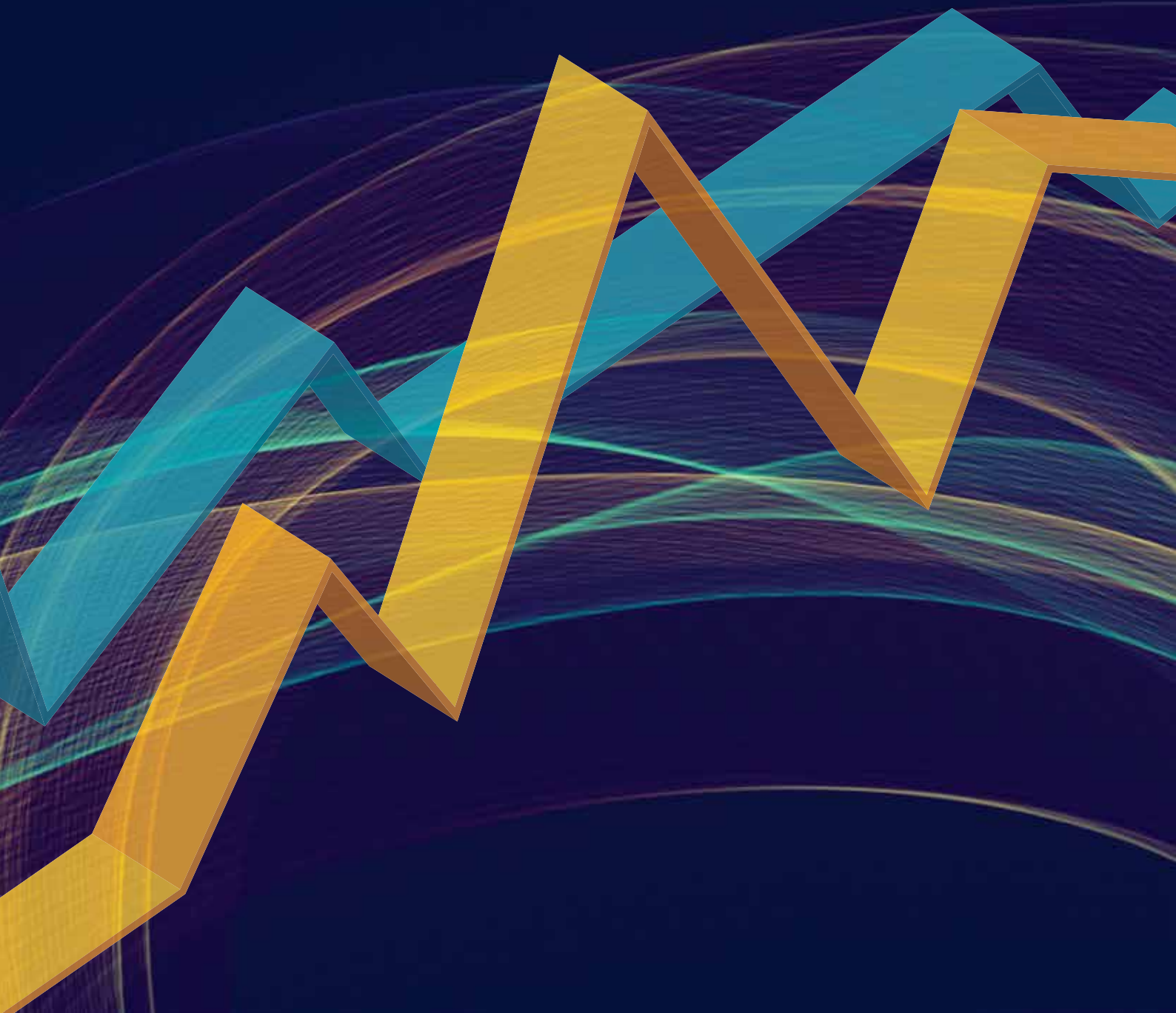
PENANG ECONOMIC AND DEVELOPMENT REPORT

2017 / 2018



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2017 / 2018

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making ideas work

for Penang state government

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Preface

This biennial report is initiated by the Penang Economic Planning Division (BPEN), and Penang Institute is commissioned to prepare this report. The report presents an overview of Malaysia's economic performance followed by an in-depth analysis of the present state of socio-economic development in Penang. This includes the sectoral developments, namely, manufacturing, services, construction and agriculture sectors. This report also comprises the analysis of environmental issues such as pollution and waste management, as well as public finance performance.

Acknowledgements

Our deepest gratitude goes to Penang Economic Planning Division (BPEN), Penang Island City Council (MBPP), Seberang Perai Municipal Council (MPSP), State Finance Office, Invest Penang, Penang Global Tourism, Penang Port, Penang Water Authority (PBA), Department of Statistics Malaysia (DOSM), National Property Information Centre (NAPIC), Malaysia Investment Development Authority (MIDA), Department of Environment (DOE) and Meteorological Department, to name a few. We also like to thank the members of Economic Planning State Executive Council committee for their feedback on this report.

The project was ably led by Ms Ong Wooi Leng, Head of Penang Institute's Head of Socioeconomics and Statistics Programme, with concerted and dedicated efforts by her research team. Her key team members include Ms Yeong Pey Jung, Dr Negin Vaghefi and Mr Timothy Choy Xia Wei. Our special appreciation goes to Dr. Lim Chee Han, Mr Darshan Joshi, Dr Sri Ramasamy, Mr Tan Lii Inn and Mr Jonathan Dason (intern), who also contributed towards the writing for this report. Last but not least, this report would not have been made possible without the endless statistical assistance from Penang Institute's Statistician – Ms Ng Kar Yong. Her commitment in gathering and compiling relevant statistics for all the researchers is highly appreciated.

Message from
The Right Honourable Chief Minister of Penang

It has been an inspiration for Penang to achieve success in development over the last 10 years. This is due to the effort of various parties in ensuring that the welfare of the people is well taken care of. The change of government at the federal level does bring new possibilities for Penang. While Penang is still maintaining its status as a rapidly developing industrial state in the country, a slight change in the state's administrative focus to family-focused policy-making is essential to ensure sustainability and resilience of the state.

In August 2018, a new vision for the state of Penang was launched – **Penang2030: A Family-focused Green and Smart State that Inspires the Nation** – which will be fundamental for Penang's state administration philosophy. This is a visionary package that is built upon the many projects that are implemented and planned over time. Over the last decade, Penang has built a strong foundation in its economic development through investments from various sectors. The outcome of this investment has certainly benefitted more than 1.7 million Penangites. Such an achievement becomes more meaningful with due recognition accorded from within and outside Malaysia. In addition to actual economic investment, there is a significant emphasis on human resource development, the creation of a better lifestyle environment and the provision of business and employment opportunities for the local people. The inclusive and sustainable development for the people reflects the State Government's commitment to bring Penang towards becoming a family-focused green and smart state that inspires the nation.

The Penang state government will continue to focus on efforts that can improve the quality of life of the people. Hence, all planned development projects will ensure that it covers all aspects of the people's livelihood and that no one is left behind in the development of the state. More importantly, the Penang2030 vision encourages the empowerment of people to strengthen civic participation. As mentioned, Penang2030 being a visionary package that is built upon the many projects Penang has pioneered, data and trends have become effective indicators that could diagnose the current as well as actual performance of Penang in many significant areas. Evidence-based policy making will definitely benefit the development of niche business services and will be able to assist in identifying the untapped potential of the various important sectors developing in Penang.

It is my pleasure to take this opportunity to congratulate the State Economic Planning Division and the Penang Institute for the commitment given to the successful publication of this biennial publication. This ensures that every agenda for the development of the state is recorded as a reference in the future.

Thank you.

CHOW KON YEOW
CHIEF MINISTER OF PENANG

Message from
The Honourable Deputy Chief Minister II of Penang

Salam Sejahtera dan Salam Integriti.

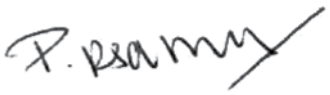
Over the past 10 years many new initiatives have been mobilized through various policies and programmes that prioritize the development and sustainability of the people of Penang towards a brighter future. Various efforts to further stimulate economic activity in strengthening existing growth continue to be the mainstay of development plans. Focus remains on human resource development so that it meets social needs and ensures that revenue sharing is fair and equitable.

The State Government is aware of its responsibility to give the best to the people and stakeholders by emphasizing the welfare and local development of Penang.

Therefore, the State Government is called upon to make significant contribution towards the welfare of the people of Penang. The State Government has always been getting support from various sections of society. Despite the continued emphasis on strengths in the economic sector, the State Government at the same time is faced with various challenges to ensure the people can share the benefits generated from these economic activities through various inclusive programmes.

The State Government is aware that there are still many things that need to be done. Hence, it will continue to increase its efforts to serve and meet the needs of its stakeholders and the people. The focus is now clear, translating all State Government policies for the benefit of the people as a whole. Despite having to face the uncertain economic situation, the people will always remain the Government's priority in making progressive decisions beyond expectations in order to ensure that the income is truly shared fairly and equitably.

Finally, it is hoped that such a report will further enhance the progress and excellence of Penang throughout the country and the world.



PROF. DR. RAMASAMY A/L PALANISAMY
DEPUTY CHIEF MINISTER II OF PENANG

Message from
The Honourable State Secretary of Penang

Assalamualaikum WBT.

Gratitude to the Divine Presence as the Penang Economic and Development Report for 2017/2018 is once again published.

I would like to mention here that Penang is a very special state. Its uniqueness lies in the fact that it not only focuses on physical and economic development but also emphasizes on social development, resource optimization and human resource management. At the same time, the people's welfare is not neglected. Every development implemented has benefited the people and the entire community.

In continuing to build a more competitive Penang, a number of key projects have been successfully implemented through policies and programmes that benefit both investors and the people. In future, more programmes will be planned and executed to ease the rising cost of living. These wealth sharing efforts will be implemented through plans and space development to create a competitive and skilled community in Penang. The outlined strategies are in line with policies and programmes undertaken by the State Government.

This achievement is an excellent proof of close cooperation and strong support from all strategic players in Penang, the State Government and the masses. This valuable support is crucial when the country is facing global economic challenge and the State Government should continue to plan for greater achievement. The accomplishments achieved so far will set the direction of future planning of the State of Penang.

Wabilahhi taufik wal hidayah wassalamualaikum WBT.

DATO' SERI FARIZAN BIN DARUS
STATE SECRETARY OF PENANG

PENANG:
KEY STATISTICAL TABLES

Area (Square kilometers)					
Penang	**Timur Laut**	**Barat Daya**	**Seberang Perai Utara**	**Seberang Perai Tengah**	**Seberang Perai Selatan**
1,032	119	173	263	236	241

	2015		2016		2017	
	RM million	***% change***	**RM million**	***% change***	**RM million**	***% change***
POPULATION ('000) 1	**1,704.5**	***3.6***	**1,725.8**	***1.2***	**1,746.7**	***1.2***
Timur Laut	411.8	-	417.4	*1.3*	422.9	*1.3*
Barat Daya	322.9	-	327.4	*1.4*	331.9	*1.4*
Seberang Perai Utara	186.8	-	189.1	*1.2*	191.4	*1.2*
Seberang Perai Tengah	561.3	-	566.9	*1.0*	572.5	*1.0*
Seberang Perai Selatan	221.8	-	224.9	*1.4*	228.0	*1.4*
Total Malaysians	**1,566.6**	***1.5***	**1,584.8**	***1.2***	**1,602.8**	***1.1***
Bumiputera	705.4	*2.6*	718.1	*1.8*	730.6	*1.7*
Chinese	690.7	*0.6*	694.4	*0.5*	698.0	*0.5*
Indian	165.2	*0.6*	166.9	*1.0*	168.5	*1.0*
Others	5.2	*13.0*	5.4	*3.8*	5.6	*3.7*
Non-Malaysians	**137.9**	***34.0***	**141.0**	***2.2***	**144.0**	***2.1***
DOMESTIC PRODUCTION						
Gross Domestic Product (GDP) (constant 2010 prices)	**69,835**	***5.5***	**73,739**	***5.6***	**77,641**	***5.3***
Agriculture	1,551	*1.9*	1,507	*-2.8*	1,540	*2.2*
Mining and quarrying	54	*4.4*	59	*8.7*	63	*6.2*
Manufacturing	31,181	*6.8*	32,870	*5.4*	34,759	*5.7*
Construction	2,060	*-3.5*	2,273	*10.4*	2,045	*-10.1*
Services	34,344	*4.7*	36,297	*5.6*	38,312	*5.6*
GDP per capita (current prices, RM)	**44,844**	***6.5***	**47,345**	***5.6***	**49,873**	***5.3***
STATE GOVERNMENT FINANCE						
Operating revenue	897.7	*12.2*	1,029.9	*14.7*	687.4	*-33.3*
Operating expenditure	825.9	*10.8*	940.6	*13.9*	1,354.5	*44.0*
Operating balance	**71.8**	-	**89.2**	-	**-667.1**	-
Development revenue	168.3	*4.8*	317.2	*88.4*	887.4	*179.8*
Development expenditure	194.8	*1.3*	307.5	*57.8*	887.4	*188.6*
Development balance	-26.5	-	9.7	-	0.0	-
Overall balance (surplus/deficit)	***45.3***	-	***99.0***	-	***-667.1***	-

Note:
The population is the revised projection based on the adjusted 2010 Population and Housing Census, Malaysia.
The State government finance in 2017 is the revised estimate.

PENANG:
KEY STATISTICAL TABLES

	2015		2016		2017	
	RM million	% change	RM million	% change	RM million	% change
EXTERNAL TRADE						
Gross exports	**189,444**	***8.8***	**193,444**	***2.1***	**233,493**	***20.7***
of which:						
Machinery & transport equipment	137,055	*9.4*	137,468	*0.3*	161,453	*17.4*
Miscellaneous manufactured articles	31,016	*15.3*	32,976	*6.3*	42,400	*28.6*
Chemicals	6,461	*1.2*	7,382	*14.3*	9,036	*22.4*
Manufactured goods	7,945	*-7.2*	7,880	*-0.8*	8,702	*10.4*
Crude materials, inedible	2,480	*6.7*	2,675	*7.9*	4,411	*64.9*
Miscellaneous transactions and commodities	799	*-6.8*	1,265	*58.4*	3,277	*158.9*
Gross imports	**156,389**	***1.2***	**166,250**	***6.3***	**196,427**	***18.2***
of which:						
Machinery & transport equipment	101,104	*1.7*	109,321	*8.1*	128,473	*17.5*
Manufactured goods	11,602	*2.9*	12,029	*3.7*	13,319	*10.7*
Miscellaneous manufactured articles	10,845	*15.9*	12,065	*11.2*	13,224	*9.6*
Chemicals	8,897	*13.5*	9,734	*9.4*	11,526	*18.4*
Miscellaneous transactions and commodities	7,042	*-2.2*	7,144	*1.5*	9,669	*35.4*
Food	6,828	*4.5*	7,052	*2.8*	7,449	*5.6*
Total trade	**345,833**	**5.3**	**359,694**	***4.0***	**429,920**	***19.5***
Trade balance (surplus/deficit)	***33,055***	***68.3***	***27,194***	***-17.7***	***37,065***	***36.3***
PRICES						
Consumer price index (2010 = 100)	113.4	*2.5*	116.2	*2.5*	120.9	*4.0*
House price index (2010 = 100)	171.4	*7.3*	180.7	*5.4*	189.8	*5.0*
LABOUR FORCE						
Labour force ('000)	848.1	*3.2*	845.5	*-0.3*	839.5	*-0.7*
Labour force participation rate (%)	69.9	-	69.0	-	67.5	-
Female labour force participation (%)	59.0	-	57.9	-	55.7	-
Male labour force participation (%)	80.6	-	79.9	-	79.2	-
Employed ('000)	834.2	*3.1*	827.4	*-0.8*	822.2	*-0.6*
Unemployed ('000)	13.9	*6.9*	18.1	*30.2*	17.3	*-4.4*
Unemployment rate (%)	1.6	-	2.1	-	2.1	-
Youth unemployment rate (15-24 years old: %)	5.5	-	5.5	-	6.9	-

PENANG:
KEY STATISTICAL TABLES

	2015		2016		2017	
	RM million	% change	RM million	% change	RM million	% change
APPROVED MANUFACTURING INVESTMENT						
Total investment	**6,724.3**	***-17.6***	**4,293.9**	***-36.1***	**10,811.9**	***151.8***
Domestic investment	2,225.6	*-27.0*	1,237.0	*-44.4*	2,271.4	*83.6*
Foreign investment	4,498.7	*-12.0*	3,056.9	*-32.0*	8,540.5	*179.4*
Number of employment	18,725	*4.6*	10,816	*-42.2*	13,553	*25.3*
Total investment by district						
Timur Laut	19.0	-	9.7	*-49.1*	-	-
Barat Daya	1,637.9	-	2,205.9	*34.7*	7,363.7	*233.8*
Seberang Perai Utara	40.5	-	28.4	*-30.0*	53.5	*88.7*
Seberang Perai Tengah	2,382.2	-	1,195.4	*-49.8*	1,583.4	*32.5*
Seberang Perai Selatan	385.5	-	507.5	*31.7*	1,811.2	*256.9*
Seberang Prai	2,259.2	-	347.1	*-84.6*	-	-
Total investment by major industry						
Electronics & Electrical Products	4,456.9	*-7.3*	1,735.5	*-61.1*	6,710.1	*286.6*
Scientific & Measuring Equipment	191.0	*-62.4*	983.3	*414.9*	1,769.3	*79.9*
Chemical & Chemical Products	141.6	*-6.1*	52.9	*-62.6*	796.0	*1,404.4*
Machinery & Equipment	229.9	*-83.2*	194.3	*-15.5*	423.9	*118.2*
Textiles & Textile Products	-	-	30.0	-	332.5	*1,008.7*
Transport Equipment	202.0	*40.5*	646.2	*219.9*	173.0	*-73.2*
Fabricated Metal Products	86.9	*-67.2*	160.8	*85.1*	225.5	*40.2*
Non-Metallic Mineral Products	970.0	*3,191.4*	117.1	*-87.9*	-	-

	2014	2016	Compounded annual growth rate (%)
HOUSEHOLD INCOME			
Number of household ('000)	**413.3**	**430.7**	***2.1***
Median household income (RM)	**4,702**	**5,409**	***7.0***
Timur Laut	4,979	5,964	*9.0*
Barat Daya	5,148	5,844	*6.3*
Seberang Perai Utara	4,259	4,753	*5.5*
Seberang Perai Tengah	4,508	5,172	*6.9*
Seberang Perai Selatan	4,390	4,872	*5.2*

Percentage of household (%)	2014			2016		
	T20	M40	B40	T20	M40	B40
Timur Laut	42.2	38.6	34.5	45.9	37.5	31.9
Barat Daya	16.1	12.0	10.9	14.8	14.9	10.8
Seberang Perai Utara	15.4	15.4	20.4	13.2	15.1	20.1
Seberang Perai Tengah	18.2	24.1	23.0	19.6	22.2	24.7
Seberang Perai Selatan	8.0	9.9	11.2	6.6	10.3	12.7

Contents

Abbreviations

ACFTA	ASEAN-China Free Trade Agreement
AEC	ASEAN Economic Community
AES	*Agenda Ekonomi Saksama* or Equitable Economic Agenda
AFTA	ASEAN Free Trade Agreement
AHKFTA	ASEAN-Hong Kong Free Trade Agreement
AI	Artificial intelligence
AIFTA	ASEAN-India Free Trade Agreement/Area
AIIB	Asian Infrastructure Investment Bank
AJCEP	ASEAN-Japan Comprehensive Economic Partnership
AKFTA	ASEAN-Korea Free Trade Agreement
APAC	Asia-Pacific
API	Air Pollution Index
APMG	Asia-Pacific Masters Games
BNM	Bank Negara Malaysia
BOD	Biochemical Oxygen Demand
BoG	Bill of Guarantees
BOR	Bed occupancy rate
BPO	Business process outsourcing
BRI	Belt and Road initiative
BRT	Bus rapid transit
CAT	Competency, accountability and transparency
CAT	Congestion Alleviation Transport
CAT	Crush Aedes Totally
CM	Contract manufacturing
CO	Carbon Monoxide
COD	Chemical Oxygen Demand
CPI	Consumer Price Index
CPTPP	Comprehensive and Progressive Agreement for Trans-Pacific Partnership
DHPI	Detached House Price Index
DL	Distribution licensee
DO	Dissolved Oxygen
DVS	Department of Veterinary Services
E&E	Electrical and electronic
ECB	European Central Bank
ECRL	East Coast Rail Link
EEI	Estimated economic impact
EFTA	European Free Trade Association
EMDE	Emerging market and developing economy
ETS	Electric Train Service
EU	European Union
FiT	Feed-in tariff
FTA	Free Trade Agreement
GBS	Global Business Services
GDP	Gross domestic product
GNI	Gross national income
GST	Goods and Services Tax
GTWHI	George Town World Heritage Incorporated
GVC	Global value chain

HPI	House Price Index
HSR	High-speed rail
IMF	International Monetary Fund
IoT	Internet of things
IP	Invest Penang
ITO	Information technology outsourcing
KLIA	Kuala Lumpur International Airport
KLIA2	Kuala Lumpur International Airport 2
KPO	Knowledge process outsourcing
KTMB	Keretapi Tanah Melayu Berhad
LAIA	Latin American Integration Association
LED	Light-emitting diodes
LRT	Light rail transit
LSS	Large-scale solar
LTV	Loan-to-value
MAFTA	Malaysia-Australia Free Trade Agreement
MBPP	Penang Island City Council
MCKIP	Malaysia-China Kuantan Industrial Park
MEEPA	Malaysia-European Free trade Area Economic Partnership Agreement
MHTC	Malaysia Healthcare Travel Council
MICE	Meetings, incentives, conferences and exhibitions
MICECA	Malaysia-India Comprehensive Economic Cooperation Agreement
MIPTA	Malaysia-Iran Preferential Trade Agreement
MJEPA	Malaysia-Japan Economic Partnership Agreement
mmscfpd	million standard cubic feet per day
MNC	Multinational corporation
MNE	Multinational enterprise
MPSP	Seberang Perai Municipal Council
MSR	Maritime Silk Road
MSW	Municipal Solid Waste
MWQI	Marine Water Quality Index
NAFTA	North American Free Trade Area
NEM	Net energy metering
NH_3	Unionized Ammonia
NH_3N	Ammoniacal Nitrogen
NO_2	Nitrogen Dioxide
NO_3	Nitrate
NWQS	National Water Quality Standards
O&G	Obstetrics and gynaecology
O&G	Oil and Grease
O_3	Ozone
PBAPP	Penang Water Authority
PBO	Purpose-Built Office
PCC	Penang Cybercity
PCEB	Penang Convention and Exhibition Bureau
PCET	Penang Centre of Education Tourism
PDC	Penang Development Corporation
PGT	Penang Global Tourism

PIA	Penang International Airport
PM_{10}	Particulate Matter with a diameter less than 10 micron
PMED	Penang Centre of Medical Tourism
PO_4	Phosphate
PRF	Permanent Reserved Forest
PTMP	Penang Transport Master Plan
PV	Photovoltaic
PWCC	Penang Waterfront Convention Centre
R&D	Research and development
RCEP	Regional Comprehensive Economic Partnership
RE	Renewable energy
REF	Renewable Energy Fund
REPP	Renewable energy power producer
RFP	Request for Proposal
ROO	Rules of Origin
RPA	Robotic process automation
SAARC	South Asian Association for Regional Cooperation
SCO	Shanghai Cooperation Organisation
SEDA	Sustainable Energy Development Authority
SESB	Sabah Electricity Sdn. Bhd.
SME	Small and medium enterprise
SO_2	Sulphur Dioxide
SOHO	Small Office-Home Office
SREB	Silk Road Economic Belt
SS	Suspended Solids
SSL	Self Sufficiency Level
SSO	Shared services and outsourcing
SST	Sales and Services Tax
SWM	Solid Waste Management
TEU	Twenty-foot Equivalent Unit
THPI	Terraced House Price Index
TNB	Tenaga Nasional Berhad
TPPA	Trans-Pacific Partnership Agreement
TSS	Total Suspended Solids
UiTM	Universiti Teknologi Mara
US	United States
USM	Universiti Sains Malaysia
VA	Virtual agents
VSS	Voluntary Separation Scheme
WCS	Water conservation surcharge
WQI	Water Quality Index
WSTS	World Semiconductor Trade Statistics
y-o-y	year-on-year

Figures

Tables

Executive Summary

Recent economic developments and outlook

Penang's economy recorded stable growth in 2017 despite being moderated to 5.3%, underpinned by strong growth in all economic activities except construction, as well as mining and quarrying sectors. A similar growth rate is also seen in Penang's GDP per capita, which was the third-largest rate of growth after Kuala Lumpur (9.6%) and Labuan (6.6%). The manufacturing and services sectors continued to be key economic drivers, accounting for about 45% and 49% of the total GDP in Penang, respectively. While agriculture, mining and quarrying, and construction sectors altogether contributed less than 5% of the state's economy, the construction sector experienced a double-digit decline in output at 10.1% in 2017, largely due to the slowdown in demand and supply of residential units.

The external market maintained its positive growth with improved global demand on exported goods, along with increased trade surpluses in 2017 amid a stronger Ringgit Malaysia. Machinery and transport equipment continued to make up the largest proportion of export and import values. This includes industrial machinery, office machines, telecommunications, and sound recording. This also reflects the main manufacturing industries in Penang such as semiconductors, optoelectronics, and automation where most of the goods were handled by the North Butterworth Cargo Terminal (seaport) and Bayan Lepas airport; the latter is ranked number one among all air cargos in Malaysia by trade value. Due to an increase of about 40% in export value recorded at the airport in the first four months of 2018 over the same period in 2017, Penang's trade surplus is projected to steadily accelerate in 2018.

At the household level, Penang's median monthly household income expanded at a faster rate than its median household expenditure. This means that households possess higher real income along with better living standards. Based on the latest Household Income and Expenditure Survey, households on Penang Island had higher income than those in Seberang Perai. However, households in Seberang Perai Selatan are expected to have higher income in the first half of 2019 as development projects in Batu Kawan will provide job opportunities to local residents. While the rise in retail fuel prices was the main contributing factor to growth in household expenditure in 2017, total expenditure is projected to be moderated in 2018 due to the zero-rated goods and services tax (GST) that took place in June, boosting purchasing power. In contrast, the return of the sales and services tax (SST) – a single-stage tax – will affect the manufacturing cost of taxable goods and services, where processed goods and services are likely to be affected.

In terms of income distribution, while Penang's household median household income for the top 20% (T20) was slightly lower than the national T20 median household income, both middle 40% (M40) and bottom 40% (B40) households had higher median household income against the national median monthly income. A majority of T20 households resided in Timur Laut, followed by Seberang Perai Tengah, which grew at 3.7% and 1.4% per annum, respectively, from 2014–16. Meanwhile, Timur Laut was also topped with B40 and M40 households in Penang. Though the overall Gini coefficient was lowered in 2016, income inequality improved across all administrative districts in Penang except Seberang Perai Tengah. However, under a conditional cash transfer programme provided by Agenda Ekonomi Saksama (AES), hardcore poverty has been abolished, with all districts registering a poverty incidence rate of zero, except Seberang Perai Selatan.

Penang's labour market remained resilient, with stable unemployment rate and lower retrenchment activity in 2017. Despite the declining trend of employment size in other economic sectors, manufacturing was the only sector experiencing an expansion in employment. While the share of tertiary educated workforce stood at 32%, Penang has the fourth-largest tertiary educated workforce in the country, with a proportion of high-skill positions recruiting non-tertiary graduates. Youth unemployment remained low compared to the national youth unemployment rate (6.9% versus 10.8%).

In addition, the manufacturing sector continued to register an increasing number of job vacancies, where high-tech manufacturing companies advertised the most job vacancies that are largely related to product development and manufacturing processes. However, software design vacancies at information technology and global business services (GBS) took much longer to fill compared to other jobs. In 2018, the labour market condition is expected to remain strong due to the expansion of manufacturing operations in Batu Kawan Industrial Park, with continued investment support from foreign and domestic companies.

Manufacturing sector

The manufacturing sector continued to play a fundamental role in Penang's economy – as well as Malaysia's as a whole. The sector's GDP grew at 5.7% in 2017 compared to 5.4% in 2016, contributing 13% to the national manufacturing output. Approved investment improved more than twofold, generating over 13,000 new jobs, with foreign investment continuing to be the major driver in 2017. Electrical and electronic (E&E) products remained the top investment industry for both domestic and foreign companies. Given that Penang is the country's key E&E hub, the industry contains a high level of capital productivity with relatively high levels of imported technological content, such as computer, electronic, and optical products as intermediate inputs.

While the global demand for electronic components remains strong, over half of the total approved investment in the first three months of 2018 were related to machinery and equipment, reflecting the positive growth in precision machining and industrial automation industry. This industry is projected to contribute significantly to the state's manufacturing growth in 2018, largely spearheaded by investment from the local large companies and small and medium enterprises (SMEs) – which have often been supporting the multinational corporations (MNCs) in the ecosystem.

In addition, to embrace the rise of the fourth industrial revolution – involving digitisation of manufacturing, internet of things, autonomous robotics, big data analytics, and additive manufacturing, industrial automation needs to be a key technological enabler. While transitioning the existing establishment towards Industry 4.0 is important, upskilling the vocational and academic systems to overcome skill shortages is equally essential – a collaborative effort led by Penang STEM 4.0.

Services sector

The services sector grew at a rate of 5.6% in 2017, down by 0.1 percentage point from 2016. This was largely attributed to the growth in utility, transport and storage, information and communication (7.4%), wholesale, food, beverages and accommodation (6.5%), and other services (5%). Parallel with the robust growth in external trade, the logistics sub-sector continued to gain support from Penang port and airport, with air cargo handled exceeding the ship cargo handled. While the number of ship calls and total gross registered tonnage recorded negative growth rates of 7.3% and 7.4%, respectively, the port showed an increase in containers handled (4.5%), dry bulk (10.6%), liquid bulk (2%), and containerised goods (10.8%) for Q1 2018 – a result of declining foreign shipments. Over 90% of air cargo, on the other hand, handled international freight, which grew at 5.7% y-o-y over the same period. This trend is expected to continue in 2018 due to positive growth in trade, where Bayan Lepas International Airport is the main air logistics hub in Malaysia.

For local transport, Penang saw a reduced number of new motor vehicle registrations in 2017, particularly due to the shrinking number of new private passenger car registrations. Meanwhile, rail service has also become the main mode of transport within Seberang Perai and from outside Penang. Apart from the inter-city KTM Electric Train Service (ETS), the northern region's KTM commuter services connect many small towns in Perak, Penang, and Kedah. In total, rail services had an increase of more than eightfold in passengers carried in 2016, and this number is projected to continue rising with the opening of Penang Sentral in 2018, which will be the main transportation hub for Greater Penang. This will also lead to an increase in the number of users for ferry services.

GBS is a relatively new services sub-sector in Penang, involving advanced services in accounting, procurement, finance, information technology, and knowledge process. Penang attracted GBS companies by establishing itself as a hub for third-party outsourcing, as well as a shared services center. The latter is set up by MNCs which already have their manufacturing bases in Penang or Malaysia, while the former are knowledge and service providers, which include IHS Markit, Thomson Reuters, Tesla, and Swarovski. The state government is committed to developing this sub-sector by continually expanding office buildings within Penang Cybercity to cater to the needs of GBS companies.

The tourism sector is expected to continue growing strong in 2018 particularly due to a number of international events, such as the Asia Pacific Masters Games 2018 and the Penang International Food Festival; outstanding medical services; and a thriving international cruise industry. Total air passengers arriving at Penang International Airport increased by 8.1% to 3.5 million passengers in 2017; international passengers arriving from Thailand, China, and Taiwan showed a significant increase, with Singapore and Indonesia still holding the largest share of visitors. Cruise passengers, on the other hand, also surged by about 25% in 2017, with cruises to nowhere being the most popular among domestic and international tourists. In terms of accommodation, beach hotels recorded higher occupancy rates compared to city hotels at about 66% in 2016 and 2017.

Penang consistently dominated in health tourism, accounting for about 60% of total health tourists in the country; 10.3% of international visitors comprised health tourists whose main purpose of visiting Penang was to seek medical treatment. The state attracts more than 90% of health tourists from Indonesia per year, generating increasing revenue for the medical tourism sector. While the state will continue to host conventional tourism activities, the wedding and education tourism sub-sectors are the new areas of focus for Penang's tourism industry.

Penang's health services in general made a significant contribution to the state's GDP. According to the 2016 Economic Census, the value of gross output for health services increased by 7.5% per year from 2010–15, accounting for 2.4% of the state's GDP with a workforce of about 11,000. While government hospitals recorded high numbers of outpatients, private hospitals received a larger pool of in-patients and admissions compared to government hospitals, with 92 admissions per 1,000 population compared to 77 per 1,000 population for public hospitals. For major communicable diseases, head, foot, and mouth (HFM) disease is the major health threat in terms of number of incidents in 2016, followed by dengue. Meanwhile, the workforce for health services showed vast improvement, with the doctor-population ratio narrowing significantly from 1:817 in 2008 to 1:554 in 2016. Interestingly, private hospitals in Penang had more nurses than public hospitals; private hospitals had 3.35 nurses to support one doctor compared to only 1.83 nurses to a doctor in government hospitals.

Construction sector

Though the construction sector experienced a double-digit decline of 10.2% in GDP, the sector is projected to recover moderately in 2018, supported by solid growth in construction work for residential and non-residential projects in the first three months of 2018. However, the prices of all types of houses in Penang grew at a slow pace except for semi-detached units, which is also reflected in the reduced number of existing residential housing available, with a majority of the completed housing units located in Seberang Perai Utara. The number of incoming supply – or under construction – is also balanced out by a gradual decline in planned supply – new residential units – where all districts saw a decrease in new residential units except in Seberang Perai Selatan. Likewise, non-residential units also saw a drastic drop in incoming supply, attributed to slow construction activity in commercial and industrial properties.

Agriculture sector

As one of the smallest sectors in Penang, agriculture activity continued to grow at 2.2% in 2017, driven by crop production and aquaculture. Paddy fields marked the largest share of total agricultural land use for rice production, trailing behind rubber and palm oil, and the production is affected by weather condition. It is important to note that Penang's rice yield is the second-largest in the country after Selangor. While the planted area for vegetables were on an expansion rate of 6% per year from 2009–16, the planted area for fruits would remain the same despite an increase in fruit production.

The livestock industry declined by 2.5% in 2017, and the total livestock population also plunged by 15% in the same year. Beef production grew by 3.6% annually from 2012–17, but demand for beef still exceeds current production. Similarly, lamb production remains insufficient compared to chicken, pork, and eggs. While chicken production dipped in 2017, poultry meat overall had stable production, catering well to domestic demand. In contrast, eggs production declined significantly to 235.6 million in 2017, valued at RM78.5 million, down nearly 20% from 2016.

While marine landing fish reported a rising trend over the last three years, overfishing has led to the development of an aquaculture industry in Penang. It is forecast that overall aquaculture production will increase at a rate of 10% per year until 2020. Penang is now marked as the third-largest aquaculture producer after Sabah and Perak. The industry had the majority of its production originating from brackish water ponds and cages, contributing to about one-third of the total fish production in Penang.

1 Global and Malaysia's Economic Performance

1.1 Global economic performance

Resilient growth in advanced and emerging economies

The world economy is estimated to exceed its growth potential, largely supported by the steady performances of most advanced economies except Japan. According to the April 2018 World Economic Outlook published by the International Monetary Fund (IMF), growth in advanced economies, as well as emerging market and developing economies (EMDEs) will continue to strengthen before levelling off in 2019. Therefore, it is important for policymakers to present appropriate economic plans and policies so that the growth can be boosted sustainably before the next downturn.

Real global GDP grew at 3.8% in 2017 (3.2% in 2016), and will grow slightly to 3.9% in 2018. This is led by the improved growth in advanced economies and EMDEs. Advanced economies are projected to surge by 2.5% in 2018 (2.3% in 2017), with faster rates of growth in the United States and the euro area, supported by the recovery in export commodities and the European Central Bank's (ECB) highly accommodative monetary policy.

The US domestic economy has shown improvement, where the unemployment rate shrank to 4.4% in 2017 – the lowest rate in nine years. The industrial production index rose by 1.5% in 2017 after a drop of 1.9% a year ago. Likewise, investment as a share of GDP increased to 19.8% in 2017, and is expected to increase to 20.2% in 2018 (Table 1.2). It is, however, projected that the US output expansion may not be sustainable due to external downside risks, namely increased protectionism and rising geopolitical tensions in North Korea and the Middle East, which could dampen confidence and lead to financial market volatility. Moreover, imports jumped to 4.0% growth in 2017 (versus 1.3% in 2016), and the volume of imports is predicted to increase further by 6.8% in 2018 amid an escalating protectionism trade policy.

Table 1.1 Real GDP growth for selected economies (%)

	2015	2016	2017	2018*	2019*
World	**3.5**	**3.2**	**3.8**	**3.9**	**3.9**
Advanced economies	**2.3**	**1.7**	**2.3**	**2.5**	**2.2**
United States	2.9	1.5	2.3	2.9	2.7
Euro area	2.1	1.8	2.3	2.4	2.0
Germany	1.5	1.9	2.5	2.5	2.0
France	1.1	1.2	1.8	2.1	2.0
Italy	1.0	0.9	1.5	1.5	1.1
Japan	1.4	0.9	1.7	1.2	0.9
South Korea	2.8	2.8	3.1	3.0	2.9
Emerging and developing economies	**4.3**	**4.4**	**4.8**	**4.9**	**5.1**
China	6.9	6.7	6.9	6.6	6.4
India	8.2	7.1	6.7	7.4	7.8
ASEAN	**4.9**	**5.0**	**5.3**	**5.3**	**5.4**
Singapore	2.2	2.4	3.6	2.9	2.7
Thailand	3.0	3.3	3.9	3.8	3.8
Indonesia	4.9	5.0	5.1	5.3	5.5
Philippines	6.1	6.9	6.7	6.7	6.8
Malaysia	5.0	4.2	5.9	5.3	5.0

* *Projections*
Source: World Economic Outlook database April 2018, International Monetary Fund (IMF).

Table 1.2 Investment to GDP for selected economies (%)

Percent of GDP	2015	2016	2017	2018*	2019*
World	**25.8**	**25.2**	**25.6**	**26.0**	**26.4**
Advanced economies	**21.2**	**21.0**	**21.2**	**21.5**	**21.8**
United States	20.4	19.7	19.8	20.2	20.8
Euro area	20.0	20.4	20.9	21.1	21.3
Germany	19.1	19.2	19.7	19.7	20.0
France	22.8	23.0	23.4	23.2	23.1
Italy	17.3	17.1	17.5	17.7	17.9
Japan	24.0	23.6	24.0	24.6	24.7
Emerging and developing economies	**32.9**	**32.1**	**32.3**	**32.9**	**33.0**
China	44.7	44.1	44.4	44.2	43.7
India	31.8	30.3	31.7	32.0	32.1
ASEAN	**28.0**	**28.3**	**28.5**	**29.2**	**29.6**
Singapore	27.1	27.0	27.6	27.7	27.6
Thailand	22.3	21.1	22.8	24.2	24.7
Indonesia	34.1	33.8	33.4	33.9	34.2
Philippines	21.2	24.3	25.0	26.2	27.0
Malaysia	25.1	25.9	25.5	25.4	25.7

** Projections*
Source: World Economic Outlook database April 2018, International Monetary Fund (IMF).

In contrast, Japan's economy is expected to stumble to a growth rate of 1.2% in 2018, compared to the 1.7% increase in 2017, due to the stalled exports of electronic parts and other items, as well as rising prices of goods. The planned consumption tax hike in 2019 will have negative effects on growth in 2020, along with the country's aging population and shrinking labour force. Japan will experience a full employment situation; its unemployment rate declined to only 2.8% in 2017.

In comparison to South Korea, the country's forecast for economic growth was lowered by 0.1 percentage point to 3% in 2018. Subdued employment and consumption are likely to contribute to the softer growth rate. These are offset by the investment in infrastructure and government spending to support public health insurance. South Korea's unemployment rate also increased by 0.1 percentage point to 3.8% in 2017, while the inflation rate surged by 1.9% in 2017, up from 0.97% in 2016, which resulted in lackluster private spending (Table 1.3).

EMDEs on the other hand are set to expand at 4.9% in 2018 (4.8% in 2017). This is largely supported by the relative solid expansion in China's and India's economies. Despite the fact that China's economy expanded to 6.9% in 2017, it is expected to experience lower rates of growth at 6.6% in 2018 and 6.4% in 2019, stemming from rapid credit growth and a diminishing fiscal stimulus. Apart from rising trade frictions in advanced economies, rising geopolitical tensions with North Korea will also pose downside risks to the world's second-largest economy.

China's exports peaked in 2017 at a 9.2% rate of growth while its imports spiked at a 6.9% growth rate. As the United States-China trade dispute looms, both exports and imports are expected to grow modestly in 2018 due to tariff barriers on 128 US products including soybeans, oranges, and cars, following the new US trade policy to impose duties on China's steel and aluminum. Box 1.1 discusses the state of affairs of the trade war between China and the United States.

India's economy is among the very few countries to show continued progress. It grew from an increase of 6.7% in 2017 to a forecast increase of 7.4% in 2018 and 7.8% in 2019. India is believed to become the fastest-growing major economy in the world, and it could potentially reach a double-digit growth rate as its medium-term prospects remain optimistic. This is attributed to its recovery from demonetisation and the introduction of the Goods and Services Tax (GST), as well as robust private consumption. The country's young demographics will lead to a better consumption pattern, since India is the world's second-most-populous nation after China.

Table 1.3 Inflation rate for selected economies (%)

Percent of GDP	2015	2016	2017	2018*	2019*
World	**2.8**	**2.8**	**3.0**	**3.5**	**3.4**
Advanced economies	**0.3**	**0.8**	**1.7**	**2.0**	**1.9**
United States	0.1	1.3	2.1	2.5	2.4
Euro area	0.0	0.2	1.5	1.5	1.6
Germany	0.1	0.4	1.7	1.6	1.7
France	0.1	0.3	1.2	1.5	1.6
Italy	0.1	-0.1	1.3	1.1	1.3
Japan	0.8	-0.1	0.5	1.1	1.1
South Korea	0.7	1.0	1.9	1.7	1.9
Emerging and developing economies	**4.7**	**4.3**	**4.0**	**4.6**	**4.3**
China	1.4	2.0	1.6	2.5	2.6
India	4.9	4.5	3.6	5.0	5.0
ASEAN	**3.3**	**2.4**	**3.1**	**3.2**	**2.9**
Singapore	-0.5	-0.5	0.6	1.2	1.0
Thailand	-0.9	0.2	0.7	1.4	0.7
Indonesia	6.4	3.5	3.8	3.5	3.4
Philippines	1.4	1.8	3.2	4.2	3.8
Malaysia	2.1	2.1	3.8	3.2	2.4

** Projections*
Source: World Economic Outlook database April 2018, International Monetary Fund (IMF).

Box 1.1 The US-China trade war, and the Belt and Road initiative

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The impact of US-China trade war on Malaysia's economy

Malaysia's trade is heavily dependent on China, with about 13.5% of exports trading into the country – making it Malaysia's second-largest export destination – and 19.6% of imports originating from China, highest among importing countries. Most of Malaysia's traded commodities are intermediate goods, with E&E products taking the lion's share (Nawawi et al., 2015). With a trade dependence on the Asia-Pacific region centering on China, Malaysia's trade position may be exposed to a short-term risk in the global supply chain.

Given the dominance of E&E in Malaysia's trade, and the Trump's administration's intention to decrease its dependence on China for manufacturing, US companies might experience a growth in the production of such goods within the country. If this is the case, Malaysia would face decreasing exports to China in the short term.

In the long run, this may create opportunities for US companies to increase their investment into establishing offshore corporations in Southeast Asia. Malaysia is thus predicted to see a boom in foreign investment, which may then allow the supply chain to vertically integrate, and potentially give Malaysia the capability to export more finished goods directly to the United States.

This is evidenced by the growth in Malaysia-United States trade of 16.3%, with the E&E sector driving more than half of the expansion in 2017 (Kana, 2018).

Penang will benefit from the escalation of trade tensions between the United States and China as the majority of the US E&E companies are concentrated in Penang. The increasing level of trade and investment is expected to further accelerate Malaysia's economy.

