

10-2016

# New skills at work: Managing skills challenges in ASEAN-5

Kim Song TAN

*Singapore Management University*, [kstan@smu.edu.sg](mailto:kstan@smu.edu.sg)

James T. H. TANG

*Singapore Management University*, [jamestang@smu.edu.sg](mailto:jamestang@smu.edu.sg)

Follow this and additional works at: [https://ink.library.smu.edu.sg/soe\\_research](https://ink.library.smu.edu.sg/soe_research)



Part of the [Asian Studies Commons](#), [Growth and Development Commons](#), [Labor Economics Commons](#), and the [Public Affairs, Public Policy and Public Administration Commons](#)

---

## Citation

TAN, Kim Song and TANG, James T. H.. New skills at work: Managing skills challenges in ASEAN-5. (2016). Research Collection School Of Economics.

**Available at:** [https://ink.library.smu.edu.sg/soe\\_research/1891](https://ink.library.smu.edu.sg/soe_research/1891)

This Book is brought to you for free and open access by the School of Economics at Institutional Knowledge at Singapore Management University. It has been accepted for inclusion in Research Collection School Of Economics by an authorized administrator of Institutional Knowledge at Singapore Management University. For more information, please email [libIR@smu.edu.sg](mailto:libIR@smu.edu.sg).

**NEW SKILLS AT WORK**

# MANAGING SKILLS CHALLENGES IN ASEAN-5



**TAN KIM SONG  
JAMES TANG**

# TABLE OF CONTENTS

EXECUTIVE SUMMARY

ACKNOWLEDGEMENTS

ABBREVIATIONS

CHAPTER ONE: OVERVIEW OF SKILLS CHALLENGES IN ASEAN-5

CHAPTER TWO: SKILLS CHALLENGES IN SINGAPORE

II.1 Macroeconomic Overview

II.2 Labor Market Overview

II.3 Industry Skills Challenges

Information and Communications Technology

Electronics and Electrical Manufacturing

Finance and Insurance

II.4 Outlook

Case 1: SkillsFuture

CHAPTER THREE: SKILLS CHALLENGES IN MALAYSIA

III.1 Macroeconomic Overview

III.2 Labor Market Overview

III.3 Industry Skills Challenges

Information and Communications Technology

Oil and Gas

Electronics and Electrical Manufacturing

III.4 Outlook

Case 2: TalentCorp

CHAPTER FOUR: SKILLS CHALLENGES IN THAILAND

IV.1 Macroeconomic Overview

IV.2 Labor Market Overview

IV.3 Industry Skills Challenges

Automotive

Information and Communications Technology

Tourism

IV.4 Outlook

Case 3: Panyapiwat Institute of Management

## **CHAPTER FIVE: SKILLS CHALLENGES IN INDONESIA**

### **V.1 Macroeconomic Overview**

### **V.2 Labor Market Overview**

### **V.3 Industry Skills Challenges**

**Automotive**

**Information and Communications Technology**

**Tourism**

### **V.4 Outlook**

#### **Case 4: Bali Tourism Institute**

## **CHAPTER SIX: SKILLS CHALLENGES IN THE PHILIPPINES**

### **VI.1 Macroeconomic Overview**

### **VI.2 Labor Market Overview**

### **VI.3 Industry Skills Challenges**

**Information Technology/Business Process Outsourcing**

**Electronics and Electrical Manufacturing**

**Tourism**

### **VI.4 Outlook**

#### **Case 5: Ayala Education**

## **CHAPTER SEVEN: RESPONDING TO SKILLS CHALLENGES IN ASEAN-5**

### **VII.1 Responding to Common Skills Challenges in ASEAN-5**

### **VII.2 Managing Skills Challenges in Individual ASEAN-5 Countries**

## **CHAPTER EIGHT: MOVING FORWARD**

**Appendix I: Literature Review**

**Appendix II: References**

**Appendix III: List of Interviewees**



## EXECUTIVE SUMMARY

### ***Promising Growth Potential of ASEAN-5***

A shortage of industry-ready skilled workers presents one of the biggest challenges for the five core member countries of the Association of Southeast Asian Nations, ASEAN-5, as they strive to realize their economic visions. With an estimated gross domestic product (GDP) growth of close to 5% a year and a combined GDP larger than that of India, the group comprising Singapore, Malaysia, Thailand, Indonesia and the Philippines represents one of the most dynamic and promising growth regions in the world today. Blessed with a rich endowment of natural resources and a young and dynamic workforce, the five core economies of the 10-member ASEAN group have the potential not only to raise their own income levels significantly in the medium term, but also to become a major growth engine in the region and help maintain East Asia's pivotal position in the global economy.

Regional economic integration and urbanization could further boost ASEAN-5's growth momentum. The implementation of the ASEAN Economic Community (AEC) initiatives and the anticipated formation of the Trans-Pacific Partnership (TPP) and other regional economic integration groupings could significantly expand trade and investment and unleash powerful forces of competition in the region, raising productivity levels and growth rates in the five countries. Continued urbanization in the ASEAN-5 region will create demand for infrastructure investment and many services industries especially education, healthcare, logistics, transportation, and telecommunication, etc.

The peace and political stability the region enjoys means that the five countries could engage in longer-term planning to realize their enormous economic potential. Indonesia and the Philippines, with their young and growing workforce, are particularly well-positioned to become the next Asian tigers. However, whether ASEAN-5 could successfully achieve robust and sustainable growth depends crucially on their abilities to equip their workforce with general and job-specific skills needed by the growth industries they are promoting.

### ***ASEAN-5 Skills Challenges: Common Threads and Diversity***

The nature and the extent of the skills challenges vary widely among the five ASEAN countries. Differences in their stage of development, economic structure, and growth strategy explain the different skill mix they need. At the same time, differences in demographic profile, institutional capacity and workforce characteristics define their abilities and effectiveness in responding to the skill needs of industry.

Singapore, a high-income country, faces a tight labor market characterized by a largely skilled, educated and English-speaking workforce, and a heavy reliance on foreign labor including both professionals and low-skilled foreign workers. In pursuing an innovation-driven growth strategy, it is trying not only to be on the technology frontier, but also to help push the frontier. Keeping up with the latest technology and dealing with the impact of disruptive technology mark a major skills challenge for Singapore's workforce.

Both Malaysia and Thailand aspire to break out of the middle-income trap by moving towards technology- and knowledge-intensive industries. They face similar challenges in equipping their workforces with the necessary science and engineering skills and in broadening the appeal of technical education to a wider segment of the student population. Malaysia has a well-educated workforce with the second-highest mean years of schooling of 10 years amongst the ASEAN-5, but it can do more to raise the female participation rate which stays below 40%. The Thai workforce enjoys near full employment but there remains substantial underemployment in the agriculture and the informal sectors. Both countries rely on foreign workers to carry out low-skilled and unskilled work. Unlike Malaysia, Thailand must also cope with a fast ageing population – the fastest among ASEAN-5.

Indonesia and the Philippines aim to join the rank of upper middle-income countries. Both countries enjoy a strong comparative advantage in low-skill industries in manufacturing and services. They also have an exceptionally growth-boosting demographic profile, with 43% of the population being under the age of 25 in Indonesia. However, both countries face the daunting challenge of equipping their workers with basic skills and knowledge required by key growth industries which need basic science, technology, engineering, and mathematics (STEM) skills. In both countries, the public sector is under tremendous pressure to prepare workers well to pick up job-specific skills. High youth unemployment rates – 18.3% and 14.4% in Indonesia and the Philippines respectively – reflect in part this failure. Additionally, the exodus of workers, including professionals, to take up jobs abroad reduces the supply of skilled workers these two countries need at home to realize their growth potential.

Against this backdrop, ASEAN-5 must contend with the interplay of global and region-wide trends that are reshaping the global demand for skills.

- Disruptive technology threatens to render jobs obsolete in many industries, including those in information and communications technology (ICT), tourism, electronics manufacturing, and financial services – industries that are important to ASEAN-5 countries. Managing disruptive technologies requires a paradigm shift in the thinking of policy makers, employers, and employees alike. Policy makers and employers must find new ways to develop a skilled but flexible workforce that accepts the need for continuous and lifelong learning.
- Liberalization of the labor market envisaged by the AEC could result in greater cross-border labor flows and unleash powerful forces, at once competitive and complementary, among the ASEAN-5 countries. This could complicate the task of managing skills challenges. The adoption of the mutual recognition arrangements (MRA) for skilled labor in particular could exacerbate the outflow of skilled labor from certain ASEAN-5 countries.
- The ongoing industrial restructuring in China could pose competition to key industries in ASEAN-5 and cause disruption to their job markets. At the same time, it could provide new employment opportunities as wages in China rise and low-wage industries relocate out of the country. ASEAN-5 could also see more Chinese investments, bringing with them demands for both high-skilled and low-skilled workers, with the launch of the One Belt, One Road initiative and the funding by the Asian Infrastructure Investment Bank (AIIB). Meanwhile ASEAN businesses could move their production facilities back to their own region as the relative wage advantage between China and ASEAN changes. The relocation will deepen regional economic integration, favoring industries such as automotive, electronics, and food manufacturing.

This study differs from previous works on skill shortages. It puts the spotlight on the need for an industry-oriented approach to develop job-specific skills in key growth industries, on which the success of the national growth strategy hinges. The industries selected include the ICT industry (in all five countries), electronics and electrical manufacturing (Singapore, Malaysia, and the Philippines), finance and insurance (Singapore), oil and gas (Malaysia), automotive (Thailand and Indonesia), and tourism (Thailand, Indonesia, and the Philippines). By focusing on skills gaps in key growth industries, the study provides insights into the nature of the skills challenges and how they can be effectively managed in ASEAN-5 countries. For each country, we have also used a successful skill-training initiative to illustrate how skills challenges can be overcome in each country given its peculiar constraints.

ASEAN-5 countries need to take decisive actions to overcome the skills challenges they face. While skills challenges and national responses to them vary across the five countries, this study highlights the shortage of industry-relevant skills as a critical bottleneck to their growth which requires urgent attention by both public and private sector players in all five countries. Specifically, the study suggests that education and training institutions at all levels, perhaps to a lesser extent in Singapore, have not been able to equip graduates adequately with skills that the growth industries need. The low competency level in STEM education and the shortage of workers with sufficient technical and engineering skills, in particular, could threaten to derail the ambitious industrial development plans of the group and their move towards a more technology- and knowledge-intensive economy.

There is a pressing need to recalibrate the role of the public and the private sector in skills training. An overburdened public sector as a skills training provider and the absence of an effective framework for tripartite collaboration lie at the root of the skills challenges the five countries face. The private sector should be given a much bigger role in education and training. Experiences in a number of ASEAN-5 countries have shown that the private sector, be it large corporates or industries trying to meet their own skills needs, or general private educational services providers, can respond more quickly, with greater agility and flexibility, to skills demands. In contrast, the public sector tends to move slowly to meet emerging skills demands. The public sector could play an effective role coordinating the skills development efforts of the private sector and other stakeholders.

## ***Common Skills Challenges and Recommendations for ASEAN-5***

The study finds that despite the diversity among the ASEAN-5 countries, they share a number of common skills challenges, albeit with different degrees of seriousness. The ability to respond to the challenges also varies among the five countries.

Specifically, the study identifies 10 key common challenges for ASEAN-5:

1. Inability of the educational institutions to meet industry demands
2. A lack of a comprehensive skills development roadmap to support economic growth
3. Inadequacy in English proficiency and other soft skills
4. Weakness in STEM and Technical and Vocational Education and Training (TVET) programs
5. Over-reliance on the public sector to meet the skills challenges

6. Lack of lifelong learning opportunities for mid-level workers
7. Seriousness of youth unemployment
8. Skills challenges arising from intra-regional labor flows
9. Skills challenges posed by disruptive technology
10. Skills challenges coming from industrial restructuring in China

The study recommends the following actions to address the common challenges confronted by the ASEAN-5 group and specific suggestions for each of the 5 countries:

### **Give the Private Sector a Bigger Role in Meeting the Skills Challenges**

The different roles between the public and private sectors in skills training provision should be recalibrated, to give the latter a much bigger role, especially in Thailand, Indonesia, and the Philippines. A lighter regulatory approach on education and skills training including deregulation of the education sector could be considered in some countries. The government should act as an effective facilitator using a mix of policy support, regulatory support, and other incentives. There is also an urgent need to strengthen the tripartite cooperation among the government, industry and the educational and training institutions to coordinate the skills training efforts by various stakeholders.

The government's role as a facilitator could encompass the following:

- Provide a consistent framework for private sector training at both the national and the local level.
- Help the private sector companies tap into the resources of the educational institutions to address various industry-school gap issues.
- Design different incentives to promote industry- and company-level training initiatives, and to broaden the reach of such training beyond specific companies or industries.
- Provide incentives for multinational corporations (MNCs) and large corporations to involve small- and medium-sized enterprises (SMEs) in their training schemes.

### **Provide a Clear Roadmap to Meet Skills Challenges**

The government should work with the private sector and the educational institutions to provide a comprehensive roadmap for skills development that is consistent with, and targeted at supporting its growth and development vision for the economy. Among other details, the roadmap should provide a credible projection of supply and demand for critical skills needed in key growth industries, spell out clear roles for the main stakeholders and provide guidance on possible collaboration among them. Where resources permit, consideration could be given to setting up a one-stop service agency, with sufficient autonomy and authority, to manage the various facets of the skills challenges.

### **Revamp Curriculum to Emphasize STEM, TVET and Soft Skills Training**

The school curriculum should be substantially revised to increase the emphasis on STEM and TVET education in all ASEAN-5 countries (with the possible exception of Singapore). The revamp should be accompanied by a focused effort to correct societal bias against technical education. Furthermore there needs to be a stronger emphasis on English proficiency and the teaching of various soft skills, an area where the private sector training providers could be encouraged to take on a greater responsibility.

Considering the difference in their funding capacity, the public sector could focus on building up the students' general strengths in basic technical and STEM skills, both at the high school and tertiary levels, and to take the lead in providing TVET education. The private sector could take on greater responsibilities in industry-specific technical skills training. The private sector could also play a bigger role in soft skills training.

### **Deepen School-industry Links to Improve Employability of Graduates**

A formal tripartite mechanism for regular consultation among the government, the industry, and the education institutions is needed to narrow or close the industry-school gap, with the aim of making improvement in the following areas:

- Employment of instructors with practical experience and industry links.
- Increased industry exposure for students through internship, apprenticeship, on-site training and other schemes.
- Providing more transparency about the employability and salaries of graduates from different schools; and
- Independent audit of the quality of educational/training institutions.

### **Expand and Strengthen Continuous and Lifelong Learning**

A strengthened framework for lifelong learning programs is needed to help workers re-skill and up-skill, and to help address the youth unemployment in some ASEAN-5 countries. To be effective, the framework should incorporate the following elements: inculcating the value of continuous learning among the workers; and training in both technical knowledge and soft skills. The private sector education providers should be encouraged to be a leading provider of lifelong learning programs.

### **Policy Coordination on Cross-border Labor Flows**

More policy consultation and coordination is needed to manage the complex challenges arising from increased intra-regional labor movement, in light of the expected implementation of the ASEAN-wide MRA for skills and labor market liberalization. ASEAN-5 countries should try to take advantage of the synergy that exists among them to help overcome the supply side constraints. Being in different phases of economic development allows them to draw lessons from countries that had gone through similar phases of industrial development earlier. Singapore, Malaysia and Thailand, for example, have experiences in developing skilled workers for industries that Indonesia and the Philippines are trying to promote currently.

They could also tap on each other's skilled workers to augment their own skills base, as Singapore has been doing for years. Given that there are various competitive and complementary forces at work in the five labor markets, they should consider broadening their policy coordination to help ensure a win-win outcome for all. Meanwhile, individual countries will need to further calibrate their labor market practices in order to capitalize on the new sources of skilled labor supply and to achieve the right foreign-local labor mix.

## ***Country-Specific Skills Challenges and Recommendations for ASEAN-5***

For each of the five countries, the study recommends that attention should be focused on a few specific challenges. While some of these challenges mirror the common concerns shared by all five countries, they are more serious and require a more forceful response from some countries than others.

### **SINGAPORE**

Singapore's proactive and forward-looking approach in education and training coupled with a liberal policy on foreign workers, have worked well in helping the country manage its skills challenges. The success of the approach has however, brought with it other challenges that would have to be resolved in the coming years. Disruptive technologies are emerging as a major skills challenge for some key growth industries. Three challenges in particular require urgent attention from the various stakeholders.

#### **1. Reduce Reliance on Foreign Workers and Improve Labor Productivity**

Fundamental solutions are needed to redesign jobs in many sectors to achieve a better use of technology and to increase the labor productivity, so as to reduce the heavy reliance on foreign workers, especially the low-skilled foreign workers. More innovative ways are needed to restructure jobs so as to tap into the vast experiences of displaced mature Professionals, Managers, Executives, and Technicians (PMETs) and non-traditional sources of workers including retirees and homemakers, and to help workers stay meaningfully employed beyond the official retirement age. In choosing new growth industries to promote, the government should consider, in addition to these industries' potential contribution to GDP growth, the availability of local workers who can meet or who can be trained within a relatively short period of time to meet the skill needs of these industries.

#### **2. Moderate the Pace of Industrial Policy Change to Allow for Deepening of Skills**

The government should consider moderating the pace of industrial policy change and provide more time for targeted industries to mature to gain scale and depth, and to achieve international competitiveness. This would also allow time for the workers to keep up with the changing skills demands.

#### **3. Managing Disruptive Technologies and an Innovative Workforce**

While education institutions in Singapore do not suffer from the same extent of school-industry gap as in other ASEAN-5 countries, their orientation and pedagogy need to continuously evolve to keep up with the demands of an innovation-driven economy. Such an economy requires workers not only with the right technical skills sets, but also the right mindset – one that is at once curious, creative, collaborative, and willing to be adaptable and to take risks. Such an orientation in skills training is especially important in the presence of disruptive technologies to which a number of key growth industries in Singapore are vulnerable.

## **MALAYSIA**

The main skills challenges that Malaysia face are those related to the gap between what the educational and training institutions produce and what the industry needs, in technical and soft skills. The country has the advantage of having a sound public education system and a thriving private education services industry, which forms a strong base for efforts to tackle the various skills challenges. The following three areas need immediate attention:

### **1. Revamp Curriculum to Emphasize on STEM Education, Soft Skills and English Proficiency**

The curriculum in schools and the institutes of higher learning (IHLs) needs to be revamped to substantially increase the emphasis on STEM education, teaching of soft skills, and English language, to meet the demands of the 12 National Key Economic Areas (NKEAs) and to strengthen Malaysia's competitiveness in the global market. Efforts are also required to align education quality and standards at the IHLs with other international institutions.

### **2. Tighten Coordination between Government, Industry, and Education Institutions**

Tighter coordination in skills training is required at two levels: between the government and the industry, and between the industry and the educational and training institutions. An autonomous agency with strong mandate and authority could be set up to coordinate the provision of the diverse skill sets needed by the 12 NKEAs. This could take the form of a strengthened TalentCorp or a separate new agency.

### **3. Expanding the Sources of Skilled Workers**

Malaysia needs to tap on talents both within and outside the country. More aggressive measures are needed in addition to those already put in place by TalentCorp, both to attract skilled workers from abroad (including both foreigners and Malaysians) and to retain existing talents within the country.

## **THAILAND**

A shortage of workers with sufficient science and engineering, and technical skills stands out as a key skills challenge for Thailand. Weakness in soft skills and English proficiency poses another challenge for the workforce as it faces increasing global competition in the services sector. While the government has made efforts and set out ambitious targets to rectify the deficiency, bolder actions are needed by various stakeholders in the immediate term in the following areas:

### **1. Provide Stronger Incentives for Private Sector-led Skill Training Programs**

The government should explore more creative and differentiated incentives to encourage different modes of skills training by the private sector, either working on its own or in collaboration with the public sector. Experiences of neighboring countries in leveraging on the goodwill and expertise of the MNCs and their host governments in setting up various technical training institutions could be



used as references. While most of these private sector-led trainings are undertaken by MNCs and large domestic corporates, efforts should be made to spread the benefits of the trainings to workers outside the company and the industry.

## **2. Increase Emphasis on STEM and TVET Education**

A strong national campaign to correct the bias against technical and vocational education among the students is urgently needed to reduce the concentration of tertiary education enrolment in social sciences and humanities programs. This needs to be accompanied by a concerted effort by all stakeholders to improve the teaching of STEM programs in schools.

## **3. Strengthen Training of Soft Skills and English Language**

The government should provide more incentives to the non-corporate private educational service providers to work with the formal educational sector, to play a larger role in the teaching of soft skills and English language. The openness of the Thai economy and Thai culture makes for easy participation of foreign skill trainers which should be further exploited.

## **INDONESIA**

Indonesia enjoys a large demographic dividend that could help form the basis for robust economic growth. But the relatively low base of skilled workers, especially in technical, science and engineering fields, dampens such a possibility. The government needs to reprioritize its spending plans to allocate a larger budget to education, to improve the efficiency and effectiveness of the public education system which currently shoulders most of the skills training responsibilities. The increased spending should target raising the quality of instruction in schools, including training for instructors and improving the physical infrastructure such as equipment and machineries used in TVET education. In addition, efforts in the following areas need to be accelerated:

### **1. Develop a Comprehensive Roadmap for Skills Training**

A comprehensive and detailed roadmap to strengthen the education system with emphasis on training industry-ready graduates at all levels, especially in TVET is critical. Direction should be provided to help narrow the school-industry gap, revise outdated curriculum, increase the number of qualified trainers, enhance consultation between the industry and the schools regarding skills needs and training pedagogy, and promote re-training and skill upgrading for workers.

### **2. A Stronger Role for Private Sector-led Skills Training**

The private sector, especially large corporations (including MNCs), need to take on a greater responsibility in skills training, especially in providing technical training on globally recognized industry standards. Industry associations such as GAIKINDO of the automotive industry should explore ways to widen the impact of private sector-led training beyond individual companies.



### **3. Relaxing Rules on Skilled Foreign Workers**

The government should consider liberalizing the labor laws to allow for easier employment of skilled foreign workers, at least in the key growth industries. The government could set a timeline to achieve a certain balance of local-foreign skilled workers for different industries. Such changes in labor laws need to keep pace with the establishment of the Indonesia Quality Framework (IQF) for skilled workers in key industries.

### **4. Measures to Raise the Youth Employment Rate**

High youth unemployment deprives Indonesia of a key source of energy for economic growth. Bolstering the industry relevance of the curriculum at all levels of education, including more structured entrepreneurship training, deserves urgent attention from policy makers and educators. Private education providers could be incentivized to play a leading role in such endeavors.

## **THE PHILIPPINES**

The Philippines faces daunting skills challenges, with a large school-industry gap rooted in structural weaknesses including budgetary constraints and the weak institutional capacity of the public education system. Alternative solutions are needed from other stakeholders.

### **1. Rebalancing the Budgetary Priority to Increase Education Spending**

The Philippines currently has the second-lowest spending on education as a percentage of GDP among the ASEAN-5. Increasing the budget allocation for education will help address basic issues such as inadequate teaching facilities and the lack of high quality teachers. The government should rationalize publicly-funded training programs and stop supporting commercial programs which do not satisfy minimum competency standards. With more resources, Technical Education and Skills Development Authority (TESDA) could also expand its work at its regional and provincial offices and develop competency standards not just for entry-level but also mid-level workers.

### **2. Urgent Need to Strengthen the School-industry Link**

The government should help establish a mechanism for regular consultations between the industry and the educational institutions. Inadequate involvement of the industry in curriculum planning, lack of industry knowledge among the instructors, and lack of industry exposure opportunities for students are among factors that contribute to the large school-industry gap in the Philippines. Recent initiative by the Information Technology and Business Process Association of the Philippines (IBPAP) to engage IHL instructors over a two-year period provide one such example of bridging the school-industry gap.

### **3. More Policy Incentives to Increase Private Sector-led Training Programs**

The government should explore new incentive structures, fiscal or otherwise, to encourage more skills training by large companies including the MNCs, and incentivize them to extend the training opportunities to workers outside the companies or the industry. Private educational service providers could also be encouraged to play a larger role in the training of soft skills which are important to the services industries such as IT/BPO and tourism.

#### **4. Stronger Incentives to Encourage Foreign Direct Investment (FDI) Inflows**

MNCs not only create new jobs for the economy but usually jobs with higher wages because of the higher labor productivity they enjoy. Encouraging more FDI into the Philippines could help reduce the outflows of skilled Filipino workers and help bring some of them back from abroad.

#### **5. Strategy to Reintegrate Returned PMETs into the Workforce**

A more focused strategy to reintegrate Filipino professionals from abroad into the labor force should form part of the centerpiece of the country's long-term skills development plan. Many returned PMETs end up embarking on start-up businesses with generally low rates of success, putting the human resources to waste.

### ***ASEAN-5 Must Seize the Moment***

Blessed with a number of favorable domestic and external conditions, the ASEAN-5 countries are well-placed to move swiftly up the developmental ladder, to realize their economic visions, and to remain a main engine of growth in Asia Pacific. Critical to their success is their ability to formulate and execute a comprehensive skills development plan, especially one that caters to the skills needs of the key growth industries. Indonesia and the Philippines, in particular, have tremendous potential in making huge leaps to become major contributors to the region's growth if they are able to rise to the skills challenges.

The peace and stability in the region provides an excellent environment for ASEAN-5 leaders to engage in long-term planning for sustained growth and development. It is the right time to map out a comprehensive skills development plan to support the growth strategy. They should seize the opportunity to make this an exciting turning point for their economies.

## **ACKNOWLEDGEMENT**

We would like to acknowledge the financial support from J.P. Morgan for this report, but its contents and recommendations are the responsibilities of the authors.

JPMorgan Chase & Co. (NYSE: JPM) is a leading global financial services firm with assets of \$2.5 trillion and operations worldwide. JPMorgan Chase & Co. serves millions of consumers in the United States and many of the world's most prominent corporate, institutional and government clients under its J.P. Morgan and Chase brands.

The firm's New Skills at Work program focuses attention on what can be done to overcome unemployment – ranging from macro strategies to boost job creation, expand labor market participation and develop a skilled workforce for the future, to specific innovations that bridge workforce skills and local employers' needs.

We are grateful to Professor Arnoud De Meyer, President of Singapore Management University for sharing his thoughts on future skills challenge and his strong support to the project.

Professor Pang Eng Fong at the Lee Kong Chian School of Business, SMU, for his input, feedback and participation in our field trips.

Assistant Professor Michael Genkin at the School of Social Sciences, SMU, for contributing to the cases for each of the country chapters in this report and participation in our field trips.

Diana Tsui, Head of Global Philanthropy for Asia Pacific at J.P. Morgan, and Arian Hassani, Vice President, Global Philanthropy Asia-Pacific at J.P. Morgan, who attended a number of workshops during the preparation of the report and provided useful feedback.

We benefited from the insights and comments of two external reviewers: Lee Chee Sung, Adviser to Institute of Labor Market Information and Analysis and Eduardo Pedrosa, Secretary-General of the Pacific Economic Cooperation Council.

Research associates: Shayus Shahida Sharif and George Wong Boon Keng. Research assistants: Ian Ng Derong and Nurhisyam Noorzailan (both undergraduate students at SMU), and Heron Lim Shi Shun and Xie Kaiwei (students from SMU's Ph.D in Economics program) provided research support to the team at different phases of the project.

This report would not have been completed without Yeo Ai Hoon who took over from Cheryl Lee, as administrative coordinator and assumed an important editing role in addition to her work in managing the project and supporting the field trips.

Leo Leng and Sandra Tan at the School of Social Sciences at SMU for administrative support.

We would also like to thank representatives from the following international organizations, national agencies and business associations and other organizations for advise and valuable information:

International Organizations: Asian Development Bank, ILO in Asia and the Pacific.

Indonesia: KADIN (Indonesia Chamber of Commerce and Industry), GAIKINDO (The Association of Indonesia Automotive Industries), Badan Nasional Sertifikat Profesi.

Malaysia: TalentCorp, ILMIA (Institute of Labour Market Information and Analysis), Malaysia Chamber of Commerce and Industry, PEMANDU (Performance Management and Delivery Unit)

The Philippines: Ayala Education, TESDA (Technical Education and Skills Development Authority, Philippines), Department of Labor and Employment, The Philippines Board of Investments, Tourism Industry Board Philippines, Development Academy of the Philippines, ITBPAP (IT Business Processing Association of the Philippines).

Singapore: Singapore Chinese Chamber of Commerce and Industry, Singapore National Trade Union Congress, Singapore Workforce Development Authority, Infocomm Development Authority.

Thailand: Thailand Development Research Institute, Thailand Automotive Institute, Federation of Thai Industries, Dusit Thani, CP Group, Department of Skill Development, Thailand Ministry of Labor, The Association of Thai ICT Industry.

## ABBREVIATIONS

A*STAR	Agency for Science, Technology and Research
ADB	Asian Development Bank
ADB-CIDA	The Asian Development Bank and the Canadian International Development Agency
AdEPT	Advanced English Pre-Employment Training
AEC	ASEAN Economic Community
AHRDA	Automotive Human Resource Development Academy
AHRDP	Automotive Human Resource Development Project
AISP	Association of Information Security Professionals
APINDO	The Employers' Association of Indonesia
ASEAN	Association of Southeast Asian Nations
ATCI	Association of Thai ICT industry
BNSP	Badan Nasional Sertifikasi Profesi, National Professional Certification Board
BTI	Bali Tourism Institute
CAGR	Compound Annual Growth Rate
CFE	Committee on the Future Economy
CHED	The Commission on Higher Education
COL	Critical Occupations List
DSD	Department of Skills Development
DTAC	Total Access Communication Public Company Limited
E&E	Electronics and Electrical Manufacturing
ECG	Education and Career Guidance
EIC	Economic Intelligence Center (a unit of Siam Commercial Bank)
EIU	Economist Intelligence Unit
EMS	Electronics Manufacturing Services
ETP	Economic Transformation Program (ETP)
FinTech	Financial Technology
FTI	Federation of Thai Industry
GAIKINDO	The Association of Indonesia Automotive Industries
GDP	Gross domestic product
HCD-SRI	Human Capital Development Strategic Reform Initiatives
IC	Integrated Circuit (semiconductor)
ICT	Information and Communications Technology
IHL	Institute of Higher Learning
ILMIA	Institute of Labour Market Information and Analysis
ILO	International Labour Organisation
ILP	Individual Learning Portfolio
IM	Iskandar Malaysia
IMF	International Monetary Fund
IPP	Investment Priority Plan
IQF	Indonesia Quality Framework
IT	Information Technology
IT/BPO	Information Technology/Business Process Outsourcing
ITO	Information Technology Outsourcing
KPO	Knowledge Process Outsourcing

LCGC	Low Cost Green Car
LGUs	Local government units
MDEC	Malaysia Digital Economy Corporation
MNC	Multinational Corporations
MP3EI	Master Plan for Acceleration and Expansion of Indonesia Economic Development 2011 to 2025
	MPRC – Malaysian Petroleum Resources Corporation
MPV	Multi-Purpose Vehicles
MQA	Malaysian Qualifications Agency
MRA	Mutual Recognition Arrangements
NESDP	National Economic and Social Development Plan
NKEAs	National Key Economic Areas
NRI	Networked Readiness Index
NTESDP	National Technical Education and Skills Development Plan
O&G	Oil and Gas
OEM	Original Equipment Manufacturer
OFSE	Oil field service equipment
OFW	Overseas Filipino Workers
OJT	On-the-job Training
PATHS	Product and Technology Holistic Strategy
PICTourism	Philippines Improving Competitiveness in Tourism
PIKOM	Persatuan Industri Komputer dan Multimedia Malaysia, The National ICT Association of Malaysia
PIM	Panyapiwat Institute of Management
PISA	Programme for International Student Assessment
PMET	Professionals, Managers, Executives and Technicians
PQF	Philippine Qualifications Framework
RICE	Regional IT Centers of Excellence
RIE2020	Research Innovation Enterprise 2020 Plan
RIPPARNAS	Long-Term National Tourism Development Plan
RPJPN	National Long-Term Development Plan 2005 to 2025
SCCCI	Singapore Chinese Chamber of Commerce and Industry
SEIPI	Semiconductor and Electronics in the Philippines Foundation
SHRDC	Selangor Human Resource Development Center
SIMTech	Singapore Institute of Manufacturing Technology
SiTF	Singapore infocomm Technology Federation
SME	Small- and Medium-sized Enterprises
SMP	Sectoral Manpower Plans
SMS	Semiconductor Manufacturing Services
STC	Sectoral Tripartite Committee
STEM	Science, technology, engineering, and mathematics
SUV	Sport Utility Vehicles
TAF	Toyota and Astra Foundation
TAI	Thailand Automotive Institute
TDRI	Thailand Development Research Institute
TESDA	Technical Education and Skills Development Authority
TIA	Toyota Indonesia Academy
TIMSS	Trends in International Mathematics and Science Study

TVET	Technical and Vocational Education and Training
UNDP	United Nations Development Programme
VA	Value Added
VEC	Vocational Educational Commission
WDA	Workforce Development Agency

# CHAPTER ONE

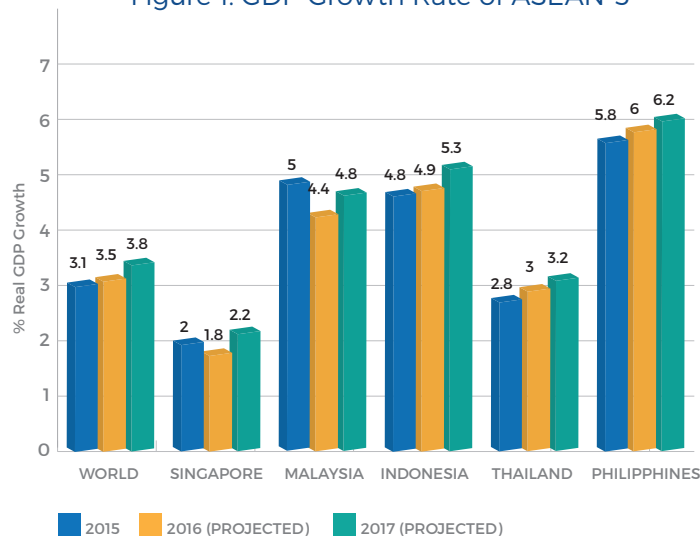


# OVERVIEW OF SKILLS CHALLENGES IN ASEAN-5



Rich in natural resources and agricultural production, and blessed with a young and dynamic workforce, the ten-member Association of Southeast Asian Nations (ASEAN) grouping<sup>1</sup> represents one of the most dynamic growth regions in the world today (see **Map 1**). It continues to outperform other regions in economic growth amidst a slowing global economy. In 2015, ASEAN as a group posted an average gross domestic product (GDP) growth of 4.7%, compared with 3.1% for the global economy. In 2016, growth in ASEAN is expected to reach 4.7% again, exceeding the 3.2% forecasted growth of the global economy<sup>2</sup> (see **Figure 1**). The open and pro-business policy that most ASEAN governments have adopted makes the region attractive to foreign investors. The grouping’s sizeable market, with a combined population of over 600 million and a combined GDP of US\$3 trillion, adds tremendously to its long-term growth promise.

Figure 1: GDP Growth Rate of ASEAN-5



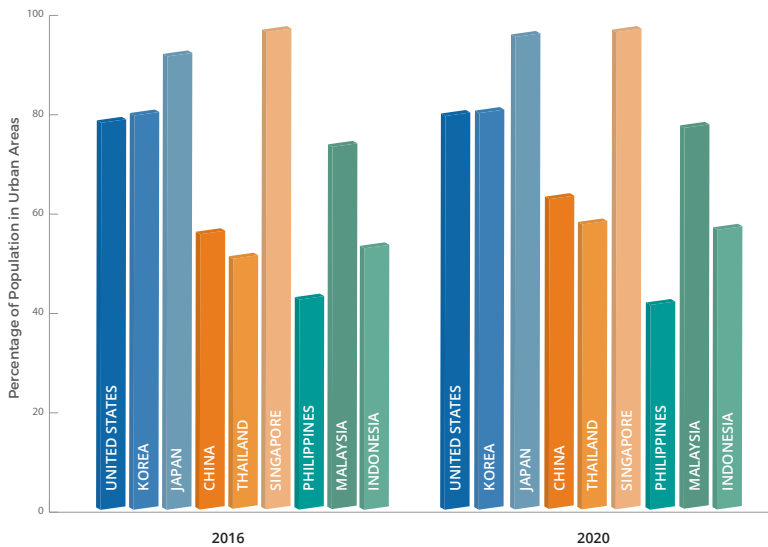
Source: IMF World Economic Outlook; Regional Economic Outlook, 2016

The five core economies of ASEAN (ASEAN-5) – Singapore, Malaysia, Thailand, Indonesia, and the Philippines – are particularly well-positioned to take advantage of global and regional forces to accelerate their pace of development. Given their long history of economic openness, the five countries stand to benefit enormously from the powerful growth momentum that regional economic integration and urbanization could unleash in the coming years. The ASEAN Economic Community (AEC), a vision to transform the 10-nation grouping into a single market and production base, and the Trans-Pacific Partnership (TPP) which includes four ASEAN member countries,<sup>3</sup> could significantly expand trade and investment in the region, and raise their productivity through greater competition (see **Map 2**). Meanwhile, there remains considerable room for urbanization in many of the five countries, which will speed up infrastructure investment and fuel the growth of services industries such as housing, education, and healthcare, etc (see **Figure 2**).

1. The 10 member countries are Brunei Darussalam, Cambodia, Indonesia, Lao People’s Democratic Republic (PDR), Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Vietnam.
2. See IMF, World Economic Outlook, April 2016 for global figures and IMF, Regional Economic Outlook Asia and Pacific, April 2016 for ASEAN figures.
3. These are Singapore, Brunei, Malaysia, and Vietnam.

Whether the ASEAN-5 countries could fulfil their potential to realize their economic visions and become a significant player in the global economy, however, depends crucially on their abilities to provide a sufficiently large number of skilled workers to meet the needs of the growth industries. Without the right skill sets, it would be difficult for the workers in the five countries, especially the young ones, to participate meaningfully in the restructuring and the advancement of the economies.

Figure 2: Estimated Population Living in Urban Areas



Source: World Bank, World Development Indicators; United Nations Database, 2016

In this study, we will examine how well-prepared the ASEAN-5 countries are in responding to the skills challenges they face. Specifically, how well-equipped their workforces are in supporting their growth strategies and in meeting the skills and manpower needs of the key growth industries. As the growth strategy in a country is usually framed around that of a few key industries, failure to provide the relevant skilled workers for these industries could critically undermine the success of the strategy.

