KPMG

The Global Demand for Skills

A report for the Department of Education and Training's International Skills Training Initiative

16 January 2019

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Executive Summary

This study examined the potential skills needs in a selection of international economies to help inform the development of International Skills Training (IST) courses. The IST program is an Australian government program designed to promote international education exports through off-shore delivery, and also to assist labour markets in emerging economies to up-skill their workforce and grow the skilled labour market.

This analysis included research and data collection/interpretation, combined with stakeholder consultations across government, training organisations and industries. The stakeholder consultations were designed to collect expert opinion of - and experience in - where skills needs are perceived in different countries, and how these needs might be best addressed through education and training.

A select group of countries were examined in this report. These countries were from the Asia Pacific, the Middle East and Latin American regions.

The key themes emerging from this study highlight the growing need for up-skilling in service industries such as transport and logistics, health services, and tourism. Specific occupations that have presented opportunities are care workers (discussed further in case study 1) and tourism advisors (discussed further in case study 3).

Industries that show multiple demand for up-skilling, in order of global need, include:

1. Transport and Logistics
2. Tourism
3. Construction
4. Aged Care
5. Health Services
6. Retail and Wholesale
7. Food and Beverage
8. Child Care

There are a number of key occupations (listed below) that support these industries. Training in these occupations for either currently unemployed persons, or to up-skill the existing workforce, is needed to improve industry performance and enhance economic growth in emerging economies. The priorities for these occupations are tied to the key industry opportunities shown above.

- freight handlers
- supply and distribution managers
- skilled transport workers such as truck drivers
- personal care workers
- aged care service managers
- tourism and travel advisors
- tour guides and charter tour bus operators
- child care workers
- child care service managers
- building construction labourers
- electricians (multiple skill levels)
- plumbers (multiple skill levels)
- sales representatives
- retail managers
- wholesale managers
- food preparation assistants
- cooks
- waiters
- health care assistants
- medical assistants
- nurses (multiple skill levels)

This detailed analysis examines the skill needs in different countries across a number of different industries. The **key findings by country and industry are presented in Section 2 of this report.**

1. Introduction

The purpose of this report is to identify potential skills needs in a selection of economies in order to provide an informed evidence-base of where to target International Skills Training (IST) courses. The IST program was launched by the Australian Government in April 2017, with the objective of providing a quality delivery model, which matches the requirements of strengthening international capacity, and meeting needs through competency based industry-aligned courses. IST courses are another option of non-Australian Qualification Framework (AQF) vocational education and training (VET) delivery exports by Australian Registered Training Organisations (RTOs).

Greater promotion of Australian VET exports abroad has multiple benefits to both Australia and its trading partners. Improved exports are a source of revenue for the nation, and as a key exporter of education, further strengthening of this comparative advantage is a strong strategy for the economy. Additionally, Australia's role in providing education and training to emerging economies can assist in their economic development through up-skilling their labour force.

To achieve these goals, the policy involves developing IST courses that are suitable for international economies, to meet their economic and labour force requirements. The AQF represents a very high standard of education, training and qualification in Australia. However, delivery of AQF to emerging economies as they are delivered in Australia has been recognised as a challenge due to high costs for delivering, monitoring and accrediting qualifications abroad. The IST courses aim to deliver the quality of education that Australian RTOs are recognised for internationally, with a product that is fit-for-purpose globally.

A pilot of the IST program involved delivery of international training and assessment courses (ITAC) by several RTOs. This pilot program was delivered to learners from Chile, China, Colombia, India, Mexico, Peru, Saudi Arabia, the Solomon Islands, and South Korea between October 2015 and January 2017. The ITAC suite was designed to provide training and assessing skills, to facilitate further learning in these economies, and to open up new avenues for human capital development through professional development and up-skilling of the labour force. (Note that the use of the term ITAC has been discontinued since the IST courses were officially launched in April 2017).

The Department of Education and Training is now seeking an understanding of other potential industries and countries that might benefit from access to Australian IST courses. In this study, KPMG has conducted desktop research, consulted with a variety of stakeholders and analysed this information to determine potential global skills needs. This study represents a cohesive analysis that incorporates both research and data analysis, and consultation with multiple stakeholders across government, industry and the VET sector. This provides a solid evidence-base to move the IST program forward. The scope of this study, the conceptual framework guiding the methodology, and the structure of this report are presented below.

1.1 Scope

Analysing skills needs is a complex exercise and can be approached with a variety of techniques. While analysing global skills needs and the complexity of labour markets across the globe, there is a very broad range of possible research avenues to understand drivers for skill demand, industry needs and education and training institutes. The scope of this report seeks to identify:

- Industry sectors requiring a greater number of skilled workers
- Specific occupations for which there is a shortage or growing need
- Skills needs in priority countries/regions
- Future skills shortages and demands in Australia.

The approach used to analyse skills needs has included desktop research, stakeholder consultations, and analysis of the collected data to achieve the Project's outcomes.

- Desktop research has included analysis of economic data, examination of country/industry specific articles, and a meta-analysis of previous studies that examine skills gaps in the countries of interest (described further in the Regional Analysis section).
- Stakeholder consultations were conducted to collect direct observations and understandings from government, training organisations and consultants, and industry organisations and companies. (Further information on the consultations is discussed in the Appendix).

At the industry level, preliminary ideas of potential target sectors were provided by the Department, based on their research and feedback from education and training stakeholders. While KPMG has considered these sectors, a broader scope was maintained during consultations with various stakeholders. The priority industries presented in the Key Findings have been determined as the study has progressed, and are explained in Section 3.

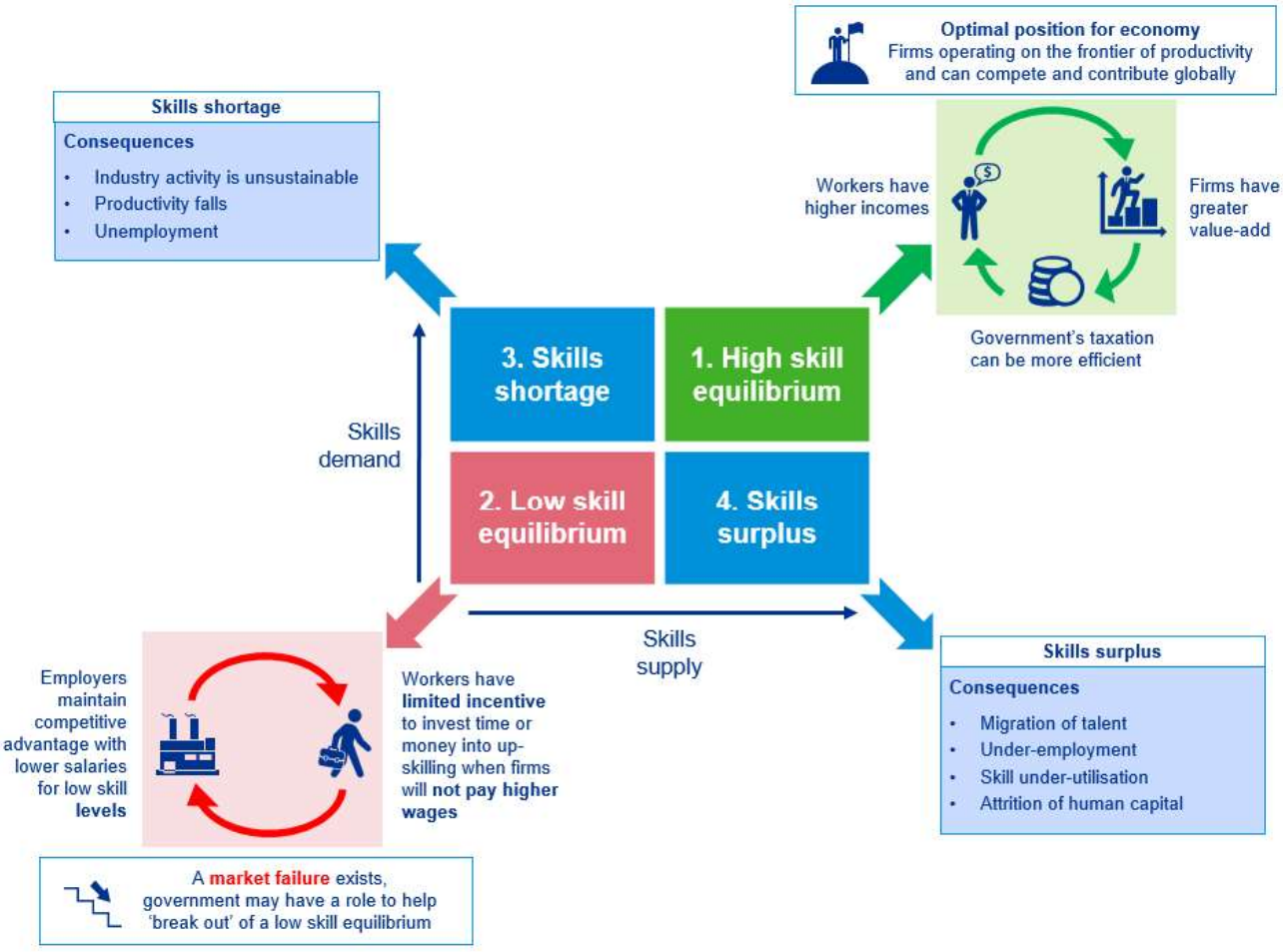
The potential countries that the IST courses could be delivered to, and hence the total countries of interest to research, is very broad. Within the scope of this study are the 20 countries agreed with the Department – listed in the key findings on page 5 and discussed in detail in *Section 4.5: Regional Analysis*. This sample of countries includes key countries to which off-shore education is currently being delivered, and present a diverse range of economic development and labour market structures. Note that there are many countries not included within the scope of this report to which the IST program could target.

1.2 Conceptual Framework

This study starts by introducing a conceptual framework for analysing skills gaps, which has been adapted from *OECD Skills for Competitiveness report* (OECD, 2012). This framework is used to understand the tools and governance mechanisms around labour market skills, and the interaction of multiple variables.

Specifically, in this study we have used this framework when considering the needs across particular countries or specific industry sectors. That is, the first step in examining a potential skills need (and whether there is scope to help address this need) is to identify where a particular country or industry currently sits on the conceptual framework as depicted on the following page.

Figure 1: Labour market – conceptual framework



Source: OECD (2012) synthesis of Green et al., (2003), Froy et al., (2009), and Coyle (2001).

This report now steps through the four spectrums identified in the diagram above, in turn.

1. High skill equilibrium

The high skill equilibrium is the optimal state for an economy and its labour force to be in. A high demand for skilled labour means that firms are more productive, pay higher wages, and are more likely to continue innovating and advancing. This demand is met by a high supply of skilled labour, which is typically due to broad access to education and the high quality of education and training institutes. Government policies that help achieve a high skill equilibrium have significant benefits for an economy.

2. Low skill equilibrium

The low skill equilibrium is a sub-optimal 'trap' into which a local labour force can fall. In this environment, employers remain competitive by keeping salaries low. This in turn reduces the incentive for individuals to pay for, or invest time into, up-skilling. This is because they know that employers will not be willing to pay wages that match (and compensate them for) their improved ability. This cycle is then maintained – forming an equilibrium.

This occurs regularly in regional areas when labour mobility is low, the quality of education is poor, and firms have limited access to capital and technology.

3. Skill shortage

This is a situation where there is demand from businesses (employers) for more skills, but there is inadequate supply. Understanding drivers of skill demand and supply is essential to determine labour market adjustments that will close skill gaps.

A wage response that attracts more highly skilled workers may push the industry/country closer to the High Skill Equilibrium. On the other hand, if the market responds by reducing industry activity or employing lower skilled workers (reducing productivity), this can drive the industry/country closer to the Low Skill Equilibrium.

4. Skill surplus

A skills surplus occurs when supply of skilled labour is higher than the demand from businesses. From this situation, businesses will either need to innovate and upgrade to utilise the extra skills (pushing the industry/country closer to the High Skill Equilibrium), or the level of skilled labour may not be maintained as attitudes to education and training fall (leading towards the Low Skill Equilibrium).

Another consequence of a skill surplus is that workers may migrate to other regions where skill demand is higher. This can provide opportunities for remittances which can still benefit the local economy.

1.3 Report Structure

This report has been designed to begin with the broad, key findings, and then gradually provide more detail to support the analysis. The contents are structured as follows:

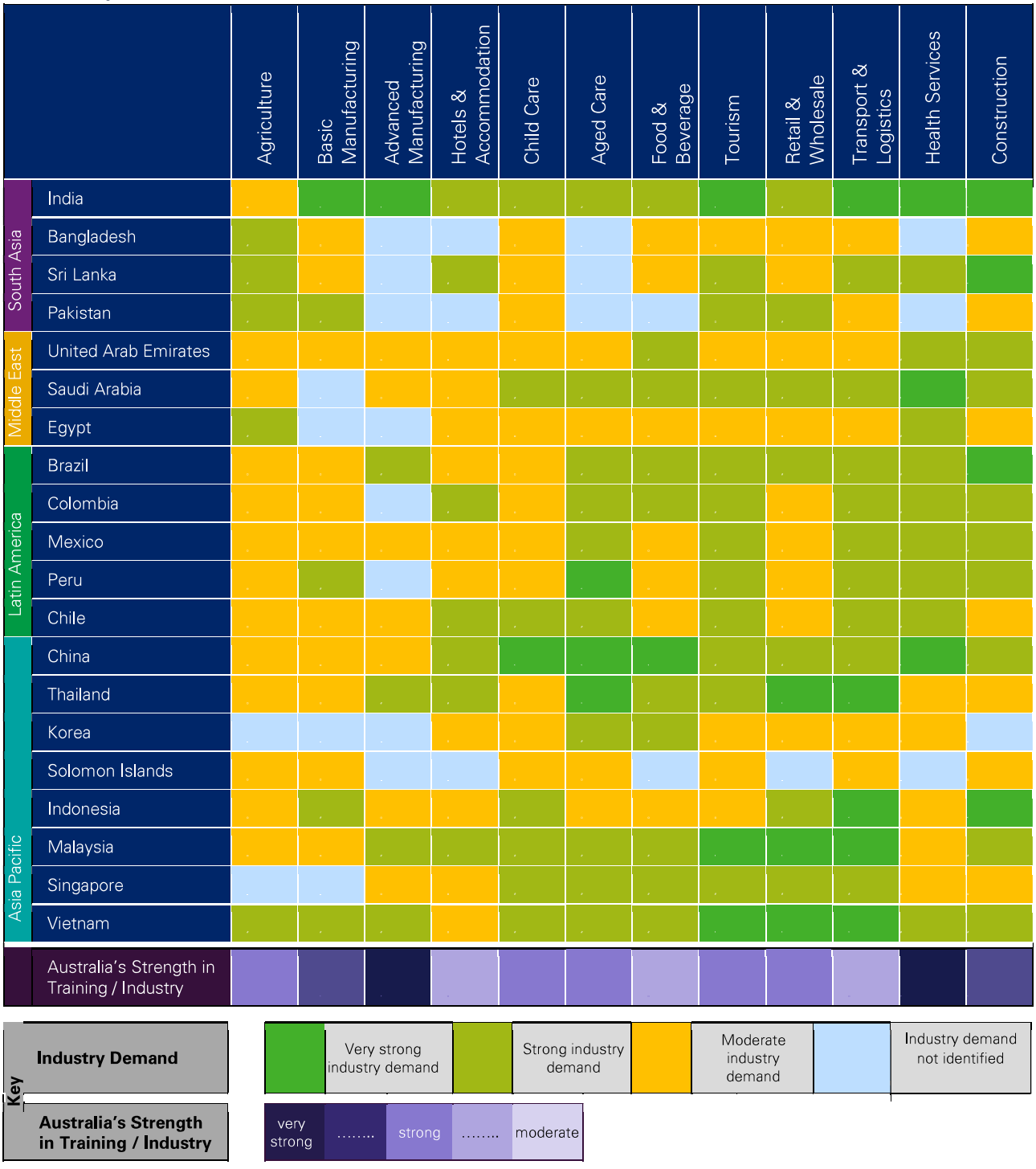
- This section, Section 1, discusses the scope of this research and the conceptual framework applied to the analysis.
- Section 2 reports the key findings across countries of interest and sectors, and includes considerations on how the International Skills Training Initiative may be positioned.
- Section 3 summarises the skills needs identified across industries and occupations, and elaborates on the opportunities for vocational education and training exports.
- Section 4 discusses five case studies that address some specific global skills needs and trends in training and up-skilling.
- Section 5 contains a detailed regional analysis including the countries of interest identified in the scope section.
- Finally, the appendices contain occupation and industry classifications, a summary of the consultations conducted for this research, a glossary of key terms and a reference list of sources used in this study.

Specifically, the findings and analysis are initially presented at a broad level, with additional layers and details presented in the subsequent sections.

2. Key Findings

This section provides an overview of the key industries identified in our research and consultation. These key industries are indicated by country in terms of the potential "strength" in industry demand.

Table 1: Key industries across countries-of-interest



The key findings in the table above present a high-level overview of sectoral skills needs across countries, accounting for trends observed in employment, productivity, meta-analysis of existing studies on skills gaps, and opinions from stakeholders across training institutes, government, and industry. (Note that a light blue square does not necessarily indicate that there is no skills-needs or role for education or training, but rather that particular sector within that particular national economy has not been an emerging theme across this study).

The strength of the findings in the table above have been developed by applying a 'rating' to the level of demand identified across four avenues: economic data, desktop country/industry research, meta-analysis of previous studies, and stakeholder consultations. With additional meta-analysis and consultations and an update of the data, the strength of some skills needs presented in this 2018 report have increased, while some skill needs that were not identified previously have now emerged.

Broadly, there are potential opportunities for Australian training providers to up-skill workers across most sectors – as advanced economies typically have best-practices in many production and service roles.

It is important to note that there are limitations to anticipating future skills needs, and current economic trends can shift within economies. Case Study 2 discusses some of the potential impacts of technological change on the skills needed in the future and how these skills might be taught, while Case Study 5 highlights the opportunities and challenges that Industry 4.0 (the Fourth Industrial Revolution) will present. Additionally, data used in the analysis has considered labour productivity in each country and benchmarked it against the same measure in an advanced economy. This can provide an indication of the development path economies will take, and hence the short-and-medium-term industries that will demand skills.

2.1 Key Themes

The key themes emerging from this study highlight the growing need for up-skilling in service industries such as transport and logistics, health services, and tourism. Specific occupations that have presented opportunities are care workers (discussed further in Case Study 1) and tourism providers (discussed further in Case Study 3). Further occupational detail is discussed in Section 3.

Industries that show multiple demand for up-skilling, in order of global need, include:

1. Transport and Logistics
2. Tourism
3. Construction
4. Aged Care
5. Health Services
6. Retail and Wholesale
7. Food and Beverage
8. Child Care

Of the original 12 industries presented in Table 1, the eight priority industries in the box above represent sectors that repeatedly emerged – through research and consultation – as having significant industry need and/or a need for up-skilling. These eight key industries are ordered above according to the strength of industry demand for skilled labour, and are described in turn below.

2.1.1 Transport and Logistics

Transport and logistics is a critically important sector to global economies. Many emerging economies can benefit from up-skilling in this sector – to better coordinate movement of goods domestically and their exports abroad, to help source imports from trade partners, and to better connect to global value chains.

Occupations needed include freight handlers, supply and distribution managers, and skilled transport workers such as truck drivers. Noting that this sector is likely to be significantly influenced by technological advances and implementation (such as autonomous vehicles), and thus required skill sets are likely to continue to evolve.

2.1.2 Tourism

Tourism is a booming sector in many economies, due to the growth in middle-income populations, and the reduction in barriers such as cost of travel. A strong tourism industry can complement the unique qualities of various regions and countries. Further, many emerging countries are now more targeted in their approach to tourism as an important contributor in a strong diversified economy. This industry requires skilled workers who can liaise with tourists and support the promotion of other interconnected industries that benefit from tourism such as food and beverage, and hotel and accommodation.

Tourism and travel advisors, tour guides, charter and tour bus operators, tour coordinators, and cultural guides are occupations necessary to improve tourism industries and better attract foreign visitors while maintaining a sustainable sector.

2.1.3 Construction

Many countries seek to attract foreign direct investment and to improve the capital stock across all sectors of the economy. Construction industries are essential in this role, and there are major up-skilling requirements to build more 'efficient' buildings and civil infrastructure, improve work practices and increase access to basic necessities and improve quality of life.

There are many technical roles required for this industry, such as earth moving, crane and other heavy plant and machinery operation, welders, electricians and plumbers of varying skill levels. Building construction labourers are lower-skilled roles that are, nonetheless, essential to support construction and demolition activities and these present a high volume of demand by employers.

2.1.4 Aged Care

Aging populations and changes to family structures means that there is growing demand for care services for the elderly. Better access to care services (and trained carers) was identified as a growing need across many of the countries researched, and was seen as beneficial through offering a better quality of life to those under care and also allowing younger generations to further participate in the workforce.

Personal care workers and aged care service managers are occupations that will likely face major shortages as this sector grows.

2.1.5 Health Services

A variety of health services have rapidly growing demand in emerging economies, and are essential to improve quality-of-life for citizens. Many high-skilled occupations in this industry require extensive study and training. However, there are also up-skilling opportunities in low to moderately skilled health occupations which provide patient care and essential support services to medical professionals.

Health care assistants, medical assistants and nurses are roles that require training and up-skilling in many economies to improve health care services.

2.1.6 Retail and Wholesale

The nature of wholesale and retail is shifting in many economies, particularly as retail businesses consolidate and sections of the economy shift from the informal to the formal sector. Increasing disposable income in populations also encourages greater need for better customer service and quality of goods and services.

Occupations needed in this sector include sales representatives, supply chain managers, retail managers and wholesale managers.

2.1.7 Food and Beverage

Food and beverage industries are changing in emerging economies due to increased tourism, increasing discretionary incomes of populations, and establishment of franchises and other international businesses. Up-skilling in this sector is required to meet the higher standards of customer service expected, and also to raise the quality of food preparations standards and hygiene.

Occupations in this sector include food preparation assistants, cooks, waiters and similar service staff.

2.1.8 Child Care

Access to quality child care is also experiencing growing demand in many emerging economies. Similar to aged care, child care can allow parents to participate further in the workforce. Additionally, pre-school care is increasingly being recognised as an important period in a child's development, and parents with increasing incomes want the best for their families. These factors are driving a growing need for trained childcare providers across many economies.

Up-skilling is required for child care workers and for child care service managers to meet the needs of parents and changing communities.

2.1.9 Other sectors / occupations

KPMG notes that mining and business service industries are not presented in the key findings. While these sectors are important in many economies, and Australia does have expertise in these areas that could be offered to emerging economies, there are several reasons for not targeting them in the context of the IST program.

- Mining is typically a capital intensive industry (discussed on page 14), meaning that fewer workers are required per unit of economic activity than in other sector. For many of the workers that are required, many of the skilled roles in demand require an advanced level of education and experience. Additionally, mining activities are generally operated by large multinational companies, who often have their own, well-established training processes.
- Business services are important industries, and have experienced significant growth in many countries. For the current delivery of off-shore education by RTOs, business related courses are the most popular, indicating a market that is perhaps already being accessed. In addition, many students study certificates or diplomas in business for the purpose of further education such as a bachelor degree. This means that the existing qualification framework is currently contributing to the up-skilling of workers in this category.

If we also consider skills more generally (and less sector specific), a particular style of opportunity for Australian off-shore delivery of training is that of 'enabling' occupations. This type of training does not necessarily meet a specific, technical industry need, but addresses skills gaps at an institutional level. The ITAC suite delivered in the IST pilot program could be an example of an enabling occupation, as educating trainers and assessors will enable further training across many disciplines/industry sectors.

A targeted business area that could be considered in this space is entrepreneurship – which has been mentioned several times across consultations – and could help address current informal practices / prevalence issues in a country. Potential entrepreneurs require some business skills, but could undertake additional training in a specific economic setting and in a way that complements the existing business skills that are held by workers.

Interestingly, Information Technology was also identified by a number of stakeholders as a necessary enabling skill across most disciplines, not just a stand-alone career path. This is because (as elaborated more in the Industry 4.0 case study in this report), with the continued advancement of technology across all industries, training providers will need to factor in appropriate technology skills to meet the changing profile of the workforce and deliver relevant training both onshore and offshore.

2.2 Australia's Strengths

Understanding Australia's industry and training strengths is important when determining how Australia is positioned to address skills needs in the selected economies.

The purple row at the bottom of Table 1 of the Key Findings page rates Australia's recognised level of strength in providing education and training for each industry. These strengths have been rated based on a combination of how well Australia performs in the sector and international stakeholder views on Australian training. A classification of 'very strong' indicates that Australia currently exports VET for this sector, has a high value-added domestic industry, and aligns with the Industry Growth Centres initiative determined by the Department of Industry, Innovation and Science. 'Strong' indicates that two of this criteria are met, and 'moderate' indicates one element of this criteria is met. One limitation of this method is that it considers Australia's strength unilaterally, while further analysis would expect to find differences in Australia's relative industry and training strength with Australia's bilateral relationships across the globe.

Despite differences across the sectors, Australia's education system in general is recognised as a strength. In particular, our competency based system is seen as a key strength across many different types of courses. **Competency** prioritised over **curriculum** often means that students are both well placed to meet the needs of industry, and can better adapt as occupations change their skill requirements.

However, stakeholders have indicated that to remain competitive and current, Australia's education system must continue to develop. There were many positive comments around the competency focus of Australian VET training and the integration with industry – and this is definitely seen as a strength both domestically and overseas. There were a few cases where it was noted that the quality of training across Australian VET providers and the quality of graduates varied significantly – as with any industry, there are likely differing levels of quality and delivery. Thus, it is important that Australia continue to support our Australian providers in delivering a high quality product to the overseas market, to continue to build on our already strong international reputation.

3. Skills Needs

This section elaborates on the key findings presented earlier, by mapping the recommended priority industries to associated occupations and articulating where Australia VET providers could be best positioned to provide up-skilling and professional development opportunities.

3.1 Industries and Occupations

An understanding of the occupations associated with priority industries is important for developing and providing training services to these industries.

Consultation and research has shown that occupation definitions differ significantly across countries. Different countries each have varied methods, procedures and standards for defining industry sectors within their economies. Information from data analysis, literature review, and consultation has been matched where possible to the International Standard Classification of Occupations (ISCO), to provide the most globally standardised approach.

The table below presents the occupations associated with the priority industries identified in Section 2 as having skills needs in the selected economies. The associated skill levels for these occupations are discussed below to provide an understanding of education requirements for each occupation.

Table 2: Occupations within priority industries

Industry	Occupations	Skill level	Example tasks
Aged Care	Personal care workers (Home or facility based)	2	• Assist with routine personal care and activities of daily living • Provide emotional and psychological support, therapeutic and personal care needs • Maintain a clean and hygienic living environment
	Aged care services manager	3	• Coordinate residential and care services for elderly • Supervise work activities of medical, nursing, technical services, maintenance and other personal services • Administer welfare programs, and perform administrative tasks such as budgeting and reporting
Child Care	Child care services managers	3	• Facilitate programs to build physical, social, emotional and intellectual development of young children • Oversee provision of care for day care centres and services
	Child care workers	2	• Assist children to wash, dress and feed themselves • Assist preparation of materials and equipment for education and recreation • Manage children's behaviour and social development • May work at a commercial or residential location
Trade and Logistics	Supply, distribution and related managers	3	• Facilitate purchasing, storage and distribution plans • Oversee dispatch of road vehicles, trains, vessels or aircraft • Maintain record systems of goods movements
	Freight handler	1	• Freight handling, including loading and unloading goods from transport vehicles • Carrying, stacking and sorting goods in warehouses • Use of conveyor belts, pipes or hoses to transport commodities such grain, sand, coal, petroleum and other solids and liquids
	Forklift truck driver	2	• Operate forklift to load and unload goods • Perform routine maintenance

Industry	Occupations	Skill level	Example tasks
	Heavy truck drivers	2	• Drive heavy motor vehicles to transport goods, liquids and heavy materials over short or long distances • Determine appropriate routes, do minor maintenance and organise major maintenance • Stow goods securely, assisting with loading and unloading and complying with load limits
Construction	Earth moving and related plant operator	2	• Operate and monitor excavating machinery equipped with moveable shovels, concave steel blades or power rollers for movement of earth • Follow occupational health and safety requirements associated with dangerous machinery
	Crane, hoist and related plant operators	2	• Operate stationary and mobile cranes or other hoisting equipment to move and position equipment and materials • Follow occupational health and safety requirements associated with dangerous machinery
	Building construction labourers	1	• Mix, pour and spread materials such as concrete, plaster and mortar • Load and unload construction materials • Dig and fill holes with handheld tools and spreading sand, soil, gravel and similar materials
	Building and related electricians	2	• Install, maintain and repair electrical wiring systems and related equipment • Inspect electrical systems, equipment and components for hazards
	Plumbers and pipe fitters	2	• Install, repair and maintain pipe systems, drains, gutters and related fittings and fixtures • Install gas appliances, dishwashers, water heaters, sinks and toilets • Inspect and test installed systems and pipes
Retail	Sales Representatives	2	• Sell goods and services to meet customer needs • Process sales including various payment methods, issuing invoices and recording sales • Assist with stock management and display of goods
	Retail and wholesale trade managers	3	• Organise and coordinate operations to sell goods on a retail or wholesale basis • Determine product mix, stock levels and service standards • Train and supervise staff
Food and beverage	Food preparation assistant	1	• Prepare and cook to order a limited range of foods or beverages • Operate high-volume single process cooking equipment such as grills and deep-fryers • Take customer orders and serving food and beverages • Clean food preparation areas and maintain food standards
	Cook	2	• Prepare and cook meals according to recipes or as instructed by chef • Check quality of food and coordinating kitchen helpers • Inspect and clean kitchen and equipment to ensure sanitary food practices
	Waiters and bartenders	2	• Serve food and beverages in commercial dining and drinking places such as restaurants and clubs • Greet customers, advising of menu and taking orders • Prepare and clear tables, collecting payments for sales, meeting alcohol serving laws
Tourism	Tourism and travel advisors	2	• Provide information about local and regional attractions, sightseeing tours, restaurants entertainment activities and issuing literature • Prepare itineraries, making reservations and issuing tickets for vouchers • Help customers with travel documentation, relevant government regulations, and guidance for emergency situations such as lost luggage
	Gallery museum and tour guides	2	• Greet visitors and planning, organising and conducting tours • Arrange transportation and accommodation for visitors following planned itineraries, and arranging entry to places of interest

Industry	Occupations	Skill level	Example tasks
			• Answer questions, providing commentaries, issuing brochures and tour literature, show audio-visual material
	Charter and tour bus driver	2	• Stop to pick up and set down passengers, collecting fares and giving change • Advise passengers on destinations, maintain conduct of passengers, provide tour commentaries, and assist with baggage and accommodation • May maintain, service and clean coaches
Health Services	Nurse	4	• Provide treatment, support and care services for people who are injured, ill, ageing or have a physical or mental impairment • Coordinate patient care with various health care professionals and teams • Monitor pain, cleaning and dressing wounds, providing various therapies including drugs
	Medical assistant	3	• Perform basic clinical and administrative tasks to support patient care • Prepare patients for examination and treatment • Assist medical doctors and other healthcare professionals in performing various procedures • Maintain clean and hygienic environments • Administrative task such as recording patient information and scheduling appointments
	Health care assistants (including Nursing aide)	2	• Provide direct personal care and assistance to patients in medical, rehabilitative and residential care facilities • Follow care plans established by nursing and health professionals • Maintain a hygienic environment and monitoring patient's conditions

Source: International Standard Classification of Occupations (2012)
Note: Where possible, ISCO definitions are used. Tourism occupations refer to ANZSIC definitions.

3.1.1 Occupations and skill level

The skill level (as indicated in the third column of the table above) provides an indication of the education, training and experience required for various occupations. As recognised earlier, these will depend on the national context, development of the economy and unique variations in industry structure.

Skill level 1

These are the least ranked occupations of all skill requirements. However, they can typically be overlooked in training and education agendas and miss a valuable area to improve support workers and provide a starting point for up-skilling emerging economy industries.

Skill level 2

Occupations at this skill level typically require the first stage of secondary education. Importantly, most roles that require some level of customer service or interaction with clients are at this skill level or above. These roles are growing in demand as more economies grow their service industries such as retail, tourism and food and beverage sectors.

Skill level 3

At this skill level, workers often need complex technical and practical skills, combined with significant factual and procedural knowledge in a specialised field. Vocational education and training could either improve existing training that workers have in this sector, or focus on some specific tasks that fit within a training schedule.

Skill level 4

This skill level is typically achieved after 3-6 years of higher education for a first degree or higher education, and often requires further on-the-job training or extensive experience in relevant, less skilled roles.

Occupations at skill level 4 would not be expected to be the target for the IST program. However, there are many important supporting roles that have skills shortages in emerging economies, which are highly-demanded occupations that complement these higher-skilled roles.

In summary, the courses that are designed to meet skills needs require consideration of the skill level of that occupation. While many economies typically emphasise growth of highly skilled occupation industries (i.e. Skill level 4), there are major demands for training and education that raise the basic skill level of global labour forces.

3.2 Opportunities and Challenges for Australian VET

Once skills needs have been broadly analysed across regions and sectors, the challenge of how to address these needs can be approached with a range of strategies. As noted by the Asian Development Bank:

> *There is no 'one-size-fits-all' solution in addressing skills mismatch in Asia. Asian economies are diverse, fast growing, and rapidly evolving, and they face increasingly varied skills requirements.*
>
> Asian Development Bank (2015, p25)

The quote above could be applied to all regions, and highlights the need for flexibility in addressing skills needs in economies. This reflects a key strength that the IST program can provide in providing education and training services that fit the economic and institutional context of economies.

In particular, IST programs are designed to assist in human capital development. This ranges from capacity building and up-skilling in countries with a greater number of low-skilled workers (such as India) through to providing professional development in countries where technical education is provided by a university trained teacher (such as in countries of Latin America and South Korea).

IST courses are based on a competency-based industry-aligned model, which is a different mode of learning and training applicable across the range of human capital development. For example, for those building capacity or up-skilling, this can mean that IST courses better align with industry needs and, as such, produce workers that are more "job ready". For those accessing professional development in countries where technical education is provided by a university trained teacher, IST provides an international perspective of training that can inform their teaching practices and processes.

3.2.1 Economic structure and assessing training needs

In assessing a country's specific educational needs, the current stage of economic development in the country and across industries should be considered. The World Development Report on Jobs (World Bank, 2013) examined labour markets, economies and the impact of jobs around the world.

Figure 2: Economic development and skill needs

JOBS CHALLENGE	WHAT ARE GOOD JOBS FOR DEVELOPMENT?
AGRARIAN ECONOMIES	More productive smallholder farming, Urban jobs connected to global markets
CONFLICT-AFFECTED COUNTRIES	Jobs demobilizing combatants, Jobs reintegrating displaced populations, Jobs providing alternatives to confrontation
URBANIZING COUNTRIES	Jobs providing opportunities for women, Jobs moving the country up the export ladder, Jobs not leading to excessive congestion, Jobs integrating rural migrants
RESOURCE-RICH COUNTRIES	Jobs supporting export diversification, Jobs not subsidised through transfers
SMALL ISLAND NATIONS	Jobs connected to global markets, Jobs not undermining fragile ecosystems
COUNTRIES WITH HIGH YOUTH UNEMPLOYMENT	Jobs not supported through rents, Jobs not allocated on the basis of connections
FORMALIZING COUNTRIES	Jobs with affordable social benefits, Jobs not creating gaps in social protection coverage
AGING SOCIETIES	Jobs keeping the skilled active longer, Jobs reducing the cost of services to the elderly

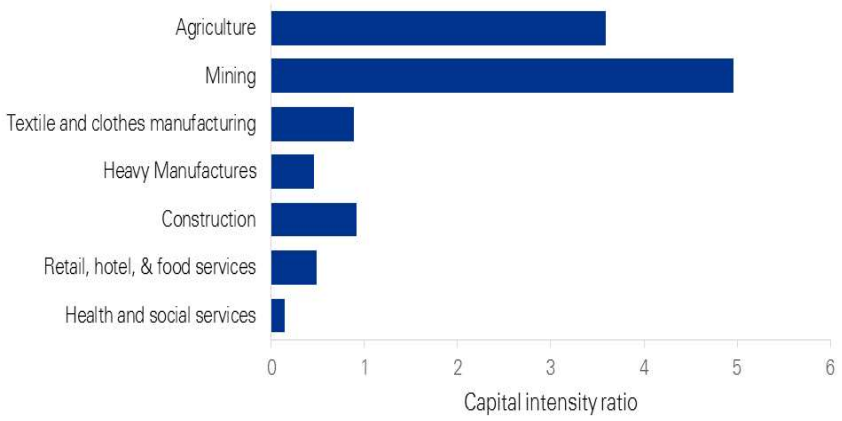
Source: Figure 14, page 20, World Development Report 2013

The World Bank report found that the jobs that were good for the development of a country are tied to the development stage of that country. This is also reflected in the skill needs found in different countries. The current stage of economic development across industries within the country should also be considered – along with the perceived current labour and capital requirements of the industry/country.

For example, where there is insufficient capital – such as machinery, vehicles, plant, buildings and infrastructure – the priority for that economy could be foreign direct investment or access to better technology. Training and education will be required to improve industry performance, but new investment may need to be made initially, so that the better-skilled workers have the equipment and machinery they need.

The capital intensity of an industry can provide an indication of the potential labour market training opportunities/benefits across different sectors for a particular country. Generally, the less capital-intensive an industry (and the more labour intense), the more potential there is for up-skilling of the labour force that can improve industry performance. The capital intensity ratio for selected Australian industries is shown below.

Figure 3: Capital intensity ratio for selected Australian industries



Source: KPMG calculations, ABS catalogue 5209.0.55.001
Note: Capital intensity is calculated by dividing income to capital over income to labour. Higher values indicate that more capital is needed relative to labour.

These ratios show that agriculture and mining in Australia have very high demands for capital (such as heavy machinery and infrastructure). While this data reflects Australia's economy, emerging nations will trend towards this ratio as structural adjustments occur in the economy.

For services such as retail, hotel, food, health and social services, these sectors are much more labour intensive. This means that strategies to improve industry performance have a very strong focus on up-skilling the labour force. It is not surprising that many of these sectors have been identified as those with opportunity for Australian VET delivery in emerging economies.

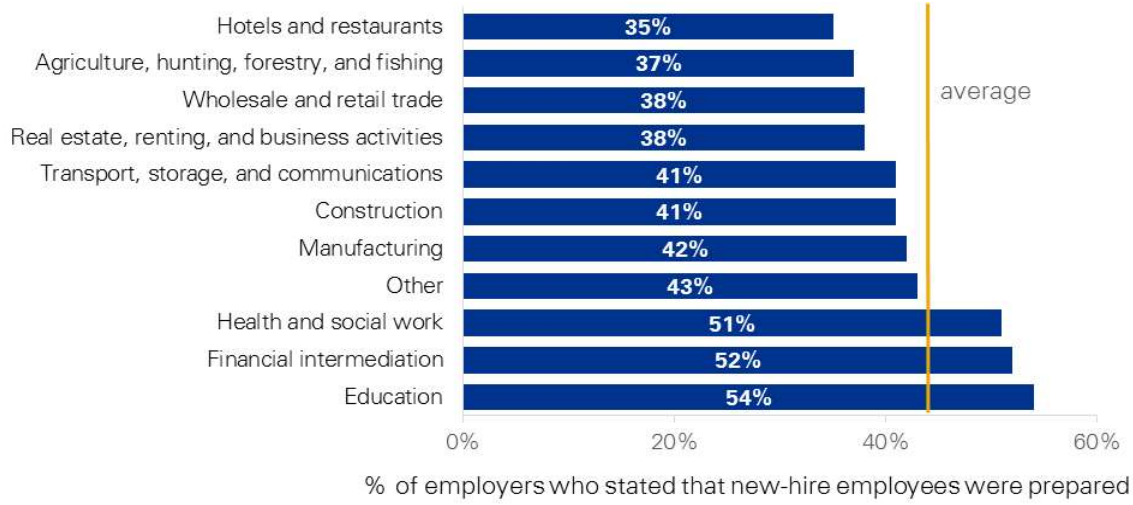
Thus, at the sectoral level, there are multiple opportunities for delivery of training to up-skill labour forces across emerging regions. Broadly, as an advanced economy, Australia has strength in service industries and many emerging economies have a growing need to train the labour force in these. Particular key opportunities are in aged care, child care and tourism (discussed further as case studies in Section 4).

3.2.2 Global skilled labour needs

The later sections of this report target a number of different economies – as identified in the scope – to present the key findings for the IST program. Before focussing the analysis on target countries, it is useful to look more broadly at skills needs across the world. Research by McKinsey (2013) has asked industry sectors if they believed their new employees were ready for work. On average, 43 per cent of businesses across all sectors responded in the affirmative, leaving 57 per cent who believed their new employees needed to be better prepared for employment.

The McKinsey (2013) study identified the greatest skills gaps in hotel and restaurants, agriculture, wholesale and retail trade, and real estate and business services, with only around one-third of businesses considering their new employees to be ready for work. While a higher proportion of new employees in health and social work, financial intermediation and education were considered to be prepared – still only around half of the businesses surveyed in this group identified their new-employees as ready for work – highlighting that new employees' skills are not being identified as meeting those of industry.