The Belt and Road initiative

Malaysia may be well positioned to take advantage of the escalating United States-China trade war spat in terms of trade, China's influence in Malaysia from a geopolitical standpoint is unlikely to wane, especially when its Belt and Road initiative (BRI) is taken into consideration.

Mooted in 2013 by President Xi Jinping, the BRI aims to invigorate the economies of more than 60 countries through the land-based Silk Road Economic Belt (SREB) and the sea-based Maritime Silk Road (MSR) (China's OBOR: opportunities and challenges, 2017). It seeks to enhance regional connectivity and economic cooperation through infrastructure investment, education, automobile, and real estate.

The BRI takes precedence, especially with the United States pulling out from the Trans-Pacific Partnership Agreement (TPPA). In fact, China has committed US$40 billion to its Silk Road Fund and led the establishment of the Asian Infrastructure Investment Bank (AIIB) (Lau, 2017). It is likely to use strategic investments and infrastructure development to place itself in a position of economic and political dominance within the region of its coverage.

Unveiled by the Shanghai Stock Exchange, the Association of Chartered Certified Accountants (2017), and Lau (2017), the five priorities of BRI can be explained in the context of Malaysia.

i. Policy coordination which aims to boost intergovernmental cooperation and build mechanisms for the facilitation of such processes. Malaysia received a good sum of BRI-related investment, with low levels of political barriers for regional projects.
ii. Connecting infrastructure that aims to align technical standards to link Asia, Europe, and Africa through an infrastructure network. Projects include the East Coast Rail Link (ECRL), the Malaysia-China Kuantan Industrial Park (MCKIP), the Melaka Gateway deep-sea port, and the upgrading of the Kuantan Port. However, the ECRL is being reviewed by the current Malaysian administration.
iii. Unimpeded trade which seeks to remove barriers for investment and trade. This can be observed with the establishing of a digital free trade zone by China's Alibaba Group Holding Limited in Malaysia. Apart from e-commerce, the unimpeded trade is also seen in the pineapple trade; exports to China are expected to double by 2020.
iv. Financial integration, which seeks to enhance the financial system by creating facilities for monetary stability, systems for investment, and financing. The AIIB and the Shanghai Cooperation Organisation (SCO) were set up to regulate the Silk Road Fund.
v. People-to-people bonds intends to bring people together to deepen partnerships through cultural, academic, and talent exchanges. For example, Malaysia's Xiamen University campus – the first overseas campus by a Chinese university – is a means of fostering academic and cultural ties.

Although the BRI initiative will bring positive spillover effects through the development of infrastructure projects – the property and tourism sectors in particular with significantly benefit – it is still too early to assess the benefits and risks of the BRI projects. The ability of the government to meet loan repayments of large-scale infrastructure projects is the key concern, highlighted by the present government.

The way forward

Looking at Malaysia's trade pattern and foreign policy, China has become the country's top trading partner. While the nation effectively remains focused on the Asia-Pacific region, it would be wise to consider diversifying trade destinations. Agreements such as the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) may help facilitate market access and the movement of people and ideas beyond the ASEAN+6[1] region.

[1] ASEAN member countries are Brunei Darussalam, Burma, Cambodia, Indonesia, Philippines, Malaysia, Laos, Singapore, Thailand, and Vietnam. ASEAN+6 added China, Japan, South Korea, Australia, New Zealand, and India.

Presently, Malaysia faces substantial trade risks due to its dependence on a small set of countries. With China asserting its influence through its BRI initiative and its strong influence within the Regional Comprehensive Economic Partnership (RCEP), Malaysia risks falling deeper into China's influence, using its trade prowess as a bargaining tool.

With Malaysia experiencing a small but increasing trade with the United States, the United States-China trade war appears to be what the country needs to move up the production value chain. Furthermore, free trade agreements (FTAs) such as the Malaysia-Iran Preferential Trade Agreement (MIPTA) and the Malaysia-European Free Trade Area Economic Partnership Agreement (MEEPA) have the potential to balance Malaysia's trade relationships.

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Modest growth in ASEAN countries

A majority of ASEAN countries are projected to experience moderate growth in 2018, while a steady growth rate is estimated for the entire ASEAN economy. This is likely due to the regional cooperation agreements such as the ASEAN Free Trade Area (AFTA) agreement within the ASEAN community to foster regional integration. As the fourth-largest exporting region in the world, ASEAN accounts for only 3.3% of world output and more than 7% of exports, trailing the European Union and North America (Menon, 2018). Since both exports and imports grew at more than 9% in 2017, the forecast for the region's trade growth for 2018 and 2019 is optimistic. While the predicted growth in most ASEAN countries is slowing down, the real GDP is projected to maintain its growth at 5.3% in 2018. Among the five major ASEAN countries, Indonesia and Philippines are forecasted to sustain its growth momentum to 5.3% and 6.7% in 2018, respectively (2017: 5.1% and 6.7%).

As the most developed country in ASEAN, Singapore's economy peaked at 3.6% in 2017 (2016: 2.4%), which was predominantly attributed to solid manufacturing expansion. The sector's growth will continue to support economic expansion in 2018 with an estimated milder growth at 2.9%. However, the first quarter of 2018 showed a continued surge in the manufacturing sector, expanding by 10.1%, with electronics and precision engineering clusters as the biggest drivers. In addition, the services sector will continue to strengthen due to the positive spillover from the ongoing global recovery. The labour market continued to show improvements in terms of low retrenchment and unemployment rates. The downside risk is likely to persist due to protectionist sentiments and trade policies globally.

The Thai economy is expected to expand at 3.8% in 2018 (2017: 3.8%) with domestic demand recovery. The World Bank estimated that regulatory reforms and policy stability, including skills reform and quality infrastructure investments, are contributing to the improvements in business sentiment. The growth gains traction in the external sector are benefiting from buoyant tourist inflows and strong demand for merchandised exports. In terms of labour market conditions, Thailand recorded the lowest unemployment rate among ASEAN countries with just 1.1% in 2017. Nevertheless, policymakers will have to tackle the challenges of innovation breakthroughs to expand new industries, create jobs, and increase incomes.

While other countries are estimated to post a weaker growth in real GDP, Indonesia will experience a persistent and solid growth rate at 5.3% in 2018 (2017: 5.1%) despite the unemployment rate dropping by 0.2 percentage point to 4.3% in 2017. This is largely led by strong investment and net exports resulting from recovering commodity prices and robust international trade. Indonesia's investment as a share of GDP is the largest among ASEAN countries, which proportionately accounted for at least one-third of the country's GDP. However, Indonesia's fiscal policy will need to address resource allocation on priority areas to enhance the effectiveness of government spending (The World Bank, 2018a).

The Philippine economy retained its growth momentum at a decent pace, and it posted the strongest real GDP growth rate among the world's fastest-growing economies. The country grew at 6.7% in 2017 (2016: 6.9%) with the IMF maintaining its growth projection for 2018. Robust external demand is the key contributor to the sustained growth rate. The exports increased by 11.4% in 2017 while imports rose by 7%. The double-digit growth in exports is projected to continue in 2018. As the inflation rate increased to 3.2% in 2017 (2016: 1.8%), the Philippine central bank mounted pressure by raising the interest rate to 3.25% in response to the rising inflation rate and the weakening peso.

1.2 Malaysia's Economic Performance

Domestic demand accelerates national growth

In 2017, the Malaysian economy grew at a faster rate of 5.9% compared to the past two years amid a challenging global trade environment. The growth, underpinned by domestic demand, continued to be the key driver of growth with strong private consumption and investment, and an improved external market. Bank Negara Malaysia (BNM) forecasted the GDP growth at between 5.5% and 6% in 2018. Meanwhile, the gross national income (GNI) measuring the contribution of Malaysian nationals to the output grew by about 10% in 2017, albeit with a continued increase in money flowing into foreign countries.

Private consumption surged by 7% in 2017, accounting for nearly 46% of total GDP, and it is expected to accelerate further to 7.2% in 2018 (Table 1.4). Meanwhile, private investment is projected to continue growing at a relatively high rate of 9.1% in 2018. Due to the new lineup in the federal government, the forecasted public investment will decelerate by more than 3.2% in 2018 in response to the reviews of several infrastructure projects, including the Kuala Lumpur-Singapore high-speed rail (HSR), gas pipeline projects, and the ECRL.

Private consumption is expected to increase from June to August 2018 following the zero-rated GST. During the three-month tax holiday period, consumers' purchasing power is estimated to improve. Moreover, the propensity to consume among consumers within this period may likely be lead the consumers' spending for the year, holding all else constant.

With a budgeted RM43.8 billion GST revenue, which is to be collected in 2018, Malaysians pay an average of RM3.65 billion per month in consumption tax, and they have an additional estimated RM3.65 billion or RM114 per person to spend every month from June to August before the Sales and Services Tax (SST) is reinstated in September. B40 and M40 income earners are likely to spend on durable products such

Table 1.4 Annual growth rate of GDP by demand components in Malaysia (at 2010 constant prices)

	2014	2015	2016	2017	2018f	Q1 2018
Final consumption expenditure	6.4	5.7	4.9	6.7	-	5.7
Private	7.0	6.0	6.0	7.0	7.2	6.9
Public	4.4	4.5	0.9	5.4	0.6	0.4
Gross fixed capital formation	4.8	3.6	2.7	6.2	-	0.1
Private	11.1	6.3	4.3	9.3	9.1	0.5
Public	-4.7	-1.1	-0.5	0.1	-3.2	-1.0
Export of goods and services	5.0	0.3	1.3	9.4	8.8	3.7
Import of goods and services	4.0	0.8	1.3	10.9	9.1	-2.0
GDP	6.0	5.1	4.2	5.9	5.5-6.0	5.4

f Forecast
Source: Bank Negara Malaysia and Economic Planning Unit, Malaysia.

as passenger cars, consumer electronics, and home appliances. No significant effect will be seen in consumption patterns among T20 income earners.

Headline inflation[2] rose steeply at 3.7% in 2017. This was mainly attributed to the increase in the prices of transportation and food and beverages, at about 14% and 4%, respectively. The rate softened to 1.8% y-o-y in Q1 2018 compared to 3.6% y-o-y in Q4 2017, which was lower than the full-year projection made by BNM at between 2–3%. A smaller increase in domestic fuel prices was the contributor to this reduction, where global oil prices rose marginally along with rebounded value of the Ringgit – as of April 2018, the Ringgit appreciated by about 10% against the dollar. Likewise, the three-month zero-rated GST, along with the reintroduction of the SST in September 2018, will essentially make consumable goods slightly cheaper; the projected headline inflation will potentially increase at a slower rate in 2018.

In contrast, the producer price is expected to increase in the final four months of 2018 as a result of the SST, which will have ripple effects in the cost of production, which will then translate into higher prices of goods. During the first three months of 2018, the producer price index for local production decreased by 2.3% y-o-y compared to a decrease of 4.4% in Q1 2017. The reduction was seen in agriculture, forestry, and fishing at an average rate of 13.8%, and the manufacturing sector contracted at 1.8%. In terms of stage of processing, all three stages had lower prices, which include crude materials for further processing (-2.5%), intermediate materials, supplies and components (-2.4%), and finished goods (-1.6%) (Figure 1.1).

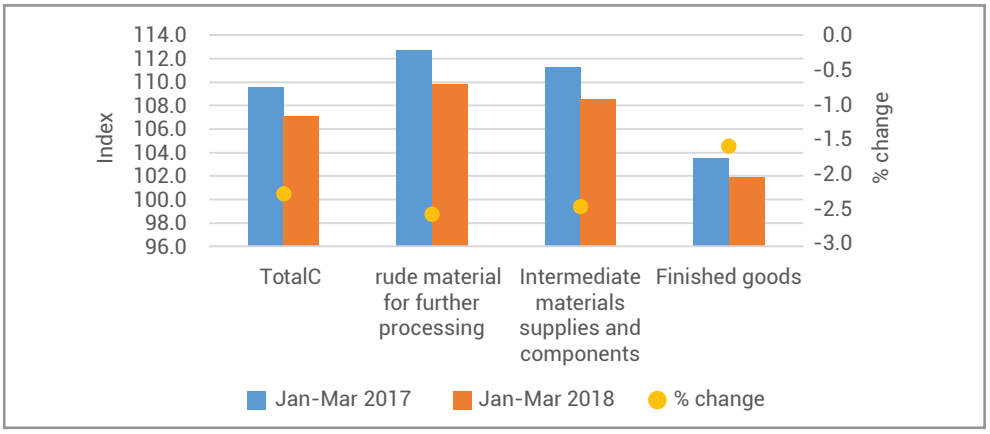
Given a weight of 56% for intermediate materials, supplies and components, the prices of materials for food manufacturing dropped significantly by 13.5% in the first quarter of 2018, while the price of processed fuels and lubricants rose by 5.3%. The weight for finished goods, on the other hand, is about 27.4%, and with the exclusion of foods, the prices of finished consumer goods plunged by 1.8%, with a significant hit specifically in durable goods (-4.8%). For example, the producer prices of computers, electronics, and optical products; and motor vehicles respectively slumped by 3.5% and 0.9%. The prices are expected to fall further from June to August 2018 due to the zero-rated GST, but will increase moderately after the return of the SST in September.

Within a relatively low interest rate environment, aggregate domestic demand is anticipated to increase through consumption and investment. Consumers have greater access to loans, and businesses take on debt at a low cost to boost spending and investment. While BNM raised its overnight policy rate from 3% to 3.25% in January 2018, the effect on consumers and borrowers is accommodative to balance the risk of excessive outstanding debt, surrounding with the low rate of inflation and steady outlook of domestic growth.

Services sector continues to be the key economic driver

From the supply side, all sectors exhibited strong expansion, except for the mining and quarrying sector (1%). Agriculture grew at 7.2%, followed by construction (6.7%), services (6.2%), and manufacturing (6%). The services sector remained

Figure 1.1 Producer price index and y-o-y change for local production, Malaysia



Source: Estimated from Bank Negara Malaysia and Department of Statistics, Malaysia.

[2] Headline inflation rate is a measure of total inflation within an economy, which includes commodities such as food and energy prices (e.g. oil and gas).

Table 1.5 GDP performance by economic sectors, Malaysia (at 2010 constant prices)

Sector	y-o-y change (%)					Share (%)
	2015	2016	2017	2018f	Q1 2018	2017
Agriculture	1.4	-5.2	7.2	3.6	2.8	8.2
Mining and quarrying	5.3	2.1	1.0	1.8	0.1	8.4
Manufacturing	4.8	4.4	6.0	5.9	5.4	23.0
Construction	8.4	7.4	6.7	7.3	4.9	4.6
Services	5.3	5.7	6.2	6.1	6.5	54.4
GDP at purchasers' value	5.1	4.2	5.9	5.5-6.0	5.4	100.0

f Forecast
Source: Bank Negara Malaysia and Economic Planning Unit, Malaysia.

as the main economic driver for the country. In 2017, this sector accounted for nearly 55% of the total national GDP, followed by manufacturing activity (23%), mining and quarrying (8.5%), agriculture (8.2%), and construction (4.6%) (Table 1.5). While the total GDP during Q1 2018 grew slightly slower than in Q1 2017, the services sector expanded by 6.5% during the first quarter of 2018, registering a higher rate of growth compared to the targeted rate of growth of 6.1% made by BNM. The growth was largely underpinned by wholesale and retail trade, insurance, and information and communication, which respectively grew at 7.9%, 9.8%, and 8.3% (Table 1.6).

Accounting for 23% of the national GDP, the growth in the manufacturing sector was supported by E&E products; optical products; and petroleum, chemical, rubber, and plastic products. This expansion corresponds to the production performance of export- and domestic-oriented industries. Based on the industrial production index, export-oriented production grew by 6.7% in 2017, up from 5% a year ago. During the first quarter of 2018, growth was high (5.8%) compared to domestic-driven industries such as food products (4.3%), beverages (5.4%), and transport equipment (1.6%). Among export-oriented industries, primary-related clusters such as chemical products (6.0%) and textiles wearing apparel and footwear (6.6%) outpaced the growth in electrical products (4.9%) from the E&E cluster—except electronics (6.1%) and machineries (7%). Nevertheless, for the full-year 2018, growth in the manufacturing sector will continue to be led by the E&E cluster and primary-cluster cluster from export-oriented industries.

Table 1.6 GDP growth rate for services sub-sectors, Malaysia (at 2010 constant prices)

Services sub-sector	y-o-y change (%)			
	2015	2016	2017	Q1 2018
Electricity and gas	3.1	5.0	2.0	3.9
Water	5.8	6.7	6.0	5.9
Wholesale trade	9.3	8.3	6.5	7.9
Retail trade	5.5	7.1	9.4	7.4
Motor vehicles	4.2	-3.0	1.2	-0.5
Accommodation	3.5	4.5	5.2	5.7
Food and beverage	7.2	7.8	8.1	8.2
Transport and storage	5.8	5.7	6.2	5.7
Information and communication	9.5	8.1	8.4	8.3
Finance	-0.1	1.3	4.9	6.8
Insurance	-1.7	6.6	3.7	9.8
Real estate and business services	6.5	6.9	7.4	7.4
Government services	4.2	4.9	4.9	4.8
Other services	4.8	4.9	5.1	5.3
Total	5.3	5.7	6.2	6.5

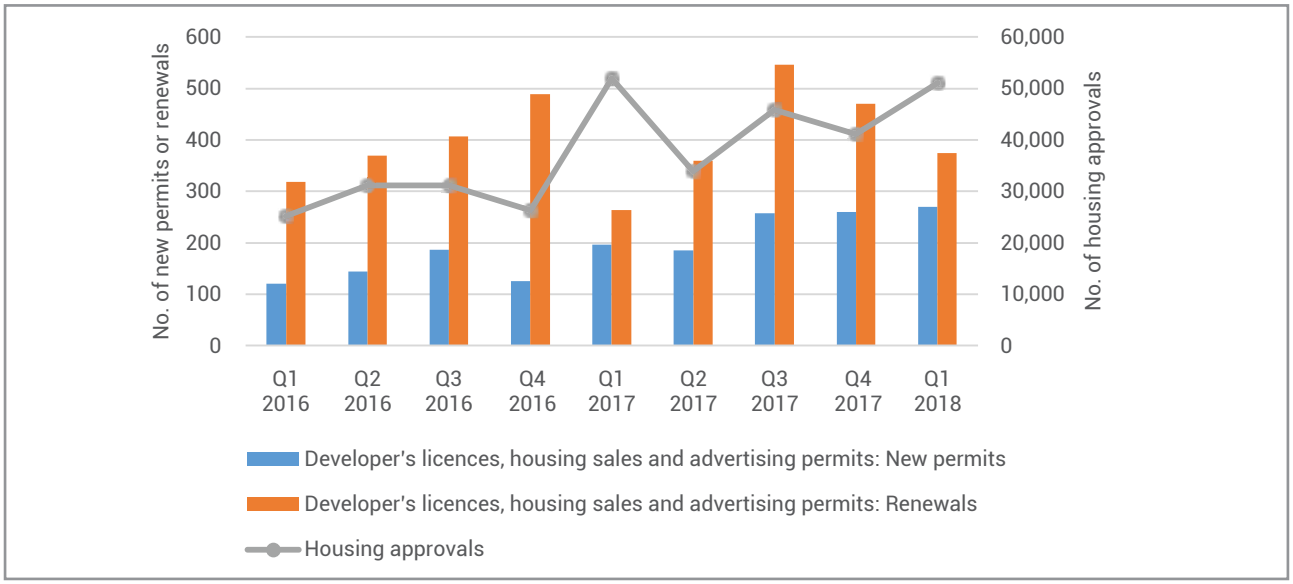
Source: Bank Negara Malaysia and Economic Planning Unit, Malaysia.

Table 1.7 Production of major agricultural and mining commodities

Commodities		2016	2017	Q1 2017	Q1 2018	y-o-y change	
						2016/17	Q1 2017/18
Rubber	('000 tonnes)	673.5	740.2	235.0	164.4	9.9%	-30.0%
Crude palm oil	('000 tonnes)	17,320.0	19,919.6	3,999.4	4,503.4	15.0%	12.6%
Crude palm kernel oil	('000 tonnes)	1,959.4	2,280.9	462.9	563.0	16.4%	21.6%
Saw logs	('000 cubic metres)	13,933.8	11,046.2	2,776.3	n.a.	-20.7%	-
Cocoa	(tonnes)	1,756.7	1,028.8	359.3	218.0	-41.4%	-39.3%
Tin-in-concentrates	(tonnes)	4,123.0	4,819.0	973.0	n.a.	16.9%	-
Crude oil and condensates	('000 barrels per day)	666.5	647.9	665.5	669.6	-2.8%	0.6%
Natural gas (net)	(mmscfpd)	6,536.2	6,904.2	7,076.0	6,858.5	5.6%	-3.1%

Source: Bank Negara Malaysia.

Figure 1.2 Selected construction indicators in Malaysia, Q1 2016–Q1 2018



Source: Bank Negara Malaysia.

For primary economic sectors, the growth in agricultural activity was mainly supported by crude palm oil and crude palm kernel oil, which expanded by 12.6% and 21.6%, respectively, in Q1 2018 compared to Q1 2017 (Table 1.7). For the same period, production of rubber and cocoa substantially declined by 30% and 39.3% y-o-y, respectively. This is likely attributed to unstable weather conditions, resulting in supply disruptions and increased rubber and cocoa prices. Meanwhile, saw log production is estimated to considerably decrease due to environmental concerns over forest degradation. In 2018, the primary sectors are expected to grow insignificantly due to unpredictable weather conditions.

The construction sector made up the smallest share of the national GDP, of less than 5%, with a rate of growth of 4.9% y-o-y in the first three months of 2018 (Q1 2017: 6.6%). According to the Department of Statistics, the sector's growth was primarily attributed to expansion in civil engineering and specialised construction activities. The former posted a double-digit growth of 19.5%, which was enhanced by transportation and utilities-related projects, while the latter expanded by 8.6%. There was also an expansion in the production of concrete, cement, and plaster; and basic iron and steel products, as well as increases in new permits issued to developers, housing sales, and advertisements (Figure 1.2). In contrast, loans approved for construction recorded a decline of 28.3% to RM5.7 billion in Q1 2018 (Q1 2017: 83.3% and RM4.3 billion). For full-year 2018, growth in construction sector is anticipated to slow down due to a number of infrastructure projects undergoing assessment by the new federal administration.

Labour market remains stable

Malaysia's labour market remained buoyant in the first three months of 2018, with a favourable unemployment rate at 3.3% compared to 3.5% in the first three months of 2017. Total labour force participation increased by 2.2% y-o-y in the first quarter of 2018 with an increased employment rate of 2.3% y-o-y. In terms of occupational groups, service workers and shop market sale workers remained the largest employment composition, accounting for 22.4% of the total employed persons in Q1 2018, followed by elementary operators (12.8%), machine operators and assemblers (12.3%), and professionals (12.2%).

According to the Ministry of Human Resources, total job vacancies declined by 2.5% y-o-y for Q1 2018, likely due to reduced movement among employees between jobs. This can be seen in the reduced number of active job seekers, with a drop of 18.3% to 254,177 persons for Q1 2018 as compared to 311,276 job seekers registered in Q1 2017. The manufacturing sector had the highest number of job vacancies in the country, accounting for more than 40% of total vacancies, followed by wholesale and retail trade (7.8%). Among the occupational groups, elementary occupations, and plant and machine operators and assemblers were reported to have the most job vacancies compared to mid- and high-skill occupations.

Malaysian labour productivity, measured by value added per employee, recorded an increase of 3.6% in 2017 compared to 3.5% in 2016. This was attributed to an improved growth in value-added labour of 5.9% and total employment of 2%. However, the growth is lower than the rise in average salaries and wages (8.4%), with 1.8 million low-skilled foreign workers hired in Malaysia. Labour productivity in general should be boosted further if Malaysia is to move up the value chain by reducing the number of low-skilled foreign workers and increasing the number of high-skilled workers along with high quality jobs.

Despite its relatively small GDP contribution, mining and quarrying made up the highest rate of productivity growth at 6.3%, followed by services (4.7%) and manufacturing (4.2%) (Figure 1.3). Within the manufacturing sector, the production of transport equipment was the most productive, registering a growth of 8.8%, followed by the production of vegetables, animal oils and fats, and food at 7.0%. Meanwhile, among the services activities, retail trade saw the strongest increase in labour productivity at 7.4%, followed by transportation and storage (5.1%) and electricity and gas (4.5%). Labour productivity in motor vehicles and water, sewerage and waste management, on the other hand, declined by 3.6% and 4%, respectively.

The growth in mean salaries and wages outpaced the growth in labour productivity in all sectors except agriculture and manufacturing (Figure 1.3). This in turn reflects the productivity gap between how much employees are being paid and their productivity levels – the productivity level is not keeping pace with wages. Scarcity of labour, particularly in the areas of mining and quarrying and construction, may contribute to the growth of salaries in these sectors in order to make the jobs attractive to workers.

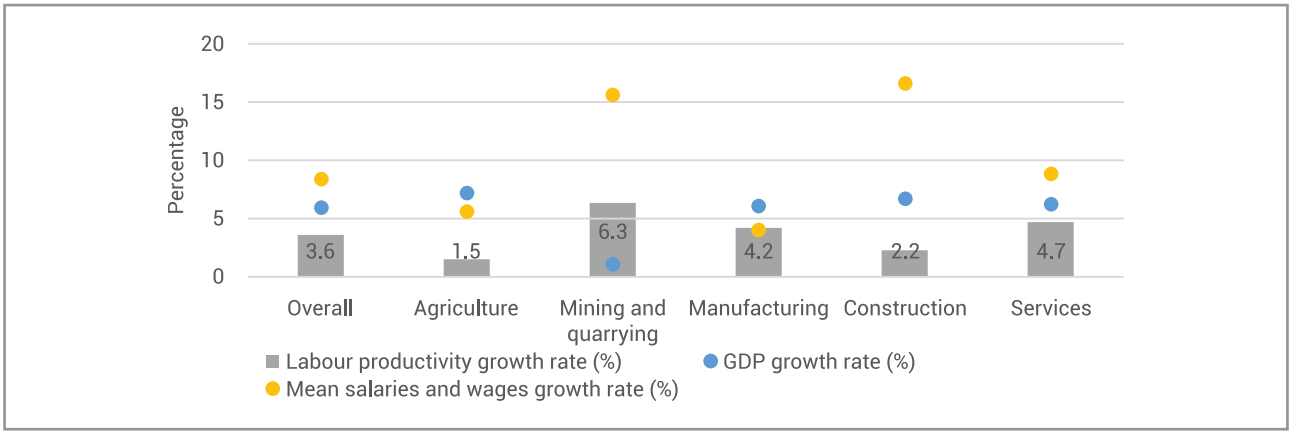
The productivity level among small and medium enterprises (SMEs) remained low compared to the labour productivity growth in large enterprises. According to the Malaysia Productivity Blueprint, SME productivity rate had been declining at 0.6% per year between 2010 and 2015, while large enterprises grew at a rate of 2.9% per year. The five key challenges hindering productivity growth include shortage of talent, low level of investment in technology and digitisation, lack of government incentive structure, inconsistent interpretation of regulations, and limited understanding of the importance of productivity among enterprises.

Rebounded external trade environment

Malaysia's external trade rebounded in 2017 after a subdued surplus a year ago. Total trade improved by nearly 20% in 2017 compared to 1.5% in 2016, which was largely due to robust global demand (Table 1.8). Both exports and imports had double-digit rates of growth at 18.9% to RM935.4 billion and 19.9% to RM838.1 billion, respectively. This gives a moderate growth in trade surplus of 10.3% (2016: -3.7%).

During the first four months of 2018, total trade grew mildly by nearly 5% y-o-y, with growth rates of 7.8% in exports and 1.6% in imports amid a stronger Ringgit and competitive trade environment (Table 1.8). The trade performance is complemented by the strong growth in trade surplus at 68.7% y-o-y for January–April 2018. Moving forward, Malaysia is expected to experience a double-digit growth in trade surplus.

Figure 1.3 Growth rates of labour productivity, mean salaries, and GDP in Malaysia, 2017



Source: Bank Negara Malaysia.

Table 1.8 Exports, imports and balance of trade in Malaysia

RM million	2016	2017	% change	Jan–Apr 2017	Jan–Apr 2018	% change
Export	786,964	935,393	18.9%	298,560	321,872	7.8%
Import	698,819	838,145	19.9%	271,029	275,431	1.6%
Total trade	1,485,783	1,773,538	19.4%	569,589	597,303	4.9%
Balance of trade	**88,145**	**97,249**	**10.3%**	**27,531**	**46,441**	**68.7%**

Source: Authors' own calculations based on the Department of Statistics, Malaysia.

The manufacturing sector continued to form the largest growth in exports in 2017. It grew at nearly 19%, and accounted for about 82% of total exports in Malaysia, followed by mining (8.6%) and agriculture (8.4%) (Figure 1.4). Among manufactured goods, E&E products expanded by about 19%, making them the largest exports commodity (36.7%), boosted by higher global demand in semiconductors that are used to produce smartphones and tablets. The manufacture of petroleum products had the second-largest composition in the manufacturing sector, accounting for 7.7% of the total exports. A similar trend is expected for 2018 following a stable export demand for E&E products worldwide.

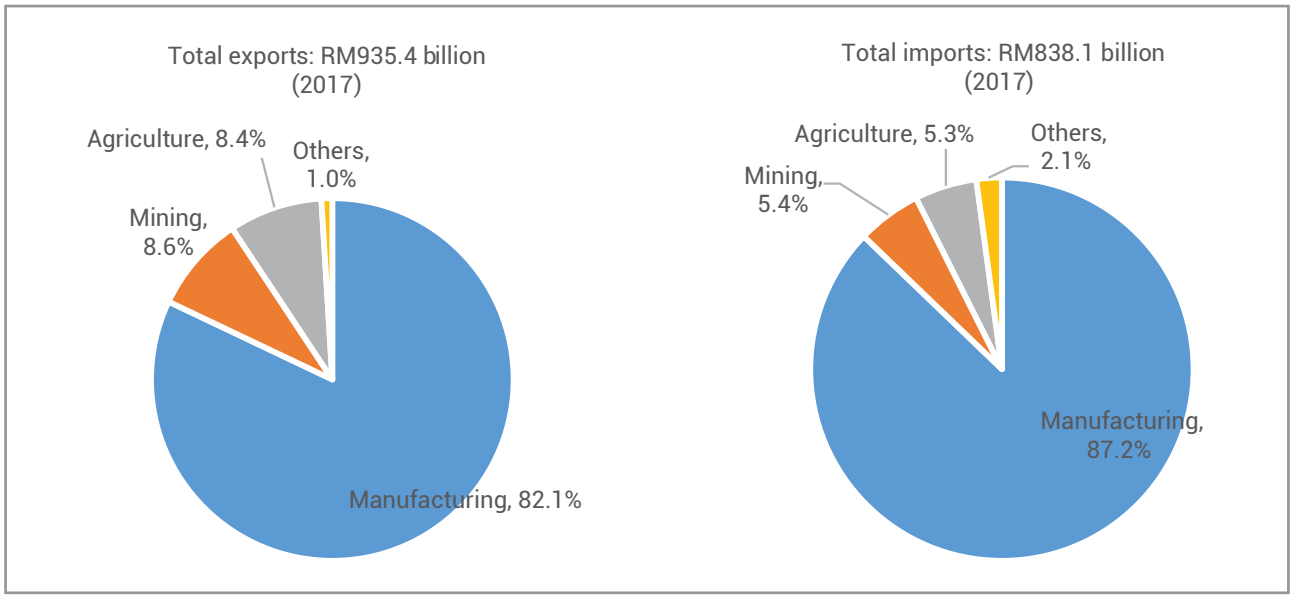
For imports, about 87% of total imports were from manufactured products, which were the largest imported commodity in the country. E&E products contributed 30.2% of total import value, growing at a rate of 20.5% in 2017. For the first four months of 2018, the commodity expanded modestly by 3.5%, supported by the importing of semiconductors, particularly in electronic integrated circuits. Nevertheless, the majority of trade surplus are from E&E products.

Agriculture and mining products registered positive rates of growth in export receipts at 10.9% and 23.9%, respectively. This is a positive sign because more products in the agriculture and mining sectors are exported versus imported. In contrast, Malaysia imports more chemical products, petroleum products, machinery equipment, and transport equipment than it exports, reflecting a trade deficit for these products. Therefore, in 2018, Malaysia is estimated to continue importing more petroleum products and machinery equipment, despite the fact that Malaysia is one of the largest producers of petroleum in Southeast Asia, and exporting more E&E products and agriculture products.

The majority of export destinations were to countries in AFTA (29.2%), followed by countries participating in the North American Free Trade Agreement (NAFTA, 10.9%) and the European Union (10.2%) (Figure 1.5). Based on the Malaysia Economic Report 2017/2018, Singapore, Indonesia, and Thailand were the major export markets for E&E products; petroleum products; and machinery, equipment, and parts.

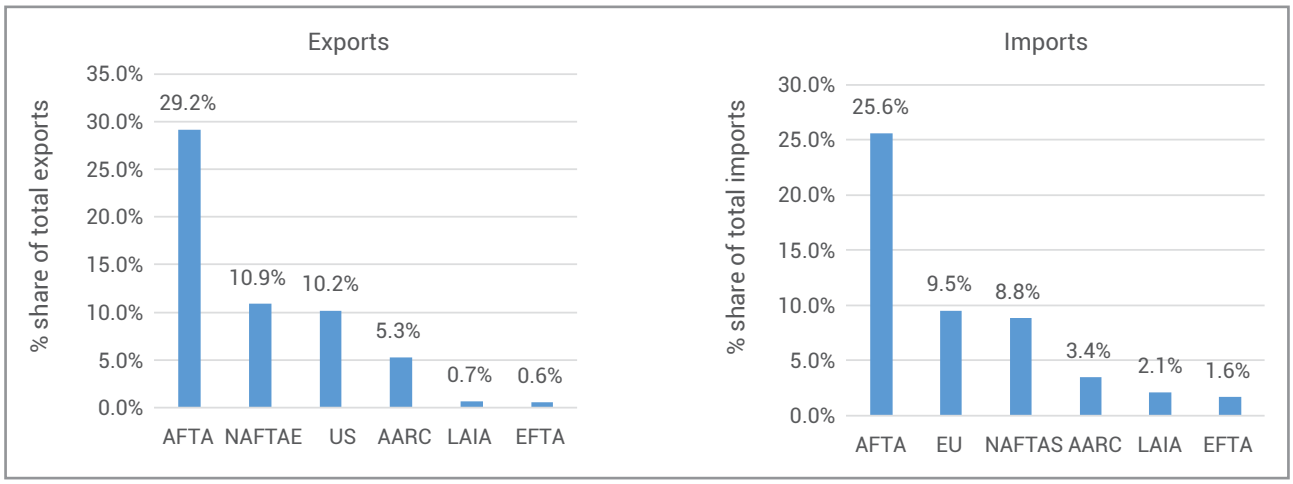
As part of ASEAN, Malaysia benefits from the regional trade agreements. Trade barriers with China, South Korea, India, Japan, Australia, New Zealand, and the European Union are estimated to further decrease as a result of RCEP under AFTA. In addition, bilateral FTAs with Pakistan, Australia, Japan, India, Turkey, and Chile will continue to strengthen economic ties (See Box 1.2).

Figure 1.4 Exports and imports by sector, 2017



Source: Department of Statistics, Malaysia.

Figure 1.5 Direction of external trade by economic grouping, 2017



Note: AFTA refers to ASEAN Free Trade Area; EU refers to European Union; NAFTA refers to North American Free Trade Agreement; SAARC refers to South Asian Association for Regional Cooperation; LAIA refers to Latin American Integration Association; and EFTA stands for European Free Trade Association, which includes Iceland, Norway, Switzerland, and Liechtenstein.

Source: Authors' own calculation based on external trade data published by the Department of Statistics, Malaysia.

Box 1.2 The Free Trade Agreements in Malaysia

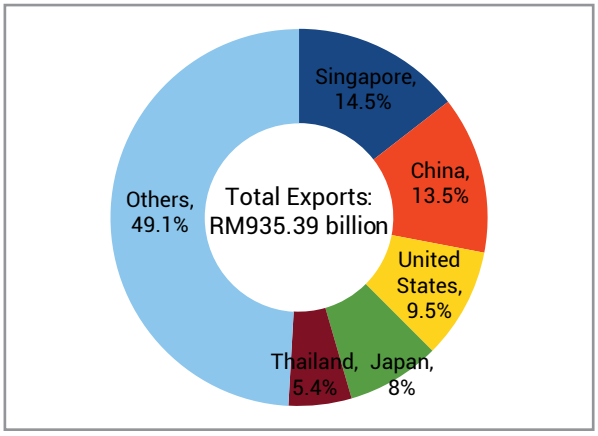
by Jonathan Dason, Socioeconomics & Statistics Programme

Trade composition

In 2017, Malaysia's total trade stood at RM1.7 trillion, up from RM1.4 trillion in 2015. Malaysia had a positive balance of trade with exports standing at RM935 billion and imports at RM838 billion. The top three export products were E&E products at 36.7%, petroleum products at 7.7%, and chemicals and chemical products at 7.3%.

Slightly more than 50% of Malaysia's total exports were split between its top five trading partners, with Singapore accounting for the largest share at 14.5% and China trailing at 13.5% (Figure 1.6). The bulk of Malaysia's exports were destined for the Asia-Pacific region and the United States. Among these export destinations, the United States is the only destination without a bilateral or regional FTA with Malaysia. Table 1.9 summarises FTAs of Malaysia's top 10 export destinations. Likewise, about 70% of total imports originated from the Asia-Pacific region and the United States (Figure 1.7). Among Malaysia's top 10 importing countries, Malaysia has FTAs with seven of them, excluding the United States, Taiwan, and Germany.

Figure 1.6 Malaysia's major export countries, 2017 (%)



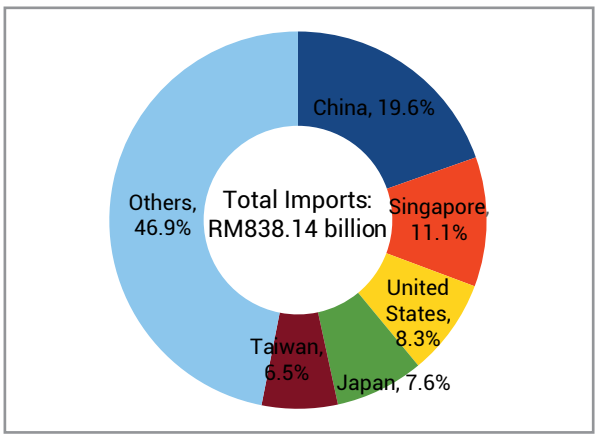
Source: Malaysia External Trade Development Corporation (MATRADE).

Table 1.9 List of top 10 export countries and trade agreements

Country*		FTAs
1.	Singapore	AFTA
2.	China	ASEAN-China Free Trade Agreement (ACFTA)
3.	United States	Nil
4.	Japan	Malaysia-Japan Economic Partnership Agreement (MJEPA)
		ASEAN-Japan Comprehensive Economic Partnership (AJCEP)
5.	Thailand	AFTA
6.	Hong Kong	ASEAN-Hong Kong Free Trade Agreement (AHKFTA): Under negotiation
7.	Indonesia	AFTA
8.	India	ASEAN-India Free Trade Agreement (AIFTA)
9.	Australia	Malaysia-India Comprehensive Economic Cooperation Agreement (MICECA)
10.	South Korea	Malaysia-Australia Free Trade Agreement (MAFTA)

** All countries are involved in RCEP except the United States, which is still under negotiation.*
Source: Malaysia External Trade Development Corporation (MATRADE).

Figure 1.7 Malaysia's major import countries, 2017 (%)



Source: Malaysia External Trade Development Corporation (MATRADE).

ASEAN Free Trade Area (AFTA)

ASEAN is the world's sixth-largest economy, featuring rapid urbanisation and a young and growing population, and the region is forecast to grow healthily (Yusof, 2017). Signed in 1992, the AFTA agreement sought to reduce the region's inter-trade tariffs and non-tariff barriers, and it became the precursor to the ASEAN Economic Community (AEC). So far, trade within ASEAN has taken a dominant role in comparison to trade going out of the region, with close to 25% of exports staying within Southeast Asia (Reed and Romei, 2018).

AFTA's main objectives are to:

i. Create a single market and an international production base.
ii. Attract foreign direct investments.
iii. Expand intra-ASEAN trade and investments.

AFTA followed the thread set by other regional FTA deals around the world such as the EU and the North American Free Trade Area (NAFTA). Such an agreement would foster the critical links that would allow SMEs in ASEAN to scale (ASEAN, 2008). AFTA however, differed from other FTAs in that it does not impose a common external tariff. This means that if a country had a lower tariff for a certain item and the cost of transporting the goods to the destination country would be low, this item would enter via the member state and then be transported to the destination state. There would be advantages should a country be a transit point or a value-added producer, which then exports to the rest of ASEAN.

For example, the Thai automotive industry is one of the benefactors of the AFTA, much to the detriment of the Malaysia's own automotive industry (though Proton arguably did not compete in the same market segment as Thailand). As the world's 12th largest automobile production – where most of the global automotive manufacturers had a presence (Thailand Board of Investment, 2016), Thailand is further aided by the bilateral AFTA agreement with China and Japan, which reduces the production cost of assembling cars in Thailand. As a result, Indonesia and Malaysia would use the tariffs set by AFTA to import the vehicles, the latter of which would suffer from a lack of liberalisation and competitive advantage of its national automotive market.

Despite benefiting exporters from market access, there are limitations to the AFTA agreement. Adapting exported products to local market requirements such as making changes in terms of packaging (e.g. language) could make potential exporters hold back from marketing their products in member countries. Another factor is a fluctuating exchange rate, since many FTAs are held between countries with different

macroeconomic policies (Zahariah et al., 2008). Nevertheless, the issues faced by the exporters are more pronounced with SMEs, which may lack the capital to adapt or to deal with such risk, and may not benefit from an FTA.

An ecosystem to help SMEs adapt and effectively sell their products abroad needs to be in place to fully take advantage of such agreements.

Trade agreements with Japan: AJECP and MJEPA

While having in-force a pre-existing bilateral FTA with Japan, Malaysia also benefits from multilateral trade agreements resulting from the ASEAN-Japan Comprehensive Economic Partnership (AJCEP) in 2008. All member countries within the agreement would enjoy preferential tariffs; potential traders would have a larger base to source their materials – under the regional accumulation principle relating to Rules of Origin (ROO) – compared to the bilateral Malaysia-Japan Economic Partnership Agreement (MJEPA). For scale, the MJEPA allows for progressive liberalisation over a 5–10 year period, while the AJCEP would speed up the process for 91 tariff lines. With the immediate elimination of tariffs for 11 tariff lines, Malaysian products such as chemicals, textiles, and agriculture may be marketed more competitively.

The progress from TPPA to CPTPP and RCEP

The TPPA is now known as the Comprehensive and Progressive Agreement for Trans-Pacific Partnership (CPTPP) after the United States' withdrawal in 2017. Given that the CPTPP is in the midst of ratification, RCEP will be the world's largest economic bloc for trade integration. Compared to CPTPP, RCEP involves ASEAN member states and six other countries – including China, India, New Zealand, South Korea, Australia, and Japan, which make up over half of the world's population and 30% of global GDP (Ministry of International Trade and Industry, 2018). This would be more than half of the total output and population of the CPTPP.

With geopolitics taken into consideration, Malaysia's participation in FTAs such as CPTPP and RCEP involve potential gains that are not covered by its current trade agreements. With RCEP, 61.7% of Malaysia's trade in 2016 were within the coverage area of the partnership. Briefly, for the CPTPP its greater market access to Canada, Mexico and Peru; while for the RCEP, it is a tidying-up exercise.

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A large proportion of Malaysia's exports were made through seaports, followed by airports and land transportation. Among the three modes of transport, goods exported through airports recorded the largest hike at 25.3%, rising from RM213 billion in 2016 to RM267 billion in 2017 – the second-largest share of total export value (Table 1.10). For the first four months of 2018, exports expanded further by 26.4%, corresponding to about 32% of total exports. In terms of air channels, air cargo carriers at Bayan Lepas outperformed air cargo carriers in Kuala Lumpur International Airport (KLIA); about 19% of total exports were transported through the Bayan Lepas air channel, compared to 8.8% at KLIA in 2017. The former's share increased to 23% y-o-y from January to April 2018 while the latter dropped to 7.9% y-o-y. E&E products are estimated to remain the main exported goods at Bayan Lepas.