The study will discuss issues related to the nature of the skills challenges in ASEAN-5, the causes of these challenges, the responses from the various stakeholders and how successful they have been. We will also look into the lessons that the five countries could draw from each other's experiences, and provide recommendations on how they could more effectively manage the skills challenges going forward, both individually and as a group.

The nature and the extent of skills challenges vary widely across the five countries, reflecting the different labor market conditions among them, both on the supply and the demand side. On the demand side, differences in economic structure, developmental stage, demographics, and growth strategy give rise to varied demands for skills. On the supply side, the diversity in policy support,

institutional capacity for training, characteristics of the workforce and the readiness for skills training of the various stakeholders, help account for the uneven outcomes in the provision of needed skills.

Map 1: 10 ASEAN Countries



Broadly speaking, we can divide the ASEAN-5 countries into three groups: Indonesia and the Philippines (lower middle-income countries), Malaysia and Thailand (middle-income countries), and Singapore (high-income country). The vast differences among the five can be seen in various socio-economic indicators. The per capita income, for example, ranges from US\$52,888 for Singapore to US\$2,899 for the Philippines in 2015. Likewise, the level of human development index (HDI) varies widely, with Singapore being ranked 11<sup>th</sup> in the world while the Philippines takes the 115<sup>th</sup> place (see **Table 1**).

The five economies are currently pursuing very different growth strategies. Singapore has embarked on an innovation-driven growth strategy, focusing on developing industries characterized by high innovation. Malaysia and Thailand are seeking to transit into high-skilled, high value-added manufacturing activities, while enhancing the productivity of their services sectors through greater use of technology. Meanwhile, Indonesia and the Philippines still enjoy strong comparative advantage in low-skill industries, both in manufacturing and services. With the exception of Singapore, all the other four ASEAN-5 economies are agriculture and commodity producers, with Indonesia having the highest concentration of agriculture and mining activities, accounting for about 20% of the GDP.

Table 1: Key Socio-economic Indicators of ASEAN-5, China and India, 2015

	Total GDP (billion US\$)	GDP per Capita (US\$)	Population Size (million)	Human Development Index (Ranking)	Mean Years of Schooling
China	10,866.4	7,924.7	1,371.2	0.727 (90)	7.5
India	2,073.5	1,581.6	1,311.1	0.609 (130)	5.4
Singapore	292.7	52,888.7	5.5	0.912 (11)	10.6
Malaysia	296.2	9,766.2	30.3	0.779 (62)	10.0
Indonesia	861.9	3,346.5	257.6	0.684 (110)	7.6
Philippines	292.0	2,899.4	100.7	0.668 (115)	8.9
Thailand	395.3	5,816.4	68.0	0.726 (93)	7.3

Source: World Bank, UN, 2016

The characteristics and the skills profile of the workforce vary considerably across the five countries too. Singapore has a tight labor market characterized by a largely skilled, educated, and English-speaking workforce. Tertiary-educated workers account for 51% of the workforce. With its relatively small resident population of 3.9 million, the country relies heavily on foreign labor, both professionals and lower-skilled workers, to fill jobs ranging from banking to manufacturing and construction. Foreigners make up 38% of the workforce in 2015.

Malaysia has a well-educated workforce with the second-highest mean years of schooling of 10 years amongst the ASEAN-5. Like Singapore, it depends on foreign labor to fill many jobs, but mostly in the low-skilled and unskilled segments. Female labor participation is relatively low at less than 40%. Thailand enjoys near full employment although this is masked by underemployment in the agriculture sector which takes in about one-third of the workforce. The capital city Bangkok which houses close to 18% of the population attracts most of the skilled workers. With a perceived preference for general academic education, there is a chronic shortage of skilled technical workers in the country.

Indonesia and the Philippines have the youngest workforce among the ASEAN-5 countries. However, a large number of them are not seen to be adequately prepared for skilled work. Despite robust economic growth in the last few years, both countries face serious youth unemployment problems - 18.3% and 14.4% in 2015 for Indonesia and the Philippines respectively - reflecting in part

the failure of the education system to produce industry-ready graduates. In addition, many Filipino workers - about 17.4% of new entrants to the workforce each year - seek employment overseas.

There is already a large body of works by various multilateral organizations on different aspects of the skills challenges confronting ASEAN countries. A key concern in these studies revolves around the issue of “skills gap”, a term that refers generally to the gap between skills that are in demand and skills that are available in an economy. This can come in the form of skills shortages, skills mismatches, or having workers who are under or over-qualified. Various measures have been used in the literature to reflect the extent of the skills gap, including “time taken to fill job vacancy”, “wage premium”, “turnover rate of hires”, and “unemployment rate within certain industry”.<sup>4</sup> In this study, we shall use the term “skills gap” more broadly to refer to an under-supply of skills that are needed in the economy or an industry (see **Appendix A**).

Most of the studies to date have approached the subject from an economy-wide perspective. Given the different economic structures and the different growth industries they are targeting, we believe an industry-oriented approach could more accurately reflect the skills challenges the ASEAN-5 countries face. While each industry might have its unique features and skill needs, the challenges they face generally reflect those of the economy at large.

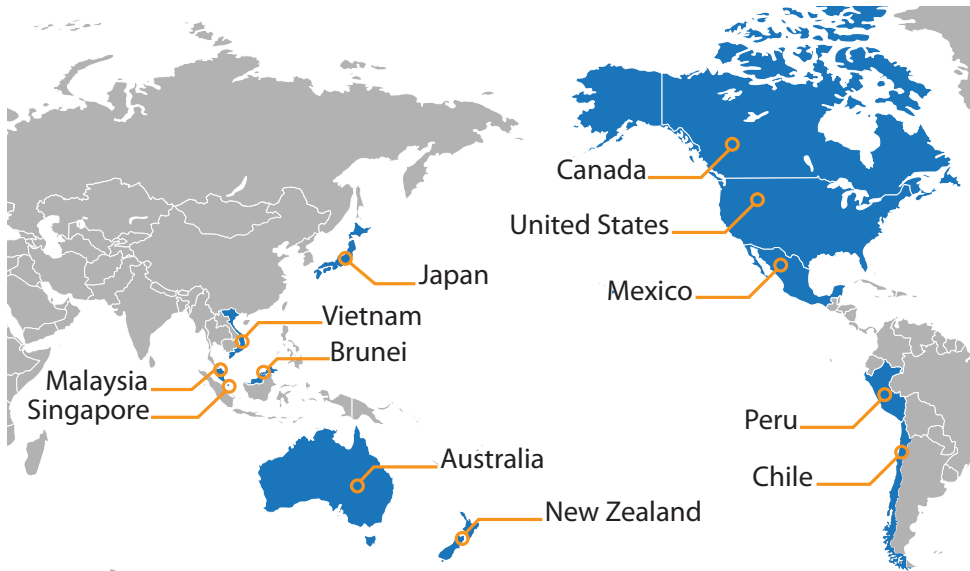
Specifically, the study will draw on the experiences of three representative growth industries in each country to help illustrate the nature of their skills challenges. An important part of the findings comes from the insights distilled from the interviews we conducted with various stakeholders in the five countries, including representatives from key growth industries. In addition, a case on a specific skill training initiative will be used to show how the skills challenges can be effectively managed in each country.

The next five chapters examine in detail the skills challenges confronting the ASEAN-5 countries, both nationally and at the industry level. Each country has adopted a different approach, reflecting the varied supply-side constraints they face and the different roles the government, the industry and other stakeholders like the educational and training institutions and the workers play. We synthesize the discussion in chapter seven, identify common challenges as well as country-specific challenges for each country and provide recommendations on ways to manage these challenges. Chapter eight concludes the study with a summary of the key findings and a discussion of how ASEAN-5 should approach the skills challenges going forward.

4. These include works by International Labour Organization (ILO), World Bank, Asian Development Bank (ADB), Asia-Pacific Economic Cooperation (APEC) and Economist Intelligence Unit (EIU), etc. See Appendix I for a brief review of the literature.

Overcoming the skills challenges is pivotal to ASEAN-5's efforts to realize their economic potential. This study helps to identify key issues that define these challenges in the five countries. We hope the study will provide a basis for further conversation with various stakeholders in ASEAN-5 countries on how they could effectively respond to the skills challenges and achieve their growth objectives in the coming years.

Map 2: TPP countries



# CHAPTER TWO



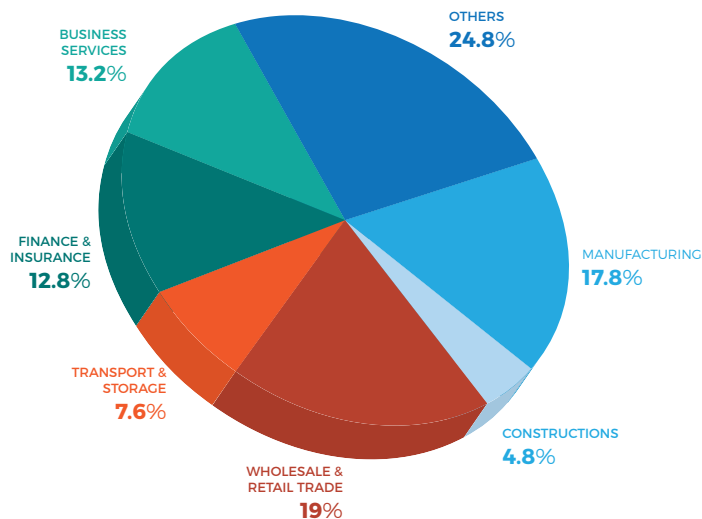
# SKILLS CHALLENGES IN SINGAPORE

## II.1 Macroeconomic Overview

A dynamic export-oriented economy, Singapore experienced strong GDP growth over the past few years, averaging 4.4% between 2010 and 2014. Growth however, slowed to 2% in 2015 due to heightened global economic uncertainty and a fall in external demand, leading in particular to a sharp decline in manufacturing production. Over the medium term, this high-income economy is projected to expand by an average of 2 to 4% per year from 2016 to 2020. Although the smallest country in terms of population size at 5.5 million, Singapore has the highest per capita income amongst the ASEAN-5 at US\$52,888 in 2015, with a GDP of US\$292.70 billion.

The Singapore economy is dominated by the services sector which accounts for 67.9% of GDP in 2015. Within services, the information and communications technology (ICT), finance and insurance sectors are key drivers, accounting for 4% and 12.8% of GDP respectively. Manufacturing remains a vital pillar in the economy, with the government targeting it to have a near 20% presence so as to maintain a certain degree of diversification in the economy. Within manufacturing, electronics, biomedical, and chemicals are among the largest clusters (see **Figure 1**).

Figure 1: Share of GDP by Key Sectors, 2015



Source: Department of Statistics, Singapore, 2015

### Key Growth Drivers

A notable aspect of the Singapore economy is the pervasive presence of the government, driving the transformation in the economy over the past 50 years. In the early 2000s, Singapore strategically shifted its growth strategy to focus



on the development of industries characterized by a high level of creativity and innovation. The innovation-driven growth strategy remains in place today even though the specific industries identified by the government as the main growth drivers have continued to evolve.<sup>1</sup>

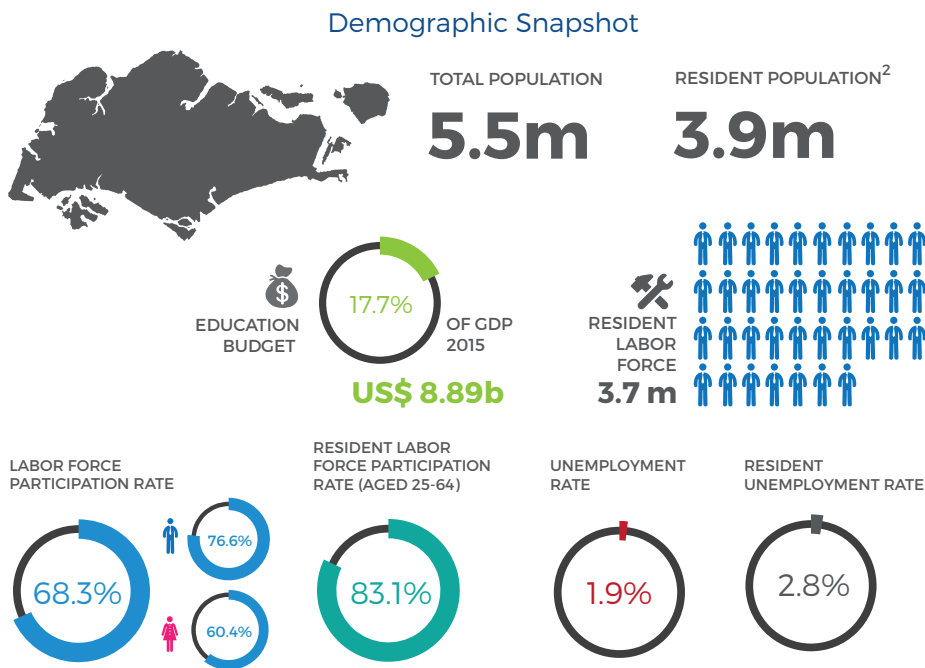
The 2015 budget highlighted five industry clusters as future key growth drivers: advanced manufacturing, applied health sciences, smart and sustainable urban solutions, logistics and aerospace and Asian and global finance services. In addition, the ICT sector is fundamental to the implementation of the Smart Nation Program, a major national initiative launched in 2014 to harness and develop technology-enabled solutions in everyday lives to help raise the productivity in the economy.

The strategic direction for the economy's growth could see more changes in the next few years, as the new Committee on the Future Economy (CFE) set up in December 2015 deliberates on new growth industries that would not only "add value" but also "create value" for the economy.

Various initiatives have been unveiled to support the growth of new industries, with a strong emphasis on productivity improvement. A total of US\$4.5 billion has been earmarked for the Industry Transformation Program launched in March 2016 to accelerate industry upgrading through increased technology use and automation enablement. The US\$13.83 billion Research Innovation Enterprise 2020 Plan (RIE2020), put in place in January 2016 to promote research and development (R&D) activities from 2016 to 2020, underscores the government's commitment to help drive economic growth through value creation. Meanwhile, the National Robotics Program announced in 2015 has a US\$328 million budget to help transform the healthcare, construction, manufacturing, and the logistics sectors.

1. See recommendations by the Economic Review Committee (2003) and the Economic Strategies Committee (2010).

## II.2 Labor Market Overview



Source: Singapore Labor Force Survey, 2015

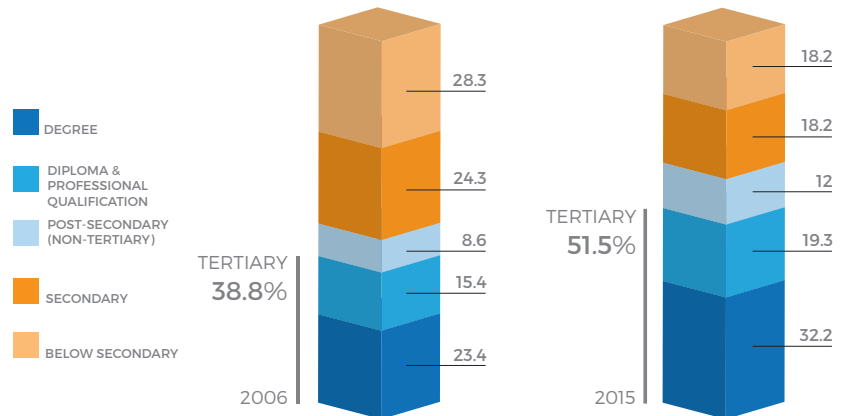
### Labor Market Conditions

Slightly more than half (51.5%) of the resident labor force in 2015 are tertiary-educated, possessing degrees and/or diplomas and professional qualifications, up from 39% in 2006. The degree holders in the labor force rose from 23% to 32% from 2006 to 2015, resident labor with post-secondary (non-tertiary) qualifications comprised 12.0% of the total resident labor force. Secondary and below secondary qualified resident labor contributed 18.2% each to the total resident labor force.

With its ageing population, Singapore has relied heavily on foreigners to help plug gaps in its workforce. In 2015, foreigners comprised 38% of the total workforce while local residents made up the other 62%. Despite some tightening of the foreign workers policy in recent years, the total number of foreign workers continues to increase. The Population White Paper (2013) projected that about 33 to 40% of the medium term GDP growth would come from an increase in labor inputs while higher labor productivity accounts for the remainder (see **Figure 2**).

2. Refers to both Singapore citizens and Permanent Residents.

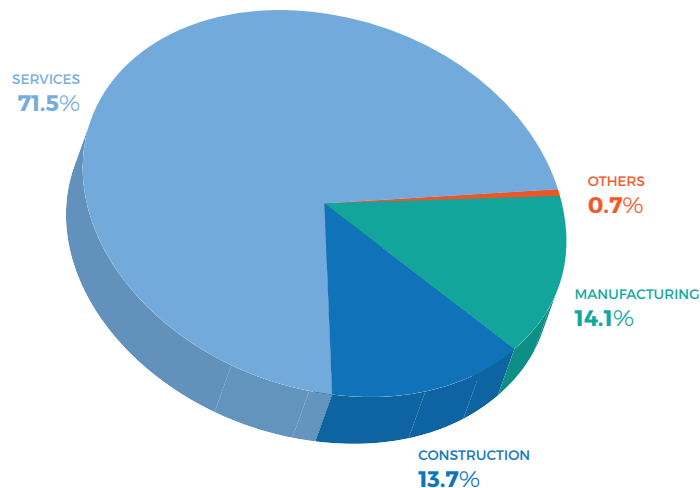
Figure 2: Distribution of Resident Labor Force by Highest Qualification Attained, 2006 and 2015



Source: Labor Force Survey, 2015

Figure 3 shows employment in key sectors, with the services sector being the largest employer. Within services, the financial and insurance services and the ICT sectors employ 5% and 2.4% of the workforce respectively. In the manufacturing sector, the largest employers are the transport equipment industry (5.5%), the fabricated metal products, machinery and equipment industry (4.6%), and the electronics, computer, and optical products industry (3.9%). Together, they account for 60.4% of the total manufacturing workforce in 2015.

Figure 3: Employment in Key Sectors, 2015



Source: Ministry of Manpower, 2015

### Skills Challenges

Despite the low unemployment rate, skills gap exists in a number of industries, as a result of the ongoing structural changes in the economy and the impact of disruptive technologies. Matured Professionals, Managers, Executives and Technicians (PMETs) are especially vulnerable to job displacement. In the latest labor market report, 71% of those retrenched in 2015 were PMETs while 65.3% were 40 years and above.

Among the factors contributing to the skills gap are a shortage of students enrolled in certain critical fields such as engineering and cyber security and challenges that educational institutions face in equipping graduates with industry-relevant skills in a number of industries.

Increased expectations of graduates and younger workers regarding their job scopes have also led to difficulties in recruitment. With more than 50% of the workforce being tertiary-educated, lower-end jobs are hard to fill. Small and medium-sized enterprises (SMEs) which employ seven in 10 workers in Singapore, face particularly daunting challenges in meeting the need for skilled and semi-skilled workers.

Table 1 Types of skills that will be in demand over the next few years

Industry	Emerging Job Areas and Skills
Precision Engineering/ Manufacturing	Industry 4.0, Additive Manufacturing, Advanced Materials, Optics & Laser Engineering, Advanced Robotics
Food Manufacturing	Food innovation and use of high technology processing methods to improve productivity
Logistics	Supply chain design and optimization; such as the growth of e-commerce and its impact on last mile fulfillment, data analytics
Electronics (semiconductor)	IC Design and Fin Field Effect Transistor (FinFET) technology. FinFETs are next generation nano-sized 3D structures, which are fast becoming the future technology of choice at feature sizes below 20nm.
Retail and F&B	Data analytics, Omni-channel Retailing, Menu Design, Techno Cooking, Revenue Management, Digital Marketing, Experience Creation and Leadership Development in Services
ICT/Media/ Games	Big Data Analytics, Internet of Things, Cyber Security, Digital Experience Design and Transmedia Storytelling
Healthcare/ Social Services	Grief Therapy, Geriatric Nursing, Diagnostic Radiology, Neuro-developmental Treatment
Security	Cyber Security, Data Analytics

Source: Workforce Development Authority (WDA), 2016

## Recent Skills Development Initiatives

In 2015, the government launched SkillsFuture, a major national movement aimed at promoting lifelong learning and preparing the workforce to be resilient and adaptable. Spearheaded by a Tripartite Council chaired by the Deputy Prime Minister, the movement will spend US\$730 million over a five-year period (2015 – 2020) on various initiatives such as career guidance for students, enhanced internships and subsidies for mid-career learning, and promoting career progression based on skills mastery (see **Case on SkillsFuture**).

A number of Sectoral Tripartite Committees (STCs), one for each key sector in the economy, have been tasked to provide Sectoral Manpower Plans (SMP) for the sector. To help ensure the relevance of the plans, each STC is chaired by a government agency assigned to champion the sector, supported by employers and labor unions. These SMPs are expected to map out the sectors’ future development plans, identify the manpower and skills required, as well as policy interventions needed to ensure an adequate supply of skilled workers in each sector.



Source: Singapore Department of Statistics, 2015

## II.3 Industry Skills Challenges

### INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT)

#### Industry overview

The ICT industry benefits from Singapore’s robust intellectual property laws, good connectivity, and easy access to global talents. As a global data management hub, the Republic accounts for more than 50% of the commercial data center space in South-east Asia. With Singapore’s push to become a Smart Nation, the ICT sector is expected to be a key contributor to economic growth both directly and also as an impetus to the growth in other industries such as healthcare and logistics.

The industry grew at a 7.0% compounded annual growth rate (CAGR) from 2010 to 2015, outpacing many other sectors. Employment in the ICT sector has also grown rapidly at a 5.3% CAGR during the same period, reaching 125,300 (or 4% of the workforce) by 2015.

## Skills Challenges

The ICT industry employs close to 150,000 workers, comprising one-third foreigners and two-thirds residents. It is projected that by 2017, the ICT industry would require an additional 15,000 workers particularly in the areas of cyber security, data analytics, development and network infrastructure – a number set to rise to 30,000 by 2020. However, if the demand from other industries is included, the number of ICT professionals required is likely to reach 39,000 by 2020.<sup>3</sup>

The shortage of skilled workers for cyber security is particularly acute, especially at the middle and senior tiers due to insufficient training programs and entry routes for mid-career professionals. In 2012, only 0.8% of Singapore's 144,300 ICT workers were considered IT security specialists. Relatively little progress has been made since then to narrow the skills gap despite recommendations by the National Cyber Security Masterplan 2018 in 2014.

There is also a shortage of workers for lower-level software engineering and programming jobs. Singapore has so far addressed this through importing foreign workers. However, this has created a vicious cycle in the demand for foreign workers: influx of foreign workers leads to lower wages, resulting in local graduates shunning this segment which in turn creates more demand for foreign workers.

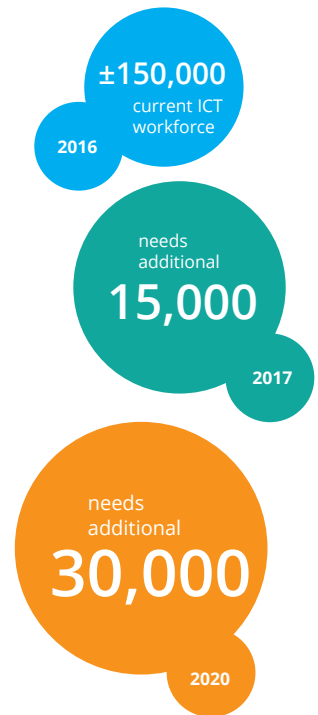
The Association of Information Security Professionals (AISP) also pointed to a weakness among the ICT workers in soft skills, especially in client and stakeholder management, project and vendor management and people management skills in general.

## Initiatives and Responses

The government has unveiled a number of initiatives to help meet the ICT manpower needs, especially in data analytics, cyber security and software development. TechSkills Accelerator, for example, offers a platform for skills certification and job placement to promote employment based on certified skills proficiency rather than mere academic qualifications. The Tech Immersion and Placement program, on the other hand, provides quick training and job opportunities for those with no formal background in ICT. In addition, the SkillsFuture program offers up to 150 study awards over the next five years while the Smart Nation Fellowship Programme aims to bring home Singaporean data scientists, technologists and software engineers who are residing overseas.

Other initiatives range from imparting computational thinking to primary and secondary school students through CodeSG (train up to 72,000 students), to increasing the number of internships for institutes of higher learning (IHL) students (from 130 to 800 a year), and expanding training programs to reach fresh and mid-level ICT professionals and those with science, technology, engineering, and mathematics (STEM) backgrounds (from 160 to 900 each year).

3. According to the Singapore infocomm Technology Federation, leakage of ICT professionals to other industries is estimated to be about 30%.



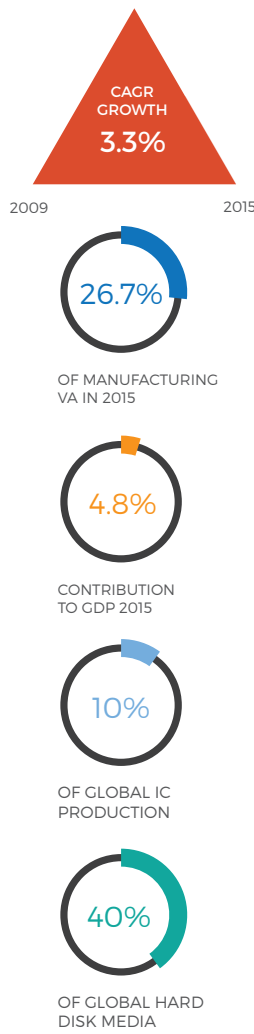
Source: Infocomm Development Authority, 2015

Despite the numerous well-funded initiatives, skills challenges remain in the ICT industry. Our interviews with the Singapore infocomm Technology Federation (SiTF) suggest that mid-career PMETs are reluctant to move into the industry because of the pay cuts and the steep learning curves they face given the breakneck speed innovation and technological changes are taking place in the industry.

While the IHLs are incorporating more specialized technical skills into their ICT curriculum, they are not seen to be introducing relevant courses to meet industry needs fast enough. For example, “business analytics” studies, increasingly essential for business planning, were only introduced at the local universities three to four years ago even though such studies had been popular and important elsewhere much earlier.

Wage depression in certain lower-level programming jobs, partly a result of widespread hiring of foreign workers, may hinder efforts such as the Earn and Learn apprenticeship program for polytechnic and vocational school graduates. The government has tried to change the situation by increasing the starting public servant pay in the ICT sector by 20% to US\$3,000 per month. However there is a limit to the effectiveness of such pay increases unless they are matched by a rise in productivity in the sector.

In 2014, only 38% of the Infocomm workforce was female, much lower than the number (47%) for the whole services sector. More could be done to find out the reasons for low female representation and if necessary, attract them into the sector.



## **ELECTRONICS AND ELECTRICAL MANUFACTURING (E&E)**

### *Industry Overview*

The E&E industry is the largest cluster within Singapore’s manufacturing base. Manufacturing output of the industry grew at a 3.3% CAGR from 2009 to 2015. In 2015, it contributed 26.7% of manufacturing’s VA (or 4.8% of the country’s GDP) and accounted for 17.3% of manufacturing employment. Within the E&E industry, the largest contributors are semiconductors and data storage, making up 71.7% and 11.1% of the VA respectively.

Singapore accounts for 10% of the world’s integrated circuits (IC) production and 40% of the hard disc media. It is home to many global industry players, with 14 silicon IC wafer fabrication plants, 15 assembly and test operations,

Source: Economic Development Board, 2015; Singapore Ministry of Manpower, 2015

and about 30 IC design centres. The global top three storage players and four of the world's top five electronics manufacturing services (EMS) providers are also located in Singapore.

As the E&E industry has been shifting steadily towards more technology-intensive and high value-added segments, employment in the industry has decreased more than 15% from 2010 to 2015 despite the robust growth of the sector. The government, through RIE2020, hopes to strengthen the industry's competitiveness by seeding new growth niches such as robotics, digital manufacturing, advanced materials, and additive manufacturing through the use of new technologies. Recent technological advancements such as the Internet of Things (IoT) could drive up the demand for IC chips and represent a growth opportunity for semiconductor producers.

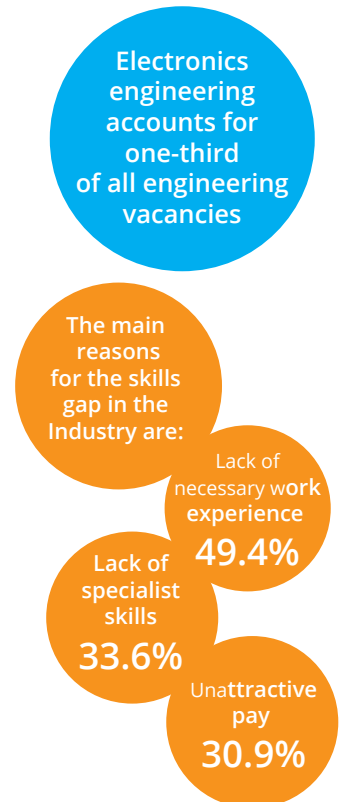
## Skills Challenges

Engineers including E&E engineers are among the top five jobs currently in demand in Singapore. The latest Ministry of Manpower 2015 job vacancies report shows that of the top 10 professional jobs with the highest number of "vacancies hard-to-be filled by local residents", three are engineering-related. Electronics engineering accounts for one-third of all engineering vacancies. The main reasons for the skills gap in the E&E industry are lack of necessary work experience (49.4%), lack of specialist skills (33.6%), and unattractive pay (30.9%).

With the move towards an innovation-driven economy, the demand for engineers is set to increase, especially in newer engineering fields. Google's decision in January 2016 to set up an engineering hub in Singapore and the government's push to realize the Smart Nation vision will raise the demand for engineering talents further. In early 2016, the government announced it would recruit 1,000 more engineers to supplement the 7,700 it already employed for various infrastructure projects.

## Initiatives and Responses

The E&E companies in Singapore are mostly SMEs, operating as sub-contractors to the MNCs, with few home-grown products to boast about. They also lack the resources or know-how to innovate. A government-led initiative to boost SMEs' innovative capabilities is through the licensing of R&D products developed by the government-led Singapore Institute of Manufacturing Technology (SIMTech). Interviews with the Singapore Chinese Chamber of Commerce and Industry indicate that the SMEs need support in improving productivity, attracting, and retaining talents to keep up with the transformation of the industry.



Source: Singapore Ministry of Manpower, 2015



The WDA, together with research institute Agency for Science, Technology and Research (A\*STAR) and various educational institutes, has introduced a series of customized “master-classes” to train more than 400 engineers over a one-year period in emerging technologies such as advanced robotics and automation, additive manufacturing, and optical and laser engineering. This will complement engineering programs in the IHLs. In emerging technologies where Singapore lacks a critical creative mass, internships or work exposure to cutting-edge companies such as those in the Silicon Valley is seen as a possible solution.

## FINANCE AND INSURANCE

### Industry Overview



The finance and insurance sector (or “financial sector” in short) has grown at a rapid 8.6% CAGR from 2010 to 2015. In 2015, the sector contributed to 11.2% of GDP and employed 9.4% of the total workforce, with half of the VA contributed by the banking sub-sector. A fast growing segment is wealth management which saw a strong CAGR of 14% from 2009 to 2014, raising its share of the sector’s VA from 8.5% in 2010 to 11.4% in 2015. As a financial hub, Singapore is well-positioned to support the rapid growth of Asian finance in areas such as infrastructure funding, structured trade finance and wealth management, and to benefit from growth opportunities provided by wider regional financial sector integration.

Technological changes and innovation will likely have a major impact on the demand for skills in the financial sector in the next few years. The rapid adoption of financial technology (FinTech) could render a number of jobs obsolete. In Nordic countries, technology changes have reduced the number of bank branches by half since 2008. A similar outcome could take place elsewhere including Singapore.

### Skills Challenges

Over 3,000 graduates in business and finance programs from the IHLs a year help meet the skills demand from the financial sector. Increasingly, however, more workers will be needed in niche areas. Wider adoption of Fintech, for example, would result in an increase in demand in IT-related skills, including jobs in cyber security, project management, and IT development and programming.

With the increased use of mobile banking applications and robo-advisors,<sup>4</sup> there would be rising demand for workers who could integrate knowledge across different areas, possessing both technical, and entrepreneurship skills. Workers with expertise in US and European regulatory regimes and more

4. Two companies, Infinity Partners and Smartly have announced that they will be launching robo-advisors that would be made available in Singapore in 2016. See <http://fintechnews.sg/1483/roboadvisor/smartly-sg-announces-robo-advisor-targeted-southeast-asian-millennials/>

Source: Economic Survey of Singapore, 2015

generally, familiarity with global market conditions, are also in demand. Anti-money laundering is another area where there is a shortage of local talents.

### *Initiatives and Responses*

The Singapore government has launched a number of initiatives for the finance professionals to deepen and broaden their skills. One such initiative is the formation in February 2016 of the Financial Sector Tripartite Committee (FSTC), a joint collaboration among the industry, the government, and the labor union to work with the Association of Banks of Singapore to review standards and provide avenues for skill upgrading, re-skilling, and acquisition of new skills.

The industry has stepped up efforts to attract relevant talents to prepare for the challenges posed by Fintech. The Monetary Authority of Singapore launched the Asian Financial Leaders Program in 2015 to equip senior financial sector professionals with competency in emerging fields such as data analytics and digital banking. Foreign banks in Singapore are increasing efforts to support the development of a core of local talents. This will help to sustain Singapore's financial hub status over the long run.

## **II.4 Outlook**

The responses to skills challenges in Singapore over the years have been led largely by the government, with a top-down approach. The government projects the needs for various types of skills, maps out the manpower development strategy – even down to the industry level – and then leads in implementing the strategy. To succeed, the government often engages and coordinates closely with other stakeholders (including the industry, the educational institutions and the labor unions), by aligning their interests with each other. By and large, the educational and training institutions have been able to adjust to the changing needs of the industries.

This proactive and forward-looking approach of the government is supplemented by a liberal policy on employment of foreign workers. The large influx of skilled foreign workers plays a critical role in plugging skills gaps in industries where the local education and training institutions have not been able to supply the needed skilled workers fast enough.

The combination of a proactive and forward-looking human capital management policy by the government and a liberal foreign worker policy, appear to have worked well for Singapore so far, despite the many transformations that the economy has gone through and with them, the many changes observed in labor demand, over the past 50 years.

In the 1970's, for example, the primary focus in manpower policy was to produce enough workers skilled in science, engineering, and technical fields to serve the needs of the multinational corporations. The government leveraged on the expertise and goodwill of the MNCs and their home governments to set up various government-industry and government-government training institutes.<sup>5</sup> This was supplemented by the establishment of a number of polytechnics and a drastic shift in the curriculum of the IHLs to have a strong orientation towards science and engineering. At the same time, a Skills Development Fund was set up to encourage employers to send their workers for skills training. This multi-pronged effort played a critical role in supplying the technical skills Singapore needed to succeed in its industrialization program.

Over the past 15 years, as Singapore embarked on the innovation-driven growth strategy, a multi-pronged strategy was again used to change the profile of the workforce, including changing the curriculum and pedagogy of educational institutions at all levels and attracting multinational corporations (MNCs) that are more innovation-oriented. In addition to continued emphasis on science and engineering skills especially those related to new industries, a lot of attention has been given to enhancing the workforce's capacity for innovation, as well as its ability to "up-skill" and "re-skill", so as to adapt to the changing demand for skills.

Throughout the two periods, the inflows of foreign workers continued to help fill the job and skill vacancies that the local workforce was unable to take up, allowing the economy to continue with its robust growth without being dragged down by any serious skills gap.

**The main skills challenges confronting Singapore today are those arising from the fast-changing structure of the economy.** Skills gaps exist not because the education institutions are not producing a sufficiently large number of skilled workers for the key growth industries, but because the industries are constantly going through rapid changes – partly encouraged by the frequent changes in the government's industrial policy – and demanding somewhat different skill sets. This in turn perpetuates the need for foreign workers, to make up for the shortage of the new skills that are in demand.

The skills challenges are obvious in the three industries discussed. In the ICT industry, for example, Singapore is trying to gain a leadership position in high value added areas like big data analytics (BDA), cyber security, Internet of Things (IoT), network engineering, cognitive computing/robotics, immersive media, future communications, etc, areas which are relatively new in the local industry landscape. Likewise, in manufacturing, the government is pushing the industry to move into advanced manufacturing, medical technology, robotic engineering, aerospace engineering, etc; while in the financial sector, the government is embracing changes brought about by the wider use of FinTech.

5. These include Japan-Singapore Technical Institute, Japan-Singapore Training Centre, Japan-Singapore Institute of Software Technology, French-Singapore Institute, German-Singapore Institute, Philip Government Training Center, Tata-Government Training Center, and Rollei-Government Training Center.

The recent initiatives to promote skills training in newly targeted industries and the SkillsFuture movement to foster lifelong learning and skills adaptability, point to a continuation of the government's active role in managing the skills challenges in the country. The setting up of the various sectoral manpower plans is yet another example of the government's attempt to align the interests among the various stakeholders.

To anticipate the change in the manpower needs in the financial sector, for example, the government is already looking to build up a workforce with expertise in areas affected by FinTech, with MAS taking the lead in the endeavor. To prepare for the manufacturing industry's transition to advanced manufacturing, the government has started efforts to help workers acquire skills in fields such as robotics engineering, medical technology, and aerospace engineering. In the ICT industry, the educational institutions have introduced various programs and to prepare for the 30,000 additional skilled workers that the industry needs by 2020.

Foreign workers will continue to be used to supplement the local workforce. The total number of foreign workers in Singapore continues to increase despite a slowdown in growth rate after 2011.

The success of the approach has nevertheless brought with it other skills challenges. The heavy reliance on foreign workers and the low productivity growth performance signal a lack of strong indigenous production capacity. This in turn points to an urgent need to re-orientate the education and training policy and to re-examine the pace of change in industrial policy. In addition, given the heavy emphasis on innovation-driven growth and adaptability of the workforce, there has been insufficient focus on the teaching of soft skills and other cross-job skills, a deficiency that is also seen in the SkillsFuture programs, which tend to encourage learning of technical knowledge and skills.

## Case 1: SkillsFuture



**Motivation:** The case represents an example of a government effort to change the mindset towards continuous skills acquisition through incentives and support provided not only to individuals and workers but also to employers.



**Snapshot:** SkillsFuture is a nationwide movement started by the Singapore government in 2015 to promote lifelong learning through the acquisition and updating of skills. It aims to provide Singaporeans with the opportunities to develop their fullest potential throughout life, regardless of their starting points. A key intent of SkillsFuture is to empower individuals to take ownership for acquiring new skills and deepen their skills throughout life. It involves individuals, employers, unions, government agencies, as well as educational institutes working together to create a culture of continual skills upgrading, and re-training.