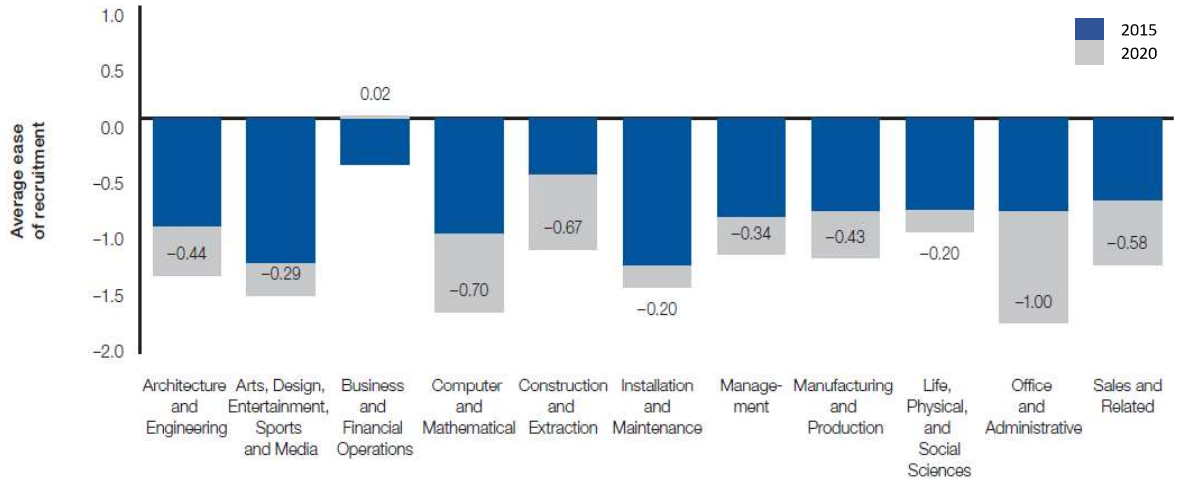
Figure 4: Employee preparedness by sector



Source: McKinsey (2013)
Note: Average from employer surveys in United States, India, Germany, Mexico, Saudi Arabia, Turkey, Brazil, United Kingdom, Morocco. Minimum of 100 firms surveyed per sector. Higher percentage indicates more firms in that sector were satisfied with skills and ability and new hires.

The World Economic Forum also recently published a report examining the future of jobs (2016). This report identified a number of key job families that, in general, are likely to continue to grow worldwide. In particular, Computer and Mathematical, Architecture and Engineering, Management, Business and Financial Operations, and Sales and Related roles were all seen as areas of growth. While these were all identified as areas of growth, there were differing levels of expected recruitment ease identified across these and other job families, as shown in the chart replicated below.

Figure 5: Ease of Recruitment 2015-2020 Perception Rating (-2:"very hard" to +2:"very easy" scale)



Source: World Economic Forum (2016)

More recently, in 2018, the Manpower Group published the results of a survey of almost 40,000 employers across the globe, which examined the levels of difficulty faced when filling job vacancies. Almost half of these companies indicated that they have difficulty finding the skills that they need. This is not confined to one industry or one type of skill – the survey found that gaps have been identified across manufacturing, mining, transport & logistics, trade and many service industries.

Similar to many of the findings in the country specific analysis presented in later chapters of this report, the Manpower Group survey found that the rise of consumerism is a strong driver of demand for service delivery skills such as sales representatives and transport & logistics. Further, the survey found that many of the roles in demand required post-secondary training, but more often in the trades space rather than full university degrees. The survey also found that many businesses envisaged workers needing continual skills development, as roles continue to evolve and are augmented with technology.

These studies all indicate some general trends across the world in terms skill needs. As economies continue to develop, there will likely be more movement away from the traditional agriculture, resources and basic manufacturing industries towards advanced manufacturing, technology and consumer/service sectors. This shift in demand drives shifts in skill needs.

Looking at the counties of interest for this study, there are a number of sectors identified in the key findings table as having existing or emerging skill needs. These are predominantly due to either a demographic or income change (aging population or emerging middle class) driving higher demand for services, and/or technological advancement. However, many of these economies/industries may have a tendency to move towards a low-skill equilibrium, where there is little incentive or willingness to pay for up-skilling. A combined effort is needed to guide the country/industry, instead, towards a high income equilibrium – with particular emphasis on the need of co-operation and understanding between the Australian government / RTOs, the target country government and local industry.

3.2.3 Global competition

Another important factor to consider is competition from global providers of skilled training, as well as countries (or industries) where domestic delivery of skilled training is strong. Through consultations and research, it is apparent that there are a number of strong competitors that already have a footprint in a number of the selected economies. Germany, for instance, has been highlighted on numerous occasions as being the benchmark leader in skills training and delivery in the advanced manufacturing and technology space.

The German Corporation for International Cooperation (German acronym GIZ), for example, is an international enterprise owned by the German Federal Government operating in many fields and countries. GIZ is a service provider in the field of international education and provides tailor-made programs for countries and industries that have certain specific skilled-labour needs. Strong industry cooperation in this space has led to successful delivery and implementation of these skilled training programs.

Japan has also been reported as another country that is very active in the offshore delivery of skilled training. Japan not only operates in the industrial and manufacturing space but also in the services sector. For example, training healthcare professionals in their country-of-origin and providing practical internships/placements in Japan has been one of the key programs of the Japanese. Japan is a strong competitor in this area in Indonesia.

In selected countries, such as Singapore and South Korea, domestic delivery of skilled training is relatively strong and reputable. South Korea, for example, has a well-developed VET system of their own and the suitability of non-AQF delivery of training has been questioned by stakeholders. The implication here is that, going-forward, these countries might not be the optimal choice for offshore Australian training programs due to the growing strength of domestic providers. In markets such as these, it might be that the delivery models need to be reassessed/redesigned as appropriate – such as implementing or strengthening provision through joint ventures with domestic training providers or industry/government.

Australia's training programs are viewed, globally, as highly regarded and reputable. With this strong foundation, opportunities exist in international markets. Training providers should leverage this reputation and continue to work closely with industry to deliver practical, needs-based, dynamic and flexible training programs.

4. Case Studies

This section presents five case studies highlighting some key themes and trends identified in the research.

- Case Study 1 presents trends in care worker occupations, including aged and child care services.
- Case Study 2 discusses the impact of technology on labour requirements, and the types of occupations that are most vulnerable to disruption.
- Case Study 3 examines the skill needs in tourism and the associated industries of hotel, food and beverage and transport, which all generally experience significant growth as income levels rise across economies.
- Case Study 4 discusses the need for soft skills, a recurring theme from stakeholder discussions, which points to important implications for determining and delivering skills training.
- Case Study 5 examines Industry 4.0 – the Fourth Industrial Revolution – and the opportunities and challenges it may present to the global workforce.

4.1 Case Study 1: Care Workers

The world's population is both ageing and becoming wealthier, and these two factors contribute to the increasing demand for more care givers. A common theme across our consultations (particularly mentioned by those in-country and a number of RTOs) is the need for early childcare and aged care skills, and Australia's strengths in providing this training. Research has shown that there is a need for training workers at multiple skills levels such as:

Personal care workers	Child care workers	Nurses and health care assistants	Managers for aged care and child care services

The case for industry demand for these occupations is described below.

Aged care

Data from World Population Prospects show that population ageing is taking place in most countries regardless of their degree of development – the number of older people in the world is increasing and is projected to grow by more than 50 per cent between 2015 and 2030 (United Nations, 2015).

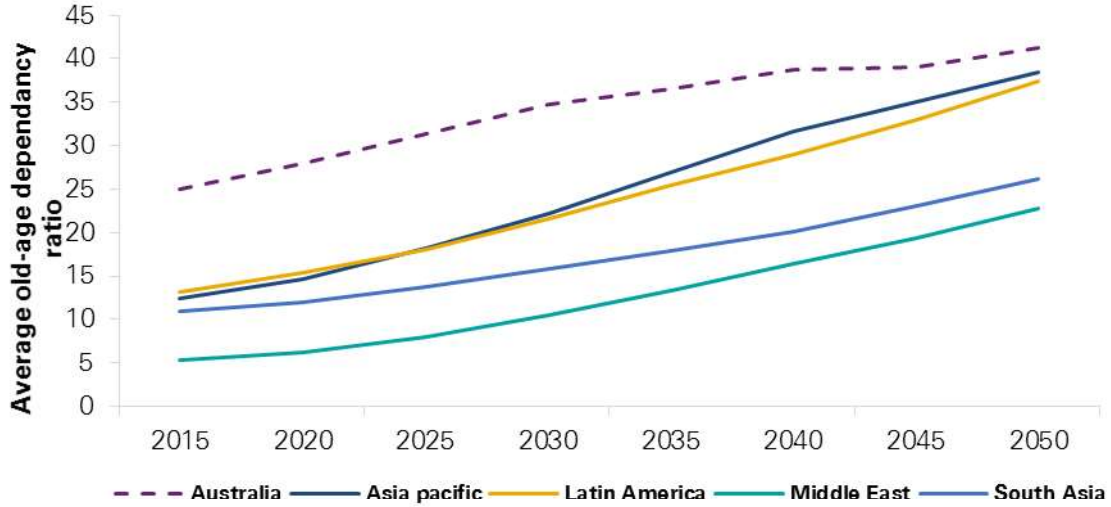
The Department of Employment's labour market research into personal care workers in Australia indicates that the personal care workforce is large and employment growth is strong as Australia's population ages and services continue to become more accessible. Interestingly, most employers in the aged care sector in Australia indicate that they require workers who hold a Certificate III in aged care or community care (Department of Employment, 2014).

Figure 6 outlines the average old-age dependency ratio by the regions of interest for this study, over the period 2015-35.[1] Over the next 20 years, the average old-age dependency ratio is projected to have the fastest growth in the Asia Pacific countries of interest, followed by Latin America and South Asia.

While the old-age dependency ratio for Australians is currently relatively high compared to the regional averages for the other countries of interest, it is projected to rise more modestly over the next 30 years. This means that the countries of interest in the Latin America and Asia Pacific regions are expected to have a similar average old-age dependency ratio as Australia by 2035.

[1] The old-age dependency ratio is the percentage of old population (aged 65 years and over) divided by the percentage of the working age population (aged 15–64 years).

Figure 6: Average regional old-age dependency ratio by countries of interest



Sources: World Population Prospects, the 2015 Revision (United Nations, 2015), KPMG estimates
Note: The old-age dependency ratio is the percentage of old population (aged 65 years and over) divided by the percentage of the working age population (aged 15–64 years)

Of the studied regions, the old-age dependency ratio in China, Singapore and Thailand is expected to grow faster than other countries in Asia Pacific. China's education system is not producing enough relevant skilled workers to meet the growing need for aged care workers with the population of elderly estimated at over 200 million. This will continue to be a challenge as China's old-age dependency ratio is projected to increase from 14 elderly per 100 working-age population to 27 per 100 working-age population by 2030 (UN, 2016). Similarly, India has a vast population and is projected to have an increasing ratio of elderly from 10 per 100 in 2015 to 14 per 100 in 2050.

The increasing old-age dependency ratio indicates that the working population in these countries will face a greater burden to support their older population, and will likely need more workers in areas such as health and aged-care. Roles in demand will include professions such as doctors, facility managers, nurses, physical therapists, and also low-skilled roles such as bedside assistants. According to the PRC Ministry of Civil Affairs, the current supply of low-skill caregivers will not meet 10 per cent of demand, and a caregiver in Beijing earns four times more than a university graduate (ADB, 2015).

The average old-age dependency ratio in the Middle East is lower than other areas, ranging from 5 to 13 persons per 100 working-age population over the period 2015-35. However, the old-age dependency ratios are projected to increase across all regions, indicating that greater aged care services will be needed across all regions, albeit to varying degrees.

The need for aged-care services and better training was also a theme echoed across many of the stakeholder consultations. Australia's relatively high quality of services and good reputation for delivering training was repeated as an opportunity to provide quality aged care training in emerging economies. However, it was commented that Australian providers both in Australia and abroad need to be careful in their structuring of their courses. There is a growing concern that some courses are being delivered through more hours of "homework", such as learning about effective manual handling via YouTube at the expense of face-to-face teaching.

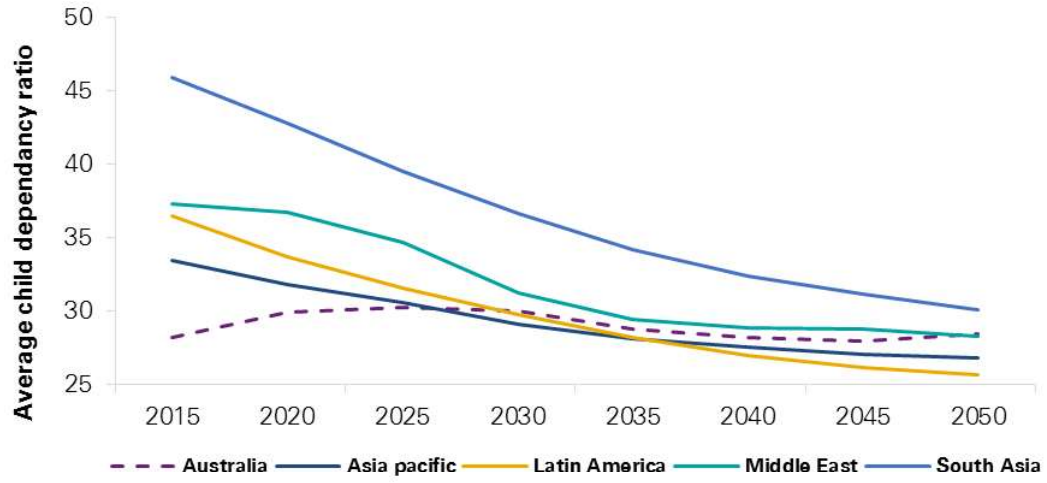
A key constraint to providing this training overseas was identified as access to facilities to conduct training, such as training beds and practice dummies. Also, the availability of specialised equipment and medical equipment needs to be considered for some aspects of training. A further consideration for all providers is the differences in culture – for example, some countries have strict caste systems while some countries may be more naturally caring. Education providers must be cognisant of any cultural differences so that courses can be designed or delivered in the best way for the country in question.

Child care

The need for care workers will also likely extend to care of the younger and disabled population. In contrast to the aged-care drivers, a significant driver for these care workers is the changing nature of the emerging economies.

Figure 7 outlines the average child dependency ratio by major area over the period 2015-35. According to data from World Population Prospects, the 2015 Revision (United Nations, 2015), over the next 20 years the average child dependency ratio in all regions is expected to fall steadily. In 2015, countries in South Asia will experience a higher average child dependency ratio compared to other areas in the world, accounting for 46 children for every 100 (working-age) people and is expected to drop to 34 children for every 100 (working-age) people in 2035. A higher child dependency ratio in South East Asia implies that a higher social support in child-care and schooling is likely to be required in this area. In 2015, the child dependency ratios in Australia and China were lower than the average ratio in other areas, accounting for around 28 and 23 children for every 100 (working-age) people respectively, and are expected to remain at these levels for both countries over the next 20 years.

Figure 7: Average child dependency ratio by Regions/Countries of interest



Sources: World Population Prospects, the 2015 Revision (United Nations, 2015), KPMG Estimates
Note: The child dependency ratio is the percentage of children (aged 0-14 years old) divided by the percentage of the working age population (aged 15–64 years)

The Department of Employment's latest report into Child Care occupations in Australia indicates that, while child care workers were in national shortage almost consistently over the decade to 2013, there has been a marked easing in the labour market for child care occupations over recent years and widespread shortages have abated (Department of Employment, 2015). Similarly, shortages of child care centre managers occurred continuously between 1996 and 2011, but the latest research does not indicate that there are significant recruitment problems (Department of Employment, 2015).

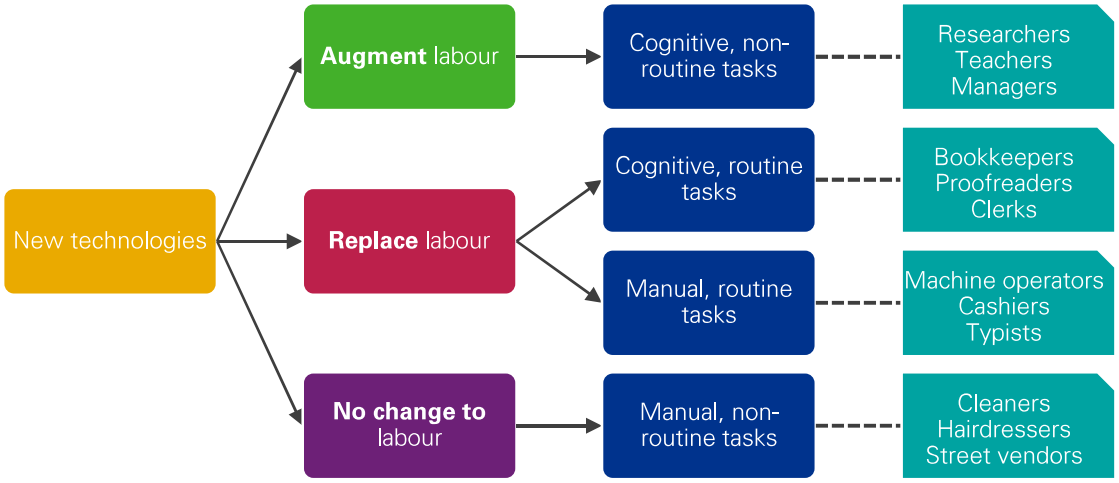
The need for child-care services and better training across the globe was also a theme echoed in many of the stakeholder consultations. A key driver of this is the growing incomes of populations, and increase in the size of the middle class in many economies. These households are increasingly seeking better quality of early childhood care to promote the best upbringing for their families. Additionally, cultural shifts are seeing more women enter the workforce who would otherwise raise families, further driving demand for childhood care.

In summary, demographic and economic shifts are seeing new demand for aged care and child care services. Many of these services require skill sets that are new to emerging economies, so the demand for up-skilling care workers is expected to increase in both the short and medium term. Data reviewed in this research have been incorporated into the key findings in section 2. Australia's well established practices for care workers present an opportunity for offering training to emerging economies.

4.2 Case Study 2: Technology and changes to skill needs

The analysis in this report has aimed to identify the current skills needs in a number of selected economies, and anticipate some future trends. Technology has a major role to play, both as emerging economies 'catch-up' to processes and techniques that advanced economies use, and for current jobs and tasks that will be 're-invented' globally.

The World Development Report 2016 focuses on technological change, economic development, and how jobs will change in the future. Advances in artificial intelligence, falling ICT prices, and greater internet access all highlight the potential that technological change has to alter skill needs in the workforce (World Bank, 2016a). This change may either *replace* labour, *augment* labour, do some combination of both, or leave labour *unchanged*.



Cognitive tasks include analytical skills and also often require high socio-emotional skills, while manual tasks typically require more physical activity. Routine tasks involve repetitive actions or processes while non-routine tasks are variable and require adaptation to achieve their outcome.

Occupations that are augmented by technology, and have limited possibility of automation, will benefit the most from technological progress – such as researchers, teachers and managers. Training for these occupations can deliver long term benefits, but will need to adapt to changing technology, and also develop a high level of 'soft skills' (see Case Study 4).

Routine tasks are the most susceptible to automation and are expected to have major impacts in emerging economies that receive new technology, or as new frontier technologies are developed. Potential job losses include bookkeepers, machine operators and cashiers.

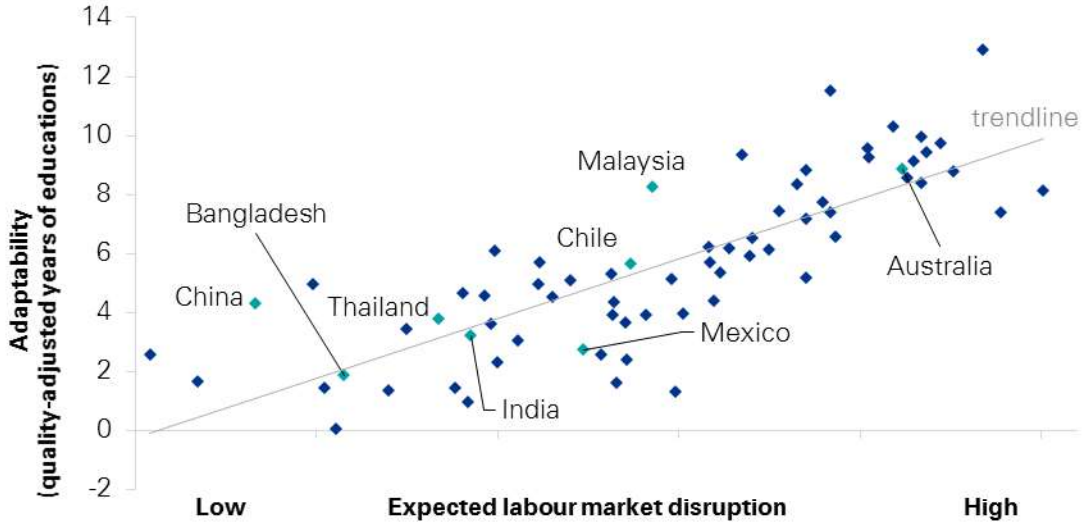
The list below includes occupations with a high probability of automation and a low level of ICT intensity. This suggests that although there might be short to medium term opportunities in emerging economies, demand may weaken in the long term.

- Agricultural workers
- Subsistence farmers
- Cooks
- Metal-processing operators
- Food processors
- Drivers
- Transport and storage labourers
- Cleaners
- Garment workers
- Protective services workers

Some occupations are relatively limited by the impact of technology, such as cleaners and hairdressers. This is because they involve non-routine tasks that cannot be easily automated.

At the industry level, the World Bank (2016a) estimates that retail and wholesale trade, transport, and insurance and banking are the most amenable to digital technology, meaning that education or training directed there should keep mindful of changes to the industry. The least amendable industry is construction, suggesting that training in this sector could remain relevant for longer (World Banks, 2016, p251).

Figure 8: Expected labour market disruption and quality-adjusted years of education



Source: World Banks (2016a)
Note: Labour market disruption weighs job automation probability and ICT intensity. Adaptability weighs years and quality of education. Countries analysed are not exhaustive and only countries in the scope of this report have been labelled.

Factoring in the expected labour market disruption from automation, and the adaptability of the education system, the World Bank (2016a) analyses potential technological impacts across countries.

- There is a clear positive trend for advanced economies, as these economies with more labour market disrupting technology typically have better educational institutions that can adapt.
- Conversely, emerging economies that have less access to technology often have a less developed education framework.
- Latin American countries – Chile and Mexico – have a moderate level of expected market disruption but limited adaptability of education, suggesting that there is potential for importing education and training to better adapt with new technology.
- India sits slightly below the trend line, indicating that the education system will be challenged to adapt to skills needs from new technology – which will have a significant impact given India's population of over 1.2 billion.

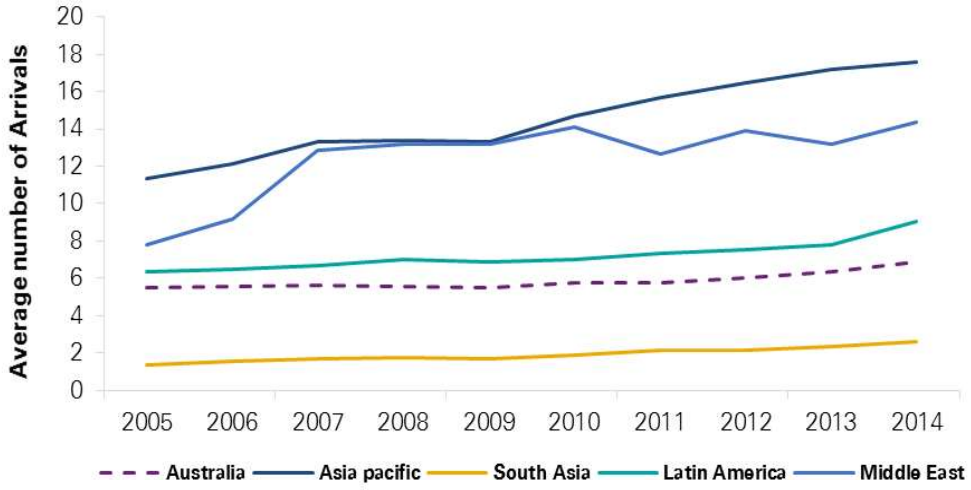
In summary, while the future is difficult to predict, we can anticipate some of the impacts that technology will have across industries and occupations by examining existing ICT intensity and industry structures, and identifying whether tasks are cognitive, manual, routine or not. These impacts have been considered in KPMG's key findings on page 5.

Providing education and training that meets skills needs and complements changes in technology can assist economies to reach the high-skill equilibrium discussed in the conceptual framework, with productive outcomes for the economy.

4.3 Case Study 3: Tourism

Over the last decade, the tourism industry has grown rapidly across the world. Figure 9 outlines the trend in the average number of tourists by the regions/countries of interest for this study over the period 2005-14.

Figure 9: Average number of tourists (million) by major area



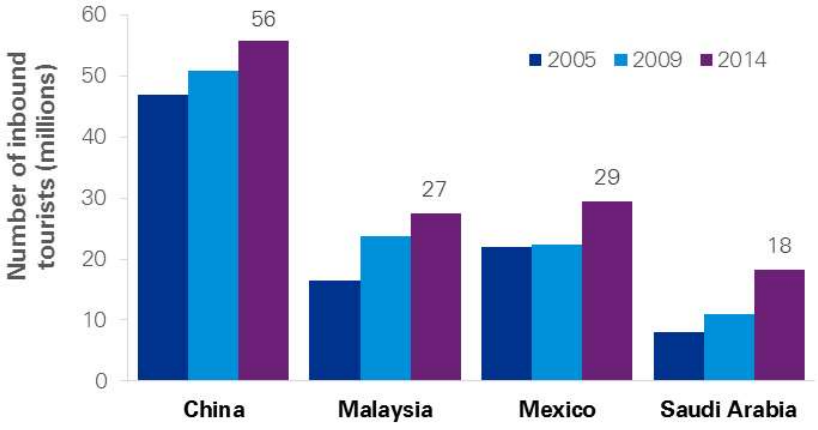
Sources: World Bank, Yearbook of Tourism Statistics, KPMG Analysis

According to data from World Bank and Yearbook of Tourism Statistics, countries of interest in the Asia Pacific will play a major role as tourist destinations in the world. China, Malaysia and Thailand had the highest number of international visitors in 2014 compared to the other countries of interest examined in the Asia Pacific region. Tourism has generated large foreign exchange revenues and also contributed to the socio-economic development of these countries. In addition, the average number of international tourists visiting the Asia Pacific countries of interest has grown at an average annual rate of five per cent over the last 10 years.

- The countries of interest in the Middle East region experienced significant growth in the number of overseas visitors compared to other regions. For instance, since 2005, the numbers of visitors in Saudi Arabia and United Arab Emirates have grown at average annual rates of 11 and 12 per cent respectively. This indicates that the tourism industry in the Middle East likely needs employees to not only meet the current need, but to also maintain growth into the future.
- Tourism in the Latin American countries-of-interest was also strong. In particular, since 2004, Mexico has welcomed over 20 million international tourists each year, reaching 30 million in 2014. In contrast Brazil, Peru, Colombia and Chile attracted less than 15 million total annual visitors between all of them, over the same period.
- In 2014, Australia welcomed around 6.8 million tourists, an increase of about eight per cent from 2013. There are a number of different factors that influence the performance of the Australian tourism industry. Among others, exchange rates, airfares and domestic discretionary income are the main drivers of the growth of the Australian tourism industry, according to 2015 forecasts by Tourism Research Australia.
- India had the highest number of overseas visitors among the countries of interest in South Asia, in 2014. In that year, visitor numbers reached around 7.6 million, an increase of about 10 per cent from 2013.

Figure 10 shows the levels and recent changes in the number of international tourists by most visited countries – China, Malaysia, Mexico and Saudi Arabia – in the countries of interest for the period 2005-14.

Figure 10: Countries with the highest number of tourists (million)



Sources: World Bank, Yearbook of Tourism Statistics

- In 2014, China welcomed the highest number of international tourists amongst the countries of interest in this study, accounting for around 56 million. However, the total number of overseas visitors to China has declined slightly after 2012.
- Within the Asia Pacific region, Malaysia was ranked high in terms of the total number of international tourists as well as growth in the travel and tourism industry. In 2014, Malaysia welcomed around 27 million tourists, an increase of about 12 per cent from 2010. The main drivers of growth in Malaysia's tourism industry are infrastructure investments and government expenditures on tourism promotion (Giap, et al., 2016).
- Mexico's tourism industry was ranked first in terms of the number of international tourist arrivals amongst the Latin American countries-of-interest in this study. According to recent research, the sector represents nearly 6.8 per cent of GDP in Mexico, reflecting the economic activities generated by restaurant and hotels industries as well as airlines and other transportation services industries (World Travel & Tourism Council, 2015). The sector has been growing at an annual average rate of 3.5 per cent since 2005. The increased promotional efforts by SECTUR and the Tourism Promotional Board in Mexico has been one of the main drivers of growth in the Mexico tourism sector.
- Over the past few years, Saudi Arabia has endeavoured to diversify its economy, with an emphasis on services such as tourism. The Saudi Arabian tourism industry welcomed more than 18 million international tourists/pilgrims visiting Makkah and Madinah in 2014, contributing nearly 2.7 per cent to the total GDP (Jeddah Chamber, 2016). The sector has been growing at an annual average rate of 11 per cent since 2005. To maintain the high growth rate in future, the Saudi government has invested in infrastructure projects and organised training programs for employees in tourism organisations to meet both the skilled workers and infrastructure demand of the future.

These trends show the importance of tourism and related industries and highlight the up-skilling that will be required as nations attract more tourists, and want to improve the experiences of visitors.

Occupations that will require up-skilling include:

Tourism and travel advisors	Gallery, museum and tour guides	Waiters and bartenders	Cooks and food preparation assistants	Commercial cleaners

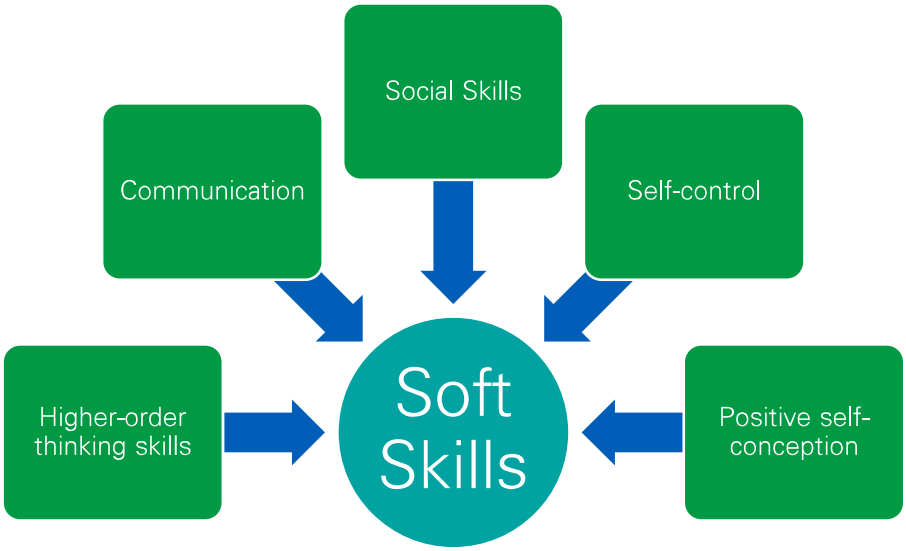
There is widespread agreement that skill development for employees of tourism organisations - such as cultural establishments, museums and art galleries, restaurants and bars - play an important role in the development of the tourism industry in each country. In the increasingly competitive environment of today's tourism sector, countries seeking to maintain or improve their position in the tourism industry will continue to develop a skilled tourism-related workforce.

4.4 Case Study 4: Soft Skills

Research of skills-gap literature and consultation with stakeholders has repeatedly identified that 'soft skills' are in demand by employers globally, and that Australia has a strong reputation for developing these qualities through our education and training system. Hence, consideration of soft skills should be considered as an important element in the design of courses that need to meet international up-skilling requirements.

What are they?

Developing 'soft skills' is an essential part of improving human capital in an economy's labour force. Also known as 'generic skills', they refer to traits and qualities of employees that do not explicitly relate to or describe the task or occupation they perform. These skills complement technical, vocational and academic skills (Lippman et al., 2015). There are several broad and varied definitions of soft skills, but Lippman et al. (2015) summarise them concisely in the list below.



Why do they matter?

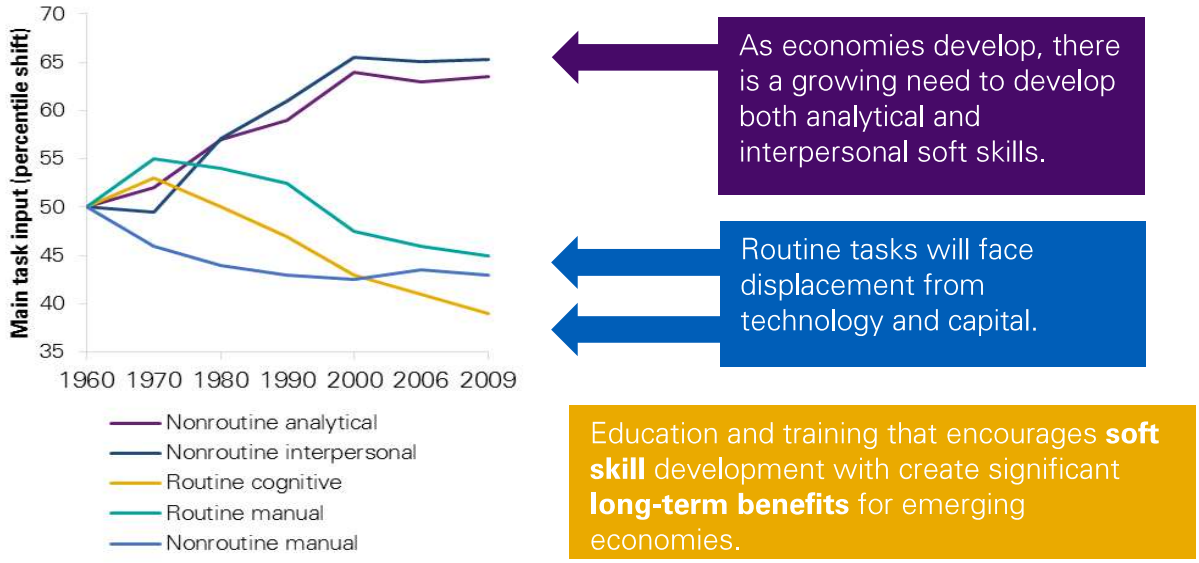
Soft skills are becoming increasingly important not just for advanced nations, but for all economies as technology and globalisation change the skills that workers need. A survey by Manpower in 2018 indicates that more than half (56%) of employers across the world indicate that their most valued human strengths are communication skills (written and verbal), followed by collaboration and problem-solving.[2]

When understanding the skills gaps in an economy or industry, there can potentially be availability of labour with technical or core skills to perform the task, but not the softs skills to apply them effectively and be useful in an organisational or applied context.

Research by Autor and Price (2013) distinguishes tasks – a unit of work that produces output – from skills – the worker's stock of capabilities to perform tasks, and present a historical trend to identify the path of skill needs of an advanced economy. Figure 11 shows that non-routine analytical and interpersonal tasks heavily outweigh routine and manual tasks due to automation of processes, access to computers, and off-shoring jobs. This highlights the importance of soft skills, and that emerging economies need to teach more than core skills in order to develop their workforce and improve labour productivity.

[2] Skills Revolution 2.0: Robots Need Not Apply, ManpowerGroup, 2018

Figure 11 Worker tasks in the US economy (1960-2009)



Source: Autor & Price (2013)

Furthermore, routine cognitive and routine manual tasks are the most likely to be automated as technology advances (see Case Study 2). This emphasises the importance of improving soft skills, not just for addressing current skills gaps in emerging economies, but also for maintaining relevance as the economy develops and labour skill demands change.

What can Australian RTOs do?

Educational institutions at all levels have an important role to play in not only developing literacy, numeracy, ICT and native and foreign language skills – but also encouraging soft skill development (Development Economics, 2015). However, the context of the local culture and business norms is critically important when addressing soft skills. The pivotal study by Hofstede et al. (1991) matches organisational design and summarises multiple factors that need to be considered. Stakeholders interviewed by KPMG noted that soft skills cannot be 'forced' into a unique cultural setting, but need consideration of cultural organisational factors such as power distance, collectivism vs individualism (whether the person or group is the primary entity), gender roles, and uncertainty avoidance (society's tolerance for uncertainty).

At the industry and occupational level, roles that require communicating complex ideas, customer service, and critical thinking will increasingly demand greater soft skills. Service industries particularly, such as those listed below, will need to develop these traits in students and workers who receive training.

High demand for soft skills are needed in:

- Aged Care
- Tourism
- Child care
- Retail

International stakeholders noted that graduates from the Australian education and training system are well developed in soft skills. While this is a culmination of the economic and cultural position, identifying ways that these skills can flow to other foreign labour markets can benefit these economies significantly. One channel through which Australian distinguishes itself in this regard, according to stakeholders, is the robust English language training support provided alongside skill development.

In summary, identifying ways that soft skills can be transferred through international education presents an important complement to core skills, and will benefit both business and workers.

4.5 Case Study 5: Industry 4.0

Industry 4.0, or the Fourth Industrial Revolution, is a major industrial transformation that will drastically alter the way businesses operate in the globalised environment. In essence, Industry 4.0 refers to the next phase of 'digitisation' in industry[3] driven by big data, computational power, and artificial intelligence, amongst others.

The Department of Industry, Innovation and Science refers to Industry 4.0 as the current trends of:

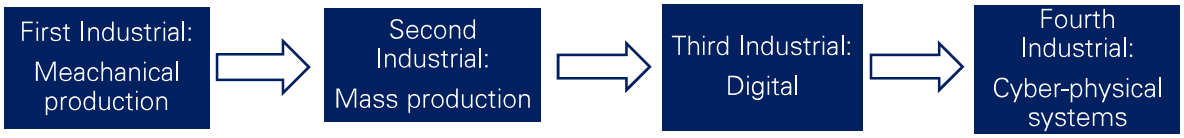
- Advanced automation and robotics;
- Machine-to-machine and human-to-machine communication;
- Artificial intelligence and machine learning; and
- Sensor technology and data analytics.

The four key drivers enabling these trends are:

1. Rising data volumes, computational power and connectivity
2. Emerging analytics and business-intelligence capabilities
3. New forms of human-machine interaction, such as touch interfaces, augmented and virtual reality systems
4. Improvements in transferring digital instructions to the physical world, such as robotics and 3D printing

Figure 12 below depicts the transformation from the First to the Fourth Industrial Revolution

Figure 12 Industrial Revolutions – innovation across industries



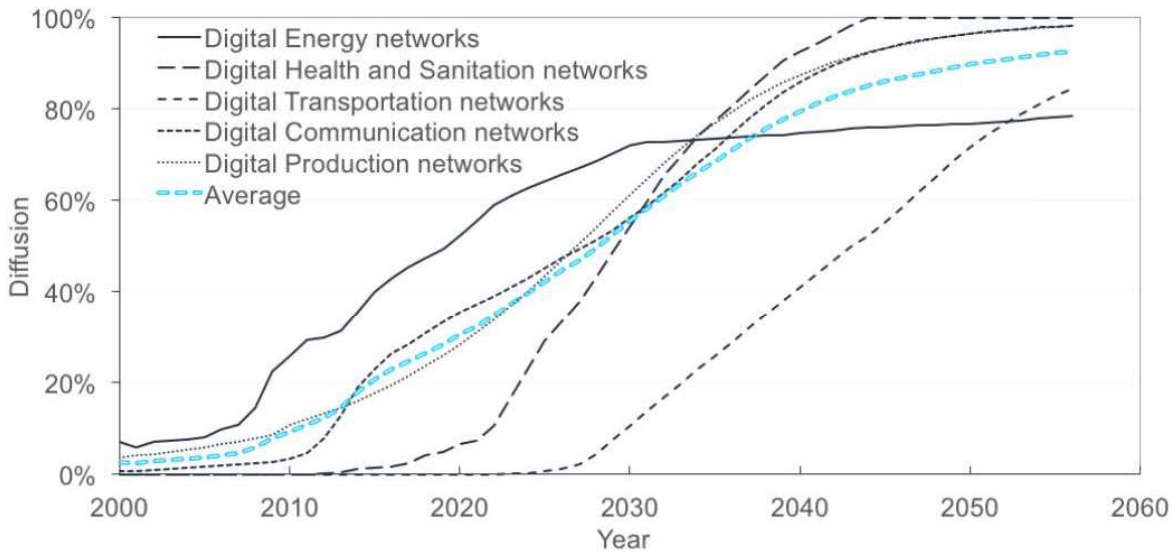
Source: Adapted from Schwab, K. (2017) The Fourth Indsustrial Revolution

The adoption and deployment of Industry 4.0 in Australia and globally has the potential to boost productivity across industry groups in emerging and advanced economies. A report by Nokia Bell Lab researchers[4], which analysed the potential impact on productivity of the fourth industrial revolution, found that emerging digital technologies in energy, transport, health and communication has the potential to significantly boost productivity by the late 2020s.

Figure 13 below illustrates the 'jump' in productivity occurring around 2028-2030 when projected diffusion of such technologies in the relevant industries surpasses 51 per cent.[5] Similarly, a World Economic Forum (WEF) White Paper[6] - in collaboration with McKinsey & Company - on the next economic growth engine postulate that after a decade of stagnated productivity, Industry 4.0 is expected to create up to $3.7 trillion in value by 2025. Technologies such as advanced robotics, the Internet of Things, and additive manufacturing are already helping to generate net productivity increases.

[3] Industry 4.0 will affect all industries although the most significant impact is likely to be on the Manufacturing sector.
[4] Will Productivity Growth Return in the New Digital Era? An analysis of the potential impact on productivity of the fourth industrial revolution (Saniee et al. 2017).
[5] Whilst this study is based on the U.S. economy, the authors note that similar productivity gains are anticipated in India, China and other nations.
[6] World Economic Forum (2018). The Next Economic Growth Engine – Scaling Fourth Industrial Revolution Technologies in Production.

