufficient industry.

Potentially transformative factors

- A change of government in March 2018 ousting the five-term rule by Communist Party of India (Marxist).
- The Airports Authority of India has plans to upgrade Agartala airport, the second busiest in north-east India, to an international airport. Improved connectivity through Bangladesh would reduce the distance between Agartala and Kolkata from 1,570 km to 463 km and greatly ease trade. Tripura depends on Bangladesh for low-cost supplies of bulk supplies and some food products.
- The Tripura Industrial Investment Promotion Incentive Scheme 2017 identifies the state's agricultural strengths as 'thrust sector industries', particularly those industrial units using bamboo, rubber, tea, horticultural produce and gas as major inputs.

UTTAR PRADESH

Uttar Pradesh in northern India is the most populous state of over 220 million in the country (and indeed, anywhere in the world) and a bellwether for national politics. It is India's third largest state economy driven largely by agriculture, but remains one of India's less developed states, with per capita income half the national average. Despite improvements in recent years, the landlocked state has struggled with poor natural resource endowments, slow growth, and poor human development. The state has a history of truculent caste-based politics and inter-religious tensions, which continue to carry risks of social conflict. Australian commercial engagement has been limited to date, including due to poor perceptions of the ease of doing business and infrastructure gaps. But the state has unparalleled scale, untapped markets and out to 2035, the significance of its young demographics and national political clout will only increase. There are pockets of economic potential with relatively higher income segments, particularly in the state's west, driven by proximity to New Delhi.

Rankings	Rank
Business Reforms Action Plan 2016	14
State Investment Potential Index 2017	20
Public Affairs Index 2017	23
Gender Vulnerability Index 2017	29

Key statistics	Uttar Pradesh	India
Area (square km)	240 928	
Real GSDP 2016–17 (AUD billion)	192	1 972
Population (million)	223.8 (≈Brazil)	1 300
Urbanisation rate (%)	22.3	31.2
Number of million plus cities	10 (Kanpur, Lucknow, Varanasi, Agra, Meerut, Allahabad, Ghaziabad, Aligarh, Bareilly, Moradabad)	63
Income and growth		
Per capita income	1 032	2 052
NSVA by sector 2015–16 (%)		
Agriculture	28	17
Industry	24	31
Services	48	52
Average GSDP growth 2012–17 (%)	7	6.9
State contribution to GDP (%)	7.9	

Key statistics	Uttar Pradesh	India
Infrastructure		
Power deficit 2016–17 (%)	–1.7	–0.7
Road density 2014–15 (km/100 km^2)	172.4	139.1
Rail density 2014–15 (km/1,000 km^2)	37.1	20.1
Human development		
Literacy rate (%)	67.7	73
Gender literacy gap (pp)	20	16.7
Public finances 2016–17		
Proportion of fiscal deficit to GSDP	3.9	2.9
Debt to GSDP ratio (%)	35.5	23.9
Health spend (% of total spend)	5.6	5.6
Education spend (% of total spend)	16.3	9.7
Investment		
Share of FDI inflows 2000–2017 (%)	0.2	

Economic fundamentals

Uttar Pradesh is India's third largest state economy, driven largely by agriculture. The state produces a fifth of India's total food and half of food grains. Agriculture is the largest employer, employing one in every two workers, but productivity is considerably lower than other major food growing states given small landholdings, weak investment and inefficiencies in water distribution. The state's decision to write-off farm debt has resulted in a sharp decline in capital expenditure (including much needed expenditure on agriculture and irrigation).

Economic development has been hampered by infrastructure gaps, energy deficits and skill shortages. Uttar Pradesh lags most states on human development indicators and poverty reduction has been slower than the national average.

Although per capita income across the state is around half the national average, there are wide regional disparities. Western Uttar Pradesh has a stronger agricultural sector, greater agricultural productivity and is both more urbanised and industrialised than the rest of the state, driven by its proximity to New Delhi. The western part of the state includes the higher-growth cities of Ghaziabad, Meerut, Mathura as well as Noida, north India's emerging IT and business process outsourcing hub. Agra is a major agricultural processing centre, including of cotton, dairy and flour milling. Lucknow, the state capital, is the base of India's largest tanneries, and a centre for wheat, rice and sugarcane production, as well as an emerging centre for aeronautical engineering.

High on the state's agenda is improving ease of doing business, including setting aside land for industrial use, proposed expansions of highways across the state and improved training programs for the workforce. But in a state with complex governance challenges, and stretched public finances, visible results for the business environment are at least a medium to long term proposition.