**Context:** Despite a small population and few natural resources, Singapore has developed into an advanced economy. A major concern for the government has been to maintain the country's competitive edge both regionally and globally. Policy makers have recognized that this goal requires a culture where workers are willing to constantly up-skill, re-skill, deep-skill, and second-skill. Thus, one of the key intended outcomes of SkillsFuture is to shift the mindset of Singaporeans in this direction. To support SkillsFuture and lifelong learning efforts in Singapore, the government has set aside an average of over US\$730 million per year from 2015 to 2020.



**Structure:** SkillsFuture is driven by the Council for Skills, Innovation and Productivity, with representatives from industry, labor union, and government. The Council aims to develop an integrated system of education, training, and career guidance for Singaporeans. Key SkillsFuture initiatives include Education and Career Guidance (ECG); Individual Learning Portfolio (ILP); SkillsFuture Credit; and SkillsFuture Earn and Learn Program (ELP); P-Max; SkillsFuture Study Awards; SkillsFuture Qualification Award; and SkillsFuture Mid-Career Enhanced Subsidy. This case focuses on the SkillsFuture Earn and Learn Program and the SkillsFuture Credit.

## SkillsFuture ELP

**Overview:** The SkillsFuture ELP is a work-study program that places fresh graduates from Singapore's Institute of Technical Education (ITE) and polytechnics with employers. Currently, some 37 ELPs across 22 sectors (including accountancy, air transport, electronics, energy and chemicals, facilities management, healthcare, hotel, maritime, spatial design, and visual communication) have been rolled out.

**Mechanism:** Participants deepen their skills through a blended classroom and structured on-the-job (OJT) training and mentorship with the employers at the workplace. The program ranges from a period of 12 to 18 months. At the end of the program, participants will be accorded with an industry recognized certification or qualification. To incentivize them, participants who are Singapore Citizens will get a US\$3,715 sign-on incentive upon successful completion of the program. From the employer side, participating companies receive up to US\$11,145 depending on incurred costs for the various components to offset the cost of developing and providing OJT, mentorship, and to set out career progression pathways for participants.

A typical ELP participant may work most days of the week and attend classes once or twice a week. The participants have close supervision at work and in school by both employers and lecturers to respectively integrate theory and develop deep industry specialist skills. They may also get to work on a project related to the company operations to solve real work problems by applying what they have learned in classes. The average remuneration ranges from a monthly salary of US\$1,709 to US\$2,080, which matches the starting pay of ITE and polytechnic graduates. This however varies across sectors and companies.

## SkillsFuture Credit

**Overview:** In 2016 all Singaporean Citizens aged 25 and above received a US\$366.50 SkillsFuture Credit with the goal of encouraging a commitment to skills development and lifelong learning. The non-expiring credit will see periodic top-ups from the government, and enables individuals to sign up for skills development courses available from the SkillsFuture Credit course directory.

**Mechanism:** There are currently over 15,000 courses available in the SkillsFuture Credit course directory and this is meant to be expanded. The top five areas of training Singaporeans have used their credits thus far include courses in security and investigation, language skills, information and communication technology (ICT), food and beverage, and productivity and innovation.

Online course offerings have also almost doubled from 586 in January 2016 to 1,072 in April 2016. Online courses, including those providing training in web development and data analysis, are especially popular among Singaporeans aged 40 and below, constituting 10% of all SkillsFuture credit claims made. In total, approximately 64,000 people have utilized their SkillsFuture credit between January and July 2016.

**Outcomes:** As the SkillsFuture movement has only been implemented relatively recently, assessing its outcomes and impact is still premature.

**Outlook:** The SkillsFuture movement takes a broad and ambitious approach to the skills gap issue given the challenges of Singapore's advanced economy. Rather than focusing on a set of companies or sectors, SkillsFuture is organized as a "national movement", to create a mindset change in how Singaporeans – both employers and employees – think about skills. The goal is to inculcate values of lifelong learning and upgrading of skills in keeping with new demands and technologies. One of the more interesting philosophies underpinning the SkillsFuture movement is that while it is a government-initiated effort – the goal is for both individuals and employers to take ownership of developing the needed skills, with the government playing an enabler role. One of the key challenges of this major effort with such lofty goals is to develop appropriate metrics to monitor and evaluate its success. Nonetheless it appears to be a highly promising and creative endeavor to address the skills issue.

# CHAPTER THREE



# SKILLS CHALLENGES IN MALAYSIA



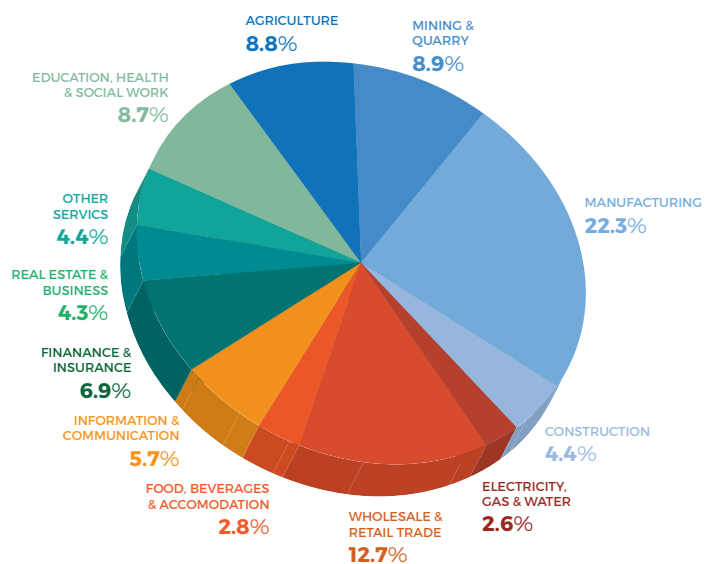
## III.1 Macroeconomic Overview

An open diversified upper-middle income economy, Malaysia has enjoyed robust economic growth in recent years, with GDP averaging 5% growth per annum since 2011. While the International Monetary Fund (IMF) predicts that real GDP growth would moderate to 4.4% in 2016, it is set to accelerate again to 4.8 - 5% between 2017 and 2021. Malaysia's per capita income stood at US\$9,766 in 2015, the third-highest within ASEAN after Singapore and Brunei while the total GDP was at US\$296.20 billion.

The Malaysian economy is made up largely of the services sector which accounts for more than 53% of the GDP (see **Figure 1**). Within the services sector, information and communications technology (ICT) plays an important role as the third largest contributor, accounting for 5.4% of GDP in 2015. The finance sector follows closely behind, with 5.2% contribution to GDP. The direct contribution of travel and tourism to the economy was estimated at 4.4% of GDP in 2015 but the figure rose to 13.1% if indirect contribution was included.

Manufacturing made up about 23% of the GDP in 2015 with manufacturing exports contributing 60.9% of the country's gross exports. Electronics and electrical (E&E) exports alone comprise 35.6% of total gross exports. Agriculture contributes to 8.8% to GDP in 2015, with the palm oil industry accounting for more than 5% of Malaysia's gross exports.

Figure 1: Share of GDP by Key Sectors, 2015



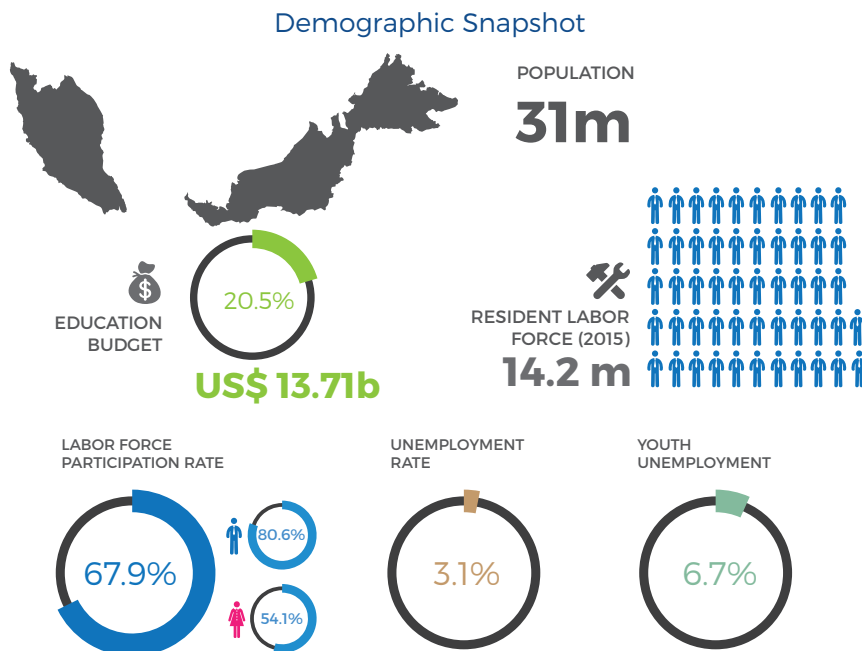
Source: Economic Planning Unit, 2015

## Key Growth Drivers

In its 2010 Economic Transformation Program (ETP), a roadmap to steer the country towards a high-income, innovation-oriented and knowledge-based economy by 2020, the government identified 12 National Key Economic Areas (NKEAs) to create high value-added jobs. To be driven largely by the private sector, these NKEAs include 11 key sectors as well as a regional economic zone. Of the 12 NKEAs, the sectors with the largest projected gross national income (GNI) contributions are: oil, gas and energy (OGE), E&E, palm oil and rubber, financial services and business services (see **Table 1**).

In addition, as part of the broader 11th Malaysian Plan (2016 – 2020), the ETP has a more immediate focus on driving economic growth through infrastructure improvement and accelerated transformation of the key industries. In the ICT industry, for example, there are strong efforts to significantly broaden the adoption of ICT technology across industries and to speed up the development of technology in areas such as digital content, software development, Internet of Things, data centers, and big data analytics. In manufacturing, initiatives are being put in place to push the E&E industry up the value chain through having more diverse and complex products, and enhanced productivity via automation and innovation.

## II.2 Labor Market Overview

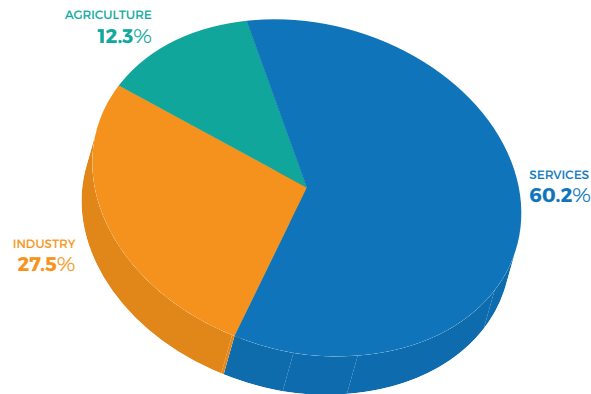


Source: Labor Force Survey Report, Malaysia 2015

## Labor Market Conditions

The services sector is the largest employer, accounting for 60.2% of the workforce in 2015. This is followed by industry at 27.5% and agriculture at 12.3% (see **Figure 2**).

Figure 2: Employment in Key Sectors, 2015



Source: Labor Force Survey Report, Malaysia 2015

About 15% of Malaysia's workforce is made up of non-resident labor. Of these, 44% occupy low-skilled jobs and only 5% in high-skilled occupations, with the other 51% in mid-skilled roles.

Unemployment among youth is much higher than the overall unemployment rate of 3.1% in 2015 – 10.7% for the 15 to 24 age group and 9.3% for the 20 to 24 age group in 2015. As a percentage of total unemployed, youth between the ages of 20 to 24 constituted a staggering 42.1% with more than one-third of them being fresh graduates, highlighting the urgent need to address graduate employability.

Together, the NKEAs are projected to create 1.52 million jobs from 2016 to 2020. In addition, the ETP aims to increase the number of skilled workers from 28% of the workforce in 2015 to 35% by 2020 to meet the demands of a knowledge-based economy, while reducing those of semi-skilled and low-skilled workers from 62% to 58% and 10% to 7% respectively during the same period.

## Skills Challenges

Our interviews with key stakeholders in the labor market suggest that the lack of quality skills-based and job-relevant training, outdated curricula, and poor soft skills especially declining English proficiency, are three main skills challenges in Malaysia. The 11<sup>th</sup> Malaysia Plan (2016 – 2020) also highlighted a serious information gap between the institutes of higher learning (IHLs) and the industry on the types of skills that the industry needs. About 60% of the 1.5

million new jobs expected to be created between 2016 and 2020 will require Technical and Vocational Education and Training (TVET)-related skills. However, the TVET institutions have not been able to produce enough graduates with the right skill sets to meet industry demand. TVET education also suffers from an “image” problem as it is seen to be a less attractive pathway compared to an academic education with the prospects of better pay. The lack of lifelong learning programs to support up-skilling, especially for mid-level career workers also add to the skills challenges in the economy.

Table 1: Additional Jobs Created per year, by NKEA, 2016-2020  
(all figures in '000)

Industry	2016	2017	2018	2019	2020	Total Jobs to be created in NKEA 2016 – 2020
Oil & Gas	5.3	8.7	0.9	4.7	7.3	26.9
Palm Oil	12.9	14.7	16.8	19.3	22.6	86.3
Rubber	2.9	2.9	2.9	2.9	2.9	14.5
Financial Services	23	24.2	26	28.5	34.4	136.1
Wholesale	46.6	48.5	49.9	51.9	54.1	251
Telecommunications	4.2	4.4	4.6	4.8	5.5	23.5
Education	54.9	59.6	64	67.1	70	315.6
Electronics & Electrical	11.9	9.1	10.4	11.7	14.9	58
Business Services	18.1	21.1	24.6	29.2	35.1	128.1
Healthcare	16	20.6	18.8	21.3	19.5	96.2
Agriculture	2.2	4.2	3	3.5	3.7	16.6
Tourism	50.6	49.8	53.5	58.7	64.9	277.5
Greater Kuala Lumpur / Klang Valley	66.6	-43.2	18.9	16.2	32.9	91.4
Total Jobs	315.2	224.6	294.3	319.8	367.8	1521.7

Source: Institute of Labour Market Information and Analysis (ILMIA), 2015

The severity of the skills challenges may be seen in a 2014 employability survey conducted by TalentCorp among employers. An overwhelming majority of the respondents surveyed expressed dissatisfaction with the education and training system: 80% of them think the university curricula should be revised to reflect the realities in the labor market and 90% of them felt more practical training should be provided for students. In addition, many of the respondents pointed to a lack of soft skills among the graduates. About 81% of the respondents identified communication skills as lacking among fresh graduates, followed by creative/critical thinking (56% of respondents) and analytical and problem-solving competencies (51% and 49% respectively). Other soft skills that are perceived to be lacking include the ability to work independently, time management skills, teamwork, and foreign language skills especially English proficiency.

### *Recent Skills Development Initiatives*

The government has been proactive in developing initiatives to expand the pool of skilled workers. The ETP developed a Human Capital Development Strategic Reform Initiatives (HCD-SRI) roadmap aimed at enhancing the skills of the workforce and addressing the human capital needs of the 12 NKEAs. Specifically, the goals are to increase graduate employability from 75.5% in 2013 to more than 80% by 2020, improve labor productivity and promote lifelong learning.

To address the skills needs of the NKEAs, the government established a new agency, the TalentCorp, in 2011 with the following four key thrusts: promoting training; guiding graduate employability; retaining skilled Malaysians, persuading talented Malaysians who are overseas to return; and attracting foreign talents.

Together with the Institute of Labour Market Information and Analysis (ILMIA), TalentCorp has worked out a pilot Critical Occupations List (COL) to highlight the key skills gap in the economy. The initial list covers occupations in six important sectors: E&E, oil and gas, information and communication technology, and global business services (ICT & GBS), telecommunications and media, and financial services and accounting.

The latest data on the Malaysian diaspora indicates a moderate brain drain – about 2% of those who are tertiary-educated and 25 years and above are living overseas. To reverse this drain, the government has introduced a Returning Expert Program which provides tax incentives for returning Malaysians (see **Case on TalentCorp**).

The 11<sup>th</sup> Malaysia Plan identified TVET as the main vehicle to supply the skills needed as the economy transits to higher valued-added industries. More resources would be allocated to help reduce the industry-school gap, including various schemes to encourage apprenticeship and skills upgrading. Specifically, the government is targeting to raise the annual TVET intake from 164,000 in 2013 to 225,000 by 2020.

Recognizing human capital as key to achieving a knowledge-based economy, the Ministry of Education's Malaysian Education Blueprint 2015 to 25 (Higher Education) stresses the need to increase access to higher education, setting the target of increasing the enrolment rate per cohort from the current 36% to 53% by 2025. This is to be achieved through growing the TVET institutions, private higher learning institutions, and online learning. It also recognizes the need to involve the industry in curriculum development and teaching at the IHLs.

The education blueprint also places emphasis on entrepreneurship education, soft skills training, and raising the level of English proficiency. At the primary and secondary school level, the government is prioritizing science, technology, engineering, and mathematics (STEM) education, aligning national curriculum to international standards, and improving the ICT infrastructure to provide the framework needed for digital learning, and to prepare students for a more knowledge-based economy.

### III.3 Industry Skills Challenges



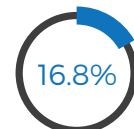
## INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT)

#### Industry Overview

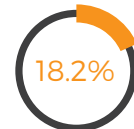
The ICT sector has been growing at a double-digit rate each year since 2009. The sector, which comprises ICT Services (ICTS), ICT Manufacturing (ICTM), ICT Trade and e-commerce, accounted for 16.8% of GDP 2015. This is expected to rise to 18.2% by 2020. At the same time, the sector is moving away from manufacturing to export of higher value-added services, as reflected in the decline of ICTM subsector's contribution to GDP from 4.6% in 2010 to 3.9% in 2015, with a gradual increase of the ICTS contribution to GDP from 5.2% to 5.5% in 2015.

The 11th Malaysia Plan (2016 – 2020) identified the ICT services sector as a key enabler for the knowledge economy and recognized its crucial role in improving productivity. To this end, a number of strategies have been unveiled to re-energize the ICT industry including infusing and widening the usage of ICT in small and medium-sized enterprises (SMEs), expanding R&D efforts in ICT, and improving the digital infrastructure.

While the ICT services sector<sup>1</sup> employs 214,000 people or 1.5% of the workforce in 2015, the NKEAs aim to produce 43,162 new jobs directly for the ICTS by 2020. With the growth of the digital economy, another 160,000 high-value high-skilled



CONTRIBUTION TO GDP 2015



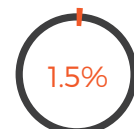
OF GDP BY 2020



160,000

NEW JOBS BY 2020

EMPLOYS



OF WORKFORCE 2015

Source: Department of Statistics, Malaysia, 2015

1. As classified by the LFS 2015

jobs requiring ICT skills are expected to be created by 2020. The main segments of the workforce targeted by the NKEAs are digital entrepreneurs, Malaysian youths, and SMEs.

## *Skills Challenges*

The key skills challenge faced by the ICT sector is the lack of industry-ready graduates. According to the 2014 findings by PIKOM, the national ICT association, only 10% of the new entrants to the ICT industry are employable, with the remaining 90% requiring substantial training before they are work-ready. One reason for this is that on the whole, the ICT curriculum in IHLs is not catching up fast enough with the rapidly evolving industry needs and global trends. For instance, the IHLs only began to offer data science courses in 2015 even though Malaysia Digital Economy Corporation (MDEC), a government-owned agency created in 1996 to transform Malaysia's digital economy, is aiming to increase the number of data professionals four-fold to 16,000 between 2016 and 2020, and to establish Malaysia as ASEAN's Big Data Analytics hub. This problem is compounded by the lack of industry involvement in curriculum design.

The skills gap is aggravated by the gradual decline in the number of ICT graduates. A MDEC study in 2015 indicated that while the demand for graduates in core ICT areas (such as computer science, information technology, and software engineering) almost doubled from 7,121 in 2010 to 13,300 in 2014, the supply of graduates had decreased from 8,237 to 8,000 during the same period. The reasons for the decline include "ICT subjects not taught in most secondary schools" and the perception of poor career prospects for this field of study. ILMIA estimates that there would be a shortage of close to 10,000 ICT professionals at various levels in 2016.

At the same time, PIKOM reported a lack of interest amongst workers to attain higher global ICT standards and competencies, with little incentives given to them for training or skills upgrading. One hindrance to the training of ICT workers is the requirement by the Malaysian Qualifications Agency (MQA) that trainers must have higher academic credentials than the students. This effectively excludes trainers with vast industry experience but without the requisite academic qualification to teach in the IHLs.

Adding to the skills gap in the ICT sector is the exit of talents to countries such as Singapore, Hong Kong, and the Middle East that offer more attractive career and salary opportunities.

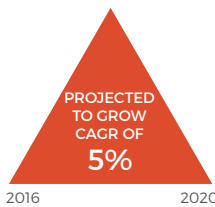
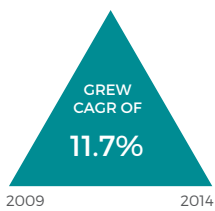
## *Initiatives and Responses*

To enhance the employability of ICT graduates, MDEC has implemented several skills development initiatives to get them to be industry-ready. For example,

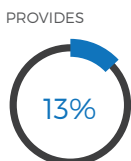
the job camp – Graduate Employability Management Scheme - trained 38,377 graduates and 12,363 working professionals from 2010 to 2014. The scheme involves the participation of over 1,200 companies and 40 IHLs, pointing to a closer industry and academia collaboration to manage the skills gap in the ICT industry.

Additionally, TalentCorp has implemented various internship and apprenticeship programs including an up-skilling program, which partners training providers and industry players to provide training for fresh graduates. This nine to 12-month long program includes both classroom and practical project-based training with the host company. MSC Malaysia, the national ICT development initiative under MDEC has also implemented the MSC Malaysia ProCert (SRI), which is a certification program aimed at providing training such as enterprise resource planning (ERP), data science, and cyber security to professionals within the ICT industry.

Some industry players have suggested elevating the status of ICT workers by developing a professional body for ICT workers, such as those for accountants and lawyers. This would help to enhance the attractiveness of the ICT career while ensuring that the qualifications of the workers would be on par with global standards. In response, the government is considering a governance body that would also act as a national registry for ICT workers.



**26,900**  
NEW JOBS CREATED  
BETWEEN 2016 - 2020



OF WORLD'S  
LNG



OF EMPLOYMENT  
2014

Source: Department of Statistics, Malaysia, 2015

## OIL AND GAS (O&G)

### Industry Overview

The Malaysian O&G industry has been a key driver of the economy, growing at a CAGR of 11.7% from 2009 to 2014. The growth of the industry is expected to remain robust at an average of 5% per annum from 2016 to 2020 despite headwinds from declining oil prices. Including downstream activities such as distribution and marketing, the industry contributes about one-fifth to the GDP in 2015. Recent major O&G discoveries and the development of 29 petrochemical plants are expected to attract US\$52.61 billion in investments. The industry employs approximately 2.5% of the workforce in 2014.<sup>2</sup>

While the government-owned Petronas dominates the industry, Malaysia's existing O&G ecosystem and established infrastructure have helped attract new industry players to the country, including the relocation of some multinational oil services companies from Singapore. Most of Malaysia's natural oil and gas are found in Sabah, Sarawak, and Terengganu, but its distribution and refining are carried throughout the Peninsula, including the relatively new economic zone of Iskandar Malaysia.

2. See the Report on Survey of Manufacturing Industries 2015 for the manufacturing sub-sector of Petroleum, Chemicals, Rubber and Plastic Products from the Department of Statistics, Malaysia.



## *Skills Challenges*

The NKEA forecasts 26,900 new jobs to be created from 2016 to 2020 in the O&G industry. Approximately 40% of these jobs are for highly-skilled professionals such as engineers and geologists. As the global O&G industry is facing a shortage of skilled workers, Malaysia would have to do more to retain its skilled talents and to increase the supply of new talents so as to prevent brain drain and to support the growth of its domestic O&G industry.

A study conducted by research firm Ipsos projected a talent shortage of up to 300 to 400 engineers and 1,500 to 1,700 technicians by 2020 in the O&G industry in Sabah, a state in East Malaysia, alone. The same study attributes the skills shortage to the lack of a clear industry development roadmap to identify the direction, strategies, and needed action plans to grow the Sabah O&G industry.

The skills demand and shortages of the O&G industry in Iskandar Malaysia (IM), however, is slightly different from those of Sabah. IM focuses on high value-added activities, namely in oil trading, oil field service equipment (OFSE), and petrochemicals refining. According to a PricewaterhouseCoopers (PwC) study, skills in electrical, instrument, quality and safety, civil and structural engineering are expected to be in shortage, as well as refinery architects, quality and safety personnel with specific industry experience in the midstream segments. A refinery plant in Johor, which is part of IM alone is expected to create a demand for 4,000 skilled workers after its completion in 2016.

The lack of a structured program for workforce planning and training, an absence of co-ordination between industry needs and school curriculum and limited student internship vacancies are seen to have contributed to the industry's skills challenges.

## *Initiatives and Responses*

The O&G industry in Malaysia has implemented a number of initiatives to meet the talent demands, mostly through key industry players such as Malaysian Petroleum Resources Corporation (MPRC), and Petronas, Shell and Selangor Human Resource Development Center (SHRDC). For example, Petronas and its contractors have started programs to train work-ready engineers in exploration and production with specific focus on critical skills such as drilling, petroleum engineering, process and operations, and project management. At the same time, academia has taken the initiative to develop R&D capabilities through partnerships with Petronas and Shell, to develop innovative solutions for the industry.

Despite these initiatives, local companies still lack the technological knowledge and expertise to conduct projects in exploration, development and production in oilfield settings. There is also a lack of engineering and installation skills for the OFSE segment among the local workforce.



## ELECTRONICS AND ELECTRICAL MANUFACTURING (E&E)

### Industry Overview

The export-oriented E&E industry contributes approximately 6.1% to Malaysia's GDP in 2015. Its output grew at a CAGR of 1.7% from 2009 to 2014.<sup>3</sup> The industry comprises four segments: consumer electronics, electronic components, industrial electronics, and electrical components. Within the electronic segment, semiconductor is the key driver, anchored by more than 50 multinational corporations (MNCs). This segment is benefitting from increased global demand in mobile devices, optoelectronics, storage devices, and embedded technology.

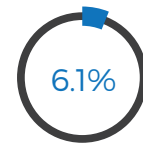
The E&E industry has been identified by both the 11th Malaysia Plan and ETP as a key NKEA with the potential of being a major player in the global E&E value chain. Hence, the government is actively pushing the E&E industry towards higher value-added activities and product manufacturing.

As the largest segment in the manufacturing sector, E&E contributes significantly to the country's employment (3.6% of total employment in 2014).<sup>4</sup> The industry is expected to create 58,000 new jobs between 2016 and 2020.

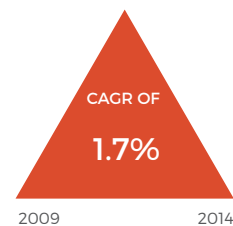
### Skills Challenges

There exists an acute shortage of engineering talent in the E&E sector, especially in product design and development. In addition, the quality of talents available often falls short of employers' expectations. The problem is aggravated by the fast-changing demand for skills, particularly in the semi-conductor segment, because of changing technologies. These problems have hindered the E&E industry's move up the value chain. A recent study commissioned by TalentCorp shows the E&E industry faces a shortage of 4,782 engineers and technicians in 2016 alone. As the industry endeavors to move towards higher value-added activities, the demand for skilled workers, especially skilled technicians and engineers in R&D, is set to increase.

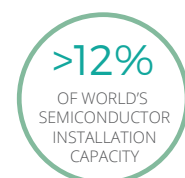
A number of reasons have been put forward to explain the skills challenges in the E&E industry: lack of industry relevant curricula, weak practical training and weak technical education in general. E&E graduates are also found to lack understanding of the changing nature of the industry, especially the changing skills needed to manage the move from labor-intensive manufacturing to technology- and innovation-driven production.



TO GDP  
IN 2015



**58,000**  
NEW JOBS BETWEEN  
2016 - 2020



Source: Department  
of Statistics, Malaysia,  
2015

3. Estimated from Report on the annual survey of manufacturing industries, 2009 and 2014, Department of Statistics Malaysia.

4. Based on the Report on Survey of Manufacturing Industries 2015 for the manufacturing sub-sector of Electrical, Electronics and Optical Products from the Department of Statistics, Malaysia.

## *Initiatives and Responses*

As the lack of relevant practical training is seen to be a key skills challenge in the E&E industry, there is increased emphasis to strengthen the collaboration between industry, academia, and the government. TalentCorp, for example, launched an US\$730,000 industry-academia collaborative initiative in 2015 to accelerate the training for industry-ready graduates. This initiative involves 14 leading employers and nine public universities to address the skills gaps in seven key E&E technology clusters: integrated circuit design, embedded system, wireless communications (radio frequency), wafer fabrication, optoelectronics/light-emitting diodes Opto/LED, solar, and advanced manufacturing.

Collaborative Research in Engineering, Science and Technology (CREST), a non-profit company formed by the industry in 2012 in partnership with the IHLs, helps to train industry-ready professionals for R&D work as well as technopreneurs and domain experts. It is expected to play a key role in boosting the R&D capability in the E&E industry. Of the 15 original members, 11 are leading industry players that collectively employ 5,000 R&D professionals.

## **III.4 Outlook**

Malaysia is trying to accelerate its move towards achieving a high income economy status, sustained by a high value-added knowledge economy by 2020. It recognizes a key hurdle in the journey lies in the lack of a high-skilled workforce with the competence to handle jobs in the 12 new growth areas (NKEAs). [The main skills challenges it faces are those related to the “school-industry gap” – the gap between what the educational and training institutions produce and what the industry needs, both for technical and soft skills.](#)

Difficulty in adjusting school curricula in tandem with industry demands and a lack of practical training opportunities have been cited as among the causes of the school-industry gap. Such experiences are shared across industries including ICT, O&G and E&E manufacturing industries. Weakness in the teaching of STEM subjects, technical and vocational education, as well as soft skills training lies at the roots of many of these deficiencies.

Uneven standards among the IHLs are seen by industry players as another cause of the skills gap in many industries. Many are not known to be aligned with those at other international institutions. This misalignment is especially noted in three areas: STEM education; cognitive skills training; and English proficiency.

Nonetheless, Malaysia is well-positioned to deal with these skills challenges. It has a long tradition of strong educational and training institutions. The liberalization of the education services sector in the 1990s had led to the emergence of many private educational institutions including tertiary institutions that offer a wide

range of educational and training services. This provides a strong base for re-skilling and up-skilling of the workforce. The generally sound fiscal position of the federal government would help the government carry out large-scale human resource development programs, either through public sector agencies or private sector companies.

The government recognizes that its progress towards a knowledge-intensive economy has to be anchored by its people. It has therefore put together a comprehensive and systematic roadmap to develop the country's human capital through higher education and the TVETs. The HCD-SRI reflects a conscious national effort to address the economy's current and future skills needs. Specifically, TVET is now assigned a major role to help transform the workforce.

To improve the efficiency in education provision, steps are being taken to tighten the policy implementation process. For example, the Economic Planning Unit (EPU) has started to coordinate across ministries to help private and public TVET institutions produce industry-ready graduates. TalentCorp is working with the industry to provide COLs to help prioritize skill training in key sectors. The COLs could prove useful in helping other agencies working in these sectors to sharpen their focus as they try to up-skill the workforce, develop the TVET and IHL programs, retain skilled Malaysians, and attract talents from abroad.

Despite these efforts, the realities in the three key growth industries discussed above indicate a number of obstacles still need to be overcome to raise the skills level across the economy. These include weak coordination amongst stakeholders, and inadequate monitoring of the quality and impact of various publicly-funded education and training initiatives. While efforts are beginning to be made to involve the industry in curriculum development and in providing more internships such as those witnessed in the E&E industry, different stakeholders in many industries are still operating in independent spheres with insufficient dialogue regarding skill training needs and measures on developing closer partnerships. In many cases, there is no clear collective view by the industry on the types of skill and the competency levels needed.

Inadequate opportunities for continuous and lifelong learning represent another weakness that hampers the workers' ability to acquire knowledge and skills needed in new knowledge-based industries. It limits the possibility for mid-career up-skilling and second skilling.

More efforts could be made to help the large number of unemployed youths find suitable jobs. At 6.7%, the youth unemployment rate in 2015 remained high although it was lower than those in previous years (over 10%).

Malaysia is beginning to acknowledge the need for more foreign professionals to supplement the skills deficit in the resident workforce, especially in high-skilled industries such as O&G. Currently, skilled professionals only make up a small proportion (5%) of foreign labor in the country. Malaysia is also tapping

into its educated diaspora to meet the needs of key growth industries such as O&G, E&E, ICT, and financial services.

To achieve projected growth in the 12 NKEAs and to realize its vision of attaining a high-income status for the country by 2020, Malaysia needs to take strong and urgent actions to bridge the school-industry gap, so as to elevate the skills profile of its workforce from low- and mid-skilled to high-skilled. These include measures to align tertiary educational institutions to international standards, accelerate investment in STEM education and promote TVET. At the same time, it needs to tighten collaboration amongst the different stakeholders including government, industry, education and training institutes, while providing adequate opportunities for mid-career up-skilling and expanding its program to attract global talents.

## Case 2:

# TalentCorp



**Motivation:** The case represents an example of a government initiative to attract highly skilled workers for key growth industries. It involves the creation of incentives to attract skilled overseas citizens as well as foreign nationals. While the program is initiated by the public sector, it collaborates with private companies in terms of placement and transition of the recruited talent.



**Snapshot:** TalentCorp was established by the government in 2011 to formulate initiatives that would increase the supply of skilled labor required for Malaysia's 12 NKEAs.



**Context:** Malaysia is transitioning from a manufacturing-oriented to a knowledge and innovation-oriented economy, and aspires to be a high-income nation by 2020. The government's economic policy is thus aimed at elevating the skill profile of the Malaysian workforce and to shift towards higher value-added activities.



**Structure and Operation:** The four key thrusts of TalentCorp are optimising Malaysian professionals, enhancing graduate employability, engaging Malaysians abroad, and facilitating foreign talent. Initiatives under these four main thrusts include: Structured Internship Program, Public Service-Management Apprenticeship Program, Up-skilling Programs, Graduate Employability Management Scheme, the flexWorkLife.my platform to facilitate the return of women to the workplace, Talent Procurement tax incentive for employers to invest in employee certification, as well as industry-academia-government partnerships to develop human capital and talent in specific industries.

This case focuses on two talent attraction initiatives implemented by TalentCorp: Returning Expert Program (REP) and Residence Pass-Talent (RP-T). These initiatives are the main talent attraction programs under TalentCorp's stewardship.

## Returning Expert Program

**Overview:** The REP was introduced in 2001 to attract Malaysians abroad to return and contribute skill sets and experiences in various key sectors. The goal of the program is to facilitate the return of Malaysian professionals from abroad through attractive living and financial incentives, as well as to aid companies to apply for the REP program.

**Mechanism:** The incentives include a flat 15% tax rate for five years; exemption from tax for all personal effects brought into Malaysia as well as exemption from paying duty/taxes on a personal vehicle up to a maximum of US\$38,000. The program also provides for foreign spouses and children of returning professionals to become Permanent Residents.

## Residence Pass-Talent

**Overview:** RP-T is aimed at attracting expatriate talent especially for the OGE sector, business services, and manufacturing sectors.

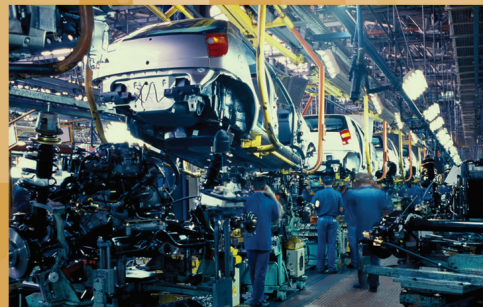
**Mechanism:** Expatriates contribute their expertise in critical sectors and industries through a 10-year renewable pass. The RP-T offers expatriates the flexibility to change employers multiple times during the duration of the pass. The program also provides RP-T dependent passes for spouses and dependents.

**Outcomes:** A 2015 World Bank study found that both the REP and RP-T are generally effective in attracting skilled workers for which there is clear demand. Returning Malaysians commanded a wage premium of 2.3 times that of otherwise comparable Malaysian professionals, while expatriates under the RP-T program earned a wage premium of 4.3 times.

**Outlook:** While TalentCorp has been contributing to narrowing the skills gap among industries that require highly specialized talent, there is still room to increase the program's impact, especially in attracting back the large number of highly educated and highly skilled Malaysians working abroad. Relative to the total pool of Malaysians abroad, the number of REP approvals is modest. As of April 2015, there have been over 3,100 REP and RP-T approvals each since TalentCorp started the program in 2011. In contrast, in 2010, there were 310,845 Malaysians living in OECD countries, of which close to 55% have completed tertiary education or a higher level of study. A potential focus on developing programs aimed at retention of existing talent may prove more economical for Malaysia in the long run.



# CHAPTER FOUR



# SKILLS CHALLENGES IN THAILAND

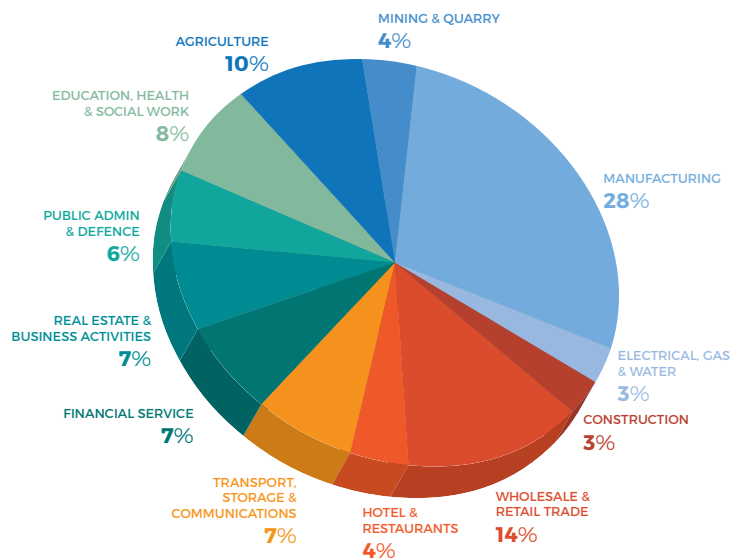


## IV.1 Macroeconomic Overview

The export-driven Thai economy grew at a modest 2.9% per annum between 2011 and 2015. The Economist Intelligence Unit (EIU) predicts its economic growth will continue at between 2.5% and 3% a year for the next five years. An upper middle-income country, Thailand's GDP stood at US\$395.30 billion in 2015 with a per capita GDP of US\$5,816. To realize its ambition of becoming a high-income economy by 2027, Thailand will need to achieve an average annual GDP growth rate of 5% and productivity growth of 3% - 4% per year over the next 10 years.