For sea transport, while it stood at over half of all exports, the increase was not as significant as those exported through airports. Exports through seaports increased by 17.3% to RM530.6 billion in 2017, accounting for about 57% of total exports. In addition, the exports swung upwards by 2.2% y-o-y for the first four months of 2018. Port Klang remained as the main exporting seaport in Malaysia, accounting for about 18% of total exports. Meanwhile, Penang's North Butterworth Cargo Terminal ranked as the fourth-largest seaport transporting exported goods.

Exports through land transport on the other hand saw a decrease in export value for the January–April period in 2017 and 2018. It dropped by 4% y-o-y from January to April 2018, with checkpoints at both Johor Bahru and Tanjung Kupang, Johor showing negative growth rates of 10.4% and 6.4% respectively. For the same period, however, Bukit Kayu Hitam checkpoint registered a boost of about 12%. This suggests that more goods are estimated to carry into Thailand compared with the value of exported goods transporting into Singapore.

Likewise, sea transport continued to be the most popular mode of transport for imports. Over half of total imports were contributed by sea channels (57.3%), followed by air (29.3%) and land channels (13.4%) (Table 1.11). For the first four months of 2018, while the North Butterworth Cargo Terminal

Table 1.10 Exports by mode of transport for selected channel in Malaysia

Exports (RM million)	2016	2017	% change	% share
Sea	**452,473**	**530,558**	**17.3%**	**56.7%**
Port Klang	148,722	171,188	15.1%	18.3%
Bintulu	53,369	68,471	28.3%	7.3%
Pasir Gudang, Johor	46,483	57,542	23.8%	6.2%
North Butterworth Cargo Terminal	45,008	50,724	12.7%	5.4%
Tanjung Pelepas Port	34,274	38,903	13.5%	4.2%
Tanjung Gelang/Kuantan Port	11,973	9,842	-17.8%	1.1%
Others	112,644	133,888	18.9%	14.3%
Air	**213,146**	**267,092**	**25.3%**	**28.6%**
Bayan Lepas	142,827	176,805	23.8%	18.9%
Kuala Lumpur International Airport (KLIA), Sepang	64,846	82,743	27.6%	8.8%
Others	5,473	7,544	37.8%	0.8%
Land	**121,345**	**137,743**	**13.5%**	**14.7%**
Tanjung Kupang, Johor	79,308	92,445	16.6%	9.9%
Johor Bahru (Tambak/Causeway)	20,260	20,764	2.5%	2.2%
Bukit Kayu Hitam	15,586	16,945	8.7%	1.8%
Others	6,191	7,589	22.6%	0.8%
Total	**786,964**	**935,393**	**18.9%**	**100.0%**

Source: Department of Statistics, Malaysia.

Table 1.11 Imports by mode of transport for selected channel in Malaysia

Imports	2016	2017	% change	% share
Sea	**402,365**	**479,855**	**19.3%**	**57.3%**
Port Klang	201,284	220,924	9.8%	26.4%
Bintulu	9,627	8,587	-10.8%	1.0%
Pasir Gudang, Johor	55,058	66,611	21.0%	7.9%
North Butterworth Cargo Terminal	32,635	39,572	21.3%	4.7%
Tanjung Pelepas Port	16,188	16,417	1.4%	2.0%
Tanjung Gelang/Kuantan Port	6,255	11,500	83.9%	1.4%
Others	81,319	116,244	42.9%	13.9%
Air	**203,398**	**245,744**	**20.8%**	**29.3%**
Bayan Lepas	118,665	139,639	17.7%	16.7%
Kuala Lumpur International Airport (KLIA), Sepang	73,875	96,025	30.0%	11.5%
Others	10,859	10,080	-7.2%	1.2%
Land	**93,056**	**112,545**	**20.9%**	**13.4%**
Tanjung Kupang, Johor	57,158	74,052	29.6%	8.8%
Johor Bahru (Tambak/Causeway)	18,119	17,368	-4.1%	2.1%
Bukit Kayu Hitam	13,787	16,116	16.9%	1.9%
Others	3,992	5,009	25.5%	0.6%
Total	**698,819**	**838,145**	**19.9%**	**100.0%**

Source: Department of Statistics, Malaysia.

seaport recorded the third-largest exports in the country, the value of imports grew minutely by 1.5% y-o-y compared to the same period in 2017. For air transport, Bayan Lepas was the biggest channel for imports. While its share lingered at about 16%, the import value decelerated by 2.4% y-o-y from January to April 2018.

1.3 Prospects for 2018

The Malaysian economy is projected to flourish in 2018 with strong support from domestic demand and a favourable external environment. BNM forecasts the GDP growth to be between 5.5% and 6% in 2018. Despite the solid growth momentum, structural reforms under the new administrative regime are necessary to tackle the high level of national debt. Stable oil prices and a rebounded Ringgit are impetuses to the growth of fiscal and current accounts of the country. The impact of a trade war between China and the United States is yet to be felt by Malaysia. However, the focus to bring in quality investment and infrastructure is important to strengthen the country's economic growth.

On the demand side, private consumption is expected to boost from June to August 2018 following the zero-rated GST and stable labour market condition, but will potentially moderate after September 2018 with the reintroduction of the SST. The three-month tax holiday will essentially increase the purchase of durable goods such as motor vehicles and merchandised goods. However, the projected headline inflation and producer price index will increase at a slower rate in 2018 due to higher producer prices for the final four months of 2018, which will then translate into higher prices of goods. For external consumption, Malaysia is expected to experience double-digit growth in trade surplus.

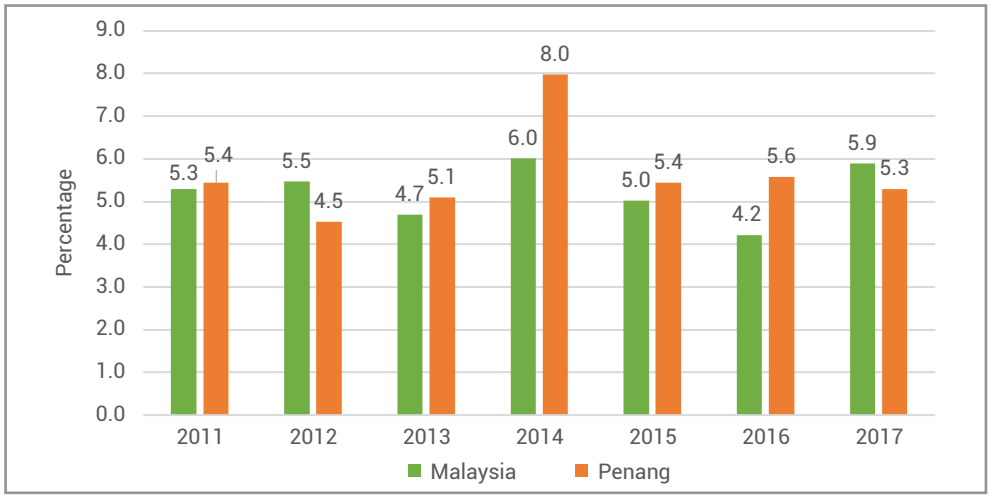
On the supply side, the economic growth is expected to continue, driven by the services sector, followed by the manufacturing sector. Wholesale and retail merchandised goods continue to play a key role in strengthening consumption growth in response to the zero-rated GST. Meanwhile, the E&E cluster and primary cluster from export-oriented industries continue to be responsible for the growth in the manufacturing sector. Approved manufacturing investment for Penang recorded about RM12.5 billion for Q1 2018, accounting for more than one-third of total investment approved in 2017. Investor confidence continues to be robust and hopeful despite the change in federal government. While it is the smallest contributing economic sector, the construction sector is anticipated to slow down due to a number of infrastructure projects requiring further review.

2 Penang's Macroeconomic Performance

2.1 Output performance

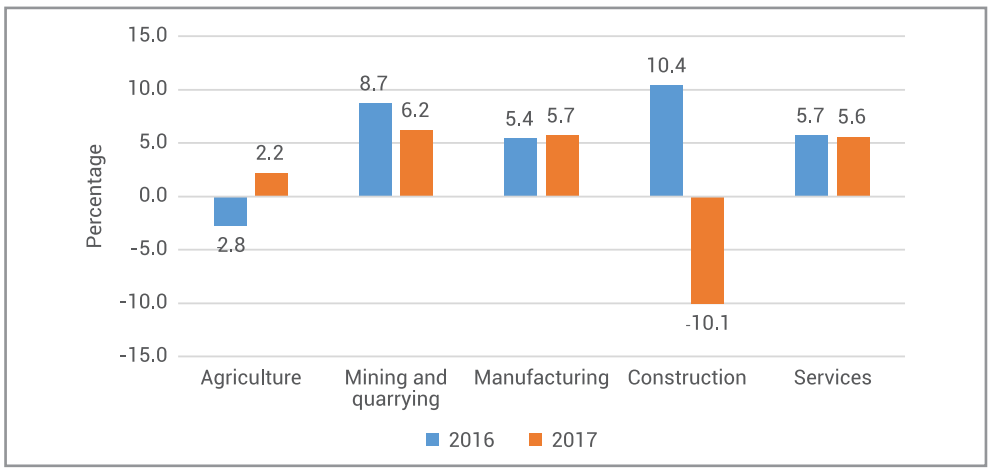
Penang's economy has been growing at an average rate of 5.6% over the past seven years (Figure 2.1). The state's GDP growth slowed down by 0.3 percentage point to 5.3% in 2017, mainly due to the negative 10.1% growth rate in the construction sector. Agricultural and manufacturing sectors registered the higher growth rates at 2.2% and 5.7%, respectively, in 2017 compared to 2016, while the services sector remained at 5.6%. Although growth in Penang's mining and quarrying sector had slowed down from 8.7% in 2016 to 6.2% in 2017, it still exceeded the national average (1%) (Figure 2.2). The manufacturing and services sectors have been the main contributors to Penang's GDP over the past seven years. In fact, Penang's economic structure is mainly manufacturing- and services-oriented. In 2017, the services sector accounted for 49.3% of GDP, while 44.8% was from the manufacturing sector (Table 2.1). However, the agricultural (2%), mining and quarrying (0.1%), and construction (2.6%) sectors were less significant, altogether accounting for only 4.7% of Penang's GDP.

Figure 2.1 GDP growth in Malaysia and Penang, 2011–17 (at constant 2010 prices)



Source: Department of Statistics, Malaysia.

Figure 2.2 GDP growth rate by sector in Penang, 2016–17 (at constant 2010 prices)



Source: Department of Statistics, Malaysia.

Table 2.1 Percentage share of economic activity to Penang's GDP, 2010–17 (at constant 2010 prices)

Economic activity	2010	2011	2012	2013	2014	2015	2016	2017
Agriculture	2.4	2.4	2.4	2.4	2.3	2.2	2.0	2.0
Mining and quarrying	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Manufacturing	45.9	45.2	43.9	43.5	44.1	44.7	44.6	44.8
Construction	2.8	2.8	3.3	3.1	3.2	3.0	3.1	2.6
Services	48.3	48.9	49.6	50.2	49.5	49.1	49.2	49.3

Note: Total may not add up due to rounding and exclusion of import duties component.
Source: Department of Statistics, Malaysia.

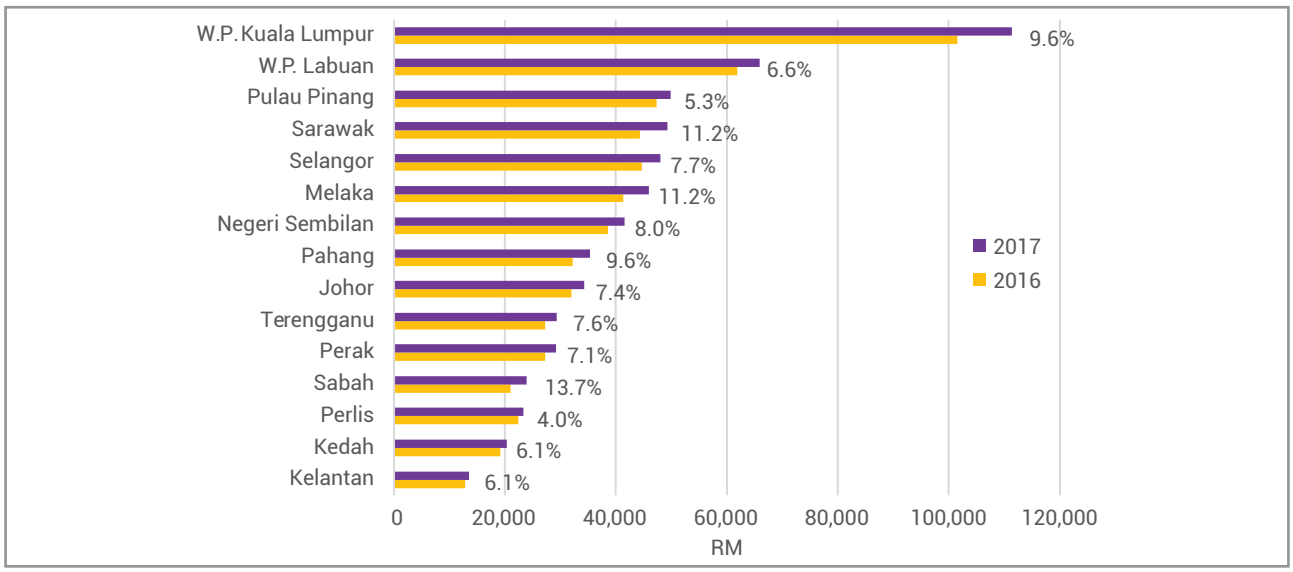
In 2017, Penang contributed 12.9% to the country's manufacturing revenue of RM269.8 billion, second after Selangor (29.4%). The sector is dominated by E&E products. Penang's manufacturing sector recorded better growth in 2017 compared to 2016, which could be partly due to a huge increase in approved manufacturing investments from RM4.3 billion in 2016 to RM10.8 billion in 2017, as well as the improved global economy. Meanwhile, the services sector held steady at 5.6%, driven mainly by the wholesale and retail trade, food and beverage and accommodation; utilities, transportation and storage; and information and communication sub-sectors. Over the years, the services sector has experienced slight growth as a proportion of state output, while the manufacturing sector has had a slight gradual decline. Indeed, the services sector has overtaken manufacturing's slow growth, indicating the growth of shared services and outsourcing (SSO) activities in Penang.

Considering Penang's highly industrialised nature and limited land size, the agriculture sector contributes very little to Penang's GDP. However, this sector plays an important role in overall growth and poverty reduction through linkages with the manufacturing sector and connecting the poor along the agri-supply chain. The share of the agriculture sector in Penang's GDP dropped from 2.4% in 2010 to 2.0% in 2017. This was associated with a decrease in overall agricultural land use.

The mining and quarrying sector's share in Penang's GDP constituted less than 1% in 2017; this has not changed significantly since 2010. Similarly, the contribution of the construction industry to Penang's GDP has been almost consistently low. This sector recorded a significant decrease of 10.1% in 2017, mainly due to the contraction in residential, non-residential, and special trade activities.

Penang's GDP per capita registered a growth rate of 5.3% in 2017, reaching RM49,873 compared to RM47,345 in 2016. This suggests the strong likelihood of more goods and services that are available to consumers – and that consumers are in a better position to buy them, as the GDP per capita is the most widely used measure of standard of living. Penang was ranked third in GDP per capita in 2017, after Kuala Lumpur and Labuan (Figure 2.3).

Figure 2.3 GDP per capita and GDP growth rate by state, 2016–17 (current prices)



Source: Authors' own calculations; data from Department of Statistics, Malaysia.

Being an open economy and a main hub for exports, Penang's economy is positively affected by the improvements in the global and domestic economies. Furthermore, the elimination of the GST in June 2018 and the reintroduction of the SST in September 2018 are expected to create more disposable income which, in turn, may boost consumer spending and business activities. Going forward, Penang's GDP growth is expected to remain favourable.

2.2 External trade performance

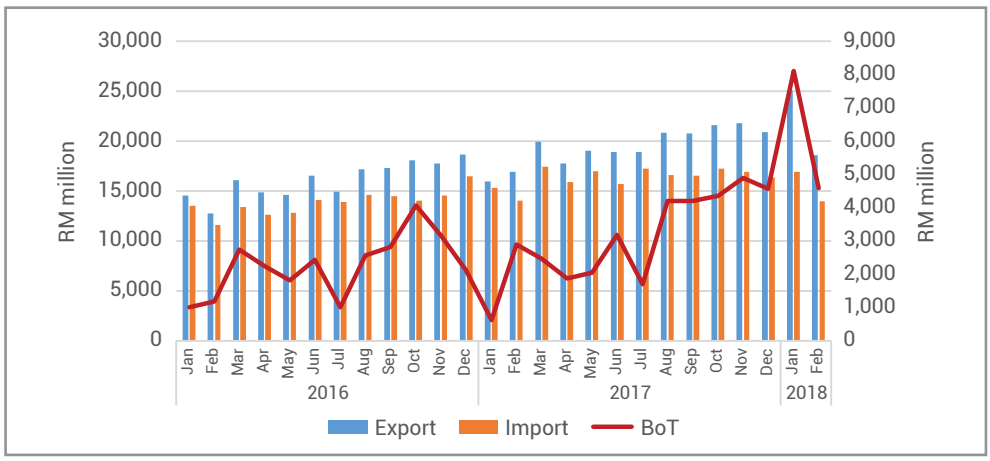
Penang's total volume of external trade had dramatically increased by 19.5% in 2017, mainly driven by improved global demand and robust domestic activities. As presented in Figure 2.4, Penang's exports, imports, and trade surpluses had increased by 20.7%, 18.2%, and 36.3%, respectively, in 2017 compared to 2016. The increase was the result of positive growth in all major import and export commodities, with miscellaneous transactions and commodities recording the highest export and import growth rates of 158.9% and 35.4%, respectively (Table 2.2). The trade surplus increased dramatically by about 50% in the final five months of 2017 compared to January–July 2017. It also registered an additional surplus of about RM7.5 billion over the same period in 2016. This was mainly attributed to the growth in export value as a result of a stronger Ringgit.

In 2017, machinery and transport equipment accounted for a significant share of Penang's total gross exports and imports at 69% and 65.4%, respectively. These include general industrial machinery and equipment; office machines and automatic data processing; telecommunications and sound recording and reproducing apparatus; electrical machinery, apparatus, and appliances; and road vehicles. This reveals that Penang's external trade is still highly driven by the E&E industry, which is a leading industry in Penang's manufacturing sector. In fact, this industry has benefited from growing global demand in the usage of mobile devices (smartphones, tablets), storage devices (cloud computing, data centres, personal data drives), optoelectronics (photonics, fibre optics, light-emitting diodes (LEDs)) and embedded technology (integrated circuits, printed circuit boards, LEDs).

For the first two months of 2018, Penang's trade registered an additional surplus of about RM9 billion over the same period in 2017, with export and import growths of 32.5% and 5.2%, respectively. Machinery and transport equipment remained the largest exported (71.9%) and imported (66.3%) commodity in the first two months of 2018.

The North Butterworth Cargo Terminal and Bayan Lepas air cargo are two important gateways for trade in Malaysia. In 2017, the North Butterworth Cargo Terminal recorded the third-highest trade value among the major seaports in Malaysia, after Port Klang and Pasir Gudang in Johor. The export and import values gathered at this port were approximately RM50.7 billion and RM39.6 billion, respectively, an increase of 12.7% and 21.3% in 2017 compared to 2016. In the first four months of 2018, the port's exports value dropped by 0.2%, while the value of its imports grew by 1.5% compared to the same period in 2017. The Bayan Lepas airport is ranked number one among all air cargos in Malaysia by trade value. Its exports and imports

Figure 2.4 Monthly export, import, and balance of trade, Penang, January 2016–February 2018



Source: Department of Statistics, Malaysia.

Table 2.2 External trade, Penang, 2016–17

External trade	2016		2017	
	RM million	% Change	RM million	% Change
Gross exports	**193,444**	**2.1**	**233,493**	**20.7**
Machinery and transport equipment	137,468	0.3	161,453	17.4
Miscellaneous manufactured articles	32,976	6.3	42,400	28.6
Chemicals	7,382	14.3	9,036	22.4
Manufactured goods	7,880	-0.8	8,702	10.4
Crude materials, inedible	2,675	7.9	4,411	64.9
Miscellaneous transactions and commodities	1,265	58.4	3,277	158.9
Gross imports	**166,250**	**6.3**	**196,427**	**18.2**
Machinery and transport equipment	109,321	8.1	128,473	17.5
Manufactured goods	12,029	3.7	13,319	10.7
Miscellaneous manufactured articles	12,065	11.2	13,224	9.6
Chemicals	9,734	9.4	11,526	18.4
Miscellaneous transactions and commodities	7,144	1.5	9,669	35.4
Food	7,052	2.8	7,449	5.6
Total trade	**359,694**	**4.0**	**429,920**	**19.5**
Trade balance	**27,194**	**-17.7**	**37,065**	**36.3**

Source: Department of Statistics, Malaysia.

values amounted to RM17.7 billion and RM14 billion in 2017, respectively, for an increase of 23.8% and 17.7% compared to the year before. In the first four months of 2018, the value of its exports increased dramatically by 40.3%, while its imports value decreased by 2.4% compared to the same period in 2017.

In line with the increase in global trade activities, strong domestic investment, and Penang serving as the main electronics hub for Southeast Asia, Penang's external trade position is expected to remain resilient. This is supported by significant growth in the global manufacturing sector, with a 12.4% increase in the world semiconductor market in 2018 compared to 2017, as forecast by the World Semiconductor Trade Statistics (WSTS), as well as higher crude oil prices. Furthermore, a healthy trade balance is expected for 2018 as a result of the Ringgit appreciating against many major currencies, which may lead to lower import costs and higher export prices.

2.3 Prices

The overall inflation rate[3] in Penang stood at 4% in 2017 (1.5% higher than the preceding year), most likely due to the higher retail fuel prices. Higher price hikes were seen in transport (13.7%) and education (5%) groups, contributing 1.58 percentage points to the Consumer Price Index (CPI) increase in 2017 (Table 2.3). Yet, the communications group experienced lower prices at 0.3% in 2017. Inflation in the food and non-alcoholic beverages group rose at a slower pace of 4.4% compared to 4.9% in 2016, contributing 1.25 percentage points. In fact, the CPI reflects the patterns in consumer expenditure[4]; Penang households are spending more of their income on transport, education, and food and non-alcoholic beverage, while a lower share of income is being spent on communications.

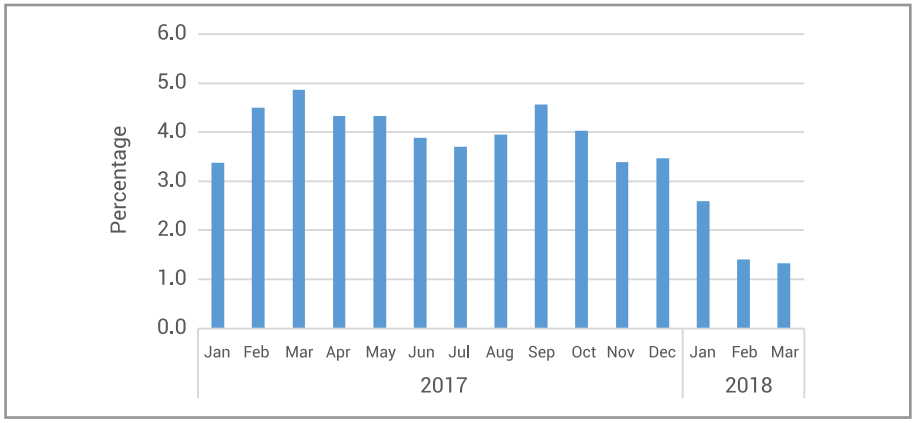
[3] The inflation rate is measured by the annual changes in the CPI.
[4] The weights used in the calculation of the CPI are based on the pattern of expenditure obtained from the Household Expenditure Survey conducted in 2016.

Table 2.3 Changes in CPI, Penang 2016–17 (2010=100)

	Weights	Changes (%)		Contribution to CPI growth (percentage points)	
		2016	2017	2016	2017
Total	**100.0**	**2.5**	**4.0**	**2.5**	**4.0**
Food and non-alcoholic beverages	28.4	4.9	4.4	1.39	1.25
Alcoholic beverages and tobacco	2.3	16.2	0.7	0.37	0.02
Clothing and footwear	3.0	0.0	0.4	0.00	0.01
Housing, water, electricity, gas, and other fuels	29.2	2.8	2.4	0.82	0.70
Furnishings, household equipment, and routine household maintenance	3.3	3.3	3.0	0.11	0.10
Health	1.8	4.4	4.1	0.08	0.07
Transport	11.0	-5.5	13.7	-0.60	1.50
Communication	4.6	-2.1	-0.3	-0.10	-0.01
Recreation services and culture	5.2	1.5	1.8	0.08	0.10
Education	1.7	2.8	5.0	0.05	0.08
Restaurants and hotels	2.8	3.7	2.5	0.10	0.07
Miscellaneous goods and services	6.7	3.4	2.6	0.23	0.18

Source: Authors' own calculations; data from Department of Statistics, Malaysia.

Figure 2.5 Year-on-year percentage of change in the CPI in Penang, January 2017–March 2018



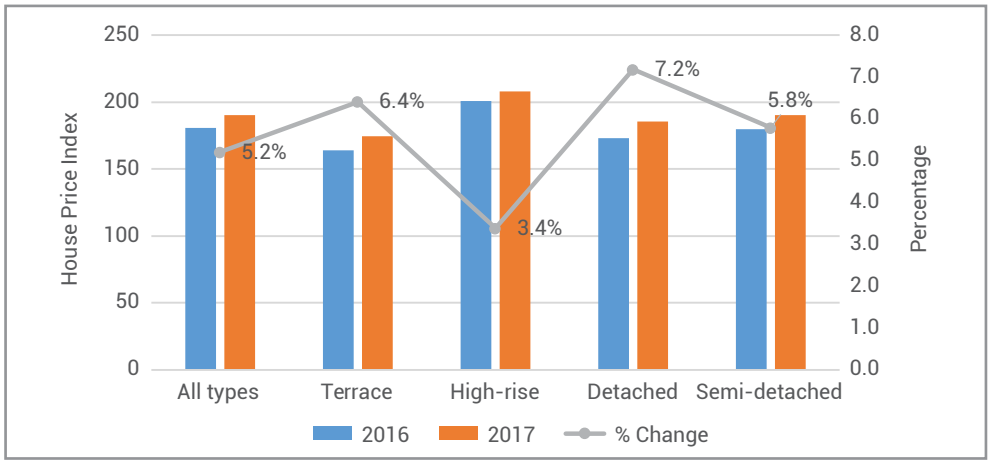
Source: Department of Statistics, Malaysia.

The CPI for the first quarter of 2018 increased by an average rate of 1.8% compared to 4.2% for the same period in 2017 due to the sharp decrease in cost of transport. Prices of food and non-alcoholic beverages also slowed down to 3.3% in Q1 2018 from 4.3% in Q1 2017 (Figure 2.5).

Penang's House Price Index (HPI) grew at 5.2% to 190.1 points in 2017, up from 180.7 points in 2016. This rise was mostly driven by the Detached House Price Index (DHPI) (7.2%) and Terraced House Price Index (THPI) (6.4%) (Figure 2.6). It shows the popularity of landed homes among buyers. Notably, the THPI in Seberang Perai outpaced Penang Island's over the past five years. However, Penang Island has had higher HPI for high-rise properties than Seberang Perai.

The imposition of the zero-rated GST in June 2018 is estimated to have a positive effect on prices, especially food and beverage, retail, and property prices since savings can come from input costs, leading to an increase in consumer expenditure. In addition, reintroducing the SST will benefit consumers, as the SST will result in lower prices of goods in general. Yet, there might be a potential increase in the prices of certain items such as automobiles or charges for services rendered.

Figure 2.6 House Price Index by types of residential property in Penang, 2016–17



Source: National Property Information Centre (NAPIC).

2.4 Household income and expenditure

The median monthly household income for the people of Penang improved by 7% biannually to RM5,409 in 2016 from RM4,702 two years ago. It was the highest monthly household income in the northern region of Malaysia. While Penang's median monthly household income was lower than Johor and Malacca, its median per capita household income fared well above households in these two states at a growth rate of 10.1% (Table 2.4).

In Penang, urban households earned RM1,112 more than rural households, or RM5,477 and RM4,365, respectively, with annual growth rates of 6.7% and 9.7%. Among the ethnic groups, Chinese households had the largest income at RM6,401 with an annual increase of 9.4% in 2016, followed by Malay households (RM4,874; 7.5%) and Indian households (RM4,751; 4.4%).

Table 2.4 Median monthly household income by state and gender, 2014 and 2016

States	Median monthly household income (RM)		2016				
	2014	2016	Compounded annual growth rate (%)	Median per capita household income (RM)	Male (RM)	Female (RM)	Difference between male-female (RM)
MALAYSIA	4,585	5,228	6.6	1,443	5,455	4,145	1,310
Johor	5,197	5,652	4.2	1,564	5,824	4,376	1,448
Kedah	3,451	3,811	5.0	1,055	3,955	2,758	1,197
Kelantan	2,716	3,079	6.3	796	3,191	2,571	620
Malacca	5,029	5,588	5.3	1,555	5,873	4,142	1,732
Negeri Sembilan	4,128	4,579	5.2	1,357	4,812	3,512	1,300
Pahang	3,389	3,979	8.0	1,128	4,040	3,612	428
Penang	4,702	5,409	7.0	1,595	5,767	4,111	1,655
Perak	3,451	4,006	7.5	1,228	4,194	3,172	1,022
Perlis	3,500	4,204	9.2	1,103	4,304	3,254	1,050
Selangor	6,214	7,225	7.5	1,960	7,421	6,231	1,191
Terengganu	3,777	4,694	10.9	1,105	4,782	4,006	776
Sabah	3,745	4,110	4.7	946	4,144	3,463	681
Sarawak	3,778	4,163	4.9	1,132	4,344	3,381	962
W.P. Kuala Lumpur	7,620	9,073	8.7	2,654	9,367	7,640	1,726
W.P. Labuan	5,684	5,928	2.1	1,370	6,005	5,496	509
W.P. Putrajaya	7,512	8,275	4.8	2,339	8,706	5,232	3,474

Source: Household Income Survey 2016, Department of Statistics, Malaysia.

Male head of households had higher incomes than their female cohorts in all states. For the head of household in Penang, males earned RM1,655 more than females; males received a median monthly household income of RM5,767 in 2016.

According to the administrative districts, households from Penang Island were earning more than those in mainland Penang. Nearly half of Penang Island households earned RM6,000 and above per month while more than two-thirds of households in Seberang Perai Selatan did not make more than RM6,000 a month – the highest proportion of households whose earnings are at the lower tier (Figure 2.7). However, household income is forecasted to rise in the light of a number of development projects such as the IKEA shopping complex, which is scheduled to open by early 2019.

Interestingly, the size of Penang Island households is smaller than in mainland Penang. In particular, households in Timur Laut made up the highest income in the whole of Penang while having the smallest household size of 3.6 persons, followed closely by households in Barat Daya (3.9 persons). As the family size gets larger, the median monthly household income shrinks. This is evident in Seberang Perai Utara where households earned the lowest median income of RM4,753 a month in a family of 4.6 persons.

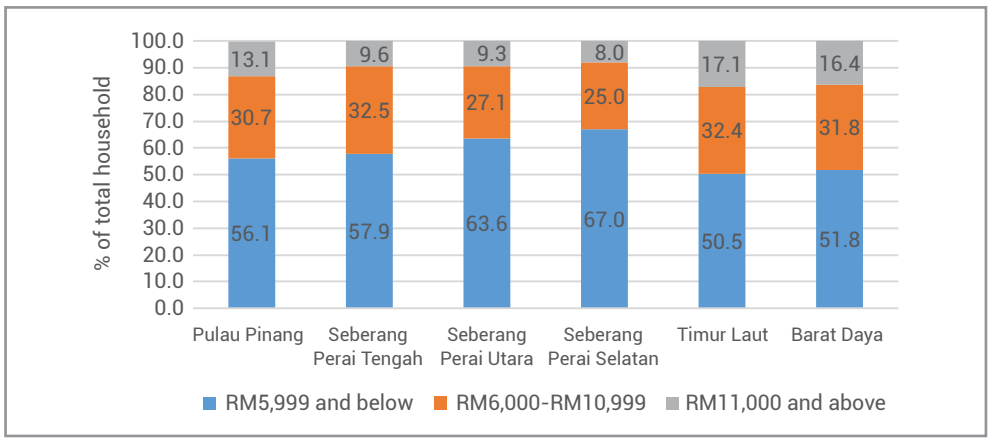
Penang Island comprises of high-tech manufacturing and business services while mainland Penang prioritises light and heavy industries along with some agricultural, fishery, and quarrying activities. This imbalance of income distribution between the island and the mainland is expected to change when Batu Kawan Industrial Park and mixed development in the vicinity of Batu Kawan are fully operational. This will then stimulate income levels in Seberang Perai Selatan.

Penang's median monthly household expenditure on the other hand increased by 4.8% per year from 2014–16. Household expenditure grew slower than more developed states – Kuala Lumpur (5.4%), Selangor (6.4%), and Johor (5.1%) – as well as some less developed states – Perlis (13.3%), Terengganu (11.4%), and Perak (8.7%) (See Box 2.1).

Figure 2.7 suggests that the implementation of the GST on 1 April 2015 had a profound effect on household expenses in less-developed states. This might have raised the cost of living and lowered purchasing power, particularly for the lower income groups. With the election of the new government, the aggregate household consumption is expected to increase in 2018 due to the zero-rated GST, allowing for greater consumption of goods and services.

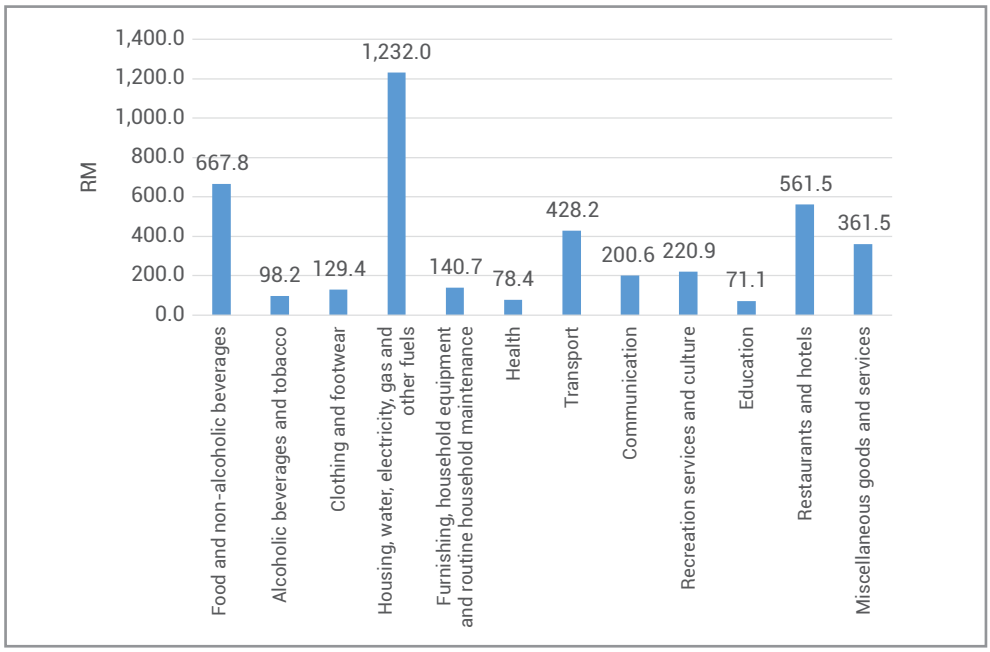
Similar to the national expenditure, Penang's households on average spent the largest proportion of total expenditure on housing, water, electricity, and gas (RM1,232), constituting nearly 30% of total expenses. This is followed by food and beverages (15.9%: RM667.78). Interestingly, spending in this category is proportionately lower than many neighbouring states such as Kelantan (26.9%: RM774.46), Perlis (24.1%: RM744.45), and Kedah (22.9%: RM699.98). While Penang is a highly industrialised state, expenditure on food is still low. This suggests that food in Penang is still relatively cheaper than many less industrialised states, holding all else constant.

Figure 2.7 Percentage of households by monthly household gross income class and administrative district in Penang, 2016



Source: Household Income Survey 2016, Department of Statistics, Malaysia.

Figure 2.8 Average monthly household expenditure in Penang, 2016



Source: Household Expenditure Survey 2016, Department of Statistics, Malaysia.

Box 2.1 Regional development disparities dictate household expenditure

by Ong Wooi Leng, Socioeconomics and Statistics Programme

Regional disparities in socio-economic development to a great extent determine the patterns of household expenditure in Malaysia. This can be seen in the variations in the prices of goods and services sold in a specific region, as well as in household earnings. For example, household expenditure is often lower in a region that has agricultural and fishery activities as its primary economic focus, compared to a region reliant on the manufacturing and services sectors.

On average spending, the central region of Peninsular Malaysia – the most developed states – has the largest household expenditure in the country, with the exception of Negeri Sembilan. Putrajaya tops in average expenditure with a household spending of as high as RM6,971 per month, followed by Kuala Lumpur (RM6,214) and Selangor (RM5,183) in 2016.

Households in the southern region account for the second-largest expenditure, with Malaccan (RM4,274) households spending RM225 more every month compared to Johor (RM4,148).

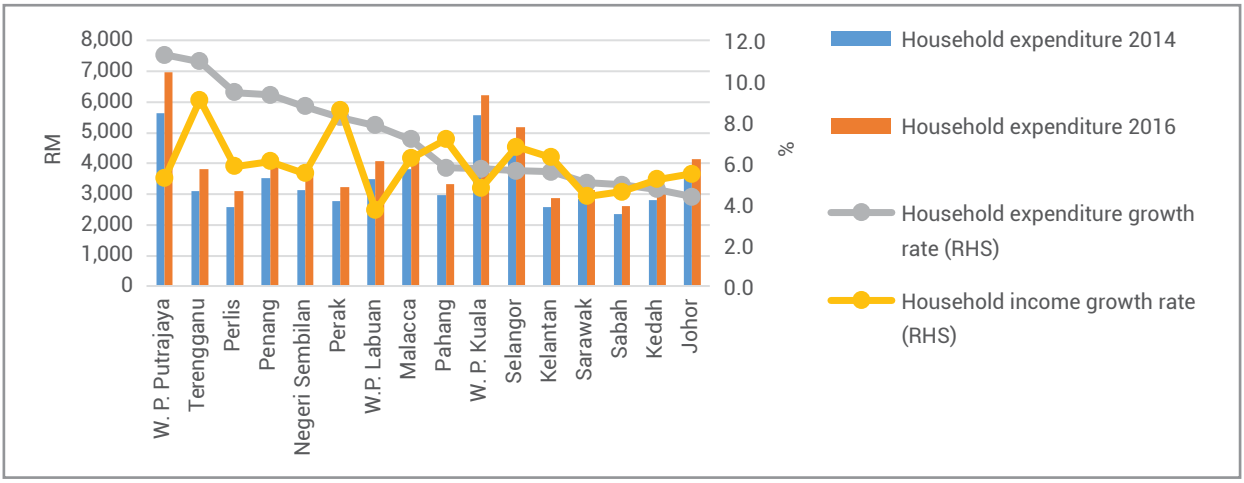
Meanwhile, with the exception of Labuan, households in East Malaysia (Sabah: RM2,595; Sarawak: RM3,118), Kelantan (RM2,875), and Perlis (RM3,085) – the least developed states and are largely agricultural- and fishery-driven – spent the least. This shows that households residing in a region with high-intensity development spent more of their monies than households from low-intensity development regions.

In terms of component expenditure, Malaysian households spend about a quarter of their entire expenditure on housing, water, electricity, gas, and other fuels. This is often the key element in household consumption, and, unsurprisingly, in states with high-intensity development, namely Kuala Lumpur, Putrajaya, Penang, Selangor, and Johor, that share is generally higher.

States with a lower development intensity on the East Coast, for example, spend more than one-fifth of total household expenditure on food and non-alcoholic beverages.

It is of concern that the increase in average household income in most states did not keep up with the rise in household expenditure. Only households in Selangor, Kelantan, Perak, Pahang, Kedah, and Johor experienced a rise in income that was greater than the rise in expenditure (Figure 2.9).

Figure 2.9 Compounded annual growth rate of mean household expenditure and income by states



Source: Household Expenditure Survey 2014 and 2016, Department of Statistics, Malaysia.

What is vital to note is that household expenditure grew proportionately more in some of the country's least developed states. Terengganu and Perlis registered increases in household expenditure of 10.4% and 9% per year, respectively, from 2014–16, just trailing behind Putrajaya (10.7%).

In addition, households from different income groups value consumption items in their own way, heavily depending on individual need. While households from the top 20% (T20) spend half their household income on health, transport, communications, and education expenses, the bottom 40% (B40) households use an equal proportion of their income on food and housing.

2.5 Income distribution and poverty

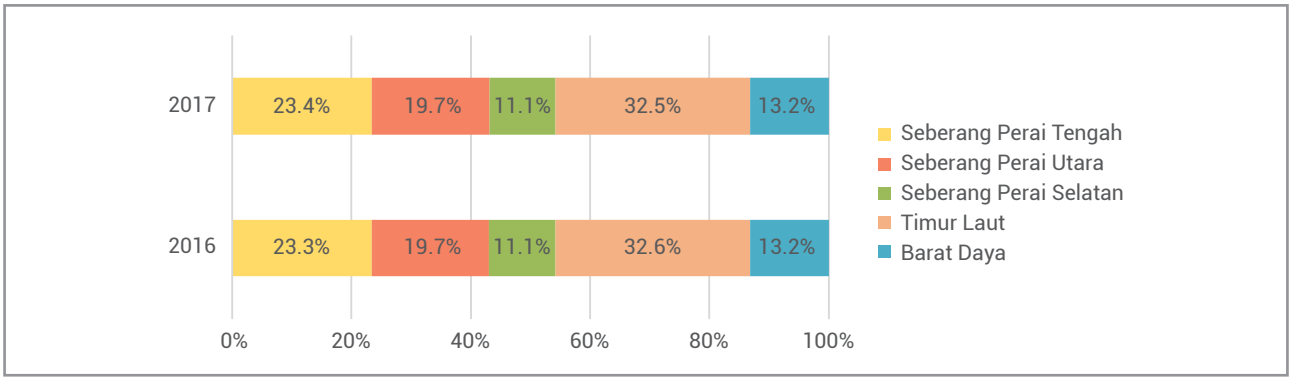
In 2017, Penang's total population stood at 1.62 million persons, which made up 5.5% of Malaysia's total population, the same proportion as it was in 2016.

As depicted in Figure 2.10, the population distribution in the state remained the same over the last two years, with Timur Laut maintaining its position as the most populated administrative district. Although Timur Laut is the smallest administrative district with a land area of 119 km^2, it comprises 32.5% of the state's population, with a population density of 4,765 persons per km^2. This is followed by Seberang Perai Tengah, which account for 23.3% of the total population and has a population density of 1,769 persons per km^2. Despite sustaining the second largest land area at 241 km^2, Seberang Perai Selatan has the lowest population share among all districts, and it has the lowest density of population, with 785 persons per km^2.

The median monthly income for Penang's T20 households stood at RM12,268, which was below the nationwide median of RM13,148. In contrast, the state's middle 40% (M40) households recorded a higher median monthly income of RM6,382 against the national median of RM6,275, while the median monthly income for B40 households was RM3,286 – slightly higher than the national median of RM3,000.

Penang's T20 median monthly income ranked below Selangor, Johor, and the three federal territories. However, for M40 and B40 households, Malacca's median monthly income was higher Penang's.

Figure 2.10 Population distribution by administrative district, Penang, 2016–17



Source: Household Income and Basic Amenities Survey Report for Penang, 2016, Department of Statistics Malaysia.