Figure 13 Projected diffusion of key enabling digital infrastructure network technologies



Source: Saniee et al. (2017)

To support this growth, it is envisaged that the adoption and deployment of Industry 4.0 will lead to a significant demand for skills associated with such technologies. The growing utilisation of digitisation, connectivity, and analytics ('smart' systems) will increase the demand for employees with competencies in such areas. This will require, not just industry-specific skills, but also additional competencies embedded in 'smart' systems and processes, for example. The World Economic Forum's Future of Jobs report (2016), details that disruptive changes to business models, as a result of the current transition to Industry 4.0, will have profound implications on the employment landscape over the coming years, and that talent shortages are expected to get worse over the next five years. [7]

Whilst Industry 4.0 will primarily have the largest impact on the Manufacturing industry, it is extremely likely that all other industries such as Construction, Transportation and Logistics, Retail and Wholesale, Food and Beverage, and Agriculture will also be 'disrupted' as a result of the key drivers underlying these trends. The Construction industry is a good example of how Industry 4.0 will transform the entire industry with technologies including building information modelling, prefabrication, robotic equipment, and 3D printing. The Energy industry is another good example with 'smart' grids and real-time data key elements of future energy systems design. These are not standalone examples, even stakeholders in traditional "soft-skill" industries such as care providers, also indicate that workers will need to be IT literate – with robotics and technology already assisting with care provision (such as medication administration, physical care and record keeping).

Early adopters of Industry 4.0 are already visible among organisations in the United States, Europe, and Asia. Countries like Germany are investing heavily to incorporate Industry 4.0 and they will be well-placed to meet the opportunities and challenges that Industry 4.0 will present going forward. Australia has to be prepared to meet the changing profile of the workforce and deliver relevant training both onshore and offshore to meet these future industry needs. Through consultations and research, it is clear that Industry 4.0 is on the radar and agenda of a number of the selected economies. As the skills and competencies needed to thrive are redefined, there will be a growing demand for skilled labour with the know-how of operating in the Fourth Industrial Revolution, and consequently a demand for delivery of training the modern workforce.

[7] World Economic Forum (2016). The Future of Jobs – Employment, Skills and Workforce Strategy for the Fourth Industrial Revolution.

5. Regional Analysis

This section breaks down the analysis by region/country of interest. In particular, this section provides detailed analysis of each country of interest, in terms of the economic structure and trends, and potential skills gaps.

5.1 Background

The countries selected are emerging economies, which are each at various stages of economic development and present different needs for human capital development.

Note that South Asia is typically considered part of Asia Pacific, but is examined separately in this report. The regional analysis does not include all countries, but only those identified in the scope.

As discussed in the scope, the regions/countries of interest examined in this analysis are:

- The Latin American countries of Brazil, Peru, Mexico and Colombia
- The Middle Eastern countries of Egypt, Saudi Arabia and United Arab Emirates
- The South East Asian countries of India, Bangladesh, Sri Lanka, and Pakistan
- The Asia Pacific countries of China, Thailand, Korea, Indonesia, Malaysia, Singapore, Vietnam, and Solomon Islands.
- Australia is provided as a reference point, to identify comparisons between economic structures and understand how Australia is positioned to export VET to the countries of interest.

Each country is analysed by considering economic data, desktop research on countries/industries, meta-analysis of existing skill-gap research, and information from stakeholder consultations. These four types of research are now discussed in turn.

5.1.1 Data (economic and employment backdrop)

Several data sources are used in this analysis in reference to drivers for the demand and supply of skilled labour presented in the conceptual framework for skills-gap analysis (see Figure 1 on page 3).

The analysis considers labour productivity across regions, to provide a macro perspective on potential aggregate skills needs and a comparison between emerging economies and Australia as an advanced economy. Low labour productivity can suggest a low-skill equilibrium, where wages remain low and dis-incentivise up-skilling. Where available, data from the World Bank Enterprise Survey on skills gaps as a major constraint are provided across regions. The firm's perspective on skills gaps between manufacturing/service, exporting/non-exporting, and domestic/foreign owned businesses are presented. This data makes an explicit connection to a skills shortage as identified in the conceptual framework, as firms are wanting more skilled labour but the supply is not available.

For each country, several sets of employment data support the analysis. Employment by sector shows the size of each industry's labour force, and shows any trends in decline or growth. Data on occupations shows the mix of occupations that make up the labour force.

Data on informal employment across sectors is estimated by the International Labour Organization and provides an important insight into skill needs. Economy sectors with significant informal employment typically have poor employee protection, low productivity, and poor linkages with the formal sector (OECD, 2009). Transactions occurring in the informal economy are not tracked, which creates additional challenges for monetary policy and monitoring inflation (Maddah & Sobhani, 2014). Additionally, they do not pay taxes, so governments have a further incentive to address formalised economic activity. Depending on the demand for skilled labour, informal employment can imply either a skill gap, or low-skill equilibrium for that sector within the economy.

Several data sources are used, but care has been taken to apply a consistent analysis between countries. Page 108 in the appendix contains industry and occupation classifications of data used.

5.1.2 Desktop research

Desktop research (an environmental scan) was also undertaken, with a focus on the countries and sectors of interest. This research was used to identify industries that have been highlighted in the different regions by recent media, business or government articles. This information was used to further inform the strength of demand identified in the regional analysis and in the key findings table (see Table 1 on page 5).

5.1.3 Meta-analysis (examples of skill shortages)

The meta-analysis has considered existing studies that identify skills gaps and opportunities for Vocational Education and Training (VET). A significant amount of research has been done in this space, however it varies between countries and sectors. Organisations that have conducted researched include the World Bank, the Organisation for Economic Cooperation and Development, Siam Commercial Bank, World Trade Organisation, and many academic institutions. Several methods have been used, including surveys, interviews, literature reviews, econometric modelling and other data analytic tools.

The meta-analysis does not present an exhaustive or conclusive identification of skills gaps – but highlights areas that have been identified as important by various institutions. As the type of information report varies, they have been applied according to the conceptual framework presented on page 3 and weighed against other sources to inform the key findings.

5.1.4 Stakeholder consultations

KPMG has interviewed a range of stakeholders across government, training organisations and industry to develop an enhanced view of where skills needs are in each country, and how Australian education providers might be positioned to address them. Each country summarises observations from stakeholders with some form of exposure to that economy's labour force.

- Training stakeholder organisations primarily include RTOs that have experience in delivering international education off-shore in the countries of interest.
- Government stakeholders have included internationally posted staff from the Australian government, experts in the Australian Qualification Framework (AQF), experts in VET in Australia and abroad, and others.
- Industry stakeholder consultations have included peak bodies that represent business or industry sectors, and businesses with international engagement – either through foreign direct investment or supply chain management. Page 107 in the appendix presents a summary of the consultation methodology.

5.2 Asia Pacific (Australia, China, Indonesia, Malaysia, Singapore, South Korea, Vietnam, Thailand, Solomon Islands)

The analysis into the Asia Pacific region has included Australia, China, Indonesia, Malaysia, Singapore, Korea, Vietnam, Thailand and Solomon Islands. Note that while India, Pakistan, Bangladesh and Sri Lanka are part of the Asia Pacific region, they are addressed separately as South Asia in section 5.2.

Analysis on Australia is provided for two purposes. The first is to identify strengths in Australian industries - to signal our expertise in supporting the development of quality and targeted education. The second is to provide a benchmark for the skill gap analysis across the countries of interest. As an advanced economy, Australia has a high level of economic development, access to technology and capital, and high labour productivity. The economic factors provide a guide for how up-skilling can enhance labour productivity and economic growth (as discussed in the conceptual framework in Section 1.2).

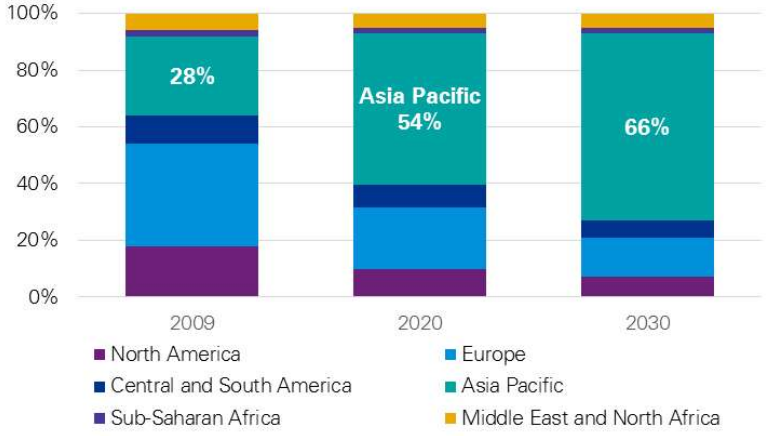
5.2.1 Key Themes in the Region

The countries studied in Asia Pacific have presented a range of themes, with no single trends that fit all economies. Some countries, such as Singapore and Korea, are relatively more developed, and any development of training products for these markets will need to strongly consider the existing qualification frameworks. Additionally, any training products should clearly target specific skills needs, as the skill needs in these economies are unlikely to be as broad as those identified in less developed economies.

Agriculture is a major employer in many parts of the region, with notable exceptions in Singapore and Korea – largely due to limited land for cultivating. Many parts of the Asia Pacific region have been building a variety of manufacturing industries. Low exchange rates and increasing openness to trade have made countries become important links in global supply chains. In addition to raising the quality of products that are produced, global value chains also require more skills in transport and logistics industries, which represent an important skill need to complement other sectors of the economy.

One common trend in the region is an increasing need to provide better services to citizens, including social, health, aged care and child care. A combination of demographics and rising incomes highlight this need for better services, and will require up-skilling of the labour force to deliver.

Figure 14: Projected share of middle class by region

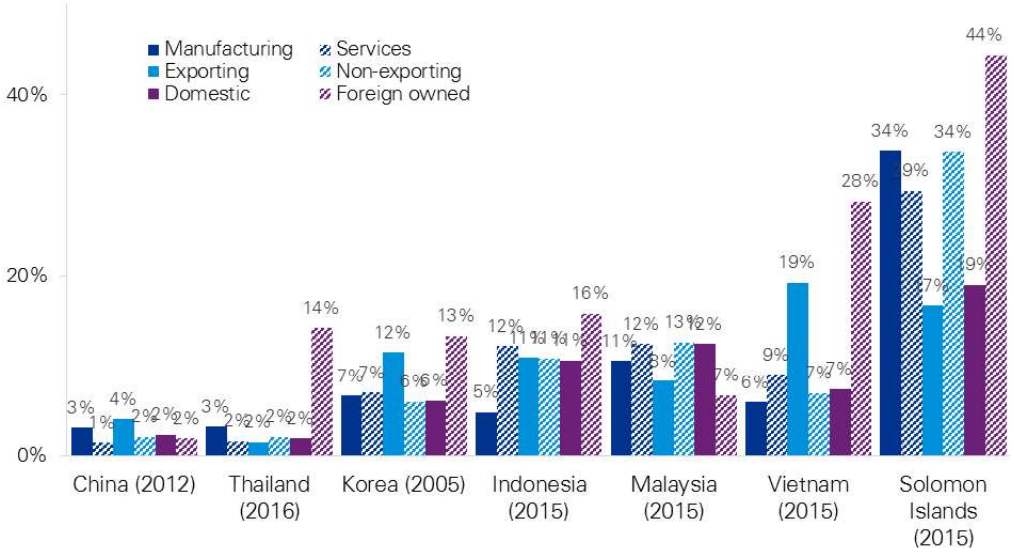


Source: Brookings Institute (2010).
Middle class is defined as households with daily expenditure between US$10 and US$100 in purchasing power parity terms. 28% of the world's middle class was living in the Asia Pacific in 2009, the projections estimate that this share will increase to 66% in 2030.

Figure 14 estimates that by 2030, the majority of the world's middle class population will live in the Asia Pacific region. The associated growth in household wealth further emphasises the need for better quality products, and higher standards of social services mentioned earlier. As discretionary incomes rise, demand for tourism goods and services will increase in the region, creating a need for up-skilling in sectors such as food and beverage, hotel services, and arts and recreational services.

Looking at the current state of labour markets in the region, firms' perspectives of skill gaps varies significantly across the Asia Pacific region as shown in Figure 15. A high percentage of businesses in the Solomon Islands identified gaps in labour force education, particularly for manufacturing firms (at 34 per cent) and foreign owned firms (at 44 per cent). Moderate skills needs are reported by businesses from Vietnam, Malaysia, Indonesia and Korea. Interestingly, very few businesses in China and Thailand reported education of the labour force as a major constraint.

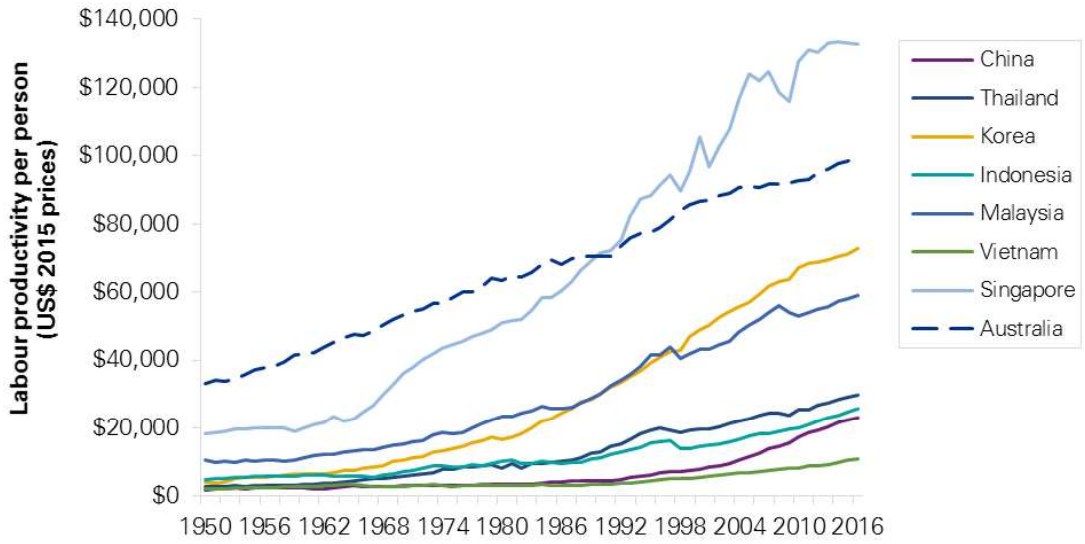
Figure 15 Per cent of Asia Pacific firms identifying an inadequately educated workforce as a major constraint



Source: World Bank Enterprise Survey (2016)

Firms' perspectives are not the only indication of skills gaps and needs for improving education and training. Figure 16 shows the labour productivity across the region, measured as USD of GDP output per worker. Note that while few firms in China reported skills gaps as a constraint in China, labour productivity in China is only USD $23,073, compared to USD $72,681 in Korea and USD $99,716 in Australia. Two key effects may cause this are: need for more investment and capital, and a low skill equilibrium in many sectors of the labour market, due to low demand and low supply of skilled labour (described in section 1.2). Similarly, relatively few businesses in Thailand and Vietnam reported skills gaps but are in low labour productivity economies. Strategies for these economies are likely to need a combination of better access to finances and improvement in human capital through up-skilling.

Figure 16 Labour productivity per person employed in 2015 US$ (converted to 2015 price level with updated 2011 PPPs)



Source: The Conference Board Total Economy Database (2016)

Both Australian government stakeholders and training stakeholders discussed the fact that the challenge in many Asia Pacific countries of promoting VET to students and parents when pursuing university education has greater prestige attached. This trend was also discussed in South Asia, further highlighting the need to develop strategies to address this. The problem can relate in-part to a low skill equilibrium in the economy, where firms are not willing to pay higher wages in some industries, hence the incentive to study and train for them is limited (and the prestige is low). Training stakeholders have noted the effect that strong government to government relations can have. Government endorsement of a program or initiative in many Asian economies provides significant value to a product, and can motivate action by industry and the community.

5.2.2 Australia

Having a US$1.2 trillion mixed market economy measured by GDP (PPP) as of 2017, Australia has experienced controlled inflation, low unemployment and public debt and continuous growth in the past two decades. A reduction in international prices for Australian key export commodities, along with a drop in the demand for Australian resources from China (Australia's biggest export destination), means that the Australian economy is facing slower growth in 2018. KPMG Economics forecasts real GDP growth for the Australian economy to be about 2.8% for FY2018 and 2.9% for FY2019.

5.2.2.1 Economic and employment backdrop

The services sector is a significant part of the Australian economy, representing more than 70 per cent of GDP and 75 per cent of Australian jobs in 2016. This sector provides a range of services including but not limited to banking, insurance, travel and telecommunications. In comparison, the industrial and agriculture sectors represented around 26 per cent and 4 per cent of Australia's total GDP respectively.

Figure 17: Australia's Economy and Industry

Economic data	
Gross Domestic Product (PPP)	US$1.235 trillion (2017 est.) US$1.209 trillion (2016 est.) US$1.179 trillion (2015 est.)
GDP composition by sector (2017 est.)	Agriculture: 3.6% Industry: 26.1% Services: 70.3%
GDP growth	2.2% (2017 est.) 2.5% (2016 est.) 2.4% (2015 est.)
GDP per capita	US$49,900 (2017 est.)
Education expenditure	5.2% of GDP (2014)
Ease of doing business	10 (2014)
Industry structure	
Major agricultural products	wheat, barley, sugarcane, fruits; cattle, sheep, poultry
Industries	mining, industrial and transportation equipment, food processing, chemicals, steel
Major export partners	China 33.5%, Japan 14.6%, South Korea 6.6%, India 5.0%, Hong Kong 4.0% (2017)
Major exports	iron ore, coal, gold, natural gas, beef, aluminium ores and conc*, wheat, meat (excluding beef), wool, alumina, alcohol
Major import partners	China 22.9%, US 10.8%, Japan 7.5%, Thailand 5.1%, Germany 4.9%, South Korea 4.5% (2017)
Major imports	motor vehicles, refined petroleum, telecommunication equipment and parts; crude petroleum, medicaments, goods vehicles, gold, computers

Country Profile Sources:
CIA World Factbook, , available at https://www.cia.gov/library/publications/resources/the-world-factbook/geos/ar.html, accessed on 07 January 2019.
OECD, World Indicators of Skills for Employment (WISE), available at http://stats.oecd.org//Index.aspx?QueryId=62775#, accessed on 21 August 2018.
ILOSTAT Database, Country Data, available at http://www.ilo.org/ilostat/faces/help_home/data_by_country?_adf.ctrl-state=yddsm3mdf_4&_afrLoop=404928031607009, accessed on 21 August 2018
*Aluminium ores and concentrates (Bauxite).

Australia is a major exporter of natural resources, energy and food commodities including coal, iron ore, gold, meat, wool, alumina, wheat, machinery and transport equipment to Asian countries and U.S

Trade and other market services (part of the broader services sector) is the highest employing sector in Australia, accounting for over 40 per cent of Australia's total workforce over the past two decades. This sector employed over 5.4 million employees in 2017.

The public and other social services sector has maintained its place as the second highest employer in the country, accounting for approximately 30 per cent of total workforce over the past decade. Overall, this sector employed nearly 4.1 million employees in 2017.

Both the trade and other market services and public and other social services registered growth in employment in the past two decades. These sectors grew at an average annualised growth rate of 1.9 per cent and 2.9 per cent respectively, between 1998 and 2015. Employment in the agriculture and manufacturing sectors has either decreased or remained constant since 1998.

Figure 18 Employment by Sector (1998 – 2014)

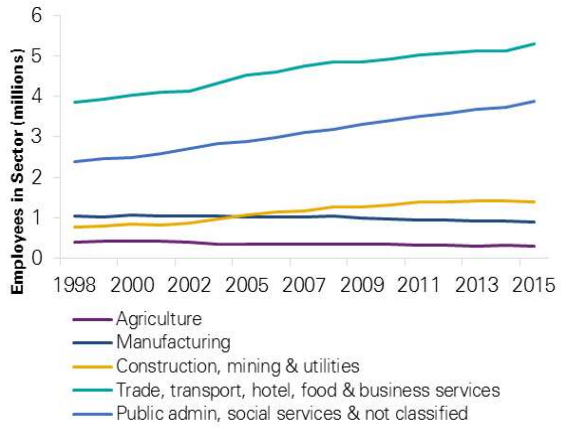
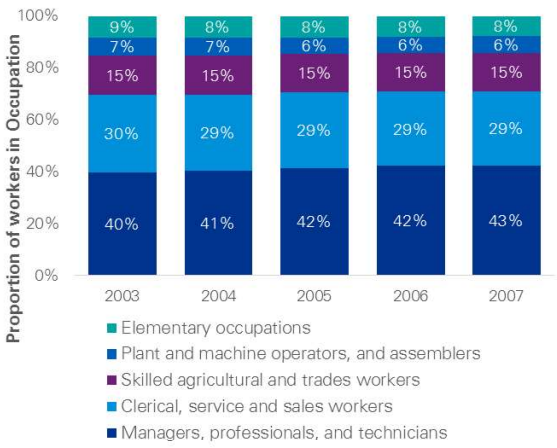


Figure 19 Labour force by occupation (2003 – 2007)



Sources: World Bank Enterprise survey (2016), International Labour Organisation (2016)

ILO occupation data is limited to the years 2003 to 2007, showing a slight decrease in the labour force share of elementary occupations as well as plant and machine operators, and a small increase in the share of managers, professionals and technicians occupations.

5.2.2.2 Examples of skills shortages

Even with a very low aggregate unemployment rate, competition for professional positions in Australia has remained strong over the past few years. Australian employers have been facing hiring difficulties for suitably skilled employees.

In the context of skill shortages in Australia, the Department of Employment (2016) identified skill shortages in over one-third of the occupations that they assessed in 2015-16. These occupations are listed in the table below.

Interestingly, of the 25 occupation categories identified as having national skill shortages in 2015-16, 22 were technician and trade occupations, with the remaining three in the professionals category.

Table 3: Occupations experiencing skill shortages, 2015-16

Technicians and Trades			Professionals
1. Chef	9. Locksmith	17. Fibrous Plasterer	1. Audiologist
2. Cabinetmaker	10. Metal Machinist	18. Glazier	2. Optometrist
3. Arborist	11. Motor Mechanics	19. Hairdresser	3. Sonographer
4. Automotive Electrician	12. Painting Trades Worker	20. Stonemason	
5. Bricklayer	13. Panel beater	21. Vehicle Painter	
6. Butcher or Smallgoods Maker	14. Roof Tiler	22. Wall and Floor Tiler	
7. Air-conditioning and Refrigeration Mechanic	15. Sheet metal Trades Worker		
8. Civil Engineering Draftspersons and Technicians	16. Solid Plasterer		

Source: Department of Jobs and Small Business, Skill Shortage Ratings

A similar pattern was again observed in 2016-17. However, the number and mix of occupations with skill shortages have changed somewhat.

Table 4: Occupations experiencing skill shortages, 2016-17

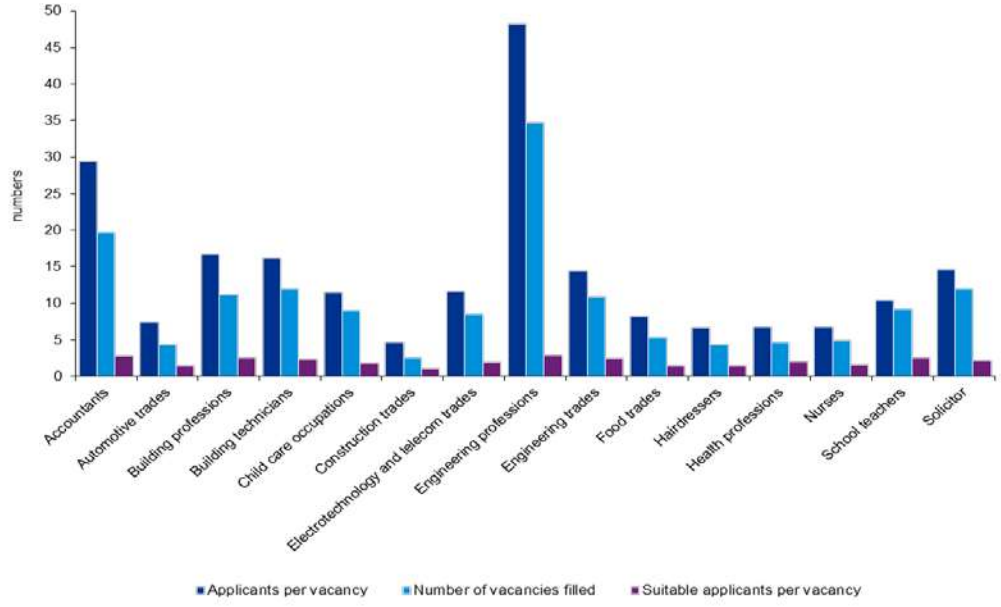
Technicians and Trades			Professionals
1. Cabinetmaker	12. Roof Tiler	22. Fitter	1. Audiologist
2. Arborist	13. Sheet metal Trades Worker	23. Carpenters and Joiners	2. Optometrist
3. Automotive Electrician	14. Fibrous Plasterer	24. Plumbers	3. Architect
4. Bricklayer	15. Glazier	25. Welder	4. Surveyor
5. Butcher or Smallgoods Maker	16. Hairdresser	26. Telecommunications Trades Workers	5. Veterinarian
6. Air-conditioning and Refrigeration Mechanic	17. Stonemason	27. Baker	
7. Locksmith	18. Vehicle Painter	28. Pastry cook	
8. Metal Machinist	19. Wall and Floor Tiler	29. Metal Fabricator	
9. Motor Mechanics	20. Aircraft Maintenance Engineer (Avionics)	30. Construction Estimator	
10. Painting Trades Worker	20. Aircraft Maintenance Engineer (Mechanical)	29. Metal Fabricator	
11. Panel beater			

Source: Department of Jobs and Small Business, Skill Shortage Ratings

The Department of Employment's Survey of Employers who have Recently Advertised (SERA) also identified the average number of applicants, vacancies filled and suitable applicants per vacancy by selected occupation clusters in 2015-16. As is evident from the figure below, a large number of engineers and accountants are competing for vacancies in the Australian job market, while there are only a few applicants competing for other vacancies in areas such as construction trade, automotive trade and health. The research also shows that while around 70 per cent of all vacancies were filled in 2015-16, the number of suitable applicants for each skilled vacancy remains very low – with only around two suitable applicants per vacancy.

Findings from the Department's SERA survey also reveals that a lack of experience and/or employability skill factors (such as communication skills, teamwork, reliability or English proficiency) are given as the major reasons as to why so few applicants were considered to be 'suitable'. In this context, Healy, Mavromaras, and Sloane (2015) note that a high demand for specific skills in a large number of vacancies in Australia is the most important cause of skill shortages.

Figure 20: Average number of applicants, vacancies filled and suitable applicants per vacancy, 2015-16



Source: Department of Employment, Survey of Employers who have Recently Advertised (SERA)

Looking forward, the Department of Education (2016) expects future employment growth for both technician and trade workers and professionals to be strong, up by 5.5 per cent and 14.5 per cent respectively over the five years to November 2020. Higher levels of education are expected to help boost the supply of professionals. In contrast, technicians and trade occupations are expected to continue to face recruitment challenges with low levels of apprentice and trainee completions.

5.2.3 China

China is the largest country in the Asia Pacific region examined in this study, with a population of over 1.4 billion. According to the CIA World Factbook (2018), the key challenges for the Chinese government are: "(a) reducing its high domestic savings rate and correspondingly low domestic household consumption; (b) managing its high corporate debt burden to maintain financial stability; (c) controlling off-balance sheet local government debt used to finance infrastructure stimulus; (d) facilitating higher-wage job opportunities for the aspiring middle class, including rural migrants and college graduates, while maintaining competitiveness; (e) dampening speculative investment in the real estate sector without sharply slowing the economy; (f) reducing industrial overcapacity; and (g) raising productivity growth rates through the more efficient allocation of capital and state-support for innovation."

5.2.3.1 Economic and employment backdrop

China has achieved significant economic growth over many decades, with GDP growing almost 10 per cent on average over the last 35 years. In 2014, China overtook the USA and became the world's largest economy (on a purchasing power parity basis). While China's GDP growth has slowed somewhat in recent years, it has still been strong at around 7 per cent per year.

Figure 21: China Economy and Industry

Economic data	
Gross Domestic Product (PPP)	US$23.16 trillion (2017 est.) US$21.7 trillion (2016 est.) US$20.3 trillion (2015 est.)
GDP composition by sector	Agriculture: 8.3% Industry: 39.5% Services: 52.2% (2017 est.)
GDP growth	6.9% (2017 est.) 6.7% (2016 est.) 6.9% (2015 est.)
GDP per capita	US$16,700 (2017 est.)
Education expenditure	N/A
Ease of doing business	90 (2014)
Industry structure	
Major agricultural products	world leader in gross value of agricultural output; rice, wheat, potatoes, corn, tobacco, peanuts, tea, apples, cotton, pork, mutton, eggs; fish, shrimp
Industries	world leader in gross value of industrial output; mining and ore processing, iron, steel, aluminum, and other metals, coal; machine building; armaments; textiles and apparel; petroleum; cement; chemicals; fertilizer; consumer products (including footwear, toys, and electronics); food processing; transportation equipment, including automobiles, railcars and locomotives, ships, aircraft; telecommunications equipment, commercial space launch vehicles, satellites
Major export partners	US 19%, Hong Kong 12.4%, Japan 6%, South Korea 4.5% (2017)
Major exports	electrical and other machinery, including computers and telecommunications equipment, apparel, furniture, textiles
Major import partners	South Korea 9.7%, Japan 9.1%, US 8.5%, Germany 5.3%, Australia 5.1% (2017)
Major imports	electrical and other machinery, including integrated circuits and other computer components, oil and mineral fuels; optical and medical equipment, metal ores, motor vehicles; soybeans

Country Profile Sources:
CIA World Factbook, , available at https://www.cia.gov/library/publications/resources/the-world-factbook/geos/ar.html, accessed on 21 August 2018.
OECD, World Indicators of Skills for Employment (WISE), available at http://stats.oecd.org//Index.aspx?QueryId=62775#, accessed on 21 August 2018.
ILOSTAT Database, Country Data, available at http://www.ilo.org/ilostat/faces/help_home/data_by_country?_adf.ctrl-state=yddsm3mdf_4&_afrLoop=404928031607009, accessed on 21 August 2018.

The Chinese economy is the largest manufacturing economy in the world. In 2017, the industry sector in China contributed to around 40 per cent of total China GDP and over 28 per cent of employment. The services sector in China is also a significant, and growing part of the economy. This sector contributed to just over half of China's total GDP in 2017, and employed around 43 per cent of the workforce in 2016.

Despite only contributing to around 9 per cent of China GDP in 2015, the agriculture sector is the highest employing sector in the economy. Agriculture employed over one-third of all workers in the economy in 2015.

Agriculture's share of employment has reduced significantly over the past decade, from around half of all workers in 2003 to just over one-third in 2011. In contrast, the services sector has become a more prominent employer, increasing its share of workers over the same period, from just over one-quarter of workers in 2003, to an estimated one-third of workers in 2011.

Figure 22: Employment by sector (2003-2011)

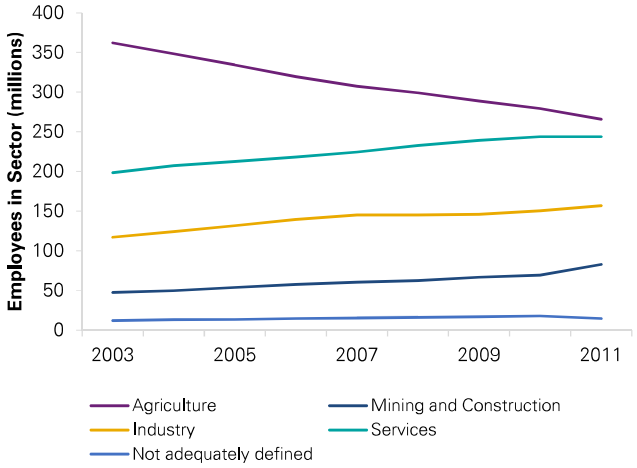
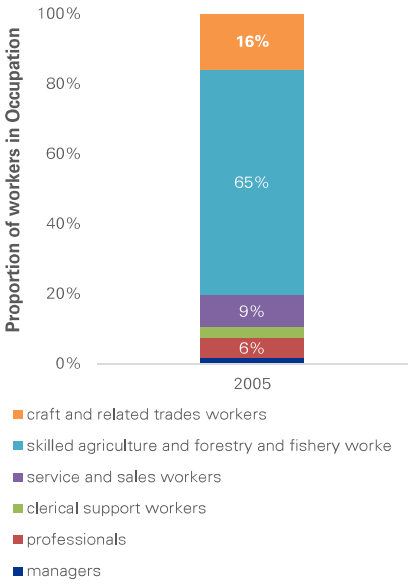


Figure 23: Labour Force by occupation (2015)



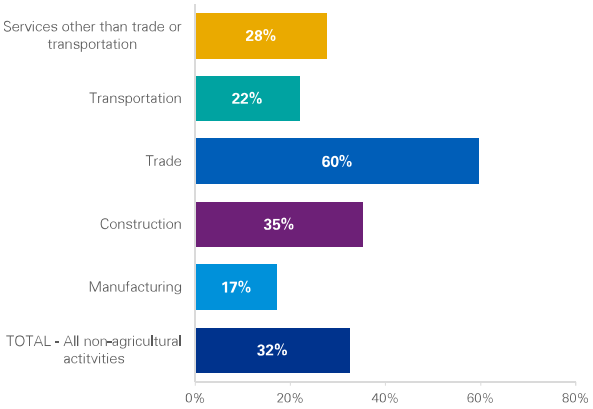
Sources: Tradingeconomics.com (2016), China Statistical Yearbook (2009-14), International Labour Organisation (2016), KPMG estimates

China is a mid-skilled economy, with skilled agriculture workers contributing to almost two-thirds of the China labour force. Higher-skilled occupations – professionals and managers – made up less than 7 per cent of the labour force in 2005.

With growth in services activity and only around 9 per cent of the labour force in service and sales worker occupations, this indicates a potential skill gap.

Compared to other Asian economies, China's informal sector is relatively small, accounting for just under one-third of total non-agriculture employment. However, within this group, the trade sector has almost two-thirds of its workers employed in the informal economy. A predominantly informal sector can encourage sectoral low-wage: low-skill equilibriums, where there is little incentive for employers to pay higher wages and employees to up skill.

Figure 24: Share of employment in informal sector (2010)



Source: International Labour Organisation (2016)

5.2.3.2 Examples of skills shortages

Research by EDFI (2016) studied a leading German owned wooden toy manufacturer in Beilun, East China. They identified challenges in recruiting and retaining quality workers with mechanical skills and knowledge of working with wood. Young Chinese people are less willing to work in dusty and noisy environments – and prefer plastic injection moulding companies or white-collar jobs. One strategy the company pursues to address this is increased automation (EDFA, 2016). Specific skills gaps identified in the study include departmental managers, global marketing specialists with work experience, carpenters, machine adjusters and R&D specialists for new, non-wood technologies.

The A.T.Kearney Global Retail Development Index rates developing and emerging economies according to their attractiveness for investment and transformation potential of the retail sector. In their 2015 report, China was identified as the most attractive retail development market. China was ranked high in market attractiveness, and also ranked high in urgent need for market transformation (A.T.Kearney, 2016). In their retail labour market strategy, they identify the need for a shift from expatriate to local staff. Shifts have been occurring in major retailers such as Walmart and Marks & Spencer. However, high expansion strategies have been slowing down, highlighting a need for stores to improve efficiency as China's economy slows.

A regulatory change identified by A.T.Kearney (2016) is the opening of e-commerce retailers to provide direct access to foreign brands – known as the traditional daigou market. This will create a change in the demand for wholesale sector workers with a need to engage in IT, logistics and e-commerce skills.

The Asian Development Bank (ABD) present a case study on China in their *Challenges and Opportunities for Skills Development in Asia* report. They describe the labour force skill structure as being more 'hour glass' shaped when a pyramid shape is optimal, meaning there is a lack of mid-skilled workers such as qualified technicians and expert technicians (ADB, 2015).

Research into China's skills gaps by McKinsey (2013) identify priority sectors and education gaps in 2020. Figure 25 shows that the greatest need is expected to be in manufacturing, health and social services, and education. Manufacturing workers will require up-skilling as the economy shifts from investment led growth to consumption led growth, and growing wages means that higher productivity will need to characterise the worker instead of low-cost, labour intensive manufactures (McKinsey, 2013).

Figure 25 Projected demand for workers in 2020 by

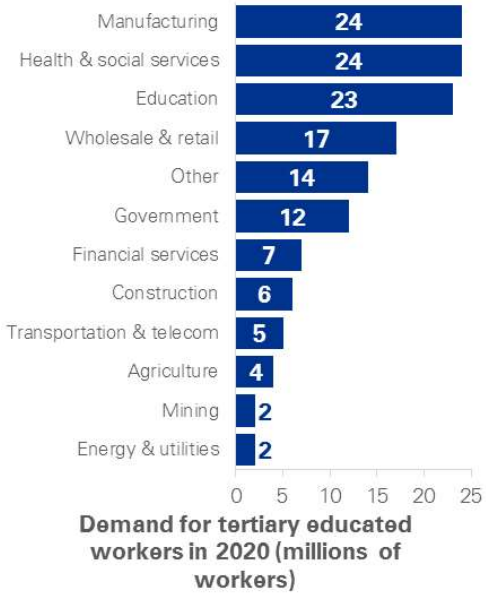
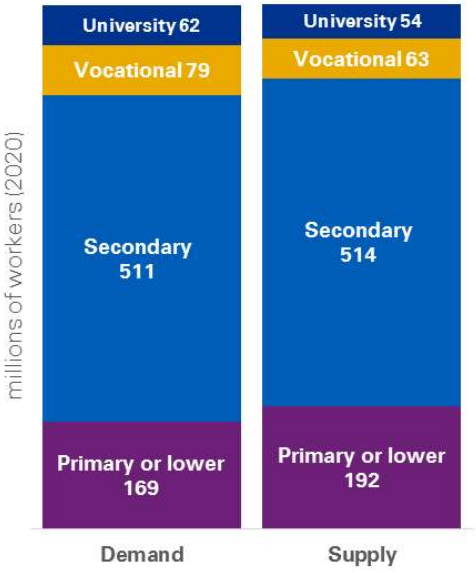


Figure 26 China labour demand and supply education in 2020



Source: McKinsey (2013)

Research also shows that a large skill shortage in the China labour force is expected to be VET graduates, with a shortfall of 16 million workers expected in 2020 (McKinsey, 2013). This highlights the importance of providing VET that can meet the needs of industry, and attract students, to prepare them for greater value-added employment.

An important issue in identifying the skills gaps is the **geographical distribution** of labour, education and training. Big cities such as Beijing and Guangzhou attract many students, and produce the higher number of university and vocational training graduates (McKinsey, 2013). However, there is an over-supply of skilled labour in these areas, without the jobs to meet it. Conversely, small and mid-size cities face a major lack of graduates and up-skilled workers, which are needed to provide skills for industry and promote economic growth. The urban population is expected to shift from 36 per cent to 62 per cent by 2020 – which will enhance geographical skills gaps and meet a physical constraint in providing space and facilities for skilled workers (McKinsey, 2013).

5.2.3.3 Stakeholder experiences

China is a major international student market, and has a diverse range of skill needs and changes to future labour demands.

At the sectoral level, Australian government and education stakeholders have identified hospitality and manufacturing industries needing better skills. Additionally, hospitality, aged care, transport and logistics and early childhood care are recognised as skills gaps in China's labour force that Australian providers could potentially be well positioned to address. Broader analysis of China's policy agenda, such as the Belt and Road Initiative, indicate significant potential opportunities in areas such as civil engineering, building and construction.

Regarding the issue of whether Australian delivered training should be part of the AQF, there has been a mix of responses. Australian government stakeholders have noted that some components of qualifications are not needed in a Chinese industry context, such as English language skills and understandings of Australian-industry specifics.

Australian government stakeholders have noted that China develops 15 to 25 year education plans, with rolling five year plans. This means that sustained policies are required by other governments if they wish to tie in and address China's training and education plans. Due to the very large population, and up-skilling requirements, an off-shore education and training strategy was emphasised to be important for meeting China's needs. Australia's connection to industry is a strength, and is a quality that China would like to develop – such as providing apprenticeships to combine training and industry.

As in many other countries, the challenge of applying high Australian standards of skills to a unique and different regulatory environment needs to be tackled. For example, there are five different building industry standards in China – this will greatly impact how skills are taught and how their relevance across the whole economy are received.

Training stakeholders have emphasised the importance of China and the significant potential for VET delivery, but noted important challenges and considerations for the market. Firstly, China's government has been working to establish a qualification framework. While there is a significant amount of development still required, introduced VET should keep aware of developments. Secondly, many companies find it easier to simply hire uneducated workers 'off the street' and train them in their preferred practices.

In positioning VET products for China's market, training stakeholders have identified several factors to meet industry need. In regards to automotive skills – while China has recognised strengths in this and many manufacturing skills, the needs will quickly change. A growing middle class purchasing valuable cars in greater volumes will require better customer service skills to service and maintain these vehicles. This combining of skills reflects the unique skills gaps that can arise in many emerging economies.

Hotel industry stakeholders have highlighted how multinational companies typically do a lot of in-house training for new staff. This training is very task specific, and typically does not conform to

any qualification framework. However, it can raise the standard of the industry and train workers with transferable skills that benefit other hotel companies. Note was made that often entry-level staff are local workers, but mid- and senior-management can be expatriates or internationals – which can impact the development of local skills in the industry.

Multiple stakeholder groups have commented on clearly identifying training products and how they fit into the existing qualification frameworks. Many students do not get the opportunity to follow-up an Australian VET course delivered offshore with further study or migration to Australia – but they are still willing to pay a premium for the potential path. These expectations need to be carefully managed to help ensure the opportunities provided by new courses are not misleading.

5.2.4 Indonesia

Indonesia is a major emerging economy located in Southeast Asia. Indonesia comprises a group of 13,677 islands, with only 6,000 of these inhabited. There are five main islands: West Papua, Java, Kalimantan, Sulawesi, and Sumatra. It is the fourth most populated country behind China, India and the USA.