The economy is dominated by the services sector, which accounted for 62% of GDP in 2014. Within the service sector, tourism alone contributed 8.6% to GDP. The manufacturing sector made up 28% of GDP in 2014 while the remaining 10% came from the agriculture sector (see **Figure 1**). The government's commitment to increase spending on transportation infrastructure together with new investment from China on railway infrastructure should boost the contribution of the construction sector to the economy till 2020.

Figure 1: Share of GDP by Key Sectors, 2014



Source: Office of the National Economic and Social Development Board, Thailand, 2016

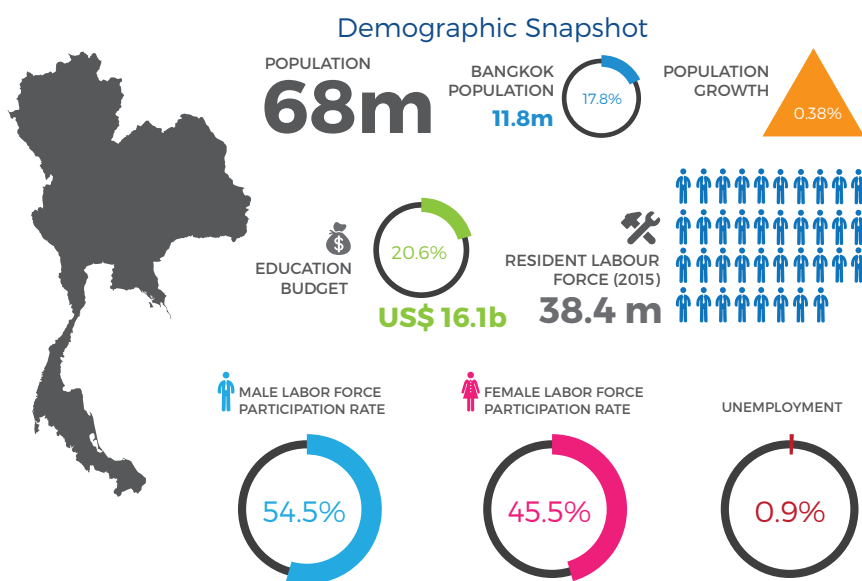
### Key Growth Drivers

The National Economic and Social Development Plan (NESDP) serves as the roadmap for economic development in Thailand in the medium term. The 12th Plan (2017 – 2021) announced in October 2016, aims to transform and upgrade key domestic industries including automotive, agriculture, food manufacturing, tourism and hospitality, and to increase the R&D focus of these industries. The information and communications technology (ICT) and the education sectors

will be instrumental in providing the physical and digital infrastructure as well as the human capital needed to support the transformation. The automotive industry and the tourism industry, two key pillars of the Thai economy, are expected to remain important drivers for the future growth of the economy.

Improving the competitiveness of the 2.7 million SMEs, which contributed 39% to GDP and provided 10 million jobs nationwide in 2014, is recognized as key to sustained economic growth. According to the Thailand Development Research Institute (TDRI), SMEs account for 98% of all business units in Thailand.

## IV.2 Labor Market Overview



Source: National Statistical Office of Thailand, 2015

### Labor Market Conditions

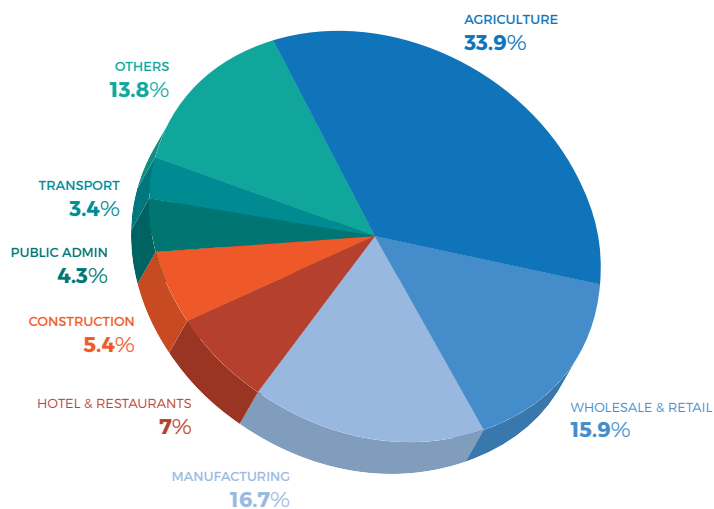
Thailand has one of the lowest unemployment rates in the region, at less than 1% since 2011. However, underemployment is widespread in the agriculture sector (which provides 33.9% of employment of the workforce) and in the informal labor market.

The services sector employs about 44.9% of the workforce in Thailand. Within services, tourism accounts for about 6% of the country's total employment in 2015. The employment contribution rose to about 15% if indirect employment was included. The latter included employment in industries such as hotels and restaurants, wholesale and retail, and transportation. Direct employment in the ICT sector makes up about 0.6% of the workforce. About one-third of these workers are in the telecommunication sector. The motion picture, video and television program production, and audio and music publishing sector makes up the other two-thirds.

Manufacturing accounts for 16.7% of the workforce. Within manufacturing, the automotive industry accounts for about 1.8% of the workforce. This however does not include those employed in related areas such as sales and other non-production areas (See **Figure 2**).

Other major employers include agriculture and construction which takes up 33.9% and 5.4% of the workforce respectively in 2015. The agriculture figure however also includes a substantial number of seasonal and informal/part-time workers.

Figure 2: Employment in Key Industries, 2015



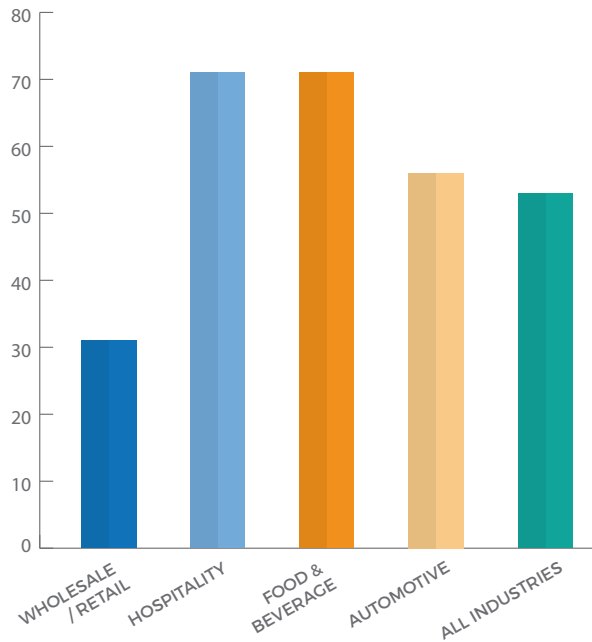
Source: Labour Force Survey, National Statistical Office, Thailand, 2015

Thailand suffers from rapidly ageing population and suffers the most severe ageing problem amongst the ASEAN-5 countries. It is projected that by 2030, those above the age of 65 will make up about 18% of Thailand's population, highlighting the urgency for the country to adopt a more technology-driven and less labor-dependent growth strategy, and to accelerate education and training programs to equip the workforce with the necessary skill sets.

## Skills Challenges

Shortage of skilled workers remains a primary constraint to the growth of businesses in Thailand. A survey by the Siam Commercial Bank Economic Intelligence Center (EIC) found that 53% of companies in Thailand could not find candidates to fill openings because of a lack of technical expertise and mismatched skills. It also found that more than half of the firms surveyed, across all industries, have difficulties finding the workers with the skills they needed (see **Figure 3**). These findings are consistent with those of the interviews we conducted.

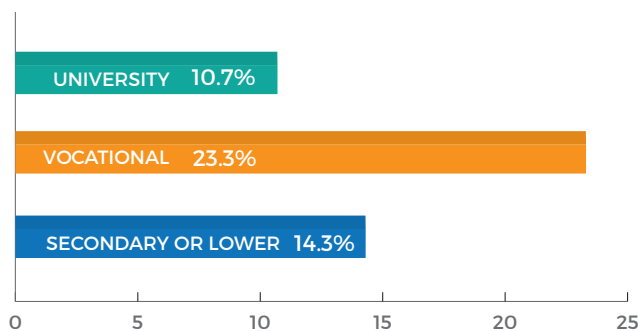
Figure 3: Percentage of 222 firms surveyed unable to fill vacancies within three months between January to March 2014



Source: Siam Commercial Bank, EIC, 2015

The key skills challenge confronting Thailand is the lack of qualified technical and vocational workers across all industries. An International Labour Organization (ILO, 2015) report finds that about 80% of firms in Thailand experience difficulties in filling job vacancies because graduates lack the relevant technical skills. The same EIC report cited above found that vocational workers face the highest hiring gap of 23.3% in 2015. That is, for every 100 vocational workers needed in the economy, only 77 are available for hire (see **Figure 4**).

Figure 4: Hiring Gap of Workers by Education Levels



Source: Siam Commercial Bank, EIC, 2015

This chronic and pervasive shortage is partly a result of a cultural bias towards a more academic education and against vocational training. At the university level, the preference for humanities and social sciences programs over science and technology is seen to produce insufficient graduates with the requisite

technical skills. Except for a handful of universities mostly situated in Bangkok, tertiary institutions are not seen to be producing sufficient graduates with industry-relevant technical skills and soft skills. Some large companies such as the Charoen Pokphand (CP) group have tried to address the problem by setting up their own universities or training institutions (see **Case of Panyapiwat Institute of Management [PIM]**).

### *Recent Skills Development Initiatives*

Human capital development is a key focus of the 12<sup>th</sup> NESDP 2017 - 22, with an emphasis on improving the technical skill profile of the workforce and equipping them for a digital economy. To support human capital development, the government is beginning to provide projections for labor supply and demand in key industries.

At the same time, the government has embarked on new initiatives to place more emphasis on the learning of science and technology. One such initiative is the STEM Masterplan 2015 with the ambitious goal of imparting STEM education to 50% of all high school and vocational school students, equipping half of the skilled workforce with STEM skills and producing 3.3 million workers skilled in STEM by 2019. Working with representatives from the private sector, the government has also set the medium-term target of having 50% of the students in each cohort enrolled in technical education programs with the other 50% pursuing a more academic education.<sup>1</sup>

Recognizing that continual skills upgrading is essential to keeping up with evolving industry demands, the Skills Development Promotion Act encourages the private sector to participate in workforce training with a carrot and stick approach. Private businesses with more than 100 employees are required to provide skills training for at least 50% of their staff once a year. They could receive tax exemption of up to 200% of training costs if they do so. If they fail to provide training, they would have to contribute to a compulsory skills training fund.

To prepare its workers for easier labor mobility in anticipation of the implementation of the AEC free trade agreements, the Thailand Professional Qualification Institute (TPQI) was established in 2012 to develop national competency and qualification standards for various industries. Apart from setting an internationally recognized benchmark for skills, TPQI also seeks to certify workers who have the industry-relevant skills but lack academic qualifications, thereby giving these workers the necessary professional recognition. Occupations in the automotive, tourism, construction, and ICT industries are prioritized to have their occupational standards developed first.

1. Figures obtained from interview with TDRI

## IV.3 Industry Skills Challenges



### AUTOMOTIVE

#### Industry Overview

The automotive industry is a core industry in Thailand, producing 2 million vehicles a year and contributing 12% to the country's GDP in 2014. Thailand exports 50% of the cars it manufactures, making the automotive industry the country's largest exporter. The country is the leading automotive hub in ASEAN. It is also the 9th largest automotive production center in the world.

By 2020, Thailand hopes to raise the local content in the automotive industry to 40%, up from 30% in 2015. It is also targeting to produce up to 5 million vehicles a year by then, through greater automation and increased productivity from the current 3 to 4.5 cars per worker to 8 cars per worker per year.

Many international leading automotive producers have established a presence in Thailand including Toyota Motors, Tata Motors, Suzuki Motors, Volvo, and Mercedes-Benz. Japanese car manufacturers dominate with about 85% share of the market, while other international original equipment manufacturers (OEMs) take up the other 15%. Thailand has also consistently been the biggest receiver of Japanese foreign direct investment (FDI) in the automotive industry within ASEAN.

Over the years, the Thai government, in collaboration with the private sector through entities such as the Federation of Thai Industries (FTI), has formulated various Automotive Industry Master Plans (2002 to 2006, 2007 to 2011, and 2012 to 2016) to provide a roadmap for the growth and development of the industry. Under the latest Master Plan (2012 to 2016), the industry has set a number of goals for itself: to develop the research and technology capacity of the industry, to establish a long-term human resource development plan, and to encourage entrepreneurship especially in green technology and cluster supply chain networks.

To prepare for the anticipated competition from China as well as that arising from the implementation of the AEC initiative, Thailand aims to replace Japan and South Korea as the key destination for high-technology automotive production in the region. It is also striving to be a major eco-car production and R&D hub for the automotive industry in the region.



OF GDP  
2015



EMPLOYS

OF WORKFORCE,  
2015

PRODUCES



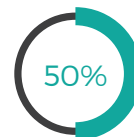
**2M** VEHICLE  
PER YEAR

TARGETS



**5M** VEHICLE PER YEAR  
BY 2020

EXPORTS



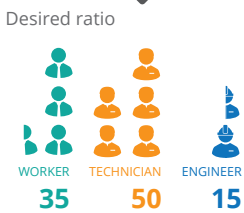
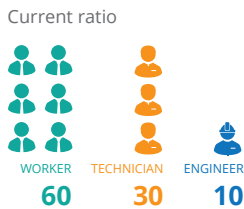
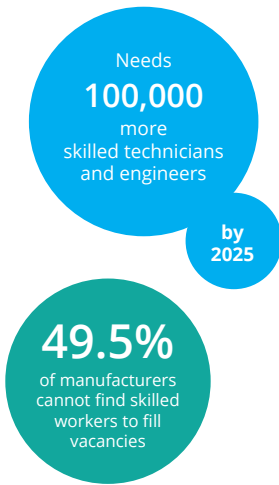
OF CARS  
MANUFACTURED



LARGEST  
AUTOMOTIVE  
PRODUCTION  
CENTER  
IN THE WORLD

Source: National  
Statistical Office,  
Thailand, 2015

## Skills Challenges



Source: Data obtained from interviews with Federation of Thai Industries

The automotive manufacturing sector currently employs between 600,000 to 700,000 workers (or about 1.6 to 1.8% of the workforce). Of these, 120,000 are foreign workers, mainly in low-skilled jobs. With the intended shift towards greater technology- and R&D-based production, the industry plans to change its worker-technician-engineer profile from the current ratio of 60:30:10 to 35:50:15 by 2025. This would require an additional 100,000 skilled technicians and engineers by 2025.<sup>2</sup> The industry will need to convert many lower-skilled workers to skilled technicians.

The main cause of skills shortages in the Thai automotive industry is the mismatch between what the education institutes teach and what the industry needs, with many workers found lacking the know-how to operate sophisticated, high-technology equipment. A 2014 investment climate survey<sup>3</sup> for example, found that 49.5% of automotive manufacturers face challenges in hiring skilled workers to fill their vacancies. Industry players we interviewed attribute the skills gap to the lack of a quality curriculum and qualified trainers with adequate industry experience in the vocational schools. The problem is aggravated by the generally low enrolment in STEM courses at the tertiary educational institutions.

## Initiatives and Responses

The Automotive Human Resource Development Academy (AHRDA), a collaborative project between Thai and Japanese private automakers and the public sector is spearheading training in the automotive industry at the national and regional level. AHRDA works closely with the Thai labor ministry through the Department of Skills Development (DSD), the government-led Thailand Automotive Institute (TAI), TPQI, the Vocational Educational Commission (VEC) and the FTI.

AHRDA plans to train and retrain as many as 300,000 operation-level staff and 1,300 trainers by 2025. Assuming that the industry needs 350,000 to 400,000 technicians in total by 2025 based on the new worker-technician-engineer profile, the Academy would be able to meet a significant part of the target. AHRDA is also working with King Mongkut’s University of Technology in Thonburi to create a new degree program to train more engineers each year.

One challenge to capacity building at the national level lies with the availability of government funding. Currently, the AHRDA receives only about US\$1.8 million from the government annually and a substantial portion is invested in equipment for training purposes.

To meet their own needs, private sector companies especially the bigger Japanese and German manufacturers, have instituted their own apprenticeship programs. A two-year program provided by German companies, for example, allows

2. Interview with Mr. Thavorn Chalassathien, Vice-Chairman of FTI and Director of Human Capacity Building Institute.  
 3. See Job Vacancies, Skill Development and Training in Workplace: Evidence from Thai Manufacturers. Journal of Applied Sciences, 14.

students on full scholarship to spend time between formal classroom lessons and the shop floors. The students are then offered a job at the end of the two-year training stint. Such programs help to bridge the skills gap in the industry, but are often not a feasible option for the smaller Thai auto parts suppliers.



## INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT)

### Industry Overview

The ICT industry in Thailand has grown significantly over the years, with an average annual growth rate of 10 to 15% between 2007 and 2012. According to the World Development Indicators (2015), nearly 35 persons out of every 100 in Thailand are now internet users, a sharp rise compared with 9.3 out of 100 in 2003. ICT expenditure accounts for 7% of the Thai GDP in 2015.

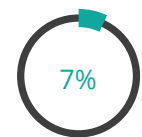
However, the penetration rate for computers and internet in business remains low. In 2014, only 24.9% of businesses in Thailand used computers and 20.5% used the internet. In a study on ICT competency amongst ASEAN countries, Thailand scores consistently below Singapore, Malaysia, and the Philippines.

To help push for wider adoption of ICT, the government approved a 20-year Digital Economy Master Plan in February 2016, with priorities placed on improving rural infrastructure connectivity, promoting internet use for SMEs and a move to e-government. The International Data Cooperation predicts that the Digital Economy Master Plan, if “done right”, will be able to contribute to as much as 30% of Thailand’s gross national product (GNP) by 2020.

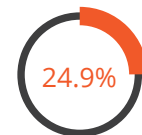
### Skills Challenges

Officials from the Association of Thai ICT industry (ATCI) estimate that as many as 90% of the 20,000 ICT graduates each year are unable to meet the basic qualifications for companies to even begin job-specific training, highlighting a massive problem of under-skilled graduates, and irrelevant and outdated curricula. Companies looking for ICT workers have to train ICT graduates for another half a year before they can meet industry expectations. Many of these students lack basic skills like coding or a strong foundation in core subjects such as advanced mathematics.

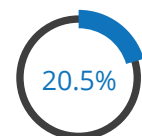
Of the 10% (or 2,000) considered to be qualified, only one out of 10 is deemed highly employable. Many of these “employable” candidates however, often end



CONTRIBUTION TO GDP 2015



BUSINESSES USE COMPUTER IN 2014



BUSINESSES USE INTERNET IN 2014

Source:

Association of Thai ICT Industry, 2016



up starting their own firms. While this contributes to a more vibrant start-up scene, it reduces the supply of workers for established ICT firms.<sup>4</sup>

Similarly, a 2013 survey by IMC Institute found that 76.4% of the employers described the lack of emerging ICT skills as the biggest challenge for the industry. Almost half the respondents cited the lack of knowledge and training facilities as the reason behind the skills gaps.

The industry is estimated to need around 6,000 to 7,000 workers annually, which translates to a skills shortage of 4,000 to 5,000 a year. The number is set to increase with Thailand's move towards a digital nation.

## Initiatives and Responses



Source: Data obtained from interviews with the Association of Thai ICT Industry

The Thai government is working to improve the teaching of STEM subjects in primary schools. Partnering with ATCI, it is also trying to increase the effectiveness of the teaching of ICT skill sets in schools and to revamp vocational education to increase the supply of needed ICT workers.

Industry players have urged vocational schools to work with ICT firms to help ensure the relevance of their diploma programs. They also call for a tightening of the standards of the ICT programs at the universities, to ensure these programs are able to meet industry demand. Currently only a small number of universities in the major cities are seen to be able to meet these standards.

Inconsistency in policy implementation poses a challenge. For example, the ICT Plan 2020 which started in 2011 was halted in 2014 when there was a change of government. The plan is now replaced by the 2016's Digital Economy Plan with a slightly different focus.

Private manpower development initiatives often take the form of in-house or internal training programs conducted by large companies. An example is the internal training program by mobile company Total Access Communication Public Company Limited (DTAC). In 2015 alone, DTAC spent around US\$900,000 to train more than 5,000 employees. SMEs which form the bulk of ICT companies are however, either unable or unwilling to provide training for workers due to the widespread practice of poaching by other firms. This in turn affects the employees' incentives to stay in the SMEs, contributing to the vicious cycle of having high turnover rates and underqualified staff.

Adding to the skills challenge is the lack of co-ordination among the ICT stakeholders. Co-ordination currently exists mainly in harmonizing the competency standards. Even then, there is difficulty in implementing a common framework among the universities. The stakeholders in the ICT industry could consider adopting similar collaborative approach as that used by the automotive industry.

4. From interview with Dr Thanachat Nummomda, President of ATCI.

## TOURISM

### Industry Overview

As a core industry of the Thai economy, tourism contributed 8.6% to the country's GDP in 2014. The contribution rose to a hefty 19.2% when indirect and associated sectors were included. By 2020, the direct and indirect contributions are expected to rise to 8.9% and 25.8% respectively. The industry grew at a CAGR of about 8% from 2009 to 2014. The CAGR for 2014 to 2025 is projected at 6.6%.

A key employer, the industry directly hires about 2 to 2.3 million workers or 5.8% of the workforce in 2014. Of these, 100,000 are unskilled or low-skilled foreign workers. If indirect employment is included, tourism would account for 9.5% of total employment or 3.5 to 3.8 million workers.

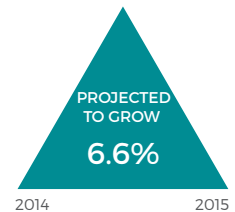
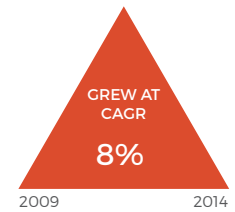
The industry's growth potential remains strong. Thailand was ranked Asia Pacific most popular destination in MasterCard's Asia Pacific Destination Index 2015. It took in approximately 29 million visitors that year, with Bangkok alone welcoming 21.9 million visitors. In comparison, the next popular destination, Singapore, saw only 11.8 million visitors in 2015. Thailand expects the number of visitors to increase by 3 million per year till 2020.

### Skills Challenges

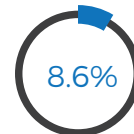
The tourism and hospitality industry requires about 200,000 trained workers every year but only about 20,000 graduates are industry-ready. The problem is set to become more acute as the industry expands into new businesses like medical tourism and beyond the usual tourist destinations to more remote regions with tourism potential.

High attrition rate in the industry exacerbates the problem. Our interview findings show that while close to 10,000 students with potential managerial skills graduate annually with a degree in a tourism-related field, as many as 70% of them exit the industry after three years. Low level of rigor in tourism-related degree programs is seen as one reason for the high industry dropout rate. Many students enrolled in tourism courses as a convenient route to obtain a degree before moving on to jobs in other sectors.<sup>5</sup> The lack of tourism workers fluent in foreign languages, especially English, poses another challenge.

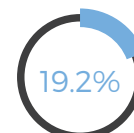
The seasonal nature of the industry has also contributed to the high turnover rates in both the lower-skilled and the managerial jobs. The high turnover rate in turn reduces the employers' incentives to invest in their training. There is also an imbalance of talents between the global hotel brands and the less renowned ones. Students often pick branded companies because of greater opportunities for upward career mobility that they offer. As a result, many lower-tiered hotels



CONTRIBUTE

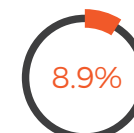


DIRECTLY TO GDP,  
2014

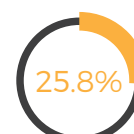


DIRECTLY AND INDIRECTLY  
TO GDP, 2014

PROJECTED TO  
CONTRIBUTE



DIRECTLY TO GDP,  
BY 2020



DIRECTLY AND INDIRECTLY  
TO GDP, BY 2020

Source: World Travel and  
Tourism Council, 2016

5. Interview with Dr Yongyuth Chalamwong, Research Director of Labor Development in TDRI.



Source: Data obtained from interviews with Dusit Thani International

have difficulty either hiring or retaining their managerial staff. Those who do stay are often underqualified.

## Initiatives and Responses

The government has recognized the need for vocational schools to take on a greater role in training. A roadmap is expected to be released by end-2016 to address this issue. This could help reduce the over-reliance on universities which often produce degree holders with few industry-relevant skills.

The Tourism Professional Training Institute, under the purview of the Ministry of Tourism and Sports, is improving the tourism education curriculum to meet the ASEAN Mutual Recognition Arrangement (MRA) standards. It is also encouraging greater collaboration between the public and the private sectors to ensure that the curriculum meets industry expectations. To meet the shortage of tourism workers, the Institute is trying to promote employment and skills development at the local and community levels.

Several leading private sector companies operate their own internal training programs. These range from small in-house programs to large vocational schools, or educational arms of the businesses which are designed alongside their hotel operations, providing practical training opportunities for students while serving as a source of supply of skilled workers. An example is Dusit Thani College which offers hospitality and tourism degree programs. While the college is open to anyone eligible for a college education, Dusit Thani provides scholarships and bursaries for outstanding students, preparing them for management positions in the company once they graduate.

One challenge highlighted in our interviews lies in the lack of support and incentives for businesses to provide training to low-skilled staff, to help raise their productivity. Retaining the existing pool of well-trained workers presents another challenge, as many of these workers find only a limited career path in many tourism companies. As Thailand expands its tourism industry into the less developed parts of the country, it will also have to deal with the reluctance of workers to move away from major cities where many of the vocational schools and universities are situated.

## VI.4 Outlook

Thailand has the ambition of becoming a technology- and knowledge-intensive production base and a high-income country by 2027. [The main obstacle to this journey is the limited supply of technical and vocational workers across all industries.](#)

Currently about 65% of Thai students are enrolled in general academic education programs such as humanities and business studies while 35% study in vocational institutes. Among the latter, a large number of graduates are found to be not industry-ready, suggesting a need to improve the quality and relevance of education, especially in the face of cultural and systemic bias against it. Recent studies pointed to a bigger shortage of industry-ready graduates in vocational schools (23.3%) relative to university graduates (14.3%) and secondary school leavers (10.7%).

To improve the technical skill profile of the workforce and equip them for a digital economy, the Thai government has singled out human capital development as a key focus of the 12th NESDP 2017-2022 and implemented other plans such as the STEM Masterplan 2015. In addition, it is promoting dual vocational training programs to enhance the industry readiness of the graduates. At the same time, the government aims to raise the enrolment in technical education to 50% of each student cohort by 2025 from 35% currently. Efforts by TPQI in certifying workers who have the industry-relevant skills but lack academic qualifications could also boost the supply of labor in skills-based industries such as automotive, tourism, construction, and ICT.

The challenges faced by the three key growth industries discussed above in recruiting skilled workers point to the failure by both the public and the private tertiary education to keep pace with industry demands. The curricula do not reflect the needs of industries wanting to progress to a higher value-added production such as R&D work in the automotive industry; nor do they reflect the fast-changing skills requirements in dynamic industries such as the ICT. Many education and training programs including degree programs in tourism are found to be lacking in rigor and thus not able to prepare graduates for immediate employment. Low proficiency in foreign languages especially English poses a huge challenge for Thailand as it tries to gain global competitiveness in industries such as tourism, health care, and educational services.

The private sector has been supplementing the public sector efforts in skills development. The experiences of both PIM, the Dusit Thani College, and DTAC, show that with a relevant curriculum, instructors with adequate industry experience and reinforced learning methods through industry internships and practicums, students can be prepared for a smooth integration into the workforce. The success of these programs could also help change prejudice against a TVET or science and engineering education.

Importantly, there is now greater public and private sector collaboration to address skills challenges at the industry level. The automotive industry, through the AHRDA, is leading and championing skills development efforts not just at a company level but also across the industry, so that workers in smaller enterprises can also benefit from the training. As the majority of Thai enterprises are SMEs with limited resources for skills development, this industry approach if successfully implemented, could help elevate the workers' skills and alleviate skills shortages across the industry.

As the economy with the fastest ageing population in ASEAN, Thailand needs to move away from labor-intensive to more technology-dependent industries. Its aspiration to become a knowledge-based economy while retaining its traditional forte in services industry such as tourism calls for urgent actions to accomplish the following: Embrace of technical and vocational education by the workforce, strengthening the learning of STEM, improving the relevance of tertiary education to meet industry demands, promoting the acquisition of foreign language especially English, and speeding up private-public sector collaboration in skills development both at the corporate and the industry level.

### Case 3:

# Panyapiwat Institute of Management



**Motivation:** The case represents an example of a private-sector initiative to provide a set of skills needed by the sponsoring enterprise and its partners. It is centered around the idea of a work-based education where studies are divided between classroom learning and on-the-job training (OJT). The initiatives are implemented at the private vocational colleges and university levels.



**Snapshot:** PIM was established in 2007 by CP All Plc., part of the CP Group, and one of Thailand's largest conglomerates. PIM is a corporate university whose goal is to develop a pipeline of workers capable of meeting its own talent needs.



**Context:** The Thai economy is transitioning to a higher value-add manufacturing and service-based economy and is thus facing growing capacity challenges. One of the central stakeholders of the Thai economy is CP Group, a conglomerate of more than 200 companies that collectively employ almost 300,000 people, and generates annual revenue of more than US\$12.30 billion. The group's companies span agri-foods, retail, and telecommunications. Due to the limits of the Thai educational system in meeting the industry's skill needs, CP Group developed its own corporate university to provide the necessary training and education for its businesses.



**Structure and Operation:**

Overview: As a corporate university, PIM offers both vocational training and tertiary programs, developed and updated based on the emerging industry needs of CP Group and its partners.

## Skills Assessment/Training

The university forms relationships with companies, both within and outside of CP Group, to identify skills gaps and develop programs to fill these gaps. For example in January 2015, Sodexo Thailand signed a Memorandum of Understanding with PIM to develop a joint curriculum in the facilities management sector. The Modern Trade Business Management (iMTM) program leverages the expert knowledge of CP All Plc in their investments and operations in shopping malls, hypermarkets, wholesale and retail businesses in Thailand and the engagement with other businesses outside the CP Group of Companies to design its course.

Since 2008, PIM has partnered with private vocational colleges to offer certified training in areas such as mechanical engineering and retail business. The partnership has provided the needed skills for the retail industry, such as product exhibition, quality assurance, computer literacy, and the art of selling.

For the tertiary programs, PIM recruits students through its CP scholarship schemes. Approximately 60% of students are given scholarships with a bond they have to serve post-graduation. These scholarships may cover 50 to 100% of total tuition. A four-year bachelor degree costs around US\$5,600. The core component of the PIM tertiary programs is the “work-based education” (WBE) combining classroom and workplace training to cultivate a wide range of skills including social competencies, life skills, livelihood skills, and higher-order thinking skills. Students divide their time between class time, OJT and part-time work. For example, the iMTM program incorporates WBE as 12% of its credit structure while 35% of curriculum time is allocated for internships with the PIM Corporate Partners. Hence, by the time the iMTM graduates finish the program, they would have gained one year of work experience.

The faculty in PIM has extensive industry experience in large companies, are lecturers from other universities, or professionals involved in consultancy work. Besides the WBE, the curriculum used in PIM incorporates the research efforts within the corporate network, using case studies of Thai companies to make real-world application of theory and knowledge a consistent practice throughout the PIM education experience.

**Scope:** Over the past 10 years, more than 12,000 have graduated from PIM and its associated learning centers and training institutes, as well as the various participating private vocational colleges. In March 2015, CP announced the allocation of US\$1.14 million in scholarships for tuition fees and living allowances.

**Outcome:** Based on data supplied by PIM, the graduate employability outcomes are promising. PIM graduates fare better in terms of employment and employability, earning an average of 25% more than non-PIM graduates, with all graduates securing employment by graduation. Employers have also noted the industry and workplace relevance of the PIM model: 93.4% of surveyed employers reflected that PIM graduates have the knowledge, skills and experience that are relevant and applicable to their jobs. Studies done by PIM even suggest has other positive impact on the graduates. According to surveys conducted by PIM, the parents of PIM graduates have indicated that their graduate children demonstrate a greater degree of responsibility (88% of parent respondents), are more reasonable in their disposition (79.5%), and are more patient and self-assured (78.7%), all of which are key soft skills.

**Outlook:** PIM serves as an important example of how private companies can take the initiative to supplement the existing educational systems and provide necessary skills. Part of the advantage lies in the vantage point that private industry has as well as the pragmatic orientation it is forced to take as a market player. The large connections of PIM's parent company, CP Group, have clearly helped.

One key limitation however, is that the types of training provided is geared toward CP companies and its partners. The bonds required of scholarship recipients may also curtail their employment choices outside the CP Group. On this, it differs from Ayala Education, in the Philippines which aims to provide general skills beyond the needs of its own companies. Because PIM has been around for a decade, it has experimented and developed a fairly structured system of education that appears to be highly successful. The numerous partnerships between PIM and companies outside of CP Group are another indication of the program's efficacy.



# CHAPTER FIVE



# SKILLS CHALLENGES IN INDONESIA

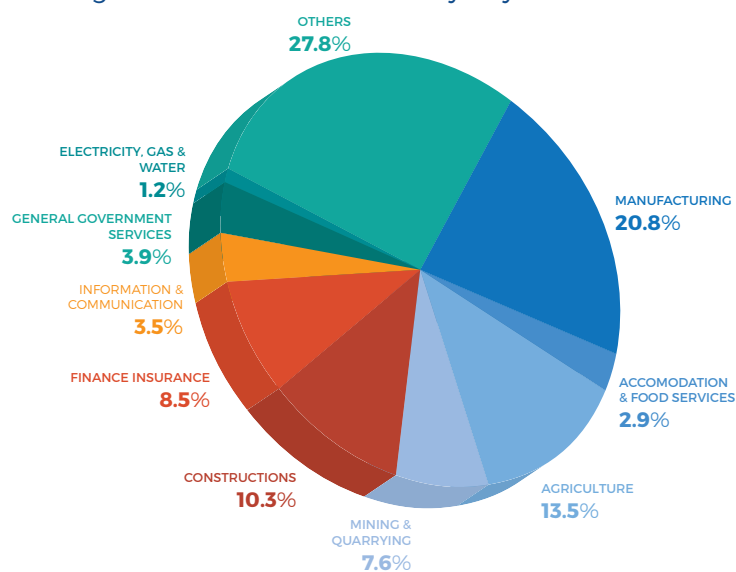
## V.1 Macroeconomic Overview

Indonesia is the world's fifth most populous country with 257 million people spread across more than 17,500 islands and an annual population growth rate of 1.3 to 1.6%.<sup>1</sup> With a GDP of US\$861.90 billion, it is also the largest economy in the ASEAN and the 16th largest in the world after Mexico. With a per capita GDP of US\$3,346.50 in 2015, it is classified as a low-middle income country, alongside other countries in the region such as the Philippines, India, and Vietnam.

Powered by increased domestic consumption through a rapidly growing middle class and public investment in infrastructure, the Indonesian economy grew 5.8% on average over the past five years, exceeding that of most other ASEAN economies. Over the next five years, the economy is expected to continue to thrive at 5.4% a year, making it one of the most dynamic economies in the region. Indonesia wants to become an upper-middle income country by 2020. To achieve this, the government is beginning to open up the economy, with a bid to attract more foreign direct investments (FDI).

Manufacturing is the largest contributor to GDP, followed by agriculture and construction. Within manufacturing, automotive production and sales made up close to 7% of Indonesia's GDP in 2015 while manufacturing of ICT products accounted for 3.5%. Food and beverage (F&B) manufacturing accounted for 27% of the total manufacturing output. The economy is also supported by a fast-growing services sector which grew at a 9% compounded annual growth rate (CAGR) between 2012 and 2015. A large part of the services sector's growth is contributed by the financial and professional services, communications, and trade services. Healthcare is also an area that the Indonesian government is prioritizing for growth (see **Figure 1**).

Figure 1: GDP Contributions by Key Sectors, 2015



Source: Central Bureau of Statistics, Indonesia, 2016

1. See World Bank, 2015.

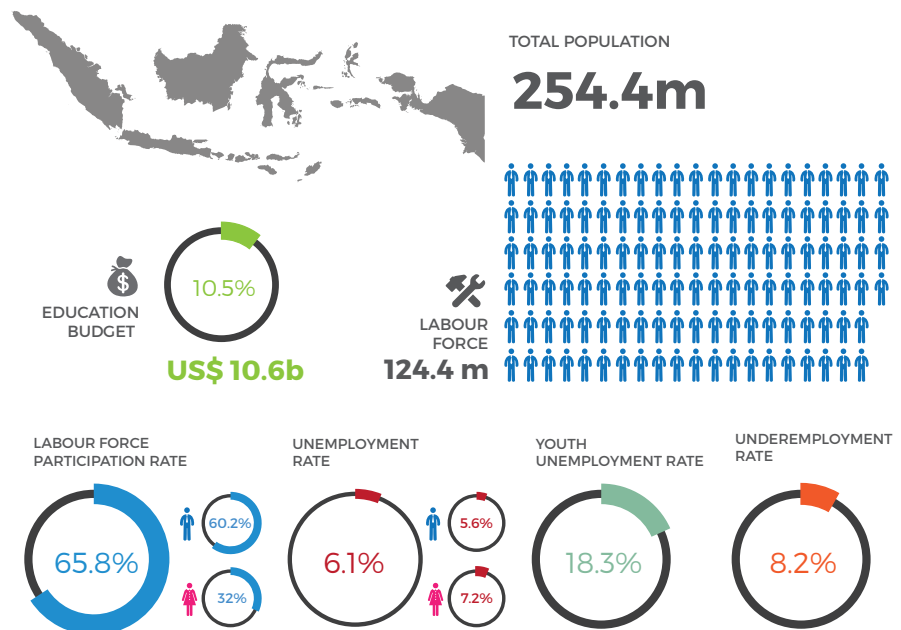
## Key Growth Drivers

Indonesia’s economic development is currently guided by two national plans: the National Long-Term Development Plan 2005 - 2025 (RPJPN) and the Master Plan for Acceleration and Expansion of Indonesia Economic Development 2011 to 2025 (or MP3EI).<sup>2</sup> Both plans aim to shift Indonesia from a labor-intensive, agriculture-based economy to one that is dominated by the services and the manufacturing sectors. A key focus of MP3EI is human capital development.