Table 2.5 Median monthly household gross income of household groups by income and state, Malaysia, 2016

State	Median monthly income (RM)		
	Bottom 40%	Middle 40%	Top 20%
Malaysia	**3,000**	**6,275**	**13,148**
Johor	3,420	6,554	12,304
Kedah	2,154	4,412	9,602
Kelantan	1,869	3,667	8,427
Malacca	3,458	6,572	12,077
Negeri Sembilan	2,658	5,409	10,857
Pahang	2,722	4,648	9,049
Penang	**3,286**	**6,382**	**12,268**
Perak	2,366	4,678	9,540
Perlis	2,572	4,751	9,017
Selangor	4,395	8,585	17,410
Terengganu	3,135	5,443	10,692
Sabah	2,169	4,843	10,886
Sarawak	2,275	4,986	10,688
W.P. Kuala Lumpur	5,344	10,564	20,201
W.P. Labuan	3,654	7,217	15,238
W.P. Putrajaya	5,960	9,492	21,994

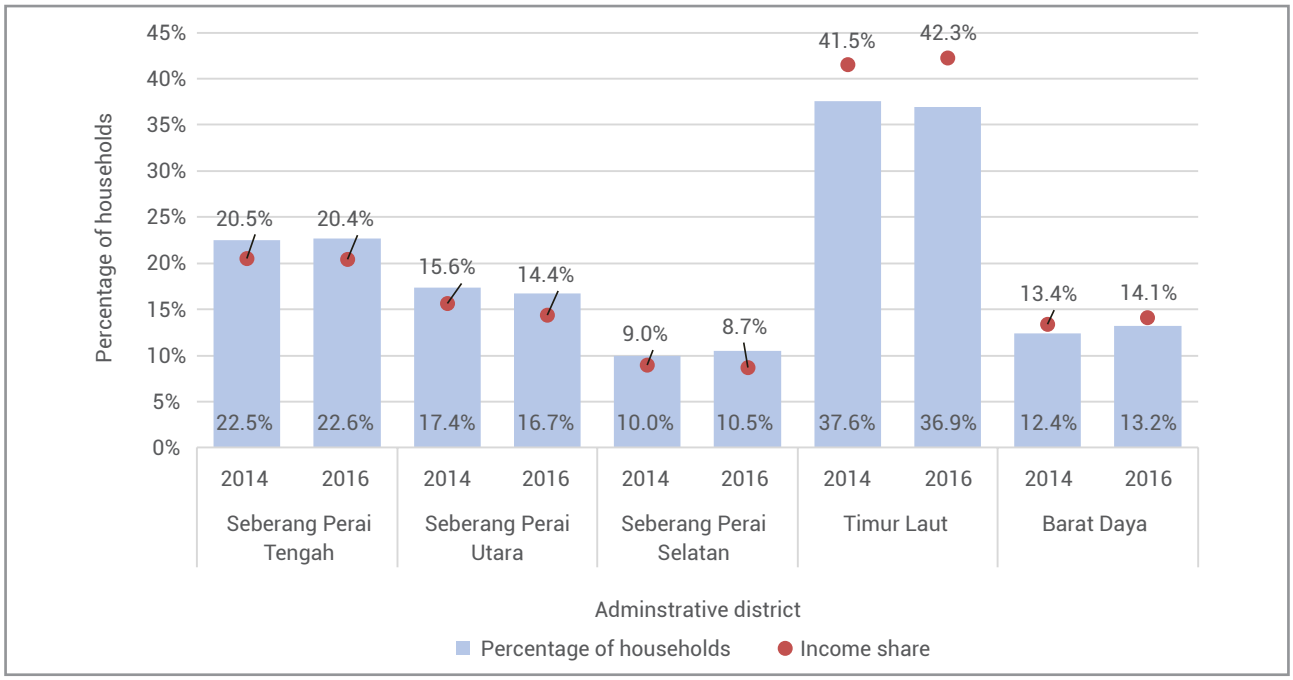
Source: Household Income and Basic Amenities Survey Report for Malaysia, 2016, Department of Statistics Malaysia.

Based on the latest data available[5], the highest percentage of Penang households for 2016 (36.9%) were concentrated in Timur Laut. Timur Laut also held the highest income share across all districts for both 2014 and 2016. Despite a decrease of 0.7% in percentage of households, Timur Laut saw an income share increase of 0.8%, going up from 41.5% to 42.3% for 2016 (Figure 2.11). The neighbouring administrative district of Barat Daya, however, recorded a 0.8% increase in its percentage of households, and a 0.7% increase in income share. Timur Laut and Barat Daya were the only two adminstrative districts with an income share higher than the percentage of households, with the proportion of the former being significantly higher.

Meanwhile, Seberang Perai Utara saw a decrease of 0.7% in households while Seberang Perai Selatan saw an increase of 0.5% in households. Seberang Perai Tengah generally maintained its percentage of households, seeing only a minimal increase of 0.1%. All three districts experienced a decrease in overall income share from 2014 to 2016, with the biggest decrease of 1.2% found in Seberang Perai Utara. Nevertheless, Seberang Perai Tengah maintained the second-highest income share in the state (20.4%). The district with the lowest income share is Seberang Perai Selatan (8.7%).

[5] Household income and expenditure data is collected biennially by the Department of Statistics, with 2016 being the latest year of reference. Therefore, the analysis of Penang's income distribution and poverty will use data from 2016 as its reference point.

Figure 2.11 Percentage of households and income share by administrative district, Penang, 2014 and 2016



Source: Household Income and Basic Amenities Survey Report for Penang, 2016, Department of Statistics Malaysia.

Timur Laut retained the highest household percentage in each income group, in accordance to its population and household share (Figure 2.12). In 2016, about 46% of T20 households were in Timur Laut, which was an increase of 3.7% from 2014. Seberang Perai Tengah followed, but at a significantly lower percentage of 19.6% – an increase of 1.4% from 2014.

The trend of Timur Laut and Seberang Perai Tengah maintaining their top-two ranking in total share of households was observed across all income groups. In 2016, both districts saw decreases in their share of M40 households in 2016. While Timur Laut's share of B40 households was reduced by 2.6%, Seberang Perai Tengah recorded an increase of 1.7%.

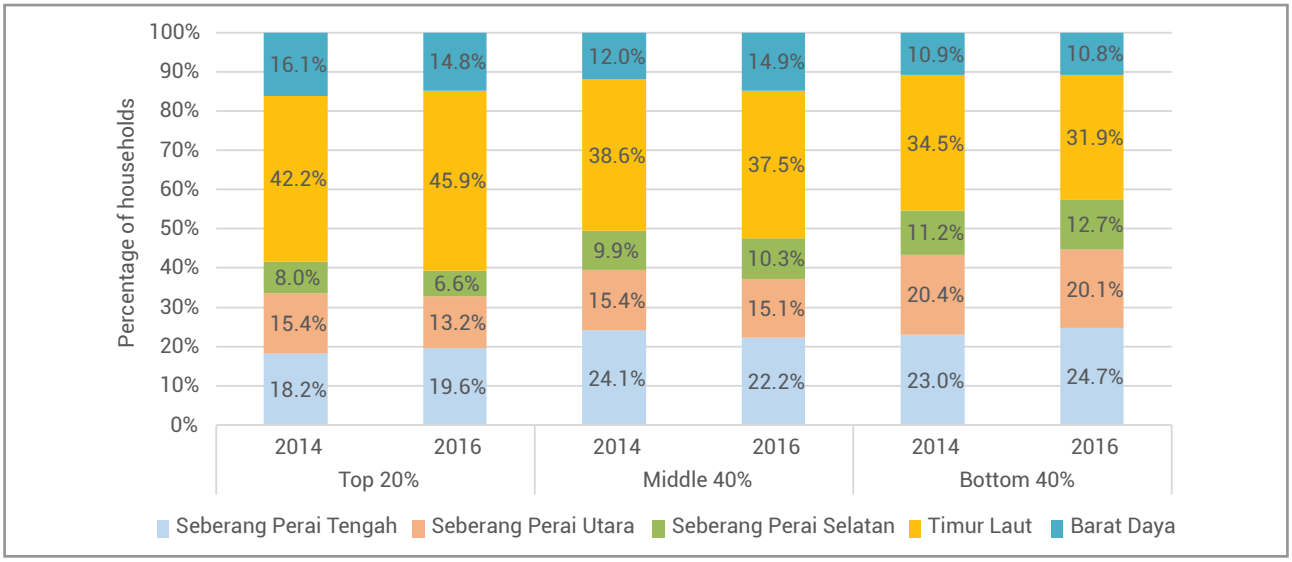
In contrast, Seberang Perai Selatan had the lowest share in T20 and M40 households, while seeing a 1.4% drop in the former and a 0.4% rise in the latter in two years. The district with the lowest share of B40 households would be Barat Daya, whose percentage of 10.8% held steady from 2014 to 2016. Barat Daya also experienced a decrease of 1.3% in T20 households, but saw an increase of 2.9% in M40 households. Seberang Perai Utara was the only district that recorded a decline in all three household income groups over the two-year period.

Within each administrative district, the proportion of income groups varied considerably (Figure 2.13). In 2016, Timur Laut and Barat Daya held a much higher percentage of T20 households at 25.9% and 23.4%, respectively. In addition, the T20 households held 52% of total income share in Timur Laut, and 45.7% in Barat Daya. The proportion of T20 households in the remaining districts were all below 20%, with Seberang Perai Tengah having the highest percentage at 18.6%. However, the income share of the T20 households in all districts exceeded 30%, with the lowest share of 31% found in Seberang Perai Selatan, whose share of T20 households stood at 13%.

With a corresponding percentage of 36.7% and 36.0%, Barat Daya and Seberang Perai Tengah again had the highest percentages of M40 households within its districts, but the rest were not significantly far behind. Seberang Perai Utara had the lowest percentage at 29.6%. Surprisingly, the income share of M40 was the lowest in Timur Laut, with 30.1% of total income share, accounting for 34.6% of its total households. At 41.2%, the highest income share sustained by M40 households was found in Seberang Perai Selatan.

B40 households made up the majority of households in each administrative district. The highest percentage of B40 households was found in Seberang Perai Utara, accounting for more than half

Figure 2.12 Percentage of households by household income group and administrative district, Penang, 2014 and 2016

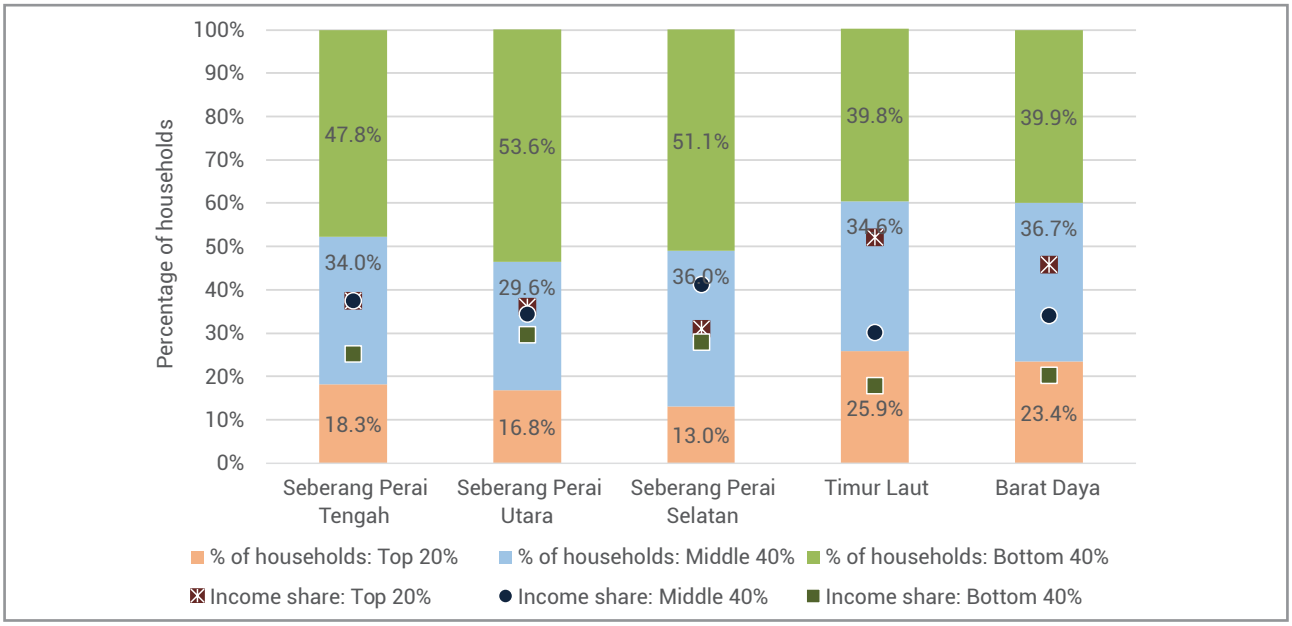


Note: Income thresholds are as follows: T20: ≥ RM9,200, M40: RM4,640–9,199, B40: <RM4,640[6].
Source: Household Income and Basic Amenities Survey Report for Penang, 2016, Department of Statistics Malaysia.

the households at 53.6%, and the lowest percentage was found in Timur Laut, at 39.8%. Despite being the majority group, the income share of B40 households was the lowest, falling below 30% of the state's total income share. Seberang Perai Utara's B40 households had the highest income share at 29.7%. B40 households in Timur Laut had only 17.9% of total income share, the lowest across all districts.

It is apparent that there were huge discrepancies in income distribution across different household groups and administrative districts. The discrepancies were especially significant in Timur Laut and Barat Daya. However, income distribution appeared to be more levelled in Seberang Perai – bearing in mind that their share of T20 households was also much lower than the share of Timur Laut and Barat Daya.

Figure 2.13 Percentage of households and income share within administrative districts, Penang, 2016



Note: Income thresholds are as follows: T20: ≥ RM9,000, M40: RM 5,000–8,999, B40: <RM 4,999[7]
Source: Household Income and Basic Amenities Survey Report for Penang, 2016, Department of Statistics Malaysia.

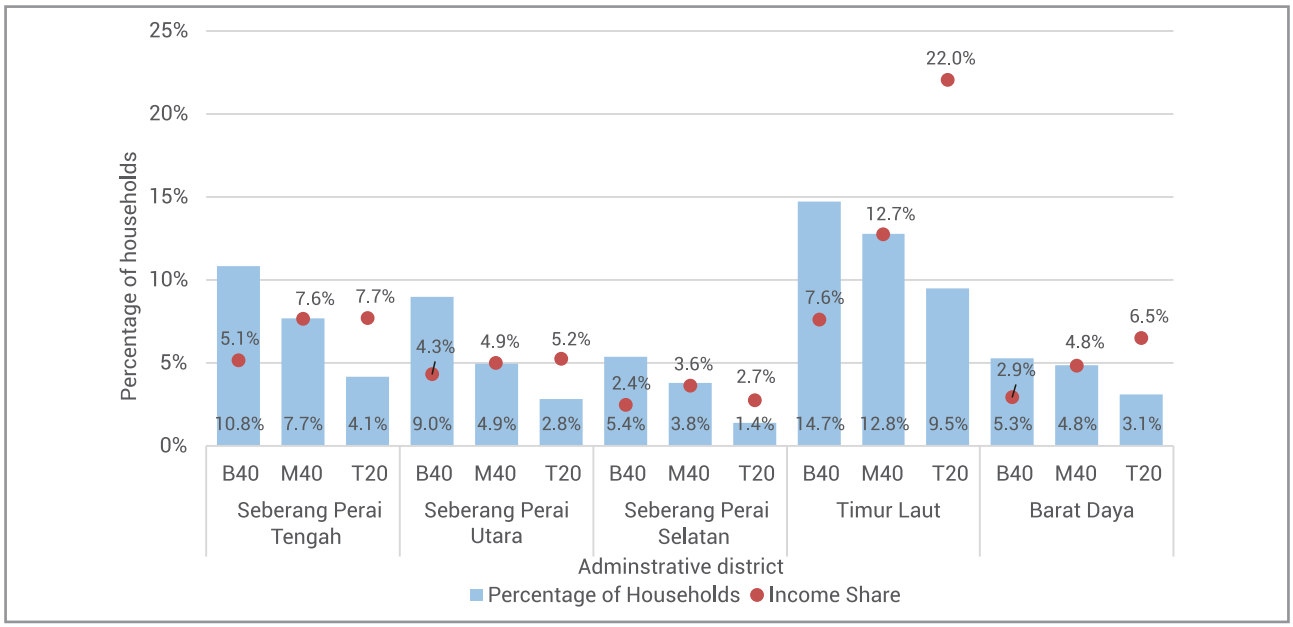
[6] The income thresholds for the respective household groups are as calculated and published by the Department of Statistics Malaysia.
[7] The income thresholds for household groups are readjusted in accordance to the categorisation of monthly gross income class of household in comes, as published by the Department of Statistics Malaysia.

Taking a state-wide perspective of income distribution across different household groups and administrative districts in accordance to share of households, it was found that 22% of the state's income share belonged to Timur Laut's T20 households, which accounted for only 9.5% of total households (Figure 2.14). All T20 households within each administrative district had income shares that was higher than the respective share of households, with the reverse observed for B40 households. M40 households generally had an income share proportionate to the corresponding household share.

Within the M40 households, the group with the second-highest income share in the state was found in Timur Laut as well. Likewise, the district's B40 households also had the biggest share of income in comparison to all B40 households in other districts, bearing in mind that its share of B40 households was the highest. In fact, the income share of Timur Laut's B40 households outweighed that of every other income group in other districts, with the exception of M40 and T20 households in Seberang Perai Tengah.

The disproportionate share of income to population found in Timur Laut's T20 households can be explained by the fact that the biggest share of households (8%) in the group earned a monthly household income of more than RM15,000, accounting for 11.5% of the district's total income share.

Figure 2.14 Percentage of households and income share by administrative districts, Penang, 2016



Note: Income thresholds are as follows: T20: ≥ RM9,000, M40: 5,000–8,999, B40: <RM4,999[8]
Source: Author's own calculations, data from Household Income and Basic Amenities Survey Report for Penang, 2016, Department of Statistics Malaysia.

Table 2.6 Gini coefficient of monthly household gross income, Penang 2014 and 2016

	Gini coefficient	
	2014	2016
Urban	0.364	0.356
Rural	0.314	0.324
Seberang Perai Tengah	0.317	0.330
Seberang Perai Utara	0.345	0.338
Seberang Perai Selatan	0.342	0.339
Timur Laut	0.395	0.377
Barat Daya	0.359	0.327
Penang	**0.364**	**0.356**

Source: Household Income and Basic Amenities Survey Report for Penang, 2016, Department of Statistics Malaysia.

[8] The income thresholds for household groups are readjusted in accordance to the categorisation of monthly gross income class of household in comes, as published by the Department of Statistics Malaysia.

Penang's Gini coefficient was the sixth-lowest in Malaysia for 2016, and it was also lower than the national Gini coefficient of 0.399. As the two states with a higher M40 and B40 median monthly household income, Johor and Malacca's Gini coefficient was lower than Penang's. However, the Gini coefficient of these two states actually increased from 2014 to 2016.

Overall, Penang's Gini coefficient decreased from 0.364 in 2014 to 0.356 in 2016, and the same situation was observed across all administrative districts, with the exception of Seberang Perai Tengah. This signifies that the income inequality gap had decreased somewhat across the majority of districts. However, looking at the urban/rural divide, the Gini coefficient had a slight increase in the rural area from 0.314 to 0.324. Timur Laut was the district with the highest Gini coefficient (0.395), which could be explained by the large discrepancies in household incomes between B40 households and T20 households. Barat Daya had the lowest Gini coefficient at 0.326.

With the establishment of *Agenda Ekonomi Saksama* (AES) or Equitable Economic Agenda, hardcore poverty has been abolished in Penang. The incidence of poverty declined from 2014 to 2016, with the state's incidence of poverty standing at 0.1 for 2016. All districts except Seberang Perai Selatan recorded a decrease in their respective incidence of poverty to zero, with Seberang Perai Utara recording the biggest decrease. However, despite the increase in the number of AES recipients in Seberang Perai Selatan, its incidence of poverty increased from 0 to 0.1.

Table 2.7 Incidence of poverty by administrative district, Penang, 2014 and 2016

Administrative District	Incidence of poverty	
	2014	2016
Seberang Perai Tengah	0.2	0.0
Seberang Perai Utara	0.6	0.0
Seberang Perai Selatan	0.0	0.1
Timur Laut	0.3	0.0
Barat Daya	0.1	0.0
Penang	**0.3**	**0.1**

Source: Household Income and Basic Amenities Survey Report for Penang, 2016, Department of Statistics Malaysia.

Box 2.2 Agenda Ekonomi Saksama (AES)

by Yeong Pey Jung, Socioeconomics and Statistics Programme

In 2009, the Penang state government established the state's poverty alleviation programme, AES, which has the core objective of abolishing hardcore poverty and reducing income equality in the state. Initially named Bantuan UPEN, the AES acts as a cash transfer programme, where households earning below the state-defined poverty threshold will be given monthly financial aid in order to lift them above the poverty line. Presently, families earning a monthly household income of RM790 and below will qualify for AES assistance.

In its inception, the AES was a non-conditional cash transfer programme, where the only requirement was a household income of less than the minimum threshold. However, it has been redefined as a conditional cash transfer programme since 2015, where recipients are expected to submit vaccination records, school attendance, and academic records of their children (if any). Elderly recipients are also required to submit their health records in a bid to ensure that they are receiving the necessary medical attention. The change from unconditional to conditional was done based on the need to monitor the economic and social impact of the AES. The data collected from AES recipients will allow analysis on the profile of Penang's poor, and encourage the development of sustainable programmes to help elevate vulnerable groups and bring them out of the cycle of poverty.

Table 2.8 Amount received by number of recipients in the AES programme by administrative district, 2006–17

District	2016		2017	
	Number of recipients	Amount (RM)	Number of recipients	Amount (RM)
Seberang Perai Tengah	214	614,810	267	900,872
Seberang Perai Utara	695	2,159,897	661	2,232,647
Seberang Perai Selatan	158	495,780	181	662,315
Timur Laut	140	253,990	178	639,565
Barat Daya	168	560,116	191	749,641
Penang	**1,411**	**4,084,593**	**1,478**	**5,185,040**

Source: State Economic Planning Division, Penang, 2018.

The AES had spent a total of RM29.2 million since its inception in 2009, and has helped to lift more than a thousand households out of poverty. In 2017, the district with the highest number of recipients was Seberang Perai Utara, with a total of 661 households receiving aid. This is expected, as Seberang Perai Utara had the highest of proportion of B40 households within the district. With the lowest proportion of B40 households at 39.8%, Timur Laut had the least number of households needing financial aid, with 178 households registered for the programme for 2017. Seberang Perai Utara received the largest amount of aid, consistent with its number of recipients, while Timur Laut had the least amount of aid dispersed with the fewest recipients.

It should be noted that all districts, with the exception of Seberang Perai Utara, recorded an increase in their respective number of AES recipient households in 2017. The most significant increase was found in Seberang Perai Tengah, with an increase of 53 households. Seberang Perai Utara marked decline of 34 households from the previous year. However, the amount of aid had grown from 2016, as with every other district.

2.6 The labour market

The current state of the labour market

Penang's labour market remained stable, with minor frictional unemployment[9]. Although both numbers of labour force and employed persons has declined, the state maintained its unemployment rate far below the national unemployment rate of 3.4%. Youth unemployment remains prevalent but Penang still performs far better than the national average. The job market is highly concentrated in the manufacturing sector.

The labour force participation rate declined to 67.5% in 2017, 1.5 percentage points lower than in 2016. Total number of employed persons also dropped by less than 1% from 827,400 people in 2016 to 822,200 in 2017. The services sector made up the largest proportion of employment, accounting for about 55%, followed by the manufacturing (36.4%) and construction (5.9%) sectors. While the size of employment in other economic sectors was declining, the manufacturing sector grew by 9.8% in 2017 (Table 2.9).

The proportion of workforce with tertiary education softened by 0.2% to 32% in 2017 while those employed in high-skill positions rose by 1.1% to 33.4% in 2017. Nevertheless, Penang still has one of the largest share of highly educated workforce in the country with more non-tertiary graduates accepting high-skill positions (See Box 2.3).

[9] Frictional unemployment is a short-term effect on the employment market where job seekers leave their old jobs voluntarily while waiting to resume work in new jobs.

Table 2.9 Employment by industry in Penang, 2016 and 2017

Industry	('000)		% share	
	2014	2016	2014	2016
Agriculture, forestry, and fishing	10.5	10.2	1.3	1.2
Mining and quarrying	0.1	0.4	0.0	0.0
Manufacturing	272.5	299.2	32.9	36.4
Electricity, gas, steam, and air conditioning supply	5.3	1.9	0.6	0.2
Water supply; sewerage, waste management, and remediation activities	3.3	6.4	0.4	0.8
Construction	61.3	48.4	7.4	5.9
Services	465.8	449.6	56.3	54.7
Wholesale and retail trade; repair of motor vehicles and motorcycles	127.6	135	15.4	16.4
Transportation and storage	42.6	40.5	5.1	4.9
Accommodation and food and beverage service activities	79.2	69.1	9.6	8.4
Information and communication	7.8	7.4	0.9	0.9
Financial and insurance/takaful activities	19.6	15.5	2.4	1.9
Real estate activities	7.0	5.6	0.8	0.7
Professional, scientific, and technical activities	19.6	21.4	2.4	2.6
Administrative and support service activities	32.8	29.2	4.0	3.6
Public administration and defence; compulsory social security	29.1	32.4	3.5	3.9
Education	47.2	40.3	5.7	4.9
Human health and social work activities	33.6	30.9	4.1	3.8
Arts, entertainment and recreation	5.5	5.5	0.7	0.7
Other service activities	14.2	16.8	1.7	2.0
Activities of households as employers	8.4	6.1	1.0	0.7
Total	**827.4**	**822.2**	**100.0**	**100.0**

Source: Labour Force Survey, Department of Statistics, Malaysia.

In 2017, the number of unemployed persons plummeted by 4.4%, leading to an unemployment rate of 2.1%. Penang recorded the third-lowest rate of unemployment in the country after Putrajaya (1.8%) and Malacca (0.9%). However, among the top developed states, Penang was ranked the lowest in workforce that were not employed (Figure 2.15).

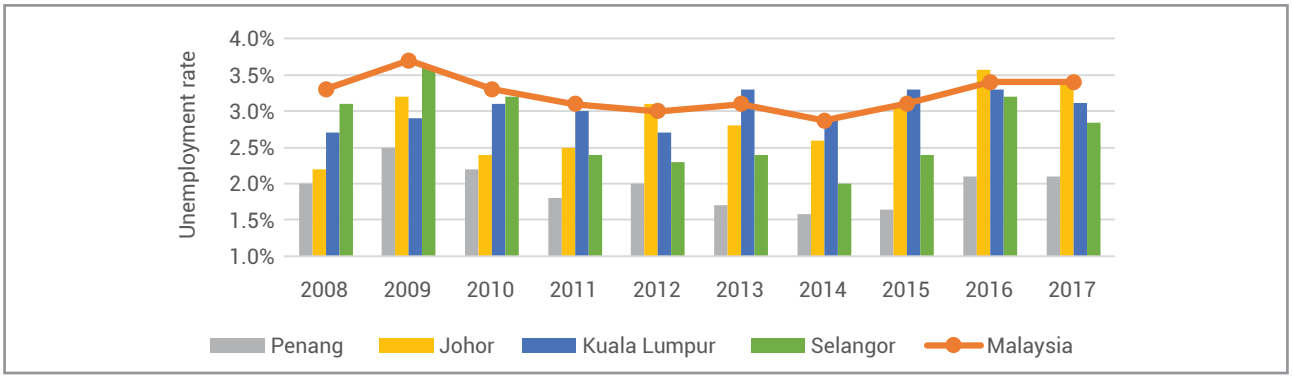
The unemployment situation is largely attributed to an increased number of youth unemployment and a bigger number of tertiary educated workforce that are unemployed. Penang's rate of youth unemployment increased from 5.5% in 2016 to 6.9% in 2017, while the unemployed workforce with tertiary education rose from 2.6% in 2016 to 2.8% in 2017. Nevertheless, these rates are considered low as compared to the national average of 10.8% for youth unemployment and 4.2% for labour force with tertiary education[11] last year.

Gender disparity in the workforce still remains evident. In 2017, Penang's male and female labour force participation rates softened to 79.2% and 55.7%, respectively. However, the state's female workforce residing in urban areas had a bigger representation in Malaysia than males, where the female workforce contributed 7.1% has compared to 6.8% for male workforce in urban areas.

More women were employed in professional and clerical support positions compared to men. As can be seen in Table 2.10, most men worked as plant and machine operators and assemblers (20.1%), followed by service and sales workers (18%) and technicians and associate professionals (16.3%). Meanwhile, the majority of women were employed as service and sales workers (22.9%), followed by plant and machine operators and assemblers (20%) and professionals (16.8%).

[10] Youth unemployment refers to youth labour force aged between 15 and 24 who are available to work but are not employed.
[11] According to the 2016's Graduate Tracer Study by Ministry of Higher Education, over half of unemployed graduates were from arts and social sciences programmes.

Figure 2.15 Unemployment rate by major developed states in Malaysia, 2008–17



Source: Derived from the Labour Force Survey published by Department of Statistics, Malaysia.

Table 2.10 Employed persons by main occupational groups and gender in Penang, 2017

Main occupational groups	('000)		% share	
	Male	Female	Male	Female
Managers	36.1	10.5	7.4	3.1
Professionals	54.0	56.3	11.1	16.8
Technicians and associate professionals	79.5	38.0	16.3	11.3
Clerical support workers	18.4	55.5	3.8	16.5
Service and sales workers	87.5	76.9	18.0	22.9
Skilled agricultural, forestry, livestock, and fishery workers	8.5	0.2	1.7	0.1
Craft and related trades workers	64.1	12.4	13.2	3.7
Plant and machine operators and assemblers	97.8	67.1	20.1	20.0
Elementary occupations	40.4	19.1	8.3	5.7
Total	**486.4**	**335.9**	**100.0**	**100.0**

Source: Labour Force Survey, Department of Statistics Malaysia.

Women were highly employed in human health and social work activities; education, financial, and insurance activities; and professional, scientific, and technical activities. While both men and women accounted for the largest proportion of their employment in manufacturing industries, men outnumbered the number of women employed in manufacturing industries, construction, and wholesale and retail trade.

Box 2.3 More non-tertiary educated workforce working in high-skill jobs

by Ong Wooi Leng, Socioeconomics and Statistics Programme

As a primary source of labour supply, Malaysia's public universities produced an average of 116,764 graduates per year in the past decade from 2008–17, with an average annual growth rate of 3.1%. Social sciences, business, and law continued to have the largest number of graduates produced by public universities, or about one-third of total graduates. This was followed by engineering, manufacturing, and construction (22.3%) and science, mathematics, and computer (16.8%).

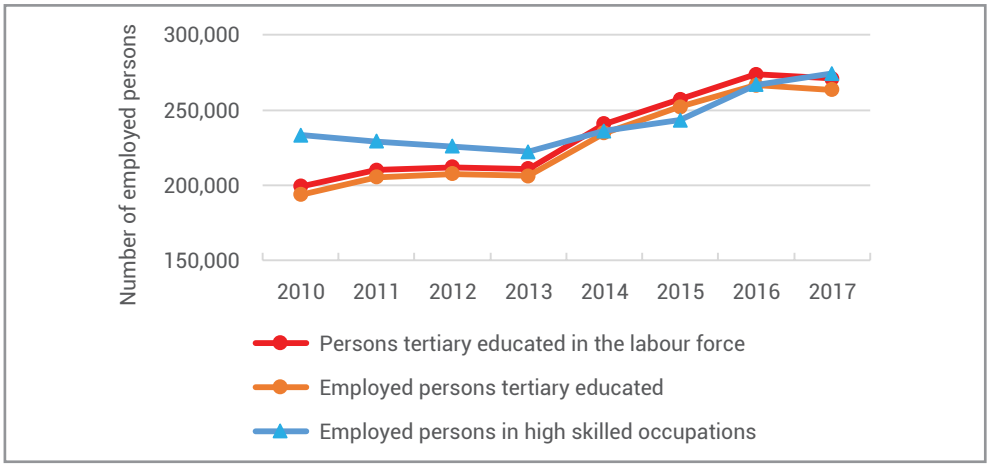
An increase in the production of tertiary-educated graduates signifies an increase in tertiary-educated labour force. Penang's share of labour force with tertiary education has increased by fourfold from 8.7% in 1990 to 32.3% in 2017, with a substantial rise after 2000. The state's labour force was the fifth-largest labour force with tertiary education in the country, constituting the third largest share of labour force with tertiary education in the country.

While labour with no formal and primary education dropped significantly, secondary-educated labour remained as the largest proportion of the workforce in Penang and Malaysia.

The employment market is also progressing towards university graduate hires. The aggregate supply of tertiary-educated labour has to keep pace with the increase in demand for highly skilled labour. However, this gap has gradually been closed, indicating an oversupply of tertiary-educated labour.

As can be seen in Figure 2.16, before 2014, some high-skilled occupations did not appear to employ all tertiary-educated labour. Workers with secondary education were also qualified to work in high skilled positions. Since 2014, the supply of labour with tertiary education exceeded the number of those hired in high skilled positions. This means that not all labour with tertiary education worked in high-skilled occupations. In fact, an increasing share of tertiary-educated hires has not been absorbed into high-skilled jobs, though the number of employed labour with tertiary education has doubled.

Figure 2.16 Tertiary educated and high-skill employment in Penang, 2010–17



Source: Authors' calculations based on Labour Force Survey, Department of Statistics, Malaysia.

Job market

Employee recruitment continued to accelerate due to positive business performances and private investment. Based on the latest data from the Ministry of Human Resources, JobsMalaysia reported that the number of job vacancies proliferated by 68%, with the manufacturing sector recording the highest number of vacancies in 2017.

According to 2017 Penang Skilled Workforce Study by the Penang Institute, JobStreet's job vacancy analysis shows that a majority of job advertisements searched for experienced workers to fill senior executive and above positions. Meanwhile, high-demand vacancies require five or more years of work experience. High-tech manufacturing companies topped in staff recruitment need, accounting for over half of total vacancies in Penang. Nearly one-third of these vacancies were related to product development and manufacturing processes, with high demand for R&D, product, and design engineers.

Junior positions, on the other hand, are largely required in the precision engineering and automation industry, with specific hard skills in basic machine design, PLC (programmable logic controllers) programming, and CNC (computer numerical control) machining. It takes an average of about two months to search for suitable candidates. Skills in demand include industry- and job-specific skills, as well as achievement skills[12], and relationship and services skills[13]. According to job advertisements, soft skills are particularly in demand at large corporations, and also when the position levels are higher. For example, positions for senior managers would require high proficiency in achievement skills than managers and senior executives.

[12] Achievement skills include problem-solving skills, being proactive, result-oriented, and self-motivated.
[13] Relationship and service skills comprise communication skills, interpersonal skills, team-building spirit, being a team player, and customer-oriented.

Coupled with the strong expansion in approved manufacturing investment, the number of planned employment opportunities increased by a quarter in 2017 from the total number of jobs created in 2016. E&E products continues to make up the largest proportion of employment to be generated in the economy, representing nearly 40%, followed by scientific and measuring equipment (16.1%) and textile products (10.2%).

Labour recruitment

Based on the same study by the Penang Institute, software design positions take the longest to fill. Network engineers and software development engineers or developers may take up to six months to recruit, with high demand for SAP (systems applications and products in data processing) consultants and Java programmers in IT and global business services (GBS) industries. Some of the skills required are somewhat niche and specialised, hence the longer period needed to fill these positions.

In contrast, recruitment difficulties are less prevalent in human resource positions. These vacancies take the least amount of time to fill; they can be filled within a month. The majority of the openings are for junior and senior executive positions.

Investment in skills training to reduce skill deficiencies within the organisation would be key to retaining employees, but it also opens up job opportunities for employees. The cost of attrition is non-bearable by some companies as it allows employees to become more mobile in the job market.

Worker retrenchment

Employee retrenchment has significantly improved. The number of retrenched workers decreased to about 1,000 persons in 2017, a significant decline of nearly 74% after retrenchment levels peaked a year earlier at 4,045 persons (Figure 2.17). The manufacturing sector accounted for the most retrenchment activities at 74%, followed by the services sector (36%).

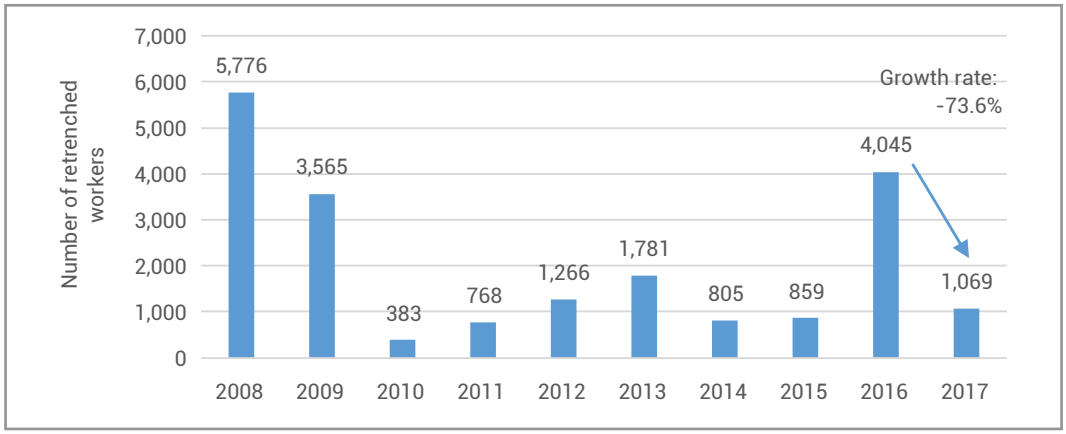
This shows that some reorientation of business operation strategies has occurred, along with improved business structures, especially among MNCs. According to the Penang Labour Department, the reasons for retrenchment include reducing the cost of production through automation in the manufacturing process, outsourcing part of operational processes for to save cost.

Likewise, the number of workers participating in the Voluntary Separation Scheme (VSS) significantly declined by about 83% to 146 persons in 2017. Despite the fact that manufacturing industries contributed over 60% of the total VSS workers, employers implemented fewer VSS programmes, and fewer employees were needed to be cut.

Salaries and wages

Penang recorded the highest growth in median monthly salaries and wages among the most developed states in Malaysia. Its median monthly salaries and wages increased by 8% to RM2,160 in 2017 (2016: 5.3%; RM2,000) compared to Kuala Lumpur (6.0%), Selangor (3.2%), and Johor (2.3%).

Figure 2.17 Number of retrenched workers in Penang, 2008–17



Source: Penang Labour Department.

Internal migration

A positive net migration was again recorded in Penang for 2015–16. Net migration increased by nearly 43% to 12,000 persons, marking the second-largest number of in-migrants exceeding the number of out-migrants after Selangor (Figure 2.18). Meanwhile, Kuala Lumpur had the most number of persons moving out of the territory. Penang also had the highest positive migration effectiveness ratio at 58.4%, indicating that for every 100 inter-state migrants, the number of people migrating in and out increased by 58 persons. In contrast, the population in Kuala Lumpur shrank by 93 people for every 100 inter-state migrants.

In 2015–16, about half of migrants aged 15–64 who moved to Penang had tertiary education; about one-fourth of in-migrants worked in sales and services areas, followed by plant and machine operators and professional occupations. Two-thirds were employed in the services sector.

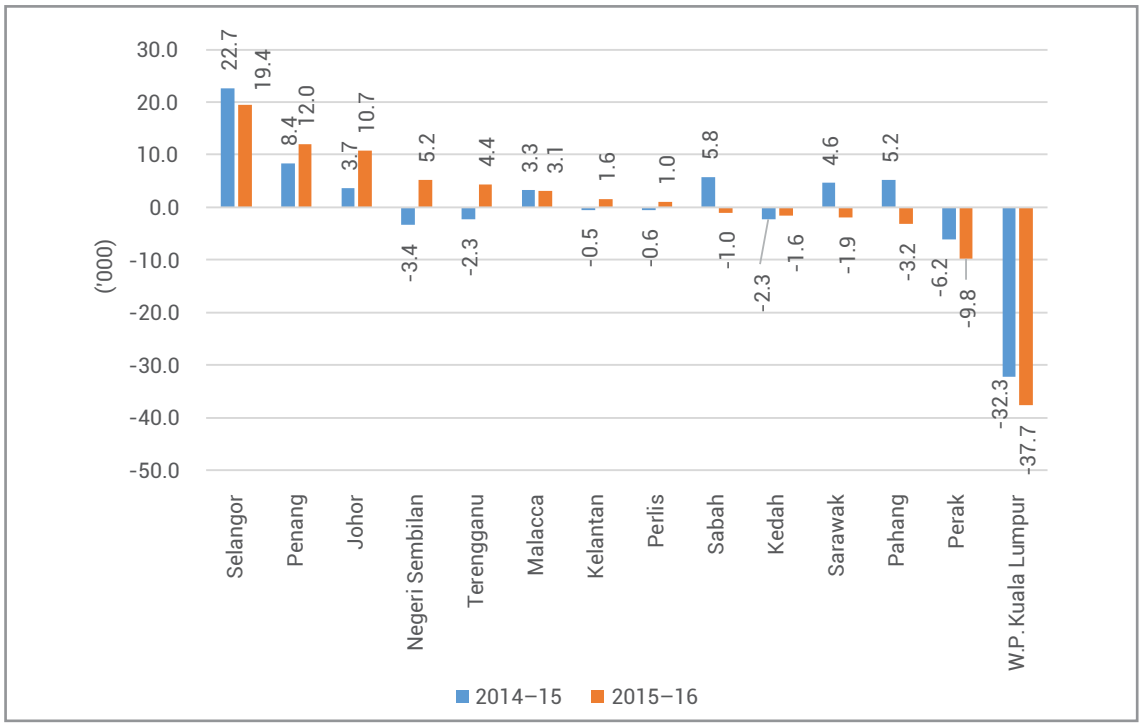
Foreign workers

As of February 2018, Penang received about 130,000 foreign workers, accounting for 7.4% of the entire foreign workforce in the country. One-third of these workers are employed in the manufacturing sector, followed by construction (12.9%), services (11.7%), and domestic help (5.7%). Male foreign workers dominate in all sectors except domestic help.

Given the insufficient information gathered as of this writing, it is difficult to analyse the nationality of foreign workers in Penang. However, at the national level, the majority of foreign workers are from Indonesia, Nepal, and Bangladesh as of February 2018, or about 40%, 22%, and 15% of the total foreign workers, respectively. Most Bangladeshi and Nepalese workers are employed in the manufacturing sector, while Indonesian workers are employed in the farming industry.

While the number of foreign workers is high, the number of approved temporary work passes has reduced significantly since 2014. The number of temporary work visit passes approved by the Penang Immigration Department halved in 2015 from 164,885 persons in 2014, and further declined to 23,735 in 2016, before increasing by 24.5% to 29,550 in 2017.

Figure 2.18 Net migration by state in Malaysia, 2014–15 and 2015–16



Source: Migration Survey Report 2016, Department of Statistics, Malaysia.

2.7 Prospects for 2018

Penang's economic performance and GDP growth is expected to continue growing and improving in 2018, in the light of increasing foreign direct investments in the state's manufacturing sector. The services sector is also expected to contribute to economic growth due to its steady expansion and the rapid development of the state's SSO activities. Advancements in the global and domestic economy will have a positive impact on Penang's economy due to the state's position as an export hub.

The significant increases in Penang's total volume of external trade in 2017 is expected to continue in 2018. Machinery and transport equipment accounted for the largest export and import commodity in the first two months of 2018, and this is expected to remain going forward. Additionally, as a hub for the E&E industry, Penang's external trade position and trade balance is projected to remain strong, buoyed by the consistent growth in the world semiconductor market in 2018.

The abolishment of the GST and reinstatement of the SST is predicted to have a positive effect on prices, in particular on food and beverage, retail, and property prices. The lowering of input costs will lead to lower prices for consumers.

Household income will continue to improve, owing to the booming digital economy. On top of annual increments in wages and salaries, income generated from digital activities, including ride-sharing and e-commerce, are likely to increase the household income of Penangites in 2018. Part-time income earned from being ride-sharing drivers are relatively well received by groups such as housewives, full-time and part-time workers, and unemployed youth. Household expenditure is projected to modestly increase due to the abolishment of the GST in the second half of 2018. The purchasing power of households may increase as consumers can now spend more on food and travel.