5.2.4.1 Economic and employment backdrop

Indonesia is a rapidly growing economy and was the third-fastest-growing member of the G20 in 2014. In 2011, Indonesia was identified as one of six key emerging economies dubbed CIVETS[8] and then maintained a status of investment focus being classified in MINTS[9] in 2013. These economies are seen as potential significant contributors to future world growth, having young and growing populations, relatively advanced financial systems and diverse economies.

The CIA (2016) identifies Indonesia's key challenges as: "poverty and unemployment, inadequate infrastructure, corruption, a complex regulatory environment, and unequal resource distribution among its regions".

Figure 27: Indonesia Economy and Industry

Economic data	
Gross Domestic Product (PPP)	US$3.243 trillion (2017 est.) US$3.087 trillion (2016 est.) US$2.944 trillion (2015 est.)
GDP composition by sector	Agriculture: 13.9% Industry: 40.3% Services: 45.9% (2017 est.)
GDP growth	5.1% (2017 est.) 5% (2016 est.) 4.9% (2015 est.)
GDP per capita	US$12,400 (2017 est.)
Education expenditure	3.6% of GDP (2015)
Ease of doing business	114 (2014)
Industry structure	
Major agricultural products	rubber and similar products, palm oil, poultry, beef, forest products, shrimp, cocoa, coffee, medicinal herbs, essential oil, fish and its similar products, and spices
Industries	petroleum and natural gas, textiles, automotive, electrical appliances, apparel, footwear, mining, cement, medical instruments and appliances, handicrafts, chemical fertilizers, plywood, rubber, processed food, jewellery, and tourism
Major export partners	China 13.6%, US 10.6%, Japan 10.5%, India 8.4%, Singapore 7.6%, Malaysia 5.1%, South Korea 4.8% (2017)
Major exports	mineral fuels, animal or vegetable fats (includes palm oil), electrical machinery, rubber, machinery and mechanical appliance parts
Major import partners	China 23.2%, Singapore 10.9%, Japan 10%, Thailand 6%, Malaysia 5.6%, South Korea 5.3%, US 5.2% (2017)
Major imports	mineral fuels, boilers, machinery, and mechanical parts, electric machinery, iron and steel, foodstuffs

Country Profile Sources:
CIA World Factbook, , available at https://www.cia.gov/library/publications/resources/the-world-factbook/geos/ar.html, accessed on 21 August 2018.
OECD, World Indicators of Skills for Employment (WISE), available at http://stats.oecd.org//Index.aspx?QueryId=62775#, accessed on 21 August 2018.
ILOSTAT Database, Country Data, available at http://www.ilo.org/ilostat/faces/help_home/data_by_country?_adf.ctrl-state=yddsm3mdf_4&_afrLoop=404928031607009, accessed on 21 August 2018.

Indonesia's service sector contributed to around 46 per cent of GDP and employment in 2017. Of this, trade and other market services employs the bulk, or almost one-third of Indonesia's total workforce.

The industry sector in Indonesia contributes around 40 per cent to GDP, with a smaller share of the workforce. This is likely due to the industry sector being much more capital intensive, or conversely, the much higher labour intensity of the services sector. In contrast, while agriculture contributes a modest 14 per cent of GDP, it employs around one-third of the workforce.

Significant growth in the trade and other market services workforce and a decline in the agricultural workforce has brought these two sectors almost level in terms of the size of their workforces. While

[8] Colombia, Indonesia, Vietnam, Egypt, Turkey and South Africa
[9] Mexico, Indonesia, Nigeria and Turkey

employment in the agriculture sector has declined modestly in terms of levels, the services workforce has increased by around 50 per cent in total since 1998. The construction, mining and utilities sector has also seen significant growth, doubling its workforce over this period (albeit from a lower base).

Figure 28: Employment by sector (1998-2014)

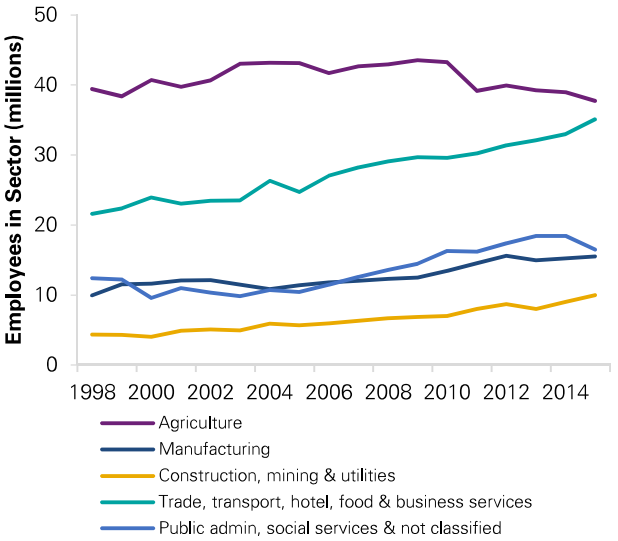
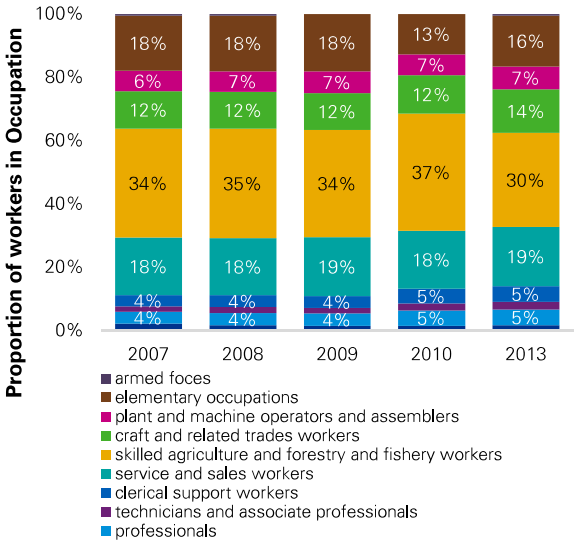


Figure 29: Labour Force by occupation (2007- 13)

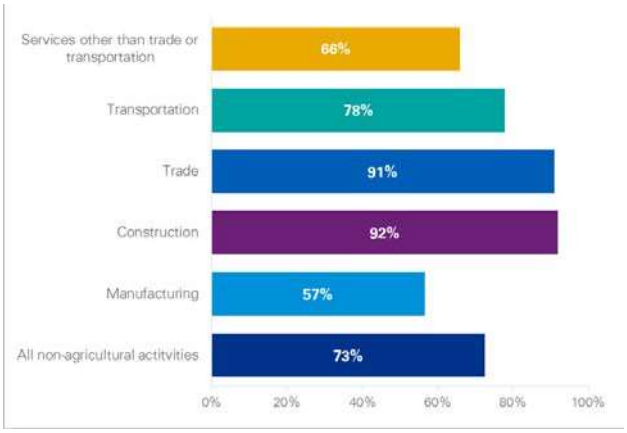


Sources: World Bank Enterprise survey (2016), International Labour Organisation (2016)

With rapid growth in an economy, access to an appropriately skilled workforce sometimes lags. Thus, these Indonesian sectors may be observing skills gaps, which unless addressed, could push them into a low-skill equilibrium – a cycle that often requires intervention to break.

This is somewhat reflected in the occupation mix data, there has been a slight decline in the share of skilled agriculture workers in 2013 compared to 2007. All other occupational shares have remained relatively constant, indicating that the workforce is not really responding to the changing structure of the economy.

Figure 30: Share of employment in informal sector (2010)



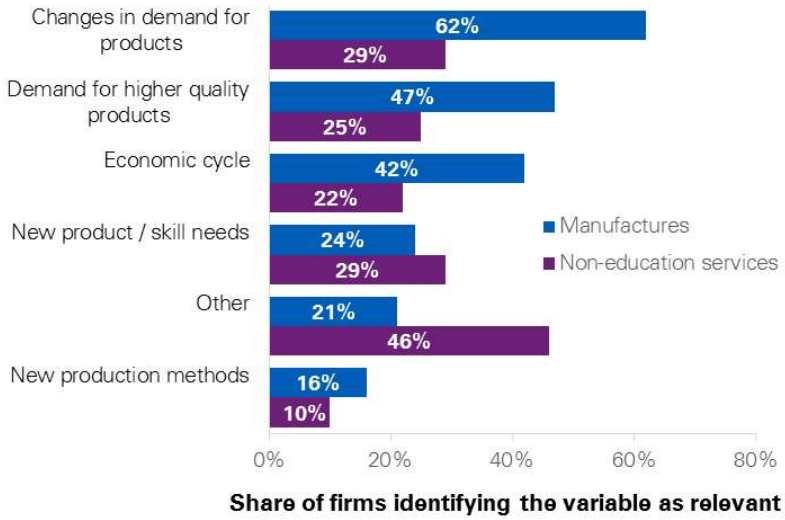
Source: International Labour Organisation (2016)

Despite solid growth in total Indonesian employment – growing by a total of 30 per cent since 1998, Figure 30 indicates that a significant proportion of the workforce are still employed in the informal economy. Almost three-quarters of all employees in non-agricultural activities work in the informal sector. Trade and construction both have the majority of their workforce in the informal economy, at 91 per cent and 92 per cent respectively.

5.2.4.2 Examples of skills shortages

Research by the World Bank provides extensive analysis of the Indonesian labour force and trends in skill-gaps for the economy. Their research has highlighted that while Indonesia has experienced strong economic growth, it has not been balanced with the right labour market, which they describe as 'jobless growth' (World Bank, 2010). The Employer Skill Survey conducted as part of the World Bank's study highlights the perceptions of industries in Indonesia to identify trends in skills shortages and anticipate future needs.[10] Research into Indonesian firms has investigated the impact of multiple drivers on staffing changes and skill demand (see Figure 31 and Figure 32).

Figure 31: Main Reason for staffing changes



Source: World Bank (2010)

Figure 31 shows that for manufacturing firms, 62 per cent said that the change in product demand and 47 per cent said a demand for higher quality products were key drivers for changing staff. This reflects that businesses are facing higher expectations for quality, and that skilled staff are also needed to meet this requirement.

Understanding the reason for staff changes in the services sector is less clear, as there is a broad mix of services in the category and a high number of firms put 'other' as a reason. A significant number of service firms did identify new products/skill needs, changing demand for products and higher quality products as a driver. This also indicates that consumers are changing their preferences in Indonesia, and businesses need appropriately skilled workers to adapt.

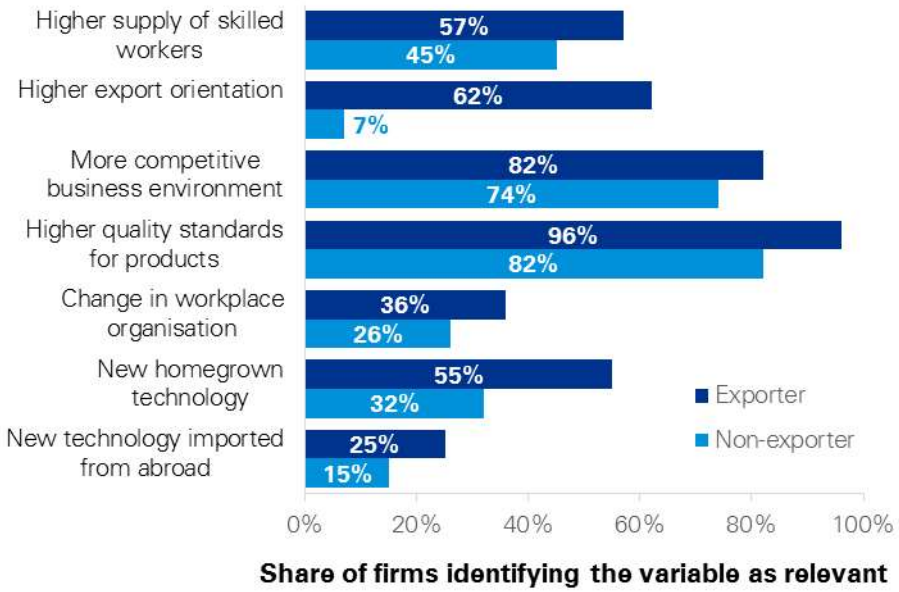
A breakdown between exporting and non-exporting firms and their drivers for staffing changes was also provided. A key trend in this data is that demand for different products and better quality products is a driver for labour changes in exporting firms, with 53 per cent of firms identifying this as the case (World Bank, 2010, p51).

Figure 32 shows an aggregated summary of the drivers for skill demand across exporting and importing firms. Key trends are the quality of products and more competitive business environments. A further breakdown of manufacturing and service subsectors is provided in the report. There is a noticeable impact of new technology brought from overseas influencing the skill needs of machinery and metal fabrication manufacturing businesses (World Bank, 2010, p52). Nearly all manufacturing sub-industries identified higher quality products as a need for increased skilled labour.

[10] This survey had 473 respondents out of 500 across 5 provinces: Kepulauan Riaou (15%), DKI Jakarta (18%), West Java (35%), East Java (24%), Banten (8%). The majority of respondents were manufacturing firms (57%) with the rest consisting various non-education services.

For the service industry, technology has less of an impact. A couple of emerging themes are the higher quality standards for products, particularly in the health, real estate and transport sectors. Most service industries report increased competitiveness as a driver for skill needs. On the labour supply side, 87 per cent of construction firms, 60 per cent of health service firms and 59 per cent of financial service firms indicated that an increased supply of skilled workers influenced their skill needs (World Bank, 2010, p54).

Figure 32: Drivers of firm's increased use for skills in Indonesia



Source: World Bank (2010)

In other studies that focus on Indonesia, empirical evidence suggests that it is issues regarding the relevance and quality of education and training, rather than quantity that is leading to skills gaps. An IMF survey shows that finding the right candidate for a high profile position like a director is perceived to be difficult by over 80 per cent and for professional jobs by 60 per cent of respondents. The study also identified gaps in computer and English skills which are likely to affect the export and technologically oriented sectors. While English remains the largest gap, other gaps identified are in creativity and some technical skills for young workers.

Indonesia's TVET system is also seen as problematic in its operation. With severe underfunding, it has limited capacity and produces relatively low-skilled workers, earning a relatively poor reputation. This is compounded by a lack of incentive for curriculum designers to implement what is demanded by industry. The supply side approach has led to a fragmented system with gaps, duplications and policy inconsistencies disadvantageous to learners (Ramos, 2016).

Di Gropello (2011) research points towards both relevance and quality concerns around workforce skills. In this paper, quality was identified as a critical issue especially for upper-secondary education graduates. Despite improvements in educational attainment, Indonesian youth still have intense skills gaps that present challenges in employment prospects to its workforce. Young workers (27 and below) exhibit lower sense of preparedness or qualification for their job or professional life in general and data shows that more than 40 per cent of young workers very much agree that there is a need to improve their skills to help improve their performance.

5.2.4.3 Stakeholder experiences

Australian government stakeholders identify Indonesia as a priority country with which to build relationships, given their close proximity and strong trade relationship.

Multiple stakeholders commented that industry-specific skill needs are broad, but some specific examples included aquaculture, civil construction and automotive manufacturing.

Training stakeholders have noted that there is potential to be explored in Indonesia, but that a low willingness to pay for training currently exists. Furthermore, a highly complex regulatory system is also increasing the barrier to entry of Australian providers. However, opportunities should be explored given their close proximity, and that the government is eager to engage in strategies to motivate idle youth. As travel expenses are one of the most significant barriers for off-shore education delivery, Indonesia's proximity is an important factor. Proximity, and the trust resulting from it, also provides Australia with an edge over major competitors such as Germany.

Also noted, was that high risk skills – such as electrical and construction – are in demand but face significant challenges from poor regulation and low occupational health and safety standards.

High level instruments such as ASEAN Mutual Recognition Agreements and President Widodo's VET revitalisation instructions, as well as projects such as KOMPAK (a project funded by DFAT to develop national competency standards) have also enabled the identification of priority sectors for Indonesian VET. These include fisheries, agriculture, power and electricity, electronics, automotive, telecommunications, creative industries, logistics, tourism, construction, engineering, nursing, architecture, surveying, dental practitioners, medical practitioners and accountancy.

5.2.5 Malaysia

Malaysia is made up of two parts: the peninsula south of Thailand and the northern third of the island of Borneo. Malaysia has undertaken significant structural change over the past half century, moving away from being a country dependent on primary production / raw materials to its current form as a middle income, emerging, and multi-sectoral economy.

5.2.5.1 Economic and employment backdrop

Malaysia has set itself a target of achieving high-income status by 2020. In May 2015, The Diplomat (2015) reported that, according to analysts, "Malaysia was on track to achieve its goal of first-world status by 2020".

It also reported that the IMF identified structural reforms as key to achieving this goal, saying that "continued investment in infrastructure and in research and development can help spur home-grown innovation and increase incomes. Together with improvements in the quality of education, these efforts can help raise labour productivity, support higher sustainable growth, and foster a more inclusive society."

Figure 33: Malaysia Economy and Industry

Economic data	
Gross Domestic Product (PPP)	US$930.8 billion (2017 est.) US$893.1 billion (2016 est.) US$850.3 billion (2015 est.)
GDP composition by sector	Agriculture: 8.4% Industry: 36.9% Services: 54.7% (2017 est.)
GDP growth	5.9% (2017 est.) 4.2% (2016 est.) 5% (2015 est.)
GDP per capita	US$29,000 (2017 est.)
Education expenditure	4.8% of GDP (2016)
Ease of doing business	18 (2014)
Industry structure	
Major agricultural products	Peninsular Malaysia - palm oil, rubber, cocoa, rice; Sabah - palm oil, subsistence crops; rubber, timber; Sarawak - palm oil, rubber, timber; pepper
Industries	Peninsular Malaysia - rubber and oil palm processing and manufacturing, petroleum and natural gas, light manufacturing, pharmaceuticals, medical technology, electronics and semiconductors, timber processing; Sabah - logging, petroleum and natural gas production; Sarawak - agriculture processing, petroleum and natural gas production, logging
Major export partners	Singapore 15.1%, China 12.6%, US 9.4%, Japan 8.2%, Thailand 5.7%, Hong Kong 4.5% (2017)
Major exports	semiconductors and electronic equipment, palm oil, petroleum and liquefied natural gas, wood and wood products, palm oil, rubber, textiles, chemicals, solar panels
Major import partners	China 19.9%, Singapore 10.8%, US 8.4%, Japan 7.6%, Thailand 5.8%, South Korea 4.5%, Indonesia 4.4% (2017)
Major imports	electronics, machinery, petroleum products, plastics, vehicles, iron and steel products, chemicals

Country Profile Sources:
CIA World Factbook, , available at https://www.cia.gov/library/publications/resources/the-world-factbook/geos/ar.html, accessed on 21 August 2018.
OECD, World Indicators of Skills for Employment (WISE), available at http://stats.oecd.org//Index.aspx?QueryId=62775#, accessed on 21 August 2018.
ILOSTAT Database, Country Data, available at http://www.ilo.org/ilostat/faces/help_home/data_by_country?_adf.ctrl-state=yddsm3mdf_48&_afrLoop=404928031607009, accessed on 21 August 2018.

Malaysia's economy is highly export oriented, with exports of electronics, oil and gas, palm oil, and rubber significant contributors to the economy. Overall, exports make up around 75 per cent of Malaysia's GDP.

The government is highly dependent on oil and gas activity in Malaysia, earning just under one-quarter of its revenue from this sector in 2015.

In terms of sectoral activity, the services sector in Malaysia contributed over half of GDP in 2017, with the industry sector contributing over one-third and the agriculture sector contributing the remaining 8 per cent.

In contrast to other emerging countries in this region, Malaysia's services sector is the highest employer in the country (and has been for over 15 years). Trade and other market services employ

over 40 per cent of Malaysia's workforce, while the public and other social services employ around 20 per cent. Trade and other market services has also had the fastest growing employment of all sectors in the economy, more than doubling its workforce over the past 15 years.

Figure 34: Employment by sector (1998 - 2014)

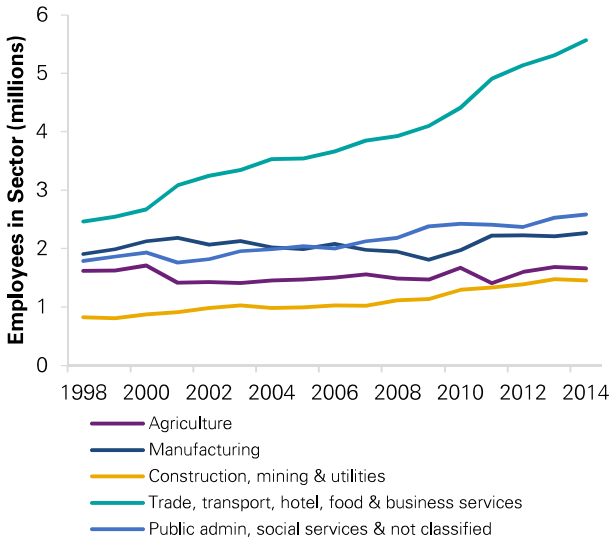
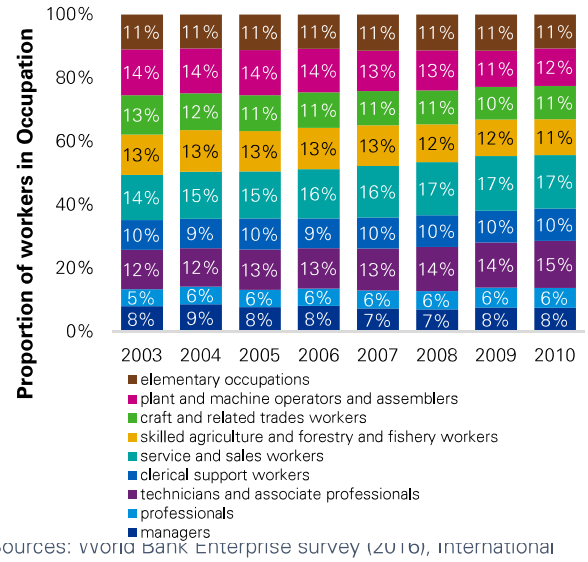


Figure 35: Labour Force by occupation (2003-10)



Sources: World Bank Enterprise survey (2016), International Labour Organisation (2016)

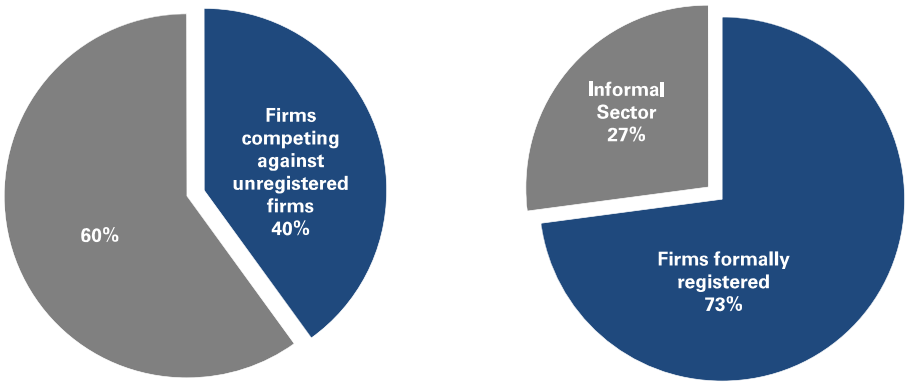
In line with the strong growth in services, there has been an increase in the service and sales workers share of the labour force, increasing from 14 per cent in 2003 to 17 per cent by 2010.

The economy has become slightly higher skilled, with an increase in the share of the labour force held by technicians and associate professionals and a decrease in craft and related trades workers, skilled agriculture workers, and plant and machine operators and assemblers.

Figure 36 shows that in 2015, around 27 per cent of businesses in the Malaysian economy were unregistered when they first started operating. Nearly 40 per cent of firms identify as facing competition from unregistered or informal businesses, indicating that the informal economy is still a significant part of the Malaysian economy.

Countries with skills mismatch are often characterised by a higher informal sector (OECD, 2014). As the economy continues to develop, parts of the informal sector will likely move into the formal economy. This will potentially include regulatory reform and create demand for up-skilling of both workers and management.

Figure 36: Informal economy share (2015)



Source: World Bank Enterprise survey (2016)

5.2.5.2 Examples of skills shortages

The Asian Institute of Finance (2015) conducted a study on skills gaps in the Malaysian financial sector and concluded that the majority of managers and HR directors observe a lack of competent and skilled employees. Moreover, almost all respondents (94 per cent) reported the talent shortage as impacting the productivity of their business, with greater than 50 per cent of the respondents believing employees skill deficiencies are impeding performance. The report also revealed that 93 per cent of employers surveyed reported that talent shortages are affecting their business productivity. Employers cite a lack of critical thinking, communication and language proficiency skills in graduates as particularly detrimental (Ramos, 2016).

A study by Anuar et al. (2016) focused on Small and Medium Enterprises (SMEs) and concluded that there is a high degree of skills mismatch in Malaysia. On one hand, there is a pool of highly skilled individuals who feel they are underemployed in the SMEs – while they have the ability to handle complex tasks, this is not a requirement of their current position. On the other hand, some employees are under-skilled for their current job and they lack the skill requirements for their job. The effect of under-skilling is to reduce productivity and slow the rate of technology adoption. That there is a skills shortage is most clearly evidenced by the fact that Malaysia's Higher Education Blueprint 2015-2025 found that there is an undersupply of technical education and vocational training (TVET) workers in 10 of the 12 national Key Economic Area sectors (Ramos, 2016).

5.2.5.3 Stakeholder experiences

Training stakeholders are currently working in Malaysia to train trainers, a task that plays an important role in facilitating further training. It was also identified that the Malaysian government has been working to improve their VET system – highlighting that international training providers need to consider local frameworks when developing/delivering training in Malaysia. Training stakeholders are also aware that many other foreign training providers are operating in Malaysia, creating a high degree of competition in the VET market.

Industry stakeholders have noted that while there is a need to provide up-skilling in some high-risk industries, care needs to be taken to protect Australia's training reputation (which is currently quite positive). An example of a successful collaboration on this front is through the 'safer together' initiative promoted by Queensland natural gas and exploration industries, which is working to improve OH&S in Malaysia.

Along with other Indian Ocean neighbours, Australian government stakeholders noted that Malaysia is part of the multilateral port and logistics occupation standardisation, presenting further opportunities for up-skilling in this sector – and also advanced skill levels in trade-relating sectors.

Other industries in Malaysia identified as having potential for up-skilling include aquaculture, tourism, civil construction and automotive manufacturing.

5.2.6 Singapore

Singapore is a highly developed, trade-oriented economy that is located in South-eastern Asia, between Malaysia and Indonesia. Since becoming independent in 1965, Singapore has re-invented itself from a small domestic-focussed economy with high levels of poverty, into a high income economy[11]. Singapore is a strong open economy that enjoys high per capita GDP and a low rate of unemployment.

5.2.6.1 Economic and employment backdrop

CIA (2018) has identified a number of challenges for Singapore including: dependence on foreign labour, weak productivity, and increasing Singaporean wages.

To maintain its competitive position despite rising wages, Singapore is focusing on high value-added activities in the manufacturing and services sectors. It is also seeking to strengthen its position as Southeast Asia's leading financial and high-tech hub. Further, many sectors such as financial services, telecommunications, and power generation and retailing are now (or are in the process of becoming) accessible to both domestic and foreign service providers.

Figure 37: Singapore Economy and Industry

Economic data	
Gross Domestic Product (PPP)	US$527 billion (2017 est.) US$514.7 billion (2016 est.) US$503.4 billion (2015 est.)
GDP composition by sector	Agriculture: 0% Industry: 24.8% Services: 75.2% (2017 est.)
GDP growth	3.6% (2017 est.) 2.4% (2016 est.) 2.2% (2015 est.)
GDP per capita	US$93,900 (2017 est.)
Education expenditure	2.9% of GDP (2013)
Ease of doing business	1 (2014)
Industry structure	
Major agricultural products	vegetables; poultry, eggs; fish, ornamental fish, orchids
Industries	electronics, chemicals, financial services, oil drilling equipment, petroleum refining, biomedical products, scientific instruments, telecommunication equipment, processed food and beverages, ship repair, offshore platform construction, entrepot trade
Major export partners	China 14.7%, Hong Kong 12.6%, Malaysia 10.8%, US 6.6%, Indonesia 5.8%, Japan 4.7%, South Korea 4.6%, Thailand 4% (2017)
Major exports	machinery and equipment (including electronics and telecommunications), pharmaceuticals and other chemicals, refined petroleum products, foodstuffs and beverages
Major import partners	China 13.9%, Malaysia 12%, US 10.7%, Japan 6.3%, South Korea 5% (2017)
Major imports	machinery and equipment, mineral fuels, chemicals, foodstuffs, consumer goods

Country Profile Sources:
CIA World Factbook, , available at https://www.cia.gov/library/publications/resources/the-world-factbook/geos/ar.html, accessed on 21 August 2018.
OECD, World Indicators of Skills for Employment (WISE), available at http://stats.oecd.org//Index.aspx?QueryId=62775#, accessed on 21 August 2018.
ILOSTAT Database, Country Data, available at http://www.ilo.org/ilostat/faces/help_home/data_by_country?_adf.ctrl-state=yddsm3mdf_4&_afrLoop=404928031607009, accessed on 21 August 2018.

Singapore's economy is very service focussed, with this sector contributing to around three quarters of both GDP and employment in 2015. Major services in Singapore include trade, financial and business services, transport, and accommodation and food services.

The industry sector is also an important component of the Singapore economy, providing around one-quarter of total employment and GDP in 2017. Employment in the construction sector has grown over the past 15 years, to now be an equivalent sized employer as the Singapore manufacturing sector. In contrast to many of the other economies in this region, the agriculture sector is very small in Singapore – in terms of both output and employment (the result of a scarcity of land).

[11] A high-income economy is defined by the World Bank as a country with a gross national income per capita above US$12,475 in 2015.

Figure 38: Employment by sector (1998 - 2014)

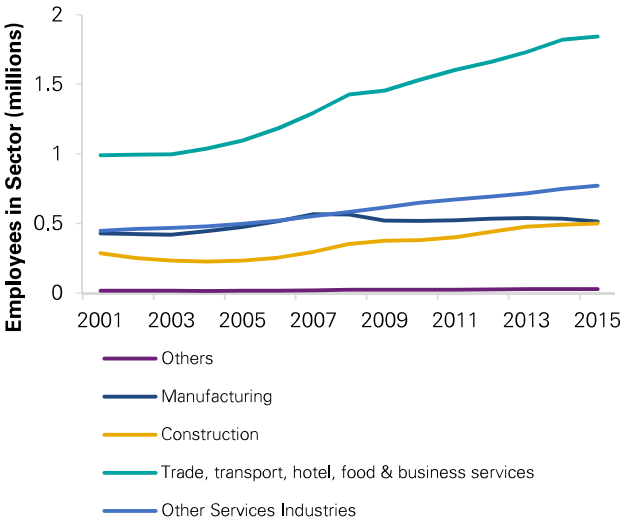
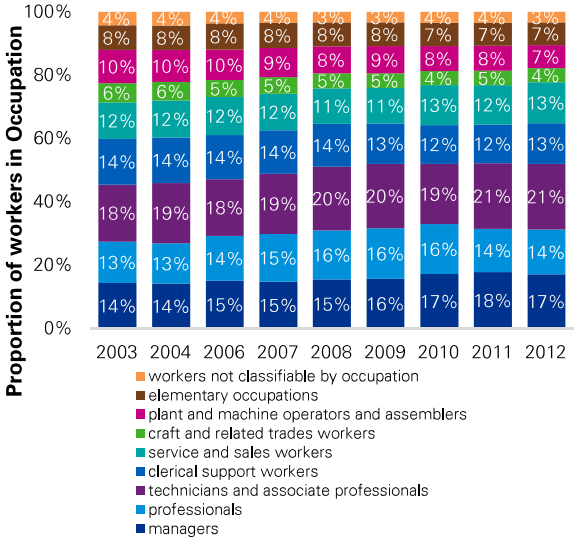


Figure 39: Labour Force by occupation (2003-12)



Sources: Singapore Ministry of Manpower (2016)[12], International Labour Organisation (2016)

Also in contrast to a number of other countries in this region, the Singapore economy is also relatively high-skilled, with over half of the labour force in occupations such as managers, professionals, and technicians and associated professionals. Only 7 per cent of the labour force are classified in elementary occupations. This up-skilling of the labour force appears be a growing trend, with medium skill – such as service and sales workers, and plant and machine worker – categories shrinking as a share of the total labour force.

One impact of this is the potential for a mismatch between a higher educated population and the more practical skill needs for the growing services and industry sectors of the economy – such as food services, construction, and manufacturing skills.

5.2.6.2 Examples of skills shortages

OECD (2015) survey showed that adults in Singapore exhibit below-average proficiency in literacy and numeracy, but above-average proficiency in problem solving in technology-rich environments compared to OECD average. The below average proficiency is attributed to the prevalence of adults whose native language is different from that of the assessment (English).

In addition, the OECD recorded a higher dispersion of proficiency scores in Singapore than in most other economics. Singaporean adults recorded a 26 per cent lack of literacy skills and 28 per cent had poor numeracy skills and the figures dramatically increased with age.

Approximately 44 per cent of employers in Singapore reported experiencing difficulties in filling a position due to lack of skilled/talented workers (Aring, 2012). This survey included businesses in the agriculture, construction and manufacturing sectors.

5.2.6.3 Stakeholder experiences

While Singapore has not been a core focus across the stakeholder consultations, many trends and needs identified for South East Asia – particularly for service industries – apply to Singapore.

Training stakeholders have also identified that the establishment of international hotel chains in Singapore set a high occupational standard not just for Singapore but also for the broader region. As a highly international country, advances in Singapore have the potential to spill-over to other local economies.

[12] Generated by: SingStat Table Builder, Date generated: 15/09/2016, Contact: info@singstat.gov.sg

5.2.7 South Korea

South Korea is a high income economy located on the southern half of the Korean peninsula, in northeast Asia.

CIA (2016) identifies South Korea's long terms challenges as including: "a rapidly aging population, inflexible labour market, dominance of large conglomerates, and the heavy reliance on exports".

A further challenge for South Korea is through its culture of identifying higher education as a necessity for socioeconomic success, and the consequential social stigma associated with vocational careers. This has led to labour market mismatch, with labour shortages in vocational occupations and an oversupply of university graduates in South Korea.

5.2.7.1 Economic and employment backdrop

South Korea is a high-tech industrialised economy, with a high dependency on exports. Exports contributed to around half of GDP in 2015, and include electronics, refined petroleum, automobiles and ships.

Figure 40: South Korea Economy and Industry

Economic data	
Gross Domestic Product (PPP)	US$2.029 trillion (2017 est.) US$1.973 trillion (2016 est.) US$1.92 trillion (2015 est.)
GDP composition by sector	Agriculture: 2.2% Industry: 39.3% Services: 58.3% (2017 est.)
GDP growth	3.1% (2017 est.) 2.8% (2016 est.) 2.8% (2015 est.)
GDP per capita	US$39,400 (2017 est.)
Education expenditure	5.1% of GDP (2015)
Ease of doing business	5 (2014)
Industry structure	
Major agricultural products	rice, root crops, barley, vegetables, fruit, cattle, pigs, chickens, milk, eggs, fish
Industries	electronics, telecommunications, automobile production, chemicals, shipbuilding, steel
Major export partners	China 25.1%, US 12.2%, Vietnam 8.2%, Hong Kong 6.9%, Japan 4.7% (2017)
Major exports	semiconductors, petrochemicals, automobile/auto parts, ships, wireless communication equipment, flat displays, steel, electronics, plastics, computers
Major import partners	China 20.5%, Japan 11.5%, US 10.5%, Germany 4.2%, Saudi Arabia 4.1% (2017)
Major imports	crude oil/petroleum products, semiconductors, natural gas, coal, steel, computers, wireless communication equipment, automobiles, fine chemicals, textiles

Country Profile Sources:
CIA World Factbook, , available at https://www.cia.gov/library/publications/resources/the-world-factbook/geos/ar.html, accessed on 21 August 2018.
OECD, World Indicators of Skills for Employment (WISE), available at http://stats.oecd.org//Index.aspx?QueryId=62775#, accessed on 21 August 2018.
ILOSTAT Database, Country Data, available at http://www.ilo.org/ilostat/faces/help_home/data_by_country?_adf.ctrl-state=yddsm3mdf_4&_afrLoop=404928031607009, accessed on 21 August 2018.

Like Singapore, services dominate the South Korean economy, contributing to around 60 per cent of GDP and over 70 per cent of employment. Trade and other market services is the largest employer in South Korea. The two fastest growing sectors are trade and other market services and public and other social services, growing by 26 per cent and 64 per cent in total over the past 15 years.

Industry employment – in manufacturing and construction, mining and utilities - has been relatively stable. Agriculture, although only a small part of the Korean economy, has observed a further contraction in employment over the last 15 years.

Figure 41: Employment by sector (1998 - 2014)

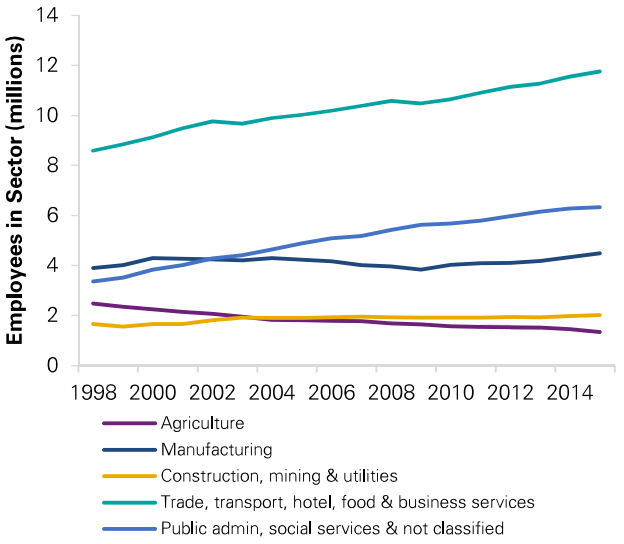
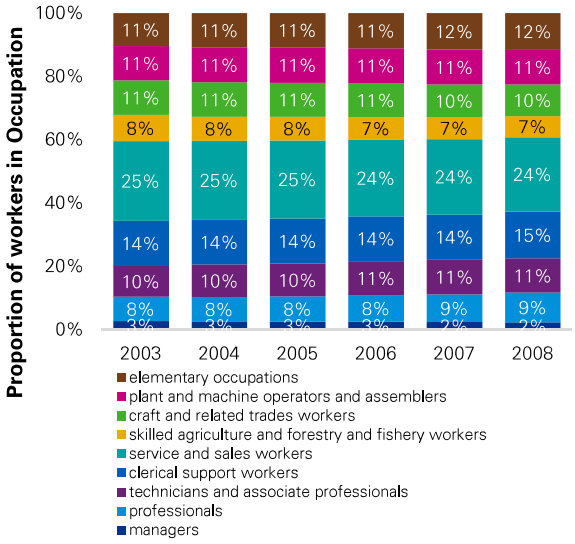


Figure 42: Labour Force by occupation (2003-08)



Sources: World Bank Enterprise survey (2016), International Labour Organisation (2016)

In line with the economic dominance of the services sector, the largest occupation observed in South Korea is that of service and sales workers, which make up almost one-quarter of the labour force. Another quarter of the labour force is spread across the high-skill categories of managers, professionals, or technicians and associated professionals. Only 12 per cent of the labour force were identified in the low skilled "elementary occupations" category.

It is also interesting to note that, despite the significant growth in the services sector compared to the rest of the economy, no major changes in the occupation composition of the labour force have been observed over the last five years (between 2003 and 2008).

Given the cultural preference for higher education and the significant and growing need for sales and service workers, there is a distinct potential mismatch between the skill needs and the educational attainment of the population. This indicates that South Korea is likely to be both on the skills gaps – for sales and services staff - part of the labour market conceptual framework (outlined on page 3) and on the skill surplus – professionals and managers – parts of the framework. There may be a need for encouraging a movement towards vocational training and away from higher education to help South Korea attain a High Skill equilibrium.

5.2.7.2 Examples of skills shortages

OECD (2015) found that skills among the Korean adult population remains low compared with other regional countries. Even though Korea has a larger proportion of educated population, about 30 per cent of Korean college graduates thought that there was a mismatch between their college majors and jobs.

Since wages is a measure of value of a worker to the firm, Lee and Lee (2015) analysed the relationship between skills attainment and earning to evaluate the effect of skills mismatch using Korean data from the Programme for the International Assessment of Adult Competencies (PIAAC).

They found that 27 per cent of full-time workers aged 25-54 in Korea are overeducated for their job requirements, while 15 per cent are undereducated. For undereducated workers, they suffer a wage penalty for the deficit of education.

Since the late 1980's and early 1990s, South Korea has also been accepting foreign workers to assist businesses fill vacancies – particularly in the low skilled labour market. This trend appears to be continuing, with the government announcing at the end of 2017 that it would again accept 56,000 foreign workers in 2018 to help tackle labour shortages – particularly in its manufacturing sector, with some working in farming, fishing, construction and services. While businesses are continuing to demand access to more (cheaper) foreign labour, the government is seeing some public backlash over 'foreigners taking locals' jobs'

5.2.7.3 Stakeholder experiences

At the Korean sectoral level, Government stakeholders have identified opportunity for up-skilling in areas of hospitality, childcare and cookery – particularly as Australia has a reputation for high quality training in these industries. Welding and IT skills were also seen as a gap in Korea where Australian training providers could potentially assist.

Like much of the region, aged care is expected to grow as longevity increases. The Korean Ministry of Health and Welfare has developed policies to address dementia and provide long-term care insurance. Korea currently has a caregiver for the elderly qualification, but the Korean government does have scope to increase the level of aged care program. The greatest challenge in this regard is finding youths willing to learn this service.

The suitability of non-AQF delivery of training was questioned by Australian government stakeholders and training stakeholders, as Korea has a well-developed VET system of their own, and the primary benefit for Australian VET is seen as the opportunity to travel or to participate in professional development that informs work practices.