Current strengths

- Vast population and untapped consumer markets.
- Competitive wage rates for labour-intensive manufacturing.
- Major producer of pulses, dairy, wheat, sugarcane, maize, potatoes, mangoes, leather and handicrafts.
- Urban development in western Uttar Pradesh driven by proximity to New Delhi, including in Ghaziabad and Noida, north India's emerging IT and business process outsourcing hub.

Sectoral opportunities for Australia

- Agriculture – food processing, bovine genetics, cold chain logistics, and other specialised services related to precision farming, post-harvest solutions, logistics, seed treatment and soil health.
- Education (vocational) – large scale demand for skilling.
- Defence – long term defence manufacturing opportunities.
- Transport Infrastructure – short term brownfield road projects (on a toll-operate-transfer model); the state ranks as India's third in terms of tourist arrivals.

Potentially transformative factors

- Demographic dividend – with sustained improvements in human capital, Uttar Pradesh's demographics could offer in the long term a greater dividend from its proportionately younger working age population than peninsular Indian states; around 60 per cent of the state is between 15–59 years of age.
- Institutional overhaul – improved law and order, transparency, public administration and the pursuit of inclusive growth would help to reverse the state's persistent record of economic underperformance. The state has seen a pattern of favourable economic governance for politically relevant geographies, so the decline of clientelist identity politics would also be transformative. But these governance traits are persistent and unlikely to shift in the short term. More broadly, the subdivision of the state for better governance has long been proposed but contested.
- Agricultural productivity turnaround – continued initiatives to increase yields, adopt new technologies and strengthen procurement policies would have enduring effects (but wholescale agricultural reform is unlikely in the short term).
- Infrastructure upgrades – moves to expand electricity coverage, curb electricity theft and reform debt-ridden state power distribution companies could be transformative. Uttar Pradesh has the largest number of cities earmarked under the Smart Cities initiative (Aligarh, Kanpur, Allahabad, Lucknow, Varanasi and Agra).

UTTARAKHAND

Uttarakhand is a landlocked state in the Himalayan foothills, consisting of plains and hill districts. The state holds strategic significance as it borders China and Nepal. Ever since the state was carved out from Uttar Pradesh in 2000, it has charted a path of high economic growth. A package of tax breaks and other incentives for business have seen manufacturing firms invest in the state. Many of these see Uttarakhand as a lower-cost base from which to access larger north Indian state economies. There remains large untapped potential in hydropower, tourism and horticulture. But the state's difficult terrain and connectivity challenges mean that costs for business (and service delivery) are considerable. Uttarakhand's economic growth has been concentrated in several districts in the plains, to the exclusion of the hills. This lopsided development has contributed to widespread migration away from the hills. Besides the geographic inequalities, exploitation of Uttarakhand's natural resource base – including deforestation and dam construction for hydropower projects – has come under criticism (particularly since major floods in 2013 had a devastating effect on the state economy).

Rankings	Rank
Business Reforms Action Plan 2016	9
State Investment Potential Index 2017	12
Public Affairs Index 2017	11
Gender Vulnerability Index 2017	13

Key statistics	Uttarakhand	India
Real GSDP 2016–17 (AUD billion)	32	1 972
Population (million)	10 (≈Portugal)	1 300
Urbanisation rate (%)	30.2	31.2
Number of million plus cities	0	63
Income and growth		
Per capita income	3 197	2 052
NSVA by sector 2015–16 (%)		
Agriculture	10	17
Industry	52	31
Services	38	52
Average GSDP growth 2012–16 (%)	7.2	6.9
State contribution to GDP (%)	1.3	

Key statistics	Uttarakhand	India
Infrastructure		
Power deficit 2016–17 (%)	–0.6	–0.7
Road density 2014–15 (km/100 km^2)	117.7	139.1
Rail density 2014–15 (km/1,000 km^2)	6.5	20.1
Human development		
Literacy rate (%)	78.8	73
Gender literacy gap (pp)	17.6	16.9
Public finances 2016–17		
Proportion of fiscal deficit to GSDP	3.1	2.9
Debt to GSDP ratio (%)	21.8	23.9
Health spend (% of total spend)	5	5.6
Education spend (% of total spend)	18.2	9.7
Investment		
Share of FDI inflows 2000–2017 (%) (includes that of all north-east states)	0.03	

Economic fundamentals

Although agriculture remains the occupation of a large proportion of the state's workforce, the contribution of agriculture to GSDP has fallen since the state's formation. Low-yield subsistence agriculture in the hill districts has substantially declined – the net sown area in the state has decreased by around 10 per cent from 2000–2014.