The government has identified eight sectors as key areas for development: agriculture, mining, energy, manufacturing, marine, tourism, telecommunications, and the development of strategic areas. Infrastructure investment especially in the construction of ports and roads to link the six economic corridors and thousands of islands across the archipelago is a top policy priority.<sup>3</sup> The automotive, the ICT and the tourism sectors are seen as among the key drivers of economic growth in the medium term.

## V.2 Labor Market Overview

### Demographic Snapshot



Source : Central Bureau of Statistics, Indonesia, 2014

2. RPJPRN is an acronym for Rencana Pembangunan Jangka Panjang Nasional, translated as National Long Term Building Plan.  
 3. The six corridors are: Sumatra Economic Corridor as a “Center for Production and Processing of Natural Resources and As Nation’s Energy Reserves”; Java Economic Corridor as a “Driver for National Industry and Service Provision”; Kalimantan Economic Corridor as a “Center for Production and Processing of National Mining and Energy Reserves”; Sulawesi Economic Corridor as a “Center for Production and Processing of National Agricultural, Plantation, Fishery, Oil & Gas, and Mining”; Bali – Nusa Tenggara Economic Corridor as a “Gateway for Tourism and National Food Support”; Papua – Kepulauan Maluku Economic Corridor as a “Center for Development of Food, Fisheries, Energy and National Mining”.

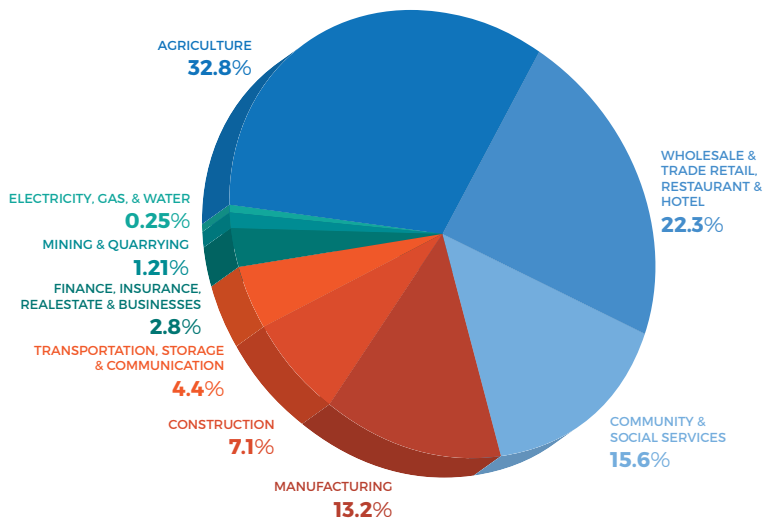
## Labor Market Conditions

Each year, about two million Indonesians enter the workforce. With 43% of its population being under the age of 25, Indonesia has one of the youngest workforces in the region. It is estimated that by 2030, more than 70% of the population or 180 million Indonesians will be of working age, providing Indonesia with a potentially huge demographic dividend (see **Figure 2**).

Women participation in the labor force is however low, at less than 40%. An increase in the labor force participation rate of women from the current rate to 64% by 2030 could potentially add 20 million to the number of skilled workers.

While robust economic growth in recent years has brought down overall unemployment rates, youth unemployment (for the group aged 15 to 24) remains a serious problem. At 18.3%, Indonesia has the highest youth unemployment rate among the ASEAN-5 countries. According to World Bank, about 20% of males and one-third of female in the age group do not have a job or attend school. An Asian Development Bank report (2016) noted that one in three unemployed youth remained unemployed after 12 months. Youth unemployment is particularly high among those with tertiary education. High expectations could have contributed to the high youth unemployment rate, but it also reflected the mismatch between the skills they possess and the skills that the industries want.

Figure 2: Employment by Key Industries, 2015



Source: Central Bureau of Statistics, Indonesia, 2016

Partly as a reaction to the strict manpower laws relating to dismissals, 40% of all jobs created in Indonesia between 2006 and 2015 are short-term contract work (less than 36 months), mainly in the services and the industrial sectors. The short-term tenure disincentivizes companies from investing in skills development.

As the economy restructures from an agrarian to a more industrial base, the demand for skilled and semi-skilled workers is set to rise. Currently, only 16% of graduates studied in fields related to engineering, construction, and manufacturing – the core skills needed as the economy industrializes.

## *Skills Challenges*

Indonesia faces both huge skills shortages and skills mismatches. A McKinsey report (2012) states Indonesia will need 113 million skilled and semi-skilled workers by 2030 in the services and manufacturing sectors compared to 55 million in 2012. An ADB report (2016) estimated that under-qualified workers may reach as high as 52% in high-skilled jobs, especially in the manufacturing sector, while 8% are over-qualified, mainly holding clerical jobs. A more recent 2015 World Economic Forum report also highlighted the acute shortage in managers, projecting that by 2020, Indonesia will have only 56% of middle managers needed.

Dr Mari Pangestu, a former Minister of Trade and Minister of Tourism and Creative Economy, noted that there is a big mismatch between what the education system is training and what the industries require. She cited several key factors contributing to the skills gap in Indonesia such as the lack of relevant equipment and machineries in technical and vocational schools, restrictive labor policy that discourages technology transfer from foreign companies and employment of foreign skilled workers.

The absence of a clear assessment of supply and demand for skilled workers in various industries makes it difficult to respond to the skills challenges. The problem is exacerbated by the lack of proper accreditation of training programs and insufficient avenues for workers to re-skill.

## *Recent Skills Development Initiatives*

Both MP3EI and RPJMN recognize the need for more investment in education and human capital development. Yet, for the past five years (2011 – 2015) Indonesia's education budget has hovered around 10% of fiscal expenditure, the lowest of all the ASEAN-5 countries. This compares with about 20% of fiscal budget that Singapore, Malaysia, and Thailand devote to education. An OECD-ADB report noted that although the tertiary education enrolment has increased from 21% to 32% of each cohort of students (or from four to six million) from 2010 to 2015, this has not translated into a larger supply of skilled workers. The polytechnics which suffer from poor organization and weak industry links, in particular, need greater funding. Currently, polytechnics account for less than 3% of all IHL students. Overall, there is an urgent need to improve the quality of both the teachers and that of instruction, and to foster greater school-industry links at all levels of education.

## V.3 Industry Skills Challenges



### AUTOMOTIVE

#### Industry Overview

Indonesia is the second biggest car manufacturer in ASEAN after Thailand. The Indonesian automotive industry market grew at an average of 10.7% per year between 2005 and 2015 and is expected to grow at 12% per year over the next decade, spurred by increased demand created by a growing middle class. Although the automotive industry’s direct contribution to GDP is only 2%, the contribution of the whole value chain from production to distribution could be as high as 7%.<sup>4</sup>

Table 1: Direct and Indirect Contribution of Automotive Industry to GDP, 2014

Automotive (production)	Land transport (utility costs)	Wholesale, retail, & repair (motor vehicles)	GDP share impact potential total
1.9%	2.4%	2.7%	7%

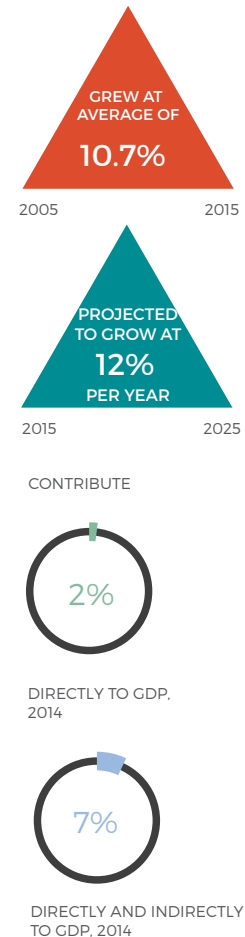
Source : Central Bureau of Statistics, Indonesia, 2015

Indonesia’s automotive industry association GAIKINDO estimates that if the country’s per capita income hits US\$12,000 by 2025 from US\$3,000 in 2014, the car ownership ratio will double from 40 people to 1 car to 20 to 1 car. GAIKINDO is lobbying to raise the production base of multi-purpose vehicles (MPVs) to include sedans, pick-ups and sport utility vehicles (SUVs) to increase exports.

Foreign companies and their joint ventures dominate the automotive industry, led by three main players – Astra International, Indomobil, and Krama Yudha. Together, the three control 85% of the annual production capacity while original equipment manufacturers (OEMs) such as Hyundai, Ford, General Motors, and the Imora Group control the other 15%. In 2012 and 2013, the foreign companies invested an estimated US\$3.30 billion in Indonesia.

The production of cars in Indonesia relies heavily on imported components due to the lack of raw materials available domestically. As part of the move to create a sustainable economy, the government passed a “low cost green car” (LCGC) regulation in May 2013 which requires 80% of LCGC car components to be locally sourced. This has led to an increase in domestic production of automotive parts.

4. Statistics Indonesia, 2015



Source: Statistics Indonesia, 2015

## *Skills Challenges*

Indonesia's automotive industry currently suffers from a shortage of skilled and semi-skilled workers across the entire value chain, including engineers, technicians, metal welders, cutters, mechanics, and components manufacturing factory workers. This shortage is especially pronounced among local manufacturers and the SMEs.

The undeveloped state of skills training systems in Indonesia, an outdated curriculum, and the lack of qualified trainers to provide industry-relevant training are key reasons for the skills gap. Our interviews indicate that there is also a lack of communication between local governments, the educational institutions, and the industry on the skills that the industry needs.

SMEs face particularly acute skills challenges. Officials at the national employer association, APINDO, estimated that most SMEs in the automotive industry operate only at half of the optimal capacity due to a lack of skilled workers.<sup>5</sup> SMEs often see little incentive to train workers as they are more focused on short-term bottom line issues rather than long-term human capital issues. This has hampered their efforts to move up the value chain to be direct suppliers to the OEMs or be key suppliers to these direct suppliers. It has also slowed down the industry's move towards mechanization and automation.

## *Initiatives and Responses*

Currently, much of the skills training in the automotive industry is done in-house, usually provided by the foreign car manufacturers. For example, Toyota Indonesia set up the Toyota Indonesia Academy (TIA) in October 2015 offering diploma courses to graduates of vocational schools and IHLs. Mercedes-Benz too, offers a three-year automotive mechatronic training program enrolling students from high schools and vocational schools. Toyota and Astra Foundation (TAF), also operates a practical training program for automotive components manufacturers.

Various business association officials have proposed that the responsibility for the apprenticeship programs in government-led training facilities be shifted from the local government to a joint-program between the central government and the automotive industry. Doing so is expected to lead to a better fit between the programs and industry-specific requirements. Early successful apprenticeship programs from companies such as Toyota have been cited as a possible training model. More scholarships and bursaries from the automotive companies could help persuade more workers to take up the apprenticeship programs.

The automotive industry is also part of the Indonesia Quality Framework provided by the national professional certification board, BNSP. This framework seeks to provide a training and certification model that is not only harmonized across domestic industries, but also with ASEAN's MRAs for the automotive market.

5. Interview with Bob Azam, Director of Toyota Indonesia and Chief of Human Resource in APINDO.





## INFORMATION AND COMMUNICATIONS TECHNOLOGY (ICT)

### Industry Overview

The ICT sector is a strategic driver for both national and regional economic development in Indonesia. The industry is projected to grow at a CAGR of 17% to reach US\$4.50 billion by 2017 (from US\$2.60 billion in 2014).<sup>6</sup> This is a result of improved infrastructure, fast growing economy, and the increasing number of ICT personnel in the workforce. However, Indonesia ranks only 79th out of 143 countries in the Networked Readiness Index (NRI) of the World Economic Forum in 2015, compared with 1<sup>st</sup> for Singapore and 32<sup>nd</sup> for Malaysia.<sup>7</sup>

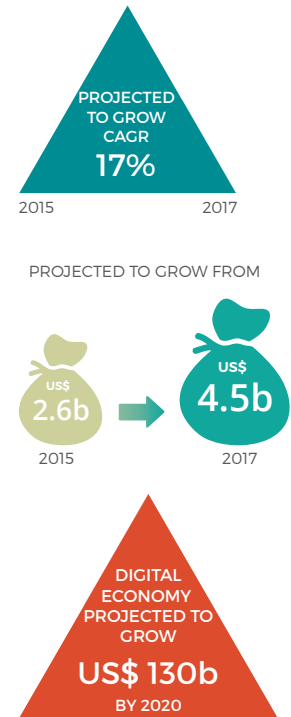
Recognizing internet connectivity as a key to higher productivity, e-government, online education, and for tapping into the global marketplace, the Indonesian government has embarked on the Indonesia Broadband Plan 2014 – 2019 to strengthen national ICT connectivity. At the same time, Indonesia has an ambitious plan to develop its digital economy to reach US\$130 billion by 2020, from an estimated US\$20 billion now, with e-commerce being the backbone of that sector. These changes could lead to increased demand for ICT-related skills such as software and hardware development, information technology (IT) security, and consulting.

Much of the ICT development is centered in the Java region, especially in the three major cities of Jakarta, Bandung, and Medan, which together account for about 50% of Indonesia's population. The government is aiming to reach out to rural areas through better and wider wired broadband service. Programs such as Desa Berding (Ringing Village) and Desa Pinter (Smart Village) were implemented to provide telephone and internet access to villages.

### Skills Challenges

Like the automotive industry, the ICT industry suffers from a severe skills gap problem. While the 200,000 ICT students produced by the universities annually appear to be sufficient in meeting the current industry needs, the graduates' skill sets often fall short of what the industry requires. At the same time, the demand for ICT workers is set to grow exponentially as the industry expands through better infrastructure and connectivity.

Skilled ICT workers are needed not only in the ICT industry but also for other industries such as manufacturing and agri-businesses whose growth are expected to accelerate through wider use of ICT solutions. Indonesia's efforts



Source: BMI Industry Forecast, 2015

6. Interview with Ms Shinta Dhanuwardoyo, founder of Bubu.com, a leading digital media agency in Indonesia's ICT industry.

7. NRI measures the degree to which countries are able to take advantage of ICT-related opportunities.



Projected shortage  
of 9 million skilled  
and semi-skilled  
ICT workers

2015-2030

to develop the IT outsourcing (ITO) business has also increased demand for IT staff, with key ITO suppliers including Accenture, Cipta Caraka, IBM, PT Sigma Unify, PT Visionnet, Samsung SDS, and Tata Consulting Services having large-scale operations. There is also increasing demand for software and apps engineers to provide high-value products and services to consumers. A report by KPMG indicated unless skill training is dramatically improved, Indonesia could face a shortfall of about nine million skilled and semi-skilled ICT workers between now and 2030.

Over-concentration of skilled ICT workers in certain geographical areas presents another skills challenge. The supply of skilled ICT workers is largely concentrated in the Java region even though they are needed in other parts of the country.

## *Initiatives and Responses*

To provide ICT-infrastructure support to start-ups in growth industries such as e-commerce, the government has set up 10 Regional IT Centers of Excellence (RICE) in 10 cities including Jakarta that are managed by representatives from the government, academia, and the business community. Programs conducted by RICE include training, seminars and forums, exhibition, and prototype-building assistance.

At the tertiary level, private universities are taking the lead in training workers for the ICT sector. The certification for ICT workers in Indonesia is done mostly through these universities as well as collaborations from vendor companies such as CISCO Systems. The Ministry of Education and Culture has expanded ICT programs in the school curriculum, although there are concerns about the level and the quality of training conducted. There are also concerns about insufficient integration between ICT and other subjects taught in schools and the lack of adequately trained instructors with effective pedagogy.

## TOURISM

### *Industry Overview*

The government has prioritized tourism as a vital growth sector, with a target to double tourist arrivals from 10 million in 2015 to 20 million by 2019. Indonesia's tourism industry is guided by the Long-Term National Tourism Development Plan (RIPPARNAS) which stresses sustainable development with a goal to create jobs. While Bali remains the number one tourist destination followed by Jakarta, the government has since early 2016 announced its plan to focus on 10 other tourist destinations throughout the archipelago.<sup>8</sup>

8. The 10 new destinations are Lake Toba (North Sumatra), Belitung (Bangka Belitung), Tanjung Lesung (Banten), Seribu Islands (Jakarta), Borobudur Temple (Central Java), Mount Bromo (East Java), Mandalika Lombok (West Nusa Tenggara), Komodo Island (East Nusa Tenggara), Wakatobi National Park (Southeast Sulawesi), and Morotai (North Maluku).

In 2014, the direct contribution of tourism accounted for 3.2% of GDP, while indirect plus direct contribution stood at 9.3% of GDP. The tourism industry is expected to grow at a 4.8% CAGR from 2015 to 2025. Direct employment and indirect employment accounted for 2.9% (3.4 million) and 8.4% (9.8 million) of the workforce respectively in 2014. Both direct and indirect employments are forecasted to grow at the rate of 1.8% to 1.9% between 2015 and 2025.

## Skills Challenges

Achieving the government's goal of 20 million tourists by 2019 through sustainable tourism will require a more skilled labor force to develop tourism products and services that meet international standards and expectations. There will also be new demand for "green" tourism skills. In the 2015 World Travel and Tourism Competitiveness Index that measures the quality of human resources and labor market practices in the tourism industry, Indonesia ranks 53 out of 141 countries, lower than that of all the ASEAN-5 countries except for the Philippines (Singapore, Thailand, Malaysia, and the Philippines rank 3, 29, 30, and 62 respectively).

One of the key challenges in developing tourism outside of the main areas of Bali and Jakarta is language proficiency. Many tourism workers outside these two areas do not speak English or well enough to communicate with tourists.

## Initiatives and Responses

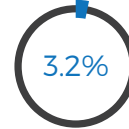
The Ministry of Tourism manages four tourism education institutes – Bandung Tourism Institute, Bali Tourism Institute (BTI), Makassar Tourism Academy, and Medan Tourism Academy – that provide vocational training, undergraduate, and graduate programs. Together they produce about 2,000 graduates each year. These institutes largely meet the local demands for tourism workers (see **Case on BTI**). In addition, there are at least 17 other public and private IHLs providing tourism-related training programs.

However, 75% of IHLs in tourism and hospitality are currently based in Java and Bali, especially Jakarta, Bandung, Yogyakarta, and Denpasar. The development of the 10 newly-designated tourism spots on the other hand, will require the IHLs to produce some skilled tourism workers in these areas as well.

The industry-led Tourism Professionals Certification Boards (there are currently 10 in different regions) work with the Ministry of Tourism and private-schools to standardize the curriculum based on the ASEAN Tourism MRA. Both the industry and the IHLs share responsibility in certifying students at different levels. For example, students at Bandung Tourism Institute are certified at the basic level while the hotel industry provides certification at the higher level. More than 40,000 tourism professionals have been certified since 2010.



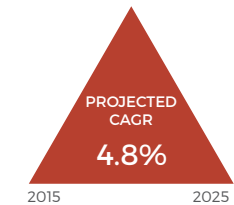
CONTRIBUTED



TO GDP DIRECTLY,  
2014



TO GDP DIRECTLY AND  
INDIRECTLY, 2014



EMPLOYED



OF WOKFORCE  
DIRECTLY



OF WOKFORCE  
DIRECTLY AND INDIRECTLY

Source: World Travel and  
Tourism Council, 2016

## V.4 Outlook

Being an agriculture- and mining-based economy with a large informal labor market filled with unskilled and semi-skilled workers, Indonesia faces a big shortage of skilled workers needed to help accelerate the development of the manufacturing and the services sector. The publicly-funded formal education sector which dominates the education and training landscape has not been able to produce sufficient adequately equipped graduates for the key growth industries, partly because of resource constraints. At 10.5% of the budget, Indonesia had the lowest fiscal spending on education among the ASEAN-5 countries in 2015.

Many workers are not equipped with basic core skills needed in the manufacturing and services industries that the country is targeting. In particular, the technical, science, and engineering profile of the workforce remains weak. Among the ASEAN-5 countries which take part in the international benchmarking exercises, Indonesia has the lowest Program for International Student Assessment (PISA) and Trends in International Mathematics and Science Study (TIMSS) scores, across the various components.<sup>9</sup>

The basic problems faced by the three growth industries discussed (ICT, automotive, and tourism) in meeting their skills challenges are echoed throughout the economy: underdeveloped state of skills training system in the public schools, outdated curriculum, lack of qualified trainers with understanding of the industry, insufficient dialogue and coordination amongst the stakeholders regarding skills needs and training, inadequate accreditation of training programs, and scant avenues for re-skilling.

High youth unemployment, especially youth who are graduates, deprives Indonesia of the use of one of its most important assets in realizing its economic vision: the young and dynamic workforce. The concentration of skilled workers in Java further leads to skills deficiencies in other parts of the country.

While the government has increased its emphasis on education reforms, including integrating more ICT into the curriculum and encouraging more to complete tertiary education, this is often hampered by weak infrastructure as well as insufficient number of suitably qualified teachers. Such weakness affects both general academic education and the TVET education.

Even as it increases the tempo of economic growth, Indonesia has yet to map out a clear manpower development plan to provide some cadence on how it will elevate the skills of its workforce. Currently, two long-term development plans RPJPN 2005 to 2025 and MP3EI 2011 to 2025 spell out the growth and development objectives for the economy, identifying eight sectors to be the key growth drivers. Although MP3EI places strong emphasis on human capital development, there are no systematic demand projections for critical skills, and more importantly, measures to equip the workforce with such skills.

9. The Philippines is excluded as it does not take part in such exercises.

To meet their own shortages, large private sector corporations, including multinational corporations (MNCs) provide in-house and/or offer apprenticeship programs. Experiences in a few key industries such as automotive and tourism have pointed to the effectiveness of such programs. However, the private sector's potential in meeting the skills challenges has not been fully capitalized, partly because of the lack of a targeted government policy to incentivize such training. Restrictive policies against foreign investment and employment of foreign workers including skilled foreign workers have made it more difficult for Indonesia to meet the skills challenges.

Education and skill training need to be accorded a much higher priority in Indonesia's national agenda if the economy were to successfully move up to more technology-intensive and higher value added industries. A large and persistent skills gap in the eight key growth sectors will undermine the country's ambition of graduating into a middle income country in the medium term.

## Case 4:

# Bali Tourism Institute



**Motivation:** The case represents an example of a demand-driven public sector initiative to provide a set of specific skills in a single industry – hospitality and tourism. It involves a four-year training college located in a highly developed tourism area that provides a direct employment pipeline to graduates.



**Snapshot:** Bali Tourism Institute BTI was established in 1978 through a joint project between the Indonesian government, the United Nations Development Project (UNDP), and the International Labor Organization (ILO) to provide tourism degree-level courses.



**Context:** When Indonesia was looking to develop tourism as a key industry in the 1970s, a study by the UNDP identified the Nusa Dua region of Bali as a potential site for tourism. This resulted in the BTI being set up as a training mechanism for the tourism industry on the island. Due to its success, BTI was transformed from a vocational school to a college under the direct administration of the Ministry of Tourism and Creative Economy in 1993. Today, BTI is often cited as an example of a successful state-owned training institute for fledging tourism industries and is currently one of the four state-directed tourism schools.



**Structure and Operation:**

**Overview:** As the main local training provider for over 30 Nusa Dua resorts and hotel chains, BTI develops local manpower into qualified staff for the various tourism-related occupations such as guides, hotelier operation and management staff, as well as F&B and service operators catering to tourists in Nusa Dua.

## Skills Assessment/Training

BTI offers various diploma programs and a four-year degree program covering eight main areas: hotel administration, hospitality accounting, tourism management, meetings, incentives, conferences and events (MICE) services, travel business management, room division management, F&B management, and culinary arts management. Its curriculum gives equal emphasis to both theoretical and practical courses. BTI uses various local and regional tourism standards such as the ASEAN Common Curriculum Standard for Tourism and Hospitality, and the Indonesian Work Standards.

These accreditations ensure that students graduating from BTI are recognized not only in Nusa Dua, Bali, but also in other ASEAN member countries. Students enrolled in the programs often undergo at least one internship stint at BTI partner hotels in Nusa Dua and other areas. Fees in BTI are subsidized by the Indonesian government with the average student paying around US\$450 annually for tuition, learning materials, and insurance. As a certified college in Indonesia, BTI also engages in R&D in tourism and hospitality pedagogies for regional use. To date, BTI has collaborative agreements with 16 foreign and seven local institutes of learning in the tourism and hospitality sector. It also has over 30 associations and industry partners, a majority of which are situated in Bali. BTI regularly holds research forums and publishes research articles for sharing of best practices through data collected from partners.

**Scope:** Since its inception, BTI has successfully trained around 18,500 students not only from Indonesia, but also from countries such as Spain, South Korea, Taiwan, and Timor Leste. It graduates between 400 to 750 students each year.

**Outcome:** Based on data supplied by BTI, an average of 60% of graduates are already either offered a contract or are employed by the time they graduate. Around 70% of the graduates are able to secure a position in Bali's tourism industry, with the other 30% going to other parts of Indonesia or employment in regions such as the Middle East, the US, or Europe, especially in the cruise or hotelier sectors.

**Outlook:** The BTI is a clear example of a successful initiative to develop a country's tourism industry. What began as a modest vocational program has grown to a college that not only satisfies the needs of Bali's tourism industry, but also that of Indonesia as well as other countries. The Institute developed internationally recognized hospitality programs and produced graduates who are able to quickly secure employment. One of the benefits of the BTI has been its age; it has existed for almost 30 years and has grown in scope and sophistication. However, the number of graduates it produces is relatively small, which might suggest some difficulties in scaling the effort. Part of BTI's success is likely due to the very opportune location of Bali and its natural advantage as a tourism destination.

# CHAPTER SIX



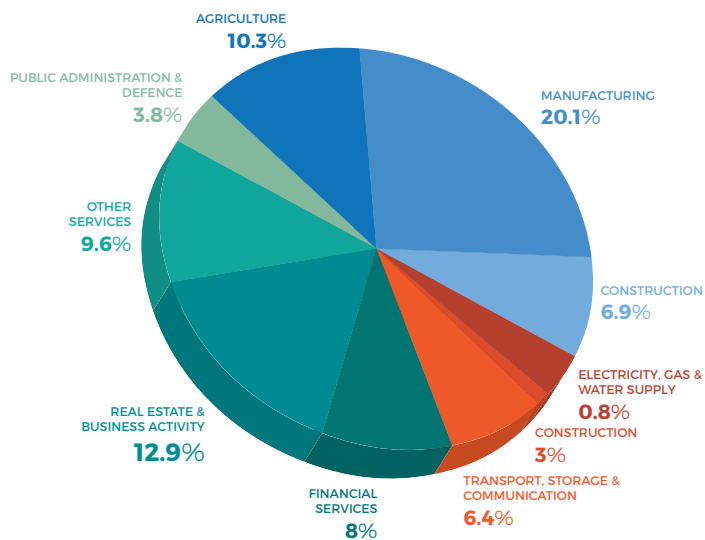
# SKILLS CHALLENGES IN THE PHILIPPINES

## VI.1 Macroeconomic Overview

The Philippines posted healthy gross domestic product (GDP) growth of at least 5% per annum over the last five years, making it one of the fastest growing economies in ASEAN. This growth momentum, partly a result of structural reforms and increased investment in infrastructure, is expected to be sustained in the medium term. The newly-elected government has promised to continue to reduce bureaucracy to improve the ease of doing business, allow for greater competition and relax its foreign direct investment (FDI) rules. The Asian Development Bank (ADB) projects an average growth rate of 6.5% GDP per annum between 2015 and 2020, driven by private consumption and investments, as the country continues to transit from an agrarian to a more services- and industry-led economy. In 2015, the country's GDP stood at US\$292 billion with a per capita GDP of US\$2,899.

The Philippine economy is made up largely of the services sector (58.8% of GDP), followed by industry (30.9%), and agriculture (10.3%). Within the services sector, information technology/business process outsourcing (IT/BPO) and tourism are major contributors. In the industry sector, manufacturing stands out as the key subsector, accounting for about 20% of GDP (or 65.1% of the value added of the whole industry sector) in 2015. The GDP share of the agriculture sector, which faces falling productivity and value added as the majority of the workers tend to be unskilled, has continued to decline over the years (see **Figure 1**).

Figure 1: Contributions to GDP by Key Sectors, 2015



Source: The Central Bank of the Philippines, 2015



## Key Growth Drivers

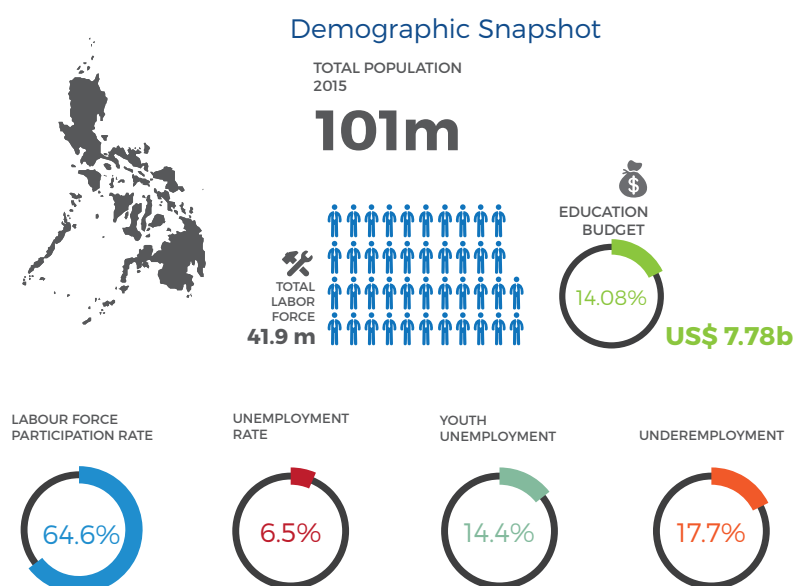
The Philippine government has identified 12 key growth drivers for the economy: agri-business, IT/BPO, health and wellness, hotel, restaurant and tourism, mining, construction, banking and finance, manufacturing, ownership dwelling and real Estate, transport and logistics, wholesale and retail trade, and overseas employment. Looking forward, the creative industries, diversified/strategic farming and fishing, power and utilities, and renewable energy are also recognized as potential contributors to healthy GDP growth.

Among these, the IT/BPO, tourism and electronic industries play major roles. The World Bank estimates that the IT/BPO industry which accounts for 10% of GDP in 2015 and in which the Philippines enjoys a strong global competitive edge, can generate up to 11% of the country’s GDP by 2020. Meanwhile, the tourism sector is projected to grow by 5.6% yearly in the next nine years (2016 – 2025) to account for 4.4% of the GDP by 2025. The total contribution to GDP of travel and tourism to GDP, including both direct and indirect contributions, is forecast to grow by 5.7% a year to reach 11.8% of GDP by 2025 (see **Figure 1**).

In the manufacturing sector, the semiconductor and the electronics industry represent the main growth drivers, accounting for over 45% of value added of the sector. As the manufacturing sector is still largely labor-intensive, it is set to absorb a large number of workers moving from agriculture to industry as the country continues to urbanize.

These three industries (IT/BPO, tourism, and electronics), together with overseas remittances, represent the top four foreign exchange earners for the Philippines. They are expected to lead the economy’s transformation from one that is agriculture-based to a more service- and industry-oriented economy.

## VI.2 Labor Market Overview

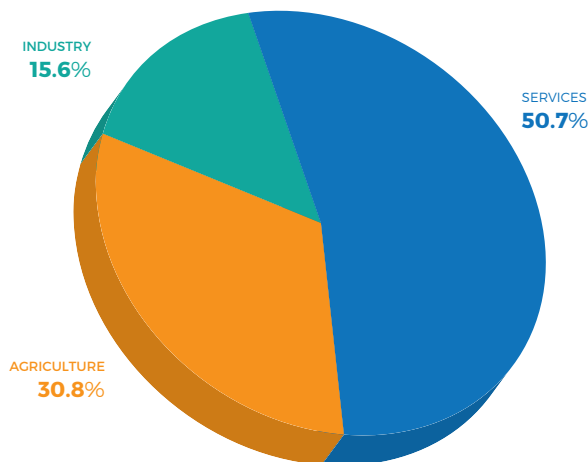


Source: The Philippines Statistical Authority, 2016

## Labor Market Conditions

The services sector accounted for 53.7% of employment in 2015 and about 76% of all jobs created in the last decade. Within services, direct and indirect employment by travel and tourism is expected to rise by 2.6% yearly on average, reaching an estimated 5.6 million jobs in 2025 (or 11.3% of total employment). The IT/BPO industry on the other hand, contributed to 2.9% of national employment in 2015. Agriculture contributed 30.8% to the total national employment while industry made up the rest of the 15.6%. Within the industry sector, manufacturing and construction provided the largest share of jobs (see **Figure 2**).

Figure 2: Contributions to GDP by Key Sectors, 2015



Source : Labor Force Survey, Philippines, 2015

Steady economic growth over the past six years has helped bring the unemployment and the under-employment rates down. By sector, 42.3% of the underemployed worked in the services sector, 40% in the agriculture and 17.8% in the industry sector. The World Bank estimates that about 200,000 (or about 17.4% of the 1.2 million) of those who enter the workforce every year seek employment overseas. Of these, about 19.3% are professionals, managers, executives, and technicians (PMETs).

The Philippines is blessed with a young workforce. Its share of working age population (15 – 64 years) is expected to increase from the current 40% to 65% by 2030, giving the country a strong demographic dividend. However, youth (15 – 24 years) unemployment remains high. In 2015, youth comprise half of the unemployed with close to 36% of the total number of unemployed persons in the country. About 960,000 of the unemployed are college graduates or workers who have attended colleges.

## Skills Challenges

Skills gap is a major issue in the Philippines. In the Asian Development Outlook 2016, it was found that Filipino college graduates took about a year to find work while high school graduates fared even worse, taking up to three years to do so. A main reason for the skills gap is that many of the graduates are not equipped with industry-relevant skills, especially in industries related to science and technology. Both the public and the private schools are seen to be facing challenges in producing graduates who can meet industry demands.

The TVET institutions take in a large number of students each year, but only a small fraction of the graduates are sufficiently equipped to meet industry demands. These institutions often operate with outdated curricula, inadequate training facilities and equipment, and unqualified trainers, making it difficult for them to conduct high-level qualification and training programs.<sup>1</sup> A cultural bias favoring traditional academic studies poses a further hurdle to equipping a larger base of graduates with the technical and vocational skills needed by the economy.

Information imperfection and other inefficiencies in the labor market have contributed to a skills gap both sectorally and geographically. The problem is further compounded by the outflow of skilled and semi-skilled Filipino workers to other countries, including graduates from both the institutes of higher learning (IHLs) and mid-level TVETs. The latest statistics estimated that of the 2.3 million Filipinos who worked abroad in 2014, 11.4% were professionals. The Overseas Filipino Workers (OFWs) in the 25 to 29 age group comprise the single largest group (24.8%), followed by those aged 30 to 34 (23.7%).

## Recent Skills Development Initiatives

The National Technical Education and Skills Development Plan (NTESDP) 2011 to 2016 is part of the government's plan to help develop a skilled Filipino workforce. The plan contains a number of major initiatives including a review of the education and training curriculum, the development of the Philippine Qualifications Framework (PQF), the implementation of a career guidance advocacy program, strengthening the job-placement mechanism like the Phil-JobNet, and better provision of labor market information.<sup>2</sup> The new government has committed to prioritizing investment in human capital development, especially in strengthening the basic education. It is also trying to provide more financial aid for training in skills demanded by the industry, and to promote science, technology, and the creative arts.

To raise the quality of graduates, the government extended compulsory basic education in 2011 from 10 to 12 years. The first batch of Grade 12 students under the new policy would graduate in 2018. The education reforms also

1. Nearly 2 million students were enrolled in technical and vocational courses with graduates numbering 1.6 million in 2012. Information obtained from interviews with TESDA officials.
2. See NTESDP 2011 to 2016. The 3rd cycle NTESDP 2011 to 2016 stresses the pivotal contribution of TVET to the national goals of inclusive growth and poverty reduction in the medium term.

emphasize preparation for higher education, eligibility to enter higher education institutions and employability upon graduation. To advance the relevance of higher education, the government collaborates with industry and educational institutions to revise and update the curricula of the IHLs and training centers, while placing a moratorium on programs that do not meet the required standards.

Following a successful pilot initiative, the Philippine government is rolling out the JobStart program at the national level to help ameliorate the information imperfection in the labor market. The program, aimed at expediting graduates' integration into the workforce, provides a full range of employment services for students who have at least completed high school. Efforts are also made to identify priority courses and to provide scholarships for studies in sectors that are in demand (e.g. IT, agriculture and related fields, STEM, health and environmental science, etc).

## VI.3 Industry Skills Challenges



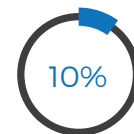
**IT/BPO**

### Industry Overview

The internationally competitive IT/BPO industry is one of the strongest drivers of the Philippine economy today. It accounts for about 10% of the global IT/BPO business, with revenue forecasted to more than double to US\$55 billion by 2020 from US\$25 billion in 2016. The industry is poised to overtake remittances as the top foreign exchange earner by 2018.

The Philippines is the global leader in voice BPO (call centers) and ranks second worldwide in non-voice knowledge process outsourcing (KPO) services. Core processes served by the KPO sector include market research, fraud analytics, equity research and investment banking, insurance and actuarial services, engineering services, project management, legal processes, healthcare information management, and medical transcription services. Information technology outsourcing (ITO) in web and software development, 3D animation, and game development are other areas of growing demand.

While call centers provide the biggest employment, the operations face the risk of being replaced by automation. Currently, 85% of the call center work involves routine tasks. The IT/BPM Roadmap 2016 has highlighted the urgency of moving up to higher value-added services in the non-voice areas. The roadmap also stresses the need to expand the industry's operations beyond the four key cities of Metro Manila, Metro Cebu, Metro Clarke and Bacolod City to tap into the talent pool in the second- and third-tier cities.



10%  
OF GLOBAL  
IT/BPO



REVENUE  
FORECAST  
FOR 2016

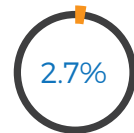
**US\$25b**



REVENUE  
FORECAST  
FOR 2020

**US\$55b**

EMPLOYS



2.7%  
OF WORKFORCE  
IN 2015

**1.3m**

Source: Information  
Technology and Business  
Process Management (IT-  
BPM) and Global In-house  
Center (GIC) Industry Road Map  
2016

Needs at least  
**200,000**  
graduates  
every year

Shortfall of  
**150,000**  
every year

High  
attrition rate  
of up to  
**60-70%**

Source : Data obtained from  
interviews with Ayala Education  
and ITBPAP

## Skills Challenges

Our interviews with industry players indicate the industry needs at least 200,000 graduates each year. However only about 50,000 graduates each year have the right skills sets to be immediately employable. There is therefore a shortfall of about 150,000 every year.<sup>3</sup> This challenge is compounded by the high attrition rate of the IT/BPO industry workers in the industry, with an increasing number of workers leaving the country. According to our interviews with the Information Technology and Business Process Association of the Philippines (ITBPAP), the attrition rate for the BPO business can reach 60% to 70% annually.