5.2.8 Vietnam

Vietnam is a country in south-eastern Asia, and shares a border with China, Laos, and Cambodia. Similar to many of the other countries examined in this region, Vietnam has experienced strong economic growth over the past few decades, transforming from one of the poorest countries in the world to its current status as a lower middle income country.

5.2.8.1 Economic and employment backdrop

Vietnam has achieved strong economic growth, averaging 6.2 per cent GDP growth since 2000.

Vietnam has a strong agricultural and fisheries export sector – including the export of seafood, rice, and coffee. Vietnam has also been building its regional presence as a foreign investment destination.

Industry is also an important, and growing, part of the Vietnamese economy – particularly in the areas of manufacturing, information technology and high-tech industries. Vietnam is also one of the region's largest oil producers.

While still a strong part of the economy, agriculture's share of the economy has fallen from around one-quarter of GDP to 17 per cent over the past 15 years. In comparison, over the same period, industry's share has grown from around one third to almost 40 per cent. Services are also a growing part of the economy, estimated to contribute just over 41 per cent of GDP in 2017.

Figure 43: Vietnam Economy and Industry

Economic data	
Gross Domestic Product (PPP)	US$647.4 billion (2017 est.) US$609.5 billion (2016 est.) US$571.4 billion (2015 est.)
GDP composition by sector	Agriculture: 15.3% Industry: 33.3% Services: 41.3% (2017 est.)
GDP growth	6.8% (2017 est.) 6.2% (2016 est.) 6.7% (2015 est.)
GDP per capita	US$6,900 (2017 est.)
Education expenditure	5.7% of GDP (2013)
Ease of doing business	78 (2014)
Industry structure	
Major agricultural products	rice, coffee, rubber, tea, pepper, soybeans, cashews, sugar cane, peanuts, bananas; pork; poultry; seafood
Industries	food processing, garments, shoes, machine-building; mining, coal, steel; cement, chemical fertilizer, glass, tires, oil, mobile phones
Major export partners	US 20.1%, China 14.5%, Japan 8%, South Korea 6.8% (2017)
Major exports	clothes, shoes, electronics, seafood, crude oil, rice, coffee, wooden products, machinery
Major import partners	China 25.8%, South Korea 20.5%, Japan 7.8%, Thailand 4.9% (2017)
Major imports	machinery and equipment, petroleum products, steel products, raw materials for the clothing and shoe industries, electronics, plastics, automobiles

Country Profile Sources:
CIA World Factbook, , available at https://www.cia.gov/library/publications/resources/the-world-factbook/geos/ar.html, accessed on 21 August 2018.
OECD, World Indicators of Skills for Employment (WISE), available at http://stats.oecd.org//Index.aspx?QueryId=62775#, accessed on 21 August 2018.
ILOSTAT Database, Country Data, available at http://www.ilo.org/ilostat/faces/help_home/data_by_country?_adf.ctrl-state=yddsm3mdf_4&_afrLoop=404928031607009, accessed on 21 August 2018.

Despite only contributing to around 15 per cent of GDP, agriculture is still the main employing sector in the economy, employing around 40 per cent of all workers in Vietnam. Similar to its contribution to GDP, the services sector is also a growing contributor to Vietnam employment, increasing its share of employment from around 25 per cent in 2004, to now employ 34 per cent of the Vietnam workforce.

While employment in the agriculture sector has remained relatively stable, significant growth in employment has been observed the rest of the economy since 1998. Construction employs almost four times as many workers in 2014 as it did in 1998. Employment has more than doubled across the manufacturing, trade and other market services, and public and other social service sectors since 1998.

Figure 44: Employment by sector (1998 - 2014)

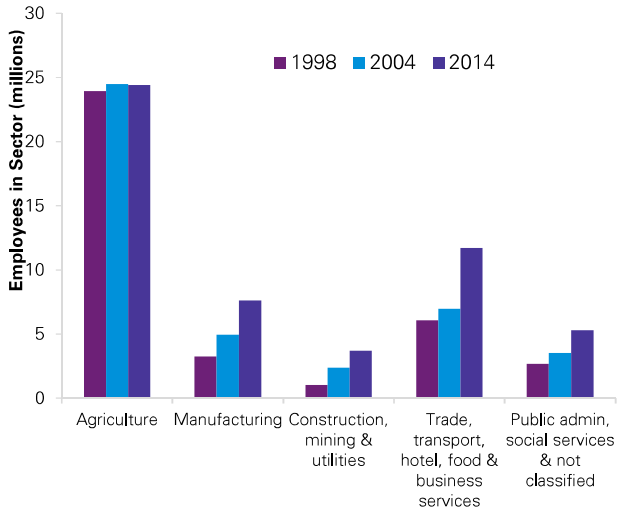
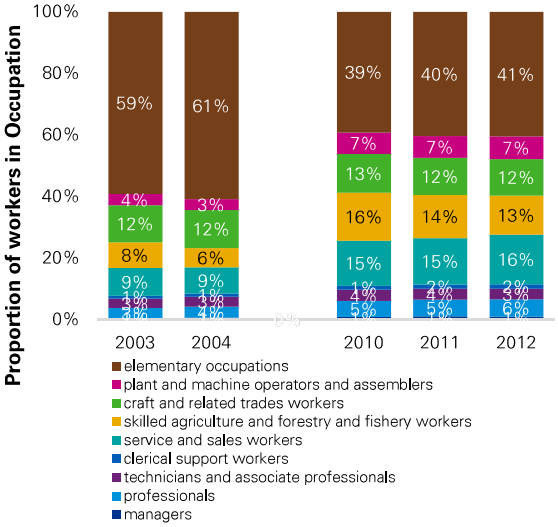


Figure 45: Labour Force by occupation (2003-12)



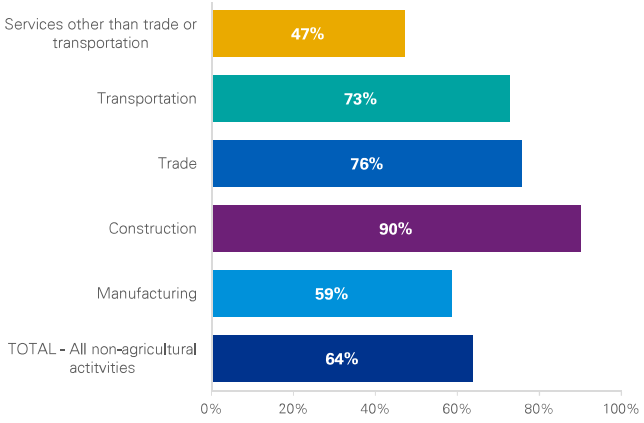
Sources: World Bank Enterprise survey (2016), International Labour Organisation (2016)

Vietnam's labour force is relatively low skilled, with around 40 per cent of the labour force in elementary occupations. Only 10 per cent of occupations are in the high skilled categories of managers, professionals, or technicians and associated professionals.

There appears to have been a significant switch between the share of elementary workers in the labour force and the share of medium skilled categories of plant and machine operators and assemblers, and skilled agriculture and forestry and fishery workers. This could reflect the government's VET priorities introduced in "MOLISA's Master Plan for the Development of a Network of Vocational Colleges, Vocational Secondary Schools, and Vocational Training Centres". Under this plan, the number of vocational training students is targeted to increase 10 per cent annually. Thus, in contrast to some of the other economies examined in this region, the Vietnam government is actively promoting the VET sector to help address existing skills gaps. With a continued focus on up-skilling the economy, Vietnam has the potential to move towards a more high skill equilibrium.

Vietnam's informal sector employs a relatively large proportion of employees. Overall, two-thirds of all employees in non-agricultural activities are part of the informal economy. Similar to many other Asian countries, employment in construction is largely informal (90 per cent). Further, almost three-quarters of employees in the trade and transportation sectors are employed in the informal economy. As the Vietnamese economy continues to develop, parts of the informal sector will likely move into the formal economy. This will potentially include regulatory reform and create further demand for up-skilling of both workers and management.

Figure 46: Share of employment in informal sector (2010)



Source: International Labour Organisation (2016)

5.2.8.2 Examples of skills shortages

A media release by the Ministry of Labour in Vietnam has highlighted the government's attention to improving education and up-skilling workers to be better prepared for industries. They mention that of the 53 per cent of the workforce that has been trained, only 20 per cent of this group underwent training for three months or longer. This was identified as a reason for insufficient skills in the labour force, and that improvements to VET were necessary to better prepare workers (MOL, 2016). Reforms to VET have occurred over the past two years, and further improvements to training have been recognised as a strategy for better integrating into the world economy.

The ILO has connected skills mismatch to low labour productivity in Vietnam. Vietnam has one of the lowest labour productivity in the Asia-Pacific region, with output per worker 15 times lower than in Singapore (ILO, 2013).

Data from the General Statistics Office of Vietnam shows that there is a higher proportion of untrained workers in Vietnam than trained workers. In addition, Vietnam's Central Institute for Economic Management (CIEM) conducted research with the support of the World Bank (2012) and also identified a mismatch between supply and demand of skills. They noted that around 47 per cent of firms claimed that the education system failed to meet the skill needs of the workplace.

Research by the World Bank (2014) has highlighted a lack of skills at several occupational levels. Notably, 83 per cent of technicians and 80 per cent of professional job applications were said to have a lack of required skills for the position. For craftsmen, a significant 40 per cent of applicants lacked the required skills. However, 41 per cent of businesses also noted a lack of applicants for craftsmen occupations. This highlights both a skill gap in the ability of workers and a skill shortage in the volume of workers required by some industries (World Bank, 2014). According to the World Bank survey:

- Many Vietnamese firms report a shortage of workers with the right skills
- Skills gaps are particularly acute among applicants for jobs in technical, professional and managerial positions
- A shortage in applicants is common among more elementary occupations
- Employers identify job-specific technical skills as the most important skill.

Good performance is observed by management staff in terms of information skills, negotiation skills, understanding of system, and ability to apply technology to assigned tasks. However, poor performance is observed in terms of time and human resource management; teamwork skills; and the ability to teach new skills, exercise leadership, improve and design systems, and to select technology (TDRI, 2012).

5.2.8.3 Stakeholder experiences

Vietnam government stakeholders have identified a number of priority industries for the next two to five years. These include mechanical, electronic, construction, automobile mechanic, IT, media, communications, tourism, commerce and retail, transport and logistics, telecommunications, and high-tech agricultural industries.

The Vietnam government has strongly identified the need to develop human capital in the economy, to become a more competitive economy and to facilitate sustainable economic growth. They note that only 20 per cent of workers have professional skills, and that enterprises typically avoid recruiting 'trained' workers as they usually require re-training to meet their needs.

Australian education providers are well received in Vietnam by parents, students and the government. However, VET has significant limitations in being affordable for potential students and workers. The Vietnam government notes that the Australian government budget per student vastly exceeds the Vietnamese government budget per student – highlighting the costs issue.

Looking at international competitors in the VET space, the Vietnam government identifies Japan and Korea as two key competitors. Germany, Canada, UK, Singapore and Taiwan also have a significant presence in the VET market.

Australian government stakeholders note that limited presence of Australian multinational companies in Vietnam may have an impact on accessing VET markets. This is emphasised due to the high amount of informal learning that occurs for workers, as Vietnam industry prefers to take unskilled workers and then train them using their own processes.

For the agricultural sector, Australian government stakeholders mentioned that Vietnam may participate in a program where farmers are brought to Australia to learn better techniques and practices. This program was previously undertaken for Israel and has the potential to deepen training opportunities.

Training stakeholders are aware that Vietnam is investing in its own teachers to learn about the Australian education system. This highlights the recognised quality of Australian education providers. The competency based VET system that Australia utilises also has strong appeal to countries, such as Vietnam, that have large informal markets and developing education industries.

5.2.9 Thailand

Thailand is located in south-eastern Asia, sharing a border with Myanmar, Laos, Cambodia and Malaysia. Similar to Vietnam, Thailand has achieved strong economic growth over the past few decades, achieving average annual growth of 7.5 per cent in the late 1980s and early 1990s. Thailand is classed as an upper middle-income economy.

5.2.9.1 Economic and employment backdrop

Exports are an important part of Thailand's economy, contributing to more than two-thirds of GDP in 2017. Exports of Thailand goods include electronics, agricultural commodities, automobiles and parts, and processed foods.

Tourism is also a significant part of the Thailand export market, with visitor exports estimated to have generated over 19 per cent of total exports in 2017 (World Travel & Tourism Council , 2018). It is estimated that the direct contribution of all travel and tourism in Thailand was close to 10 per cent of GDP in 2017.

Figure 47: Thailand Economy and Industry

Economic data	
Gross Domestic Product (PPP)	US$1.229 trillion (2017 est.) US$1.185 trillion (2016 est.) US$1.148 trillion (2015 est.)
GDP composition by sector	Agriculture: 8.2% Industry: 36.2% Services: 55.6% (2017 est.)
GDP growth	3.7% (2017 est.) 3.2% (2016 est.) 2.9% (2015 est.)
GDP per capita	US$17,800 (2017 est.)
Education expenditure	4.1% of GDP (2013)
Ease of doing business	26 (2014)
Industry structure	
Major agricultural products	rice, cassava (manioc, tapioca), rubber, corn, sugarcane, coconuts, palm oil, pineapple, livestock, fish products
Industries	tourism, textiles and garments, agricultural processing, beverages, tobacco, cement, light manufacturing such as jewellery and electric appliances, computers and parts, integrated circuits, furniture, plastics, automobiles and automotive parts, agricultural machinery, air conditioning and refrigeration, ceramics, aluminium, chemical, environmental management, glass, granite and marble, leather, machinery and metal work, petrochemical, petroleum refining, pharmaceuticals, printing, pulp and paper, rubber, sugar, rice, fishing, cassava, world's second-largest tungsten producer and third-largest tin producer
Major export partners	China 12.4%, US 11.2%, Japan 9.5%, Hong Kong 5.2%, Vietnam 4.9%, Australia 4.5%, Malaysia 4.4% (2017)
Major exports	automobiles and parts, computer and parts, jewellery and precious stones, polymers of ethylene in primary forms, refine fuels, electronic integrated circuits, chemical products, rice, fish products, rubber products, sugar, cassava, poultry, machinery and parts, iron and steel and their products
Major import partners	China 20.0%, Japan 14.5%, US 6.8%, Malaysia 5.4% (2017)
Major imports	machinery and parts, crude oil, electrical machinery and parts, chemicals, iron & steel and product, electronic integrated circuit, automobile's parts, jewellery including silver bars and gold, computers and parts, electrical household appliances, soybean, soybean meal, wheat, cotton, dairy products

Country Profile Sources:
CIA World Factbook, , available at https://www.cia.gov/library/publications/resources/the-world-factbook/geos/ar.html, accessed on 05 July 2016.
OECD, World Indicators of Skills for Employment (WISE), available at http://stats.oecd.org//index.aspx?QueryId=62775#, accessed on 05 July 2016.
ILOSTAT Database, Country Data, available at http://www.ilo.org/ilostat/faces/help_home/data_by_country?_adf.ctrl-state=yddsm3mdf_4&_afrLoop=404928031607009, accessed on 05 July 2016.

Services constituted around 56 per cent of GDP in 2017. Within services, the most important are wholesale and retail trade; transport, storage and communication; hotels and restaurants; and public administration, defence and social security.

In line with Thailand's export-orientation, the industry sector is also an important part of the Thai economy. In 2017, industry (which includes the manufacture of many exports) contributed to around 36 per cent of GDP. Agriculture also makes a significant contribution - around 8 per cent of GDP.

Prime Minister Thaksin Shinawatra came into power in Thailand in 2001 and brought with him a business focus and the objective to grow the economy. During this period, Thailand experienced

reduced uncertainty and increased overall employment. However, with a focus also on efficiencies, the government reduced its labour force, with most of this labour absorbed into the trade and other market services sector (a sector that has experienced strong growth since 2002).

Thailand is the largest rice exporter in the world, and it is not surprising to note that agriculture is the largest employer. Employment in agriculture has remained relatively stable over the past 15 years, with a slight dip observed in 2014.

Manufacturing employment levels have also been relatively stable. However, research by the OECD's Programme for International Student Assessment has highlighted that there is a gap in the basic demands of industry.

Figure 48: Employment by sector (1998 - 2014)

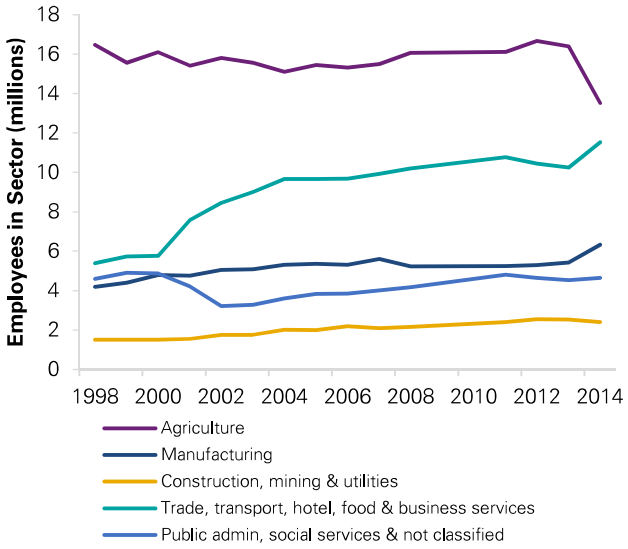
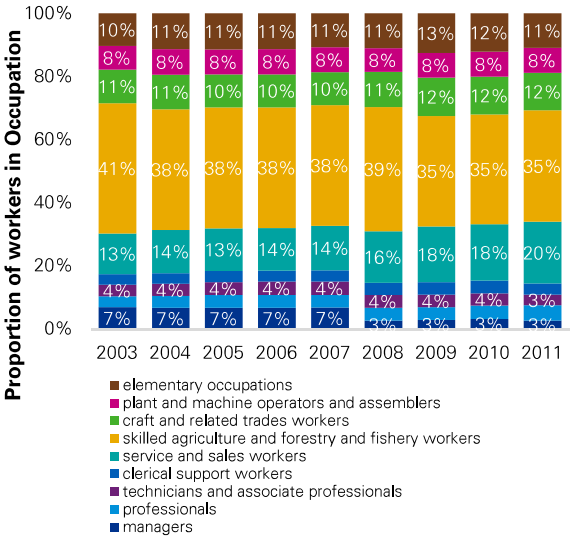


Figure 49: Labour Force by occupation (2003-11)



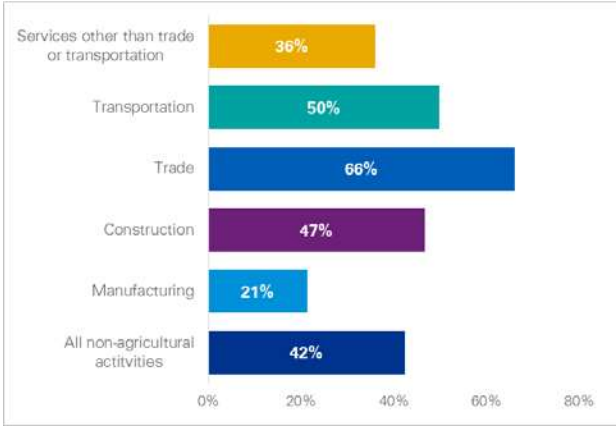
Sources: World Bank Enterprise survey (2016), International Labour Organisation (2016)

In terms of the composition of the labour force, the largest proportion of workers in Thailand are in the skilled agriculture and forestry occupation. There has been a decrease in this occupation's share of the labour force, falling from 41 per cent to 35 per cent between 2003 and 2011. Given strong growth in employment in the trade and other market services sector, it is unsurprising that the service and sales worker occupations has also grown as a share of the total labour force (from 13 per cent to 20 per cent by 2011).

Thailand's informal sector accounts for around 40 per cent of total non-agriculture employment. Within this group, the trade sector has two-thirds of its workers employed in the informal economy. Around half of all workers in the transportation and construction sectors are also employed in the informal sector.

As the Thailand economy continues to develop, and tourism continues to be a significant part of the economy, there will likely be more demand for up skilling in services skills, such as hospitality, food and beverage, and tourism.

Figure 50: Share of employment in informal sector (2010)



Source: International Labour Organisation (2016)

5.2.9.2 Examples of skills shortages

Zeufack (2006), in association with the World Bank, note that it takes about seven weeks to fill a job in Thailand and about 90 per cent of firms had a vacancy to fill in the skilled production worker category for two years running. "Applications not having the right skills" and/or "applications not having the right technical skills" were cited as the major cause for prolonged open vacancies.

The Australian Trade Commission report on ASEAN workforce skills – employer survey 2013, notes that Thailand indicated the strongest requirement for English language training across all industries. Also Thailand faces an uneven quality and quantity (shortage) of skilled workers, with quality discrepancies more severe in science, technology and related fields. Walsh (2014) confirms this finding by showing that the percentage of skills gaps in the Thailand IT sector is 25 per cent. A similar conclusion is reached by the Economic Intelligence Centre that shows there is a lack of skills to meet employer's needs, particularly for technicians, engineers and scientists. This is concretely demonstrated by a study of Japanese manufacturing firms in Asia. It found that Japanese firms in Thailand experienced the most difficulty in recruitment of regular staff and employing engineers with sound practical skills and language ability (Ramos, 2016).

5.2.9.3 Stakeholder experiences

Australian government stakeholders referred to a broad collection of priority industries that the Thailand government has identified. These include logistics, medical professions, aviation and advanced manufacturing. Aviation was identified due to the need for aircraft maintenance and other procedures to meet international standards. More broadly, it was identified that most industries need up-skilling due to the labour productivity gaps between Thailand and advanced economies.

The Thai government are focussing on a strategy called 'Thailand 4.0' which aims to bring Thailand out of the middle income trap through advances in innovation and creativity. This is part of a 20-year strategy that builds on 'Thailand 1.0, 2.0 and 3.0' which focussed on agriculture, light industry and heavy industry respectively. The direction suggests services will play a significant role in the future Thai economy and workers will likely require significant up-skilling.

Training stakeholders have identified aged care, in particular, as a skill gap in Thailand. They also noted that other services skills, such as hospitality, food and beverage, and tourism had potential training needs in Thailand.

Manufacturing industry stakeholders noted that they engage directly with factories in Thailand, hence skills in communication, logistics and quality control are valuable for this industry. Components for manufactures are also frequently sourced from Thailand, further highlighting the need for good logistics and transport practices to best engage with global value chains.

5.2.10 Solomon Islands

The Solomon Islands are a group of islands in the South Pacific Ocean, lying to the east of Papua New Guinea or approximately 2,000 kilometres to the north-east of Australia.

5.2.10.1 Economic and employment backdrop

The Solomon Island economy is largely dependent on agriculture, fishing, and forestry. Over three-quarters of the Solomon Island labour force is engaged in subsistence and fishing.

The Solomon Islands export forestry and agriculture products, and has a strong tourism sector. The economy depends on imports for most manufactured goods, fuels and chemicals.

Figure 51: Solomon Islands Economy and Industry

Economic data	
Gross Domestic Product (PPP)	US$1.324 billion (2017 est.) US$1.28 billion (2016 est.) US$1.248 billion (2015 est.)
GDP composition by sector	Agriculture: 34.3% Industry: 7.6% Services: 58.1% (2017 est.)
GDP growth	3.2% (2017 est.) 3.5% (2016 est.) 2.5% (2015 est.)
GDP per capita	US$2,200 (2017 est.)
Education expenditure	10% of GDP (2010)
Ease of doing business	87 (2014)
Industry structure	
Major agricultural products	cocoa, coconuts, palm kernels, rice, fruit; cattle, pigs; fish; timber
Industries	fish (tuna), mining, timber
Major export partners	China 64.5%, Italy 6.2%, Switzerland 4.6%, Philippines 4.4% (2017)
Major exports	timber, fish, copra, palm oil, cocoa, coconut oil
Major import partners	China 21.9%, Australia 19.6%, Singapore 10.7%, Vietnam 7.5%, NZ 6.2%, Papua New Guinea 5%, South Korea 4.7% (2017)
Major imports	food, plant and equipment, manufactured goods, fuels, chemicals

Country Profile Sources:
CIA World Factbook, , available at https://www.cia.gov/library/publications/resources/the-world-factbook/geos/ar.html, accessed on 21 August 2018.
OECD, World Indicators of Skills for Employment (WISE), available at http://stats.oecd.org//Index.aspx?QueryId=62775#, accessed on 21 August 2018.
ILOSTAT Database, Country Data, available at http://www.ilo.org/ilostat/faces/help_home/data_by_country?_adf.ctrl-state=yddsm3mdf_4&_afrLoop=404928031607009, accessed on 21 August 2018.

5.2.10.2 Examples of skills shortages

A report commissioned by AusAID looked at skills gaps in the Solomon Islands using a range of indicators (Curtain, 2013). Using business survey data, the greatest shortages were found in finance, construction and management roles. There were also moderate skills gaps in logistics and manufacturing roles. A further breakdown of construction roles that were hard to fill included designers, trades, and directors (Curtain, 2013).

5.2.10.3 Stakeholder experiences

Training stakeholders identify that the Solomon Islands, like many pacific islands, have unique economic and labour force requirements due to their geographic traits. Generally, most trades have skills gaps, particularly plumbing.

5.3 South Asia (Bangladesh, India, Pakistan, Sri Lanka)

In the South Asia region, this study has considered India, Bangladesh, Pakistan and Sri Lanka.

5.3.1 Key Themes in the Region

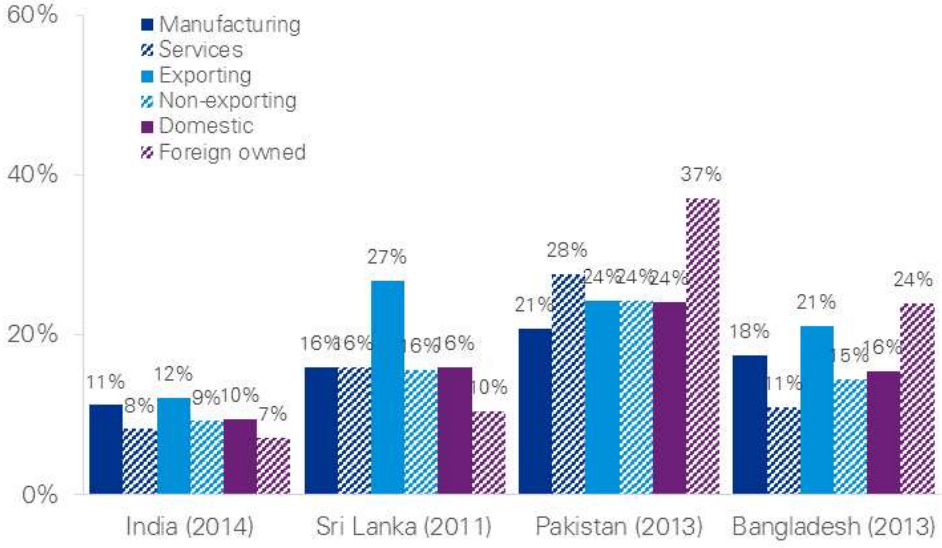
At the sectoral level, agriculture is a significant employing industry in South Asia. However, it does not always reflect a significant share of GDP, which can be one major factor in explaining the labour productivity gaps shown in Figure 53. Trade and other market services are major employers in the region, and typically have the greatest growth in employment and contribution to GDP.

Significant sections of the economies in South Asia consist of informal employment. This presents major opportunity for improving work practice, building formal sectors, and up-skilling labour. For example, an estimated 93 per cent of India's construction workers are informally employed, which suggests major skills gaps in providing business and residential construction services for a population of over 1.3 billion.

Remittances are also a significant contributor to GDP in South Asian economies. Due to the high availability of labour, many workers from India, Sri Lanka, Bangladesh and Pakistan travel abroad for work and send money back home to families. This highlights the need for up-skilling strategies to address both local and regional skills gaps, to allow skilled workers to achieve higher wages, and meet international or country-specific occupational standards.

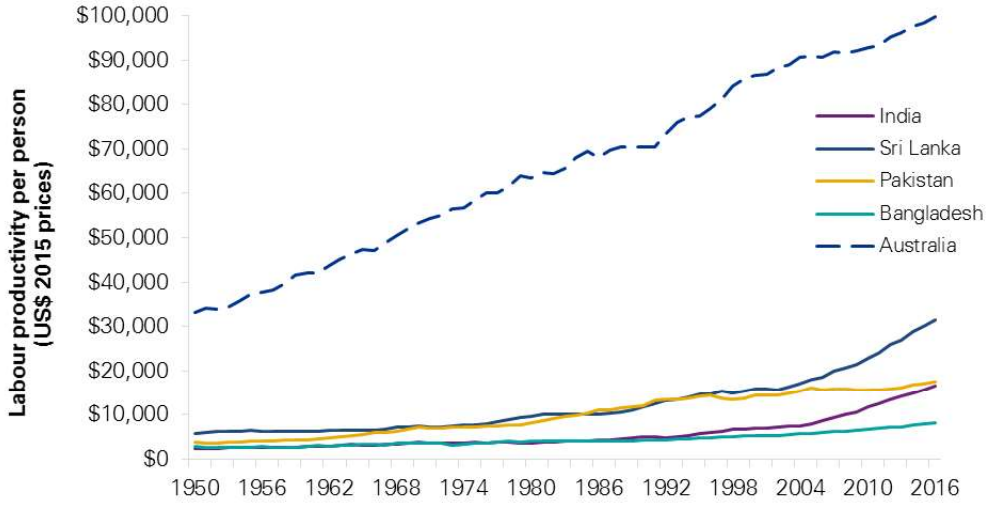
Most firms that explicitly acknowledge skills gaps in South Asia are foreign owned and/or export focussing businesses. Figure 52 shows the distribution of skills gaps in South Asia across several business types. Comparing countries within South Asia, Pakistan has the greatest acknowledged skills gaps on average, with particularly high skills gaps identified by foreign-owned businesses. India has a relatively low share of businesses identifying workforce education as a skill gap, however, the associated volumes of under-skilled labour in this country present a major need for improved education and training.

Figure 52 Per cent of South Asia firms identifying an inadequately educated workforce as a major constraint



Source: World Bank Enterprise surveys (2016)

Figure 53 Labour productivity per person employed in 2015 US$ (converted to 2015 price level with updated 2011 PPPs)



Source: The Conference Board Total Economy Database (2016)

Labour productivity indicates the average output per worker, and shows broad comparisons between the labour forces of different economies. Figure 53 shows that labour productivity is significantly lower in the selected South Asia countries than in Australia – which is expected between advanced and emerging economies.

Sri Lanka has the highest labour productivity in the group, and along with India, has been experiencing a positive trend in recent years. Labour productivity growth is relatively stagnant in Pakistan and Bangladesh, suggesting a more immediate need for strategies to improve productivity. Note that up-skilling is only one component of improving the effectiveness of a labour force. Additional considerations are the availability of capital (such as machinery, plant, vehicles and other investments), and the quality of institutions (protection of property rights, adequate social services, law and order, government corruption).

Training and government stakeholders have identified many skills gaps and opportunities across the region, including retail, construction and many different trades. Identifying the correct training product was frequently discussed, and focussed on the very different employment structures and job roles in the region, in addition to the need for the labour force to have the flexibly to work in other countries. This feedback has been incorporated into the key findings on page 5 and is discussed further in the following section.

5.3.2 India

India is located in South Asia, sharing a border with Pakistan, China, Nepal and Bangladesh. India's economy encompasses a wide-ranging set of activities – from traditional farming and handicrafts through to modern industries and services.

5.3.2.1 Economic and employment backdrop

India's service sector contributed to over 60 per cent of the country's GDP in 2017, with industry providing just under a quarter of GDP and agriculture providing the remainder (15 per cent).

Despite its lower contribution to GDP, the agriculture sector provides the bulk of employment opportunities, accounting for almost half of the entire workforce in India.

The CIA World Factbook lists the key challenges to India's longer term growth prospects as " India's discrimination against women and girls, an inefficient power generation and distribution system, ineffective enforcement of intellectual property rights, decades-long civil litigation dockets, inadequate transport and agricultural infrastructure, limited non-agricultural employment opportunities, high spending and poorly targeted subsidies, inadequate availability of quality basic and higher education, and accommodating rural-to-urban migration"(CIA, 2018).

Figure 54: India Economy and Industry

Economic data	
Gross Domestic Product (PPP)	US$9.459 trillion (2017 est.) US$8.831 trillion (2016 est.) US$8.165 trillion (2015 est.)
GDP composition by sector	Agriculture: 15.4% Industry: 23% Services: 61.5% (2016 est.)
GDP growth	6.7% (2017 est.)
GDP per capita	US$7,200 (2017 est.)
Education expenditure	3.8% of GDP (2013)
Ease of doing business	142 (2014)
Industry structure	
Major agricultural products	rice, wheat, oilseed, cotton, jute, tea, sugarcane, lentils, onions, potatoes; dairy products, sheep, goats, poultry; fish
Industries	textiles, chemicals, food processing, steel, transportation equipment, cement, mining, petroleum, machinery, software, pharmaceuticals
Major export partners	US 15.6%, UAE 10.2%, Hong Kong 4.9%, China 4.3% (2017)
Major exports	petroleum products, precious stones, vehicles, machinery, iron and steel, chemicals, pharmaceutical products, cereals, apparel
Major import partners	China 16.3%, US 5.5%, UAE 5.2%, Saudi Arabia 4.8%, Switzerland 4.7% (2017)
Major imports	crude oil, precious stones, machinery, chemicals, fertilizer, plastics, iron and steel

Country Profile Sources:
CIA World Factbook , available at https://www.cia.gov/library/publications/resources/the-world-factbook/geos/ar.html, accessed on 21 August 2018.
OECD, World Indicators of Skills for Employment (WISE), available at http://stats.oecd.org//index.aspx?QueryId=62775#, accessed on 21 August 2018.
ILOSTAT Database, Country Data, available at http://www.ilo.org/ilostat/faces/help_home/data_by_country?_adf.ctrl-state=yddsm3mdf_4&_afrLoop=404928031607009, accessed on 21 August 2018.

Despite continuing to maintain its status as the highest employing sector in India, agriculture sector employment has declined, falling by an average of just under 2 per cent per year annually between 2005 and 2010. The other industry to register a decrease in employment is manufacturing, shrinking at an average of around 1 per cent per year.

The fastest growing sector has been construction, growing at a compound rate of just over 11 per cent annually, albeit from a relatively small base. This has brought employment in the construction sector up to almost the same level as employment in manufacturing.

The trade and other market services sector has maintained its place as the second highest employer in the country, having also grown over this period, albeit at a more modest compound rate of 1.5 per cent per annum.

Figure 55: Employment by sector (2005 - 10)

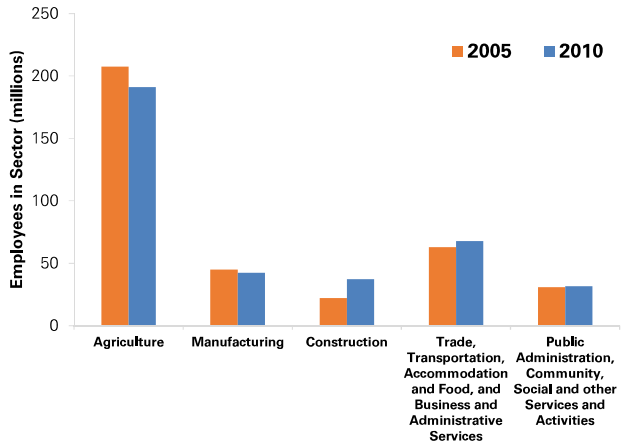
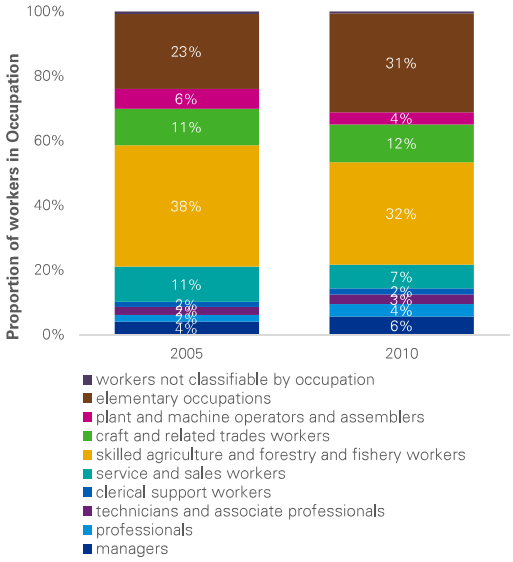


Figure 56: Labour Force by occupation (2005-10)

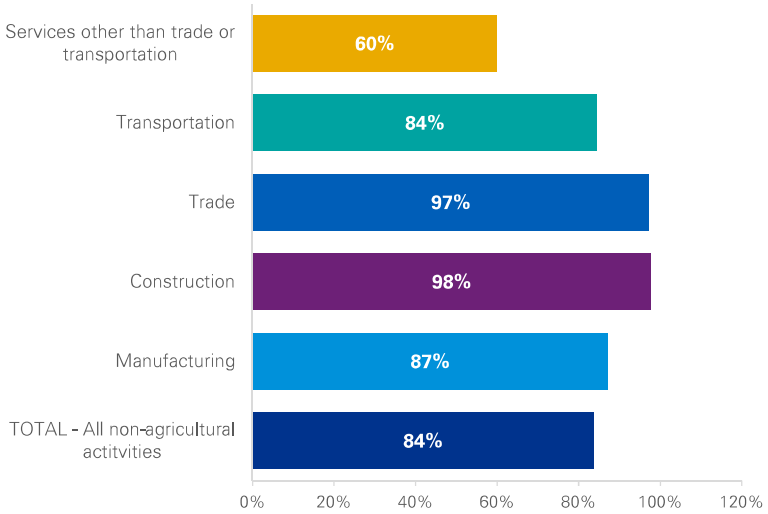


Sources: World Bank Enterprise survey (2016), International Labour Organisation (2016)

India's population are employed across a range of different occupations. In line with the dominance of agriculture employment, skilled agriculture and forestry and fishing workers make up around one-third of the India labour force. Elementary occupations generally require only basic skills, and these occupations are also around one-third of the India labour force, indicating a huge potential to up-skill the labour force.

Between 2005 and 2010, the share of elementary occupations, managers, and professionals all increased, while the share of plant and machine operators and assemblers, and service and sales occupations in the labour force decreased. With the decrease in agriculture employment, the proportion of skilled agriculture and forestry and fishery occupations in the labour force also fell, from 38 per cent to 32 per cent over the same period.

Figure 57: Share of employment in informal sector (2009-10)



Source: International Labour Organisation (2016)

Figure 57 shows the proportion of employment in the non-agriculture informal sector. Across all non-agriculture industries, a staggering 84 per cent of all employment is in the informal sector. Of this, nearly all employment in both the trade and construction industries is in the informal part of the economy. A significant share of employment in the informal sector may indicate a significant sized

informal economy. Drawing these activities into the formal economy will likely require regulatory reform and up-skilling of both workers and management.

5.3.2.2 Examples of skills shortages

The National Skill Development Corporation (NSDC) has been set-up in India to address skills gaps and build training capacity to meet the needs of industry. They have a mandate to train 150 million people by 2022. NSDC have published a large range of analysis of labour markets in India across regions and sectors.

KPMG India was commissioned by NSDC to report on the construction industry labour market. Their research highlighted that the construction workforce is expected to grow from 45 million in 2013 to 76 million by 2022. The presents a major need for up-skilling, particularly as 83 per cent of the sector is estimated to be unskilled (KPMG, 2013). Of the construction workers, approximately 90 per cent of the workforce are engaged in building construction, with small shares in demolition, plumbing and electrical activities. Approximately 10 per cent of the labour force are engaged on infrastructure projects, such as roads and railways (KPMG, 2013).

Figure 58: Construction employment in India (2011)

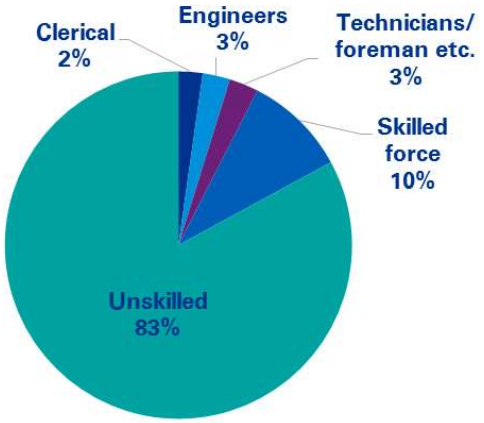
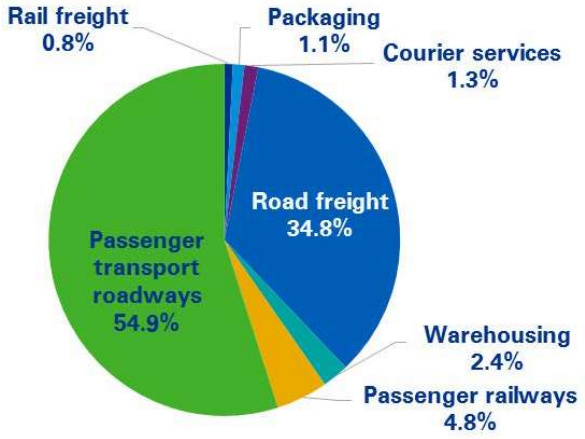


Figure 59: Transport and Logistics occupations (2022 forecast)



Source: KPMG India (2013)

Another study commissioned by NSDC analysed skills gaps in the transport and logistics industry (KPMG, 2013). This study presents forecasts on the number of workers required in sub-sectors of this industry (see Figure 59). Of the forecasted 28.4 million workers in the sector, the dominant employing groups include passenger road transport (54.9 per cent) and road freight (34.8 per cent). Skills in related occupations are expected to be in high demand over the medium-term.

Research by KPMG into the retail sector in India identified the growth of the middle class as determining major skill changes in the Indian economy (KPMG, 2014). It is noted that rising incomes and purchasing power, increased real estate infrastructure investment, and efficiencies achieved through supply chain developments will increase demand for retail skills significantly. The Indian retail sector was estimated to be 12 to 15 million fragmented outlets, worth USD $534 billion in 2013-14. Consolidation of the industry, and a shift from informal sector outlets is expected to increase demand for retail skills that can improve productivity in the sector (KPMG, 2014).