Uttarakhand's economy has been shaped significantly by its proximity to the populous state economies of north India and by the generous tax breaks. The state has emerged as a second tier automobile cluster (after Chennai, Mumbai and Delhi), a pharmaceuticals cluster, and a home to manufacturing for chemicals and food products. On the back of implementing regulatory reforms, the state moved up 14 ranks on ease of doing business in 2015–16.

Uttarakhand is in need of significant tourism infrastructure investment. The state is home not only to some of India's most sacred Hindu temples (including the Char Dham pilgrimage circuit), but also significant sites for Buddhists and Sikhs. Jim Corbett National Park, one of India's oldest national parks and a tiger reserve, is a major ecotourism destination.

While physical connectivity within Uttarakhand has seen some recent improvements, it remains a brake on growth. Transport costs put firms based in Uttarakhand at a distinct disadvantage and the rail network is confined mainly to the plains. Only two small airports connect the state with New Delhi.

Over 90 per cent of Uttarakhand is hilly and two-thirds forested, leaving only 12.5 per cent arable. The fact that the state's topography limits the agricultural and industrial sectors directly affects Uttarakhand's public finances. The state's tax base is necessarily limited, and the prospect of end user charges for infrastructure, impractical. So the state is dependent on Central Government assistance for infrastructure development – and the state's special category status (due to its hilly terrain, low population density and poor infrastructure) has afforded it a degree of fiscal space.

Current strengths

- Competitive advantages in hydropower, tourism and horticulture.
- Among top three states for hydropower potential (up to 25,000 MW potential).
- Sizeable cluster of auto companies.
- Rich tourism infrastructure development opportunities.
- Ample water resources.
- India's oldest agricultural university, the GB Pant University of Agriculture and Technology.
- Home to key national civil service training institutes in the capital Dehradun.

Sectoral opportunities for Australia

- Resources – given the state's hydropower potential.
- Niche agribusiness opportunities.

Potentially transformative factors

- Productivity of labour – Uttarakhand's medium to long term growth will depend in part on its ability to attract further industry and services, including to serve the north Indian regional economy. The availability of land and power are bound to become constraints in the long term. Given the state's topography, land for industrial use is limited (only 8 per cent is available for non-agricultural use) and the entire state is vulnerable to seismic activity. So a focus on improving the productivity of workers could prove transformative.
- Air connectivity – the development of a number of helipads and five new airstrips are under consideration (to augment the existing air connectivity provided by two airports).

WEST BENGAL

West Bengal on India's east coast is India's fourth most populous state and the centre for engagement on mining and METS. Although a former financial and industrial powerhouse, the state economy is steadily recovering from industrial decline under decades of socialist government and obstructionist trade unionism. The state's leadership has tended to a populist style but is increasingly focused on attracting foreign investment to the state. West Bengal has been the most significant METS market for Australian companies in India and is the main entry point for Australian coking coal and pulses exports to India. West Bengal is a gateway to the mineral-rich states of Jharkhand, Chhattisgarh and Odisha and the northeast. The state's capital Kolkata is re-emerging as a growth centre.

Rankings	Rank
Business Reforms Action Plan 2016	15
State Investment Potential Index 2017	21
Public Affairs Index 2017	17
Gender Vulnerability Index 2017	18

Key statistics	West Bengal	India
Area (square km)	88 752	
Real GSDP 2015–16 (AUD billion)	79	1 972
Population (million)	90.3 (≈Vietnam)	1 300
Urbanisation rate (%)	31.9	31.2
Number of million plus cities	2 (Kolkata, Asansol)	63
Income and growth		
Per capita income	1 625	2 052
NSVA by sector 2015–16 (%)		
Agriculture	17	17
Industry	18	31
Services	65	52
Average GSDP growth 2010–15 (%)	6.4	6.9
State contribution to GDP (%)	6.6	
Infrastructure		
Power deficit 2016–17 (%)	–0.3	–0.7
Road density 2014–15 (km/100 km^2)	333.5	139.1
Rail density 2014–15 (km/1,000 km^2)	45.9	20.1

Key statistics	West Bengal	India
Human development		
Literacy rate (%)	76.3	73
Gender literacy gap (pp)	11.5	16.7
Public finances 2016–17		
Proportion of fiscal deficit to GSDP	–	2.9
Debt to GSDP ratio (%)	33.8	23.9
Health spend (% of total spend)	4.5	5.6
Education spend (% of total spend)	16.8	9.7
Investment		
Share of FDI inflows 2000–2017 (%)	1	

Economic fundamentals

West Bengal's economy is primarily dependent on agriculture and mid-sized industry. The state more than doubled its GDP between 2011 and 2016 and is India's sixth largest state economy.