Graduates who join the IT/BPO industry are found to be lacking not only in relevant IT skills but also in soft skills and English proficiency. Poor quality of instructor and teaching materials used are some of the factors contributing to the lack of English proficiency of the IT students. The situation is aggravated by the widespread use of “Taglish” (a mixture of Tagalog and English) and the growing importance of local languages in the education system.

Skills gaps are also found in the growing non-voice segments such as KPO of business analytics, insurance services and health information management. The gaps in these segments include numerical competence, verbal and report writing skills, familiarity with different business models and terms, industry-specific knowledge and processes codes and terms. For emerging infrastructure management services, there is a shortage of workers with the necessary IT knowledge and IT software proficiency.

## Initiatives and Responses

The industry, the government and the educational institutions are collaborating through different schemes to help provide an adequate pipeline of talent supply from colleges, high schools, and vocational institutes. One of the schemes launched by the government is the Training for Work Scholarship Program (TWSP) which offers scholarships for industry-approved courses on animation, software development, medical transcription, and voice. This initiative is expected to add 250,000 people to the talent pool over a five-year period. The Commission on Higher Education (CHED) has also approved the 21-unit Service Management Program (SMP) course jointly developed by the IT/BPM industry and academia for college students pursuing business administration and IT studies and who intend to enter the industry.

IBPAP has launched a few initiatives to help address the skills challenges as well. The Global Competitiveness Assessment Tool (GCAT) helps measure the extent of the skill gaps and provides a guide for schools and companies in designing appropriate interventions; while the Advanced English Pre-Employment Training (AdePT) program seeks to improve the English language skills needed to help workers tap into the global market.

3. Interview with Ayala Education and IBPAP.

The industry is also considering ways to engage and leverage on the potential pool of college faculty who might be freed up for two years (2016–2018) due to the transition period to the new K-12 education system. Meaningful engagement through immersion in the industry or commissioning them to conduct relevant research would allow faculty members to have more industry insights in curriculum design and instruction.<sup>4</sup>

Some private organizations such as Ayala Education are taking initiatives to invest in more industry relevant education, incorporating professional development courses into the curricula to prepare students for the workforce. (see **Case on Ayala Education**)



## ELECTRONICS AND ELECTRICAL MANUFACTURING (E&E)

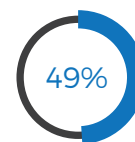
### Industry Overview

The Philippine E&E industry is an important growth driver and part of the country's Investment Priority Plan (IPP) 2014 to 2016. In 2015, the industry accounted for 49% of the total Philippine exports and employed a total of 2.8 million workers (or 6.7% of the labor force). Increased inflow of foreign investment could add to the momentum of growth in the industry. Japanese electronics firms in China, especially in computer hard disk drives and automotive electronic components, are considering relocating to the Philippines.

The industry is divided into two segments: The Semiconductor Manufacturing Service (SMS) and the Electronics Manufacturing Services (EMS). SMS accounts for the bulk of Philippine electronics exports (65% in 2013). However, EMS has been showing stronger performances in recent years, increasing its share of total electronics exports from 27% in 2007 to 35% in 2013.

The Semiconductor and Electronics Industries in the Philippines, Inc. (SEIPI) has released an industry development roadmap known as the Product and Technology Holistic Strategy (PATHS). PATHS identified several areas including integrated circuit (IC) design, consumer and auto electronics as priorities for investment and skills training, as the industry seeks to differentiate itself from its regional competitors. Vietnam and Indonesia for example, have the advantages of cheaper electricity and lower wages, critical in the lower-value assembly and package space in the value chain. Embedded in PATHS is also the goal for the Philippines to progress from low-skilled semiconductor packaging to more advanced production work, including research and development (R&D) in the SMS business.

CONTRIBUTED



OF TOTAL EXPORT,  
2015

EMPLOYS



OF WORKFORCE  
IN 2015

2.8m

Source: World Bank, 2015

4. Interview with Penny Bongato, Executive Director for Talent Development, IBPAP.

## *Skills Challenges*

The chronic shortage of skilled workers, especially highly-skilled engineers and technicians, hinders the industry's move towards automation and its progress up the value chain. The lack of skills in technology and production capacity further hampers the ability of SMEs to meet the demands of the bigger international companies in the country, while the limited pool of managerial and production expertise discourages industry players from expanding their operations.

To spearhead more R&D activities in areas such as IC design as envisaged by PATHS, the industry will need highly-skilled workers possessing the relevant technical and academic qualifications. The availability of highly-skilled talents is also critical to attracting new players in potentially competitive sub-industries such as solar cells and growing capacity in IC design.

In addition, many students are found to be unaware of job opportunities in the industry. A more efficient mechanism is needed to disseminate information of skills demand between the industry and the education institutions.

## *Initiatives and Responses*

Several initiatives have been undertaken by the various stakeholders in the electronics industry to develop talents and skills in the industry. CHED has identified several priority training courses for 2017 and 2018, and offered attractive financial aid and other incentives for students. These courses include mechanical, electronics, electrical, and industrial engineering, and electronics and communication engineering.

SEIPI has also been active in developing human capital for the electronics industry, providing training programs supplemented with financial aid.<sup>5</sup> In addition, it has helped develop training regulations for the electronics industry.

Examples of industry players assisting in training and skills development vary in terms of the depth of engagement. Many of them provide hands-on training. One example is the pilot Training Education and Skills Development Authority (TESDA)-Samsung Consumer Electronics Servicing Training Laboratory established in 2015 to allow trainees to engage with electronic tools, gadgets, appliances, and electronic equipment, so as to acquire the knowledge and skills needed to become a competent electronics technician. Other corporate initiatives use a corporate social responsibility approach to help expand the talent pool, such as the Integrated University Program designed by Hitachi Global Storage Technologies Philippines.

Despite these initiatives, several challenges remain. Our interviews with TESDA indicate that additional investment is needed to build, repair, and equip new and old classrooms, eliminate teacher shortage, raise teachers' salaries, and reduce

5. In this scheme, US\$414, 770 million was utilized in 2014 to train 3,448 aspiring workers and existing employees of SEIPI member-companies.



the teacher/student ratio in electronics training programs across the industry. There is also an urgent need to strengthen the level of study for mathematics and science subjects, not only at colleges but also at lower educational levels.

More industry and academic collaboration and partnerships are beginning to take shape which should help provide a more up-to-date curriculum and better qualified trainers with industry experience. In addition, there is a need to enforce more rigorously competency-based assessment and certification for TESDA-affiliated training centers, to ensure that they deliver quality training.

## TOURISM

### Industry Overview

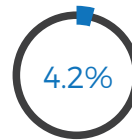
The Philippines government has declared tourism to be “an engine of investment, employment, growth and national development”. The industry’s direct contribution to GDP accounted for 4.2% in 2014, while its total contribution amounted to 11.2%. Tourist arrivals in the Philippines have been rising steadily, with 5.4 million visitors in 2015, representing an almost 11% increase from the previous year. The number of tourists is expected to reach 6 million in 2016, facilitated by better air access, new accommodation facilities, and more promotion and marketing efforts. Korean visitors are the largest group, accounting for more than one-fourth of the total arrivals in 2015. Other countries with sizeable visitors to the Philippines include Japan, China, US, Taiwan, Singapore and India.

With over 7,000 islands and a rich diversified ecosystem, there is huge potential for the Philippines to expand the ecotourism market. Foreign ecotourism receipts is projected to increase from US\$81.20 million in 2013 to US\$1.40 billion in 2016, while earnings from domestic eco-tourists are expected to rise from US\$200 million to US\$2.18 billion during the same period.<sup>6</sup>

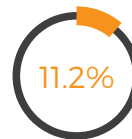
### Skills Challenges

While there are more than 600 IHLs offering tourism and hospitality programs in the country, our interviews with the Philippine Travel Agencies Association, the Asian Institute of Tourism and PICTourism (Philippines Improving Competitiveness in Tourism) suggest that there exist significant skills challenges in the industry. The gap is largely qualitative and due mainly to the inadequate training that the IHLs provide. This is in turn attributed to, among other factors, a shortage of good instructors with industry experience, curriculum that is not up-to-date or industry relevant, a lack of opportunities for meaningful on-the-job training (OJT) as well as inadequate funding for training facilities.

CONTRIBUTED



DIRECTLY TO GDP  
IN 2014



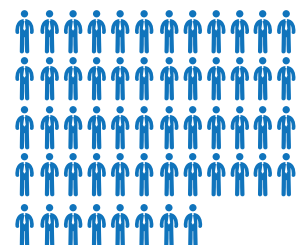
IN TOTAL TO GDP  
IN 2014

VISITORS



5.4m IN 2015

DIRECT EMPLOYMENT  
FORECAST



TO REACH  
5.6m IN 2025

OR



OF TOTAL  
EMPLOYMENT

Source : World Travel and  
Tourism Council, 2016

6. See National Ecotourism Strategy and Action Plan 2013 to 2022.



Even though Asian tourists make up more than 50% of visitors, there is a lack of tourism professionals fluent in Asian languages such as Korean, Mandarin, Bahasa Indonesia and Indian languages, hampering the industry's growth. For example, the shortage of Korean-speaking guides results in Korean travel and tourism vendors having to bring in their own guides and services, limiting the trickle-down effect to the domestic industry. Poor English language proficiency of graduates adds to the skills challenge.

Many young Filipinos enter this industry on a temporary basis, without the intention of investing their time to develop and elevate their professional skills. This limits the pool of mid-level tourism and hospitality skilled workers. Furthermore, industry players have few incentives to invest in pre-employment training because of the frustration they face in talent retention. Although growing, the number of tourism apprenticeships still falls short of demand.

The highly compartmentalized job scope in the industry prevents workers from acquiring a second skill within the industry, limiting the potential for productivity gains. Critically, the outflow of tourism professionals, especially those with a good command of English, has been on the rise, which exacerbates the skills challenge for the tourism industry.

## *Initiatives and Responses*

Funding agencies have stepped in to provide training grants in recent years. The Asian Development Bank and the Canadian International Development Agency (ADB-CIDA) Technical Assistance on Skills Development launched in 2013 provides a US\$7.10 million technical assistance for human capital development, with a focus on strengthening the linkages between the industry and the academic and training institutions.

One key initiative under this grant is PICTourism, a project that has so far trained 5,000 tourism workers. Of these, 40% are assessed and certified by TESDA, and meet ASEAN competency standards. PICTourism also gives star ratings, accreditations and establishes standards in training. Under TESDA, apprentices receive training allowance amounting to 75% of the minimum wage plus other benefits.

There are also private sector-university partnerships to spearhead quality and industry-relevant skills development. An example is the partnership between Enderun College in Manila and Les Roches International School of Hotel Management in Switzerland where students from Enderun College are enrolled in an internationally-recognized curriculum. Enderun has been recognized by CHED as a Center of Excellence for promoting tourism and hospitality-related education. The success of these partnerships, however, often depends on the capacity of the partners to sustain a beneficial outcome.

Local universities are being engaged to help develop the capacity of local government units (LGUs). Under the Tourism Act of 2009, LGUs are charged with the responsibility of establishing sustainable tourism and ecotourism programs for the foreign and domestic markets. One such example is that between Bicol and Partido State University in the Bicol Region in Central Philippines to develop curriculum that can respond to the changing industry trends and demands. With the increasing importance of ecotourism and agritourism, industry players propose that more resources be allocated to enhance the capacity of the LGUs in these areas, through partnership with universities and through closer linkages between the LGUs and other institutions in more established cities.

## VI.4 Outlook

As the Philippines continues the momentum to move from an agrarian to a more services- and industry-based economy, it faces a huge gap between what the educational institutions are producing and what the industry is demanding. Each year, the country produces more than 500,000 university graduates, but only about 50,000 of them possess employable skills. Many graduates face long periods in finding a job because they are not considered job-ready. The TVET institutions take in a large number of students each year but the level of training is often considered too low for many of the graduates to be employed. Despite steady economic growth, youth (15 – 24 years) unemployment remains high at 14.4% in 2015.

The Philippines faces a daunting task in addressing the skills challenges. Experience in the key growth industries suggests that the causes of the skills challenges are multifaceted including the following: outdated curriculum, weakness in STEM education and lack of soft skills training (including proficiency in English), insufficient collaboration between the educational institutions and the industry, inadequate instructional facilities, poor quality of instructors who often do not possess the necessary knowledge or industry experience to impart industry-relevant skills to the students, lack of industry exposure for students, and the absence of a rigorous skill competency certification program.

The Philippine government has taken progressive measures in recent years to address the school-industry gap. Among the changes made in recent years under the NTESDP 2011 - 2016 initiatives were a wide-ranging review of the education and training curriculum and the development of the PQF in 2012. The PQF seeks to provide common standards for skills qualification. The extension of compulsory basic education from 10 to 12 years helps strengthen the students' core academic skills and other capacities which in turn helps prepare them better for higher education and employment upon graduation.

The government has also collaborated with industry and education institutions to revise and update the curricula of IHLs and training centers while placing moratoriums on those that do not meet the required standards. The new administration's emphasis on improving science and technology education while also prioritizing creative arts, if successful, should give a lift to both the manufacturing and the services sectors.

Despite these measures, resource constraints in the government and inadequate capacity of education and training institutions, both in the public and private sector, continue to put a severe limit on the supply of skilled workers across all industries, including key growth drivers such as IT/BPO, electronics, and tourism industries. At 14% of the budget (or US\$7.78 billion) in 2015, the Philippines has the second lowest fiscal spending on education among the ASEAN-5 countries.

There is also geographical imbalance in skill training and employment creation. Most of the jobs created in recent years have been Metro Manila-centric. The IT/BPO industry's plan to venture beyond the major cities such as Metro Manila, Cebu, and Clark could therefore help not only to broaden the talent pool but also stimulate employment in the rural areas and the secondary urban population centers. Given the "enabling" role that the ICT industry can play for other industries, extending the IT/BPO activities beyond the key cities could also help contribute to employment creation in other industries in these regions. Both the E&E and tourism sectors have the potential to grow geographically too, thereby promoting more sustainable and inclusive growth. Opportunities for skill training need to be extended outside Manila to cater to the skills needs of regional development.

Information imperfection and other inefficiencies in the labor market, made worse by the vast geographical spread of the country, have also contributed to the skills gap in the Philippines. The launch of the national JobStart program providing employment services for students who have at least a high school certificate and the implementation of a job-placement mechanism like Phil-JobNet mark a good start in addressing such geographical skills mismatch. With better internet connectivity, up-to-date information on jobs should be more easily available and accessible.

Over the past few years, the government has recognized that a rigorous certification of competency standards is crucial in maintaining the relevance of the skills that workers acquire and ensuring that they remain internationally competitive. TESDA's work in this respect has advanced skills upgrading in industries such as ICT, E&E, and tourism. However, resource constraints continue to present challenges for TESDA in expanding its work more effectively into the provincial and rural areas.

Large corporations have played supplementary and in some cases, leading roles, in meeting skills challenges. Some companies such as Ayala and Japanese automotive manufacturers have already set up training programs or

industry-specific institutions to this end. While the results of the private sector's involvement have been uneven, they have generally contribute to the supply of skills needed in the industry.

Retaining trained and skilled workers within the Philippines represents another major skills challenge. An estimated 2.4 million Filipinos are working overseas. Of these Overseas Contract Workers (OCWs), about 11% are PMETs, including those from key growth sectors in the economy such as ICT and tourism. However, there appears to be little that the government could do to stop the outflow of skilled workers in the short run given the lack of employment opportunities in the Philippines and the country's heavy dependence on the repatriation of income which accounts for about 10% of GDP in 2015.

With its young and growing workforce, the Philippines has the potential to reap a rich demographic dividend and move up the developmental ladder rapidly. However, our study of the three growth industries shows that this opportunity is contingent upon the country's ability to effectively respond to the many serious skills challenges it faces. Strong and determined efforts are urgently needed to overcome structural weakness in the education system, budget constraints, government-private sector partnership, cross-border labor flows and labor market inefficiency. The new government, with its strong political mandate, has the opportunity to rise to these skills challenges and put the country on an accelerated growth path.

## Case 5:

# Ayala Education



**Motivation:** The case represents an example of a private sector initiative to establish for-profit institutions that offer a set of skills in demand across various industries in the services sector. It involves the building of private schools and developing a curriculum designed in consultation with the industry. The initiatives are aimed at students at the 7th to 12th grade and university levels.



**Snapshot:** Ayala Education, established in 2012, is the education business arm of the Ayala Corporation, one of the oldest and largest Philippine conglomerates, with investments spanning real estate, financial services, telecommunications, utilities, business process outsourcing, and electronics manufacturing. Ayala ventured into the education sector as it saw the opportunity to bridge the gap between demand for skills in the fast-growing services sector and graduate employability. Ayala Education has developed three main initiatives: APEC (Affordable Private Education Center), LINC (Learning With Industry Collaboration), and PEP (Professional Employment Program).



**Context:** With a population of about 100 million in 2015, the Philippines faces enormous challenges in realizing its human capital potential. Out of the 3 million children who start school, only 1.6 million remain by Grade 10. 50% of those who do graduate from high school do not go on to college. And of those who do, only about two out of three students graduate. Moreover, out of the 500,000 who do graduate each year, only 50,000 students have employable skills. The remaining 490,000 college graduates do not possess relevant or employable skills. This creates a large skills gap in the Philippine labor market, particularly in the services sector which accounts for more than 3 out of 4 jobs created in the last decade. In particular, employers face a shortage of workers competent in business English, industry-relevant skills, as well as the soft skills needed for the service sector.

This case examines the PEP program, which focuses on developing work and industry-ready university graduates.

## Professional Employment Program (PEP)

**Overview:** PEP is currently offered in partnership with Emilio Aguinaldo College, University of Iloilo, and Jose Rizal University to students in the second semester of their senior year, with the goal of boosting their employability through equipping them with the necessary skills sets to enter the workforce.

**Skills Assessment/Training:** PEP aims to foster critical skill sets through English immersion and the use of technology embedment in the program. Skills such as strong functional, business and conversational English skills, computer and workplace technology competencies, broad service, sales, support skills, and soft skills such as reliability and persistence are prioritized in PEP. Values such as professionalism, teamwork and work ethic are also emphasized in PEP. To nurture these skills, Ayala Education invested in job simulators by having students tackle real world simulations such as processing bank loans and leading workers.

**Scope:** This program involves 250 contact hours, replacing the traditional OJT model. Summer PEP is also offered at a lower cost, and PEP is made available for mid-career retraining and up-skilling. While the current PEP modules are applicable to business administration and IT students, Ayala Education and their university partners intend to extend tailored PEP initiatives across different majors such as in tourism and engineering.

**Costs and Funding:** Since 2012, PEP has trained 400 graduates at three partner universities. As the time of writing, it is being offered at a subsidized cost of US\$200 per semester.

**Outcome:** The graduates from its program are in demand and command higher salaries on the job market. According to data gathered by Ayala Education, the average starting salaries of graduates range between US\$298 to US\$320 per month, as compared to the average starting salaries of Metro Manila college graduates of US\$278 to US\$298. In a graduate employability survey conducted 90 days after graduation, students who have undergone PEP have a hire rate of 95.1%, compared to 63.4% for non-PEP graduates in the partner Universities. Furthermore, 15.6% of PEP graduates achieve Level four jobs (supervisor or specialist-level employment).

**Outlook:** Ayala Education appears to be successful in contributing to bridging the skills gap in the services sector. As part of a conglomerate, it comes with the knowledge of industry needs and thus is able to tailor its curriculum and train students in skills that are most relevant to employers. In addition the hard-nosed emphasis on employability allows Ayala Education to monitor its program's performance and make changes as needed. This kind of flexibility may not be available to public educational institutions or programs. Despite the aim of the program to be a for-profit venture, it places a premium on keeping tuition affordable and currently subsidizes certain parts of the program. While the goals of Ayala Education are ambitious, it is still relatively small and new, being established only in 2012. It is not yet clear whether the program can be scaled up while maintaining its value and relatively low cost.

# CHAPTER SEVEN



## RESPONDING TO SKILLS CHALLENGES IN ASEAN-5

To raise their income levels and elevate their economies to the next stage of development, each of the ASEAN-5 countries has articulated a medium-term strategy for inclusive and sustainable growth. However, these strategies could only be successfully implemented if the five countries can overcome a number of interlocking skills challenges. Each of the ASEAN countries needs to shape the human capital it has into a skilled workforce capable of supporting the economic transformation it envisages. In particular, ASEAN-5 needs to ensure that their workforce possesses skills that are relevant to the industries that have been identified as future growth drivers of the economies.

The skills challenges the five countries encounter diverge significantly given the vastly distinct stages of development they are at, the different policy objectives they are pursuing and the varied institutional capacities they possess. For Indonesia and the Philippines, classified as lower middle-income economies, raising the quality of the basic education provided by the public sector and ensuring that school-leavers are equipped with sufficient competency in core academic skills including science, technology, engineering, and mathematics (STEM) skills remain a major challenge. The primary task facing Thailand and Malaysia, two upper middle-income economies aspiring to graduate to the rank of high-income economies, lies in increasing the number of technical, vocational, as well as science and engineering graduates to support a knowledge-based economy. In Singapore, a high-income economy, the key challenge arises from the need to revise the school curriculum fast enough so that the workers are able to ride the waves of the latest technology and stay ahead of the innovation curve.

Despite these differences, there are also common threads that weave through all five countries. Part of the commonality arises from the same constraint of limited institutional capacity that they are burdened with. All five of them, for example, suffer from a certain “industry-school” gap – the inability of the education institutions to supply the types of skilled workers that the industry needs. Another intertwining thread comes from the common skill sets that all five countries are looking for as they pursue similar growth industries. Indeed, the main economic sectors the five countries have targeted and the kind of skilled workers they need are not vastly different. The information and communications technology (ICT) sector for example, is considered a key growth driver for all five economies. Automotive, electronics, and tourism, too, are deemed priority sectors in several countries.

The five countries have responded to their skills challenges in different ways, with varying degrees of success. An examination of the cross-country experiences helps shed light on the effectiveness of these different approaches and how they might be relevant for other countries. It also points to the possibility of region-wide cooperation to help address some common concerns among the five countries.



## **Challenges in ASEAN-5**

This section highlights a number of common skills challenges that confront all the ASEAN-5 countries and provide recommendations on how they could respond to these challenges going forward. The existence of these common challenges, despite the vast diversity in the characteristics of the economic structure, the profile of the workforce, and the approach each country takes in responding to the challenges, points to the possibility for sharing of experiences and policy coordination.

### Challenge 1:

## Inability of the Educational Institutions to Meet Industry Demands

**Foremost amongst the skills challenges that ASEAN-5 countries face is the perceived failure of the educational and training institutions to provide graduates who can meet industry demands.** This “school-industry gap” is arguably the most serious hurdle that the five countries face in developing an effective workforce to support their growth strategies. The problem manifested at different levels, from high schools to vocational institutes, through to universities. The inadequacy of instruction provided at the tertiary level is particularly glaring in some countries. The deficiency affects the five countries in varying degrees of severity. However the impact is felt across industries.

A number of factors contribute to the school-industry gap. A weak and dated curriculum is often seen as a main cause. This is in turn a result of inadequate consultation and collaboration between the educational institutions, policy makers, and the industry, limiting the practical relevance of the curriculum. Other factors contributing to the gap include poor quality of instructors who often do not have sufficient industry experience; lack of industry exposure for students such as limited arrangements for internship, on-site practical training, etc. The absence of both a rigorous certification program and an effective mechanism to monitor the success of the certification add to the challenges.

In Indonesia and the Philippines, managing the school-industry gap presents a daunting challenge as most of the factors mentioned above play a role in contributing to the gap. In Thailand and Malaysia, inadequate consultation between the industry and the schools is a main cause of the industry-school gap. The failure of the school curriculum to reflect the importance of STEM and TVET education in particular could limit their ability to become a more technology- and knowledge-intensive production base. While the industry-school disconnect is less of a problem in Singapore, education institutions in the city state often find it challenging to keep pace with the fast-changing skills demands in light of the frequent shifts in the focus of the industrial policy.

## Challenge 2:

### **Lack of a Comprehensive Skills Development Roadmap to Support Economic Growth**

While most ASEAN-5 countries are guided by a detailed medium- and long-term economic development plan, with the key growth industries clearly identified,<sup>1</sup> these plans are often not backed up by an equally robust and comprehensive skills development strategy. Such a strategy takes on different shades of comprehensiveness in individual countries. But many of them lack details about the specific role for each stakeholder or how these stakeholders could collaborate effectively. In some countries, the absence of a credible projection of demand for the critical skills needed in key industries makes it difficult to plan for skills training.

In Singapore, manpower planning has always been part of the government's industrial policy planning. But it was only in the past two years that the government started to provide a detailed sectoral manpower plan (SMP) for each key growth sector. Among other information, the SMP is expected to project the demand for the various types of skills in the medium term, the likely supply, and how the various stakeholders could work together to minimize potential skills gaps. In Malaysia, TalentCorp, a government agency, has developed a Critical Occupation List (COL) for key industries, although not all the relevant National Key Economic Areas (NKEAs) are covered yet. Thailand, too, is making supply and demand projections for skilled workers in key industries, especially those in the technical fields, under the 12<sup>th</sup> National Economic and Social Development Planning 2017 - 2022.

Related to the absence of a clear roadmap and partly as a result of it is the lack of coordination among government agencies, often with different ministries setting varied skill competency standards within the same industry, further complicating the task of managing skills challenges. In Malaysia, for example, there are seven ministries overseeing 1,000 TVET institutes which produce, in the view of industry players, far too many programs with unnecessary duplication and uneven results. In Indonesia, certification for skill competency within the same industry is often issued by different training institutions, from both the public and the private sector, making it difficult for companies to assess the employability of the graduates.

1. See for examples, the 2014 Economic Transformation Programme (ETP) in Malaysia; the National Long-Term Development Plan (RPJPN) 2005 to 2025 and the Master Plan for Acceleration and Expansion of Indonesia Economic Development 2011 to 2025 (or MP3EI) in Indonesia; the various economic plans in the Philippines, The Thailand National Economic and Social Development Plan in Thailand; and the recommendations of various economic review committees in Singapore.

**Challenge 3:****Over-reliance on the Public Sector to Meet the Skills Challenges**

Much of the burden of meeting the skills challenges in ASEAN-5 countries falls on the shoulder of the public sector. Yet, with the possible exception of Singapore and Malaysia, the public sectors in the other ASEAN-5 countries face severe limitations in meeting these challenges. In Indonesia and the Philippines, the lack of fiscal resources marks a major constraint. Despite having invested more resources in education in recent years, public education in these two countries is still not receiving as much attention as the other ASEAN-5 countries (see **Table 1**). The efficiency with which education and training policies are implemented also varies significantly across the five countries.

Table 1: Education Budget, 2015

Country	Amount in US\$	Percentage of Total Budget
Thailand	16.10 billion	20.6%
Philippines	7.78 billion	14.1%
Singapore	8.89 billion	17.7%
Malaysia	13.71 billion	20.5%
Indonesia	10.50 billion	10.5%

Source: Budget of ASEAN-5 Countries

Meanwhile, the potential of the private sector in meeting the skills challenges has not been fully capitalized. This is especially apparent in Thailand, Indonesia, and the Philippines where there appears to be no focused policy effort to encourage more initiatives from the private sector even though it has demonstrated its capacity either in company- or industry-led initiative, to meet the skills challenges in different industries.

***Company-led Skills Initiatives***

Examples of company-led initiatives abound. They could be a specific program pertaining to a particular skills need or a training institute that caters to a wide variety of skills training. The automotive companies in Indonesia run in-house training programs to supply the specific vocational skills that they need. Corporations like the Charoen Pokphand (CP) group (Thailand) and Ayala (the Philippines), on the other hand, run tertiary educational institutes that offer a more comprehensive and industry-relevant curriculum, comprising both academic and vocational training. By aligning the curriculum with the specific

needs of the companies and by providing both practical training opportunities as well as job offers upon graduation, these programs have been able to attract a large number of high quality students.

However, most of the private sector-led training initiatives are undertaken by large corporates or multinational corporations (MNCs), mainly to cater to their own skills needs. The benefits of the training are kept within a specific company even though the skills imparted are often transferrable and relevant to a much wider group of workers. Workers in the small and medium-sized enterprises (SMEs) which provide the bulk of the employment in ASEAN-5 countries, in particular, are not able to benefit from such skill training.

### *Industry-led Skills Initiatives*

An alternative is to work through the industry. The trade or industry association can play a crucial role in communicating and balancing public and private expectations, and act as a platform to initiate collaboration, with the government acting as an important facilitator. The training benefits a wider segment of workers than in-house training by individual companies. An example is the automotive industry in both Thailand and Indonesia. The modus operandi of Automotive Human Resource Development Academy (AHRDA), an automotive industry association in Thailand, in particular, has been hailed as a model that could potentially be replicated in other ASEAN-5 countries.

**Challenge 4:****Weakness in STEM and TVET Education**

There appears to be a strong preference among students in many ASEAN-5 countries to pursue a general academic degree rather than a more technical- or vocationally-oriented education. Such a preference has persisted despite the shortage of skilled workers in the technical and vocational fields and the lack of employment opportunities for graduates of general education programs. While cultural bias might partly explain this preference, the generally weak state of TVET education, the absence of a strong incentive structure and market signaling mechanism on job demands have also contributed to the slow adjustment in the labor market.

The Thai government is beginning to address this issue, with efforts to rebalance the enrolment profile of students and to achieve a 50:50 enrolment ratio between general and TVET education for each cohort. Malaysia too, with the new education policy blueprint, is prioritizing TVET as a key vehicle to help realize the vision of the ETP.

Table 2: PISA, 2012

	Mathematics Mean Score	Reading Mean Score	Science Mean Score
OECD Average	494	496	501
Singapore	573	542	551
Malaysia	421	398	420
Thailand	427	441	444
Indonesia	375	396	382
Philippines	*	*	*

\* Did not participate

Table 3: TIMSS, 2011 8th grade

	Mathematics Average Scale Score	Science Average Scale Score
Singapore	611	590
Malaysia	440	426
Thailand	427	451
Indonesia	386	406
Philippines	*	*

Note: TIMSS Scale Centerpoint – 500

\* Did not participate

Many ASEAN-5 countries suffer from having a weak STEM education. Except for Singapore, the other ASEAN-5 countries score well below the average Organization for Economic Co-operation and Development (OECD) countries in the PISA (Program for International Student Assessment) scores (see **Table 1**). Likewise, most ASEAN-5 countries score below the average of 500 points in the Trends in International Mathematics and Science Study (TIMSS) scores (see **Table 2**). This does not bode well for the economic restructuring that many ASEAN-5 countries are embarking on, which require high competency in science and engineering.

### Challenge 5:

#### **Lack of English Proficiency and Other Soft Skills Among the Workers**

With their economies increasingly plugged into the global marketplace, poor command of English marks a weakness for the workforce in many ASEAN-5 countries. This is a drag for many key industries which are often export-oriented and servicing the global market including the information technology/business process outsourcing (IT/BPO) industry in the Philippines and the tourism industry in Thailand, Indonesia and the Philippines. In Malaysia, weak command of English could pose an obstacle to the country's attempt to progress to high value added industries in both manufacturing and services.

Teaching of soft skills is often neglected in the national educational systems in ASEAN-5 countries. Workers are often found to be short in analytical and problem-solving skills, the ability to think creatively, cross-cultural competency, and the ability to work in an international setting. As ASEAN-5 economies become more globally integrated and look to expand their exportable services beyond tourism and IT/BPO into healthcare, education, and other industries, English proficiency and soft skills will become increasingly more important and deserve greater emphasis in the school curriculum.

### Challenge 6:

#### **Lack of Lifelong Learning Opportunities for Mid-Level Workers**

Most of the educational and training programs in ASEAN-5 countries cater to entry-level jobs, with few pathways for continuous and lifelong learning. This could make it difficult for workers to learn new skills, which could in turn affect their ability to join new growth industries, or to deepen their skills to help the industry move up the value chain. The skills gap would become more acute as the pace of economic restructuring steps up. The pervasiveness of disruptive technologies and the resulting phenomenon of "disappearing jobs" reinforce the importance of having a strong system of continuous and lifelong learning.

ASEAN-5 countries have responded to this challenge though not with the same speed and intensity. Singapore is perhaps the most aggressive in promoting "adaptable" and "lifelong" learning through the SkillsFuture movement launched in 2015. In Malaysia, there is also strong emphasis on lifelong learning in its manpower development plan, the Human Capital Development Strategic Reform Initiatives (HCD-SRI).

**Challenge 7:****Seriousness of Youth Unemployment**

Healthy GDP growth in most of the ASEAN-5 countries over the past few years has helped to reduce their unemployment rates, with Thailand having the lowest unemployment rate of 0.9% in 2015. However, with the exception of Thailand and Singapore, the unemployment among the youth (aged 15 – 24) has remained persistently high.

Indonesia faces the most severe youth unemployment problem with close to 20% of the youth not being able to find job, a level that is close to that in the crisis-hit Eurozone (22%). This is followed by the Philippines whose youth unemployment rate has stayed around 16% for many years. The high level of youth unemployment in some ASEAN-5 countries reflects in large part the inability of the educational system to adjust quickly to industry needs, especially for emerging industries. The different youth unemployment rates across the ASEAN-5 in turn could be seen as an indication of the different industry-relevance of their educational systems and their ability to anticipate skills demands.

The allure of ASEAN-5 economies to international investors lies in part in the young and dynamic workforce they have. Unless young workers are adequately trained and equipped with relevant skills, it would be difficult for them to take part in the economy productively. The persistence of high youth unemployment points to the urgent need for changes in the educational and training system in some ASEAN-5 countries as well as more structured initiatives such as youth entrepreneurship programs.



**Challenge 8:****Skills Challenges Arising from Brain Drain and Regional Labor Flows**

Brain drain aggravates the skills challenges in a number of ASEAN-5 countries, notably the Philippines and to some extent, Malaysia and Indonesia as well. The outflows of trained and qualified workers deprive the home country of the skilled workers they need. The problems caused by brain drain are aggravated in some labor exporting countries which place severe restrictions on the inflows of skilled foreign workers. Employers in Indonesia point to such restrictive labor policy as a major hurdle to business expansion.

There is already a great deal of intra-regional labor flows among ASEAN-5 countries. Singapore, Malaysia, and Thailand receive around 87% of the total regional migration within the whole ASEAN group.<sup>2</sup> Singapore attracts workers, both skilled and unskilled, from the other four countries and absorbs many Professionals, Managers, Executives and Technicians (PMETs) from Malaysia. A large number of lower-tier programmers in the ICT sector in Singapore come from the Philippines. Malaysia, while facing an outflow of PMETs, is taking in a significant number of low-skilled and low-wage workers from Indonesia and the Philippines.<sup>3</sup> Thailand too is importing a large number of low-wage workers from neighboring countries such as Myanmar. Relative to Singapore, Malaysia and Thailand, Indonesia and the Philippines are net exporters of labor, supplying many lower-wage workers such as domestic helpers, construction workers, and service staff in the food and beverage (F&B) and tourism businesses.

The intra-regional labor flows are driven largely by market forces, as skilled and unskilled workers respond to various financial and career incentives in different countries. The wider presence of the MNCs, through the integration of their production networks, both vertical and horizontal, also contributes to intra-regional skilled labor flows. The situation could be complicated in future as intra-regional labor flow rises with the implementation of the ASEAN Economic Community (AEC) agreements.

Under AEC, ASEAN-5 countries are committed to adopt a mutual recognition arrangement (MRA) for skilled workers, allowing them to work freely within the region. The MRA scheme is a boon for labor-importing countries as it allows them to tap into the workforce of other member countries. In addition, the harmonization of skill competency standards helps improve the efficiency of the flows by reducing information asymmetry and potential skills mismatch. For labor-exporting countries such as Indonesia and the Philippines, however, this could add to the skills challenges woes if the MRAs lead to a speedier outflow of skilled workers.

2. Papademetriou, Demetrios G., Guntur, Sugiyarto, Dovelyn, Rannveig Mendoza & Salant, Brian. (2015). "Achieving Skill Mobility in the ASEAN Economic Community: Challenges, Opportunities and Policy Implementations" ASEAN. Accessed from: <http://www.adb.org/sites/default/files/publication/178816/skill-mobility-asean.pdf>
3. About 84% of Malaysian job seekers interviewed locally mentioned that they would consider leaving overseas for better prospects. See Nadaraj, Vanitha. (18 March 2016) "Malaysia's brain drain reaching critical stage." ASEAN Today.

### *Industrial Policy and Regional Labor Flows*

A further complication for regional labor flows arises from the overlapping industrial policies that the five countries are pursuing even though the positioning within each sector differs. In the ICT sector, for instance, both Singapore and Malaysia are trying to gain a leadership position in high value added areas like big data and analytics (BDA), cyber security, Internet of Things (IoT), network engineering, cognitive computing/robotics, immersive media, and future communications, etc. In the Philippines, on the other hand, the ICT sector consists largely of the information technology/business process management (IT/BPM) business although the government is trying to encourage industry players to move into higher value added services like back office services, design process delivery, as well as services for transcription, animation, and game development, etc.

Such overlapping interests in sectoral growth suggest that there are both competitive and complementary forces at work among the five labor markets. Countries targeting different segments in the same industry could see their skilled workers play a complementary role to each other. Countries that are trying to build up the same industry segment, on the other hand, would likely compete for the same pool of skilled workers.

#### **Challenge 9:**

### **Managing the Impact of Disruptive Technology**

Disruptive technology has greatly increased the difficulty of predicting demands for skills. The phenomenon of “disappearing jobs” affects both the manufacturing and the services industries. Services industries such as IT/BPO and tourism which form parts of the economic backbone of Thailand, Indonesia, and the Philippines are among those where existing skills are in danger of being made obsolete. Financial services and advanced manufacturing which are seen as key growth drivers in Singapore and Malaysia are also vulnerable to disruption.

As the impact of disruptive technology is likely to become more pronounced over time, policy makers would have to make some fundamental adjustments in their management of skills challenges. Not only do they need to adopt a more forward-looking approach, they also need to be prepared for a greater margin of error, in projecting and equipping workers for skills of the future. The phenomenon also reinforces the importance of imbuing the workforce with a deeper understanding of having to be nimble and adaptable in skills acquisition, and to be willing to pick up “cross-job” skills that are useful in helping them to move into new professions.