In 2018, the labour market condition is expected to remain stable with low retrenchment activity and unemployment rate. The job market remains resilient due to the expansion of manufacturing operations in Batu Kawan and the upcoming opening of the IKEA shopping complex. Positive business performance and high increments in approved private investments, particularly in the manufacturing sector, will lead to increasing demand for recruitment and employment. However, there is higher demand for high-skilled and experienced workers, predominantly within the high-tech manufacturing industries, relating to product research and development as well as manufacturing and engineering processes. Fresh graduates and non-tertiary educated workers may still struggle to gain steady employment. Therefore, the state's and the industry's investment in skills training is vital in overcoming skills deficiencies and raising the employability of graduates.

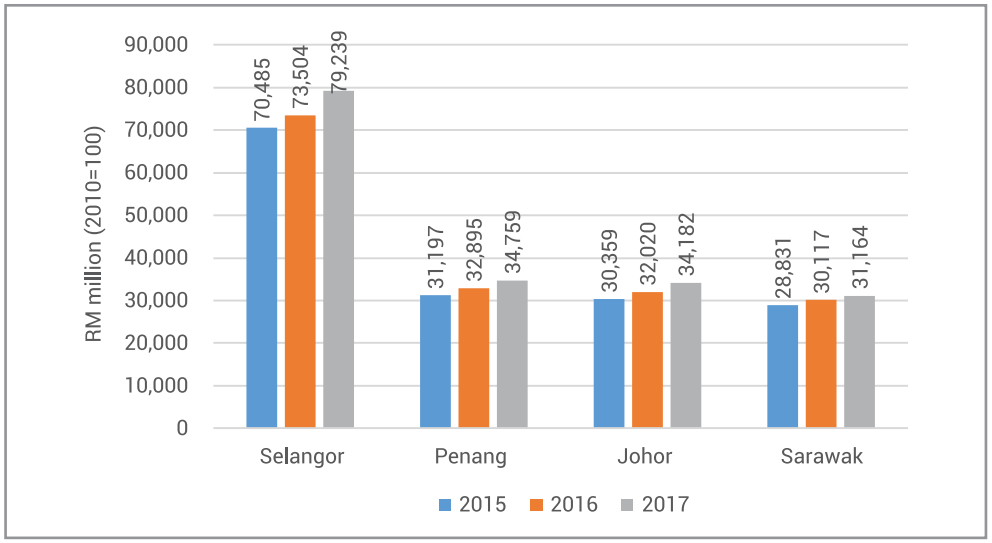
In terms of income distribution, Timur Laut is expected to continue retaining the highest income share in the state, as well as having the highest proportion of T20 households as it is the capital of the state and a highly populated urban area. With the projected growth of Penang's economy, the Gini coefficient is forecast to gradually decrease, thus bridging the income gap and reducing poverty.

3 Sectoral Economic Developments and Prospects

3.1 Manufacturing sector

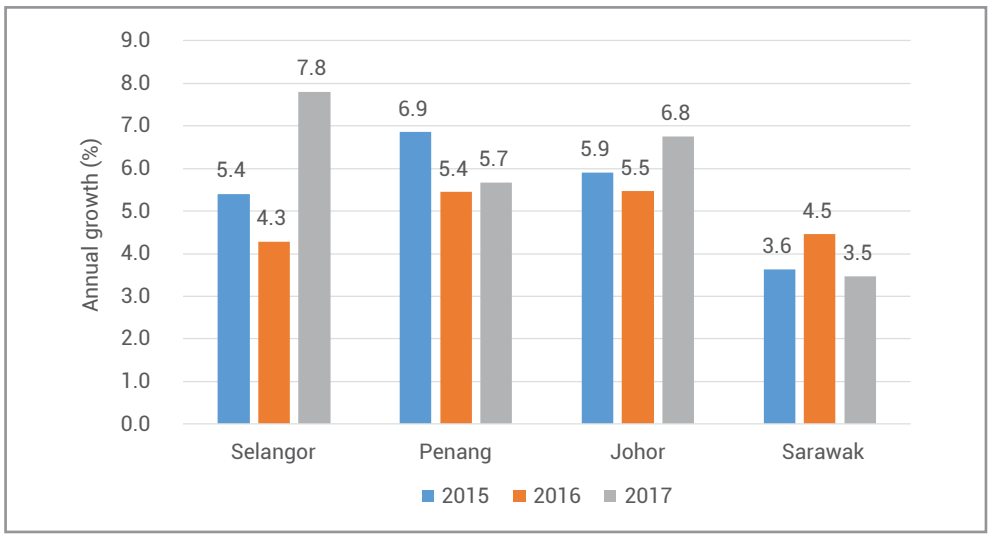
Through 2016 to 2017, the manufacturing sector continued to play an integral part in Penang's economy, and even more so in Malaysia's manufacturing sector. Penang has maintained its position as the second-largest contributor to Malaysia's manufacturing GDP through 2016–17 (Figure 3.1). However, growth rate in 2017 was sluggish at 5.7%, an increase of just 0.3 percentage points while other states had an increase of at least 1 percentage point increase in 2017 (Figure 3.2). In terms of manufacturing investments, Penang is also consistently the state of choice, receiving 17% of total approved investments in Malaysia for the 2017, and 8.1% in the first quarter of 2018 (Figure 3.3). Overall performance of the manufacturing sector is also trending positively, as evidenced by the continuous growth in the industrial production index (manufacturing) for 2015–17 (Figure 3.4). This bodes well for Penang given that the manufacturing industry is the biggest employer in Penang. Moreover, the manufacturing sector also recorded high levels of labour productivity compared to other economic sectors in 2014–17 (Table 3.1). The manufacturing sector is displaying positive labour productivity growth rates with little variance year on year. Compared to other sectors that display highly erratic growth rates, this indicates that labour productivity in the manufacturing sector is more organically driven as companies are increasingly able to incorporate the use of technologies in their production process.

Figure 3.1 Top four contributing states to Malaysian GDP in manufacturing activity, 2015–17



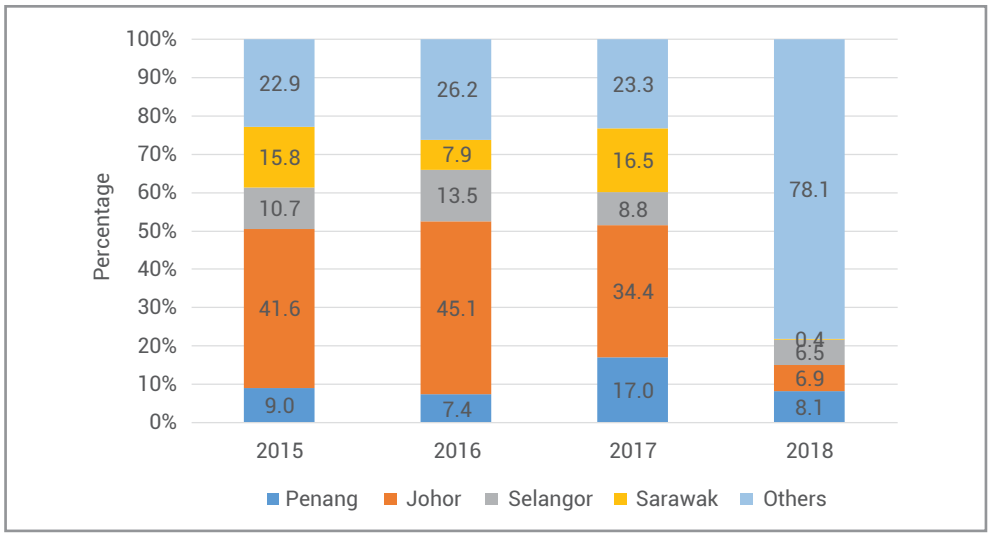
Source: Department of Statistics, Malaysia.

Figure 3.2 Annual growth rates of GDP in manufacturing activity for selected states, 2015–17



Source: Department of Statistics, Malaysia.

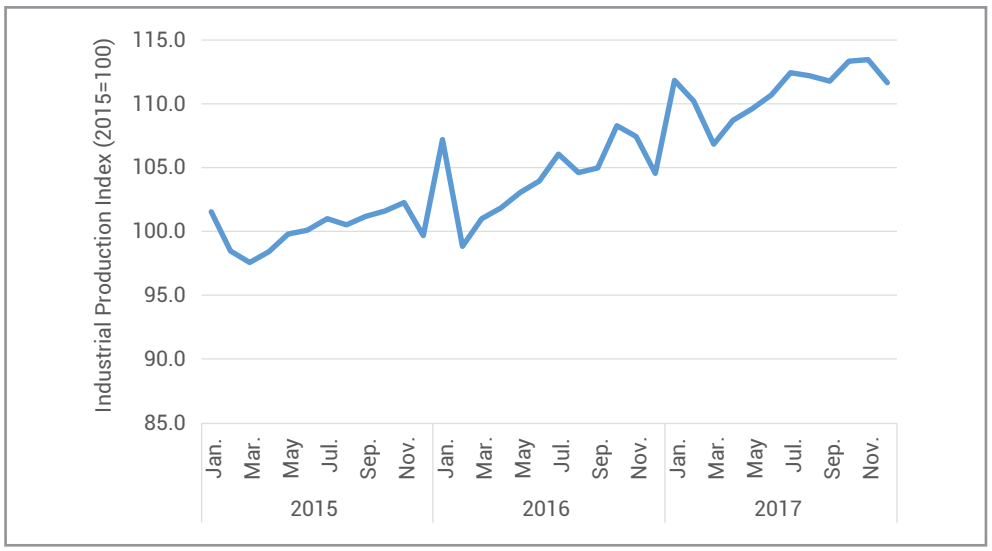
Figure 3.3 Percentage of contribution to total capital investment in manufacturing projects by major states, 2015–18



Notes: i) Data for 2018 are up to March 2018.
ii) Investment includes both domestic and foreign investments.

Source: Malaysian Investment Development Authority (MIDA).

Figure 3.4 Industrial Production Index (2015=100) for Malaysian manufacturing sector, 2015–17



Source: Department of Statistics, Malaysia.

Table 3.1 Labour productivity by type of economic activity, Malaysia, 2014–17

Year	Agriculture		Mining and quarrying		Manufacturing		Construction		Services	
	RM	Growth (%)	RM	Growth (%)	RM	Growth (%)	RM	Growth (%)	RM	Growth (%)
2014	51,741	1.5	1,159,389	3.4	97,342	4.5	34,714	13.7	64,877	3.0
2015	53,908	4.2	984,885	-15.1	102,633	5.4	35,723	2.9	66,750	2.9
2016	51,289	-4.9	1,133,372	15.1	106,307	3.6	39,298	10.0	69,534	4.2
2017	51,988	1.4	1,210,832	6.8	110,858	4.3	40,242	2.4	73,030	5.0

Source: Labour Productivity, Department of Statistics, Malaysia.

Within the manufacturing sector, the E&E industry remained the mainstay of Penang's manufacturing activities. Through 2016–17, E&E continued to be the most highly invested manufacturing industry in terms of capital investment (Table 3.2). This amounted to 40% of total manufacturing investment in 2016, and increased to 62% in 2017. This is a testament to Penang's robust and dynamic E&E industry that continually demonstrates more room for growth and expansion. Furthermore, foreign investments consistently surpassed domestic investments, indicating that the industry is heavily driven by multinational enterprises (MNEs). Such an environment has in turn made the E&E industry arguably one of the most productive industries within the manufacturing sector[14], As proven by the 24th Productivity Report 2016/2017. In 2016, the E&E industry achieved the highest productivity growth rate at 9.6%, highest contribution of added value at 23%, and highest contribution to manufacturing exports at 44.6% (MPC, 2017).

[14] This is intuitive given that MNEs within Penang's E&E ecosystem are what Andrews et al. (2015) term as "frontier firms" – firms that operate at the global productivity frontier and are characterised by their profitability, patent activities and global reach.

Table 3.2 Approved manufacturing investment by top four industries, Penang, 2016–17

Industry	(RM Million)					
	Domestic investment		Foreign investment		Total capital investment	
	2016	2017	2016	2017	2016	2017
Electronics and electrical products	92.5	800.1	1,643.0	5910.0	1,735.5	6,710.1
Scientific and measuring equipment	35.2	293.9	948.1	1,475.4	983.3	1,769.3
Transport equipment	463.2	105.0	183.0	68.0	646.2	173.0
Machinery and equipment	176.7	219.6	17.6	204.3	194.3	423.9
Chemical and chemical products	45.0	319.5	8.0	476.6	52.9	796.0

Source: Malaysian Investment Development Authority (MIDA).

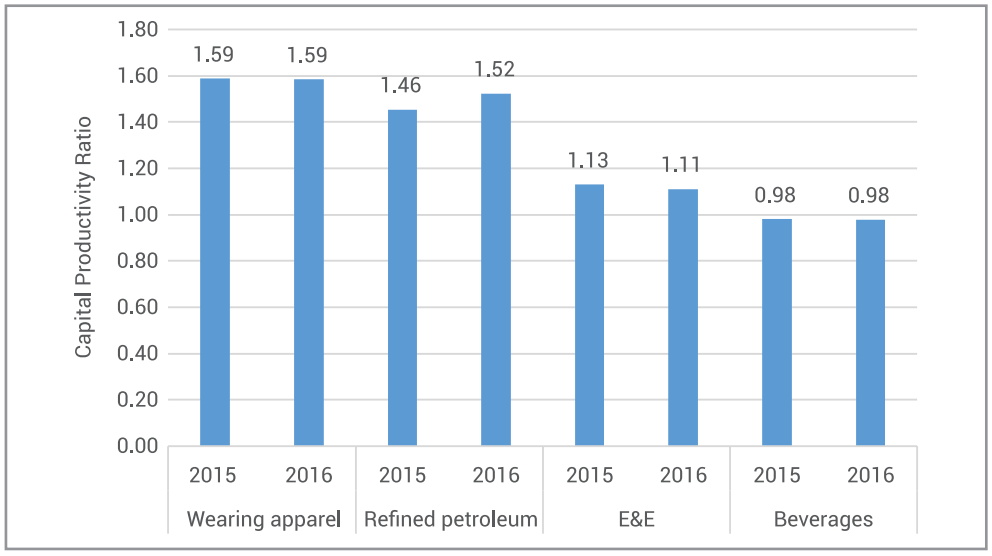
In terms of labour cost competitiveness, E&E was among the most competitive manufacturing industries, with high labour costs per employee and low unit labour cost. This indicates that employees in the E&E industry are rewarded with increased wages as productivity improves (Table 3.3). Similarly, the E&E industry reported a high capital productivity figure compared to other industries in the manufacturing sector. Given that capital productivity measures the utilisation of fixed assets such as machinery, office equipment, and transport, it provides a suitable proxy for the utilisation of technology. In this context, a high capital productivity score indicates that the E&E industry utilises high technological input (Figure 3.5).

Table 3.3 Labour cost competitiveness by top four industries, Malaysia, 2016

Industry	Growth (%)		
	Productivity	Labour Cost per Employee	Unit Labour Cost
E&E	9.6	4.7	-2.4
Wood and wood products	5.3	3.2	-1.9
Textiles	5.1	2.3	-2.6
Wearing apparel	3.4	7.8	4.3

Source: Productivity Report 2016/2017, Malaysia Productivity Corporation.

Figure 3.5 Capital productivity by top four manufacturing industries, Malaysia, 2015–16



Source: Productivity Report 2016/2017, Malaysia Productivity Corporation.

Moreover, it is also observed that the E&E industry is well integrated into the global market through global value chains (GVCs). The latest input–output tables reported that 72.6% of intermediate inputs for the E&E industry are imported, while 27.4% of intermediate inputs are domestically produced. Specifically, the E&E industry is heavily dependent on the import of computer, electronic, optical products (55.7%), and electrical equipment (5.0%) (Table 3.4). The continuous growth of the E&E industry is forming the backbone of Penang's manufacturing sector.

The Penang state government has taken active steps to continue developing a dynamic manufacturing sector through two government agencies: InvestPenang (IP) and Penang Development Corporation (PDC). Through these two agencies, the state government has chosen two policy entry points (among many others): SME development and development of industrial parks, executed by IP and PDC, respectively. To develop SMEs in Penang, IP operates the SME Centre which provides subsidised rental space for light industry SMEs that cannot yet afford to have their own facility (Table 3.5). Such policies are crucial in promoting greater participation in the industry by domestic firms. Additionally, the state government has also promoted the development of industrial parks to reap the benefits of agglomeration by industries. To date, Penang is home to seven industrial parks: Bayan Lepas Industrial Park & Free Industrial Zones, Bukit Minyak Industrial Park, Mak Mandin Industrial Estate, Perai Industrial Park & Free Industrial Zone, Batu Kawan Industrial Park, Seberang Jaya Industrial Park, and Penang Science Park (Figure 3.6).

Table 3.4 Sources of intermediate inputs for the E&E industry, Malaysia, 2010

Industry	Contribution (%)	
	Domestic	Imported
Agriculture	0.01	0.04
Mining	0.04	0.04
Food and beverages	0.00	0.00
Textiles	0.00	0.04
Wearing apparel	0.01	0.00
Wood	0.42	0.06
Petroleum refinery	0.20	0.09
Chemicals and chemical	1.03	1.16
Rubber and plastic products	1.56	0.70
Other non-metallic mineral products	1.41	0.59
Basic metals	1.46	4.54
Fabricated metal products	1.41	0.93
Machinery and equipment	0.58	1.30
Electrical equipment	0.53	5.02
Computer, electronic, optical products	1.96	55.74
Transport vehicles	0.04	0.03
Other manufacturing	0.50	0.23
Construction	1.16	0.04
Services	14.99	2.05
Total	**27.40**	**72.60**

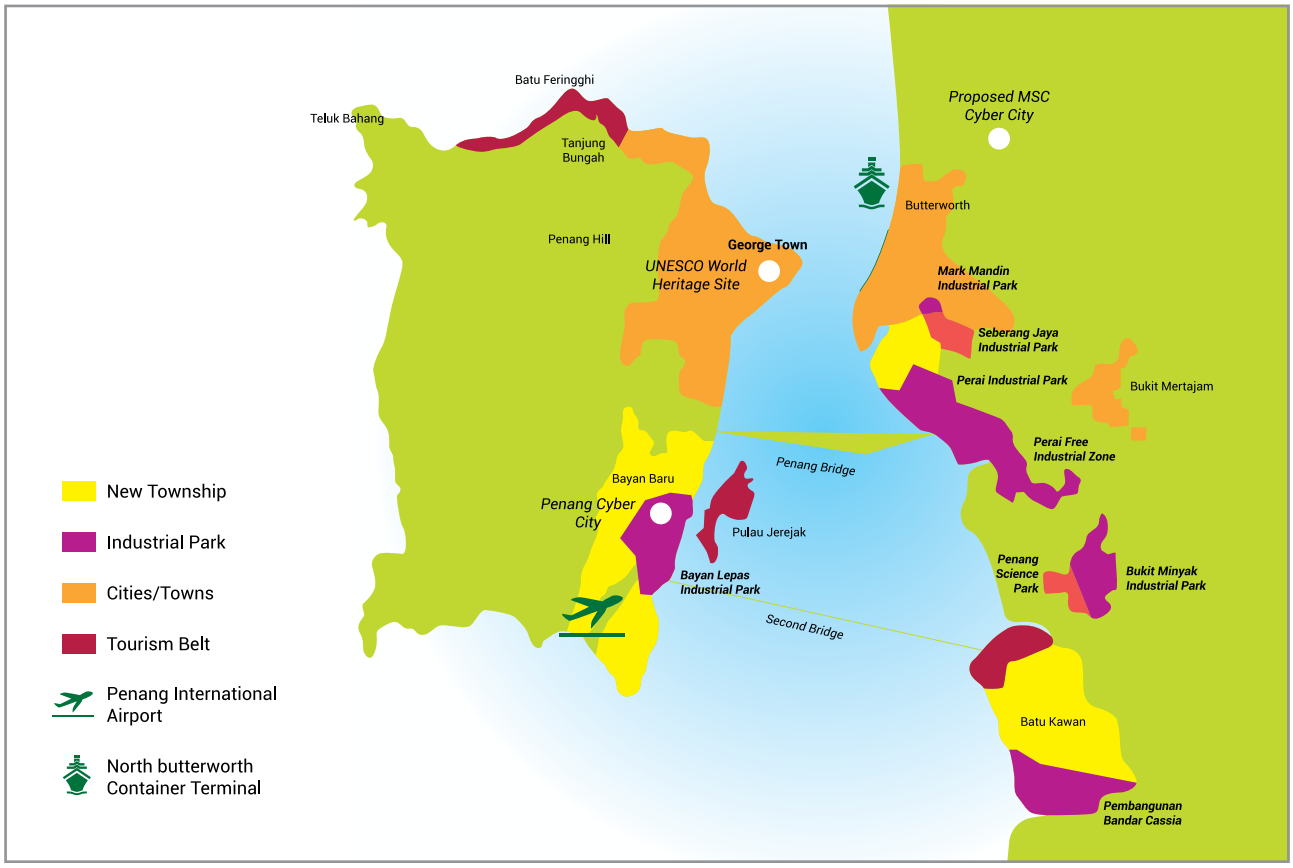
Source: Productivity Report 2016/2017, Malaysia Productivity Corporation.

Table 3.5 Subsidised rental rates for local SMEs

Renting option	Floor	Rental rate (sqft/month - RM)	
		Year 1, 2, & 3	Year 4, 5, 6 & 7
Option 1: Empty Lot	Level 1	1.8	2.6
	Level 2, 3 and 4	1.5	2.3
Option 2: Fully furnished office unit	Level 4	3.5	4.4
Option 3: Basic renovated unit	Level 1	3.1	3.9
	Level 2, 3 and 4	2.8	3.6
		Year 1 - 4	Year 5 - 6
Option 4: GBS projects	Fully furnished	4.3	5.1
	Empty lot (1-4)	2.3	3.1

Source: InvestPenang.
Figure 3.6 Penang industrial areas

Figure 3.6 Penang industrial areas



Source: Penang Development Corporation.

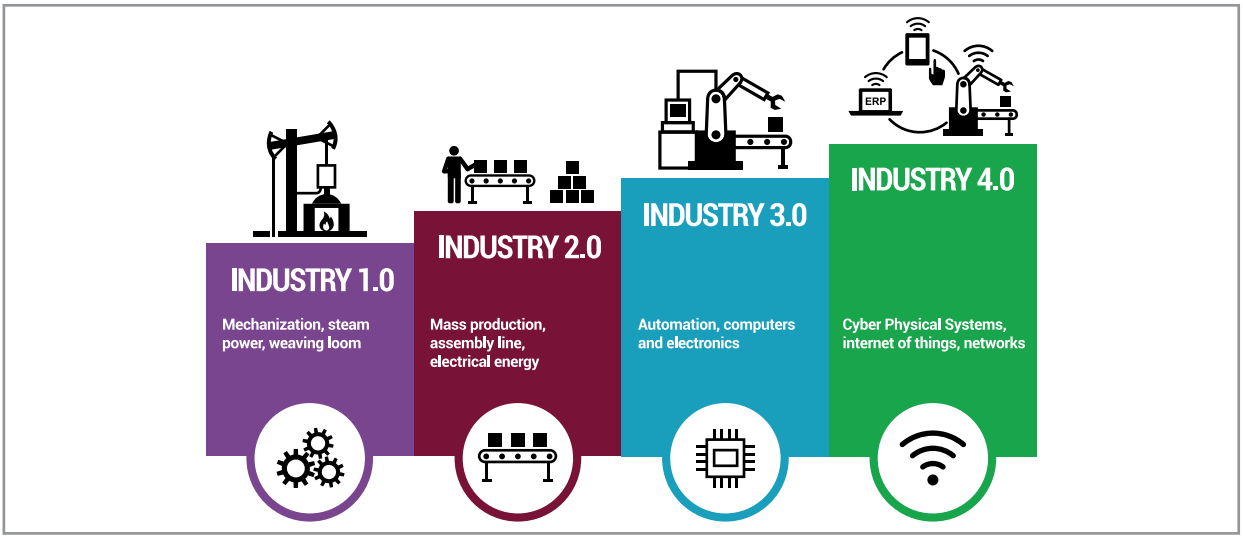
Moving forward, the manufacturing sector in Penang is set to embrace Industry 4.0 (See Box 3.1). While Penang's mainstay in E&E will definitely benefit from an exponential growth in global demand for electronic components, the next few years is crucial in determining Penang's comparative advantage and position in the global value chain. In the next few years, the manufacturing industry is poised to advance towards the importance of associated services under the Industry 4.0 umbrella. This is picked up in the section on GBS in this report.

Box 3.1 Industry 4.0 and the future of Penang's manufacturing sector

by Timothy Choy, Socioeconomics & Statistics Programme

Industry 4.0 refers to the use of digital technologies to create cyber-physical systems in the manufacturing industry (Figure 3.7).

Figure 3.7 Evolution of manufacturing technologies



Source: Simio (n.d).

The outcome of which is an identical digital copy of the physical world. To make this happen, a variety of technologies and new business areas are clustered under the Industry 4.0 umbrella. These technologies include the internet of things (IoT), robotics, cloud computing, 3D printing, and big data analytics. As with each evolution of manufacturing technologies, dramatic changes in the industry would soon follow. Industry 2.0, for example, played a catalytic role in the phenomena of offshoring – one that Penang has been a beneficiary of. Similarly, the advent of Industry 4.0 will bring about disruptive changes to the manufacturing industry and, quite naturally, to Penang.

The biggest benefit that Industry 4.0 brings to Penang is perhaps its mainstay in demand for semiconductor components. Manyika et al. (2015) estimates the IoT industry to be worth between $3.9 trillion and $11.1 trillion in 2025. Unlocking this value, however, is heavily dependent on the ability of companies to integrate and analyse data from various IoT systems – 60% of potential value, to be exact. In order for this integration to take place, Industry 4.0 dictates that machines should be able to communicate with one another – they need to be "smart". That is, machines should be able to sense its environment, process and then communicate this data in a digital form. Fundamental to this ability are semiconductor components that act as a "brain" for smart machines. Additionally, the use cases for smart products is pervasive across every industry: healthcare, consumer appliances, automotive, and even within the manufacturing plants themselves. Penang's E&E industry is therefore well placed to be guaranteed a role in meeting the exponential surge in global demand for semiconductor components.

However, there is a need to review Penang's position in the value chain. The processes of manufacturing (from design to market) a product contribute a varying degree of value-add across different stages, resembling a "smile curve".[1] The goal is therefore to move up the value chain to capture more value from manufacturing activities. This is compelling for two reasons. First, the advent of Industry 4.0 has further lowered the contribution of value from fabrication activities. In *Manufacturing in the Digital Economy*; I argue that digital technologies under the Industry 4.0 banner has made mass customisation possible, thus shifting value towards the tail ends of the smile curve (i.e. R&D and marketing). 3D printing, for

example, has allowed nascent startups to print sophisticated mechanical parts that were previously exclusive only to large, technology intensive companies (Choy, 2017). Secondly, Penang's competitive advantage in fabrication activities will quickly erode in the future. Digital technologies are commonly characterised by their favouring of new entrants rather than incumbents. This is because the process of technology upgrading exerts far more inertia on an organisation than it does to begin using new technology (Hall and Khan, 2003). It is only a matter of time before another industrial cluster elsewhere supersedes Penang's competitive advantage.

Moving up the value chain, however, does not necessarily happen organically. Rather, fulfilling a number of pre-conditions would help nudge the industry further up the chain. These include:

1. Adoption of digital technologies by domestic firms
The biggest motivation for adopting digital technologies is the productivity gains that comes with it. More than just contributing to a reduction in cost in the long run, productivity gains also open up avenues for innovation and business expansion. This happens because employees would be freed up to do more productive work while repetitive and mundane work would be left to automation. Such productivity gains mark Penang's competitive advantage in the manufacturing industry. One can think of this as a competitive advantage in vertical specialisation. For example, although contract manufacturing (CM) is positioned as a low value-add activity in the fabrication process, CM activity itself forms another smile curve. Moving up this curve then will see the development of new and novel ways to perform CM activities.2 This, however, is conditional on the adoption of digital technologies by domestic firms.

2. Investment in research and development (R&D)
In an extended case study on industrial clusters in the United States by The Brookings Institution, one common success factor that seems to recur at every cluster is their core competency in research and development. Every successful industrial cluster is built around an institution that engages in some form of R&D, most commonly universities. The tech cluster in Austin, Texas, for example, builds on the foundations of the University of Texas at Austin, Texas A&M University, and several colleges and training institutes. Similarly, clusters around biotech, information technology, and pharmaceuticals in Pittsburgh, Pennsylvania builds on the research capabilities of the University of Pittsburgh and Carnegie Mellon University (Baily and Montalbano, 2017). This, however, is not so much the case in Penang. It is therefore imperative to build a vibrant R&D sector in order for the industry to move up the value chain. While Penang may not have a strong base of readily available research institutions, the private sector, and more so the MNCs can and should invest further in R&D.

To this end, the Penang state government is in the process of drafting the Penang Digital Transformation Masterplan that, among other things, seek to nudge industries towards Industry 4.0.

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Manyika, J., Chui, M., Bisson, P., Woetzel, J., Dobbs, R., Bughin, J. and Aharon, D. (2015). *The internet of things: Mapping the value beyond the hype.* McKinsey Global Institute.

Notes:
1. The smiling curve was first introduced by Stan Shih, the founder of Acer Inc.
2. See "Diagram 2" in The Malaysian Electrical & Electronics (E&E) Industry – At an Inflexion Point by Wong Siew Hai.

3.2 Services sector

3.2.1 Transportation and logistics

Transportation and logistics are both important components of economic development; research has shown that there is a positive correlation between investment in the infrastructure of transportation and economic development (Candemir and Celebi, 2017). In advancing the technology of transportation and transport networks, transportation costs, access, and connectivity can be greatly improved, opening up more areas for economic activity and development. Furthermore, enhanced transportation systems will benefit the logistics sector, which is a vital sector in supporting all sectors of the economy by facilitating international trade, reducing the costs of doing international business as well as raising the productivity and efficiency of the country's economy (World Bank, 2016). International trade is a key component in advancing Malaysia's, and by extension, Penang's economic development. After all, Malaysia recorded a 19.4% growth in total trade in 2017, amounting to total trade value of RM1.78 trillion. Penang, on the other hand, saw a 19.5% growth that brought in RM429,920 million in total trade value.

In addition to driving the logistics industry, transportation is, of course, the facilitator in the movement of Penang's citizens and all tourists and business visitors to Penang through land, air, rail, and water, which, in turn, drives economic activity in the state.

Land

The main mode of public transportation in Penang is the public bus system operated by Rapid Penang. Unfortunately, the coverage provided are not all-encompassing. In 2018, the Penang state government announced the extension of the Congestion Alleviation Transport (CAT) plan. Originally offering two free bus routes (Central Area Transit, launched 2008 and Bridge Express Shuttle Transit, launched 2011), CAT will now add 12 more free routes throughout the island and the mainland (The Star Online, 2018). CAT acts as a feeder bus service linking commuters to Rapid Penang's main routes, with a focus on routes with hospitals, schools, government departments, markets, and shopping complexes (The Star Online, 2018).

Despite the CAT plan, connectivity and coverage still lack comprehensiveness, and Penang commuters still rely on private vehicles as their main mode of transportation. Motorcycles and passenger cars are the two primary vehicles on Penang's roads. There are more motorcycles than cars, with new motorcycles registrations more than quadrupling the new registrations of cars in the last quarter of 2017. Overall, new vehicle registrations in Penang saw a gradual decrease from 2016 to 2017, with the exception of Q4 2016 to Q1 2017, where the total number of new vehicle registrations increased by 1,045 registrations. There were also fluctuations in new registrations of passenger cars, hired cars, and lorries and vans.

Despite the decrease in new motor vehicle registrations, the state's road users continue to endure traffic congestion, especially during peak hours. The Penang state government has proposed the Penang Transport Master Plan (PTMP), which aims to improve the accessibility and efficiency of transportation in Penang (See Box 3.2).

Table 3.6 Number of new motor vehicle registrations, Penang, 2016–17

Vehicle	2016				2017			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Private motorcycles	9,582	7,999	7,772	7,237	8,651	7,187	6,702	6,596
Private passenger cars	3,081	3,350	2,461	2,424	2,063	1,862	1,742	1,599
Buses	17	38	19	17	7	10	6	7
Taxis	21	51	15	15	7	8	6	7
Hired cars	5	12	20	10	11	21	15	3
Lorries and vans	516	645	609	630	649	593	560	725
Others	127	161	127	147	137	142	135	131
Total	**13,349**	**12,256**	**11,023**	**10,480**	**11,525**	**9,823**	**9,166**	**9,068**

Source: Road Transport Department, Malaysia.

Box 3.2 Penang Transport Master Plan (PTMP)

by Sri Ramasamy and Tan Lii Inn, Urban Studies

There are more private vehicles than people in Penang, resulting in increasing traffic congestion and in reducing the availability of public transport services. With the rising population in Penang, there is an urgent need for intervention to manage and reduce the increasing traffic and congestion, where the state is also faced with a lack of transport options and limited power with regards to transport improvements.

The Penang state government has undertaken a series of initiatives including the formation of the Penang Transport Council in 2009; commissioning the PTMP Strategy from 2011–13, which formed the backbone of the state's transport master plan strategy; calling of Requests for Proposals (RFP); and implementing the PTMP and organising discussions with various governmental agencies and departments. These initiatives led to the design of the present PTMP's framework, comprising a holistic Public Transport Network and Highway Scheme which was approved and adopted by the Penang state executive council in December 2015.

The PTMP has suggested a series of physical and institutional recommendations, spanning both spatial and temporal scales to resolve the transport issues in Penang. Since 2013, a number of proposed transport components and networks of the PTMP have been updated and revised, considering findings from additional detailed studies, up-to-date information, and revised development plans and priorities. The PTMP recommendations were re-proposed in 2015 and the alternative proposal was approved by the Penang state government in 2016.

The key aims of the PTMP include:

- To adopt a holistic approach to resolving transportation challenges, and adopt a paradigm shift towards ensuring accessibility and "moving people, not cars".
- To make roads safe and accessible for all (pedestrians, cyclists, the elderly and disabled community).
- To move towards a public transport to private vehicle modal split of 40% public transport usage to 60% private vehicle.
- To ensure integration between transport systems and development plans and deliver a multi-modal transport system.
- To integrate the traffic management and transport plans of the island and mainland.

Three primary strategies have been identified to resolve transportation issues in Penang. These include:

- To improve management of existing highway network while building new roads.
- To improve the existing public transport system.
- To reduce future growth in private vehicle usage through travel demand management measures.

Additionally, the accessibility to employment opportunities can be improved with the reduction of public transport travel time. The PTMP envisions accessibility to improve by 25–40% in comparison to present travel times. Conversely, if no action to improve the transport system is taken over the next two decades, accessibility is predicted to deteriorate by 25%. The improved public transport network is designed to operate as a unified network, providing seamless and integrated public transport.

References:

Special Purpose Vehicle (SPV), the State Government of Penang.

Table 3.7 Number of KTMB passengers by station, Penang, 2012–16

Station	2012	2013	2014	2015	2016
Butterworth	84,191	69,274	60,975	64,173	536,896
Bukit Mertajam	61,163	55,176	36,860	41,812	362,336
Nibong Tebal	8,501	8,922	4,751	2,755	37,871

Source: Malayan Railways Limited, Penang.

Rail

The only rail service that serves Penang would be the train services operated by Keretapi Tanah Melayu Berhad (KTMB), which runs through three stations: Butterworth, Bukit Mertajam, and Nibong Tebal, with connectivity to the rest of the towns in Peninsular Malaysia.

Butterworth station serves the most passengers, followed by Bukit Mertajam. Nibong Tebal has by far the fewest commuters. It is theorised that Butterworth is the most utilised station due to its connectivity to Kuala Lumpur and Padang Besar. Interestingly, there was a significant spike in number of passengers for all three stations from 2015 to 2016, with passengers for Butterworth and Bukit Mertajam growing by more than eight times, while Nibong Tebal's passengers increased by more than 13 times. These increases could be due to the establishment of the Electric Train Service (ETS) in mid-2015, which commutes passengers from Butterworth to Kuala Lumpur in just three hours (The Star Online, 2014). In addition, KTM Komuter introduced a route from Butterworth to Padang Besar in 2016, contributing to the growth of passengers.

In terms of cargo handled by KTMB crossing though Penang, a value of RM69.5 million was recorded for 2016, an increase of RM6.3 million from 2015[15]. Containers held the highest monetary value (at RM43.6 million and 62.7% of the total share), followed by food and beverages. The other types of cargo carried by KTMB were land bridges, chemicals and steel rods.

Water

The Penang Rapid Ferry service has been operating since 1894, making it the oldest ferry service in Malaysia. The service carries both pedestrians and vehicles, accommodating cars and motorcycles primarily on its lower deck, but sometimes on its upper deck as well. The ferry service also serves as a tourist attraction, in addition to its primary function of connecting the island to the mainland.

Table 3.8 Statistics on Penang's ferry service, 2012–16

Type of passenger	2012	2013	2014	2015	2016
Pedestrians	1,865,836	1,652,504	1,574,874	1,461,402	1,371,098
Bicycles	18,257	20,225	21,358	21,458	19,108
Motorcycles	1,318,968	1,275,287	1,223,480	1,207,602	1,010,535
Cars	799,062	784,913	762,772	684,703	528,758
Lorries	49,612	46,314	43,403	38,361	29,310
Total	**4,051,735**	**3,779,243**	**3,625,887**	**3,413,526**	**2,958,809**

Source: Penang Port Commission.

[15] Malayan Railways Limited, Penang.

Pedestrians remain the biggest users of Penang's ferry service, followed by motorcycles and cars. However, there is a steady decline in overall usage, as seen in Table 3.8. The number of users is decreasing from year to year, marking an approximate average decline of 5.6% from 2012 to 2015, with a significant decrease of 13.3% from 2015 to 2016. Bicycles were the anomaly as its number of users saw fluctuations, with increases from 2012 to 2015, followed by a decrease in 2016.

Penang Port is the oldest port in Malaysia. It is located along the Straits of Malacca, one of the most strategic and important shipping routes in the world. The port is also the main gateway for the northern states of Malaysia and the southern provinces of Thailand. It has the ability to handle all types of cargo and is fully equipped to provide efficient logistical support.

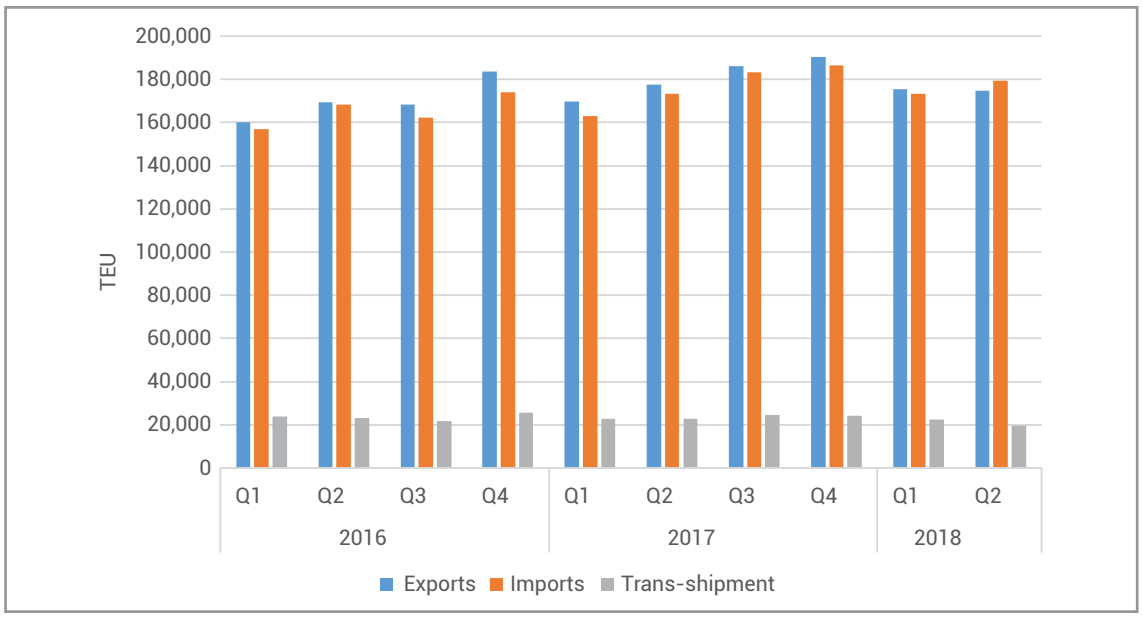
Domestic and foreign trade make up most of the total cargo and container throughput by Penang Port, with domestic trade sustaining a bigger share. As seen in Figure 3.8, the highest volume of imports was recorded in Q4 2017, while the highest volume of exports was observed in Q2 2018, totaling 3,925 and 4,909 twenty-foot equivalent units (TEUs), respectively. In comparing Q1 and Q2 across the three years, the best performance was in 2018, which recorded the highest imports and exports comparatively. There was an approximate growth of 9–9.4% for imports and exports of Q1 and Q2 from 2017 to 2018, with the exception of exports for Q2, where the growth rate was 2.5%. Additionally, at 4,909 TEUs of cargo, Q2 2018 saw the highest volume of imports across 10 quarters. The types of cargo handled by Penang Port includes liquid bulk, dry bulk, general cargo, and containerised cargo, with containerised cargo sustaining the highest percentage of overall cargo[16].

Figure 3.8 Total cargo throughput by Penang Port, 2016–17

TEU: Twenty-foot equivalent unit
Source: Ministry of Transport, Malaysia & Penang Port Commission.

[16] Penang Port Commission.

Figure 3.9 Total container throughput by Penang Port, 2016–17



TEU: Twenty-foot equivalent unit
Source: Ministry of Transport, Malaysia & Penang Port Commission.

The same trend was observed for total container throughput. The highest volume of containers passed through Penang Port in each calendar year was found in the fourth quarter (with the exception of 2018, where data is not available as of time of writing). Q4 2017 was the highest performing quarter with the largest volume of imports and exports by container, totaling 190,405 TEUs in exports and 186,546 TEUs in imports. 2017 consistently outperformed 2016 in every single quarter, while Q1 2018 performed better in comparison to Q1 2017, but recorded a lower volume of exports in Q2 2018.

The commodities handled at Penang Port are varied, and includes palm oil, petroleum, chemicals and fertiliser, iron and steel, grains, sugar, machinery, processed timber, and more, with petroleum being the commodity throughput with the highest volume[17].

With regards to trade at Penang Port, the vessels engaged in international trade at Penang Port saw a decrease from 2012 to 2014, but increased steadily from 2014 to 2016[18]. In fact, 2016 recorded the highest number of departing vessels, with an annual growth rate of 27.7%, while its arriving vessels, with a growth rate of 31.3%, were the second highest in five years.

Air

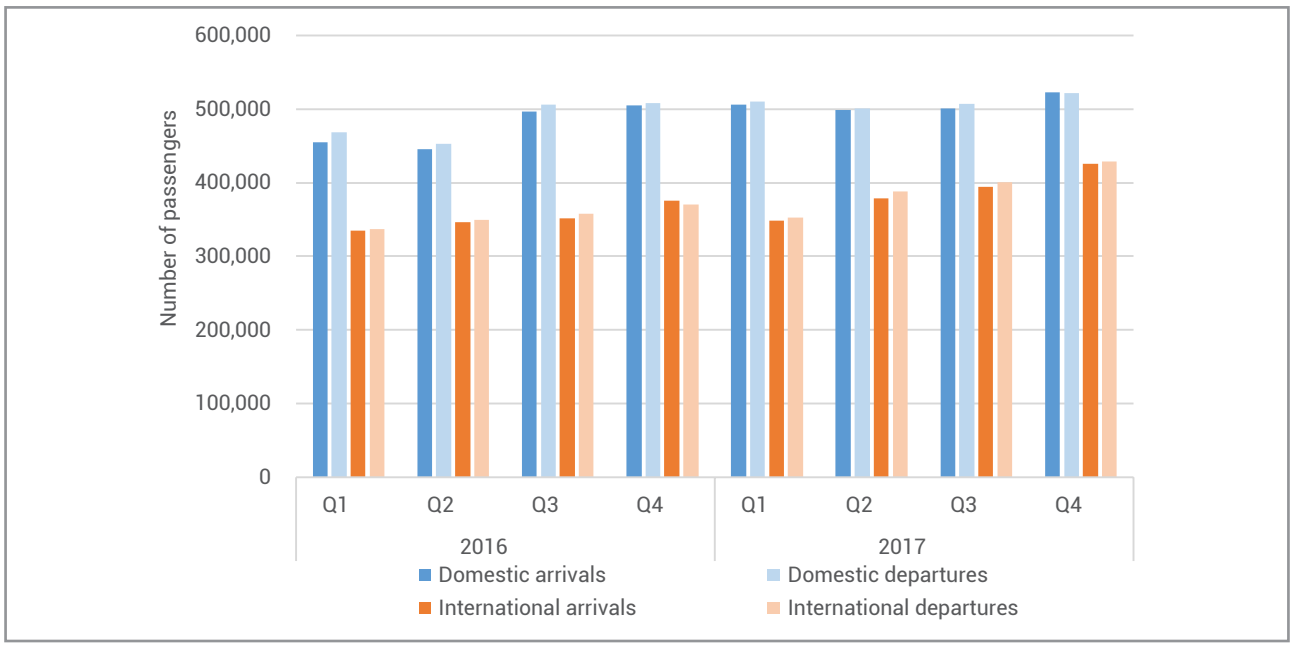
Penang's airport first began operations as Bayan Lepas International Airport in 1935, effectively making it the oldest airport in Malaysia. After substantive expansion works were completed in 1979, the airport was renamed to Penang International Airport (PIA) and, to date, remains one of busiest airports in Malaysia, with the volume of passenger traffic ranking the third highest to Kuala Lumpur International Airport and Kota Kinabalu International Airport.