West Bengal is a strong agricultural state, including the largest producer of rice, fish, prawns and jute and major producer of tea, potatoes and pineapples. The state is also home to leather, chemical and electric locomotive manufacturing industries.

The state capital Kolkata is the most developed city in eastern India. It is among India's fastest growing cities, with real GDP growth of 6.3 per cent from 2011–16 and is projected to be in the top 10 fastest growing cities in Asia in terms of GDP out to 2021. Kolkata's port is experiencing a 15.9 per cent increase in total traffic.

Kolkata is the centre of India's mining and resources sector. Coal India is headquartered in Kolkata and the city is a regional economic hub for the mineral-rich eastern states of Jharkhand, Chhattisgarh and Odisha. West Bengal itself is India's third largest in terms of mineral production, with strong minerals processing equipment and mining industries. It also ranks in the top five producers of iron and steel in India. It is the main entry point for Australian coking coal and pulses exports to India.

West Bengal serves as a gateway to India's north-eastern states and India's eastern neighbours. The Siliguri Corridor linking the north-eastern states is of particular strategic importance. But perceptions of corruption, populist leadership and the lack of land and labour reform continue to keep West Bengal from entering the first-tier of state economies. It is among the most indebted in India in terms of the ratio of debt to GSDP.

Current strengths

- Strong growth higher than the national average, and capacity for mineral production.
- Kolkata is a significant healthcare hub for eastern India and Bangladesh with a large number of super specialty hospitals and diagnostic centres.
- Digitised land records, high road and rail density and port facilities.

Sectoral opportunities for Australia

- Resources and Energy – mining operations and METS.
- Agriculture – food processing services, and other specialised services related to precision farming, post-harvest solutions, logistics, seed treatment, soil health and fisheries.
- Education (vocational) – skills development in mining and project management, and leveraging Kolkata as a regional hub, hospitality training for students from the north-east, who comprise a substantial proportion of the hospitality industry nationwide.
- Healthcare – hospital systems, maintenance of electro-medical instruments and high-level skills.

Potentially transformative factors

- Leadership of reform – political leadership prioritising robust reform could be transformative for the state's economy. West Bengal deindustrialised under three decades of left-wing rule. While recent years up to 2018 have seen a measure of political stability and increased growth, a populist style of governance remains. Perceptions of corruption, the unavailability of land for industrial development and rigid labour regulations remain.
- Enhanced infrastructure – West Bengal's prospects could accelerate with improvements in physical infrastructure, including a new major deep sea port and planned freight corridors between the state and India's north-eastern and western states, as well as regional trade connectivity (including with Nepal, Bangladesh and Bhutan). These developments are medium term propositions.

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PUBLIC CONSULTATIONS

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The Hon Steven Ciobo MP, Minister for Trade, Tourism and Investment

Senator the Hon Arthur Sinodinos AO, Minister for Industry, Innovation and Science

The Hon Barnaby Joyce MP, Deputy Prime Minister

The Hon Christopher Pyne MP, Minister for Defence Industry

The Hon Greg Hunt MP, Minister for Health, Minister for Sport

The Hon Josh Frydenberg MP, Minister for the Environment and Energy

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Senator the Hon Mathias Cormann, Minister for Finance

The Hon Peter Dutton MP, Minister for Immigration and Border Protection

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Department of Foreign Affairs and Trade

Austrade

Australian Signals Directorate

Australian Taxation Office

CSIRO

Department of Agriculture and Water Resources

Department of Communications and the Arts

Department of Defence

Department of Education and Training

Department of Employment

Department of Environment and Energy

Department of Finance

Department of Health

Department of Home Affairs

Department of Industry, Innovation and Science

Department of Prime Minister and Cabinet

Office of National Assessments

Productivity Commission

Reserve Bank of Australia

The Treasury

STATE GOVERNMENTS OF AUSTRALIA

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New South Wales

Northern Territory

Queensland

South Australia

Tasmania

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[xxxv] Minister's titles are accurate at time of meeting with Mr Varghese.