**Challenge 10:****Managing the Impact of China's Industrial Restructuring**

The impact of China's industrial reforms and restructuring on the demand for skills in ASEAN-5 countries should not be underestimated. China has been and will likely continue to be a major driver of the changes in the region's production network, affecting the demands for skills in all five countries. With its avowed intention to move its industries up the technology-and-skill ladder and its heavy emphasis on innovation, China could pose an increasingly greater challenge to ASEAN-5 countries which are heading in the same direction of economic restructuring, especially countries like Singapore, Malaysia, and Thailand. These countries need to be prepared for greater competition and with it, disruption in their job markets, from China.

At the same time, transformation in the Chinese economy could bring enormous employment opportunities to ASEAN-5 countries. The industrial upgrading in China will continue to push up Chinese wages and force more low-skilled industries to relocate out of the country, with ASEAN-5 countries being potential recipients. At the same time, given the impetus of the "One Belt, One Road" initiative and the funding of the Asian Infrastructure Investment Bank (AIIB), ASEAN is likely to see a surge in Chinese investments, bringing with them jobs of both high-skilled and low-skilled types. A large number of ASEAN businesses could also move their production facilities back to their own region as the relative wage advantage between China and ASEAN changes. Industries including automotive, electronics, and food manufacturing are seen to be favored for such relocation as they are likely to benefit considerably from further integration of the ASEAN economies.<sup>4</sup>

Policy makers in ASEAN-5 will likely face more disruption from China in managing their skills challenges. Projection for skills demand and with it, the associated capacity enhancement for education and skills training in ASEAN-5 countries would be made more complex by the economic restructuring in China.

4. A recent survey has found that one in seven manufacturers in China favor moving their operations outside of China, and of which, 21% of semiconductor manufacturers would prefer to move to ASEAN. See Narayanan, Lau, Phoo, & Lee, (2016); Tonby, Ng, & Mancini, (2014).

## **Recommendations**

In view of the common skills challenges we identified above, we believe that the following actions deserve urgent attention across all five countries.



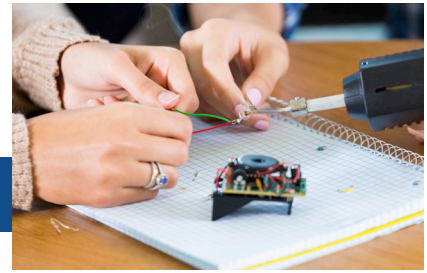
## *Give the Private Sector a Bigger Role in Meeting the Skills Challenges*

There should be a rebalancing of the roles between the public sector and the private sector, to give the latter a much bigger role in skill training. An overburdened public sector as a skill training provider and the absence of an effective framework for tripartite collaboration lie at the roots of many of the skills challenges in the ASEAN-5 countries.

Experience has shown that the private sector has the capacity to respond to the skills challenges flexibly, rapidly, and with greater industry relevance, especially in Thailand, Indonesia, and the Philippines. The government should play an active facilitating role, using a right mix of policy support, regulatory support, and other incentives. Further deregulation of the education sector should be considered in these three countries. Such deregulation in Malaysia in the 1990's has helped spur the growth of a thriving private education services sector that plays a significant role today in providing industry-relevant skills training.

The government's role as a facilitator could encompass the following:

- Provide a consistent framework for private sector training at both the national and local level to help avoid duplication and other unnecessary wastage of resources
- Help the private sector companies tap into the resources of the educational institutions to address directly the issue of industry-school gap. This includes the private sector's involvement in curriculum planning, provision of practical training and internship programs for students and arrangement of regular industry exposure for instructors
- Design different incentives to promote both industry-level and company-level training initiatives. Examples from Thailand, Indonesia, and the Philippines provide lessons on how companies and industries would successfully respond to different incentives in skill training



- Design incentives for the private sector to broaden the reach of the training opportunities beyond specific companies or industries, so as to benefit a wider segment of the economy and generate multiplier effects
- Provide incentives for MNCs and large corporations to involve SMEs in their training schemes

Above all, there is an urgent need to strengthen the tripartite cooperation among the government, the industry, and the educational and training institutions to coordinate the skill training efforts by various stakeholders.

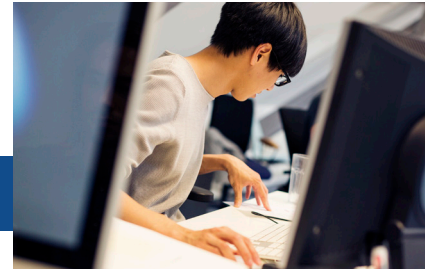


### *Provide a Clear Roadmap to Meet Skills Challenges*

The government should invest in a comprehensive roadmap for skills development that is consistent with and targeted at supporting its growth strategy. While the government assumes the leadership role in such an endeavour, the exercise should take a tripartite approach with active involvement of the private sector and the key educational and training institutions in the country.

Among other details, the roadmap should provide a credible projection of supply and demand for critical skills needed in key growth industries, spell out clear roles for the main stakeholders, and provide guidance on possible collaboration among them. Such a roadmap will help streamline efforts by various stakeholders in meeting skills challenges, increase their efficiency, and provide greater accountability of their work.

Where resources permit, consideration could be given to the possibility of setting up a one-stop service agency to manage skills challenges. Such an agency should be vested with sufficient autonomy and authority to coordinate and allocate resources and resolve conflicts among various stakeholders, especially various government agencies. Many countries have a dedicated agency to provide one-stop services to overseas investors as foreign investment is seen as important to the growth of the economy. The task of meeting skills challenges arguably plays an even more critical role to economic growth and deserves more focused attention and resources.



## *Revamp Curriculum to Emphasize STEM, TVET and Soft Skills Training*

A drastic increase in emphasis on STEM and TVET education is critical to all ASEAN-5 countries (with the possible exception of Singapore). In addition to a substantially bigger allocation of resources to such education, there is a need to change the society's bias against TVET education in a number of the ASEAN-5 countries, perhaps through a focused and sustained national campaign. A revamp of the education system to put more emphasis on the "practical training" component, based on some variation of the "dual-education" system of Germany could be considered.

Curriculum revamp is also needed to provide a stronger emphasis on English proficiency and the teaching of various soft skills in schools. Such a change is important for the push towards a knowledge economy and the promotion of more exportable services industries. These skills also serve as cross-job skills to help increase workers' adaptability in a fast-changing labor market. Private sector training providers could be asked to take on greater responsibility in such training. Meanwhile, the teaching of entrepreneurship skills could help improve the efficiency in countries that have a large informal sector and a high rate of under-employment. It could also go some way in helping to reduce youth unemployment.





## *Deepen School-industry Links to Improve Employability of Graduates*

There should be greater tripartite efforts between the government, the industry, and the education institutions to establish a formal mechanism for regular and meaningful consultation among these parties on curriculum design and implementation. The consultation should aim at improvement in the following areas:

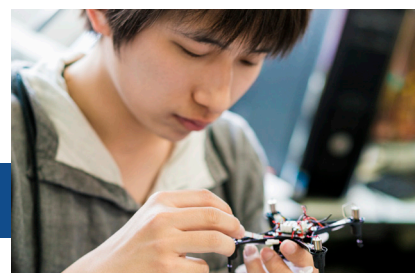
- Employment of instructors with practical experience and industry links
- Increased industry exposure for students through internship, apprenticeship, on-site training and other schemes
- Introduction of more competitiveness in the school system (for example, through regular ranking exercises) and more transparent information about graduates' employability and salaries
- Independent audit of the quality of educational/training institutions



## *Expand and Strengthen Continuous and Lifelong Learning System*

A new policy framework for lifelong learning programs could play an important role in helping workers adjust to the fast-changing industrial structures, especially in providing opportunities for mid-level workers to upgrade or acquire new skills, to meet changing skills demands. Such programs could also go a long way in helping to address youth unemployment in countries like Indonesia and the Philippines.

The different experiences in the five countries suggest that to be effective, the policy framework should incorporate the following: inculcating in the workforce a culture of continuous learning and skills improvement; provide training not just in technical knowledge and skills but also various soft skills; and allow private education providers to play a major role as they tend to have a deeper understanding of the industry's needs, and operate with greater flexibility and thus are more able to adjust better to the fast-changing skills demands of the industry.



## *Policy Coordination on Cross-border Labor Flows*

The complexity of the intra-regional flow issues points to the need for more policy consultation and coordination among ASEAN-5 (or for that matter, among all 10 ASEAN member countries), before the full implementation of the MRAs and further liberalization of the labor market.

ASEAN-5 countries should take advantage of the synergy that exists among them to help overcome the supply side constraints. Being in different phases of economic development means that there is considerable room for experience sharing and learning among them. Success factors and pitfalls in policy measures from countries that have gone through similar phases of industrial development earlier could offer useful lessons on what works and what does not. Singapore's experience in leveraging on the multinational corporations and their host governments to provide technical skill training, for example, could be relevant to countries that are trying to broaden their manufacturing sector. Similarly, Malaysia's experience in liberalizing the education sector could provide useful lessons for other countries.

ASEAN-5 countries could also tap on each other's skilled workers to augment their own skilled workforce, as intra-regional labor movement increases with the implementation of the AEC. Labor laws could be amended to facilitate the flow of skilled workers to where they are needed. Professionals and skilled workers whose skills are no longer relevant in their home country could be in demand in another country. Closer coordination among the five countries is needed to help ensure that the implementation of the MRAs for skilled workers will result in a win-win outcome for all.

Within each country, some recalibration of labor market policy would also be needed to balance the short term skills needs with longer term, broader development objectives. For example, Singapore needs a finer calibration of foreign worker policy to ensure a better mix of local-foreign skilled workers; Indonesia and Malaysia could benefit from a relaxation of policy on employment of foreign skilled workers; Thailand needs to be prepared for a reduced supply of low-skilled foreign workers especially those from Myanmar; while greater efforts are needed to help retain skilled workers in the Philippines.

## **VII.2 Managing Skills Challenges in Individual ASEAN-5 Countries**

Though the ASEAN-5 countries are confronted with a number of similar skills challenges, some of these challenges are more serious for some countries than others, requiring them to respond in a more forceful manner. There are also challenges that are unique to certain countries given the particular growth and development strategies they are pursuing and the institutional capacities they possess. This section highlights some of these country-specific issues and discusses some possible responses.

## Managing Skills Challenges in Singapore

The proactive and forward-looking approach that the Singapore government has adopted in education and training, coupled with a liberal policy on foreign workers, appears to have worked well for the city state in managing its skills challenges in the past. Singapore has been able to avoid persistent and large skills gap while new industries achieve robust growth without being slowed down by serious skills challenges. The success of the approach however, brings with it other skills challenges that would have to be resolved in the coming years.

At the same time, a number of the growth industries that Singapore is pursuing are vulnerable to the impact of disruptive technology, with finance and advanced manufacturing being among them. The rapid and wider adoption of financial technology (FinTech), for example, already renders a number of jobs obsolete in the financial sector. It is also changing the demand for skills in the sector, with rising demand for IT-related skills.

Three skills challenges in particular require closer attention from the various stakeholders in Singapore:

### *Reduce the Reliance on Foreign Workers and to Improve Labor Productivity*

Fundamental solutions are needed to redesign jobs in many sectors to achieve a better use of technology and to increase labor productivity. This will help reduce the heavy reliance on foreign labor, especially low-skilled foreign workers.

Heavy dependence on foreign labor, including skilled workers, could not be sustained over the long run. In addition to the various social and economic tensions that the presence of a large foreign workforce could create, the policy fails to build up the indigenous production capacity for the economy.<sup>5</sup> Furthermore, while the liberal foreign worker policy is targeted at high-skill, high-wage foreign workers, it also brought in a large number of low-wage, low-skill foreign workers. As a result, sluggish productivity growth remains a serious problem for the economy especially in the services sector. A steady supply of low-wage foreign workers reduces the incentives for employers to invest in productivity-enhancing technology, making it difficult for the economy to get out of the low-wage low-productivity trap in certain segments of the economy.

More innovative ways are needed to restructure jobs to tap into the vast work experiences of displaced mature PMETs and non-traditional sources of workers including retirees and homemakers, and to help workers stay meaningfully

5. Tan and Bhaskaran (2015).

employed beyond the official retirement age. In deciding on new growth industries to promote, the government should take into consideration the availability of local workers who can meet or who can be trained within a relatively short period of time to meet the skills needs of these industries. In addition to GDP growth, employment creation for the local workforce, both high-skilled and low-skilled, should also be accorded a high priority in targeting new growth industries.

### *Moderate the Pace of Industrial Policy Change to Allow for Deepening of Skills*

Rapid shifts in the focus of the government's industrial policy make it difficult for the new targeted industries to mature and the supply of skilled workers to keep up with the changing demands. Moderating the pace of such shifts could give more time not only to the industries to gain the scale and depth needed to become internationally competitive, but also to educational institutions to adjust to the new skills landscape, thereby allowing workers to develop and deepen their skill sets.

Indeed, the fast-changing focus of the government's economic growth strategy and with it the types of skilled workers required, could have contributed to the skills gap in the economy. To anticipate the global economic trends and stay ahead of the curve, the government regularly revises the growth strategy and identifies new industries to be promoted. Two recent strategic reviews, the Economic Review Committee Report (2003) and the Economic Strategies Committee Report (2010) have had a major impact on shaping the structural changes in the economy and with them the demand for skills over the past 15 years. The Committee on the Future Economy (CFE) is expected to have a similar impact on the demand for skills when it completes its work by end 2016.<sup>6</sup>

Once the new growth industries are identified, the government often provides them with strong support including changes in manpower policy, to help them take off. Educational institutions are encouraged, often with new funding and other incentives, to adjust their curricula so as to equip students with the new skills needed.

Training and growing a pool of new skilled workers however takes time and that might help explain part of the skills gap in Singapore. At the same time, the sprouting of new industries requires not only new skilled workers at the higher end of the skill ladder but also those at the lower end to carry out the more mundane aspects of the work, which presents another source of skills gap.

6. Some of the new growth drivers were already alluded to in the 2015 Budget speech. These include advanced manufacturing, applied health sciences, smart and sustainable urban solutions, logistics and aerospace and Asian and global finance services and the ICT sector. See Chapter 2.

## *Coping with Disruptive Technology and Demand for Innovative Workers*

While the education institutions in Singapore do not suffer from the same extent of school-industry gap as those in other ASEAN-5 countries, their orientation and pedagogy need to evolve continuously with the changes in the economy. An innovation-driven economy needs not only workers with the right technical skill sets, but also the right mindset – one that is at once curious, creative, and collaborative, willing to embrace changes and not afraid of taking risks in an open, international environment. Maintaining such an emphasis in the curriculum in schools and the institutes of higher learning (IHLs) is critical to the country's pursuit of an innovation-driven growth strategy. The need for such a changing emphasis becomes more pronounced in the face of the increased prevalence of disruptive technology to which many targeted growth industries in Singapore are susceptible.

SkillsFuture marks an innovative approach to promote lifelong skills re-tooling and sharpening. However, so far, it appears to focus mainly on helping workers acquire “technical” or “content” skills to meet near-term needs. There needs to be greater emphasis on the acquisition of a mindset among workers to be adaptable in coping with technology changes.

Close coordination among policy planners, educational institutions, and the industry is often cited as part of the strength of Singapore's manpower policy. Once the government decides on its manpower development strategy, it is often able to mobilize other stakeholders to work towards a common goal. This top-down approach to manpower management, while efficient, may not give sufficient voice for individual workers who are a critical part of stakeholder collaboration. More could be done to include meaningful feedback of workers in understanding their fears and challenges as they negotiate through a fast-changing economic environment.

## Managing Skills Challenges in Malaysia

To realize its vision of becoming a high-income country by 2020, Malaysia needs to substantially transform the skill profile of its workforce. With a sound fiscal position and a long tradition of strong educational and training institutions, including a vibrant education services industry in the private sector, the country is well-placed to face up to its skills challenges. Recent efforts by the government to provide a comprehensive roadmap for skills development, to tighten the policy implementation process, and to streamline the work of various stakeholders mark an important step in the country's journey in workforce transformation.

The main skills challenges that Malaysia face are those related to the gap between what the educational and training institutions produce and what the industry needs, both for technical skills and soft skills. While the government has helped set the scene at the national level for major changes in skill training, a number of challenges remain on different fronts, calling for urgent actions by various stakeholders.

### *Revamp Curriculum to Reflect Greater Emphasis on STEM Education, Training of Soft Skills and English Proficiency*

A curriculum revamp with enhanced emphasis on STEM education is crucial given Malaysia's ambitions to carve out a competitive position in industries that require high proficiency in science and engineering skills such as ICT, advanced electronics design and manufacturing, and oil and gas. Increased training is also needed in cognitive skills including analytical, creative and communication skills which are closely associated with a knowledge economy; and proficiency in English which could help strengthen Malaysia's competitive position in the international market, especially in the services industries.

Efforts are also required to align education quality and standards at IHLs with other international institutions. Currently there are close to 600 education institutions that are classified as IHLs in Malaysia. However, uneven quality of the graduates clouds the employability of their graduates.

In addition, measures are needed to monitor the quality and effectiveness of various education and training initiatives funded by the government, to help ensure a better return on investment by various stakeholders including the government, the private sector, and the students. Such monitoring calls for the provision of more comprehensive and up-to-date information on graduate employability, and well-designed tracer studies to assess the effectiveness of the various training programs.



## *Tighten Coordination between Government, Industry, and Education Institutions*

Tighter coordination of stakeholder efforts at two levels is needed to achieve a more efficient implementation of the skills development roadmap: between the government and the industry; and between the industry and the education and training institutions.

Closer government-industry consultation helps increase the relevance and feasibility of the government's skill development plans. In projecting demands and preparing the COLs, for example, a more bottom-up approach to include greater industry feedback could result in more effective investment in skills training. Closer consultation could also help tighten the government funding process for skills training. Inconsistent federal funding for TVET training, for example, has been cited as having contributed to the uneven quality of trainers.

A more formal consultation mechanism between the industry and the educational institutions is needed to provide up-to-date curricula and more industry exposure to students through work/study programs and apprenticeships. Special programs are needed to streamline the employment practices of instructors/trainers to ensure that they possess sufficient industry experience. The current selection criteria for instructors are seen to put too much emphasis on the trainers' academic qualifications and not enough on their industry experience.

An autonomous agency with strong mandate and authority could be considered to provide a one-stop service in skills training. Such an agency could play a critical role in coordinating the provision of the diverse skill sets needed to realize the growth potential of the 12 NKEAs. The one-stop service agency could take the form of a strengthened TalentCorp or a separate new agency.

## *Expanding the Sources of Skilled Workers*

Malaysia needs to tap on talents both within and outside the country. The Resident Pass-Talent scheme and the Returning Expert Program managed by TalentCorp have produced modest results so far. More aggressive measures could be considered both to attract skilled workers from abroad and to help retain existing talents.

Expanding the incentives available to foreign professionals beyond fiscal incentives to those encompassing lifestyle choices, such as those used by neighboring countries like Singapore and Hong Kong, could be considered to lure more global talents needed for the 12 NKEAs. To reduce brain drain, more efforts are needed to benchmark the salaries in Malaysia against those in the region, to chart out advancement opportunities more clearly across academia and industries, and to have professional standards globally recognized.

## *Providing More Opportunities for Continuous Learning and Skills Upgrading*

A stronger emphasis on continuous and lifelong learning is important in helping Malaysia transit to a more knowledge-based economy. There are currently not sufficient opportunities for mid-career up-skilling or second skilling which limits the supply of skilled workers needed in the new growth industries. Furthermore, the large number of unemployed youths could be more productively engaged with a greater availability of lifelong learning programs. The private sector education providers could be engaged to play a bigger role in this area.

## Managing Skills Challenges in Thailand

A shortage of workers equipped with sufficient science and engineering, and technical skills stands out as the key skills challenge for Thailand in its efforts to become a technology- and knowledge-intensive production base and a high-income country by 2027. Weakness in soft skills and English proficiency among the Thai workers poses another challenge as the country tries to gain greater global competitiveness in the services sector. While the government has made efforts and set out ambitious targets to rectify the deficiency, bolder actions by various stakeholders are needed.

### *Policy Change to Increase Emphasis on STEM and TVET Education*

A strong national campaign to correct the bias against technical and vocational education among students and a concerted effort by all the stakeholders to improve the teaching of STEM programs in schools will mark an important step in rebalancing the education system. Tertiary education enrolment continues to concentrate in social sciences and humanities courses even though graduates from such programs consistently face difficulty in employment.

The articulation by the government of a clear and attractive career path for TVET students could help reduce the social and cultural bias against a technical education. To be effective, accelerated efforts are needed both to raise the demand (e.g. creating stronger incentives such as better job opportunities and higher wages) and to remove the supply side constraints (e.g. upgrading the vocational training facilities and the quality of STEM education). The government should be prepared to allocate a bigger budget for STEM and TVET education, to be carried out by education providers in both the public and the private sectors.

### *Provide Stronger Incentives for Private Sector-led Skills Training Programs*

Experiences in various industries including automotive, tourism, and ICT show that the private sector, either working on its own or in collaboration with the government and the educational institutions, could play a major role in resolving the skills challenges and help ease the burden for the public sector in Thailand. The government should explore more creative and differentiated incentives to encourage different modes of skills training by the private sector. Experiences of

neighboring countries in leveraging on the goodwill and expertise of the MNCs and their host countries in setting up technical training institutions could be used as references.

Certain cost-sharing structures between the government and the private sector could be considered to widen the scope of the training programs and the reach of the training. Benefits of the training should be extended beyond a specific company or even industry. Workers in the SMEs should be a key target recipient in the expansion of such programs. The success stories of the private sector-led training programs in providing graduates with good employment, especially those in the technical fields, could in turn be more widely shared in the society to help change the perception against TVET and science and engineering education.

### *Step Up Efforts to Strengthen Teaching of Soft Skills and English Language*

Lack of soft skills and English language hinders Thailand's ambition to be a competitive player in the global market especially in the services sector. Incentives could be provided to expand the role of the non-corporate private sector educational service providers which typically do not have the resources to engage in TVET training. The openness of the Thai economy and the Thai culture makes for easy participation of foreign skill trainers which should be further exploited.

## Managing Skills Challenges in Indonesia

Being the largest ASEAN-5 economy with a rich endowment of natural resources and a young and growing workforce, Indonesia holds strong promise of graduating to a middle-income country in the medium term. However, the relatively low base of skilled workers, especially those in technical, science, and engineering fields, could pose a serious obstacle. The government's budget on education needs to be significantly expanded to improve the efficiency and effectiveness of the public education system and to equip students with competency in basic core skills such as mathematics and science. Education reforms could start with aggressive teacher training including strengthening the instructors' linkages with the industry, and improving the physical infrastructure in education institutions such as the equipment and machineries used in TVET education. English language learning should also be accorded a higher priority to bolster the workforce's ability to engage with global business and to facilitate online learning by the workers.

In the more immediate term, the stakeholders could focus on addressing a few specific issues:

### *Develop a Comprehensive Roadmap for Skills Training to Support Economic Growth*

A tripartite effort to develop a comprehensive and detailed roadmap to strengthen the education system with emphasis on training industry-ready graduates at all levels, especially in technical and TVET-related fields, is critical. The roadmap should contain detailed projections of demand for critical skills in key growth industries, and measures to meet these demands. These should include ways to tackle the main causes of the school-industry gap such as outdated curriculum exacerbated by lack of qualified trainers; insufficient consultation between the industry and the schools regarding skills needs and training pedagogy; and lack of opportunities for re-training and skill upgrading for workers.

### *Strong Policy Focus to Encourage More Private Sector-led Skills Training*

Tapping more deeply into the training potential of the private sector, especially large corporations (including MNCs), offers a realistic option to meet the skills challenge in Indonesia. Various ways should be explored to replicate the role

played by the Japanese automotive manufacturers to provide technical training on globally recognized industry standards. The government could also work with industry associations such as Indonesia's automotive industry association GAIKINDO to widen the impact of private sector-led training to a larger segment of the economy. The model used by the automotive industry association in Thailand – Automotive Human Resource Development Academy (AHRDA) – could provide a reference.

A more direct involvement by the central government (as opposed to local governments) in private sector-led training could help provide more policy consistency in granting incentives to companies and in implementing the rules and regulations governing training programs. Lessons could also be drawn from successful past initiatives such as the Nusa Dua project (for tourism) on how the central government, working with the industry, could tap on foreign expertise to build up a large base of skilled workers.

### *Relaxing Rules on Skilled Foreign Workers, at least for Major Growth Industries*

Strict labor laws in Indonesia make it difficult for companies to bring in foreign skilled workers. Relaxation in such labor laws in selective growth drivers could help provide space for industry expansion. It could also help attract more MNCs whose operations are often hamstrung by a lack of trained manpower. The government could set a timeline to achieve a certain balance of local-foreign skilled workers for different industries.

Labor laws liberalization takes on greater significance in light of the country's efforts to establish the Indonesia Quality Framework (IQF) for key industries. Such a framework provides a training and certification model that is not only standardized among domestic industries, but also consistent with the MRAs within the AEC. Its implementation could potentially lead to more outflows of skilled workers and aggravate the skills challenges in Indonesia if the strict restrictions against employment of foreign skilled workers remain in force.

### *Measures to Raise the Youth Employment Rate*

High youth unemployment saps Indonesia of a key source of energy for economic growth: its young and dynamic workforce. Unemployed youth with tertiary education in particular marks a huge waste of resources. Bolstering the industry relevance of the curriculum, even at lower educational levels, deserves urgent attention from policy makers and educators. New avenues should be explored to allow the youth to engage in productive work after leaving school. This includes more structured teaching in entrepreneurship skills in schools and more opportunities for continuous learning. Private education providers could be incentivized to play a leading role in such endeavors.

## Managing Skills Challenges in the Philippines

With its young and dynamic workforce, the Philippines enjoys a large demographic dividend that could help form the basis for sustained and robust economic growth in the medium term. However, the country faces daunting skills challenges, with a large school-industry gap rooted in many structural weaknesses. Budgetary constraints and the weak institutional capacity of the public education system limit the scope of the government's responses. Alternative solutions are needed from other stakeholders. Among the more immediate actions needed are the following:

### *Rebalancing the Government's Budgetary Priority to Increase Spending on Education*

The new government's emphasis on human resource development should be backed by stronger political will and more resource allocation to education and training. The Philippines currently has the second-lowest budgetary spending on education among the ASEAN-5 countries. Increasing the budget allocation for education will help ease some of the basic constraints for schools such as inadequate teaching facilities and the lack of high quality teachers.

A bigger budget and further streamlining of functions for agencies such as the Technical Education and Skills Development Authority (TESDA) could help improve the efficiency of the education and training system by allowing for more rigorous auditing and stricter certification standard of the programs. Specifically, the number of publicly funded training programs could be rationalized, to terminate those that have proved to be ineffective. Likewise, programs offered by commercial companies which do not satisfy minimum competency standards should be stopped to reduce wasteful spending by students. With more resources, TESDA could also expand its work at its regional and provincial offices, and develop competency standards not just for entry-level but also mid-level workers.

### *Urgent Need to Strengthen the School-industry Link*

The government should take a more active role to help establish a formal mechanism for regular consultations between the industry and the educational institutions. Inadequate involvement of the industry in curriculum planning, lack of industry knowledge among the instructors, and lack of industry exposure opportunities for students are among the factors that contribute to the large school-industry gap in the Philippines. Recent initiative by the Information Technology and Business Process Association of the Philippines (IBPAP) to

engage IHL instructors over a two-year period provide one such example of improving the school-industry link.

### *Stronger Policy Incentives to Encourage More Private Sector-led Training Programs*

Private sector-led skill training programs have demonstrated their effectiveness in helping to reduce the skills gap in some industries in the Philippines. The government should explore new incentive structures, fiscal or otherwise, to encourage more such training by large companies including the MNCs. In addition, differentiated incentives might be needed to encourage the companies to extend the training opportunities to workers outside the companies or the industry. Meanwhile, private educational service providers could also be encouraged to play a larger role in the training of soft skills which are important to the services industries such as IT/BPO and tourism. In tourism, soft skills could be effectively cultivated through applying classroom skills in an engaging apprenticeship.

### *Stronger Incentives to Encourage FDI inflows*

MNCs represent an important source of skill training and technology transfer for the Philippines. As MNCs not only create new jobs for the economy but usually jobs with higher wages because of the higher level of labor productivity they enjoy, they could also help reduce the outflows of skilled Filipino workers and bring some of them back from abroad. The new government has made a promising start with its commitment to reduce bureaucracy for business and to relax its FDI rules.

### *A More Focused Strategy to Re-integrate Returned PMETs into the Workforce*

The experience and skills of professional overseas workers should be recognized as a valuable latent resource to help strengthen the labor force. Many returned PMETs end up embarking on new start-up businesses with generally low rates of success. A more focused strategy to re-integrate these workers into the labor force should form an important part of the country's long-term skills development plan.



# CHAPTER EIGHT

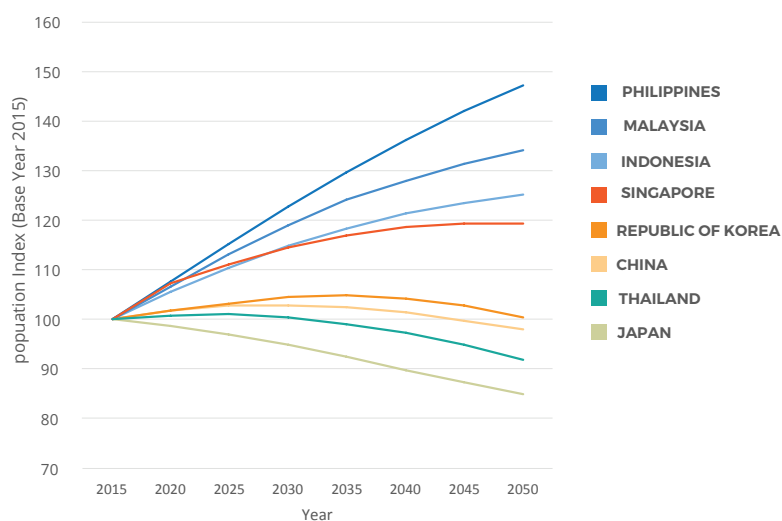


# MOVING FORWARD

Over the past two decades, the ASEAN-5 economies have performed remarkably well. Not only did they stage an impressive recovery from the devastation of the 1987 - 1998 Asia financial crisis, they also withstood the onslaught of the 2008 - 2009 global financial crisis exhibiting resilience and steadfastness. Today, these five core economies of the 10-member ASEAN grouping remain one of the most dynamic and promising growth regions in the world. At an estimated GDP growth rate of close to 5% a year and a combined GDP larger than that of India, ASEAN-5 is poised to be an important anchor of growth in Asia in the coming years.

They are also well-positioned to make the leap to the next level of development. While Singapore is already a high-income country pursuing an innovation-driven growth strategy and advancing technology frontiers, Malaysia and Thailand are embarking on a journey to break out of the middle-income rank by strengthening and expanding its technology- and knowledge-intensive industries. Indonesia and the Philippines, with their young and dynamic workforce, are especially well-placed to reap the demographic dividends to become the next Asian tigers and major growth engines in the region.

Figure 1: Population trends in Asian countries



Source: UN Database, 2016

To capitalize on the favorable conditions and to realize their growth potential, however, ASEAN-5 countries need to take decisive actions to overcome the skills challenges they face. Inadequate manpower capacity and undersupply of critical skills in key growth industries mark a serious hurdle in their efforts to realize their economic visions. All five countries are afflicted with various degrees of deficiency in industry-relevant skills, both technical and soft skills. Taking an industry-oriented approach, this study has identified a number of major skills challenges that the five countries face, and provided recommendations on what they need to do in the immediate term to meet these challenges.

The study looked at skills gaps in industries that are representative of the growth drivers in ASEAN-5 countries including the information and communications technology (ICT) industry (in all five countries), electronics and electrical manufacturing (Singapore, Malaysia, and the Philippines), finance and insurance (Singapore), oil and gas (Malaysia), automotive (Thailand and Indonesia), and tourism (Thailand, Indonesia, and the Philippines). By focusing on skills gaps at the industry rather than the economy-wide level, we believe the study provides useful insights into the nature of the skills challenges and how they can be effectively managed in the five countries. Failure to resolve skills challenges in key growth industries will ultimately undermine the success of a country's growth strategy.



ASEAN-5 countries face vastly different skills challenges given the diversity in their socio-economic conditions, characteristics of their workforce, and their growth priorities. Singapore has to find ways to increase the innovative capacity of its workforce to stay on the technology frontier while coping with the onslaught of disruptive technologies in a

few key growth industries; at the same time, it has to continue to fine-tune its industrial policy to achieve the right mix of foreign-local workforce. Malaysia and Thailand have to substantially raise the level of science and engineering education of their workers and expand the Technical and Vocational Education and Training (TVET) programs, to accelerate their moves towards a technology- and knowledge-based economy. In Thailand, concerted efforts by stakeholders are needed to broaden the acceptance of technical education among the students. Meanwhile, Indonesia and the Philippines face the more fundamental challenge of strengthening the workers' basic core skills in science, technology, engineering and mathematics (STEM) to enable them to participate in a wider base of manufacturing and services industries.

The study has also identified a number of common skills challenges that all five countries have to grapple with. The inability of the education and training institutions to equip graduates adequately with skills that the growth industries need appears to be a major challenge for ASEAN-5 countries. The low competency level in STEM education and the shortage of workers with sufficient technical and engineering skills, in particular, threaten to derail the industrial development plans in some countries including Thailand, Indonesia and the Philippines. Many varied factors contribute to such a "school-industry" gap; but closing the gap requires bold actions by stakeholders from both the public and the private sectors.

In addition, there are global and region-wide trends that have a significant impact on the evolution of skills challenges in ASEAN-5. The study highlighted three such trends:

- The prospects of greater cross-border labor flows which could unleash powerful forces, at once competitive and complementary, in the ASEAN-5 labor markets and complicate the task of managing skills challenges.
- The profound impact on skill demands in ASEAN-5 as a result of economic restructuring in China and the expansion of China's economic space through initiatives such as One Road, One Belt and the Asian Infrastructure Investment Bank.
- The rising importance of disruptive technology which renders many jobs obsolete and requires a paradigm shift in the way policy makers, employers and workers approach skills training, while highlighting the importance of acquiring cross-job skills and the necessity for continuous and lifelong learning.

The ASEAN-5 countries have responded to the skills challenges in different ways, with varied results. **What emerges clearly from this study is the urgent need in these countries to recalibrate the role between the public and private sectors, to give the latter a bigger role in skill training.** The public sector currently shoulders the bulk of the skill training responsibility in most ASEAN-5 countries. Unfortunately, its effectiveness has been limited by various constraints and it is especially inadequate in responding to emerging skill demands. Meanwhile, the private sector has been able to respond more quickly and flexibly to meet the skill needs of industry. Experiences in Thailand, Indonesia, and the Philippines, in particular, point to the substantive role that the private sector could



play in meeting a country's skills challenges. The cases included in this study show that there are possibilities for innovative private sector-led initiatives to address the skills challenges in ASEAN-5 countries, either on their own or working together with the public sector.

A lighter regulatory approach would allow the private sector to be more effective in skills training. In some ASEAN-5 countries, deregulation of the education sector could be considered. Malaysia's experience in liberalizing the education services industry in the 1990's has enabled the private sector to be a major contributor to skills today.



Meanwhile, the public sector should play an active role in facilitating and coordinating the skills development efforts of various stakeholders. It should provide a coherent policy framework to assess and plug potential skills gaps in the key growth industries, to help define and clarify the roles for various stakeholders and how they could effectively collaborate with each other. The framework should address not only the role of the formal education system, but also that of continuous and lifelong learning.

Considering the differences in their funding capacity, the public sector could focus on building up the general strengths in basic technical and STEM skills especially at the lower educational levels. A higher level of commitment to technical education, as expressed in a larger budgetary spending on technical education, is particularly important for countries such as Thailand, Indonesia, and the Philippines. The private sector, meanwhile, could be encouraged to take on greater responsibilities in industry-specific skills training such as those undertaken by the automotive industry in Thailand and Indonesia. In addition, the private sector could play a critical role in soft skills training and continuous and lifelong learning.

While they work to strengthen their institutional capacity and to provide a more efficient framework for different stakeholders to engage in skills training, ASEAN-5 countries should also try to take advantage of the synergy that exists among them to help overcome the supply side constraints. Being in different phases of economic development allows them to draw lessons from countries that had gone through similar phases of industrial development earlier. Singapore, Malaysia and Thailand, for example, have experiences in developing skilled workers for industries that Indonesia and the Philippines are trying to currently promote.

ASEAN-5 countries could also tap on each other's skilled workers to augment their own skill base, given the expected rise in regional economic integration and intra-regional labor flows. Singapore's liberal policy on foreign worker inflows has been instrumental in resolving many of the country's skills gaps. Individual countries would need to make changes to their own labor laws to capitalize on the new sources of skilled labor supply. However, in light of the various competitive and complementary forces at work in the five labor markets, they should also consider broadening their policy coordination to help ensure a win-win outcome for all.

Since its formation in 1967, ASEAN has succeeded in maintaining peace and stability and in deepening economic integration in the region, providing opportunities for member countries to grow and prosper. The founding ASEAN-5 countries, in particular, have benefited enormously from these opportunities to make big strides in economic development over the past 50 years.

As ASEAN prepares to celebrate its golden jubilee in 2017, these five core countries are rightly positive about their ability to scale greater heights in economic growth and development. Indonesia and the Philippines in particular are gearing up to become major growth engines in the region. Their confidence is manifested in the ambitious growth strategies they have articulated. To succeed, however, ASEAN-5 countries need to act decisively to solve their skills challenges. They should capitalize on the continued peace and stability in the region to engage in long-term skill development planning. They should place a stronger priority on and commit more resources to equipping their workforce with relevant skills to support the key growth industries. Industrial development plans can only work if they are backed up with corresponding skill development plans that draw upon the strengths of major stakeholders in the economy.

ASEAN-5 has tremendous growth potential. They stand a good chance of substantially transforming their economies and raising the income level of their people over the next 10 years. To realize their potential, however, the five countries must successfully rise up to their skills challenges.



# Appendix I: Literature Review

This Appendix provides a brief review on works related to the understanding and measurement of “skills gap” within the ASEAN context. In particular, we will review the works done by the ILO, ADB, APEC, OECD and the World Bank.