EIU (2015) identify skill shortage in many trades across India, particularly in construction – with employment expected to grow at six times the rate of IT roles up to 2022. An estimated 83 per cent of construction labourers are characterised as unskilled, and typically representing poor segments of the population (EIU, 2015). Cited in the report, a major construction company noted that construction management degrees are very new to India, so the skill gap has not been closed yet and this will likely take some time. Particular skills needed within this sector include procurements, supply chain management, and equipment selection and design (EIU, 2015).

International mobility is a major factor for the Indian labour force, with 4.2 million Indian nationals migrating to developing economies, and 10 million migrating to emerging economies in 2013 (ASB, 2015). This highlights the needs for up-skilling not only to meet the local labour force needs, but also to meet many other skills gaps across the region.

5.3.2.3 Stakeholder experiences

Australian government stakeholders have provided a range of insights into up-skilling India's labour force. India has ambitious growth goals, such as up-skilling multi-millions of workers and improving living conditions (e.g. a toilet in every building). As an emerging economy, India is experiencing major growth in its middle-class population, which will increase demand for quality across many goods and services.

Regarding industry-specific skill demands within India, several were noted by Australian government stakeholders. Mining and mineral exploration was seen to be a growing sector that Australia's strengths are particularly well matched to. Tourism, hospitality and retail were seen as important service-based growth areas. Interestingly, India's Defence sector is receiving policy attention and is driving the need for up-skilling in sectors such as advanced manufacturing and naval operations. There are also potential skills gaps in nuclear and uranium industries, which have recently entered trade deals with Australia.

Politically, unemployment is a major issue noted by Australian government stakeholders. While broad up-skilling will have positive effects on the economy, there is likely to be short-term adjustments and jobs losses if occupations consolidate. This touches on many political and development challenges in addressing skill needs. Also, a shift of many government provided jobs and services to the private sector is changing the skill needs of the labour force.

Training stakeholders have emphasised the complexity of the Indian market, which presents a need for targeted and flexible training. On the issue of competitors from other international VET providers, training stakeholders have noted that the volume of up-skilling is so great that plenty of market potential is available for the right product. To that end government stakeholders have indicated that a collaborative approach with countries such as Germany, Singapore and Japan may be advantageous.

Manufacturing industry stakeholders have noted that transport and logistic skills are in urgent need in India. There are ports where large queues of trucks wait for days, and product can become spoilt, particularly if it rains. This is frustrating businesses looking to build their supply chain.

Multiple stakeholder groups have emphasised the different structure of the labour force, and the need to deliver training accordingly. Many skill sets and occupations performed by a single worker in Australia are often done by many workers in India. For example, an Indian retailer can have separate workers for greeting, customer service, point-of-sale operation, bagging and packaging, shelf-stocking and other functions – while in Australia all or most of these tasks may be performed by the same worker. This highlights the need for up-skilling to target not only growth industries, but the particularities of the labour structure.

5.3.3 Bangladesh

Bangladesh sits between India and Myanmar in South Asia. The CIA World Factbook describes it as a country with "political instability, poor infrastructure, corruption, insufficient power supplies, and slow implementation of economic reforms" (CIA, 2018).

5.3.3.1 Economic and employment backdrop

Despite this difficult setting, Bangladesh has achieved around 6 per cent economic growth annually since 1996.

The service sector is an important part of the Bangladesh economy, contributing to more than half of GDP in 2017. The largest individual contributors to GDP growth in Bangladesh in the same year fall outside of this sector, achieved through garment sector exports and remittances from overseas Bangladesh workers.

On the employment front, it is the agriculture sector that dominates in terms of numbers of employees, with rice the most important individual agricultural product.

Figure 60: Bangladesh Economy and Industry

Economic data	
Gross Domestic Product (PPP)	US$687.1 billion (2017 est.) US$641 billion (2016 est.) US$599.9 billion (2015 est.)
GDP composition by sector	Agriculture: 14.2% Industry: 29.2% Services: 56.5% (2017 est.)
GDP growth	7.1% (2017 est.) 7.2% (2016 est.) 6.8% (2015 est.)
GDP per capita	US$4,200 (2017 est.)
Education expenditure	2.5% of GDP (2016)
Ease of doing business	173 (2014)
Industry structure	
Major agricultural products	rice, jute, tea, wheat, sugarcane, potatoes, tobacco, pulses, oilseeds, spices, fruit; beef, milk, poultry
Industries	jute, cotton, garments, paper, leather, fertilizer, iron and steel, cement, petroleum products, tobacco, pharmaceuticals, ceramics, tea, salt, sugar, edible oils, soap and detergent, fabricated metal products, electricity, natural gas
Major export partners	Germany 12.9%, US 12.2%, UK 8.7%, Spain 5.3%, France 5.1%, Italy 4.1% (2017)
Major exports	garments, knitwear, agricultural products, frozen food (fish and seafood), jute and jute goods, leather
Major import partners	China 21.9%, India 15.3%, Singapore 5.7% (2017)
Major imports	cotton, machinery and equipment, chemicals, iron and steel, foodstuffs

Country Profile Sources:
CIA World Factbook, , available at https://www.cia.gov/library/publications/resources/the-world-factbook/geos/ar.html, accessed on 21 August 2018.
OECD, World Indicators of Skills for Employment (WISE), available at http://stats.oecd.org//index.aspx?QueryId=62775#, accessed on 21 August 2018.
ILOSTAT Database, Country Data, available at http://www.ilo.org/ilostat/faces/help_home/data_by_country?_adf.ctrl-state=yddsm3mdf_4&_afrLoop=404928031607009, accessed on 21 August 2018.

Figure 61 shows that employment in the agricultural sector significantly declined between 2000 and 2003, and while this sector still remains the dominant employer in the country, employment in the trade and other market services sector has grown over this same period.

Figure 61: Employment by sector (2000-10)

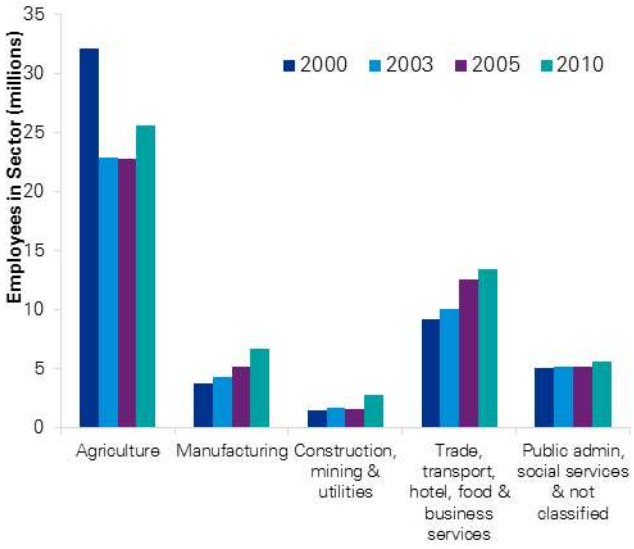
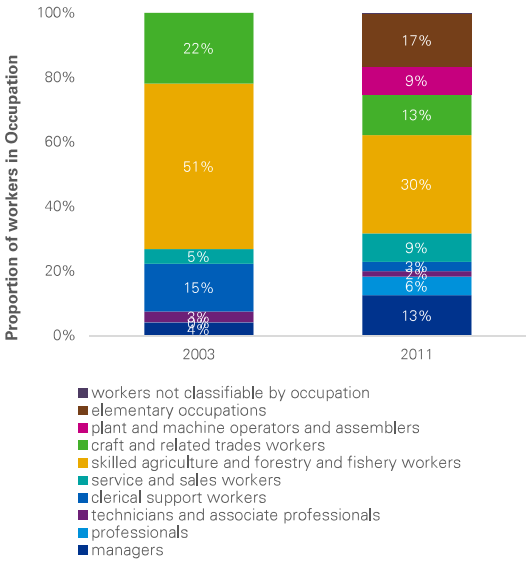


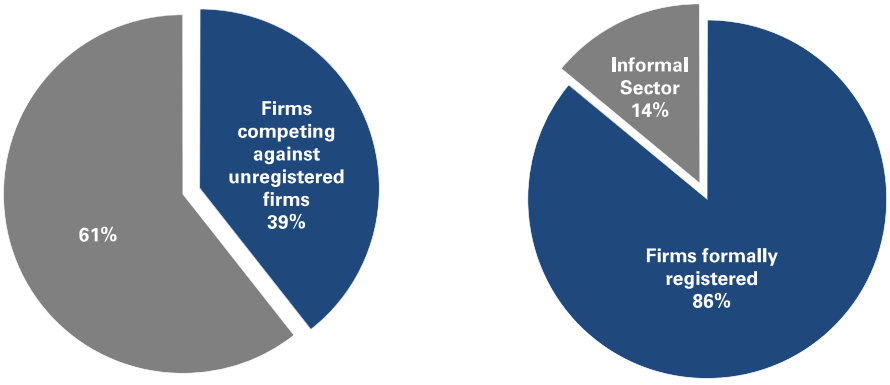
Figure 62: Labour Force by occupation (2003-11)



Sources: World Bank Enterprise survey (2016), International Labour Organisation (2016)

There has been an increase in the share of higher-skilled occupations in Bangladesh, with technicians and associate professionals, professionals and managers more than doubling their workforce contribution from an overall 8 per cent in 2003 to 20 per cent in 2011. Of the lower-skilled workers, craft and related trades fell from 22 per cent of the total labour force in 2003 to only 13 per cent in 2011, and the share of skilled agriculture and forestry and fishery workers decreased significantly from 51 per cent of the labour force to 30 per cent over the same period. While data reclassifications / inconsistencies may be impacting the exact size of these changes[13], it is likely that the trend of a movement to higher skilled occupations is real.

Figure 63: Informal economy share (2013)



Source: World Bank Enterprise survey (2016)

[13] For example, there were no unclassified or elementary occupations in the 2003 data set.

Figure 63 shows that in 2013, around 14 per cent of businesses in the Bangladesh economy were unregistered when they first started operating. However, nearly 40 per cent of firms identify as facing competition from unregistered or informal businesses, indicating that the informal sector is still a significant part of the Bangladesh economy. Similar to India, as the economy continues to develop, parts of the informal sector will likely move into the formal economy. This will potentially include regulatory reform and create demand for up-skilling of both workers and management.

5.3.3.2 Examples of skills shortages

Research by EDFI (2016) presents a case study on a garment manufacturer in Chittagong, where it was easy for the company to find workers, but they required in-house training to be prepared for the roles. Specific skill shortages include fashion-design skills, production mid-management, and more broadly basic hygiene and sanitary knowledge for the very unskilled portion of the workforce (EDFI, 2016). One strategy to address this skill gap was collaborating with a local polytechnic to teach their own sewing machine operator course. The garment manufacturer also noted a significantly lacking textile industry to produce high quality fabrics. They would like to source locally, but need to import from China where better spinning facilities produce superior fabrics that the company needs.

Research by The Economist Intelligence Unit (EIU) notes that for agricultural workers in northern Bangladesh, high illiteracy rate and low income cause an inability for workers to utilise media – which significantly limits their productivity improvements. The study, commissioned for British Council referenced Australia's MySkills program as a positive initiative, and further identified that TVET courses in mechanisation, fertilisers, crop diversification and irrigation could improve yields and help the economy (EIU, 2015).

5.3.3.3 Stakeholder experiences

Many of the India labour market trends discussed by stakeholders are also present in Bangladesh.

As in other parts of South Asia, much of the labour force travel to the Middle East for work and send remittances back. This has been noted by Australian government and education stakeholders, and broadens the up-skilling requirements for the local labour force beyond the domestic economy needs. In addition, it has been noted that Bangladesh may have skill shortages in textile manufacturing.

5.3.4 Pakistan

Pakistan is located in South Asia, with Iran and Afghanistan to the west, China to the north, and India to the east. The CIA World Factbook identifies Pakistan as having "a challenging security environment, electricity shortages, and a burdensome investment climate (which has) deterred investors" (CIA, 2016). Low levels of investment has, in turn, meant low growth and underdevelopment across the country.

Pakistan has a growing and rapidly urbanising population, which will drive higher demand for goods and services, and also require much stronger economic growth to support.

5.3.4.1 Economic and employment backdrop

Pakistan recorded relatively weak annual growth, averaging only 3.5 per cent per year from 2008 to 2013. After the implementation of a three-year government/IMF co-ordinated economic reform program started in 2013 – which helped with the macroeconomic stability of the country and boosted the credit rating, real annual GDP growth has improved. According to the World Bank expected growth in 2018 is forecasted to be 5.5 per cent.

Figure 64: Pakistan Economy and Industry

Economic data	
Gross Domestic Product (PPP)	US$1.055 trillion (2017 est.) US$1.011 trillion (2016 est.) US$972 billion (2015 est.)
GDP composition by sector	Agriculture: 24.7% Industry: 19.1% Services: 56.3% (2017 est.)
GDP growth	5.3% (2017 est.) 4.5% (2016 est.) 4.1% (2015 est.)
GDP per capita	US$5,400 (2017 est.)
Education expenditure	2.8% of GDP (2017)
Ease of doing business	128 (2014)
Industry structure	
Major agricultural products	cotton, wheat, rice, sugarcane, fruits, vegetables; milk, beef, mutton, eggs
Industries	textiles and apparel, food processing, pharmaceuticals, surgical instruments, construction materials, paper products, fertilizer, shrimp
Major export partners	US 17.7%, UK 7.7%, China 6%, Germany 5.8%, Afghanistan 5.2%, UAE 4.5%, Spain 4.1% (2017)
Major exports	textiles (garments, bed linen, cotton cloth, yarn), rice, leather goods, sporting goods, chemicals, manufactures, surgical instruments, carpets and rugs
Major import partners	China 27.4%, UAE 13.7%, US 4.9%, Indonesia 4.3%, Saudi Arabia 4.2% (2017)
Major imports	petroleum, petroleum products, machinery, plastics, transportation equipment, edible oils, paper and paperboard, iron and steel, tea

Country Profile Sources:
CIA World Factbook, , available at https://www.cia.gov/library/publications/resources/the-world-factbook/geos/ar.html, accessed on 21 August 2018.
OECD, World Indicators of Skills for Employment (WISE), available at http://stats.oecd.org//index.aspx?QueryId=62775#, accessed on 21 August 2018.
ILOSTAT Database, Country Data, available at http://www.ilo.org/ilostat/faces/help_home/data_by_country?_adf.ctrl-state=yddsm3mdf_4&_afrLoop=404928031607009, accessed on 21 August 2018.

Like many other countries in this region, the Pakistan economy is heavily dependent on agriculture activity. This sector contributes around one-quarter of GDP and almost half of employment. Services contribute over half of GDP and just over one-third of total employment.

Textiles and clothing are the largest exports for Pakistan, and are key revenue earners along with remittances from overseas workers (which average more than $1.5 billion per month).

Figure 65 highlights the dominance of the agriculture sector as an employer. Agriculture employs the largest workforce followed by trade and other market services.

Between 1998 and 2002 employment growth was relatively subdued across all sectors. Since 2002, there has been steady growth in employment across the economy. The agriculture and construction sectors have each achieved close to 5 per cent average annual employment growth between 2002 and 2008.

Figure 65: Employment by sector (1998 - 2008)

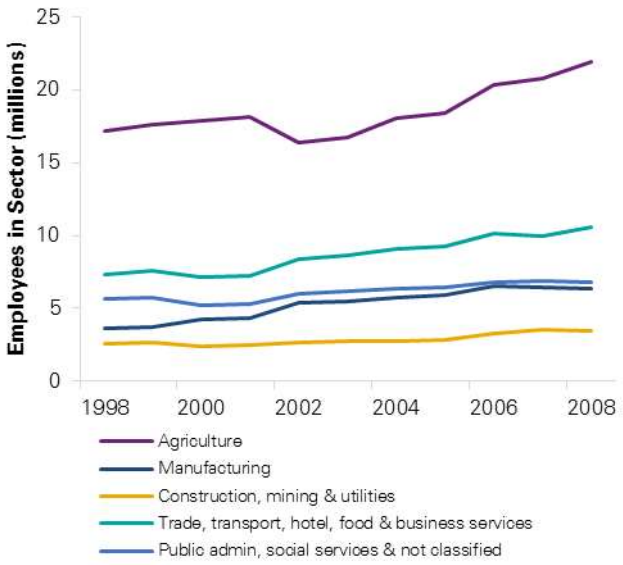
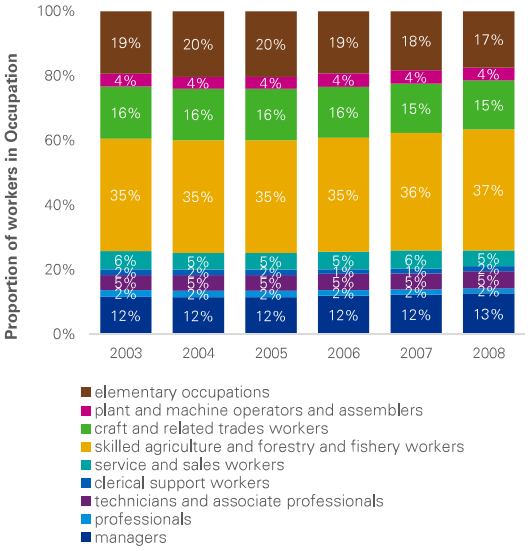


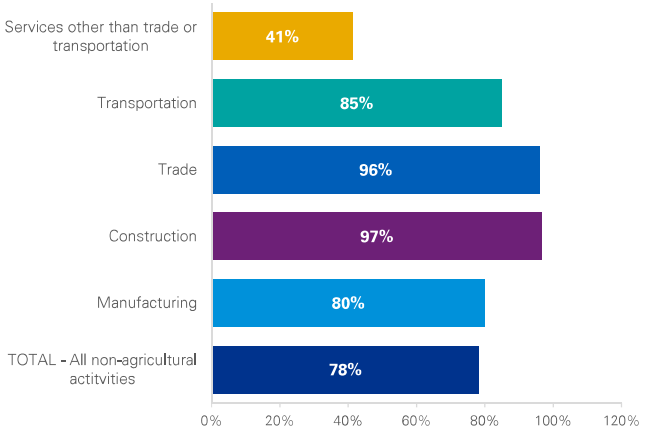
Figure 66: Labour Force by occupation (2003-08)



Sources: World Bank Enterprise survey (2016), International Labour Organisation (2016)

The second figure above examines the skill levels across the economy, as indicated by the employment composition. Reflective of the agriculture sectors significant share of employees, skilled agriculture and forestry and fishery workers contribute to over one-third of occupations in the labour force. Elementary occupations are the next highest group, with around one-fifth of the labour force in this category. Higher-skilled workers – in the form of technicians and associate professionals, professionals and managers – are a small part of the labour force, indicating significant capacity for up skilling of the Pakistani workforce.

Figure 67: Share of employment in informal sector (2010)



Source: International Labour Organisation (2016)

Figure 67 indicates that Pakistan has a relatively large informal sector, with almost 80 per cent of total non-agriculture employment identified as working in the informal economy. The share of employment in the informal sector is the highest in construction (97 per cent) followed by trade (96 per cent) and transportation (85 per cent).

Pakistan's official unemployment rate in 2015 was estimated at 6.5 per cent. However, it is unlikely that this figure fully captures the informal sector, or the fact that underemployment remains high. A large informal sector or high levels of underemployment can conceal deeper employment issues, and underlying skills gaps.

This is supported by the World Bank Enterprise surveys (2016) which show that Pakistan has the largest number of firms who reported failure to secure the right skills to fill job vacancies (as shown in Figure 52). Pakistan achieved the highest percentage of firms in Asia reporting an inadequately educated workforce as a major constraint, this was an issue particularly identified by "foreign owned" firms in Pakistan.

5.3.4.2 Examples of skills shortages

Research by EDFI (2016) presents a case study of Engro – a group of fertilisers, foods, energy, and petro-chemicals businesses – operating in Pakistan. With a good reputation, they are able to source highly skilled engineers and business graduates. As a pioneering firm in many specialist industries, such as energy generation from permeate gas, they have to train new workers in-house. With fertiliser production operations in rural Ghotki District, they also experience a geographic challenge due to the low levels of educational attainment in the local population. Specific skills gaps highlighted include agronomists, experienced fertiliser experts, chemical plant operators and maintenance technicians.

Research by CARE (2015) into human capital development in Pakistan highlights the issue of gender equality and the impact on up-skilling and education. Of their sample of businesses interviewed, the only firms that employed women were garments industries in the textile sector. However, economic compulsions can override cultural constraints, particularly in rural communities – presenting a possible openness to more VET participation (CARE, 2015).

Training infrastructure was also identified as an issue, with one Pakistani training institute noting that they offered a computing course, but no training computers were provided. Another training centre offers auto-mechanic courses, but only has a tractor engine to study on (CARE, 2016).

5.3.4.3 Stakeholder experiences

As in other parts of South Asia, much of the labour force in Pakistan also travel to the Middle East for work and send remittances back. This has been noted by Australian government and education stakeholders, and broadens the up-skilling requirements for the local labour force beyond the domestic economy needs.

Stakeholders identified family-subsistence agriculture as a potential issue in Pakistan, seeing developing Agriculture as an area ripe for opportunity. Other industries were also identified as having opportunity in Pakistan, such as hospitality and tourism; and car assembly. Pakistan was seen as a potential low cost hub for manufacturers, with a reasonable friendly regulatory environment.

Australian government stakeholders and training stakeholders have noted that political and economic problems in Pakistan make many foreign business ventures, including VET, a challenge. Despite this, up-skilling opportunities are certainly present, and the government particularly identifies VET as a strategy to address youth unemployment and prevent radicalisation.

5.3.5 Sri Lanka

Sri Lanka is an island in South Asia, lying to the south east of India. With the Sri Lanka government's focus on reconstruction and development projects, the country has recently achieved relatively strong economic growth. However, the country is facing a budget challenge with high deficits and low tax revenues.

5.3.5.1 Economic and employment backdrop

Growth in the Sri Lanka economy has slowed as it attempts balance the countervailing forces of economic growth and fulfilment of obligations under the IMF program it began in 2016. The growth that has occurred has been largely through activities in the services sector, contributing to over 60 per cent of GDP in 2017. Industry sector activity contributed around 30 per cent of GDP, while agriculture only contributed to around 8 per cent of total GDP.

Despite its small share of GDP, agriculture employs a disproportionate percentage of the Sri Lankan labour force; roughly on par with that of the industry sector at 26 per cent.

Figure 68: Sri Lanka Economy and Industry

Economic data	
Gross Domestic Product (PPP)	US$274.7 billion (2017 est.) US$263 billion (2016 est.) US$250.4 billion (2015 est.)
GDP composition by sector	Agriculture: 7.8% Industry: 30.5% Services: 61.7% (2017 est.)
GDP growth	3.1% (2017 est.) 4.5% (2016 est.) 5% (2015 est.)
GDP per capita	US$12,800 (2015 est.)
Education expenditure	3.5% of GDP (2016)
Ease of doing business	99 (2014)
Industry structure	
Major agricultural products	rice, sugarcane, grains, pulses, oilseed, spices, vegetables, fruit, tea, rubber, coconuts; milk, eggs, hides, beef; fish
Industries	processing of rubber, tea, coconuts, tobacco and other agricultural commodities; telecommunications, insurance, banking; tourism, shipping; clothing, textiles; cement, petroleum refining, information technology services, construction
Major export partners	US 24.6%, UK 9%, India 5.8%, Singapore 4.5%, Germany 4.3%, Italy 4.3% (2017)
Major exports	textiles and apparel, tea and spices; rubber manufactures; precious stones; coconut products, fish
Major import partners	India 22%, China 19.9%, Singapore 6.9%, UAE 5.7%, Japan 4.9% (2017)
Major imports	petroleum, textiles, machinery and transportation equipment, building materials, mineral products, foodstuffs

Country Profile Sources:
CIA World Factbook, , available at https://www.cia.gov/library/publications/resources/the-world-factbook/geos/ar.html, accessed on 21 August 2018.
OECD, World Indicators of Skills for Employment (WISE), available at http://stats.oecd.org//index.aspx?QueryId=62775#, accessed on 21 August 2018.
ILOSTAT Database, Country Data, available at http://www.ilo.org/ilostat/faces/help_home/data_by_country?_adf.ctrl-state=yddsm3mdf_4&_afrLoop=404928031607009, accessed on 21 August 2018.

Employment in the trade and other market services sector was the fastest growing, more than doubling between 1998 and 2014. While there was also significant growth in employment in the public administration and other social services, manufacturing, and construction sectors, there was a slight decline in agriculture employment.

Figure 69: Employment by sector (1998 - 2014)

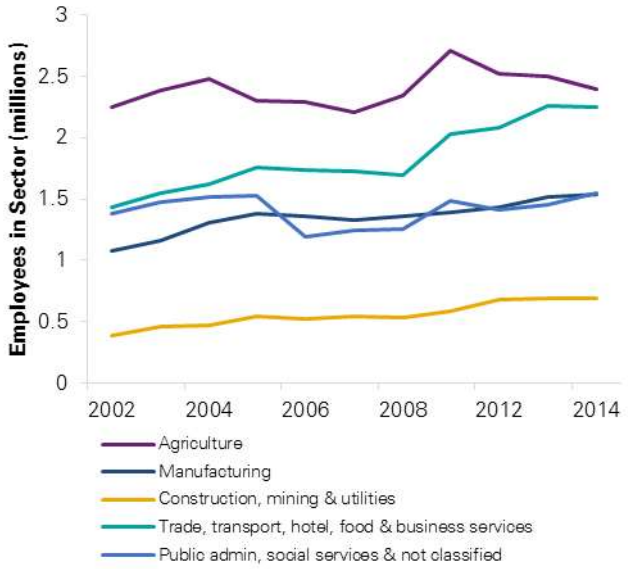
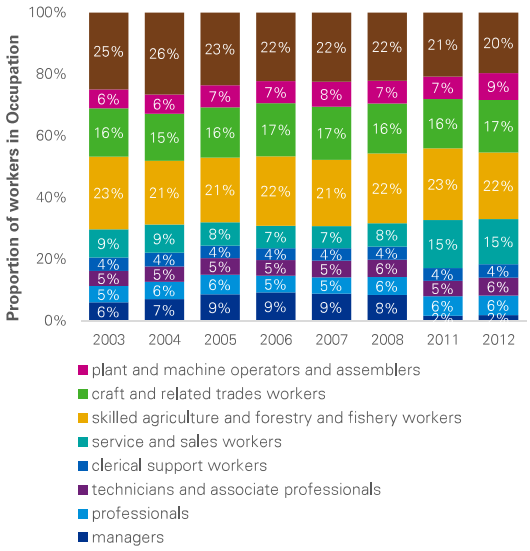


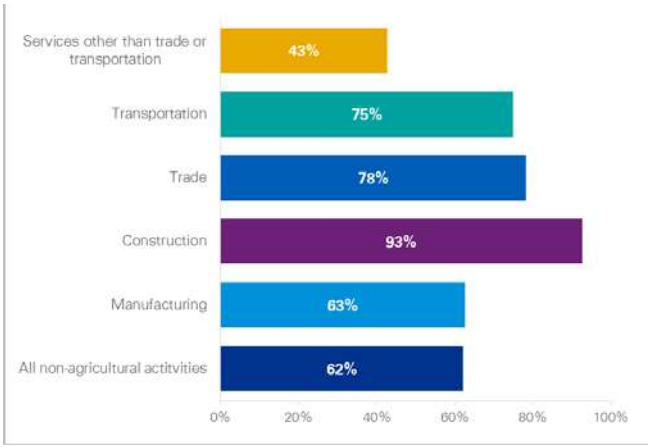
Figure 70: Labour Force by occupation (2003-12)



Sources: World Bank Enterprise survey (2016), International Labour Organisation (2016)

The share of the labour force made up by elementary occupations decreased from 25 per cent in 2003 to 20 per cent by 2012. There also has been a significant decrease in the proportion of managers from 8 per cent in 2008 to only 2 per cent in 2012. This decrease was compensated by a proportionate increase in service and sales workers. With strong growth in both the trade and market services sector, and the service and sales workers occupation – this may indicate a developing need for more workers with these skills.

Figure 71: Share of employment in informal sector (2010)



Source: International Labour Organisation (2016)

A relatively large proportion of economic activities in Sri Lanka take place in the informal sector, with over 60 per cent of total non-agricultural activity employment in the informal economy. Almost all construction workers are part of the informal economy, along with almost 80 per cent of all trade and transportation workers.

5.3.5.2 Examples of skills shortages

Sri Lanka's education system is failing to develop the right skills that prepare workers for their respective jobs, especially in technical skills such as the ability to write and effectively communicate. The national Planning Department estimates that about 152,000 individuals join the labour market each year without training. A report by KPMG (2007) reveals there is a prevalent skills gap at the expert level, where only 10 - 40 per cent received training. Training was also limited at the intermediate level.

A comprehensive study commissioned by the World Bank analyses skills gaps and VET in Sri Lanka and presents a range of challenges for the labour force (Dundar et al., 2014). Nearly all individuals with higher education use cognitive skills, however, only 52 per cent of those who possess primary and secondary education use cognitive skills. Every 1 in 10 respondents cited limited literacy as an impediment to their job search or career growth. Other skills gaps identified include:

- only 16 per cent of workers can use computers
- only 24 per cent are proficient in English
- only 77 per cent of workers actively use teamwork skills
- only 50 per cent actively use presentation skills
- only 28 per cent of the urban population and 8 per cent of rural residents use computers.

Several skills gaps are discussed at the sectoral level. Tourism is identified as a skill gap that the local TVET system has not addressed (Dundar et al., 2014). Manufacturing industries have experienced an increase in skilled labour constraint from 21 per cent in 2004 to 26 per cent in 2011. Sri Lankan government expenditure on training is particularly high in agricultural, health and construction relative to other industries (Dundar et al., 2014), highlighting their economic/skilling priorities.

5.3.5.3 Stakeholder experiences

Australian government stakeholders noted the missing middle-ground between a university elite system and the very low-skilled mass of workforce in Sri Lanka. This presents a significant need for VET to fill the gap. Sri Lanka is also a recipient of foreign aid, as recognised by the World Bank. Combined with many aid projects from places like the UK, Germany and Israel, this makes a private sector venture into VET a challenge.

As in other parts of South Asia, much of the Sri Lanka labour force travel to the Middle East for work and send remittances back. This has been noted by Australian government and education stakeholders, and broadens the up-skilling requirements for the local labour force beyond the domestic economy needs.

Australian government stakeholders noted that Sri Lanka is one of the Indian Ocean Rim Association (IORA) countries that is participating in transnational standardisation of port operation occupations. This can assist in better identifying skills gaps with industry and potentially allowing VET to be properly targeted.

5.4 Latin America (Brazil, Chile, Colombia, Mexico, Peru)

The Latin America countries that have been researched for this study include Brazil, Chile, Colombia, Mexico and Peru.

5.4.1 Key Themes in the Region

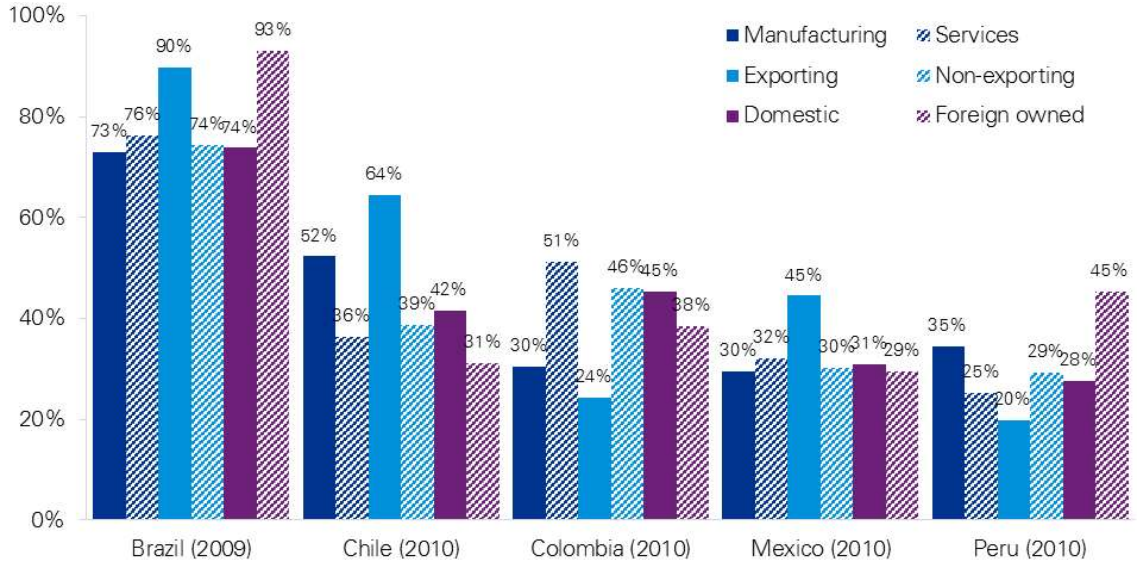
Analysis of employment data in Latin America shows that service sector jobs (both in trade and other market services and public and other social services) are generally the main employers across the region, and are the ones that have experienced the greatest growth over the past decade.

There are very high levels of informal employment across the region, in many of these service sectors and also, particularly, in construction.

Analysis by the OECD on region-wide skills gaps in Latin America has highlighted that while there are fewer industries with skills gaps, these skills gaps are concentrated and more severe (Melguizo et al., 2016). Their analysis identifies two advanced manufacturing industries – machinery and motor vehicles – as having the largest gap in adequately trained workers.

Industry and government stakeholders have identified aged care, health services and mining related industries as potential skills gaps and opportunities for training. However, there is a significant issue in identifying who is willing to pay – students, government or industry.

Figure 72 Per cent of Latin American firms identifying an inadequately educated workforce as a major constraint

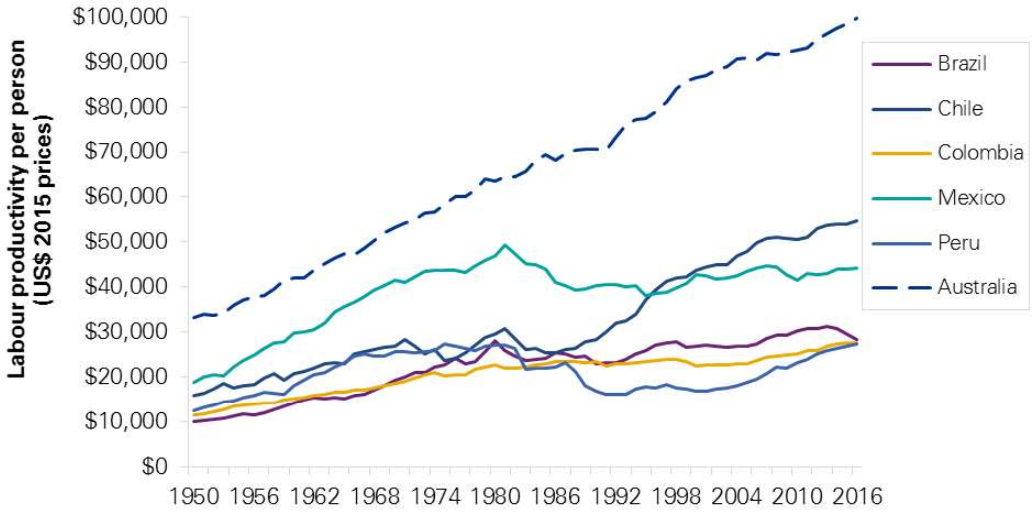


Source: World Bank Enterprise Survey (2016)

According to World Bank survey data, high percentages of firms have reported inadequate education of the labour force as a major constraint in Latin American countries. Figure 72 shows that this constraint is extremely high in Brazil, with 90 per cent of exporting firms and 93 per cent of foreign owned firms citing this problem. This indicates that there are major labour market skill mismatches, which will require a combination of labour force adjustments, up-skilling and targeted labour market and education policies.

These skills gaps are reflected largely throughout the region. Significant gaps were also identified by 64 per cent of exporting businesses in Chile, 51 per cent of service firms in Colombia, 45 per cent of exporting firms in Mexico and 45 per cent of foreign owned firms in Peru, each identifying workforce education as a major constraint.

Figure 73 Labour productivity per person employed in 2015 US$ (converted to 2015 price level with updated 2011 PPPs)



Source: The Conference Board Total Economy Database (2016)

Labour productivity in Latin America is lower compared to advanced economies such as Australia. Brazil, Colombia and Peru sit at the lowest level of productivity, with workers in these economies producing around US $27,000 of output per worker, compared to US $99,717 in Australia. Chile has improved significantly over the past two decades. In contrast, Mexico's labour productivity has declined since its peak in 1980, which has been attributed in some analyses to a significant increase of informal employment (McKinsey, 2014). This shows a need for better access to capital and technology, and an improvement in human capital through up-skilling in these economies – particularly in Brazil with a population in excess of 200 million.

In KPMG's consultations, training stakeholders have highlighted the distance to market for VET delivery as a barrier. As travel is one of the major costs for off-shore training, this presents a major challenge for Australian education providers delivering in Latin America. These costs significantly affects our competitiveness against more local international educators, particularly from the US and Canada.

5.4.2 Brazil

The largest country of South America, Brazil has borders with all South American countries other than Ecuador and Chile. Brazil has a $3.2 trillion economy, measured by GDP (PPP), making it the largest economy in Latin America, and 7th largest economy in the world in 2015, according to the World Bank (2016). Over the past decade, Brazil has experienced fast economic growth and a high rate of poverty and inequality reduction. Economic growth in Brazil from 2003 to 2014 has lifted 29 million Brazilians out of poverty (World Bank, 2016b).

5.4.2.1 Economic and employment backdrop

Brazil's economy has strong services, mining, manufacturing and agricultural sectors. Despite two quarters of recession in 2008, Brazil was one of the first economies in the world to begin a gradual path of recovery. In 2010, Brazil's economy experienced its highest annual GDP growth rate (7.5 per cent) in the past 25 years. In 2015 and 2016 it experienced its worst ever recession (as reflected in the table below). Action by the Central Bank in 2017 and economic reforms in 2016 have boosted recovery efforts as reflected by the positive annual growth in 2017.

Figure 74: Brazil Economy and Industry

Economic data	
Gross Domestic Product (PPP)	US$3.24 trillion (2017 est.) US$3.357 trillion (2016 est.) US$3.48 trillion (2015 est.)
GDP composition by sector	Agriculture: 6.2% Industry: 21% Services: 72.8%
GDP growth	1.0% (2017 est.) -3.5% (2016 est.) -3.6% (2015 est.)
GDP per capita	US$15,600 (2017 est.)
Education expenditure	5.9% of GDP (2014)
Ease of doing business	120 (2014)
Industry structure	
Major agricultural products	coffee, soybeans, wheat, rice, corn, sugarcane, cocoa, citrus; beef
Industries	textiles, shoes, chemicals, cement, lumber, iron ore, tin, steel, aircraft, motor vehicles and parts, other machinery and equipment
Major export partners	China 21.8%, US 12.5%, Argentina 8.1%, Netherlands 4.3% (2017)
Major exports	transport equipment, iron ore, soybeans, footwear, coffee, automobiles
Major import partners	China 18.1%, US 16.7%, Argentina 6.3%, Germany 6.1% (2017)
Major imports	machinery, electrical and transport equipment, chemical products, oil, automotive parts, electronics

Country Profile Sources:
CIA World Factbook, , available at https://www.cia.gov/library/publications/resources/the-world-factbook/geos/ar.html, accessed on 21 August 2018.
OECD, World Indicators of Skills for Employment (WISE), available at http://stats.oecd.org//Index.aspx?QueryId=62775#, accessed on 21 August 2018.
ILOSTAT Database, Country Data, available at http://www.ilo.org/ilostat/faces/help_home/data_by_country?_adf.ctrl-state=yddsm3mdf_4&_afrLoop=404928031607009, accessed on 21 August 2018.

Brazil's service sector is the largest component of GDP, contributing to around 73 per cent of the country's GDP in 2017. The industrial and agriculture sectors represented around 21 per cent and 6 per cent of Brazil's total GDP respectively.

The trade and other market services (part of the broader services sector) is the highest employing sector in Brazil, accounting for over one third of Brazil's total workforce from the beginning of this decade.

Over the past five years, Brazil has experienced employment growth in the services sector, while the agriculture and industry sectors have experienced 17 per cent and 11 per cent decreases respectively.

A transfer in employment from public and other social services to trade and other market services could partially reflect impacts from the South American economic crisis of 2002, or be a data issue. Regardless, growth in both service categories have increased steadily since 2002, and are likely to be

the source of skill needs, with 76 per cent of service firms identifying workforce education as a constraint (see Figure 72).

ILO occupation data is limited to the years 2003 to 2007, but shows a significant drop in the labour force share of service and sales occupations, and a large increase in the share of elementary occupations.