The air passenger trend for PIA experiences steady growth, with increases for domestic and international passengers in Q1 and Q2 in 2016–18. The number of international arrivals and departures had growth rates of 16.9% and 13.4%, respectively, for Q1 2018. The growth, however, underwent a slight decrease for the second quarter, where international arrivals grew by 12.6% and 16%. Overall, the fourth quarter had the highest volume of passengers for both 2016 and 2017, and it is anticipated the same trend will be observed for Q4 of 2018.

Domestic arrivals and departures outweighed international arrivals and departures, accounting for 54.7% of all passengers in the first half of 2018. However, international travelers recorded a higher growth rate of 16.3% compared to domestic passengers' growth rate of 8.4%.

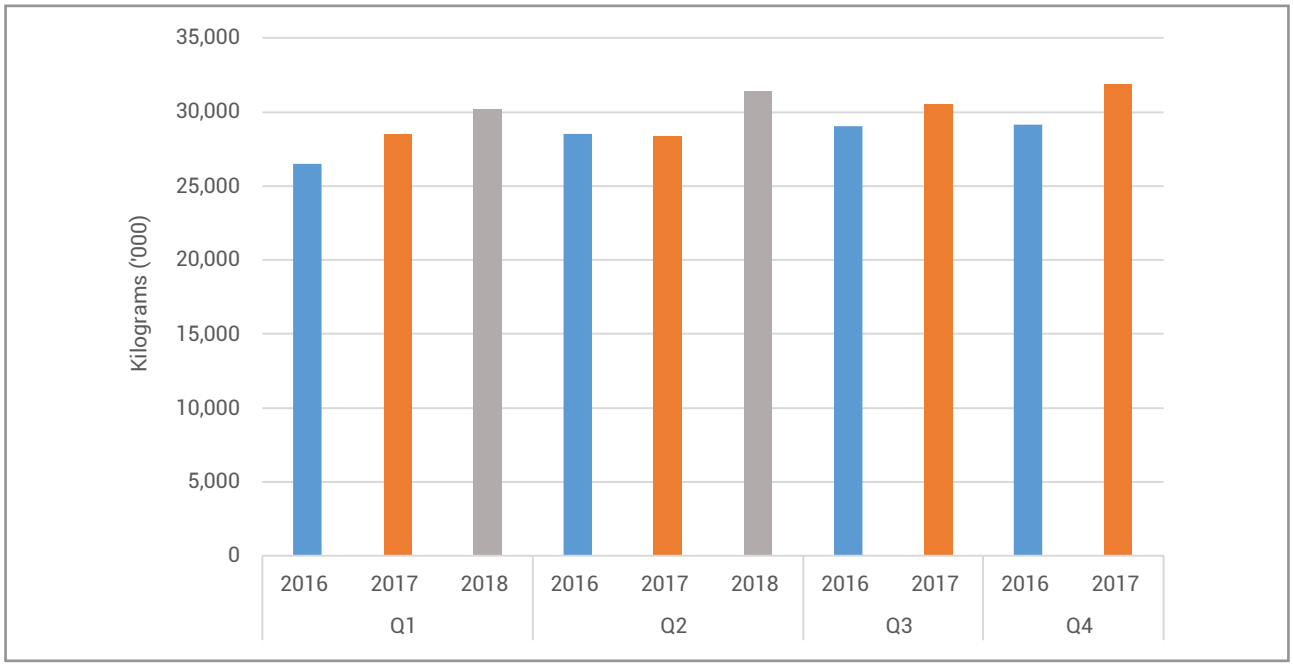
[17] Penang Port Commission, 2016.
[18] Penang Port Commission, 2016.

Figure 3.10 Total passengers handled by Penang International Airport, 2016–17



Source: Ministry of Transport and Malaysia Airports Holding Berhad (MAHB).

Figure 3.11 Total cargo handled by Penang International Airport, 2016–17



Source: Ministry of Transport and Malaysia Airports Holding Berhad (MAHB).

PIA is the third-busiest airport in terms of cargo traffic, after Kuala Lumpur International Airport and Kuala Lumpur International Airport 2 (KLIA2). Generally, the total volume of cargo handled by PIA grew in accordance by each quarter, with the exception of Q2 of 2017, where a slight decrease was recorded. Q1 and Q2 of 2018 saw a growth rate of 6.1% and 10.8%, respectively. International cargo sustained a significantly bigger share compared to domestic cargo. For the first two quarters of 2018, the total volume of international cargo amounted to 93.1% of total cargo handled at PIA. This was expected, seeing Penang's standing as one of the main manufacturing hubs of Malaysia, with numerous multinational factories conducting their respective operations in the state.

The total commercial aircraft movements handled by PIA in the first two quarters of the year saw a 6.3% increase from 2017 to 2018, a decrease of 0.1% from the growth rate of previous years. Nevertheless, PIA is expected to see a steady increase in total commercial aircraft movements for the second half of 2018.

3.2.2 Water and electricity

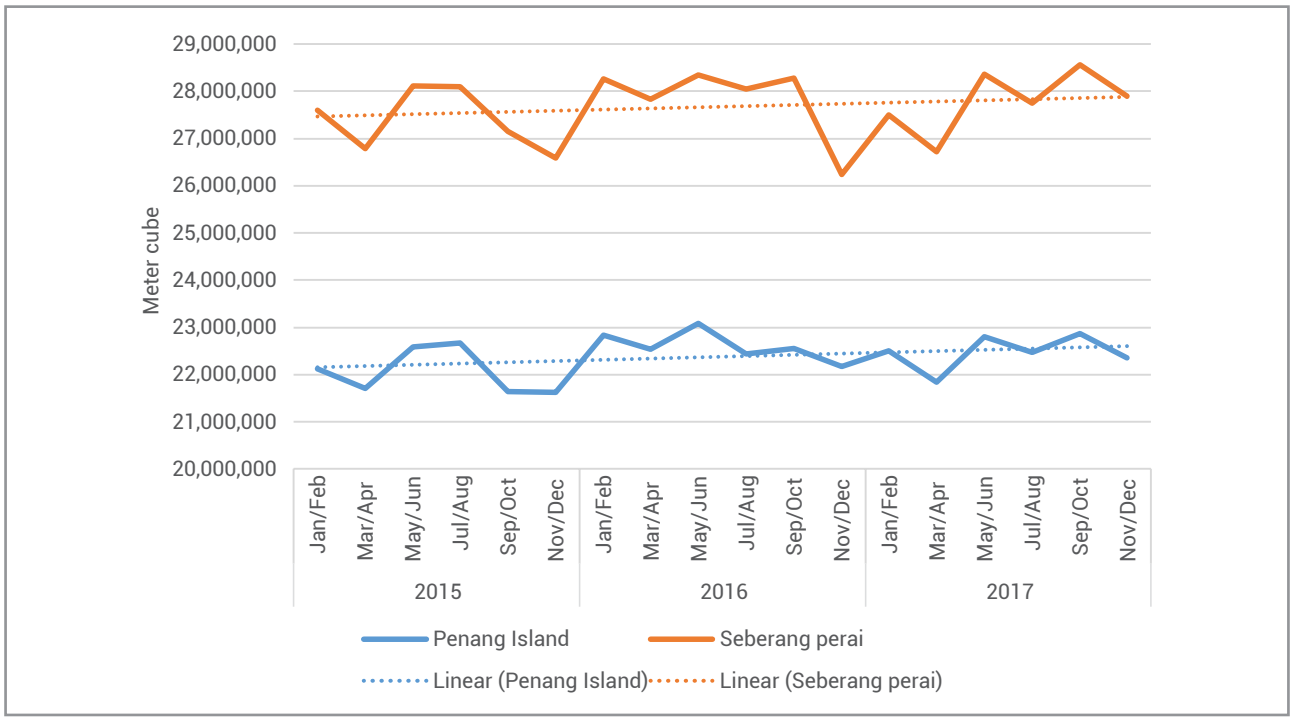
Water

Between 2015 and 2017, Penang had a slight increase in water consumption. Figure 3.12 indicates that water consumption is higher in Seberang Perai compared to Penang Island. This is proportionate to the population distribution ratio of Penang Island to Seberang Perai being 1:1.2.

In 2017, the state government announced plans to raise the water conservation surcharge (WCS) from RM0.48 to RM1 per 1,000 liters for usage of more than 35,000 liters per month. This is aimed at ensuring the optimum use of the state's shrinking water resources and as a means to discourage water wastage. In 2016, Penang recorded the highest domestic water consumption of 286 liters per capita per day –nearly 37% more than the national average of 209 liters.

Despite this move, Penang still has the lowest water tariff (Table 3.9) in Malaysia.

Figure 3.12 Water consumption in Penang, 2015–17



Source: Perbadanan Bekalan Air (PBA).

Table 3.9 Residential water tariff in selected states (RM/m³), Malaysia

	Minimum charge	Band 1	Band 2	Band 3	Band 4	Band 5	Water conservation surcharge
Johor	7.00	0.80	2.00	3.00	-	-	-
Selangor/KL/Putrajaya[1]	6.00	0.57	1.03	2.00	-	-	-
Labuan	7.00	0.70	1.20	1.70	-	-	-
N. Sembilan	5.00	0.55	0.85	1.40	-	-	-
Malacca	6.00	0.60	0.95	1.45	-	-	-
Perak	3.00	0.30	0.70	1.03	-	-	-
Kedah	6.00	0.50	0.90	1.30	-	-	-
Kelantan	4.50	0.45	0.97	1.42	-	-	-
Terengganu	4.00	0.42	0.65	0.90	1.00	-	-
Pahang	3.00	0.37	0.79	0.99	-	-	-
Perlis	4.00	0.40	0.70	1.10	-	-	-
Penang	2.50	0.22	0.46	0.68	1.17	1.30	0.48

Notes:
Johor; Selangor/KL/Putrajaya; Labuan 0-20m³ (Band 1); >20 -35m³ (Band 2); >35m³ (Band 3)
N. Sembilan 0-20m³ (Band 1); >20 -35m³ (Band 2); >35m³ (Band 3)
Malacca 0-20m³ (Band 1); >20 -35m³ (Band 2); >35m³ (Band 3)
Perak 0-10m³ (Band 1); > 10-20m³ (Band 2); >20m³ (Band 3)
Kedah 0-20m³ (Band 1); >20 -35m³ (Band 2); >35m³ (Band 3)
Kelantan 0-20m³ (Band 1); >20 -35m³ (Band 2); >35m³ (Band 3)
Terengganu 0-20m³ (Band 1); >20 -40m³ (Band 2); 40 -60m³ (Band 3); > 60m³ (Band 4)
Pahang 0-18m³ (Band 1); 18 -45m³ (Band 2); > 45m³ (Band 3)
Perlis 0-15m³ (Band 1); 15.1 -40m³ (Band 2); > 40.1m³ (Band 3)
Penang 0-20m³ (Band 1); >20 -40m³ (Band 2); 40 -60m³ (Band 3);
> 60-200m³ (Band 4); > 200m³ (Band 5)

Source: National Water Services Commission (SPAN).

Electricity

Table 3.10 records the supply and demand for electric power while Table 3.11 displays tariff rates for domestic consumers. Power demand is increasing steadily year on year, with 2017 recording a 5.92% growth rate. It is also observed that power supply received a considerable boost, with a 44.10% growth in installed capacity for 2017, resulting in an excess capacity growth rate of 23.35%.

In the area of electricity and power generation, a theme of interest is the sustainability of electricity generation. With growing concerns over the environmental impact of climate change, many countries are turning to renewable energy sources. In a country such as Malaysia, the case for solar energy generation is hard to dismiss. This, however, has yet to be captured and capitalised (See Box 3.3).

Table 3.10 Power demand and supply, 2006–17, Penang

Year	Maximum demand		Installed capacity		Excess capacity	
	(MW)	Growth (%)	(MW)	Growth (%)	%	Growth (%)
2010	1,283	19.46	3,213	0.00	60.10	-9.76
2011	1,230	-4.13	3,213	0.00	61.70	2.66
2012	1,280	4.07	3,303	2.80	61.20	-0.81
2013	1,360	6.25	3,334	0.94	59.20	-3.27
2014	1,508	10.88	3,456	3.66	56.40	-4.73
2015	1,524	1.06	3,456	0.00	55.90	-0.89
2016	1,622	6.43	3,456	0.00	53.10	-5.01
2017	1,718	5.92	4,980	44.10	65.50	23.35

Note: Excluding demand of 132 kV customers supplied via direct 132 kV connection.
Source: Penang Quarterly Statistics Q42017.

Table 3.11 Domestic tariff schedule

Tariff category	Unit	Rates
For the first 200kWh (1–200 kWh) per month	sen/kWh	21.80
For the next 100 kWh (201–300 kWh) per month	sen/kWh	33.40
For the next 300 kWh (301–600 kWh) per month	sen/kWh	51.60
For the next 300 kWh (601–900 kWh) per month	sen/kWh	54.60
For the next kWh (901 kWh onwards) per month	sen/kWh	57.10
Minimum monthly charge	RM	3.00

Source: Tenaga Nasional Berhad.

Box 3.3 Solar energy policies in Malaysia

by Darshan Joshi, Penang Institute in KL

Driven by recent technological developments and favourable policy environments, the cost of electricity generation from renewable energy (RE) sources have diminished drastically over the past decade. These changes are particularly noticeable for wind and solar energy, which exhibit the highest growth rates of all energy sources, and is to a large degree a manifestation of ever-increasing global concerns over climate change. The need to decarbonise our electricity grids has attained widespread acknowledgment in recent years, and has driven a shift in the focus of energy policies across much of the world from fossil fuels towards cleaner alternatives.

For many nations, the generation of electricity through RE sources is now cost-competitive with fossil fuel alternatives. The cost of solar photovoltaic (PV) modules has fallen by over 80% since 2009, and the cost of electricity generation through solar sources consequently fell by three-quarters between 2010 and 2017 (IRENA, 2017). These downward cost trends are projected to persist at current trajectories as the global deployment of RE amplifies over the coming decades, with onshore and offshore wind, as well as rooftop and utility-scale solar, expected to contribute greatly to the continuing proliferation of RE. The majority of the expansion in global solar capacity last year was driven by Asian countries, and moving forward, led by China and India, the continent is expected to improve on the 72 GW it added to total RE capacity in 2017.

While Malaysia has made strides in recognising the need to incorporate a larger share of renewable energy in electricity generation, this has yet to translate into effective action. By the end of 2015, RE capacity in Malaysia totalled 446 MW, less than half of the mandated target of 975 MW (KeTTHA, 2009), for an electricity capacity share of under 3%. Owing to poorly designed policy mechanisms, the overbearing influence of Tenaga Nasional Berhad (TNB), and issues related to corruption and cronyism, Malaysia's two cornerstone RE policies – the feed-in tariff (FiT) and net energy metering (NEM) – have failed to inspire the desired take-off of RE in Malaysia. A third, in large-scale solar (LSS), is showing tentative signs of promise after a shaky start, and it is imperative that progress with regards to this policy is closely monitored moving forward.

The mandate of boosting RE power generation is held by the Sustainable Energy Development Authority (SEDA). At its conception in 2011, SEDA was tasked with the implementation and administration of FiT and the concurrent Renewable Energy Fund (REF). FiT, comprised of long-term supply contracts between renewable energy power producers (REPPs) and distribution licensees (DLs) in the form of TNB (or Sabah Electricity Sdn. Bhd. [SESB] in Sabah), cover biogas, biomass, solar PV, and small hydro power producers. Under these contracts, REPPs receive per-kWh payments for generating and selling electricity to the utilities at guaranteed and favourable rates, allowing REPPs to make healthy and sustainable long-run returns on their high upfront-cost investments. FiT is financed by the REF, which itself derives funding from fixed-percentage surcharges on electricity bills paid by domestic consumers. These surcharges were set at 1% between 2012 and 2013, and 1.6% thereafter.

By the end of 2016, the FiT had added just under 421 MW of RE generation capacity to the national grid, despite the allocation of almost 900 MW worth of FiT quotas in the preceding five years. For solar PV, the added capacity totalled 223 MW. The biggest issues faced by the FiT were financial in nature; with rates offered to REPPs being overly-generous and electricity surcharge rates set low, the REF came under constant strain. This led to a policy change in 2016, with the announcement that the FiT would be phased out for solar PV participants in favour of net energy metering. NEM policies are widely used globally to foster private investment in solar technology and allow for the self-consumption of electricity generated by solar PV system users, as well as the selling of excess energy production to the DLs at a prevailing "displaced cost". This gives consumers a degree of self-sufficiency in electricity generation, reduces their reliance on importing electricity from the DLs, and leads to savings on utility bills. Consumers are also able to sell their excess energy to TNB, and in doing so claim "electricity credits" on current and future electricity bills.

Unfortunately, NEM in Malaysia has featured an essentially non-existent incentivisation structure. With a very low "displaced cost", a short rollover period of two years, and the stipulation of expiring credits, energy-efficient households that consistently amass electricity credits are forced to forfeit their credits to the relevant DL at the end of each two-year cycle. As of June 2018, and as a result of poor incentives, less than 14 MW of the available quota of 300 MW under the NEM had been taken up.

This chosen incentivisation structure serves only to protect the interests of TNB. As the quantity of self-generated electricity grows, the market share and profitability of TNB decreases. SEDA itself has stated that certain restrictions imposed on the NEM were designed to protect TNB's revenue – an admission which indicates that the NEM scheme is operating under the regulatory capture of TNB. Moving forward, it is important that the incentives offered to participants of NEM are radically overhauled. A liberalised electricity market, featuring a greater share of electricity generated by independent producers and a reduced reliance on energy-sector monopolists, represents an ideal setting for the RE revolution. SEDA, as well as the Ministry of Energy, should not allow well-meaning RE policies, such as NEM, to be unduly influenced by TNB.

Concurrent steps have been taken to move into the space of large-scale solar. After an inauspicious start to this policy, where contracts were directly awarded to politically connected companies with little or no experience in RE, two rounds of open-ballot events have been held. A total of just over 1 GW of large-scale solar capacity is expected to be connected to the grid by the end of 2020, and strong efforts must be made by the relevant authorities to ensure commercial operations deadlines are met.

Located on the Sun Belt and a beneficiary of high levels of solar irradiation, Malaysia is well-placed to take advantage of the ongoing revolution in solar energy. Studies on the potential of solar energy in Malaysia indicate that building-integrated solar PV alone can contribute at least 7,800 GWh of electricity to the grid (KeTTHA, 2009). The prospects for small- and large-scale solar plants are far greater, and there is consequently an enormous amount of unmet potential for solar power generation in Malaysia. It is certainly possible for Malaysia to strive towards a future where the majority of our energy needs are met by RE technologies, led by solar.

Unfortunately, the policies implemented to boost solar power generation have thus far failed to meet expectations. For small-scale solar electricity generation, net energy metering holds the greatest promise. This policy requires a radical overhaul of its incentivisation structure in order to encourage substantial uptake of the program, and would allow households the opportunity to contribute to the greening of the domestic electricity grid while making healthy returns on their investments in solar PV technology. At the same time, utility-scale solar plants are showing promising signs of making a large contribution to the country's power generation capacity. Combined, these two policy mechanisms can set Malaysia on the path to achieving a substantial decarbonisation of the national electricity grid.

Table 3.12 Solar PV projects by state (in MW)

State/Year	2015	2016
Perlis	13.58	15.93
Penang	3.95	14.67
Perak	9.77	16.55
Kedah	5.41	11.52
Kelantan	5.62	7.20
Terengganu	7.31	10.31
Selangor	52.68	66.46
K Lumpur	1.34	2.74
Pahang	7.31	24.57
N Sembilan	34.41	40.74
Malacca	15.57	16.75
Johor	10.4	14.79

Source: Peninsular Malaysia Electricity Supply Outlook 2017, Energy Commission.

Table 3.13 Solar energy statistics under Malaysian RE policies

Policy	Feed-in Tariff (FiT)	Net Energy Metering (NEM)	Large-Scale Solar (LSS)
Policy period	**2012–16***	**2016–present**	**2016–present**
Solar capacity added	**283 MW**	**13.56 MW**	**1 GW****
Available quota	**333 MW**	**300 MW**	**N/A**
Key issues	1) Overly generous tariff rates and insufficient funding, which have led to lack of fiscal sustainability. 2) Lack of transparency in contract awards, and allegations of cronyism in the awards process	1) A non-existent incentivisation structure that fails to encourage uptake of the programme, largely due to the influence of TNB.	1) In initial stages, a lack of transparency in contract awards. 2) Important that approved projects achieve commercial operations by stipulated deadlines; 450 MW due online by end-2018; 562 MW due online by end-2020

Source: Annual reports (2011–16), Sustainable Energy Development Authority and Joshi (2018).
*Notes: * FiT was discontinued for solar PV after 2016;*
***1 GW of LSS is expected online by the end of 2020.*

References:

IRENA. (2017). *Renewable Power Generation Costs in 2017*. International Renewable Energy Agency.

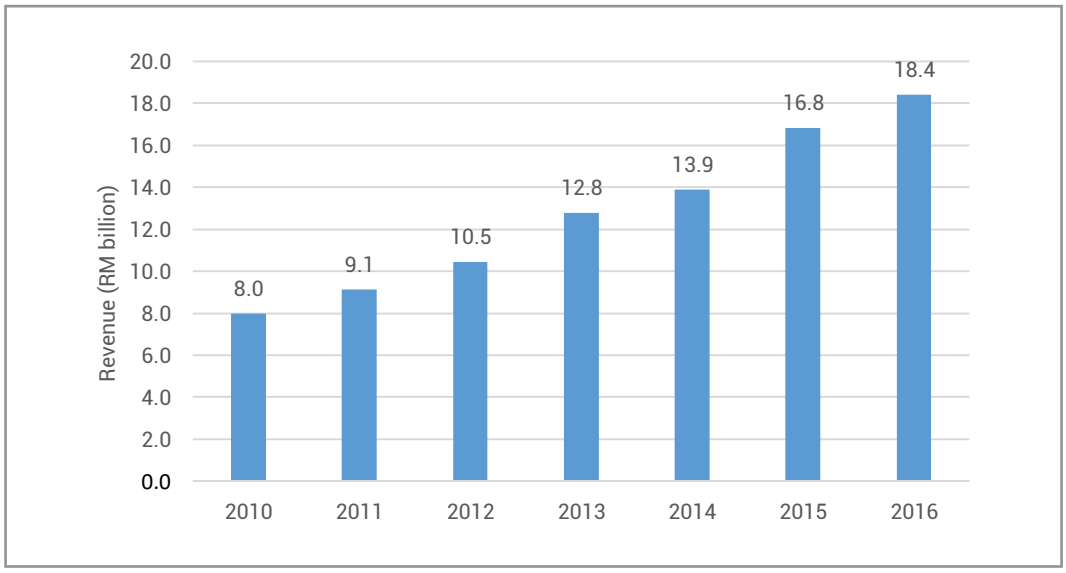
KeTTHA. (2009). *National Renewable Energy Policy and Action Plan (2009)*. Ministry of Energy, Green Technology and Water.

3.2.3 Global business services

Global business services (GBS) is an industry sector that focuses on managing most general administrative tasks and processes that happen at the back end of a business transaction. These include services like finance and accounting, procurement, human resources, IT, and customer services. The GBS industry, however, is now shifting from business process outsourcing (BPO) to knowledge process outsourcing (KPO) and information technology outsourcing (ITO). This has resulted in the GBS industry taking on more complex technology and venturing into advanced services like data analytics and IoT solutions that require highly skilled employees.

In 2016, the Malaysian GBS industry was reported to contribute RM18.4 billion in revenue (Figure 3.13), a 9.3% increase over the previous year. This growth rate is telling, given that Malaysia has been consistently ranked third among 55 countries in the A.T. Kearney Global Services Location Index (Table 3.14). Countries are ranked against three factors (financial attractiveness, people skills and availability, and business environment) that are deem crucial for service outsourcing decisions. A closer look at the scores, however, reveal opportunities for improvement to realise the full potential of the GBS sector. While Malaysia consistently ranks third overall, Malaysia has not been performing well in individual scoring categories. In fact, Malaysia has never ranked in the top three positions for each individual factors. This indicates that Malaysia's good overall performance may be due to the poor performance of other countries in certain individual factors or simply the result of being averagely good in all individual factors. In either case, it can be argued that greater effort needs to be invested to enhance Malaysia's position in each individual factor. The biggest gap is in the availability of skills, which show a lagging score behind China, which ranks third.

Figure 3.13 Revenue of GBS sector in Malaysia



Source: Beyond Borders, Malaysia Digital Economy Corporation (2015).

Table 3.14 A.T. Kearney Global Services Location Index Score for top three countries and Malaysia

Year	Rank	Overall		Financial attractiveness		Business environment		People skills and availability	
2014	1st	India	7.04	Vietnam	3.30	Germany	2.39	United States	2.88
	2nd	China	6.15	Sri Lanka	3.30	United States	2.15	China	2.71
	3rd	Malaysia	5.99	Egypt	3.20	United Arab Emirates	2.05	India	2.54
				Malaysia	2.72	Malaysia	1.84	Malaysia	1.43
2016	1st	India	6.96	Sri Lanka	3.37	United States	2.11	United States	2.88
	2nd	China	6.49	Indonesia	3.23	Poland	1.90	China	2.71
	3rd	Malaysia	6.05	India	3.22	Malaysia	1.89	India	2.55
				Malaysia	2.75			Malaysia	1.42
2017	1st	India	7.07	Sri Lanka	3.42	Singapore	2.31	India	2.83
	2nd	China	6.31	Egypt	3.37	New Zealand	2.20	United States	2.83
	3rd	Malaysia	5.99	Pakistan	3.35	Australia	2.19	China	2.69
				Malaysia	2.92	Malaysia	1.72	Malaysia	1.47

Source: A.T. Kearney Global Services Location Index (2014, 2016, and 2017).

The shift towards greater automation is also seen in the sector. According to KPMG (2017), one in three jobs will be converted to software, robots, and smart machines by 2025. The continuous development of blockchain technology is also slated to radically disrupt the way GBS services such as legal and financial practices, and supply chain management are delivered, which may lead to the redundancy of human personnel. Additionally, the GBS sector is also poised to see exponential growth emanating from the spillover effects of Industry 4.0 in the manufacturing sector, given the blurring of lines between the manufacturing and services sectors. A traditionally recognised manufacturing company like Dell, for example, is progressively building their brand as an IT solutions service provider. This is definitely good news for Penang given that the state is host to many global business centres belonging to various MNCs. With the rising demand for services like cyber security and data analytics, the presence of global business centres in Penang will serve to attract relevant talent and contribute to building a talent pool that is indispensable in the digital economy.

The Malaysian government has taken the initiative to award MSC statuses to eligible companies. Through this, companies can benefit from the Bill of Guarantees (BoG), which consist of 10 sub-bills that are shown in Table 3.15.

Table 3.15 Bill of Guarantees

Bill of Guarantees (BoG)	Details
BoG 1	To provide a world-class physical and information infrastructure
BoG 2	To allow employment of local and foreign knowledge workers
BoG 3	To ensure freedom of ownership by exempting companies with MSC Malaysia Status from local ownership requirements
BoG 4	To give the freedom to source capital globally for MSC Malaysia infrastructure, and the right to borrow funds globally
BoG 5	To provide competitive financial incentives namely Pioneer Status (100 percent tax exemption) for up to 10 years or an Investment Tax Allowance for up to five years and no duties on the importation of multimedia equipment
BoG 6	To become a regional leader in Intellectual Property Protection and Cyberlaws.
BoG 7	To ensure no censorship of the Internet
BoG 8	To provide globally competitive telecommunications tariffs
BoG 9	To tender key MSC Malaysia infrastructure contracts to leading companies willing to use MSC Malaysia as their regional hub
BoG 10	To provide a high-powered implementation agency to act as an effective one-stop super shop

Source: Malaysia Digital Economy Corporation (n.d.).

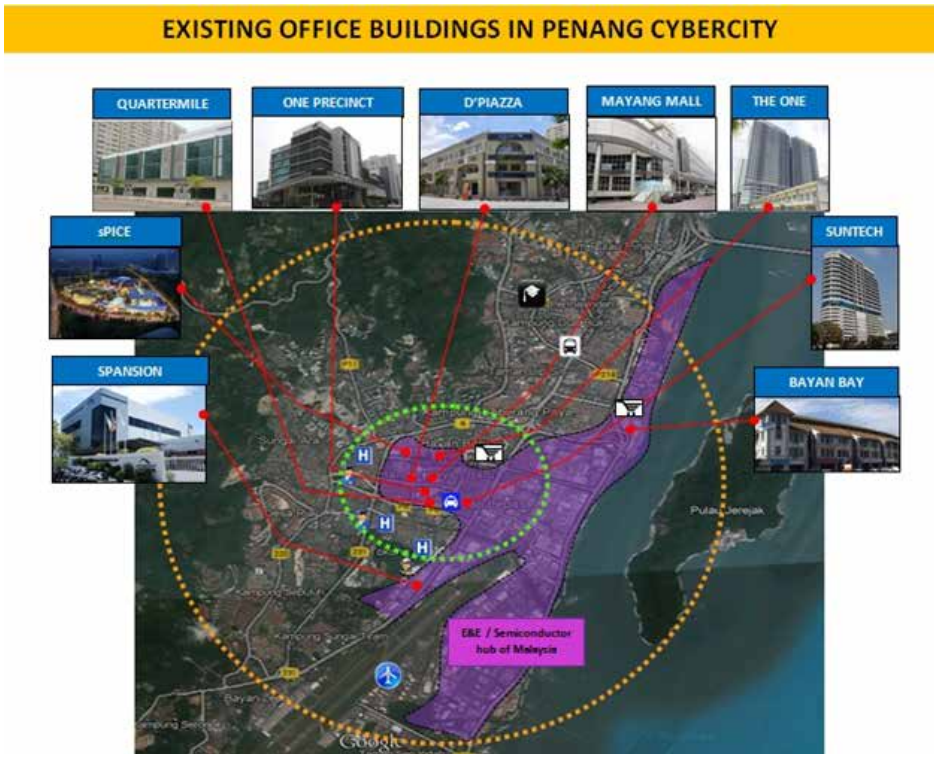
Table 3.16 Tier definition for companies with MSC status

TIER	Details
Tier 1	MSC designated premises – Enjoy 10 BoG privileges
Tier 2	Other commercial premises – Enjoy 8 BoG privileges (forgo BoG1 and BoG8)
Tier 3	Outside of Cybercities / Cybercentres: • Enjoy 6 BoG privileges (BoG 3,4,6,7,9, and 10) • Forgo BoG 1 and 8 – Tier 3 companies located outside of Cybercities and Cybercentres forgo the guarantee of world-class physical and information infrastructure and the provision of a globally competitive telecommunications tariffs • Enjoy partial BoG2 – Tier 3 companies can employ foreign knowledge workers for key positions only (maximum 20 workers) • Enjoy partial BoG5 – Tier 3 companies will enjoy income tax exemption of 70% under Section 127(3)(b) of Income Tax Act 1967 for a period of five years and no duties on the importation of multimedia equipment.

Source: Malaysia Digital Economy Corporation (n.d.).

As of 2016, Penang is home to more than 50 GBS companies, creating over 10,000 jobs and serving customers both globally and more specifically in the Asia-Pacific region. A major portion of GBS companies in Penang are involved in information technology, software development, and finance and accounting. Penang is also home to the MSC initiative, with an array of MSC Malaysia status companies and an MSC Malaysia Cybercity accolade. Officially known as the Penang Cybercity (PCC), PCC encompasses the Bayan Lepas Industrial Park and its vicinity, which consists of nine office buildings (Figure 3.14).

Figure 3.14 Penang Cybercity



Source: InvestPenang (n.d.).

In 2017, an MSC tier one office space was launched at GBS@Mayang. This is the product of a RM10 million refurbishment effort by the Penang state government on what was formerly known as Mayang Mall. Since its launch, GBS@Mayang has been home to a US-based Jabil Global Business Centre, as well as Austrian crystal jewelry maker Swarovski's Global Business Services Centre for Asia. Projecting further expansion in the GBS sector, the state government has also began constructing GBS by the Sea, a 400,000 square foot MSC tier 1 office space that is due to be completed in 2020.

Moving forward, the GBS sector is poised to display positive growth. This, however, may not necessarily translate to equal growth in employment given the rise of automation and other digital technologies. The integration of robotic process automation (RPA), virtual agents (VA), and artificial intelligence (AI) will require GBS hubs to have such expertise available. A crucial point of intervention to address this is the need for a bigger pool of highly skilled workers who are able to utilise such technologies, and in the future contribute to the development of such technologies.

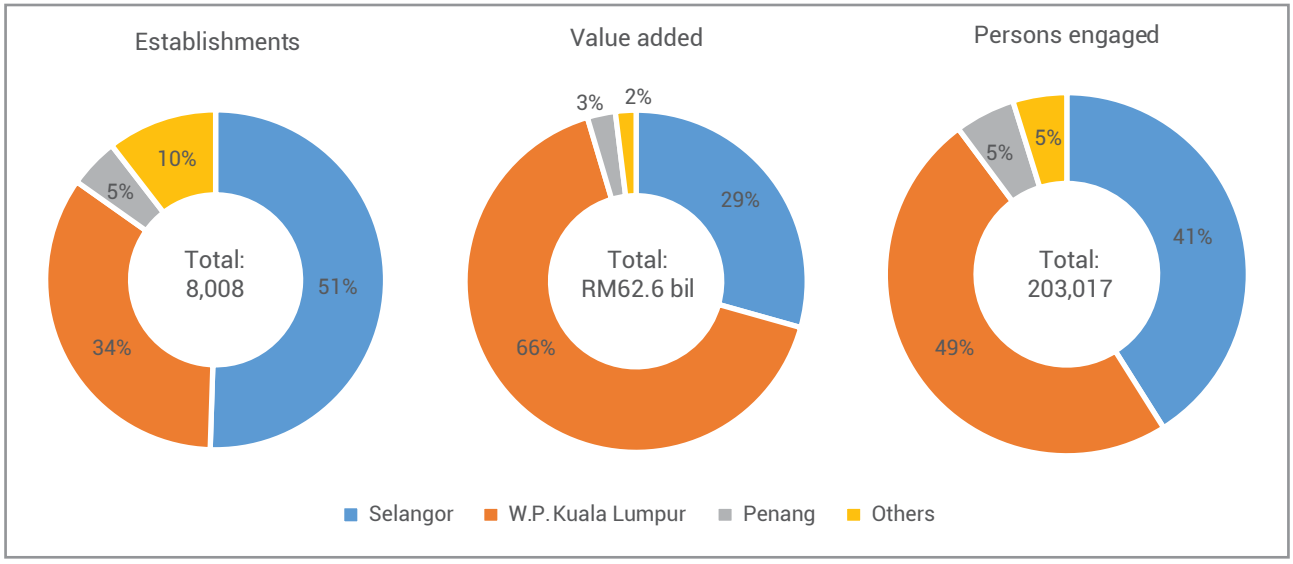
3.2.4 Information and communication

According to the Department of Statistics Malaysia, information and communication services comprise of:

i. Activity of publishing
ii. Motion picture, video, and television programme production; sound recording; and music publishing
iii. Programming and broadcasting
iv. Telecommunication services
v. Computer programming, consultancy, and related activities
vi. Information services

Figure 3.15 gives a snapshot of the sector in relation to other states in Malaysia. As can be seen, the information and communication services sector in Malaysia is predominantly congregated in three states: Selangor, Kuala Lumpur, and Penang.

Figure 3.15 Selected measures of ICT sector for top three states, 2015



Source: Economic Census 2016 (Information and Communication Services), Department of Statistics, Malaysia.

According to the Economic Census 2016, Penang contributed an average of 4% to Malaysia with a total of 379 establishments at RM1.6 billion worth of value added, while engaging 10,948 persons in the sector. The overwhelming contribution of Selangor and Kuala Lumpur, however, indicates that Penang has the potential to act as a secondary city where this sector is concerned. Table 3.17 illustrates the contribution of selected states by sub-sector. While Selangor is far ahead in this sector, both Penang and Johor have been showing signs of growth due to the emerging trend in literature and creative arts like publishing of books, production of arts, independent film making, and music publishing (See Box 3.4).

The digital economy requires the use of computers and, more importantly, an internet connection. To this end, Penang has fared relatively well with 87% of businesses recording ICT usage and 80.4% for internet usage (Figure 3.16). Similarly, SMEs in Penang also report equally high levels of ICT and internet utilisation. However, web presence usage among businesses (34.9% for all companies and 25% for SMEs) remain low.

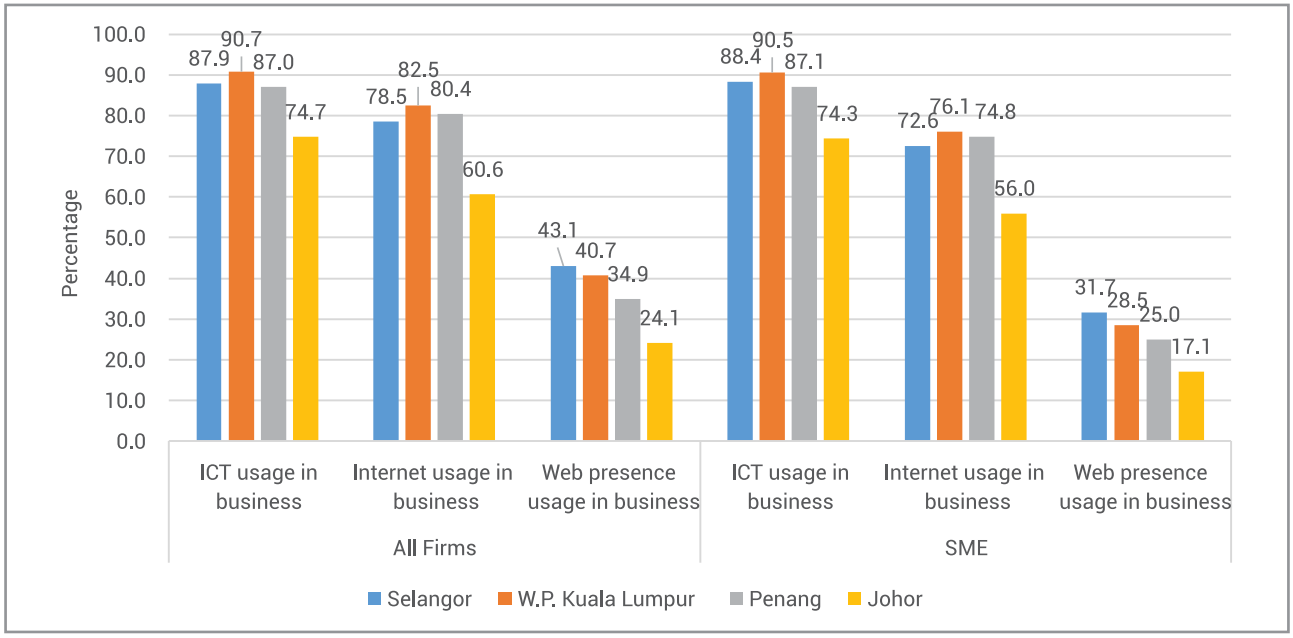
Table 3.17 Principal statistics by sub-sector for selected states, 2015

TIER		Pub.[1]	Mo.[2]	Prog.[3]	Telco.[4]	Comp.[5]	Info.[6]
Number of establishment	Penang	43	31	N/A	37	222	46
	Johor	41	36	N/A	46	140	22
	Selangor	409	571	20	627	2,113	305
Number of persons engaged	Penang	1,315	619	N/A	866	7,743	405
	Johor	577	617	N/A	303	1,546	182
	Selangor	10,025	5,299	1,099	14,344	43,870	8,696
Value added (RM '000)	Penang	81,414	54,673	N/A	246,355	1,250,005	32,385
	Johor	44,003	83,023	N/A	19,860	130,958	41,729
	Selangor	1,674,287	709,010	137,460	7,701,606	6,620,625	1,527,036

Note: 1 - Activity of publishing; 2 - Motion picture, video and television production, and sound recording and music publishing; 3 - Programming and broadcasting; 4 - Telecommunication services; 5 - Computer programming, consultancy, and related activities; and 6 - Information services

Source: Economic Census 2016 (Information and Communication Services), Department of Statistics Malaysia.

Figure 3.16 Usage of computer, internet, and web presence for all companies and SME by selected states, 2015



Source: Economic Census 2016 (Usage of ICT by Business and e-Commerce), Department of Statistics Malaysia.

This indicates that businesses are not capitalising on digital technologies. Web presence, for example, unlocks a business' potential to instantly become a global micro-company through the booming e-commerce industry, or at the very least reach customers and suppliers beyond their confined geographical location. Table 3.18 captures the purpose of internet usage among businesses where an overwhelming majority of respondents indicate that they use the internet merely for sending or receiving email (70.6%) and internet banking (41.3%). Other purposes that require greater integration into businesses operations with the promise of delivering higher value like providing customer service and delivering products online have yet to be utilised.

The importance of internet access is evidenced by its prevalent use by both businesses and households alike. In 2015, 74.8% of businesses use fixed broadband while 28.5% use mobile broadband. Likewise, in Q4 2017 Penang saw recording a broadband penetration rate of 130.2% per 100 inhabitants. The importance of an internet connection is also highlighted in its cost competitiveness; Malaysians are required to pay more for lower speeds when compared to neighboring countries (See Box 3.5).

Table 3.18 Purpose of internet usage, 2015

Purpose of internet usage	Percent (%)	
	Overall	SMEs
Sending or receiving email	70.6	71.2
Internet banking	41.3	41.2
Getting information about goods and services	38.9	38.5
Posting information or instant messaging	36.6	36.9
Getting information from government organisations	23.5	23.2
Telephoning over the internet	18.6	18.6
Interacting with government organisations	16.5	16.2
Internet or external recruitment	10.8	10.1
Providing customer service	10.3	10.0
Accessing other financial services	9.9	9.3
Delivering products online	5.7	5.2
Staff training (e-learning application)	2.5	2.4
Others	12.5	6.2

Source: Economic Census 2016 (Usage of ICT by Business and e-Commerce), Department of Statistics Malaysia.

Box 3.4 The arts as a contributor to the information and communication sector
by Timothy Choy, Socioeconomics & Statistics Programme

The arts scene in Penang, contrary to other economic sectors, seldom receive equal publicity and attention. The arts however is what gives life to people after a long day at work. It is what brings families together on a weekend of activities. It is what powers the economy outside of conventional huge office complexes and multinational companies that Penang is known for. It is an avenue for independent creatives to discover their economic potential. It is what helps realise Penang's "work, live, and play" aspirations.

Lonely Planet in 2016 encapsulates this by describing Penang as "the crucible of an artsy modern Malaysia for its versatile exhibition spaces showcasing avant garde art, film, music and dance." The George Town Festival and George Town Literary Festival are cases in point. These festivals not only allow a showcase and celebration of an ever-growing underground movement that is becoming more mainstream, but also as a signal that Penang is ready for more – the culmination of which is the production and publishing of original expressions of art that contribute to the information and communication sector and as a lifestyle attraction for Penangites at large.