## *Measuring Skills Gap*

The issue of skills gap is usually studied within the broader area of “skill imbalance”. The APEC report defines skill imbalances as the effect of ‘market disequilibrium’ that results in either over or under supply of skills relative to a given level of demand. There are two main types of skill imbalance. The first refers to “an inadequate number of persons in specified occupations and/or with specified qualifications”. The distinction is made between occupations and qualifications since not all occupations require formal qualifications for entry and different levels of qualifications might permit entry to identical or similar occupations. The second type refers to “an inadequate supply of specific skills or attributes within a given occupation”. The latter is usually referred to as “skills gaps”. For example, a prominent type of skill gap identified by employers in ASEAN countries is the gap in ‘soft skills’.<sup>1</sup>

The causes of skill imbalance are complex. These include inadequate information and uncertainty, inappropriateness of firms’ training investment, capital market imperfections, mismatch between industry need and training system output, rapid structural change, geographic immobility, differences in business and training cycles, low initial foundation skills and skill under-utilisation, cultural and social barriers, migration etc. In the ADB Outlook 2008, it was suggested that skills gap often develops as a result of economic success and the explosive growth of many industries with many of them demanding more and higher quality talents. Convergence toward international practices for environmental standards, corporate governance and financial regulation also raises the demand for professional managers and specialists and contributes to the widening of skills gap.<sup>2</sup>

As pointed out by the APEC report, a major and severe challenge in the study of skills gap lies in the difficulty of collecting data and statistics that could provide an accurate measure of the extent of skills gap as well as meaningful cross-country comparisons. Such a challenge is particularly daunting in ASEAN countries. The APEC report looks at the situation of skill imbalance including skills gap in the 21 APEC countries. All the ASEAN-5 countries are part of APEC. There is also a lack of comparable national skills qualification framework, making it difficult to have comparisons between occupations that are described as being in shortage or surplus in different economies.

## *Changing Economic Structure and Skills Gap*

The ILO report (2015) pointed out that ASEAN countries have different priority sectors for employment. In Malaysia, it is oil and gas, palm oil and related products and financial services. For Indonesia, the priority sectors are agriculture, steel, food and beverage production. For the Philippines, it is information technology (IT) and business process outsourcing as well as shipbuilding. For Thailand, the priority sectors

1. See APEC, 2014.

2. See ADB, 2008.

are automotive, electrical and electronics and hospitality. Singapore is focusing on emerging and green technologies, financial services, biotechnology and the production of chemical and petrochemicals, with a strong emphasis on developing skills in innovation and research and development (R&D). While the demands for skills are different, successful transition into these sectors generally requires significant skill development in science and technology, robotics and ICT.<sup>3</sup>

The ILO and ADB Report (2015) which focuses on the impact of the ASEAN Economic Community (AEC) on the labour market conditions and skill requirements in the member states, points to the growing need for workers in economies with transforming economic bases to have both technical and core skills, and for such skills to undergo robust skills certification. Middle- and high-income ASEAN member countries such as Malaysia, Philippines, Singapore and Thailand are targeting high-skill manufacturing (such as automotive parts and electronics) as well as knowledge-based services (including information technology and financial services). This necessitates investing in workforce qualifications in science, technology and mathematics and transforming the learning environment to foster higher levels of teamwork, creativity and innovation.<sup>4</sup>

Lack of or poor coordination between the industry and educational/training institutions is often cited as a key contributing factor to skills gaps in ASEAN countries. For example, many ASEAN countries are found to produce a too many social sciences graduates and too few science, technology and engineering graduates, when industry demands point to the opposite. ILO (2015) for example, found that only 9.3% of the tertiary graduates in Brunei have a diploma in engineering, manufacturing and construction. The corresponding numbers for Thailand and Malaysia are 15.6% and 27.3% respectively. About 80% of firms in Thailand experience difficulties in filling job vacancies because most graduates lack relevant technical skills. **OECD (2012)** suggested that the high proportion of social sciences graduates in ASEAN countries could be a result of the low cost of education (especially from private educational providers) with scant regard to industry demand.<sup>5</sup> This was consistent with findings by the ILO (2015) that tertiary completion rates do not reflect the employability of the graduates.

The lack of graduates with science, technology, engineering and mathematics (STEM) skills appears to be a common problem across ASEAN countries with the possible exception of Singapore. In Malaysia, only 10.8% of students graduated with science degrees in 2010. In Indonesia, the number was even lower at 5.5% in 2009.<sup>6</sup> A large share of the region's workforce remains engaged in low-skilled agriculture activities which rely on traditional and labour-intensive technologies. This helps explain the predominance in many parts of Asia of low-skilled occupations which require only a quality primary education.<sup>7</sup>

STEM graduates are much in demand in a knowledge-based economy. According to the Singapore Graduate Employment Survey in 2012, more than 85% of graduates in the sciences were employed full time with the exception of one or two specific occupations. Focusing only on the tertiary graduates however might not provide a full picture for the supply of workers with STEM. STEM-related industries also require technical and vocational skills that might not have to be at the tertiary level.

Many studies make a clear distinction between demand for specific technical skills and knowledge and demand for 'soft skills'. This latter set of skills refers to personal attributes such as entrepreneurial and creative spirit, team-work, flexibility, time management, problem solving, creative thinking and interpersonal communication etc. Despite widespread recognition of the importance of 'soft skills' for an effective workforce, there are at present no robust and widely implemented systems for the collection of data on the type and extent of the demand for and supply of soft skills. This is due, in part, to the difficulty of defining

3. See ILO, 2015.

4. See ILO and ADB, 2015.

5. See OECD, 2012.

6. See ILO, 2015.

7. See ADB, 2008.



and measuring in concrete terms attributes such as 'creativity', 'empathy' and 'flexibility', in a manner that these attributes can be evaluated in a survey instrument and compared across countries.

A large number of studies on skill gaps in all ASEAN countries point to the lack of soft skills as a critical void in the skills of the region's workforce. The lack of English language proficiency and computer-related or other technical skills also present challenges to employers, many of whom report difficulty in finding suitable candidates. In the EF English Proficiency Index 2015, Singapore and Malaysia are ranked top two among 16 Asian countries, Indonesia was ranked at the tail end of 'moderate' proficiency whereas Thailand scored at the 'very low' proficiency.<sup>8</sup>

## *Firm Responses and Perceptions*

Firm responses and perceptions have been used widely to analyse the challenges of skills gaps, and numerous types of firm perceptions surveys have been used across a wide variety of studies.

In a 2013 ILO survey of ASEAN enterprises and business associations, fewer than one in three respondents agreed that secondary school graduates were equipped with the relevant skills needed by their enterprises, with scores ranging from less than one in ten in Myanmar to seven in ten in Singapore. For tertiary graduate in ASEAN as a whole, the skills were viewed as better aligned with industry requirements (53% of respondents agreeing). The most positive responses came from the Philippines and Singapore – around four in five. Likewise, for vocational education and training systems, around half the respondents felt that these met their business needs with the highest proportion being in Singapore. The survey also identified the three biggest skills gaps for ASEAN overall: management and leadership (29.0% of responses), vocational training (17.0%) and customer service training (15.0%). The survey nevertheless found that most respondents (84%) rated the quality of private education and training providers as average or above, while 35% of the respondents felt that the quality of public education was poor.<sup>9</sup>

The survey projected that among the ASEAN-5, Indonesia faces the challenge of having the largest number of under-qualified workers in high-skill jobs (13.3 million or 63.0 per cent). Among the other findings of the survey were: the urgent need to improve the skills of workers and to increase their competence in adopting innovative farming methods in agriculture and agribusinesses to raise their productivity in this sector; the need to upgrade the skills in the transport, construction and infrastructure sectors (which were identified to be key sectors in a number of ASEAN economies) including the need for sound competencies in engineering and construction skills such as welding, electrical wiring and bricklaying. Efforts towards environmental sustainability also require specialized engineers and architects with training in energy-efficient construction and in retrofitting and renewable energy.

## *Other Measures of Skills Gap*

Occupations that are deemed to be in demand ("In Demand and Hard-to-Fill Occupations") are also used as a proxy for skills gap in some countries. The ILO Report (2015) projected the ten occupations that would have the highest demand in ASEAN countries in 2010-2025 with the implementation of the AEC. It is estimated that the demand for high-skill employment in these economies could potentially grow by 41% between 2010 and 2025. Nearly half of these gains would be in Indonesia with a significant expansion in

8. See Education First, 2015. The comparative results for the sampled Asian countries: <http://www.ef.sg/epi/regions/asia/>. The Philippines is not ranked despite the prevalent use of English there.

9. ILO Survey, 2014.

the Philippines. The demand for medium-skill employment is expected to grow by 22%. The biggest impact would be felt in Thailand. Demand for low-skill occupations would grow by 24%, with the Philippines seeing the biggest increase.

Unemployment statistics might reflect skills gap in certain demographic segments. The ILO Report (2015) pointed to the lack of skills in various industries for young men and women. In 2013, general unemployment in ASEAN stood at 4.2% but for young men and women, the rates were 13.1% and 13.4% respectively. The highest unemployment rates for young people were found in Indonesia (21.6%) and the Philippines (16.6%). Wage premiums are also used as a gauge of skills gap. Skills gaps may cause wage inflation that is not directly based on higher productivity gains. Employers may have to settle for fewer or less experienced professionals which can lead to lower productivity and weaker enterprise competitiveness. The World Bank report (2012) noted that Thai and Malaysian employers are willing to pay a premium for certain skills among workers working within the industry. In Thailand, skills such as English, numerical and leadership skills and even creativity skills command a wage premium. In Malaysia, professionals with very good communication, technical and IT skills command a wage premium relative to their fellow workers.

## References

- ADB (2008).** Asian Development Outlook 2008: Workers in Asia report, April 2008, <http://www.adb.org/publications/asian-development-outlook-2008-workers-asia>
- APEC (2014).** Report on the APEC Region Labour Market: Evidence of skills shortages and general trends in employment and the value of better labour market information systems, Jan 2014  
[http://publications.apec.org/publication-detail.php?pub\\_id=1533](http://publications.apec.org/publication-detail.php?pub_id=1533)
- Education First (2015).** EF English Proficiency Index 2015: Asia <http://www.ef.sg/epi/regions/asia/>
- ILO (2015).** ILO Report ASEAN Economic Community 2015: Enhancing competitiveness and employability through skill development, Feb 2015. [http://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/documents/publication/wcms\\_344796.pdf](http://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/documents/publication/wcms_344796.pdf)
- ILO and ADB (2015).** ASEAN Community 2015: Managing integration for better jobs and shared prosperity, 2014  
<http://www.adb.org/sites/default/files/publication/42818/asean-community-2015-managing-integration.pdf>
- ILO (2014).** ILO of Survey of ASEAN employers on skills and competitiveness, May 2014  
[http://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---sro-bangkok/documents/publication/wcms\\_249982.pdf](http://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---sro-bangkok/documents/publication/wcms_249982.pdf)
- IMF (2015a).** World Economic Outlook, Oct 2015
- IMF (2015b).** Regional Economic Outlook Asia & Pacific, Apr 2015
- OECD (2012).** Skills Development Pathways in Asia: Employment and Skills Strategies in Southeast Asia initiative (ESSSA), OECD Local Economic and Employment Development (LEED) Working Papers, 2012/12, OECD Publishing.
- World Bank (2012).** East Asia And Pacific Regional Report on Putting Higher Education to Work: Skills and Research for Growth in East Asia, 2012.  
[http://siteresources.worldbank.org/EASTASIAPACIFICEXT/Resources/226300-1279680449418/7267211\\_1318449387306/EAP\\_higher\\_education\\_fullreport.pdf](http://siteresources.worldbank.org/EASTASIAPACIFICEXT/Resources/226300-1279680449418/7267211_1318449387306/EAP_higher_education_fullreport.pdf)

## Appendix II: References

- ASEAN Today. (2016). *Malaysia's brain drain reaching critical stage*. Retrieved April 2016, from <http://www.aseantoday.com/2016/03/malysias-brain-drain/>
- Asian Development Bank. (2015). *Key Indicators for Asia and the Pacific 2015*. Manila.
- Asian Development Bank. (2016). *Analysis of Trends and Challenges in the Indonesian Labor Market*. Manila. Retrieved from <https://www.adb.org/sites/default/files/publication/182935/ino-paper-16-2016.pdf>
- Asian Development Bank. (2016). *Asian Development Outlook 2016*. Manila.
- Association of Thai Professionals in America and Canada. (2015). *STEM Education in the US and Its Translational Approaches to Thailand*.
- Auyong, H. (2014). *Singapore's Productivity Challenge: Part II*. Singapore: Lee Kuan Yew School of Public Policy.
- Aviation Week. (2015). *Speech by Minister of State, Teo Ser Luck at the MRO Asia Pacific*. Singapore.
- Bangko Sentral ng Pilipinas (BSP). (2015). *Economic and Financial Statistics*. Quezon City.
- Bloomberg Business. (2015). *Coding Boot Camp Enrollment Soars as Students Seek Tech Jobs*. Retrieved from Bloomberg Business: <http://www.bloomberg.com/news/articles/2015-06-08/coding-boot-camp-enrollment-soars-as-students-seek-tech-jobs>
- Business Insider. (2015). *This school won't charge women programmers for tuition until after they land jobs*. Retrieved from Business Insider Singapore: <http://www.businessinsider.sg/school-defers-tuition-for-women-coders-2015-10/#.ViXF8Xqqqko>
- Channel NewsAsia. (2015). *Channel NewsAsia*. Retrieved December 30, 2015, from More tech professionals needed in Singapore: IDA: <http://www.channelnewsasia.com/news/singapore/more-tech-professionals/2387798.html>
- Citigroup. (2016). *Citi GPS: Global Perspectives & Solutions: Digital Disruption - How FinTech is Forcing Banking to a Tipping Point*.
- Clearstate. (2015). *The Next Lap: Bioscience in Singapore 2025*. Singapore: Clearstate.
- CNBC. (2016). *Thailand is Asia Pacific's most popular tourist destination: Mastercard*. Retrieved February 2016, from <http://www.cnn.com/2016/01/27/thailand-is-asia-pacifics-most-popular-tourist-destination-says-mastercard.html>
- Deloitte. (2015). *Technology, Media and Telecommunications Predictions*.
- Department of Labor and Employment. (2012). *Industry Career Guide: Hotel, Restaurant and Tourism*. Manila.
- Department of Skills Development Thailand. (2002). *Skill Development Promotion Act*. Bangkok.
- Department of Statistics. (2016). *Labour Force Survey, Malaysia 2015*. Kuala Lumpur.
- Department of Tourism. (2014). *National Ecotourism Strategy & Action Plan 2013-2022*. Makati City.
- Department of Tourism. (2016). *Industry Performance for Travel and Tourism*. Retrieved from <http://www.tourism.gov.ph/pages/industryperformance.aspx>
- Department of Trade and Industry. (2014). *Securing The Future of Philippine Industries*. Retrieved from <http://industry.gov.ph/industry/electronics/>
- Digital News Asia. (2016). *MDeC's 2020 vision to make Malaysia a regional BDA hub*. Retrieved May 2016, from <https://www.digitalnewsasia.com/mdec%E2%80%99s-2020-vision-make-malaysia-regional-bda-hub>
- Economic Development Board. (2016). *Industry Summary: Electronics*. Retrieved from <https://www.edb.gov.sg/content/edb/en/industries/industries/electronics.html>
- Economic Planning Unit, Prime Minister's Department. (2015). Retrieved December 2015, from <http://www.epu.gov.my/en/economic-statistics/national-accounts>
- Economic Planning Unit, Prime Minister's Department. (2015). *Eleventh Malaysia Plan: Strategy Paper 10: Transforming Education System*. Putrajaya.
- Economic Planning Unit, Prime Minister's Department. (2015). *Eleventh Malaysia Plan: Strategy Paper 15: Driving ICT in the Knowledge Economy*. Putrajaya.
- Economic Planning Unit, Prime Minister's Department. (2015). *Eleventh Malaysia Plan: Strategy Paper 5: Achieving Universal Access to Quality Healthcare*. Putrajaya.

- Economic Planning Unit, Prime Minister's Department. (2015). *Eleventh Malaysia Plan: Strategy Paper 8: Labour Market for an Advanced Nation*. Putrajaya.
- Economist Intelligence Unit. (2015). *Economy Forecast: Thailand*. Retrieved from <http://country.eiu.com/article.aspx?articleid=1874158171&Country=Thailand&topic=Economy&subtopic=Forecast&sububtopic=Forecast+summary>
- EU-Indonesia Business Network. (2014). *EIBN Sector Report: Automotive*. Jakarta.
- FinTech Singapore. (2016). *Smartly.sg Announces Robo-Advisor for Singapore Targeted at Southeast Asian Millennials*. Retrieved March 2016, from <http://fintechnews.sg/1483/roboadvisor/smartly-sg-announces-robo-advisor-targeted-southeast-asian-millennials/>
- Hays Singapore. (2015). *Hays Quarterly Report - Banking and Financial Services*. Retrieved September 2015, from <https://www.hays.com.sg/report/banking-5912>
- Hays Singapore. (2015). *Hays Quarterly Report-- Finance Technology*. Retrieved September 2015, from <https://www.hays.com.sg/report/finance-technology-5913>
- Infocomm Development Agency. (2016). *Hot Demand for local Infocomm Talent*. Retrieved March 2016, from <https://www.ida.gov.sg/Tech-Scene-News/Tech-News/Tech-Adoption/2016/3/Hot-Demand-for-local-Infocomm-Talent>
- Infocomm Development Authority. (2006). *Growing to Grow Global*. Singapore.
- INQUIRER.net. (2015). *Demand in PH for network security professionals rising, says Cyberoam*. Retrieved from <http://business.inquirer.net/197323/demand-in-ph-for-network-security-professionals-rising-says-cyberoam>
- INQUIRER.net. (2016). *Electronics exports seen growing by 7 to 8%*. Retrieved March 2016, from <http://business.inquirer.net/206455/electronics-exports-seen-growing-7-8>
- Institute for Labour Studies Philippines. (2015). *Labour Force Survey 2015*.
- Institute of Labour Market Information & Analysis. (2015). *Pilot Critical Occupation List*. Retrieved from [http://www.ilmia.gov.my/dashboard/view/sas\\_jobs.php](http://www.ilmia.gov.my/dashboard/view/sas_jobs.php)
- Institute of Labour Market Information & Analysis. (2016). *Projection of jobs in NKEA sectors from 2010 to 2020*. Retrieved January 2016, from [http://www.ilmia.gov.my/dashboard/view/sas\\_forwardlooking.php](http://www.ilmia.gov.my/dashboard/view/sas_forwardlooking.php)
- International Labour Organization. (2012). *Strategic Plan: Sustainable Tourism and Green Jobs for Indonesia*. Jakarta.
- International Monetary Fund. (2016). *World Economic Outlook*. Washington, D.C.
- IT & Business Process Association Philippines. (2011). *Breakthrough: The Philippine Process Outsourcing Newsletter*.
- IT & Business Process Association Philippines. (2014). *Talent Deep Dive: An Analysis of Talent Availability for the Information Technology and Business Process Management Industry in 10 Provinces in the Philippines*. Quezon City: Department of Science and Technology Information and Communications Technology Office.
- Japan Economic Research Institute Inc. (2014). *Asian Industrial Foundation Development Research in FY2014 (Fact Finding Survey on Local SMEs in Indonesia)*. Retrieved from [http://www.meti.go.jp/meti\\_lib/report/2015fy/001104.pdf](http://www.meti.go.jp/meti_lib/report/2015fy/001104.pdf)
- Karlina Yusr, I., & Goodwin, R. (2013). Mobile Learning for ICT Training: Enhancing ICT Skill of Teachers in Indonesia. *International Journal of e-Education, e-Business, e-Management and e-Learning*, 293-296.
- Kementerian Perindustrian. (2012). *Regional IT Center of Excellence (RICE)*. Retrieved from [http://www.kemenperin.go.id/artikel/26/Regional-IT-Center-of-Excellence-\(RICE\)](http://www.kemenperin.go.id/artikel/26/Regional-IT-Center-of-Excellence-(RICE))
- Malaysia Digital Economy Corporation. (2015). *MDEC's Talent Enhancement Programmes Complements National Agenda to Boost Human Capital Development and Address Talent Gap*. Retrieved July 2015, from <http://www.mdec.my/news/talent-enhancement>
- Malaysia External Trade Development Corporation. (2015). *Top 10 Major Export Products, 2015*. Retrieved January 2016, from <http://www.matrade.gov.my/en/malaysia-exporters-section/33-trade-statistics/3816-top-10-major-export-products-2015>



- Malaysian Investment Development Agency. (2015). *IAC to address HR challenges in E&E sector*. Retrieved August 2015, from <http://www.mida.gov.my/home/2496/news/iac-to-address-hr-challenges-in-e-e-sector/>
- Manila Bulletin. (2016). *Job skills mismatch to dampen PH growth – study*. Retrieved March 2016, from <http://www.mb.com.ph/job-skills-mismatch-to-dampen-ph-growth-study/#Uag7AzzCMEXqhiYH.99>
- McKinsey & Company. (2012). *The Archipelago Economy: Unleashing Indonesia's Potential*. Jakarta.
- McKinsey & Company. (2015). *Ten ideas to maximize the socioeconomic impact of ICT in Indonesia*.
- Ministry of Communications and Information. (2015). *Infocomm Media 2025 Masterplan*. Singapore.
- Ministry of Education. (2014). *Education Statistics Digest*. Singapore.
- Ministry of Education, Malaysia. (2012). *Malaysia Education Blueprint 2013-2025*. Putrajaya.
- Ministry of Finance. (2015). *Committee On The Future Economy To Review Singapore's Economic Strategies and Position Us For The Future*. Singapore.
- Ministry of Finance. (2015). *Singapore Budget*. Singapore: Singapore Government.
- Ministry of Finance. (2016). *Singapore Budget*. Singapore: Singapore Government.
- Ministry of Information and Communication. (2016). *MCI to spend \$120 million to boost infocomm skills of Singaporeans*. Retrieved from <https://www.mci.gov.sg/web/department/infocomm/features/infocomm-manpower-development-initiatives>
- Ministry of Manpower. (2015). *Labour Market Report 2015*. Singapore.
- Ministry of Manpower. (2015). *Labour Market Statistics Information: Employment Summary Table*. Retrieved from Ministry of Manpower: <http://stats.mom.gov.sg/Pages/Employment-Summary-Table.aspx>
- Ministry of Manpower. (2016). *Job Vacancies Report 2015*. Singapore.
- Ministry of Manpower. (2016). *Statement on Labour Market Developments (March 2016)*. Singapore.
- Ministry of Trade and Industry. (2010). *Economic Survey of Singapore 2010*. Singapore.
- Ministry of Trade and Industry. (2014). *Economic Survey of Singapore 2014*. Singapore.
- Ministry of Trade and Industry. (2015). *Economic Survey of Singapore 2015*. Singapore.
- Ministry of Trade and Industry. (2015). *Singapore's Economic Growth Potential Up to 2020*. Singapore.
- Ministry of Trade and Industry. (2015). *Structure of Singapore Economy*. Singapore.
- Monetary Authority of Singapore. (2015). *Singapore Asset Management Survey 2014*. Singapore.
- Monetary Authority of Singapore. (2016). *"Talent Development in the Financial Sector" - Keynote Address by Ms Jacqueline Loh, Deputy Managing Director, Monetary Authority of Singapore, at Financial Women's Association's International Women's Day Celebration*. Retrieved April 2016, from <http://www.mas.gov.sg/News-and-Publications/Speeches-and-Monetary-Policy-Statements/Speeches/2016/Talent-Development-in-the-Financial-Sector.aspx>
- National Research Foundation. (2016). *Research, Innovation and Enterprise 2020 Plan: Winning the Future through Science and Technology*. Retrieved from <http://www.nrf.gov.sg/rie2020>
- National Statistical Office of Thailand. (2015). *Summary of the labor force survey in Thailand : July 2015*. Bangkok.
- OECD/Asian Development Bank. (2015). *Education in Indonesia: Rising to the Challenge*. Paris: OECD Publishing.
- Pang, E. F., & Lim, L. (2015). Labor, Productivity and Singapore's Development Model. *Singapore Economic Review*.
- Papademetriou, D. G., Sugiyarto, G., Mendoza, D., & Salant, B. (2015). *Achieving Skill Mobility in the ASEAN Economic Community: Challenges, Opportunities, and Policy Implications*. Manila: Asian Development Bank. Retrieved from <http://www.adb.org/sites/default/files/publication/178816/skill-mobility-asean.pdf>
- Parliament of Singapore. (2016). *Singapore Parl Debates: "Foreign Worker Representation in Tech and IT Sector". Vol 94, Sitting No 10; [24-03-2016]*. Singapore.
- Performance Management & Delivery Unit. (2012). *Economic Transformation Programme Annual Report 2011*. Retrieved June 2015, from [http://etp.pemandu.gov.my/annualreport2011/12\\_National\\_Key\\_Economic\\_Areas-@-Oil,\\_Gas\\_-%E2%97%98-\\_Energy.aspx](http://etp.pemandu.gov.my/annualreport2011/12_National_Key_Economic_Areas-@-Oil,_Gas_-%E2%97%98-_Energy.aspx)

- Performance Management & Delivery Unit. (2013). *Economic Transformation Programme - Palm Oil & Rubber*. Retrieved December 2015, from [http://etp.pemandu.gov.my/Palm\\_Oil-@-Palm\\_Oil\\_-%E2%97%98-\\_Rubber.aspx](http://etp.pemandu.gov.my/Palm_Oil-@-Palm_Oil_-%E2%97%98-_Rubber.aspx)
- Performance Management & Delivery Unit. (n.d.). *Human Capital Development (HCD)*. Retrieved January 2016, from [http://etp.pemandu.gov.my/Human\\_Capital\\_Development-@-Human\\_Capital\\_Development\\_\(HCD\).aspx](http://etp.pemandu.gov.my/Human_Capital_Development-@-Human_Capital_Development_(HCD).aspx)
- Persatuan Industri Komputer dan Multimedia Malaysia. (2014). *ICT Strategic Review 2014/15 Breaching The New Frontiers in the Digital Age*. Putrajaya.
- Philippine Government. (2009). *Republic Act No. 9593*. Retrieved from <http://www.gov.ph/2009/05/12/republic-act-no-9593-s-2009/>
- Philippine Government. (2013). *TESDA announces launch of innovative training programs as growth strategy*. Retrieved January 2016, from <http://www.gov.ph/2013/05/29/tesda-announces-launch-of-innovative-training-programs-as-growth-strategy/47/>
- Philippine Government. (n.d.). *The K to 12 Basic Education Program*. Retrieved January 2016, from <http://www.gov.ph/k-12/>
- Philippine Statistics Authority. (2015). *Employment Rate Estimated at 94.4 percent in October 2015*. Retrieved from <https://psa.gov.ph/content/employment-rate-estimated-944-percent-october-2015>
- Philippine Statistics Authority. (2015). *Labour Force Survey*.
- Philstar Global Corp. (2014). *CHED lists in-demand, priority college courses until 2018*. Retrieved from <http://www.philstar.com/campus/2014/05/26/1307196/ched-lists-demand-priority-college-courses-until-2018>
- Pholphirul, P. (2014). Job Vacancies, Skill Development and Training in Workplace: Evidence from Thai Manufacturers. *Journal of Applied Sciences*(14), 1898-1908.
- PwC. (2013). *Bridging the Gap: Human Capital requirement study for Iskandar Malaysia*. Kuala Lumpur.
- PwC. (2013). *Bridging the Gap: Human Capital requirement study for Northern Corridor Economic Region*. Kuala Lumpur.
- PwC. (2015). *Study on Potential Economic Impact of TPPA on the Malaysian Economy and Selected Key Economic Sectors*. Kuala Lumpur.
- REACH. (2016). *TechSkills Accelerator Set-Up To Engage ICT Sector*. Retrieved March 2016, from <https://www.reach.gov.sg/participate/discussion-forum/2016/03/24/techskills-accelerator-setup-to-engage-ict-sector>
- Royal Thai Government. (2016). *Committee for Digital Economy and Society approves National Digital Economy Master Plan*. Retrieved March 2016, from <http://www.thaigov.go.th/index.php/en/government-en1/item/99989-99989.html>
- Siam Commercial Bank, Economic Intelligence Center. (2015). *Insights: Staying ahead of Thailand's graying society*. Bangkok.
- Siam Commercial Bank, SCB Economic Intelligence Center. (2015). *Insights: Bridging Thailand's Labor Gap*. Bangkok.
- Singapore Infocomm Technology Federation. (2015). *Singapore Infocomm Technology Federation*. Retrieved October 2015, from Singapore needs 15000 more ICT professionals, said Communications and Information Minister Yaacob Ibrahim: [http://www.sitf.org.sg/SiTFsites/Web/SiTF\\_News\\_2015/Singapore\\_needs\\_15000\\_more\\_ICT\\_professionals.aspx](http://www.sitf.org.sg/SiTFsites/Web/SiTF_News_2015/Singapore_needs_15000_more_ICT_professionals.aspx)
- Singapore Infocomm Technology Federation. (2016). *SiTF urged to help tech companies develop ICM manpower capability*. Retrieved April 2016, from [https://www.sitf.org.sg/SiTFsites/Web/SiTF\\_News\\_2016/SiTF\\_urged\\_to\\_help\\_tech\\_companies\\_develop\\_ICM\\_manpower\\_capability.aspx](https://www.sitf.org.sg/SiTFsites/Web/SiTF_News_2016/SiTF_urged_to_help_tech_companies_develop_ICM_manpower_capability.aspx)
- Singapore Institute of Manufacturing Technology. (2015). *Working with us*. Retrieved from <https://www.a-star.edu.sg/simtech/Industry/Working-with-Us.aspx>
- Singapore Post Limited. (2014). *The Changing Face of eCommerce and Logistics in Asia Pacific*. Singapore.
- Singapore Workforce Development Agency. (2015, June). *Sectoral Manpower Development Plan (SMDP)*. Retrieved from <http://www.wda.gov.sg/content/wdaweb/L209-001About-Us/SMDP.html>
- Singapore Workforce Development Agency. (2016). *Local Workforce to Deepen Skills in Cutting-Edge Advanced Manufacturing Technologies*. Retrieved February 2016, from [http://www.wda.gov.sg/content/wdaweb/L209-001About-Us/L219-PressReleases/22\\_Feb\\_2016.html](http://www.wda.gov.sg/content/wdaweb/L209-001About-Us/L219-PressReleases/22_Feb_2016.html)

- SkillsFuture. (2015). *SkillsFuture Programmes & Initiatives*. Retrieved from SkillsFuture: <http://www.skillsfuture.sg>
- Starr, R., & Adams, J. (2015). *Strategy&*. Retrieved from 2015 Aerospace and Defense Trends: <http://www.strategyand.pwc.com/perspectives/2015-aerospace-defense-trends>
- [Editor's Note: Is there text missing (see yellow highlight above)]
- TalentCorp Malaysia. (2015). *Pilot Critical Occupation List*. Retrieved December 2015, from <https://www.talentcorp.com.my/facts-and-figures/critical-occupations-list>
- TalentCorp Malaysia. (2015). *Trends in Graduate Employment*. Retrieved December 2015, from <https://www.talentcorp.com.my/facts-and-figures/matching-talents-to-jobs>
- Tan, K. S., & Bhaskaran, M. (2015). The Role of the State in Singapore: Pragmatism in Pursuit of Growth. *The Singapore Economic Review*.
- Technical Education and Skills Development Authority. (2011). *National Technical Education and Skills Development Plan (NTESDP) 2011-2016*.
- Technical Education and Skills Development Authority. (2015). *Trainees pilot TESDA-Samsung electronics lab*. Retrieved January 2016, from <http://www.tesda.gov.ph/News/Details/6504>
- The Association of Southeast Asian Nations. (2015). *ASEAN ICT Masterplan 2015 Completion Report*.
- The Business Times. (2015). Evolving Logistics sector calls for new skill sets. Singapore: Singapore Press Holdings.
- The Jakarta Post. (2012). *Indonesia takes 19th spot as top IT spender*. Retrieved from <http://www.thejakartapost.com/news/2012/07/10/indonesia-takes-19th-spot-top-it-spender.html>
- The National Economic and Development Authority. (2011). *Philippine Development Plan 2011-2016*. Pasig City .
- The Office of Small and Medium Enterprises Promotion. (2015). *White Paper on Small and Medium Enterprises of Thailand in 2015*.
- The Star Online. (2016). *Tapping the global market*. Retrieved May 2016, from <http://www.thestar.com.my/metro/community/2016/05/04/tapping-the-global-market-council-all-set-to-boost-ee-industry/>
- The Straits Times. (2016). *Smart Nation Fellowship aims to woo top S'porean IT talent home*. Retrieved March 2016, from <http://www.straitstimes.com/singapore/smart-nation-fellowship-aims-to-woo-top-sporean-it-talent-home>
- Total Access Communication PLC. (2016). *Annual Report 2015*. Bangkok.
- World Bank. (2011). *Malaysia Economic Monitor - Brain Drain*. Washington DC.
- World Bank. (2013). *The financial sector is part of Malaysia's success*. Retrieved December 2015, from <http://www.worldbank.org/en/news/opinion/2013/06/04/The-financial-sector-part-of-malaysias-success>
- World Bank. (2015). *Malaysia Economic Monitor, December 2015 - Immigrant Labor*. Retrieved December 2015, from <http://www.worldbank.org/en/country/malaysia/publication/malaysia-economic-monitor-december-2015-immigrant-labour>
- World Bank. (2015). *Philippine Economic Update: Making Growth Work for the Poor*. Washington DC.
- World Bank. (2015). *World Databank - World Development Indicators*. Retrieved from <http://databank.worldbank.org/data/reports.aspx?source=world-development-indicators>
- World Bank. (2016). *Philippine Economic Update: Moving Full Speed Ahead: Accelerating Reforms to Create More and Better Jobs*. Washington DC.
- World Economic Forum. (2015). *Travel and Tourism Competitiveness Report 2015*. Geneva.
- World Travel & Tourism Council. (2015). *Travel & Tourism Economic Impact 2015 Indonesia*. London.
- World Travel & Tourism Council. (2015). *Travel & Tourism Economic Impact 2015 Philippines*. London.
- World Travel & Tourism Council. (2016). *Travel & Tourism Economic Impact 2016 Malaysia*. London.
- World Travel & Tourism Council. (2016). *Travel & Tourism Economic Impact 2016 Thailand*. London.
- Young, A. (1992). A Tale of Two Cities: Factor Accumulation and Technical Change in Hong Kong and Singapore. *NBER Macroeconomics Annual*, 13-64.

## Appendix III: List of Interviewees

### *Indonesia*

Bob Azam, Director, PT Toyota Motor Manufacturing Indonesia; Dr Ir Adjie Spat, M. Si, General Manager, PT Toyota Manufacturing Indonesia; Professor Dr Djusman S. Simandjuntak, Prasetiya Mulya Business School; Ir Sumarna F. Adburahaman, Chairman, National Professional Certification Board (BNSP); Armin, Certification Manager, Metalworks and Machinery, BNSP; Ir Surono MPhil, Chairman of Committee for Planning and Institutional Harmonisation, BNSP; Dr Ilham A. Habibie, Executive Chairman, National ICT Council; Farisay Setiadi, Vice Chairman Secretariat Team, National ICT Council; Nofel Saleh Hilabi SH, Indonesia Chamber of Commerce and Industry; Freddy A. Sutrisno, Senior Advisor, The Association of Indonesia Automotive Industries; Kukuh Kumara, Secretary-General, The Association of Indonesia Automotive Industries

### *Malaysia*

Lee Chee Sung, Adviser, Institute of Labour Market Information and Analysis (ILMIA); Mahuran Sariki, Head, Research, Chief Executive Officer's (CEO's) Office, TalentCorp; Daryl Yong, Analyst, CEO's Office, TalentCorp; Tina Yeung, Committee Member, Malaysia International Chamber of Commerce and Industry; Tan Mei Ling, Associate Director for Strategic Reform Initiatives (Human Capital), Performance Management and Delivery Unit (PEMANDU)

### *The Philippines*

Alfredo I. Ayala, CEO, Ayala Education; Marissa G. Legaspi, Executive Director, Planning Office, Technical Education and Skills Development Authority (TESDA); Ursuala Mendossa, Division Chief, Policy Research and Evaluation Division, TESDA; Dominique R. Tutay, Director, Bureau of Labor Employment, Department of Labor and Employment; Merliza M. Markinano, Director, Development Academy of the Philippines; Anabelle Ochoa Moreno, National Skills Development Expert, Philippines Improving Competitiveness in Tourism (PICTourism); Ma. Corazon H. Halili-Dhchosa, Executive Director, Industry Development Services, Philippines Board of Investments; Professor Miguela M. Mena, Dean, Asian Institute of Tourism, University of the Philippines; Paul So, Executive Vice-President/Chairman, Philippines Travel Agencies Association; Penny S. Bongato, Executive Director for Talent Development and Research, IT and Business Process Association of the Philippines; Dr Natalie Chun, Economist, Asian Development Bank



## ABOUT AUTHORS



**Professor Tan Kim Song** is currently a faculty member at the School of Economics, and Director of the Master in Applied Economics Program, Singapore Management University (SMU). Before joining SMU, he was a managing director at Fleet Boston Bank, having also worked at other investment banks including Chase Manhattan, primarily in the fixed income market. Prior to that, he worked as a senior correspondent at the Straits Times, Singapore Press Holdings. Prof Tan is active in advisory and other businesses in the region including China and Myanmar. He sits on the board of a number of companies in Singapore and in the region. He has written and published widely on regional investment and regional economic development issues. Prof Tan holds a PhD in Economics from Yale University and a First Class Honors in Economics from Adelaide University. Professor Tan is project lead and lead author of *Managing Skills Challenges in ASEAN-5*.



**Professor James T.H. Tang** is Dean and Professor of Political Science, School of Social Sciences, Singapore Management University (SMU). Prior to joining SMU he was a Professor in the Department of Politics and Public Administration at the University of Hong Kong (HKU), having served as Head of the Department of Politics and Public Administration (1999-2002), Dean of Social Sciences (2002-2006), and founding director of the Master of International and Public Affairs program at HKU previously. Professor Tang has held visiting appointments at leading universities in China, the UK, and the US and was a Visiting Fellow at the Brookings Institution (2005-06). He is a specialist in international relations with special reference to China/Hong Kong and the Asia-Pacific region, including China-ASEAN relations. He has published extensively in his field and serves on the editorial boards of a number of academic journals. A graduate of HKU, Prof Tang holds an M.Phil in International Relations from Cambridge University and a Ph.D. from the London School of Economics and Political Science.

We endeavor to provide accurate and timely information, still there is no guarantee that the information contained herein is accurate as of the date it is received or it will continue to be accurate in the future. Under no circumstances shall Singapore Management University be liable for damages arising from the interpretation and use of the information.

Publication date: October 2016