Figure 75 Employment by Sector (1998 – 2014)

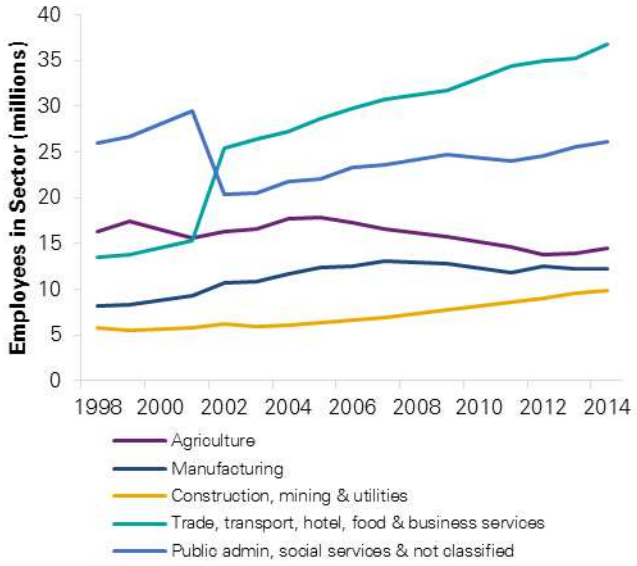
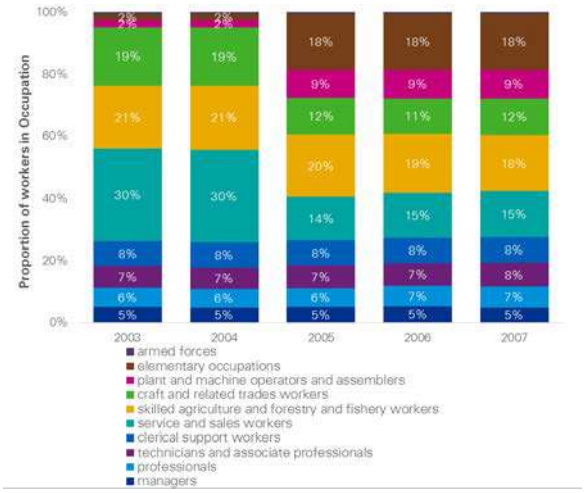


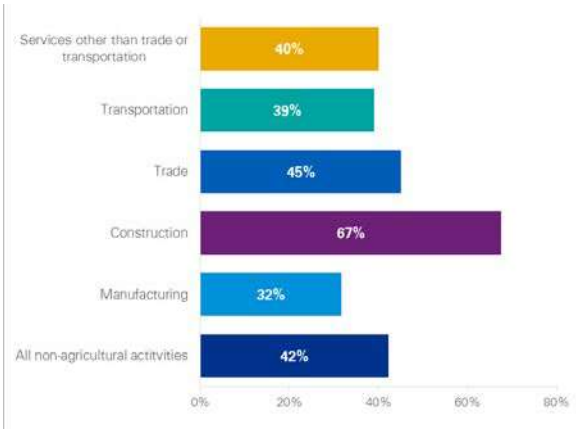
Figure 76 Labour force by occupation (2003 – 2007)



Sources: World Bank Enterprise survey (2016), International Labour Organisation (2016)

Figure 77 shows that over 40 per cent of employment in all non-agriculture industries is in the informal sector. Construction has the greatest share, with over two-thirds of construction workers employed in the informal sector.

Figure 77 Share of employment in informal sector (2009)



Source: International Labour Organisation (2016)

5.4.2.2 Examples of skills shortages

In the context of skills gaps in emerging economies, research commissioned by EDFI presents a case study of a private hospital in São Paulo (EDFI, 2016). They found that recruiting high-qualification professions such as doctors and healthcare specialists is not a problem. However, the hospital struggles to fill positions in low to medium qualified work, such as auxiliary medical tasks, nursing

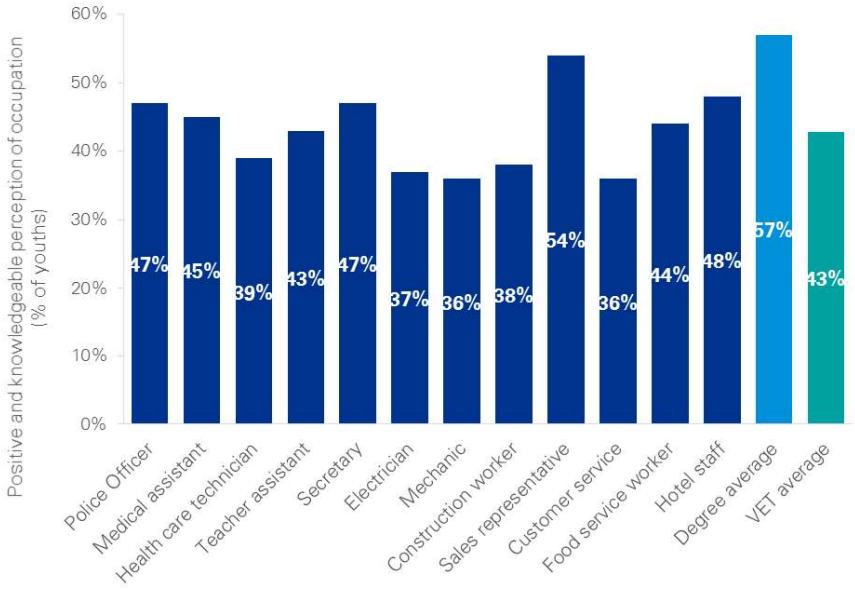
work, and technical support services. These roles also typically experience a high turnover rate, which exacerbates the challenge of finding skilled workers. The hospital has addressed this issue by developing in-house training structures, but there is a greater demand anticipated for quality healthcare workers as the population grows, and better quality healthcare above what public health provides is demanded. The study also considers broader roles than healthcare, and identifies skills gaps in technical support functions – such as electricians and plumbers – and specialist mechanics such as air-conditioning mechanics and x-ray mechanics.

In a survey by McKinsey (2013), 43 per cent of Brazilian youths said they did not do post-secondary education or training because they could not afford it, while 25 per cent said lack of time due to work prevented them.

The survey also identified occupations that appeared attractive to youths, providing an indication of where the future labour force might develop, and sectors that may have a shortfall. Perceptions of attractiveness were lowest for health care technicians, electricians, mechanics, construction and customer service occupations. Perceptions of attractiveness for occupations needing a degree were 14 percentage points higher than occupations requiring VET.

Of note, teachers also had a relatively low perceived attractiveness (McKinsey, 2013). This could highlight a broader issue in developing a strong base of teachers and trainers to facilitate further learning in the economy.

Figure 78: Youth perception of occupations in Brazil



Source: McKinsey (2013)

Note: Degree average includes perception on 6 occupations (engineer, doctor/surgeon, lawyer, financial analyst, school teacher, accountant) that require bachelor or professional degree. VET average includes perception on 12 occupations (web developer, graphic designer, IT technician, social worker, and roles shown on graph) that require a certificate or no training

5.4.2.3 Stakeholder experiences

Latin America can be a more challenging market to promote Australian education too. However, growth in the Brazilian mining industry was raised by a number of stakeholders as a potential opportunity for Australians to up-skill workers. Delivery of training was suggested to have more potential if done through direct collaboration with industry, as it can be a challenge to promote the value of Australian education to a more distant market.

Australian government stakeholders in Brazil have noted that there is a major shortfall in skill supply compared to demand. Several factors contribute to this across schooling and VET. Many school

students only attend half-days due to financial constraint and lack of teachers. From the private school system, most students aim for university degrees and careers, leaving a gap in well-resourced VET students. Stakeholders have also suggested that during the economic downturn in Brazil many people chose to up skill, increasing both qualifications and potential underutilisation.

The Brazil Federal Government has been focussing on developing VET, with expansions to the technical training system through Federal institutions. There is an industry system to provide training called SENAI (translates to National Service for Industrial Training) from one-day workshops to diplomas. However, these programs are still not meeting the up-skilling that the Brazil labour force needs.

For Australian VET, there is limited market penetration and knowledge of the quality is not well known across Brazil. Most students from Brazil look to the United States and Europe for higher education. Austrade, DFAT and Australian education stakeholder groups are working to change and improve this knowledge. Improving the professionalisation of VET, and encouraging women to pursue VET careers, are recognised as potential opportunities for the sector in Brazil. However, challenges of difficult business environments, language barriers, and local financing for courses will require long-term investment with a large appetite for risk.

Education stakeholders have also identified mining as a skills need in Brazil. More broadly, they have echoed the challenges of entering the South American market including that travel by Australian teachers represents a major cost component of off-shore VET delivery. Direct-to-industry-training could be a preferred option.

Hotel industry stakeholders have noted the effectiveness of in-house training and working for an international hotel chain to build a positive skill set for the industry. These skills are transferable to other parts of the industry. However, the industry perspective on Australian VET providers providing VET to major hotel chains is that opportunities are limited, despite the high standards of the Australian hotel and hospitality industry (see case study 3: Tourism, for further discussion).

5.4.3 Chile

Chile is located in South America, sharing a border with Argentina, Bolivia and Peru. The World Bank ranked Chile as a high-income country and one of Latin America's fastest-growing economies over the past decade. However, the economy of Chile has experienced a steady decline in annual GDP growth in recent years. In 2017, the annual GDP growth rate fell to an estimated 1.5 per cent due to the declining price of copper which, according to the CIA World Factbook, constitutes 20 per cent of government revenue as Chile's top export.

5.4.3.1 Economic and employment backdrop

Chile's economy is characterised by large services, mining and manufacturing sectors, and a high level of wholesale and retail trade. The largest sector in terms of GDP was the services sector, contributing to over 60 per cent of the country's GDP in 2017, with industry providing over one third of GDP and agriculture providing the reminder (4.4 per cent).

Figure 79: Chile Economy and Industry

Economic data	
Gross Domestic Product (PPP)	US$451.1 billion (2017 est.) US$445.4 billion (2016 est.) US$435.4 billion (2015 est.)
GDP composition by sector	Agriculture: 14.3%, Industry: 39.6%, Services: 46.1% (2015 est.)
GDP growth	1.5% (2017 est.) 1.3% (2016 est.) 2.3% (2015 est.)
GDP per capita	US$24,500 (2017 est.)
Education expenditure	4.9% of GDP (2015)
Ease of doing business	41 (2014)
Industry structure	
Major agricultural products	grapes, apples, pears, onions, wheat, corn, oats, peaches, garlic, asparagus, beans; beef, poultry, wool; fish; timber
Industries	copper, lithium, other minerals, foodstuffs, fish processing, iron and steel, wood and wood products, transport equipment, cement, textiles
Major export partners	China 27.5%, US 14.5%, Japan 9.3%, South Korea 6.2%, Brazil 5% (2017)
Major exports	copper, fruit, fish products, paper and pulp, chemicals, wine
Major import partners	China 23.9%, US 18.1%, Brazil 8.6%, Argentina 4.5%, Germany 4% (2017)
Major imports	petroleum and petroleum products, chemicals, electrical and telecommunications equipment, industrial machinery, vehicles, natural gas

Country Profile Sources:
CIA World Factbook, , available at https://www.cia.gov/library/publications/resources/the-world-factbook/geos/ar.html, accessed on 21 August 2018.
OECD, World Indicators of Skills for Employment (WISE), available at http://stats.oecd.org//index.aspx?QueryId=62775#, accessed on 21 August 2018.
ILOSTAT Database, Country Data, available at http://www.ilo.org/ilostat/faces/help_home/data_by_country?_adf.ctrl-state=yddsm3mdf_4&_afrLoop=404928031607009, accessed on 21 August 2018.

The trade and other market services sector is the largest employing sector in Chile, accounting for approximately 40 per cent of the total workforce since 2009. This sector employed over 3.3 million employees in 2017. The public and other social services sector has maintained its place as the second highest employer in the country, accounting for approximately 28 per cent of total workforce over the past decade. Overall the sector employed nearly 2.3 million employees in 2017.

All industries registered growth in employment except agriculture. The fastest growing sectors between 1998 and 2015 were construction, trade and other market services, and public and other social services which grew at an average annualised growth of 3.5 per cent, 3.4 per cent and 2.8 per cent, respectively.

Figure 80 Employment by Sector (1998 – 2014)

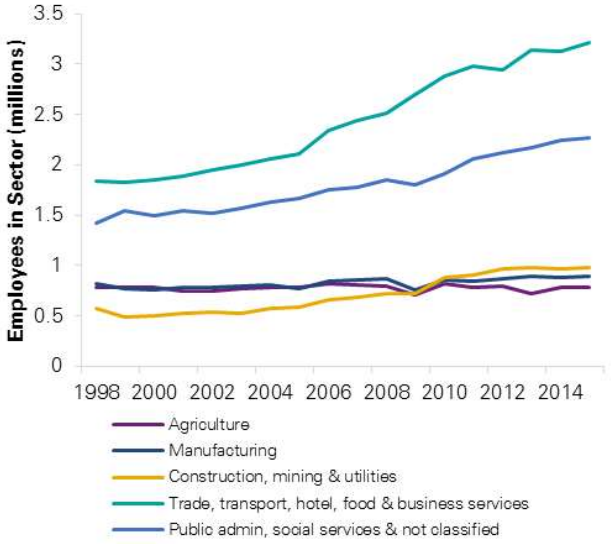
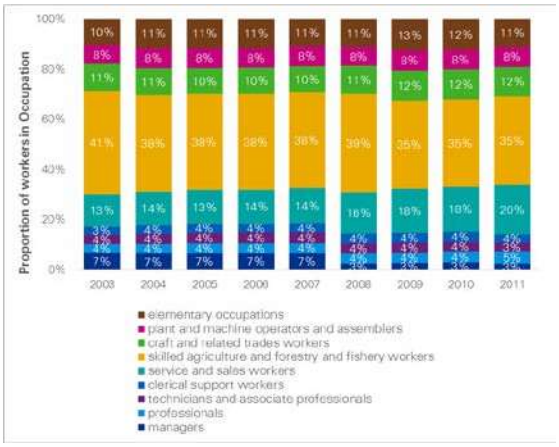


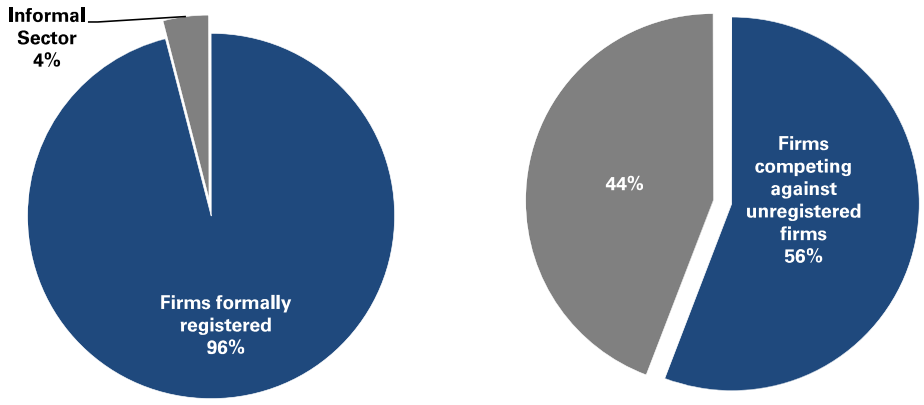
Figure 81 Labour force by occupation (2003 – 2011)



Sources: World Bank Enterprise survey (2016), International Labour Organisation (2016)

Chile's population are employed across a range of different occupations. Skilled agriculture and forestry workers make up over a third of the labour force, with another third consisting of a combination of service and sales workers, and craft and related trades workers. Between 2005 and 2011, the service and sales workers share of the labour force increased, while the skilled agriculture and forestry workers share decreased. All other occupation shares remained relatively constant.

Figure 82 Informal share of the economy (2010)



Source: World Bank Enterprise survey (2016)

Figure 77 shows that in 2010, only around 4 per cent of businesses in the Chile economy were unregistered when they first started operating. However, over half of businesses reported facing competition from unregistered or informal businesses, indicating that the informal economy is still seen as influential in the Chile economy.

5.4.3.2 Examples of skills shortages

Even though general admission in schools is high, there is uneven distribution of quality. This is leading to skills mismatch that is impeding productivity (OECD Economic Surveys Chile, 2015). The mismatch between the supply and demand of skills in Chile is reducing efficiency and productivity. Inconsistent quality of the educated workforce is spilling over into lower productivity, and affecting opportunities for innovation.

About 42 per cent of large and medium companies in Chile are facing challenges in finding the required personnel and over 87 per cent of survey respondents believe that addressing skills gaps is vital for their company (Porter, 2013). A report by the World Economic Forum, indicated that around 25 per cent of firms reported skill shortages, and that it was socio-emotional skills that were the most lacking.

Surveying the employees themselves, the Randstad Workmonitor report (2012) shows that about 41 per cent of Chilean employees agree or strongly agree that they are underqualified for their occupation. Additionally, 53 per cent of employees agree or strongly agree that their employer has trouble finding the right person for some jobs (Randstad, 2012). This highlights a broad theme of skills gaps that are identified from an employee's perspective.

5.4.3.3 Stakeholder experiences

Similar to Brazil, education stakeholders have also identified Mining as a skill need in Chile. Australian government stakeholders have supported mining as a skill need, and also extended the need to mining equipment, technology and services – with a view to better integrating global value chains into the Chile economy. Further, as part of a regional priority, Australian government stakeholders have identified both agriculture and health services as areas which could be up-skilled in Chile.

Aged care training was also identified as a potential training market in Chile by training stakeholders. However, they again identified a notable barrier as the cost associated with teachers travelling to Latin America.

Also discussed earlier, hotel industry stakeholders have noted the effectiveness of in-house training and working for an international hotel chain to build a positive skill set for the industry (see case study 3: Tourism, for further discussion). Workers trained by reputable companies then have sought-after industry skills and are able to improve local practices.

5.4.4 Colombia

Colombia is located in South America, sharing land borders with Brazil, Ecuador and Peru. Colombia has a $714 billion economy measured by GDP (PPP), making it the third largest economy in Latin America after Brazil and Mexico.

5.4.4.1 Economic and employment backdrop

Colombia has experienced robust economic growth, driving higher living standards over the past decade. The main drivers of Colombia's economic growth are the garment, construction and services sectors. In 2015, Colombia experienced a slowdown in economic growth due to modest declines in government consumption and investment as well as a massive decline in exports. The average annual GDP growth contracted from 2 per cent in 2016 to 1 per cent in 2017.

Colombia's services sector remained the main engine of economic growth, contributing to over half of the country's GDP in 2017. Industrial and agriculture sectors represented around 31 per cent and 7 per cent of Colombia's total GDP respectively.

Figure 83: Colombia Economy and Industry

Economic data	
Gross Domestic Product (PPP)	US$714 billion (2017 est.) US$699.7 billion (2016 est.) US$679 billion (2015 est.)
GDP composition by sector	Agriculture: 7.4% Industry: 31.3% Services: 61.4% (2017 est.)
GDP growth	1.8% (2017 est.) 2% (2016 est.) 3.1% (2015 est.)
GDP per capita	US$14,500 (2017 est.)
Education expenditure	4.5% of GDP (2016)
Ease of doing business	34 (2014)
Industry structure	
Major agricultural products	coffee, cut flowers, bananas, rice, tobacco, corn, sugarcane, cocoa beans, oilseed, vegetables; shrimp; forest products
Industries	textiles, food processing, oil, clothing and footwear, beverages, chemicals, cement; gold, coal, emeralds
Major export partners	US 28.5%, Panama 8.6%, China 5.1% (2017)
Major exports	petroleum, coal, emeralds, coffee, nickel, cut flowers, bananas, apparel
Major import partners	US 26.3%, China 19.3%, Mexico 7.5%, Brazil 5%, Germany 4.1% (2017)
Major imports	industrial equipment, transportation equipment, consumer goods, chemicals, paper products, fuels, electricity

Country Profile Sources:
CIA World Factbook, , available at https://www.cia.gov/library/publications/resources/the-world-factbook/geos/ar.html, accessed on 21 August 2018.
OECD, World Indicators of Skills for Employment (WISE), available at http://stats.oecd.org//Index.aspx?QueryId=62775#, accessed on 21 August 2018.
ILOSTAT Database, Country Data, available at http://www.ilo.org/ilostat/faces/help_home/data_by_country?_adf.ctrl-state=yddsm3mdf_4&_afrLoop=404928031607009, accessed on 21 August 2018.

Over the past decade, the trade and other market services sector has employed the largest workforce and has experienced the highest growth in employment since 2006. In 2017, the trade and other market services sector employed over 9 million employees, accounting for approximately 45 per cent of total employment.

The public and other social services sector is the second highest employing sector in Colombia, also experiencing steady growth in employment since 2006. Employment in the agriculture, manufacturing and construction sectors have all also increased since 2006. In 2017, the agriculture, manufacturing and construction sectors employed 7.7 million workers, as a group accounting for over one third of total employment in Colombia.

Figure 84 Employment by Sector (2001 – 2014)

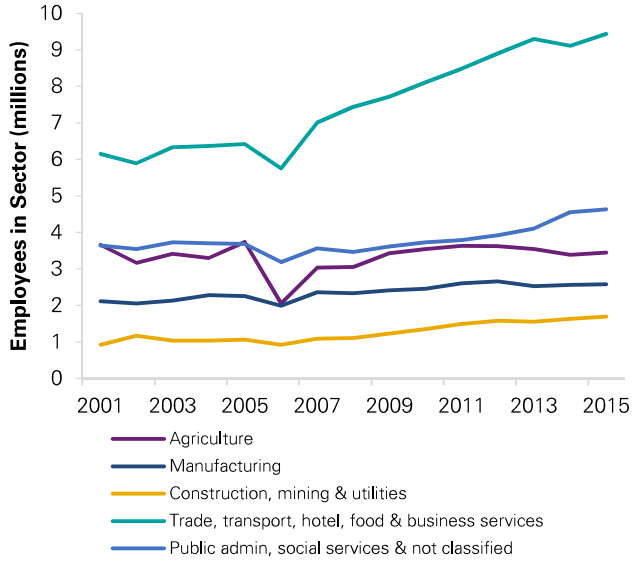
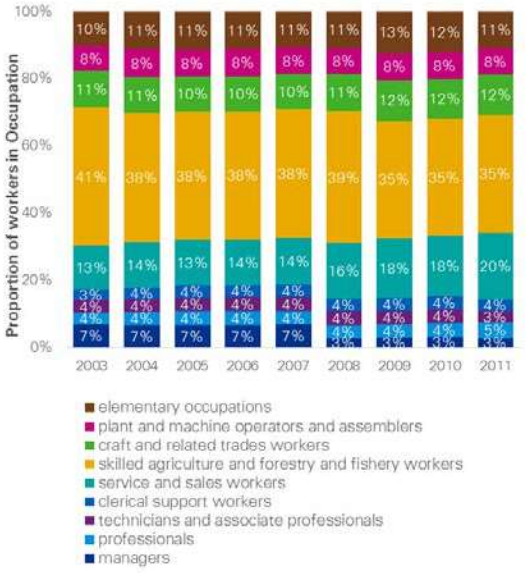


Figure 85 Labour force by occupation (2009 – 2010)



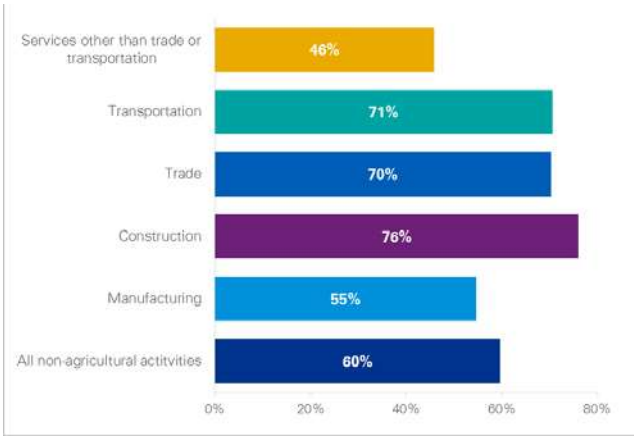
Sources: World Bank Enterprise survey (2016), International Labour Organisation (2016)

Colombia's workers are employed across a range of different occupations. Higher-skilled occupations including technicians and associate professionals, professionals and managers are only a small part of the labour force in Colombia, accounting for approximately 10 per cent of the labour force. Most of the labour force are in service and sales, or skilled agriculture and forestry and fishing occupations – with these combined making up over half of the labour force in Colombia. This indicates that there is a significant capacity for up skilling of the county's workforce.

Reflective of the services sector's significant share of employees, the share of service and sales occupations have increased between 2003 and 2011, while the share of skilled agriculture and forestry and fishing workers and managers decreased. The share of other occupations in the economy remained constant.

Almost two-thirds of Colombia's non-agriculture workforce are employed informally. This share differs across individual sectors, with almost three-quarters of workers in the construction, transportation and trade sectors employed in the informal workforce.

Figure 86 Share of employment in informal sector (2009)



Source: International Labour Organisation (2016)

5.4.4.2 Examples of skills shortages

According to the International Monetary Fund (2015), in 2012, only about 16 per cent of the employed population in Colombia was skilled, compared to the 19 per cent on average in the region (Mexico, Brazil, Chile and Peru). Also the quality of education in Colombia, measured by math Pisa scores, is among the lowest in the world and this will also impact productivity. To support this, Aring (2012) showed that in 2010, 38 per cent of firms identified labour skill levels as a major factor in productivity.

OECD (2013a) found that tertiary qualifications often do not tally with the expected skill requirement of the labour market, with around 45 per cent of firms identify an inadequately educated workforce as a main restriction, up from 30 per cent in 2006 (compared with 20 per cent in OECD economies). In addition, the report also noted that high minimum wages are pushing low skilled workers, youth, and those in less developed regions into the informal sector.

5.4.4.3 Stakeholder experiences

Education stakeholders have identified mining as a skill need in Colombia. Direct-to-industry-training could be a preferred option due to the factors associated with institutional training delivery to South America.

As part of a regional target, health services and agriculture have been identified as priority markets in Colombia by Australian government stakeholders. More specifically for Colombia, oil and gas industries were identified as a priority.

5.4.5 Mexico

Mexico is located in North America, sharing a border with Guatemala and Belize on the south, the Gulf of Mexico on the east, United States on the north, and the North Pacific Ocean on the west. Mexico has a $2.4 trillion economy measured by GDP (PPP), making it the second largest economy in Latin America after Brazil, and 11th largest economy in the world in 2017, according to the World Bank. With $19,900 GDP per capita in 2017, Mexico is classified as an upper middle income country by the World Bank.

5.4.5.1 Economic and employment backdrop

Putting over 90 per cent of trade under free trade agreements with 46 countries caused the Mexican economy to evolve into a manufacturing oriented economy and it was expected that the economy would experience stronger growth due to increased demand for Mexican exports and investment. In reality, since 2013, growth has averaged 2 per cent annually falling short of private sector expectations. According to the CIA impediments to growth include "falling oil production, weak oil prices, structural issues such as low productivity, high inequality, a large informal sector employing over half of the workforce, weak rule of law, and corruption" (CIA World Factbook, 2018).

Figure 87: Mexico Economy and Industry

Economic data	
Gross Domestic Product (PPP)	US$2.458 trillion (2017 est.) US$2.389 trillion (2016 est.) US$2.313 trillion (2015 est.)
GDP composition by sector	Agriculture: 3.9% Industry: 31.6% Services: 64% (2017 est.)
GDP growth	2% (2017 est.) 2.9% (2016 est.) 3.3% (2015 est.)
GDP per capita	US$19,900 (2017 est.)
Education expenditure	5.3% of GDP (2014)
Ease of doing business	39 (2014)
Industry structure	
Major agricultural products	corn, wheat, soybeans, rice, beans, cotton, coffee, fruit, tomatoes; beef, poultry, dairy products; wood products
Industries	food and beverages, tobacco, chemicals, iron and steel, petroleum, mining, textiles, clothing, motor vehicles, consumer durables, tourism
Major export partners	US 79.9% (2017)
Major exports	manufactured goods, electronics, vehicles and auto parts, oil and oil products, silver, plastics, fruits, vegetables, coffee, cotton; Mexico is the world's leading producer of silver
Major import partners	US 46.4%, China 17.7%, Japan 4.3% (2017)
Major imports	metalworking machines, steel mill products, agricultural machinery, electrical equipment, automobile parts for assembly and repair, aircraft, aircraft parts, plastics, natural gas and oil products

Country Profile Sources:
CIA World Factbook, , available at https://www.cia.gov/library/publications/resources/the-world-factbook/geos/ar.html, accessed on 21 August 2018.
OECD, World Indicators of Skills for Employment (WISE), available at http://stats.oecd.org//Index.aspx?QueryId=62775#, accessed on 21 August 2018.
ILOSTAT Database, Country Data, available at http://www.ilo.org/ilostat/faces/help_home/data_by_country?_adf.ctrl-state=yddsm3mdf_4&_afrLoop=404928031607009, accessed on 21 August 2018.

Mexico's economy is characterised by large services sector, and a high level of wholesale and retail trade. The largest sector by GDP was the services sector, contributed to nearly two thirds of the country's GDP in 2017, with industry providing just under one third of GDP and agriculture providing the reminder (3.9 per cent).

Consistent with other markets examined in this region, Mexico employs the greater proportion of workers in the trade and other market services sector followed by the public and other social services sector. The trade and other market services sector employed over 20.8 million employees in 2017, accounting for approximately 40 per cent of total workforce. The public and other social services sector employed over 20 per cent of total workforce over the past decade. In 2015, this sector employed around 11 million employees.

There has been a general increase in employment in both service sectors and the construction, mining and utilities sector. In contrast, employment in the agriculture and manufacturing sectors in Mexico have been flat or decreasing.

Figure 88 Employment by Sector (1998 – 2014)

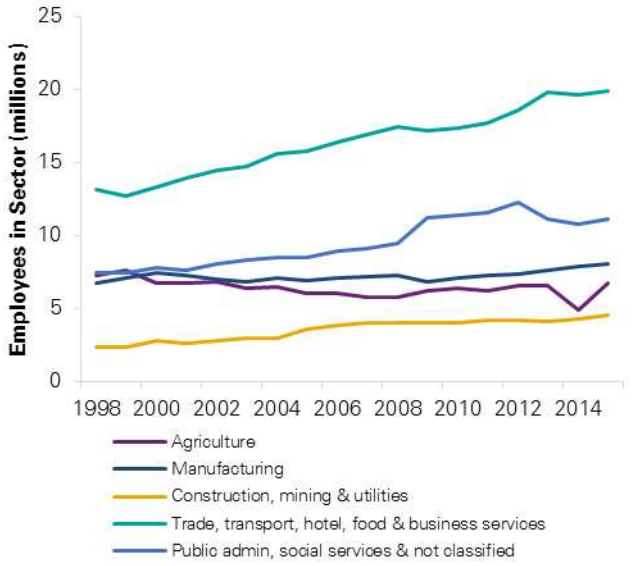
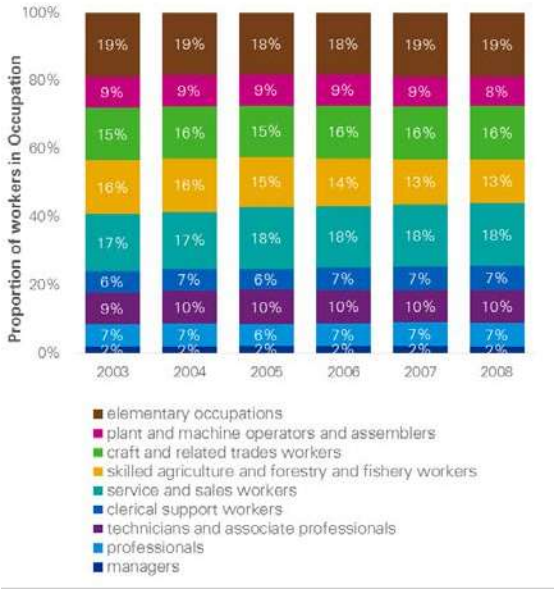


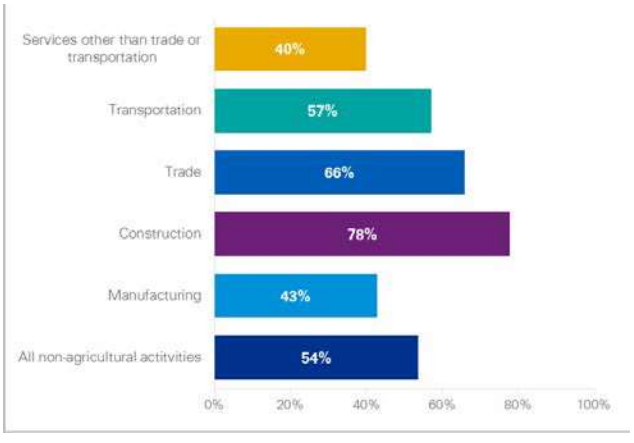
Figure 89 Labour force by occupation (2003 – 2008)



Sources: World Bank Enterprise survey (2016), International Labour Organisation (2016)

The Mexican labour force appears to be dominated by medium skilled occupations. In line with the dominance of the services sectors, service and sales occupations and craft and related trades workers make up over one third of the labour force in Mexico. Low skilled, elementary occupations are around one fifth of the Mexican labour force. Higher-skilled workers including technicians and associate professionals, professionals and managers are also only about one-fifth of the labour market. Further, the occupational composition of the Mexican labour market has been fairly stable between 2003 and 2008. With a fast growing services sector, and no real change in the proportion of sales and service occupations, this could indicate a potential existing or future gap for these skills.

Figure 90 Share of employment in informal sector (2009)



Source: International Labour Organisation (2016)

Over half of all workers in the Mexican non-agricultural sector are employed in the informal economy. Of this group, almost 80 per cent of construction sector employees are part of the informal economy. Employment in the trade and transport sectors is also predominately informal employment, with 64 per cent and 57 per cent informal sector employment, respectively.

5.4.5.2 Examples of skills shortages

A report by the OECD in 2015 showed that Mexico has relatively low education quality and quantity compared to the OECD countries. For example, in 2012, only 19 per cent of adults aged 25-64 years held upper-secondary or post-secondary non-tertiary degree as their highest-level of education and, in addition, 18 per cent had a tertiary degree. These numbers are well below the OECD averages of 44 per cent and 32 per cent, respectively. Moreover, the skills that the workers have are frequently not what employers are looking for. Almost one-third of Mexican firms report facing difficulties in securing the workers with the skills needed for their vacancies.

Mexico appears to be trapped in a low-skill equilibrium, evidenced through the dominance of employment in low-cost, low-skill labour (McKinsey, 2014). Poor schooling and education is also likely to contribute to this. For instance, in 2012 only 22 per cent of all 25-34 year olds attained upper secondary or post-secondary non-tertiary education. The International Labour Organization data shows that in 2013 more than half of the work force (54 per cent) had an informal employment relationship, a much higher rate than the average of emerging markets.

McKinsey (2014) suggest that improved vocational education and training in Mexico may go some way towards changing this. However, training on its own will likely not be enough, it needs to be combined with other policy approaches including better quality infrastructure and safety standards, and cheaper access to electricity.

5.4.5.3 Stakeholder experiences

Education stakeholders have noted direct-to-industry-training could be a preferred option due to the constraints (including cost) associated with Australian institutional delivery to South America. As in other South American countries, cultural differences in time management need consideration when training and up-skilling the local labour force.

Australian government stakeholders have identified a number of priority sectors that could present up-skilling opportunities. These sectors include aerospace, automotive, agriculture, oil and gas, which can improve connection to global value chains for Mexico's economy. Agriculture and health services are also identified priorities as they can improve the local quality of life.

5.4.6 Peru

Peru is located in the west of South America, sharing a border with Ecuador, Colombia, Brazil, Bolivia and Chile. Peru has a $424 billion economy, and is classified as an upper middle income country by the World Bank.[14]

Peru has been one of the fastest growing economies in Latin America, with an average annual GDP growth rate of 5.6 per cent from 2009-13. After a slowdown in GDP growth in 2014, increased inventories as well as metals and minerals exports contributed to economic recovery in 2015. However, falling mining investment and commodity prices have hindered growth rates.

5.4.6.1 Economic and employment backdrop

Peru's services sector is a significant part of the Peruvian economy, contributing to over 56 per cent of the country's GDP in 2017. Industrial and agriculture sectors represented around one third and 7 per cent of the total Peruvian GDP, respectively.

Figure 91: Peru Economy and Industry

Economic data	
Gross Domestic Product (PPP)	US$424.6 billion (2017 est.) US$407.8 billion (2016 est.) US$394.9 billion (2015 est.)
GDP composition by sector	Agriculture: 7.5% Industry: 36.3% Services: 56.1% (2017 est.)
GDP growth	2.5% (2017 est.) 4.1% (2016 est.) 3.3% (2015 est.)
GDP per capita	US$13,300 (2017 est.)
Education expenditure	3.8% of GDP (2016)
Ease of doing business	35 (2014)
Industry structure	
Major agricultural products	artichokes, asparagus, avocados, blueberries, coffee, cocoa, cotton, sugarcane, rice, potatoes, corn, plantains, grapes, oranges, pineapples, guavas, bananas, apples, lemons, pears, coca, tomatoes, mangoes, barley, medicinal plants, quinoa, palm oil, marigolds, onions, wheat, dry beans; poultry, beef, pork, dairy products; guinea pigs; fish
Industries	mining and refining of minerals; steel, metal fabrication; petroleum extraction and refining, natural gas and natural gas liquefaction; fishing and fish processing, cement, glass, textiles, clothing, food processing, beer, soft drinks, rubber, machinery, electrical machinery, chemicals, furniture
Major export partners	China 26.5%, US 15.2%, Switzerland 5.2%, South Korea 4.4%, Spain 4.1%, India 4.1% (2017)
Major exports	copper, gold, lead, zinc, tin, iron ore, molybdenum, silver; crude petroleum and petroleum products, natural gas; coffee, asparagus and other vegetables, fruit, apparel and textiles, fishmeal, fish, chemicals, fabricated metal products and machinery, alloys
Major import partners	China 22.3%, US 20.1%, Brazil 6%, Mexico 4.4% (2017)
Major imports	petroleum and petroleum products, chemicals, plastics, machinery, vehicles, TV sets, power shovels, front-end loaders, telephones and telecommunication equipment, iron and steel, wheat, corn, soybean products, paper, cotton, vaccines and medicines

Country Profile Sources:
CIA World Factbook, , available at https://www.cia.gov/library/publications/resources/the-world-factbook/geos/ar.html, accessed on 21 August 2018.
OECD, World Indicators of Skills for Employment (WISE), available at http://stats.oecd.org//index.aspx?QueryId=62775#, accessed on 21 August 2018.
ILOSTAT Database, Country Data, available at http://www.ilo.org/ilostat/faces/help_home/data_by_country?_adf.ctrl-state=yddsm3mdf_4&_afrLoop=404928031607009, accessed on 21 August 2018.

The trade and other market services employed more than 6.9 million metropolitan workers in 2017, accounting for almost half of the total metropolitan workforce. The public and other social services sector is the second highest employing sector in metropolitan Peru, employing nearly 3 million workers in 2017, and accounting for around one-quarter of the total metropolitan workforce.

According to the Household Income and Expenditure Surveys (HEIS), when also including the non-metropolitan population (on a self-reporting basis), the trade and other market services continues to maintain its status as the highest employing sector in Peru, contributing to 40 per cent of total Peru

[14] The World Bank, *Data by country: Peru*. Retrieved on 1 October 2011.

employment in 2013. When non-metropolitan employment is included, it is estimated that agriculture contributes to around one-quarter of employment, while public and other social services contributes just under 20 per cent.

Figure 92 Employment by Sector (1998 – 2013)

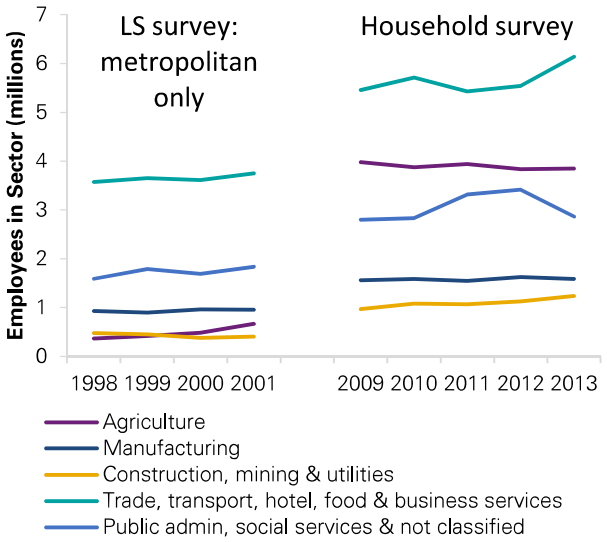
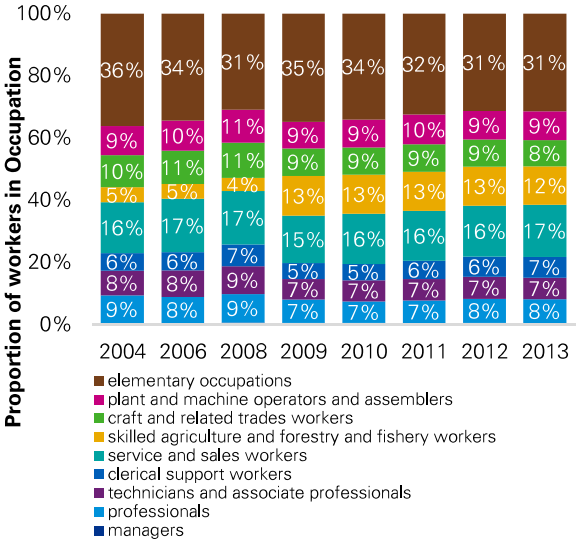


Figure 93 Labour force by occupation (2004 – 2013)

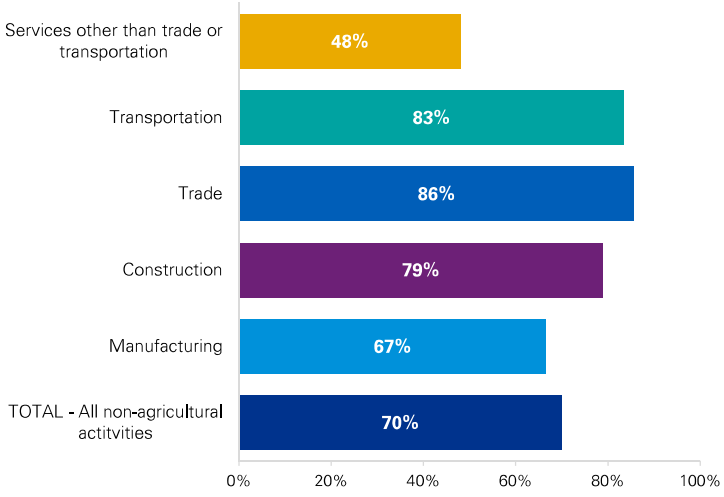


Sources: World Bank Enterprise survey (2016), International Labour Organisation (2016)
Note: for Figure 92, 1998-2001 includes main city or metropolitan area only, 2009-2013 Peru HEIS data

Elementary occupations are almost one-third of the Peruvian labour force in 2013. Medium skilled workers in the form of skilled agriculture and forestry and fishery workers, and service and sales workers, make up another third, while higher-skilled workers (technicians and associate professionals, professionals and managers) contribute to around one-quarter of the labour force. This mix of workers has been fairly stable since 2009.