Penang songbirds Bhizu and Dasha Logan, for example, are names that are no longer foreign to Malaysians in the music industry. Local bands like Volatile are also making a name for themselves in the industry, with the launch of their latest album, *It's About Art* in August this year (2018). Other names like Acidic Bunch and Charlie and The Lions are carving out niche areas in song covers and wedding singing respectively. Besides producing their own music, such bands and artists also contribute heavily to the ever-growing demand for live performances which energise the city and in turn serves as a launch pad to build their music profile.

In the area of publishing, Penang-based publishers like Areca Books, Entrepot Publishing, and Clarity have been instrumental in contributing to the dynamism of the local literary scene. Such publishers provide an avenue for writers to publish niche and more colloquial titles, whose value would be less appreciated by large-scale publishers. Additionally, Clarity has also used publishing to give space to works of art. Streetart Notebook: George Town by Ernest Zacharevic is one such example. A collection of street art and murals by Zacharevic, the book also features his photography of George Town through images of everyday people doing everyday things. *Penang Monthly*, a publication of Penang Institute, on the other hand caters to the average Penangite with bits of everything that is going on in Penang ranging from hidden bars to stories of seemingly ordinary Penangites that are doing big things that positively impact the community.

And yet, there is still huge unrealised potential in this sector. Bad Wolves, an arts group keen to turn Penang into a creative hub, sees this. Through their events and workshops on songwriting, verse writing, and poetry, Bad Wolves wants to brand Penang as the place to learn and create original works in poetry, music, and stand-up comedy. The Penang state government has also taken the initiative to support this sector through funding and grants. Additionally, the state government has begun work on a RM30 million Penang Arts District that aims to be the creative hub of Penang's contemporary arts and culture.

Box 3.5 Internet subscription: Pay more for less speed

by Jonathan Dason, Socioeconomics & Statistics Programme

Fixed broadband is typically the choice of internet connection for business entities. In 2015, 74.8% of businesses used fixed broadband, as compared to 28.5% using mobile broadband.

Akamai's State of the Internet Q1 2017 report ranks Malaysia 10th out of the 15 countries ranked within the Asia-Pacific region in terms of fixed-line connection speed (Figure 3.17). Globally, Malaysia is ranked 62nd out of 149 qualifying countries, recording an average speed of 8.9 Mbps.

Figure 3.17 Principal statistics of speed for Asia Pacific

Global Rank	Country/ Region	Q1 2017 Avg.Mbps	QoQ Change	YoY Change
1	South Korea	28.6	9.3%	1.7%
4	Hong Kong	21.9	-0.2%	10%
7	Singapore	20.3	0.8%	23%
8	Japan	20.2	3.1%	11%
16	Taiwan	16.9	7.9%	14%
21	Thailand	16.0	20%	49%
27	New Zealand	14.7	14%	40%
50	Australia	11.1	9.6%	26%
58	Vietnam	9.5	15%	89%
62	Malaysia	8.9	9.1%	40%
68	Sri Lanka	8.5	17%	58%
74	China	7.6	20%	78%
77	Indonesia	7.2	6.7%	59%
89	India	6.5	17%	87%
100	Philippines	5.5	20%	57%

Global Rank	Country/ Region	Q1 2017 Avg.Mbps	QoQ Change	YoY Change
1	Singapore	184.5	n/a	26%
4	Hong Kong	129.5	n/a	17%
5	South Korea	121.0	n/a	17%
8	Thailand	106.6	n/a	53%
13	Taiwan	94.7	n/a	14%
14	Japan	94.5	n/a	12%
35	New Zealand	70.8	n/a	42%
43	Indonesia	66.1	n/a	-40%
50	Malaysia	64.1	n/a	38%
61	Vietnam	59.0	n/a	73%
62	Sri Lanka	57.3	n/a	62%
64	Australia	55.7	n/a	27%
86	China	45.9	n/a	48%
88	Philippines	45.0	n/a	50%
97	India	41.1	n/a	62%

Source: Akamai's State of the Internet Q1 2017 Report.

A further breakdown in the report also show that uptake for higher broadband speeds in Malaysia is lagging behind neighboring countries (Figure 3.18). Adoption for 10 Mbps, for example, sees Malaysia scoring 32% while neighbouring Thailand is at 72%. This is less than ideal given that higher broadband speeds will be crucial for businesses to transition to digital technologies, like real time monitoring and big data analytics.

Figure 3.18 Broadband adoption rates by speed (4 Mbps, 10 Mbps, and 15 Mbps) in Asia Pacific

Global Rank	Country/ Region	% Above 15 Mbps	QoQ Change	YoY Change
1	South Korea	69%	7.8%	-0.4%
4	Hong Kong	54%	2.8%	13%
5	Japan	52%	3.3%	20%
6	Singapore	51%	-1.4%	20%
13	Thailand	43%	56%	186%
19	Taiwan	38%	16%	17%
27	New Zealand	32%	26%	111%
47	Australia	19%	21%	90%
52	Malaysia	14%	28%	339%
57	Vietnam	11%	69%	1,222%
58	India	10%	38%	436%
63	Philippines	6.2%	72%	509%
69	Indonesia	5.0%	16%	520%
70	China Sri	5.0%	122%	1,146%
-	Lanka	11%	101%	556%

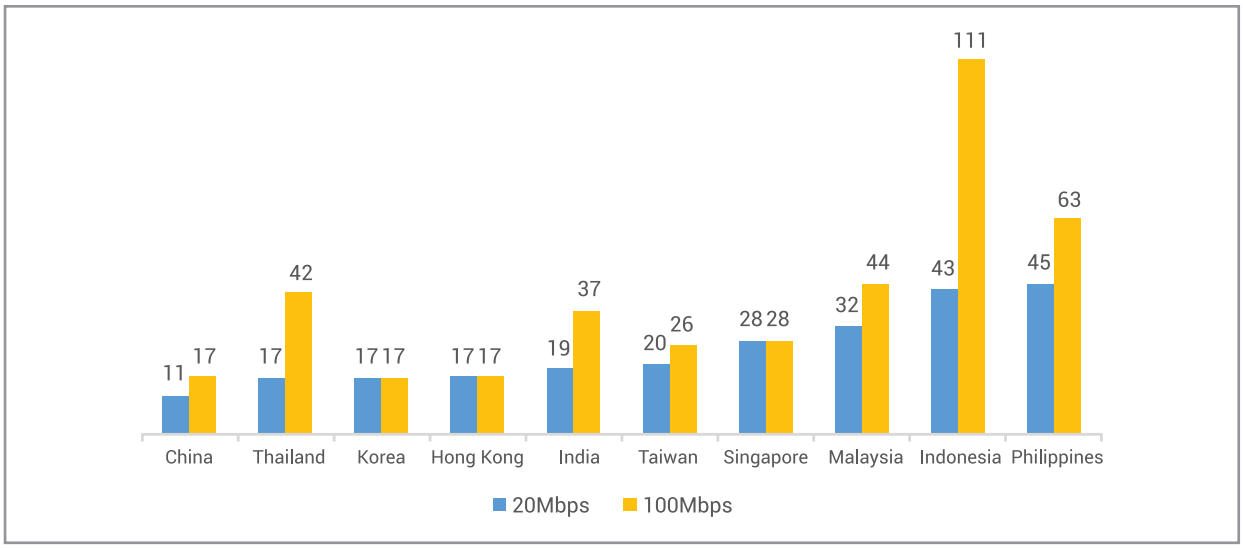
Global Rank	Country/ Region	% Above 10 Mbps	QoQ Change	YoY Change
1	South Korea	85%	3.1%	1.7%
3	Japan	73%	1.0%	11%
4	Singapore	72%	-2.1%	9.8%
5	Thailand	72%	26%	83%
6	Hong Kong	71%	1.0%	8.1%
15	Taiwan	65%	9.9%	14%
31	New Zealand	52%	17%	60%
48	Vietnam	37%	48%	656%
50	Australia	36%	16%	54%
52	Malaysia	32%	17%	179%
62	China	20%	84%	880%
64	India	19%	30%	28.5%
68	Indonesia	18%	22%	496%
78	Philippines	11%	53%	330%
-	Sri Lanka	22%	54%	399%

Global Rank	Country/ Region	% Above 15 Mbps	QoQ Change	YoY Change
1	South Korea	69%	7.8%	-0.4%
4	Hong Kong	54%	2.8%	13%
5	Japan	52%	3.3%	20%
6	Singapore	51%	-1.4%	20%
13	Thailand	43%	56%	156%
19	Taiwan	38%	16%	17%
27	New Zealand	32%	26%	111%
47	Australia	19%	21%	90%
52	Malaysia	14%	28%	339%
57	Vietnam	11%	69%	1,222%
58	India	10%	38%	436%
63	Philippines	6.2%	72%	509%
69	Indonesia	5.0%	16%	520%
70	China	5.0%	122%	1,146%
-	Sri Lanka	11%	101%	556%

Source: Akamai's State of the Internet Q1 2017 Report.

In terms of pricing, Figure 3.19 shows a comparison of monthly broadband price by countries. Malaysia's pricing schedule lie on the higher end, with comparable countries offering similar speeds at lower prices. This affects the affordability of internet connections in Malaysia given that Malaysia also has a lower GDP per capita than regional peers like Singapore and South Korea. The average Malaysian would have to use a bigger portion of their income for a similar internet connection compared to the average Singaporean with the same level of income. Figure 3.20 presents the current tariff schedule.

Figure 3.19 Monthly broadband price points (US dollar) in selected countries, 2017



Source: Equity Research Telecommunication Services, Credit Suisse (2017).

Figure 3.20 Current tariff schedule in Malaysia, 2016

TIER	2Mbps	10Mbps	20Mbps	30Mbps	50Mbps	100Mbps	1GBps
Telekom Malaysia - bundle	130	179	179	179	229	329	n.a.
Time Dotcom - bundle	188	188	238	288	n.a.	n.a.	n.a.
Maxis - bundle	188	188	238	288	n.a.	n.a.	n.a.
Time Dotcom - broadband	149	149	149	149	149	149	n.a.
Maxis - broadband	139	139	179	179	219	299	n.a.
Symphonet - broadband	98	98	98	128	138	148	n.a.

Source: Equity Research Telecommunication Services, Credit Suisse (2017).

The case for lower prices accompanying faster internet speeds in Malaysia has been widely made. The newly elected federal government has announced their decision to double internet speeds at half the price (the Sun daily, 2018).

References:

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3.2.5 Tourism

The tourism sector has always been an integral part of Penang's economy. As a key tourist destination, the state attracts millions of tourists annually, with its scenic beaches, diverse cultures, and delicious local food among the main attractions. The inauguration of George Town as a UNESCO World Heritage Site in 2007 heightened Penang's appeal as a holiday destination. In 2016, Lonely Planet (O'Hare and Delgrossi, 2016) named George Town as one of its best travel destinations in 2016. The following year, CNN (Hetter et. al., 2017) listed Penang as one of the 17 best places to visit.

Tourism in Penang has expanded into several sub-sectors such as medical tourism, cruise tourism, and eco-tourism. The constant evolution of Penang's tourism sector has contributed to the state's overall economic development by stimulating economic activities, contributing to the growth of employment opportunities, as well as creating a positive impact on income and production. As a service industry, tourism is able to generate and increase foreign income earnings that spur continuous economic growth (Lee and Chang, 2008).

PIA is the main entry point for travelers and tourists to Penang. The airport experienced passenger growth from 2016 to 2017 for both domestic travelers and international passengers. Domestic arrivals saw a 6.7% growth while domestic departures recorded a 5.4% growth (Table 3.19). While domestic passengers outnumbered international travelers, the latter experienced higher increases in total number of travelers. International arrivals increased by 9.9% while the number of international departures improved by 10.9%.

Table 3.19 Total arrivals and departures at Penang International Airport, 2016–17

Year	Arrivals			Departures		
	Domestic	International	Total	Domestic	International	Total
2016	1,901,878	1,407,785	3,309,663	1,936,020	1,415,542	3,351,562
2017	2,029,596	1,546,741	3,576,337	2,041,292	1,570,220	3,611,351

Source: Ministry of Transport and Malaysia Airport Holdings Berhad (MAHB).

Table 3.20 Total international arrivals and departures in Penang by country, 2016–17

Country	2016			2017		
	Arrivals	Departures	Total	Arrivals	Departures	Total
Singapore	608,637	617,980	1,226,617	660,736	681,188	1,341,924
Indonesia	411,713	403,716	815,429	424,665	422,245	846,910
Thailand	120,953	122,803	243,756	209,120	213,662	422,782
Hong Kong	145,227	145,664	290,891	150,340	148,099	298,439
China	50,786	55,139	105,925	66,103	68,356	134,459
Taiwan	29,557	29,101	58,658	35,590	34,089	69,679
Saudi Arabia	145	0	145	0	2,296	2,296
Vietnam	28,823	28,984	57,807	187	285	472
Myanmar	11,944	11,928	23,872	-	-	-
Japan	-	227	227	-	-	-
Total	**1,407,785**	**1,415,542**	**2,823,327**	**1,546,741**	**1,570,220**	**3,116,961**

Source: Malaysia Airport Holdings Berhad (MAHB).

There are 10 countries with flights available directly to and from PIA. It must be noted that Table 3.20 does not include all international tourists to Penang, as a huge percentage of travelers from countries not listed above would have transited through Kuala Lumpur International Airport. Indonesia, Thailand, Singapore, China, Hong Kong, and Taiwan were the six countries showing significant increases of passengers from 2016–17.

The majority of travelers originated from Singapore – the only country to surpass 1 million passengers as per Table 3.20 – and this was consistent for both 2016 (43.5% of total) and 2017 (43.1% of total). Indonesia follows, with that country's travelers accounting for 28.9% and 27.2% of total travelers in 2016 and 2017, respectively. Most of Indonesia's travelers (78.6%) originated from Kuala Namu International Airport in Medan, and their main purpose of travel was for medical purposes. Thailand came in third for 2016, but was overtaken by Hong Kong in 2017.

Swettenham Pier, established in 1904, also represents one of the major entry points for tourists into Penang. In 2017, there was a drop in total number of vessels calling at the pier, but there was also a significant increase of 24.8% in total number of passengers (Table 3.21). The number of international cruises and transit international cruises, as well as their number of passengers, both increased significantly over 2016. Cruise to nowhere ships saw a decrease of 199 vessels, yet there was a surprising increase of passengers.

Table 3.21 Number of vessels and passengers at Swettenham Pier, 2016–17

Type of vessel	2016		2017	
	Number of vessels	Number of passengers	Number of vessels	Number of passengers
Cruise to nowhere	1,170	589,859	971	598,328
International cruise	8	18,664	69	69,277
Transit international cruise	136	213,581	202	358,529
Total	1,314	822,104	1,242	1,026,134

Source: Penang Port Commission and Penang Global Tourism.

Table 3.22 Number of hotels by district and rating, Penang, 2016

District	Hotels					
	1-star	2-star	3-star	4-star	5-star	Total
Timur Laut	12	37	42	42	12	145
Barat Daya	1	5	4	4	2	16
Seberang Perai Tengah	-	3	5	2	1	11
Seberang Perai Utara	-	3	-	-	-	3
Seberang Perai Selatan	-	2	-	-	-	2
Total	**13**	**50**	**51**	**48**	**15**	**177**

Source: Penang Geographical Information System (PEGIS).

There are numerous options for accommodation for travelers to Penang, with hotels being one the key choices. Most hotels in Penang ranged from a two-star rating to a four-star rating, with 15 hotels achieving the top rating of five stars (Table 3.22). The hotels are densely concentrated on the island, which houses 90.1% of Penang's hotels. Of these hotels, 81.9% are situated in Timur Laut, the key administrative district and the centre of the island. Timur Laut is also home to the George Town World Heritage Site and other popular tourist attractions such as Gurney Drive, Bukit Bendera, the Botanical Gardens, and Kek Lok Si temple. Timur Laut would be especially preferable to free and independent (FIT) travelers due to the district's accessibility.

The other side of the island, Barat Daya, hosts 16 hotels. In contrast, 9.0% of Penang's hotels are found in Seberang Perai, with the majority found in Seberang Perai Tengah. There are only five two-star hotels in Seberang Perai Utara and Seberang Perai Selatan. It is clear that development in the tourism sector has been prioritised for the island. Nevertheless, the state government has been giving more attention to Seberang Perai in developing certain sub-sectors of tourism, such as eco-tourism.

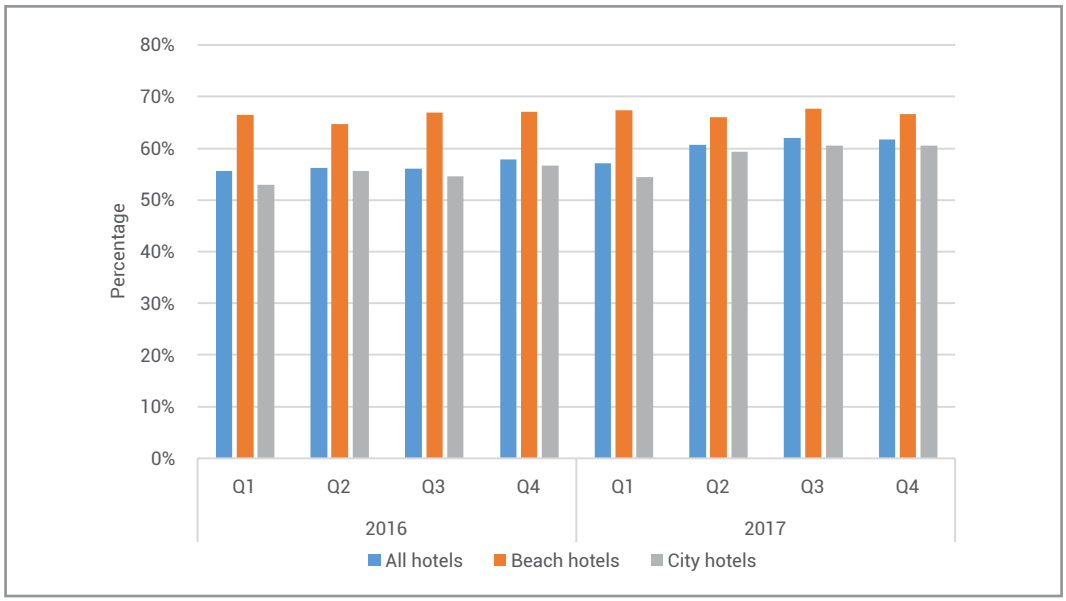
Beside hotels, budget hotels and guest houses are other popular options for tourist accommodations (Table 3.23). Timur Laut again has the majority of guest houses, budget hotels, motels, and hostels because of the district's accessibility to renowned tourist attractions. However, 42% of Penang's budget hotels are found in Seberang Perai, with 36.9% situated in Seberang Perai Tengah and Seberang Perai Utara. Seberang Perai also hosts a bigger percentage of homestays (72.3%). In contrast, there are no homestays officially recorded in Timur Laut.

Table 3.23 Number of other tourist accommodations by district and type, Penang, 2016

District	Motel	Guest house	Hostel	Serviced apartment	Budget hotel	Homestay
Timur Laut	4	46	5	1	100	-
Barat Daya	-	5	-	1	5	3
Seberang Perai Tengah	-	4	-	-	34	2
Seberang Perai Utara	2	1	-	-	31	2
Seberang Perai Selatan	3	1	-	-	6	4
Total	**9**	**57**	**5**	**2**	**176**	**11**

Source: Penang Geographical Information System (PEGIS) and Ministry of Tourism and Culture, Penang.

Figure 3.21 Average hotel occupancy rate for Penang, 2016–17



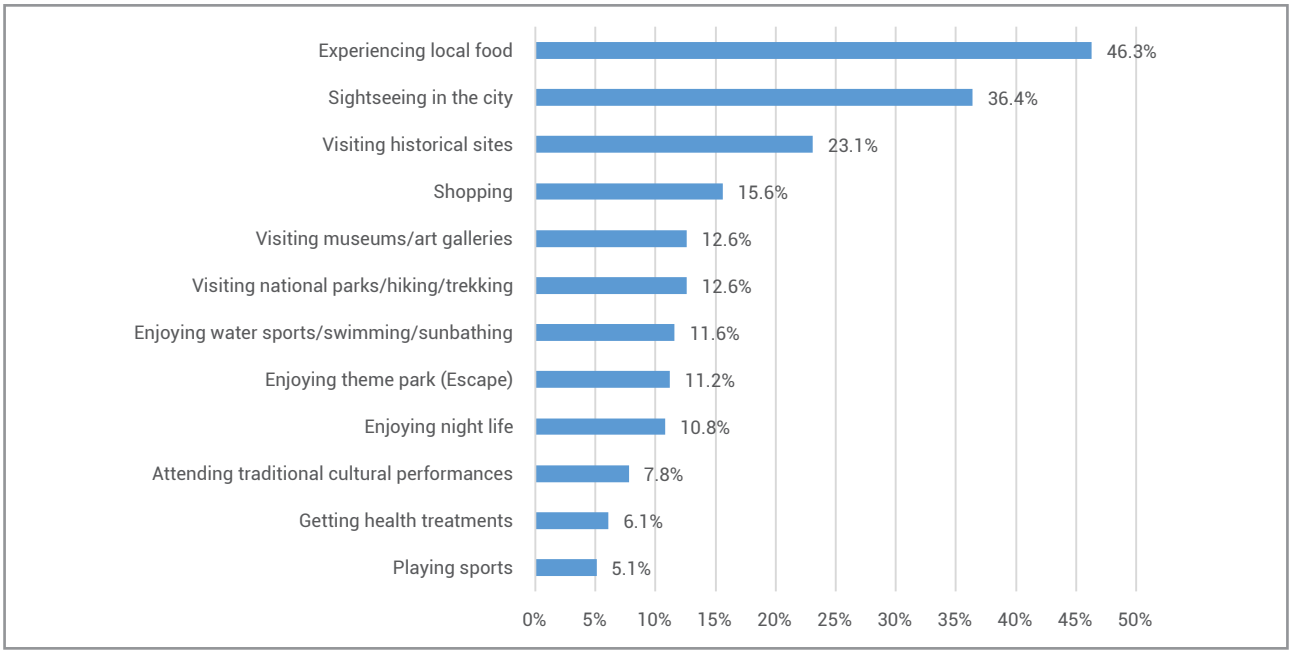
Source: Malaysian Association of Hotels, Penang Chapter.

Compared to 2016, 2017 had higher occupancy rates for all hotels across all quarters, with the largest discrepancy of 5.9% in Q3 (Figure 3.21). Occupancy rates in 2017 showed an increasing trend from Q1 to Q3, but then decreased in Q4. Concurrently, Q3 2017 recorded the highest occupancy rate for the year. In contrast, there was a decline in occupancy rates from Q2 to Q3 2016, with the highest occupancy rate achieved in Q4.

As Figure 3.21 shows, occupancy rates for beach hotels fluctuated between 66% and 67.7% across all quarters for 2017. However, 2016 saw occupancy rates decreasing by 1.9% in the first half, before steadily increasing again. There were also higher occupancy rates in general in 2017 compared to 2016, with the fourth quarter being the only quarter where 2016 performed better. The difference in beach hotel occupancy rates was smaller compared to the overall rate.

For 2016, the city hotels' occupancy rates fluctuated across all four quarters, increasing from Q1 to Q2, then decreasing, before increasing to 56.7% to record the best-performing quarter for the year. Nevertheless, 2017 outperformed 2016 in every quarter, as per average occupancy rates of all hotels. Similar to the overall occupancy rates, the largest difference was found in Q3, at 5.9%. There was an increasing trend in 2017 from Q1 to Q3, with the rates for Q4 identical to Q3. Overall, beach hotels registered a higher occupancy rate compared to city hotels, with occupancy rates reaching 60% and above for both years.

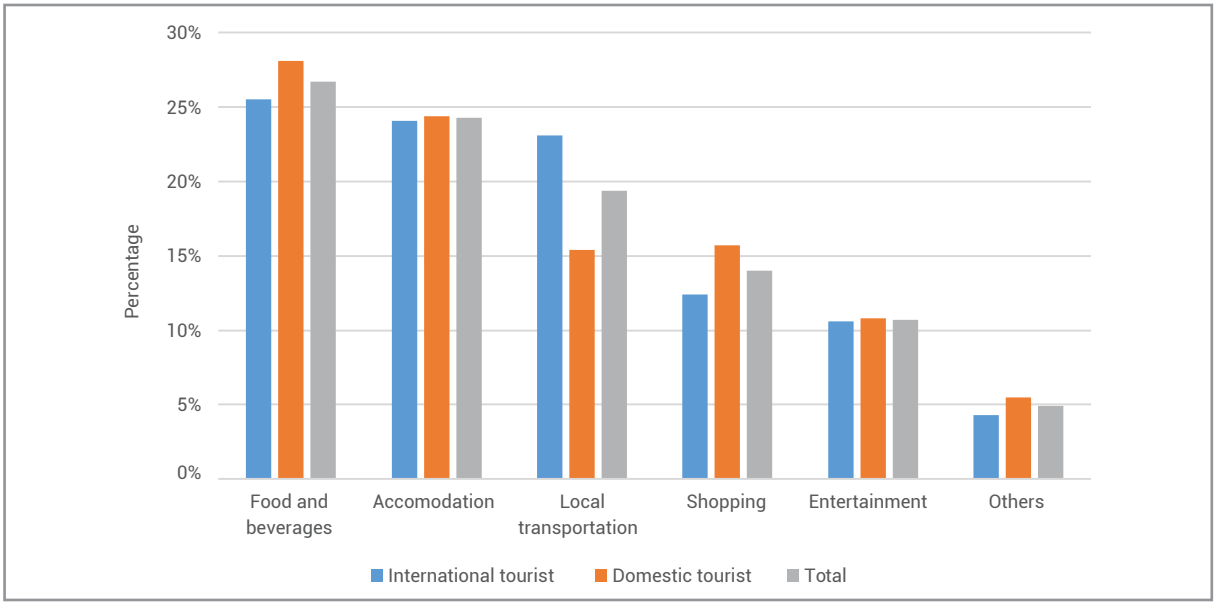
Figure 3.22 Activities by selected tourists in Penang, 2016



Note: The survey consisted of responses from 4,767 tourists (2,370 international tourists and 2,397 domestic tourists) aged 18 and above who spent a minimum of one night in Penang, from March to December 2016.
Source: Penang Tourist Survey 2016, Penang Global Tourism.

Based on a survey conducted by Penang Global Tourism (PGT), experiencing the local culinary delights emerged as the top tourist activity in Penang, with 46.3% of respondents citing it as a top priority (Figure 3.22). Sightseeing in George Town and exploring the historical sites of Penang came in second and third, with 36.4% and 23.1% of respondents, respectively, categorising these as essential activities. Tourists also indulged in the retail sector, with 15.6% of respondents citing shopping as one of their main activities. Museums, art galleries, national parks, and the Escape theme park attracted an equal share of tourists. The study also revealed that the majority of tourists surveyed saw Penang as a World Heritage Site (36.4%), with an almost equal percentage associating the state with its food and local cuisine (34.6%).

Figure 3.23 Proportion of expenditure by selected tourists, Penang, 2016



Note: The survey consisted of responses from 4,767 tourists (2,370 international tourists and 2,397 domestic tourists) aged 18 and above who spent a minimum of one night in Penang, from March to December 2016.
Source: Penang Tourist Survey 2016, Penang Global Tourism.

The 2016 Penang Tourist Survey also captured the spending patterns of the respondents (Figure 3.23). A large proportion of spending went towards food and beverages (26.7%), followed by accommodation (24.3%). The spending pattern of international tourists and domestic tourist in these categories did not differ significantly, with domestic tourists spending marginally more on food and beverages. International tourists spent more on local transportation (23.1%), while the majority of domestic tourists[19] travelled to Penang with their own personal vehicles. However, domestic tourists spent more on shopping, as shopping accounted for 15.7% of their total expenditure, compared to the 12.4% for international tourists.

Heritage tourism

With the inauguration of George Town as a World Heritage City by UNESCO in 2008, heritage tourism has emerged as one of the sub-sectors of Penang's tourism that has generated substantial economic impact for the state. Heritage tourism is defined by the World Tourism Organisation as the motivation for individuals to travel in a bid to experience different cultures and heritage that could be experienced through festivals or other cultural events.

Long before George Town is recognised as a historical site, Penang has placed importance in heritage conservation since the early 1970s (Lim and Pan, 2017). Penang Heritage Trust was established in 1986, with a key focus on preserving the heritage of Penang. After George Town's inscription, George Town World Heritage Incorporated (GTWHI) was formed to support local governments and local communities in conserving the tangible and intangible heritages of the site.

As shown by Figure 3.22, experiencing the culture, history, and heritage of George Town and Penang are among the main activities enjoyed by tourists to Penang. Penang Heritage Trust organises educational and cultural walks for tourists, bringing them through various historical sites such as the Clan Jetties, Fort Cornwallis, and Little India, with the aid of experienced guides.

As heritage tourism flourishes, local businesses stand to benefit economically from the increased consumption of their products and services. The state's labour force is also positively affected, as more employment is generated in terms of tour guides, service providers, and others. The spending by heritage tourists on accommodation, food and retail – as with all other tourists – contributes greatly to the state's tourism revenue.

Heritage tourism is able to play an important role in preserving and shaping community identities. In developing heritage tourism in a particular area for the purpose of satisfying tourists' demands, awareness, understanding, and appreciation of existing cultural identities in local communities could be further reinforced and defined (Cela et al., 2015). However, one must be mindful that commercialisation does not override the communities' existing culture and heritage. The gentrification of George Town has been a great concern to heritage conservationists, as with the commercialisation of the Clan Jetties. The state government, local communities, and other stakeholders need to play their respective parts in striking the correct balance between preserving heritage and developing heritage tourism.

Ecotourism

Defined by the International Ecotourism Society as a form of "responsible travel", ecotourism prioritises touring natural, undisturbed places of nature, designed to contribute towards the protection and preservation of the environment. Ecotourism is generally carried out on a smaller scale compared to other forms of tourism. This allows it to have minimal impact on the environment and surrounding activities. This form of tourism also generates funds for ecological conservation, and will be able to economically empower the local indigenous communities within the natural reserves (Pociovalisteanu and Niculescu, 2010). With flora, fauna, environment sustainability, and local culture being the focal points of ecotourism, eco-tourists will also be able to gain a deeper appreciation for nature.

The 2016 Penang Tourist Survey found that 11.6% of the tourists surveyed ranked visiting national parks, hiking, and trekking as their main priority in Penang. Penang is home to centuries-old natural rainforests, and which are part of the forested land in Penang classified as Permanent Reserved Forests (PRFs). PRFs also covers peat swamps and mangroves. The management of PRFs requires the application of sustainable forest conservation and principles. Penang's PRFs has enabled the state to become a main destination for eco-tourists.

[19] The 2016 Penang Tourist Survey found that 57.7% of domestic tourists surveyed travelled to Penang via their own personal vehicles.

The island hosts a number of beautiful nature spots such as Penang National Park, Penang Hill, and the Botanical Gardens. Oher attractions such as The Habitat at Penang Hill, Entopia, and ESCAPE are designed with the preservation of nature as a focal point of their development. On the mainland, bird watching as an ecotourism activity has been promoted in Teluk Air Tawar-Kuala Muda, which houses tens of thousands of water birds comprising more than 200 species of birds.

Penang's mangrove forests is also a focal point of ecotourism. The protection of the mangroves is beneficial for the local communities that rely on fishery in the mangroves as a source of livelihood. The vibrancy of the mangroves and its communities, in turn, highlights their potential as an ecotourism destination. Additionally, mangrove forests have been recognised as a viable tool in coastal defense strategies, where they play a role in reducing wind and swell waves. This then helps to limit flooding and damage to the coastal infrastructure during heavy storms (McIvor et al., 2012).

Ecotourism brings in economic opportunities such as nature guides, boatmen, homestay operators, and food and beverage operators. These are avenues that could provide employment and income for the local communities. However, as is the case with heritage tourism, a careful balance between economic benefits and preservation of nature must be struck. The development of ecotourism should prioritise long-term sustainability over short-term economic profits that lead to negative impacts on the natural environment.

Cruise tourism

Cruise tourism is a form of travelling which involves a holiday on a cruise ship, with planned itineraries and activities on the cruise ship itself. Passengers often get explore the ports and cities where the cruise ship calls.

Cruise tourism has always been integral to Penang's tourism industry, and this sub-sector has been experiencing significant growth. As Table 3.21 shows, there has been a substantial increase of 88.2% in the number of international and transit international cruise ships that had docked at Swettenham Pier from 2016 to 2017. The number of passengers also saw an impressive increase of 84.2%. In fact, in 2017 Swettenham Pier dethroned Port Klang as the port that received the most cruise ships in Malaysia (Lee, 2017).

Swettenham Pier has the advantage of a very strategic location. The pier is located within the UNESCO Heritage Zone and is close to George Town, with popular tourist areas such as Armenian Street, Beach Street, and the Clan Jetties within distance. With cruise liners usually docking at Swettenham Pier for an average of eight to 12 hours, this gives passengers ample time to enjoy what Penang has to offer. The spillover effects of cruise tourism lead to new opportunities for business and employment.

However, there are considerations of sustainability for cruise tourism. First and foremost, the cruise liners generate waste – wastewater (from toilets, sinks, and showers) and solid waste that pollute coastal areas and damage the marine ecosystem (Brida and Zapata, 2010). Likewise, as with ecotourism and heritage tourism, the recent boom of cruise tourism also has significant impact on local communities and their culture, where they face the danger of over-commercialisation. Sustainable cruise tourism can be achieved by establishing policies to protect the community and the environment.

Medical tourism

Private hospitals in Penang were already involved in treating foreign patients before the term "medical tourism" was coined. Hospital Lam Wah Ee, Penang Adventist Hospital, Loh Guan Lye Specialists Centre, and Mount Miriam Cancer Hospital were established more than 40 years ago.

Penang Centre of Medical Tourism (PMED) and Malaysia Healthcare Travel Council (MHTC) are two medical tourism-related coordinating bodies at the state and national level, respectively. They collect market intelligence, and assist and facilitate marketing efforts to promote their members' services. Table 3.24 shows the Penang medical institutions that are affiliated with these two organisations. Most medical tourism-promoting institutions are located in Timur Laut, concentrated near the Pulau Tikus-Gurney township area.

In 2015, healthcare travellers[20] contributed 31.6% (RM407.2 million) of gross revenue from private hospitals in Penang, or 0.53% equivalent to Penang state GDP. This shows the significant contribution of medical tourism to the Penang economy, especially to the private healthcare sector.

[20] "Healthcare travellers" is a catch-all term comprising health tourists, foreign works/expatriates (residents), and general tourists who fell sick during their vacation.

Table 3.24 Medical institutions in Penang which are promoting medical tourism (as of August 2018)

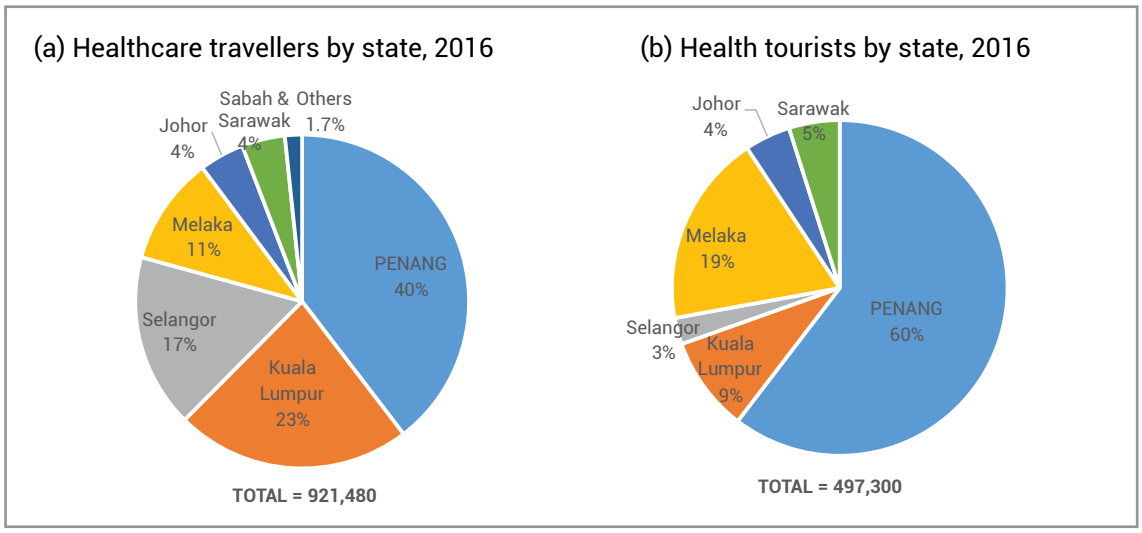
Penang Centre of Medical Tourism (PMED)	Malaysia Healthcare Travel Council (MHTC)
Members	***Elite members***
Bagan Specialist Centre	Gleneagles Penang
Genesis IVF & Women's Specialist Centre	Island Hospital
Gleneagles Penang	Loh Guan Lye Specialists Centre
Island Hospital	Penang Adventist Hospital
KPJ Penang Specialist Hospital	
Lam Wah Ee Hospital	***Ordinary members***
Loh Guan Lye Specialists Centre	Genesis IVF & Women's Specialist Centre
Mount Miriam Cancer Hospital	KPJ Penang Specialist Hospital
Optimax Eye Specialist Hospital	Pantai Hospital Penang
Pantai Hospital Penang	TMC Fertility & Women's Specialist Centre (Penang)
Penang Adventist Hospital	
Associate members	
Spinecare Chiropractic	
PS Healthcare PLT	
Clinic Hypnotheraphy Practitioners	
Klinik Pergigian A. Marina	

Source: Penang Centre of Medical Tourism and Malaysia Healthcare Travel Council.

Out of 921,480 healthcare travellers who utilised Malaysia's private healthcare services in 2016, Penang accounted for 40% (Figure 3.24a), comparable to the Klang Valley (23%+17%), the Greater Kuala Lumpur region which includes most of the populated urban areas in Selangor.

However, if we only consider health tourists with the sole intention of travelling to seek healthcare treatment, Penang dominated with about 60% of all health tourists (300,400 visitors) in Malaysia in 2016 (Figure 3.24b). The number of health tourists in Penang was about five times those who visited the Klang Valley. Health tourists also comprised 10.3% of all foreign visitors[21] to Penang in 2016.

Figure 3.24 Preferred medical tourism destination in Malaysia, 2016



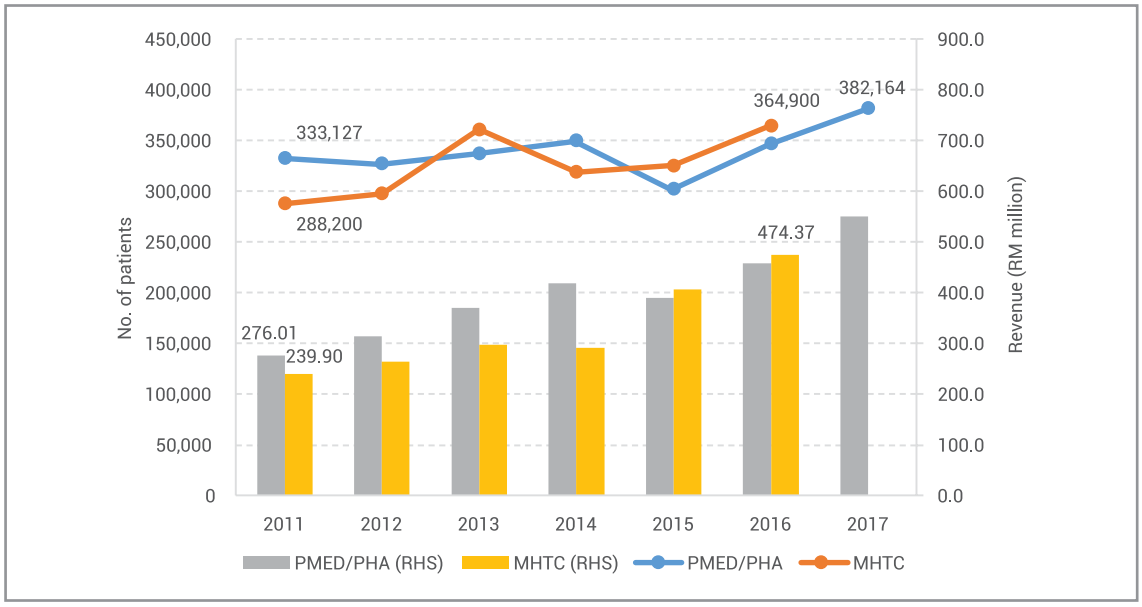
Source: Malaysia Healthcare Travel Council.

[21] 2.91 million foreign visitors arrived in Penang in 2016. *Source: Hotel Guests statistics, Tourism Malaysia*

PMED and MHTC reported a moderate increase in the number of healthcare travellers in Penang, from 4.2% to 26.6% over six years (2011–16), as well as a substantial surge in patient revenue from 66.0% to 97.7% (Figure 3.25). In terms of percentage share among healthcare travellers to Penang, health tourists increased their contribution from 75.9% in 2011 to 82.3% in 2016 (Figure 3.26). The growth of health tourists to Penang is equivalent to 16,360 patients per year (compound annual growth rate of 6.56%) during this period.

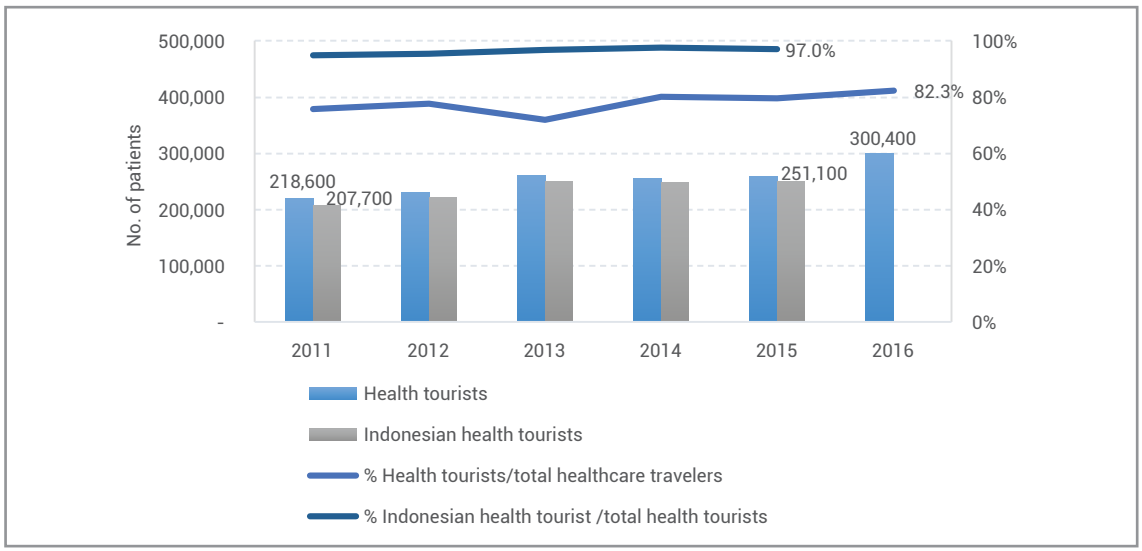
Among Penang's health tourists in 2015, 97% came from Indonesia. The proportion of Indonesian health tourists did not change much from 2011, at 95%. This highlights the major nationality base of health tourists in Penang (and in Malaysia, since Penang took the lion's share of 60%). There were 251,100 Indonesian health tourists flocking to Penang in 2015.

Figure 3.25 Number of healthcare travellers and revenue generated for the medical tourism sector in Penang



Note: Discrepancy in reported numbers by PMED and MHTC is due to inclusion of different number of medical institutions.
Source: Penang Centre of Medical Tourism and Malaysia Healthcare Travel Council.