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Australian Forest Products Association

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Export Council of Australia

Meat & Livestock Australia

Minerals Council of Australia

National Australia Bank

National Farmers' Federation

Perth USAsia Centre

Standards Australia

Swinburne University of Technology

The George Institute

Trade and Investment Queensland

University of Wollongong

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Glossary of Acronyms and Abbreviations

AAS	Australian Academy of Science
ABWI	Australia Business Week in India
ACER	Australian Council for Educational Research
ACIAR	Australian Centre for International Agricultural Research
ADF	Australia Defence Force
AISRF	Australia-India Strategic Research Fund
AIBC	Australia India Business Council
AIEC	Australia India Education Council
AILD	Australia India Leadership Dialogue
AIU	Association of Indian Universities
APEC	Asia-Pacific Economic Cooperation
APMC	Agricultural Produce Market Committee
ARFP	Asia Region Funds Passport
ASA	air service agreements
ASADA	Australian Sports Anti-Doping Authority
ASEAN	Association of Southeast Asian Nations
ASIC	Australian Securities and Investments Commission
ASX	Australian Securities Exchange
AVCA	Audio Visual Coproduction Agreement
BCA	Business Council of Australia
BCM	billion cubic metres
BIT	bilateral investment treaty
BOM	Bureau of Meteorology
BRIC	Brazil, Russia, India and China
BSE	Bombay Stock Exchange
CAGR	compound annual growth rate
CECA	Comprehensive Economic Cooperation Agreement
CERT	Computer Emergency Response Team
CII	Confederation of Indian Industries
CLIC	Climate Information Centres
CMND	Communicable, maternal and nutritional diseases
CSIRO	Commonwealth Scientific and Industrial Research Organisation
DAWR	Department of Agriculture and Water Resources
DIPP	Department of Industrial Policy and Promotion's
DPP 16	Defence Procurement Policy 2016
EAS	East Asian Summit
Efic	Export Finance and Insurance Corporation
FDI	foreign direct investment
FICCI	Federation of Indian Chambers of Commerce and Industry
FPI	foreign portfolio investment
FSANZ	Food Standards Australia New Zealand
FTA	free trade agreement
GCI	Global Competitiveness Index
GDP	gross domestic product
GITA	Global Innovation Technology Alliance
GSDP	gross state domestic product
GST	goods and services tax
GVA	gross value add
GW	gigawatt
HELE	High Efficiency, Low Emissions

HNWI	high net worth individuals
IAS	Indian Administrative Service
ICEWaRM	International Centre of Excellence in Water Resources Management
IEA	International Energy Agency
IFC	International Finance Corporation
IIMs	Indian Institutes of Management
IITB	Indian Institute of Technology Bombay
IIT-ISM	Indian Institute of Technology – Indian School of Mines
IITs	Indian Institutes of Technology
IP	intellectual property
ISA	International Solar Alliance
ISDS	investor-state dispute settlement
ISO	International Organisation for Standardisation
IST	International Skills Training
kWh	kilowatt hours
LNG	liquefied natural gas
MCA	Minerals Council of Australia
METS	mining equipment, technologies and services
MICE	Meetings, Incentives, Conferences and Exhibitions
MOOCs	massive open online courses
MoU	memorandum of understanding
MT	million tonne
MTP	Medtech, Biotech and Pharmaceutical
MW	megawatts
NASSCOM	National Association of Software and Services Companies
NCD	Non-communicable diseases
NCERT	National Council of Education and Training
NCP	New Colombo Plan
NCR	National Capital Region
NITI Aayog	National Institute for Transforming India
NPA	non-performing asset
NSE	National Stock Exchange
NSVA	net state value added
ODA	official development assistance
OECD	Organisation for Economic Co-operation and Development
PDV	production, digital and visual effects
PHWR	pressurised heavy-water reactors
PPP	purchasing power parity
PSUs	public sector undertakings
RBI	Reserve Bank of India
RCEP	Regional Comprehensive Economic Partnership
REIT	real estate investment trusts
ROBE	Riverina Oils and Bio Energy
RTO	registered training organisation
SAGE	Science in Australia Gender Equality
SEBI	Securities and Exchange Board of India
SIMTARS	Safety in Mines, Testing and Research Station
SME	small and medium enterprises
STEMM	science, technology, engineering, mathematics and medicine
TCS	Tata Consulting Services
TFR	total fertility rate
TGA	Therapeutic Goods Administration
TVET	technical and vocational education and training
UDAY	Ujwal Discom Assurance Yojana
UNESCO	United Nations Educational, Scientific and Cultural Organisation
VET	vocational education and training
VFR	visiting friends and relatives
VU	Victoria University
WTO	World Trade Organization

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