Over two-thirds of all workers employed in non-agricultural activities are employed in Peru's informal economy. Informal sector activities are particularly predominate in the transport, trade and construction sectors, with over three-quarters of all workers in these sectors employed in the informal economy.

Figure 94 Share of employment in informal sector (2009)



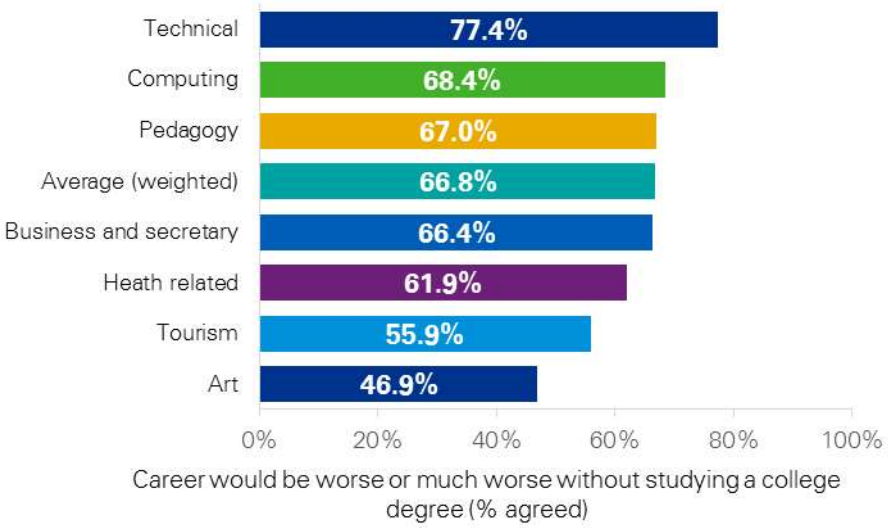
Sources: International Labour Organisation (2016)

5.4.6.2 Examples of skills shortages

The 2011 World Bank report on Peru identified the most important deficiency in Peru as the lack of a core set of cognitive and socio-emotional skills, which are highly valued by the labour market and demanded by employers. Additionally, information failures in the post-secondary skills formation process often leads to sub-optimal performance by many young Peruvians. Lastly, information asymmetry in the job matching process impedes the ability of workers to demonstrate their skills to potential employers resulting in skill mismatch.

Analysis by the World Bank (2011) recognises that many youths in Peru do not have access to enough knowledge about the labour market and what careers they could pursue. Perceived job opportunities were measured by asking individuals whether they believed their career prospects would be the worse or much worse without studying a college degree. A significant share of respondents did not value tertiary education, including courses for technical and computing skills (see Figure 95). This highlights a serious concern for addressing skills gaps, and requires better communication between training institutes and students, and between industry needs and course content.

Figure 95: Perceived labour opportunities in Peru without tertiary education



Sources: World Bank (2010)

A report by Manpower Group (2013) reveals that about 28 per cent of Peruvian firms have difficulties in filling jobs due to lack of the right skills and about 34 per cent report high or medium to the severity impact caused by talent shortages.

5.4.6.3 Stakeholder experiences

Similar to other parts of South America, education stakeholders have identified mining as a skills need in Peru. A broad challenge is the distance to market for establishing Australian VET. Direct-to-industry-training training could be a preferred option due to the factors associated with delivery to South America.

Australian government stakeholders identified tourism as a potential growth market due to regions of excellence in craft, but up-skilling in tourism related industries would be needed. Oil and gas is another sector identified, which could allow better integration into global value chains if better skills are available.

5.5 Middle East (Saudi Arabia, Egypt, United Arab Emirates)

This study has researched the Middle Eastern countries of Saudi Arabia, Egypt and the United Arab Emirates.

5.5.1 Key Themes in the Region

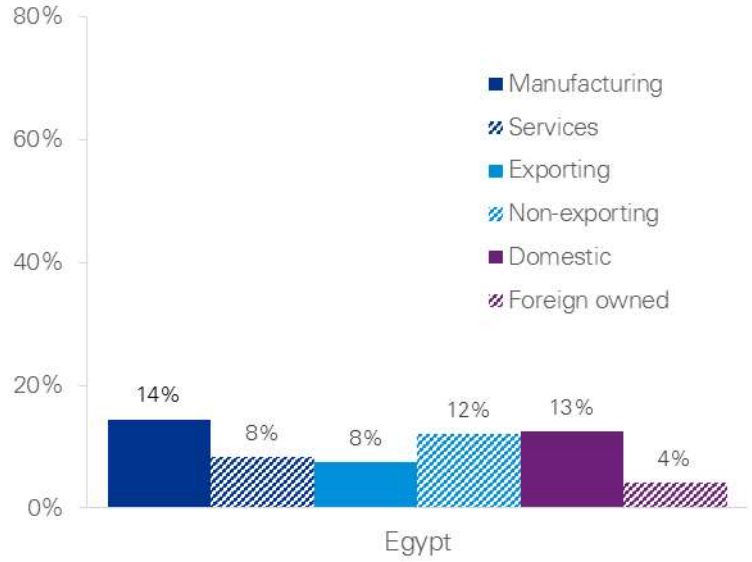
Many workers are expatriates from other countries, particularly from South Asia. This means that the consideration of supply and demand of skilled labour needs to consider this high volume of internationally mobile labour.

High dependence on expatriate workforces can also present significant policy issues for local governments in areas such as high youth unemployment of national workforces. This is particularly evident in Egypt where 42 per cent of 15-24 year olds in the labour force are unemployed, and also in Saudi Arabia with 28.5 per cent youth unemployment (ILO, 2016). As in many countries, this has been identified as an important issue to address, as a generation of low-skilled and disenfranchised workers can have negative long-term impacts on the economy.

Most economies in the region are heavily dependent on oil, which presents significant risks from fluctuating oil prices. Policies to diversify economies and address this issue have had varying degrees of success. Further attention in this area could be expected in the region, and a variety of strategies would need to be considered including attracting foreign investment, up-skilling of the labour force, and improving policy environments for other industry.

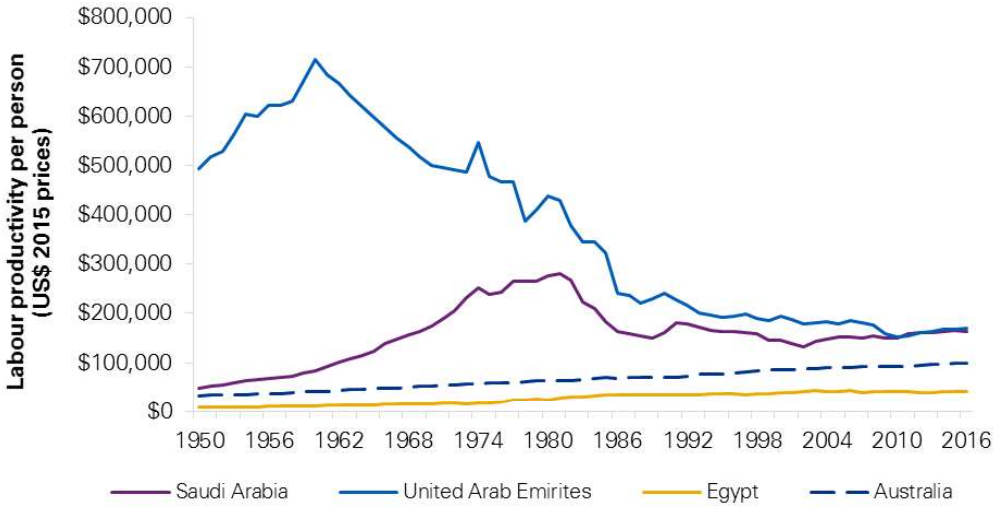
In identifying direct skill shortages, limited data on the Middle East was available from the World Bank enterprise surveys. However, businesses in Egypt identified inadequate education to be a larger constraint in manufacturing firms than in service sectors. Interestingly, domestic firms identified low education as a greater problem than foreign owned firms. One explanation for this could the availability of higher-skilled expatriates from advanced economies that foreign firms can access.

Figure 96 Per cent of firms identifying an inadequately educated workforce as a major constraint



Source: World Bank Enterprise Survey (2016)

Figure 97 Labour productivity in the Middle Eastern Countries of Interest



Source: The Conference Board Total Economy Database (2016)

Labour productivity data of Middle Eastern countries has to be carefully interpreted. Major oil discoveries and production in the UAE and Saudi Arabia can lead to a temporary "improvement" in labour productivity. This effect is exaggerated as this industry is relatively capital intensive (discussed in section 3).

As mentioned earlier, diversity of industries is still a consideration for these countries, and improving labour-productivity in non-energy sectors presents an up-skilling opportunity for training and education providers. Labour productivity in Egypt is approximately half the level of Australia's, and it has scarcely improved over the past few decades. This presents a significant need to up-skill sectors of the Egyptian economy.

Turning to soft skills, a survey of employers in the Gulf Cooperation Council asked which skills the national labour force had a strength in. The top three skill identified were local knowledge, network, and problem solving. The bottom three skills identified were communication, sound ethics and work culture (EY, 2015). Importantly, of the survey respondents which included 101 medium and large businesses across the region, only 5 per cent said 'ease of training' was a strength of locals, while no businesses in Saudi Arabia identified this as a benefit of hiring nationals (EY, 2016). This highlights a challenge that vocational education and training has in up-skilling the workforce in the region.

Another key challenge identified by training stakeholders is the risk of pursuing training and education options in the Middle East. This is due to uncertain political and economic environments, and also cultural differences that need to be considered when doing businesses (discussed briefly in Case Study 4: Soft Skills). Economic and political stability is important for an up-skilling strategy to meet the needs of the region.

5.5.2 Saudi Arabia

Saudi Arabia is a Middle Eastern country that borders a number of other nations including Egypt, Iraq and the United Arab Emirates. It is an oil-based economy, with the petroleum sector accounting for approximately 87 per cent of government budget revenues, 42 per cent of GDP and 90 per cent of export earnings (CIA, 2018).

5.5.2.1 Economic and employment backdrop

Saudi Arabia's economy has only minimal agricultural activity, with the majority almost evenly balanced across industry and services. However, employment is much greater in the service sector, as mining is capital intensive and requires a relatively smaller labour force.

Key challenges noted by the CIA World Factbook include adjusting the economy to have private sector involvement, managing a foreign workforce in excess of six million, and improving large youth unemployment with greater education and technical skill training (CIA, 2018).

Figure 98: Saudi Arabia Economy and Industry

Economic data	
Gross Domestic Product (PPP)	US$1.774 trillion (2017 est.) US$1.744 trillion (2016 est.) US$1.676 trillion (2015 est.)
GDP composition by sector	Agriculture: 2.6% Industry: 44.2% Services: 53.2% (2017 est.)
GDP growth	-0.7% (2017 est.) 1.7% (2016 est.) 4.1% (2015 est.)
GDP per capita	US$54,800 (2017 est.)
Education expenditure	5.1% of GDP (2008)
Ease of doing business	49 (2014)
Industry structure	
Major agricultural products	wheat, barley, tomatoes, melons, dates, citrus; mutton, chickens, eggs, milk
Industries	crude oil production, petroleum refining, basic petrochemicals, ammonia, industrial gases, sodium hydroxide (caustic soda), cement, fertilizer, plastics, metals, commercial ship repair, commercial aircraft repair, construction
Major export partners	Japan 12.2%, China 11.7%, South Korea 9%, India 8.9%, US 8.3%, UAE 6.7%, Singapore 4.2% (2017)
Major exports	petroleum and petroleum products 90% (2012 est.)
Major import partners	China 15.4%, US 13.6%, UAE 6.5%, Germany 5.8%, Japan 4.1%, India 4.1%, South Korea 4% (2017)
Major imports	machinery and equipment, foodstuffs, chemicals, motor vehicles, textiles

Country Profile Sources:
CIA World Factbook, , available at https://www.cia.gov/library/publications/resources/the-world-factbook/geos/ar.html, accessed on 21 August 2018.
OECD, World Indicators of Skills for Employment (WISE), available at http://stats.oecd.org//Index.aspx?QueryId=62775#, accessed on 21 August 2018.
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Figure 99: Employment by sector (1999 - 2014)

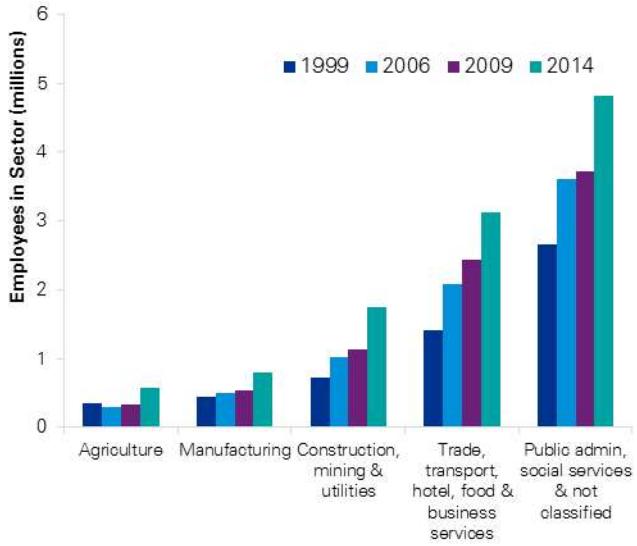
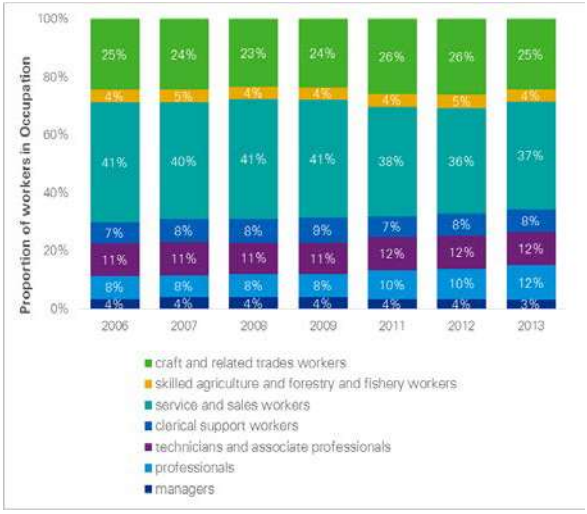


Figure 100: Labour Force by occupation (2006-13)



Sources: World Bank Enterprise survey (2016), International Labour Organisation (2016)

At the industry level, there has been a general increase in employment between 1999 and 2017, with construction, mining and utilities, trade and other market services, and public and other social services growing significantly between 2009 and 2017. Overall, services remain the greatest employer, accounting for almost three-quarters of total employment in 2017.

Across occupations, service and sales occupations constitute the largest proportion of the labour force, but decreased marginally from 41 per cent in 2006 to 37 per cent in 2013. Broadly, the proportion of occupations are relatively unchanged from 2006 to 2013.

Data on informal employment and the informal economy is unavailable for Saudi Arabia. However, the share of informal activity in the economy is believed to be relatively low, and modelling by Elgin and Oztunali (2012) estimated the size of the informal economy to be 17 per cent in 2008 – which is equivalent to most advanced economies. Note that their methodology differs from data presented by the ILO (used when examining other regions), therefore direct comparisons cannot be made.

5.5.2.2 Examples of skills shortages

Research by Abdulqadir (2015) indicates that Saudi Arabia faces significant skills gaps, with firms complaining that Saudi Arabia's educational system fails to adequately train students to meet firms' expectations. In addition to the training system, Abdulqadir noted that there are social, cultural and economic factors driving skills gaps, which includes entrenched perceptions preventing locals from pursuing certain skills. Unemployment among those with tertiary education is particularly high reaching 43 per cent in Saudi Arabia in 2014 (Vieira, 2014).

IMF (2015) noted that increasing unemployment in Saudi Arabia is being driven by skills mismatch. Employers are favouring the high quality and cheap labour from abroad. The biggest occupational group for expatriates, constituting 30 per cent, is in "basic engineering". In contrast, nationals in 'basic engineering' jobs make up less than five per cent of the total nationals workforce.

Although there has been an increase in the quality of education in Saudi Arabia, especially in technical and vocational education, the enrolment of women still lags behind. Unemployment among the youth is also high, with 30 per cent of the youth unemployed (Vieira, 2014).

Although Saudi Arabia uses a significant expatriate labour force, up-skilling the national workforce is important to the economy and recognised by the government. The Ministry of Labour in Saudi Arabia has set policies such as 'Saudization', which required companies to hire a quota of the local labour (Evosys, 2015). Policies like this have created challenges for companies to source skilled labour, and

have led to the identification of a need for government to further develop the Saudi Arabia education and training system to create skilled local workers (Evosys, 2015).

5.5.2.3 Stakeholder experiences

Australian government stakeholders have identified premium agriculture, construction, aviation, financial services, tourism, aged care and health services as sectors in Saudi Arabia and the Middle East that may present up-skilling opportunities.

The combination of Saudi Arabia expecting 84 new hotels, with over 27,000 rooms, to open this year[15], and the push to make Saudi Arabia the "Destination for Muslims"[16] should see a continued need for more workers with skills in tourism and hospitality. However, while supply is growing, demand may be a little slower, with hotel occupancy rates lower in 2018 than the previous year.

Training stakeholders also noted a major focus on health services endorsed by the government, which are likely to have significant skills gaps in meeting future demand and utilising infrastructure capacity. Also mentioned by training stakeholders is the development of the OGM Technical Institute which is delivering Australian courses to Saudi nationals. Understanding how this institute is operating and how the market is receiving these products can assist in determining how to address skills gaps in Saudi Arabia.

[15] https://gulfnews.com/business/tourism/saudi-needs-to-evolve-tourism-regulations-to-capture-opportunity-1.60690335
[16] http://www.arabnews.com/node/1416356/saudi-arabia

5.5.3 Egypt

Egypt links the Middle East and Africa, bordering Sudan, Libya, and Israel and the Gaza Strip. Egypt pursued reforms between 2004 and 2008 to improve the business environment. However, political and economic uncertainty since 2011 have negatively impacted economic growth, tourism and unemployment (CIA, 2018).

5.5.3.1 Economic and employment backdrop

Egypt is part of the CIVET group of emerging economies, which are recognised by investors to have significant medium-term potential and are targets for new investment.

Egypt has a greater portion of economic activity in the agricultural sector relative to other Middle Eastern countries at 12 per cent. Services form a greater share of GDP than Industry at approximately 56 per cent and 33 per cent respectively. With regards to employment services consume half the labour force with an even split between industry and agriculture.

Figure 101: Egypt Economy and Industry

Economic data	
Gross Domestic Product (PPP)	US$1.201 trillion (2017 est.) US$1.152 trillion (2016 est.) US$1.103 trillion (2015 est.)
GDP composition by sector	Agriculture: 11.9% Industry: 33.1% Services: 55.7% (2017 est.)
GDP growth	4.2% (2017 est.) 4.3% (2016 est.) 4.4% (2015 est.)
GDP per capita	US$12,700 (2017 est.)
Education expenditure	3.8% of GDP (2008)
Ease of doing business	112
Industry structure	
Major agricultural products	cotton, rice, corn, wheat, beans, fruits, vegetables; cattle, water buffalo, sheep, goats
Industries	textiles, food processing, tourism, chemicals, pharmaceuticals, hydrocarbons, construction, cement, metals, light manufactures
Major export partners	UAE 10.9%, Italy 10%, US 7.4%, UK 5.7%, Turkey 4.4%, Germany 4.3%, India 4.3% (2017)
Major exports	crude oil and petroleum products, fruits and vegetables, cotton, textiles, metal products, chemicals, processed food
Major import partners	China 7.9%, UAE 5.2%, Germany 4.8%, Saudi Arabia 4.6%, US 4.4%, Russia 4.3% (2017)
Major imports	machinery and equipment, foodstuffs, chemicals, wood products, fuels

Country Profile Sources:
CIA World Factbook, , available at https://www.cia.gov/library/publications/resources/the-world-factbook/geos/ar.html, accessed on 21 August 2018.
OECD, World Indicators of Skills for Employment (WISE), available at http://stats.oecd.org//Index.aspx?QueryId=62775#, accessed on 21 August 2018.
ILOSTAT Database, Country Data, available at http://www.ilo.org/ilostat/faces/help_home/data_by_country?_adf.ctrl-state=yddsm3mdf_4&_afrLoop=404928031607009, accessed on 21 August 2018.

Employment in trade and other market services has grown significantly over the past 15 years, and in 2015 these services overtook agriculture as the highest employing sector in Egypt.

All other employment sectors grew steadily between 2008 and 2010. However, a noticeable dip occurred in 2011 where the political crisis occurred, and employment growth in all sectors except trade and other market services as well as the public sector have been relatively flat since that time.

At the occupation level, skilled agricultural and trades workers account for the largest share of the labour force, however, this share has decreased from 41 per cent in 2003 to 17.6 per cent in 2016. Sectors to gain labour force share are elementary occupation and plant and machine operators and assemblers, which grew from two per cent and six per cent to 11.1 per cent and eight per cent, respectively.

Figure 102: Employment by sector (1998 - 2014)

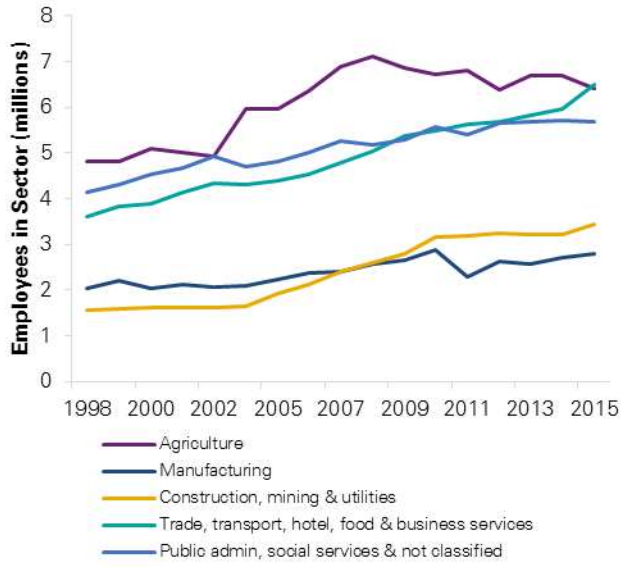
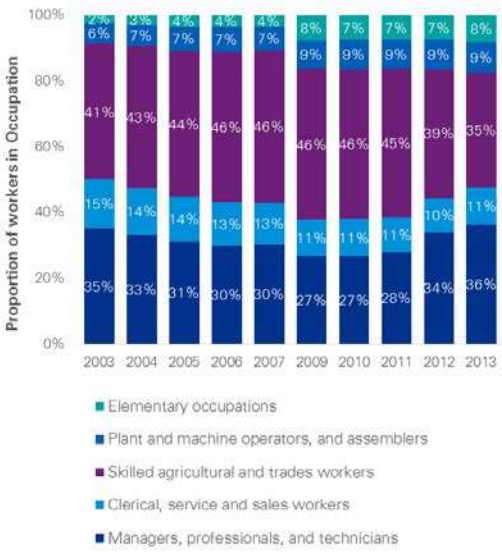


Figure 103: Labour Force by occupation (2003-11)



Sources: World Bank Enterprise survey (2016), International Labour Organisation (2016)

Informal economy and employment data is unavailable from ILO. However, the study by Elgin and Oztunali (2012) estimated the informal economy in Egypt to be around 32 per cent, which is approximately double the same estimate made for Saudi Arabia. This follows Egypt's low labour productivity/skill levels observed in Figure 97 and suggests a broad need for up-skilling in the labour force.

5.5.3.2 Examples of skills shortages

A report by ILO (2015) shows that unemployment in Egypt is high among youths and those in the professionals sector (47 per cent), followed by technicians and associate professionals (30 per cent). This increase in unemployment is attributed to a disconnected education and training system that does not deliver labour market relevant skills.

Echoing the same sentiment is Wally (2012) who argues that the general education schools and technical and vocational schools in Egypt do not provide sufficient skills that are demanded by the market. Additionally, there is a significant lack of language and technical skills, sufficient life skills training such as problem solving and the ability to apply knowledge to real problems, as well as extremely limited access to information technology. Only about two per cent of those who were unemployed used computers to search for jobs.

Addressing the UN, Salama (2015) noted the following from the Egyptian labour market:

- 790,000 school and university graduates are competing for over 200,000 jobs every year
- 15 per cent of employers identify that graduate specialisations do not meet the requirements of the labour market
- 30 per cent of graduates believe their specialisations are not relevant to the labour market
- more than 60 per cent of employees are not working in their specialisation field
- only 21 per cent of employers say there is cooperation between their organisations and educational institutions.

5.5.3.3 Stakeholder experiences

As in other parts of the Middle East, Australian government stakeholders have identified premium agriculture, financial services, and health services as sectors in Egypt that may present up-skilling opportunities.

Training stakeholders have suggested that mining and other resource and energy industries may have opportunities for up-skilling. An additional consideration noted by multiple training stakeholders is the importance of cultural awareness when delivering training that is suitable for the local economy. Challenges can include a mismatch between government priorities for training and youth not willing to participate in VET. This presents a significant risk for international training providers and can deter the willingness to enter the market.

5.5.4 United Arab Emirates

The United Arab Emirates (UAE) border Saudi Arabia and Iran in the Middle East. It is a relatively open economy in the region, and has made efforts to diversify away from oil and gas industries.

5.5.4.1 Economic and employment backdrop

The GDP of the UAE economy is evenly spread across industry and services, with a very small agriculture sector. Employment is dominated by services, despite industry presenting a sizeable component of GDP.

The CIA identify dependence on oil, inflation pressure and a large expatriate workforce as key challenges the UAE economy faces. Future economic plans are to continue economic diversification, up-skill the work force through better education and increase private sector employment (CIA, 2018).

Figure 104: United Arab Emirates Economy and Industry

Economic data	
Gross Domestic Product (PPP)	US$691.9 billion (2017 est.) US$682.8 billion (2016 est.) US$662.7 billion (2015 est.)
GDP composition by sector	Agriculture: 0.9% Industry: 49.8% Services: 49.2% (2017 est.)
GDP growth	1.3% (2017 est.) 3% (2016 est.) 3.8% (2015 est.)
GDP per capita	US$68,200 (2017 est.)
Education expenditure	N/A
Ease of doing business	22 (2014)
Industry structure	
Major agricultural products	dates, vegetables, watermelons; poultry, eggs, dairy products; fish
Industries	petroleum and petrochemicals; fishing, aluminium, cement, fertilizers, commercial ship repair, construction materials, handicrafts, textiles
Major export partners	India 10.1%, Iran 9.9%, Japan 9.3%, China 5.4%, Oman 5.0%, Switzerland 4.4%, South Korea 4.1% (2017)
Major exports	crude oil 45%, natural gas, reexports*, dried fish, dates (2012 est.)
Major import partners	China 8.5%, US 6.8%, India 6.6% (2017)
Major imports	machinery and transport equipment, chemicals, food

Country Profile Sources:
CIA World Factbook, , available at https://www.cia.gov/library/publications/resources/the-world-factbook/geos/ar.html, accessed on 07 January 2019.
OECD, World Indicators of Skills for Employment (WISE), available at http://stats.oecd.org//Index.aspx?QueryId=62775#, accessed on 21 August 2018.
ILOSTAT Database, Country Data, available at http://www.ilo.org/ilostat/faces/help_home/data_by_country?_adf.ctrl-state=yddsm3mdf_4&_afrLoop=404928031607009, accessed on 21 August 2018
*Reexports occur when previously imported goods are then exported - using the economy in question for transit only

Employment was dominated by the construction, mining and utilities sector in 2005, however this has declined significantly and the latest year of data shows a 63 per cent reduction in this sector's employment in 2008 (see Figure 105). Trade and other market services and public and other social services remain significant employers, together representing 71 per cent of the labour force in 2008.

Figure 105: Employment by sector (2000 - 2008)

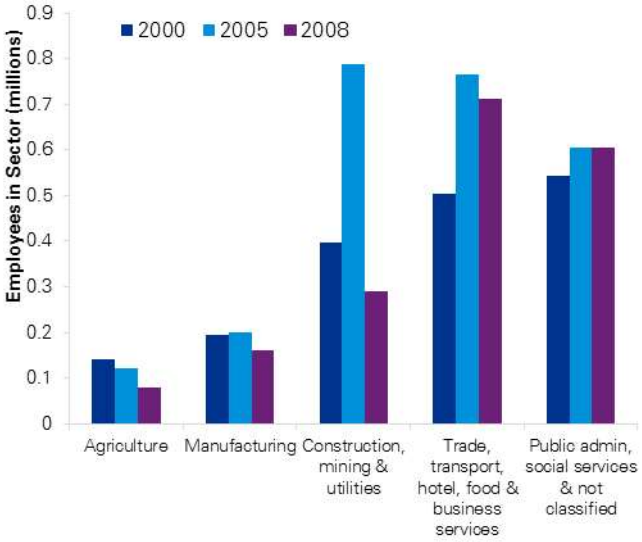
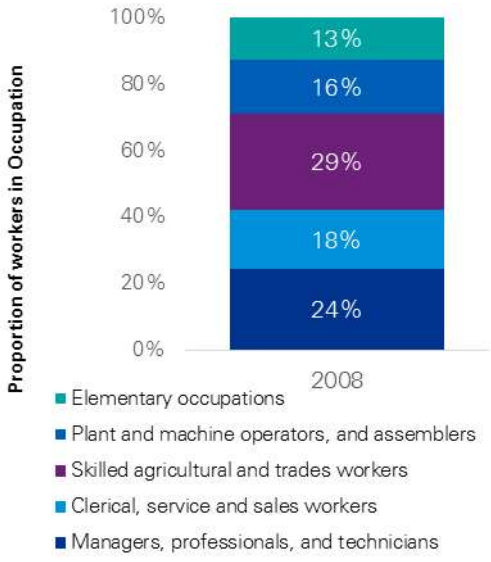


Figure 106: Labour Force by occupation (2005-11)



Sources: International Labour Organisation (2016)

Occupation data was limited for UAE, so an alternative set is presented in the figure above.[17] In 2008, the data shows that skilled agricultural and trades workers were the most common occupation in the UAE, at 29 per cent of the total labour force. A significant proportion of the labour force (24 per cent) were also managers, professionals and technicians, which are part of the higher skill-level band. Only 13 per cent of the labour force fall in the lowest skilled – elementary occupations – group.

Similar to Saudi Arabia and Egypt, informal economy and informal employment data is not available for UAE. Using the alternative measure by Elgin and Oztunali (2012), the UAE's informal economy is estimated to be 22 per cent in 2008. This suggests that a significant component of economic activity in the informal sector could be the target of up-skilling policies.

5.5.4.2 Examples of skills shortages

UAE employers are experiencing difficulty filling open positions as they struggle to find employees with the relevant skills. A workforce planning study, which was launched by Dubai International Academic City (DIAC), found the following.

- The enrolment rate in technical and vocational training (VET) has been marked at 1-3 per cent, considerably lower than the global average of 10 per cent. In some developed economies like Germany and Japan, it is as high as 40 to 50 per cent.
- About 25 per cent of males do not reach grade 12.
- Enrolment of nationals in private schools is high in the UAE (55 per cent), which is more than in Saudi Arabia (11 per cent).
- Private sector enrolment in the UAE is valued at USD $2.8 billion and is growing at 10 per cent making the country one of the largest education sectors in the GCC.
- The total number of students in the GCC Education sector is expected to grow at a CAGR of 2.7 per cent between 2011 and 2016, and reach 11.6 million in 2016.

[17] This data is more aggregated than the set used for other countries, and only has a single year available.

5.5.4.3 Stakeholder experiences

As in other parts of the Middle East, Australian government stakeholders have identified premium agriculture, financial services, and health services as sectors in UAE that may present up-skilling opportunities.

Training stakeholders have suggested that mining and other resource and energy industries may have opportunities for up-skilling. An additional consideration noted by multiple training stakeholders is the importance of cultural awareness when delivering training that is suitable for the local economy. As in other parts of the Middle East, a mismatch between government priorities for training and youth not willing to participate in VET can deter the willingness of RTOs to enter the market. An example of this can be where training contracts include a 'pay-for-completion' requirement, which can result in significant losses outside of the RTO's control.

Appendix A: Consultation summary

KPMG has consulted with a range of stakeholders across government, training organisations and industry, to provide insights into global skills gaps and how they can be addressed. Interviews were made either in person, via telephone call or teleconference, or emailed questionnaires, and were conducted over two rounds in 2016 and 2018. Questions were provided to participants in advance, to allow preparation for responses and to offer context to the research and the International Skills Training (IST) Initiative. Question structures varied depending on the stakeholder, allowing broader questions for more general stakeholders, and targeted questions for industry or region specific stakeholders.

A variety of perspectives have informed the conclusions in this report. Government perspectives have provided insights into policy approaches to up-skilling, and government-to-government relationships with countries of interest. The training stakeholder group has included registered training organisations, digital education experts and international consultants across training roles. Industry consultations have provided insight into business perspectives of global up-skilling and VET across food and beverage, construction, mining, healthcare services, transport, hotel and manufacturing industries.

KPMG notes that consultations did not include any foreign governments,[18] or foreign, non-international companies. This was outside the scope of the study but could be useful for future research and to better understand how the IST program can be developed and brought to international VET markets.

Table 5: Summary of Stakeholder Consultations

Stakeholder group:	Government	Training	Industry
Consultations (2016):	**13**	**8**	**6**
Organisations:	Department of Education and Training, Austrade, Department of Industry, Innovation and Science.	TAFE Directors Australia, Australian Council for Private Education and Training, Registered Training Organisations (RTOs) and other Education Training Specialists.	Australian Industry Group, Energy Skills Queensland, International hotel companies, international food and beverage company, international manufacturing company.
Consultations (2018):	**11**	**6**	**4**
Organisations:	Department of Education and Training, Austrade, Department of Jobs and Small Businesses	TAFE Directors Australia, Australian Council for Private Education and Training, Registered Training Organisations (RTOs) and other Education Training Specialists.	Transport company, Master Builders Australia, Healthcare company, Global training and skills consultancy

[18] With the exception of written responses provided by the Government of Vietnam.

Appendix B: Data classifications

This appendix contains industry and occupation classifications used in this report.

B.1 Industry Definitions

Economic and employment backdrop sectors

Broad Sector	Definition
Trade and other market services	Includes trade, transport, hotel, food and business service
Public and other social services	Includes public administration, defence, education, health, personal and household services, and international organisations and extra-territorial bodies

ANZSIC and ISIC industries

Below are definitions to the industries and classifications used throughout this report. Definitions are taken from the International Standard Classification of All Economic Activities (ISIC) revision 4, the Australian New Zealand Standard Industry Classification (ANZSIC) and the World Trade Organisation.

Industry	Definition
Agriculture	The full sector name is agriculture, forestry and fishing, and includes the exploitation of vegetal and animal natural resources, comprising the activities of growing of crops, raising and breeding of animals, harvesting of timber and other plants, animals or animal products from a farm or their natural habitats.
Basic Manufacturing	This industry includes the physical or chemical transformation of materials, substances, or components into new products. It includes generally smaller goods and less sophisticated technology for production, and excludes advanced manufactures described below.
Advanced Manufacturing	There are multiple definitions, this report adopts the Australian Bureau of Statistics definition of the Advanced Manufacturing growth Sector described as any manufacturing process that takes advantage of high-technology or knowledge-intensive inputs as an integral part of its manufacturing process. It includes chemical and medicinal manufacturing, vehicle and transport manufacturing, professional and scientific equipment manufacturing, computer and electronic manufacturing and specialised machinery and equipment manufacturing.
Hotels and Accommodation	This industry includes the provision of short-stay accommodation for visitors and other travellers.
Child Care	This industry consist of businesses providing day care of infants or children, such has before and after school care, child care services, and children's nursery operations.
Aged Care	This industry consists of businesses that provide residential aged care often combined with nursing, supervising and medical care.

Industry	Definition
Food and Beverage	This industry includes food and beverage serving activities providing complete meals or drinks fit for immediate consumption, whether in traditional restaurants, self-service or take-away restaurants, whether as permanent or temporary stands with or without seating. Decisive is the fact that meals fit for immediate consumption are offered, not the kind of facility providing them.
Tourism	Tourism has multiple definitions, but for this report primarily consist of recreational and cultural activities for tourists, and associated support services. The WTO refers to activities of persons travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business and other purposes. However, hotels, transport, food and beverage are reported separately, hence excluded in this category.
Retail, Wholesale	This section includes wholesale and retail sale (i.e. sale without transformation) of any type of goods and the rendering of services incidental to the sale of these goods. Wholesaling and retailing are the final steps in the distribution of goods. Goods bought and sold are also referred to as merchandise.
Logistics	This section includes the provision of passenger or freight transport, whether scheduled or not, by rail, pipeline, road, water or air and associated activities such as terminal and parking facilities, cargo handling, storage etc. Included in this section is the renting of transport equipment with driver or operator. Also included are postal and courier activities.
Health	This section includes the provision of health and social work activities. Activities include a wide range of activities, starting from health care provided by trained medical professionals in hospitals and other facilities, over residential care activities that still involve a degree of health care activities to social work activities without any involvement of health care professionals. Excluded are aged care and child care which are identified separately.
Construction	This section includes general construction and specialised construction activities for buildings and civil engineering works. It includes new work, repair, additions and alterations, the erection of prefabricated buildings or structures on the site and also construction of a temporary nature.

B.2 Occupation classifications

Below are the occupation classifications, typical skill level and description according to the International Standard Classification of Occupations (ISCO). The four skill levels relate to the typical tasks the occupation requires, and the level of education needed. Further details are available on the ILO website.[19]

Occupation	Skill	Description
Managers	3	Managers plan, direct coordinate and evaluate the overall activities of enterprises, governments and other organisations.
Professionals	4	Professionals increase the existing stock of knowledge; apply scientific or artistic concepts and theories; teach about the foregoing in a systematic manner; or engage in any combinations of these activities.
Technicians and Associate Professionals	3	Technicians and associate professionals perform technical and related task connected with research and the application of scientific or artistic concepts and operational methods, and government or business regulations.
Clerical Support Workers	2	Clerical support workers record, organise, store, compute, and retrieve information and perform a number of clerical duties in connection with money-handling operations, travel arrangements, requests for information and appointments.
Service and Sales workers	2	Services and sales workers provide personal and protective services related to travel, house-keeping, catering, personal care, protection against fire and unlawful acts; or demonstrate and sell goods in wholesale or retail shops and similar establishments, as well as at stalls and on markets.
Skilled Agricultural workers	2	Skilled agricultural and fishery workers grow and harvest field or tree and shrub crops, gather wild fruits and plants, breed, tend or hunt animals, produce a variety of animal husbandry products, cultivate, conserve and exploit forests, breed or catch fish and cultivate or gather other forms of aquatic life in order to provide food, shelter and income for themselves and their households.
Craft and related trades workers	2	Craft and related trades workers apply specific technical and practical knowledge and skills to construct and maintain buildings; form metal; erect metal structures; set machine tools or make, fit, maintain and repair machinery, equipment or tools; carry out printing work; and produce or process foodstuffs, textiles, wooden, metal and other articles, including handicraft goods.
Plant and machine operators and assemblers	2	Plant and machine operators and assemblers operate and monitor industrial and agricultural machinery and equipment on the spot or by remote control; drive and operate trains, motor vehicles and mobile machinery and equipment; or assemble products from component parts according to strict specifications and procedures.
Elementary occupations	1	Elementary occupations involve the performance of simple and routine tasks which may require the use of hand-held tools and considerable physical effort.
Armed forces occupations	-	Armed forces occupations include all jobs held by members of the armed forces. Included are regular members of the army, navy, air force and other military services, as well as conscripts enrolled for military training or other service for a specified period.

[19] http://www.ilo.org/public/english/bureau/stat/isco/intro.htm

B.3 Glossary and Acronyms

AQF	Australian Qualifications Framework – is the national policy for regulating and quality assuring Australia's education and training system.
Global Value Chains	Global value chains involve the production of a final good comprising different stages from different geographic regions. They require international coordination, and can maximise competitive advantages of multiple economies.
Industry value add	The contribution or output of an industry, less the intermediate inputs from other industry sectors. The sum of all value-add across all industries equal Gross Domestic Product.
Informal economy	Also known as the informal sector, is economic activity that is not taxed, or monitored by government or captured in the national GDP. There are multiple economic and policy challenges associated with the informal economy. Note that measures of informal economy differ between sources.
Informal employment	Informal employment includes workers who are employed by a business or operation in the informal economy. These workers typically do not pay tax, are not protected by regulations or standards, and receive low wages.
IST	International Skills Training courses program - this is an Australian Government initiative to develop international courses designed to be delivered offshore by Australia RTOs. The IST is the key motivator for this study.
ITAC	International Training and Assessment Courses - this was the pilot program for the Department of Education and Training's IST initiative delivered to learners from Chile, China, Colombia, India, Mexico, Peru, Saudi Arabia, the Solomon Islands, and South Korea. The term ITAC was discontinued when the IST courses program was officially launched in April 2017.
Labour productivity	This is a measure output per one unit of labour, and higher values indicate better performance of an economy. Education, skills, access to capital and technology all impact labour productivity.
OECD	Organisation for Economic Co-operation and Development
RTO	Registered Training Organisation – is an organisation registered in Australia to deliver VET and issue qualification or statements of attainment.
Skills gaps	This is where the demand for skilled labour exceeds the supply of skilled labour as described in the conceptual framework on page 2.
Soft Skills	Also known as 'generic skills' these are personal attributes that improve the employability of workers. They differentiate from core or technical skills.
VET	Vocational Education and Training – includes a variety of courses and education services to provide job-ready training and build competency for many different vocations.

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