Figure 3.26 Number and proportion of health tourists among healthcare travellers in Penang

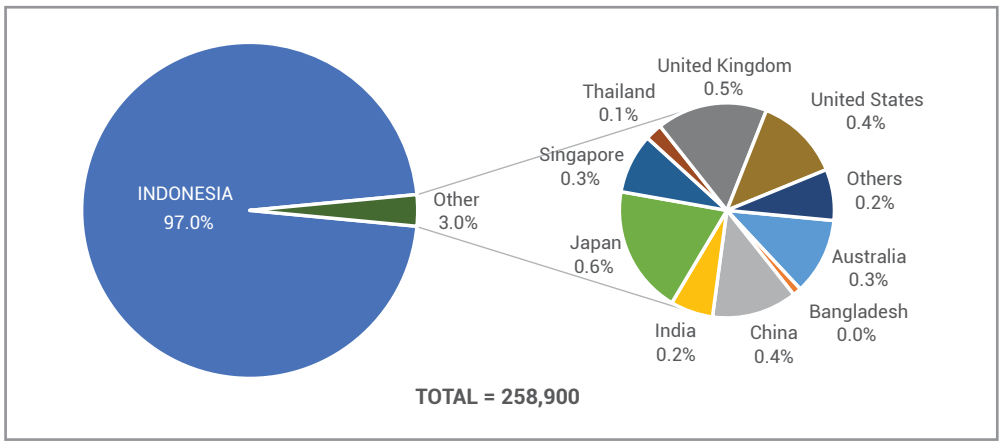


Source: Malaysia Healthcare Travel Council and authors' calculation.

Besides Indonesians, health tourists from other nationalities only accounted for 3% of the total in 2015. The largest of these were the Japanese (1,500 or 0.6%), followed by the British (1,300 or 0.5%), Americans, and Chinese (both at 1,000 or 0.4%) (Figure 3.27). However, in terms of revenue per patient, Indonesian and Australian health tourist paid an average of RM1,360 and RM1,330 per person, respectively, in 2015, followed by Singaporeans (RM1,140 per person).

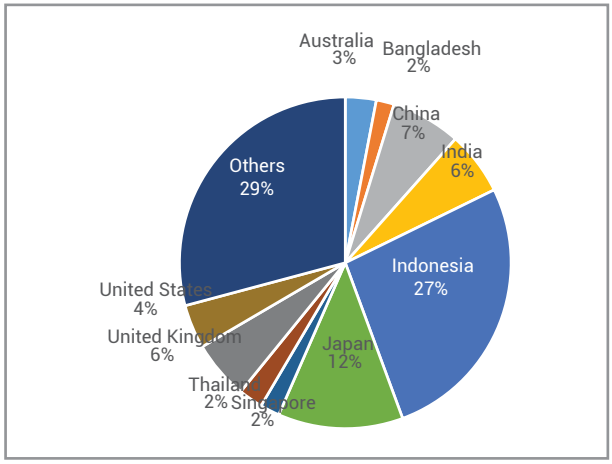
Among foreign nationalities[22] residing in Malaysia, Indonesians were still the largest group to use private healthcare services in Penang, but only account for 27% of the total of 16,800 individuals in 2015 (Figure 3.28). This number is about 15 times smaller than the size of health tourists who came directly from their home country. The Japanese were second at 12% or 7,700. The Japanese – and other nationalities – instead had more foreign residents than health tourists using Penang's private healthcare facilities in Penang.

Figure 3.27 Health tourists in Penang by nationality, 2015



Source: Malaysia Healthcare Travel Council and authors' calculation.

Figure 3.28 Foreign resident patients in Penang, 2015



Source: Malaysia Healthcare Travel Council and author's calculation.

[22] Healthcare travellers also include residents from foreign nationalities. A sizeable population of foreign workers, expatriates, students are residing in Penang and Malaysia. They, too, were using the private healthcare facilities while they were here in the country.

Education tourism

Education tourism has been determined as a growing sub-sector of tourism for Penang. The concept of education tourism can be classified as "education first" or "tourism first", as defined by Ritchie (2003, cited in McGladerry and Lube, 2017). For example, the primary purpose of a secondary school field trip to another country may be education, but students will inevitably partake in tourist-related activities.

Education tourism in Penang is more connected to the private higher education sector. The state government had established Penang Centre of Education Tourism (PCET) to promote Penang as an education destination for prospective international students, by increasing awareness and recognition of the state's education industry, both regionally and internationally.

PCET currently has 14 members – among them, KDU University College and Penang Medical College – and five associate members, and PCET serves to strengthen the credibility of these colleges. In conjunction with the colleges themselves, PCET promotes education in Penang by partaking in education fairs in other countries.

According to PCET, popular courses chosen by international students include, but are not limited to, hospitality, tourism, business and administration, marketing, and accounting. In addition to the usual standards of full degrees, diplomas and graduate diplomas, the colleges are also able to customise short-term courses for student exchange programmes. These exchange courses combine education and travel, giving students the opportunity to travel and experience the Penang's culture, in addition to receiving an education.

Indonesian students account for a significant proportion of the market – a spillover effect of medical tourism. As education tourism in Penang is semi-dependent on word of mouth, it is surmised that medical tourists, who are attracted to the environment and livability of the state, opted for or recommended Penang as a tertiary education prospect for their family and friends. The countries of origin of other international students in Penang include Thailand, Myanmar, China, India, and South Korea.

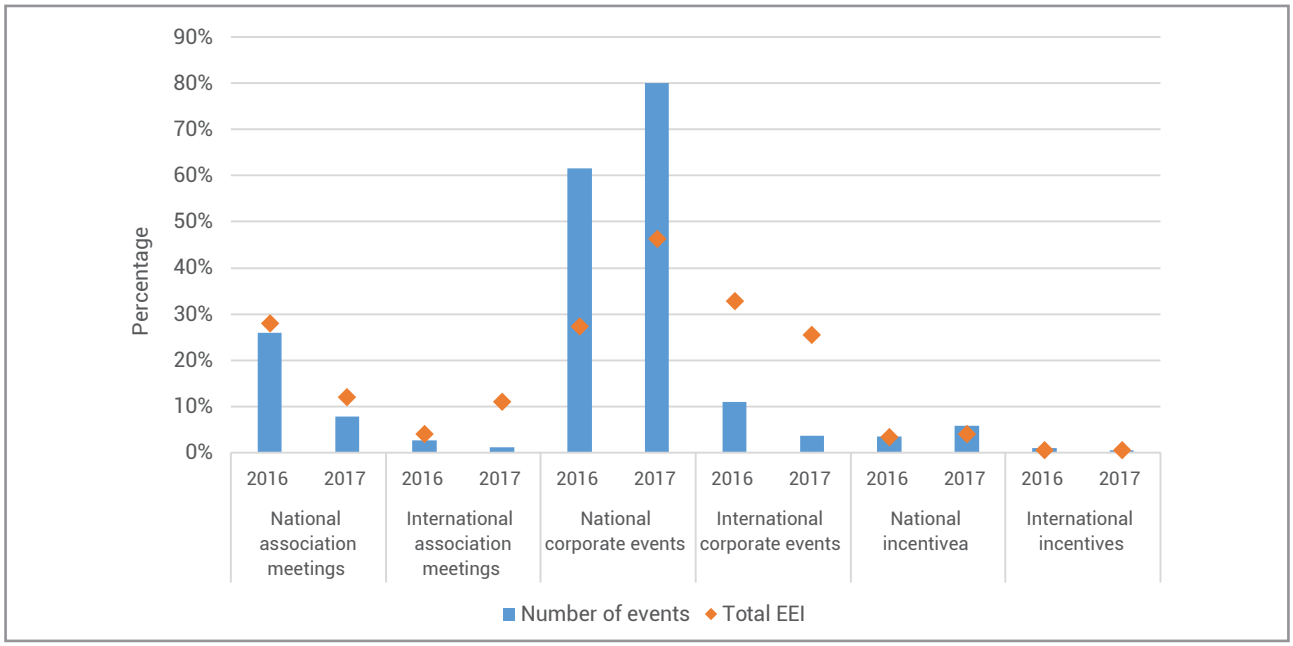
Education tourism creates an economic impact for Penang through the education investment made by international students. Furthermore, in a bid to remain competitive in the education market, private higher education institutes in Penang will focus on improving the courses offered and the quality of the education provided. Higher-quality education will produce more high-skilled graduates, creating a workforce with more qualified workers.

MICE (meetings, incentives, conferences, and exhibitions) tourism

With the globalisation of business and international trade, business and event tourism, or MICE (meetings, incentives, conferences and exhibitions) tourism, as it is more popularly known, is a rapidly expanding sub-sector of tourism that can generate substantial returns to the economy. MICE tourism involves the travel of individuals and/or a delegation to participate in meetings, congresses, exhibitions, and conferences in an official or professional capacity. The growth of MICE tourism enables the growth of the hospitality sector, as well as transportation and other auxiliary services of the host destination (Getz and Page, 2015).

Rich in culture and heritage and renowned for its food, Penang is a highly attractive destination for MICE travellers. The Setia SPICE Convention Centre in Bayan Lepas is fully equipped to host international events with thousands of participants. Furthermore, Penang has many five-star hotels capable of handling large-scale international conferences, in addition to providing world-class accommodation for MICE tourists. The Penang Convention and Exhibition Bureau (PCEB), an agency established by the state government to promote MICE tourism, stated that MICE has become a significant contributor to Penang's tourism revenue, registering an estimated economic impact (EEI) of more than a billion ringgit in 2017.

Figure 3.29 Percentage of events and EEI by type of event, Penang, 2016 and 2017



Source: Penang Convention and Exhibition Bureau Annual Report for 2016 and 2017.

From hosting 1,251 events in 2016 to 2,511 events in 2017, the total number of events held in Penang had recorded an increase of more than 100% over the two-year period, while the EEI had a growth of 24% (Figure 3.29). National events increased by 119.6%, while international events had a decline of 11.7%. However, despite the decrease in events, the total EEI of international events increased by 12.5%. The EEI of national events increased by 32.0%.

National corporate events held the biggest share in number of events for both years, seeing a growth of 18.5%, and contributed the biggest percentage of EEI (46.3%) for 2017. However, the number of national association meetings and the corresponding EEI both saw a drop of 18.1% and 15.8%, respectively.

Despite the small percentage share for number of events, international association meetings, and international corporate events, their contribution towards overall EEI was quite high. For instance, the percentage of events for international association meetings decreased by 1.5% in 2017, but the generated EEI increased by 5.9%. The same trend can be observed for international corporate events for both years – the EEI generated was high comparative to the percentage of events. International incentives were the smallest contributor towards number of events and EEI for both years.

Table 3.25 Percentage of events and EEI by type of event and sector, Penang, 2017

Sector	National		International	
	Events %	EEI % (RM mil)	Events %	EEI % (RM mil)
Government	8.2%	7.2%	0.0%	0.0%
Industry	12.8%	7.4%	1.8%	0.9%
Economics	6.4%	4.7%	0.3%	1.2%
Commerce	4.0%	3.4%	0.4%	26.4%
Corporate	24.6%	8.7%	1.0%	3.5%
Management	8.5%	5.5%	0.4%	0.4%
Education	6.6%	5.4%	0.0%	0.0%
Culture and ideas	0.4%	1.3%	0.2%	2.5%
Science	0.0%	0.0%	0.1%	0.1%
Technology	3.6%	4.1%	0.2%	0.2%
Medical sciences	3.7%	2.9%	0.3%	0.7%
Social sciences	0.3%	0.3%	0.0%	0.0%
Mathematics and statistics	0.2%	1.2%	0.0%	0.0%
Transport and communications	1.1%	0.5%	0.2%	0.0%
Sports and leisure	1.0%	0.5%	0.3%	0.1%
General	4.3%	2.3%	0.2%	0.3%
Others	7.7%	6.9%	1.0%	1.3%
Total	**93.6%**	**62.3%**	**6.4%**	**37.7%**

Source: Penang Convention and Exhibition Bureau Annual Report for 2017.

Breaking down the number of events held and EEI by sector in 2017, it is found that national corporate events sustained the biggest percentage in number of events (24.6%), while international events in the commerce sector, despite accounting for a 0.4% share, contributed the highest percentage of EEI (26.4%) (Table 3.25). National industry events came in second in percentage of events held. National events in government, industry, and corporate sectors were among the top generators of EEI, ranging from 7.2% to 8.7%, respectively. National events accounted for 93.6% of total events, producing an EEI of 62.3%. However, 37.7% of overall EEI was contributed by international events, despite the small percentage of events held.

Table 3.26 Percentage of events and EEI by type of event and country, Penang, 2017

Country of origin	Association		Corporate events		Incentives	
	% Events	% EEI (RM mil)	% Events	% EEI (RM mil)	% Events	% EEI (RM mil)
Southeast Asia	6.9%	7.9%	34.0%	4.0%	6.9%	0.2%
Asia Pacific	3.8%	13.9%	9.4%	61.1%	10.7%	2.8%
Middle East	0.6%	0.0%	1.3%	0.1%	4.4%	0.1%
United Kingdom	0.0%	0.0%	2.5%	0.4%	2.5%	0.3%
Europe	1.3%	0.4%	2.5%	0.3%	0.6%	0.1%
United States	1.3%	2.6%	2.5%	0.1%	0.6%	0.1%
Australia	0.0%	0.0%	3.8%	0.6%	0.0%	0.0%
Others	3.1%	4.0%	1.9%	1.2%	0.0%	0.0%
Total	**17.0%**	**28.9%**	**57.9%**	**67.7%**	**25.2%**	**3.4%**

Source: Penang Convention and Exhibition Bureau Annual Report for 2017.

For international events, as organisers for 44.8% of all international events, Southeast Asian countries were the biggest event contributors in terms of volume, with Singapore hosting 92.8% of events. In terms of EEI (Table 3.26), however, Asia Pacific was by far the biggest contributor, accounting for 77.8% of total EEI. The biggest share was claimed by India, which generated an EEI of RM190 million by holding a five-day conference with more than 18,000 participants, while China held the second-largest share at 33.6% (RM97.4 million).

The economic impact from MICE tourism in Penang is significant. business travellers spend substantially more than free and independent travellers. The rise of MICE tourism also helps the growth of SMEs involved in hospitality, catering, logistics, printing and designing, and others, where employment and income opportunities will increase. With international events, there are also returns of investment in the form of knowledge procurement and innovation enhancement through exposure to global best practices. These benefits will impact the economy in ways that stretches beyond tourism revenue from direct spending.

Prospects

The tourism sector in Penang is predicted to sustain its continual growth, generating substantial economic revenue for the state. Penang's growing reputation as a tourist destination will continue to attract tourists to experience all that Penang has to offer.

Heritage and cultural tourism will benefit from the ongoing restoration of George Town and the development of boutique hotels. In addition, it is envisaged that the annual George Town Festival and George Town Literary Festival will continue to bring in delegates and participants that will contribute to the revenue of heritage tourism.

The focus of the state government in developing certain areas in Seberang Perai as destinations for eco-tourists will significantly boost ecotourism. The Air Itam Dalam Educational Forest, Pulau Burung, mangrove forests of Kuala Bekah, and Teluk Air Tawar-Kuala Muda are among the sites targeted to be developed and promoted as destinations for bird watchers. Seberang Perai has the potential to become the main eco-tourism hub for Penang, and should be developed as such.

The prospects for growth in cruise tourism is extremely positive. Swettenham Pier has been primed for further development, with Royal Caribbean Cruises partnering with Penang Port Commission in a 40/60 joint venture to upgrade and improve the cruise terminals at the pier. The project will see major extensions of the existing berths to accommodate the docking of larger international cruise ships, resulting in more cruise tourists at the shores of Penang.

Given Penang's competitiveness in the region, the steady growth in medical travellers and revenue generated in medical tourism is expected to continue. The opening of an oncology centre in Adventist Hospital, extensive upgrades undertaken by Gleneagles Medical Centre, and planned extensions to Island Hospital will improve Penang's private healthcare services. Indonesian health tourists will continue to be the biggest contributor to this sub-sector.

Penang is highly competitive as an education hub, with reputable and respected private higher education institutions offering quality learning opportunities. Although tuition costs are competitive to private higher education institutions in Kuala Lumpur, the cost of living in Penang is relatively lower. Moreover, Penang hosts a large number of MNCs that are able to provide internships, as well as offering opportunities for future employment. The prospects for growth in education tourism are considerably bright.

MICE tourism has made significant contributions to Penang's tourism revenue. Penang continues to attract international events such as the World Seafood Congress, which Penang won the bid to host in 2019, and is expected to lift Penang's status as a MICE destination. It was found that the share of revenue generated by international events was substantial in comparison to the much smaller number of events. There should be more focus in promoting Penang as a destination for international organisations to hold their meetings and conferences, as international events are proven to be a huge generator of income. With the expected completion of Penang Waterfront Convention Centre (PWCC) in 2021, MICE tourism is anticipated to experience exponential growth in the coming years.

There are other sub-sectors in Penang's tourism sector with the potential to grow. For instance, sports tourism, where tourists travel to participate in sports-related activities, has been gaining ground in Penang. The state hosted the first Asia-Pacific Masters Games (APMG) in September 2018, where participants took part in sporting events at various venues in Penang, including the Setia SPICE Convention Centre.

Wedding tourism represents another sub-sector that has been gaining traction. According to PGT, couples have travelled from Singapore, Hong Kong, China, and Australia to stage wedding photoshoots at various sites in Penang, mostly in the UNESCO World Heritage Site or the beaches of Batu Feringghi. PGT has formed a committee to promote Penang as a destination for weddings and wedding photography to cultivate this sub-sector for further development.

Overall, the prospects for growth for Penang's tourism is highly positive as individual tourism subsectors are expected to continue expanding significantly in terms of number of travellers involved as well as revenue generated.

3.2.6 Education

Education has long been identified and recognised as one of the fundamental factors of economic development, and as a determinant for long-term economic growth. The government's investment in education, from pre-school education to tertiary education – including skills and vocational training – is equitable to human capital investment. As the foundation of human capital development, education is vital to improving labour productivity and cultivating the technical and intellectual capabilities of the work force. In addition to securing economic progress, education also plays an important role in ensuring social progress, as it is a key to improving income inequality.

Primary and secondary schools in Penang has been categorised into several types, as seen in Table 3.27. As it is the most populated district in the state, Timur Laut hosts the largest number of schools, accounting for 29.6% of all schools in Penang. The majority of Chinese national-type primary schools are stationed here as well, with the district's Chinese 37 schools accounting for 41.1% of all primary schools of the said type.

Table 3.27 Number of schools by district and type, Penang, 2017

Type	Timur Laut	Barat Daya	Seberang Perai Utara	Seberang Perai Tengah	Seberang Perai Selatan	Total
Primary						
National schools	30	23	43	32	21	149
Chinese national-type	37	14	16	16	7	90
Tamil national-type	5	2	4	6	11	28
Special education	2	0	0	1	0	3
Government-assisted religious	0	0	0	1	0	1
Private	2	1	1	0	0	4
Secondary						
National and national-type	31	11	22	24	14	102
Technical	1	0	0	0	0	1
Religious national	2	0	1	0	1	4
Special education	1	0	0	0	0	1
Religious boarding	0	0	1	1	0	2
Government-assisted religious	1	1	4	5	0	11
Vocational colleges	1	1	1	1	1	5
Private	6	0	1	2	0	9
Other						
Special model schools	0	0	1	0	0	1
International schools	5	3	0	0	1	9
Expatriate schools	1	0	0	1	0	2
Total	**125**	**56**	**95**	**90**	**56**	**422**

Source: Penang State Education Department and Malaysian Educational Statistics 2017, Ministry of Education.

Seberang Perai Utara comes in second with 22.5% of schools situated in the district, even though Seberang Perai Tengah is the more populated mainland district. Seberang Perai Utara has more primary schools – especially national primary schools – compared to Seberang Perai Tengah, but the situation is reversed for secondary schools. Government-assisted religious schools are also concentrated in these two districts, accounting for 81.8% of schools.

The districts with the fewest schools are Barat Daya and Seberang Perai Selatan. However, the biggest percentage of Tamil-type national primary schools are found in Seberang Perai Selatan. Barat Daya also accounts for 33.3% (three schools) of the state's international schools, but the majority are found in Timur Laut, with 55.6% of international schools operating in the district.

A decline can be observed for total number of enrolments for most types of primary and secondary schools in Penang. Government-assisted religious schools – for both primary and secondary – as well as vocational, international, and expatriate schools are the only schools to see constant growth in number of enrolments from 2015 to 2017. Vocational schools saw a significant increase in enrolments from 2015 to 2016; enrolments continued to increase in 2017, albeit at a much lesser rate.

In fact, national and national-type secondary school enrolments saw a decrease of 3.2% from 2016 to 2017. There were significant decreases in enrolments from the total number of primary enrolments to secondary enrolments across national-type public and religious schools. There was a decrease of 11.8% in 2016, while 2017 had an even bigger decrease of 15.1%.

This is concerning because the data suggest that there is a significant drop-out rate for students transitioning to secondary school. Some primary school students may have moved out of Penang or opted for private or international schools for secondary education, but the increase in the number of students in private schools and international schools did not come close to making up for the discrepancies. Further analysis will be needed to study the reasons for the decrease of secondary students in national and national-type schools.

Table 3.28 Number of enrolments for primary and secondary schools by type, Penang, 2015–17

Type of school	2015	2016	2017
Primary			
National schools	78,557	78,778	78,523
Chinese national-type	48,285	47,570	46,187
Tamil national-type	5,528	5,481	5,264
Special education	370	359	358
Government-assisted religious	108	110	114
Private	1,290	916	N/A
Secondary			
National and national-type	104,549	102,703	99,440
Technical	599	561	552
Religious national	2,614	2,631	2,452
Special education	133	133	133
Religious boarding	1,310	1,282	1,232
Government-assisted religious	3,224	3,363	3,467
Vocational college	2,692	3,397	3,498
Private	627	566	N/A
Other			
International schools	3,408	4,158	N/A
Expatriate schools	248	267	N/A
Total	**253,542**	**252,275**	**241,220**

Note: Data for 2017 have yet to be made available for private schools, international schools, and expatriate schools.
Source: Malaysian Education Statistics 2015–2017, Ministry of Education, and Social Statistics Bulletin 2016–2017, Department of Statistics.

Table 3.29 Number of intake, enrolment, and graduates for Penang-born students in public universities by field of study, 2016–17

Field of study	2016			2017		
	Intake	Enrolment	Graduates	Intake	Enrolment	Graduates
General programmes	10	30	27	2	2	0
Education	344	1,415	515	414	1,461	375
Humanities and the arts	587	1,972	445	643	2,075	387
Social sciences, business, and law	2,744	8,453	2,588	2,879	8,620	2,087
Science, mathematics, and computing	1,155	3,791	876	1,387	3,933	876
Engineering, manufacturing, and construction	1,917	6,638	1,544	1,932	6,747	1,424
Agriculture and veterinary	155	483	106	118	427	64
Health and welfare	500	2,077	417	517	2,050	433
Services	306	786	222	302	846	143
Total	**7,718**	**25,645**	**6,740**	**8,194**	**26,161**	**5,789**

Source: Ministry of Higher Education, Malaysia.

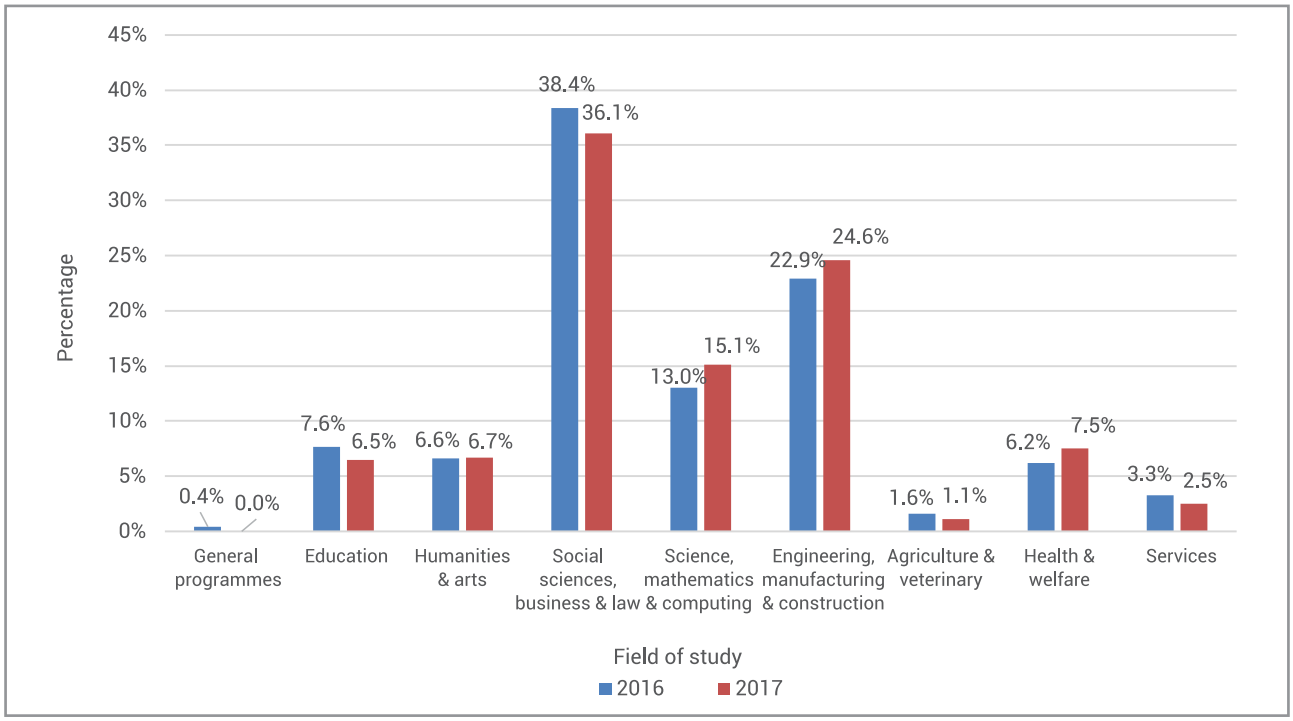
For tertiary education, there are two public universities in Penang: Universiti Sains Malaysia (USM), which is situated in Timur Laut, and Universiti Teknologi Mara (UiTM) in Seberang Perai Tengah. In addition, there are 32 private higher education institutes in the state. Other options for tertiary education include institutes of teacher education (two), community colleges (six), and polytechnic schools (three).

In examining the trend for the field of study chosen by Penang-born students in all public universities for 2016 and 2017, it is observed that social sciences, business, and law garnered the most enrolments and produced the most graduates (Table 3.29). This field accounted for close to 33% of total enrolments and more than 35% of total graduates for both years.

The next preferred field of study was engineering, manufacturing, and construction, which accounted for close to 30% of Penang-born students. Intake and enrolments were also on the rise from 2016 to 2017, as with science, mathematics, and computing – the third most popular choice for field of study. Penang-born students were least interested in agriculture and veterinary, and services, with the former recording declining intake and enrolments (with a percentage decrease in 2017), but the latter seeing an increase for enrolments in 2017.

Graduates from the field of social sciences, business, and law made up the biggest proportion of overall Penang-born graduates for both 2016 and 2017; however, there was a decrease in the number of graduates in 2017 (Figure 3.30). Expectedly, graduates from engineering, manufacturing, and construction, as well as science, mathematics, and computing, produced the second- and third-most graduates, respectively, with both fields seeing an increase of 2.1% and 1.5% for 2017. Health and welfare graduates also increased in 2017, while other fields experienced a decrease. Humanities and the arts managed to maintain its percentage of graduates (6.7%) for both years.

Figure 3.30 Percentage of Penang-born graduates in public universities by field of study, 2016–17



Source: Ministry of Higher Education, Malaysia.

Female students in tertiary education has consistently outnumbered males. In 2017, 64.4% of all Penang-born enrolments in public universities were female versus 35.6% of male students. The percentage of female Penang-born students is marginally higher than the national average of 61.9% for 2017.

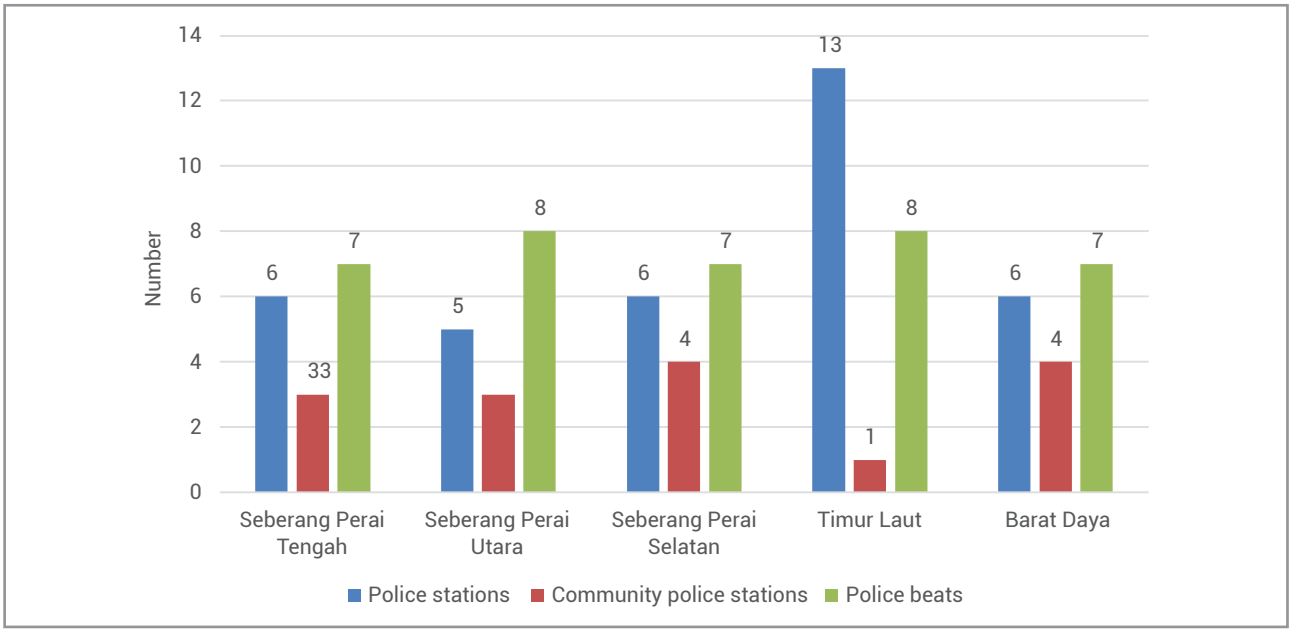
In considering gender parity in different fields of study among Penang-born students, the trends for enrolments and graduates are almost identical: the percentage of female students was vastly higher than their male counterpart across all fields, with the exception of engineering, manufacturing, and construction. Even so, the discrepancy was considerably smaller compared to other fields: male enrolments and graduates stood at 55.6% and 54.0%, respectively, with their female counterparts standing at approximately 10% behind. The biggest gender disparity was found in education, where female enrolments were 74.6%, and with female graduates reaching 76.8%.

As Penang moves towards Industry 4.0, there is a pressing need to revolutionise the work force and produce high-skilled workers in the field of science, computing, and technology. Education is the vital component in ensuring the creation of these workers. The global work force has been transformed by technological advancements, and the education sector, specifically the tertiary sector, has to take up the challenge of preparing students for the changing landscape. The education system needs a more flexible and adaptable system to enable effective educating for Industry 4.0 and beyond. The digitisation of manufacturing signifies that there needs to be a shift of emphasis towards the field of ICT and future technologies, especially for tertiary studies. There is a need to ensure that the Penang work force can adapt to and apply the relevant technologies in order to create a highly productive labour force.

3.2.7 Public safety and security

Public safety perception is often one of the key indices in measuring quality of life. Countries and places with low crime rates and strong public safety systems are generally regarded as more desirable to live in. In most economies, the ability of a city to attract talent and investment can be directly correlated to the city's level of public safety (Blair, 1998). Good public safety helps foster social trust and interaction which, in turn, encourages the growth of business and investments, contributing to economic development and vitality.

Figure 3.31 Number of police stations, community police stations, and police beats in Penang by district, 2016



Source: Royal Malaysian Police, Penang.

Public safety is measured in terms of number of crimes committed or detected, incidents that affect the safety of the people, and the appropriate emergency response. Policemen, firefighters, and emergency management personnel are responsible for protecting the society and its people from harm, in addition to maintaining public order and safety.

Law enforcement, crime, and drug addiction

Timur Laut, which is Penang's most densely populated district, has the most police stations. The other districts share a similar number of police stations. However, there is only one community police station in Timur Laut compared to other districts, which have at least three community police stations each. The number of police beats is constant across all five districts.

For 2016, Penang was ranked sixth in terms of crimes committed (6,116 cases), accounting for 5.5% of all crime in Malaysia. Selangor recorded the highest number of crimes (32,222 cases), followed by Kuala Lumpur (16,989 cases) and Johor (7,440 cases).

Table 3.30 Number of violent crimes by category, Penang, 2012–16

Crime category	2012	2013	2014	2015	2016
Murder	47	37	54	33	28
Rape	124	117	93	77	66
Molest	100	88	97	84	N/A
Gang robbery with arms	3	6	4	4	2
Gang robbery without arms	609	730	545	575	407
Robbery with arms	0	0	1	2	1
Robbery without arms	169	169	190	199	224
Blackmail	78	124	124	85	N/A
Crime threat	462	511	490	492	N/A
Riot	236	214	182	177	N/A
Injury*	350	338	327	323	313
Total	**2,178**	**2,334**	**2,107**	**2,051**	**1,041**

*Note: *As according to Section 324-326 of the Penal Code.*
Source: Royal Malaysian Police, Penang.

Overall, there has been a reduction in total cases for violent crimes from 2012 to 2015, although there was a spike from 2012 to 2013. Due to the lack of data for some crimes, 2016 has not been taken into consideration for the overall picture. Gang robberies without arms was the crime most committed in Penang across all years.

In individual categories, murder, rape, molestation, gang robbery (with and without arms), riot, and injury cases have decreased over the five-year period, despite fluctuations in certain years. In contrast, there has been an increase in crime rates for robbery (with and without arms), blackmail, and crime threat. It should be noted that armed robbery cases were very few.

Property crimes saw a decline from 2012 to 2016, with the exception of general theft which saw an increase from 2015 to 2016. Motorcycle theft was the most common property crime, accounting for 47.4% of property crimes in 2016, while heavy vehicle theft had the fewest cases, accounting for 2.2% of property crimes in 2016.

The overall reduction of all property crimes and for some categories of violent crimes suggest that public safety in Penang improved somewhat; however, with increases noted in robbery, blackmail, and crime threat cases, there needs to be more vigilance from law enforcement personnel.

Table 3.31 Number of property crimes by category, Penang, 2012–16

Crime category	2012	2013	2014	2015	2016
Theft	1,259	1,089	1,126	969	1,012
Car theft	671	716	642	494	446
Motorcycle theft	3,582	3,364	2,966	2,488	2,412
Van/lorry/heavy machinery/bus theft	164	212	166	154	110
Snatch theft	280	165	245	231	191
House break in and theft	1,127	994	1,126	1,151	919
Total	**7,083**	**6,540**	**6.271**	**5,487**	**5,090**

Source: Royal Malaysian Police, Penang.

Table 3.32 Number of drug addicts aged 15–40 years old by state, Malaysia, 2014–17

State	2014	2015	2016	2017
Johor	1,605	2,074	2,086	1,703
Kedah	2,149	2,484	3,286	2,271
Kelantan	1,236	1,740	2,781	3,092
Malacca	611	656	687	479
Negeri Sembilan	702	811	864	801
Pahang	1,560	1,729	1,963	1,637
Perak	1,964	2,235	2,016	1,157
Perlis	435	675	620	571
Penang	**1,931**	**2,978**	**3,566**	**2,353**
Sabah	832	797	892	921
Sarawak	760	601	477	398
Selangor	1,508	2,329	2,423	1,858
Terengganu	480	842	1,402	1,690
W.P. Kuala Lumpur	1,078	891	1,087	1,108
W.P. Labuan	16	31	70	78
W.P. Putrajaya	15	29	44	33
Total	**16,882**	**20,902**	**24,264**	**20,150**

Source: Ministry of Home Affairs, 2017.

Penang leads the country for most number of drug addicts from 2015–16. In 2017, Penang was ranked second overall in number of total drug addicts, despite a decrease of 1,213 drug addicts from 2016–17. Selangor and Johor, states with a similar socioeconomic profile to Penang, had much lower numbers of drug addicts. Drug rehabilitation centres play a central role in the process of aiding addicts on the road of their recovery, and more resources should be allocated to these centres, in the bid to rehabilitate and reduce drug addicts.

Road accidents and safety

Timur Laut consistently recorded the most number of accidents from 2012 to 2016, followed by Seberang Perai Tengah, with the number of accidents rising year to year, excluding 2013–14. Although Barat Daya has fewer road accidents, saw a constant increase in road accidents across the five-year period. Seberang Perai Selatan had the fewest road accidents, but also recorded an increase over the same period.

The data also shows that cars were involved in the majority of accidents, accounting for 68.1% of total road accidents in Penang for 2016. Motorcycles ranked second, accounting for 21.2% of total accidents for 2016.

Evidently, with the increasing number of road accidents, road safety is still a major issue in Penang. In addition to road safety campaigns, measures such as the increase in traffic cameras and CCTVs need to be taken into consideration.

The Penang State Exco for Local Government, Housing, and Urban and Rural Planning announced that Penang will have 1,041 CCTV units installed by May 2019, with 911 units on the island and 130 units on the mainland (Mok, 2018). There are currently 680 units installed in Penang.

Table 3.33 Number of road accidents by administrative district, Penang 2012–16

Administrative district	2012	2013	2014	2015	2016
Seberang Perai Tengah	11,059	11,314	11,075	11,500	12,218
Seberang Perai Utara	5,102	5,322	5,142	5,252	4,111
Seberang Perai Selatan	3,713	3,771	3,695	3,813	4,647
Timur Laut	14,229	14,863	14,513	14,685	15,759
Barat Daya	3,748	4,091	4,322	4,669	5,509
Total	**37,851**	**39,361**	**38,747**	**39,919**	**42,244**

Source: Bukit Aman Traffic Department; Royal Malaysian Police, Penang.

Table 3.34 Number of deaths and injuries reported in road accidents, Penang, 2012–16

Type of accidents	2012	2013	2014	2015	2016
Death	400	381	378	390	411
Serious injuries	157	147	178	178	230
Minor injuries	244	94	194	178	294
Total deaths/injuries	**801**	**622**	**750**	**746**	**935**

Source: Bukit Aman Traffic Department; Royal Malaysian Police, Penang.

Fire and safety

There are 17 fire stations in Penang. In 2016, the highest number of firefighters was found in Timur Laut, while Seberang Perai Selatan had the fewest. This is in line with the population share and density of the districts.

The number of fire cases has been fluctuating over the 2012–16 period. Fire cases decreased from 2014 to 2015, but increased significantly in other years. Crank calls increased significantly in 2014, but saw declines in other years. The number of deaths resulting from fires in Penang was low across the years; however, there were more injuries recorded, with obvious increases in 2014 and 2016.

The number of fires related to vehicles and gas were consistent throughout the five-year period, with small fluctuations observed. Fires involving buildings, however, increased steadily while fire cases related to machinery and tools decreased. Forest fires and bush fires spiked dramatically in 2014 and 2016, which could be attributed to the drought in 2014, which saw fires in Penang Hill and Bukit FRU (The Star, 2014) needing days to be extinguished. Similarly, in 2016 the northern states in Malaysia, including Penang, went through a dry spell (The Star, 2016), which potentially contributed to the significant rise in forest and bush fires.

Table 3.35 Number of firefighters by administrative district, Penang, 2012–16

Administrative district	2012	2013	2014	2015	2016
Seberang Perai Tengah	198	198	199	190	188
Seberang Perai Utara	155	155	155	143	147
Seberang Perai Selatan	50	50	50	44	48
Timur Laut	231	231	231	214	210
Barat Daya	120	120	121	108	102
Total	**754**	**754**	**756**	**699**	**695**

Source: Fire and Rescue Department, Penang.

Table 3.36 Fire statistics for Penang, 2012–16

Type	2012	2013	2014	2015	2016
Fire cases	1,754	2,046	3,593	2,718	3,480
Crank calls	13	49	207	141	132
Deaths	3	1	7	3	4
Injuries	17	7	36	18	34

Source: Fire and Rescue Department, Penang.

Table 3.37 Number of fire cases by type, Penang, 2012–16

Type	2012	2013	2014	2015	2016
Buildings	291	377	330	406	426
Vehicles	229	213	205	219	236
Machinery tools	168	160	173	115	97
Petrol chemicals	1	0	1	0	2
Gas	93	95	91	79	84
Forests, bushes, etc.	325	390	1,717	871	1,372
Stalls	10	9	6	9	8
Others	597	786	1,070	1,019	773
Total	**1,714**	**2,030**	**3,593**	**2,718**	**2,998**

Source: Fire and Rescue Department, Penang.

3.2.8 Healthcare

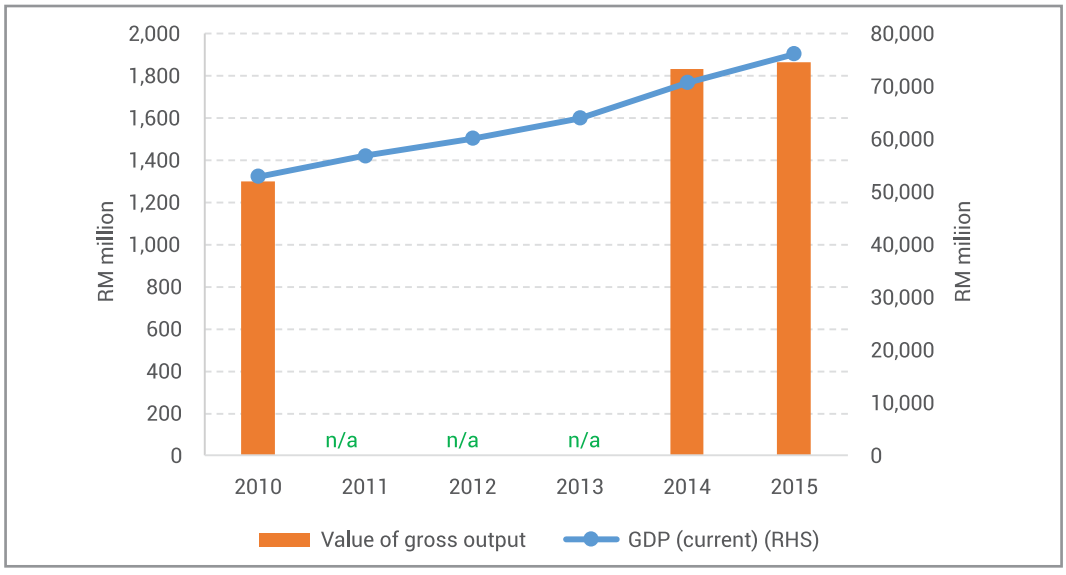
Penang is well-known for its medical excellence, not only in the northern region of Peninsular Malaysia but also among neighbouring countries, especially Indonesia. Penang is still the leading state for medical tourism in Malaysia, accounting for 60.9% of all health travellers in 2016. The private healthcare sector made considerable contributions to Penang's economy.

Economic contribution

The gross output value of private health services in Penang is RM1.86 billion, equivalent to 2.4% of the state's GDP in 2015 (Figure 3.32 and Table 3.38). The sector's growth from 2010 to 2015 was 43.5%, nearly matching the state's GDP growth of 43.8% in the same period, as shown in Figure 3.32. However, the growth of gross output value for Penang was still slower than the national average and selected states, as shown in Table 3.38. The same is observed with private hospital growth for Penang, which was only an increase of 23.3% in gross output value from 2010 to 2015. Hospital revenue comprised 69.2% of the total health services revenue in Penang in 2015, declining from 80.5% in 2010 (Table 3.39). A decline in the proportion of hospital-based revenue was also observed for many other selected states (-1.8% to -8.57%) and the national average (-4.1%), but none were as severe as Penang (-11.31%).

"% Value added/ Value of gross output" would be a good indicator of profitability or finance efficiency. In 2010, Penang (45.5%) used to surpass the national average (41.0%) and was only behind hospitals in Kuala Lumpur (47.4%), but in 2015, Penang's profitability (40.3%) declined by 5.2%, dropping the state behind the national average (42.4%), while hospitals in Malacca improved markedly from 31.3% in 2010 to 43.6% in 2016 (Table 3.39). However, private hospitals in Penang still contributed significantly to the total value of gross output for Penang at 69.2% in 2015, equivalent to RM1.29 billion.

Figure 3.32 Value of gross output of health services for Penang, 2010–15



Source: Economic Census 2011–16, Department of Statistics Malaysia.

Table 3.38 Principal statistics of health services by selected states, 2010 and 2015

	No. of establishments			No. of persons engaged (during December of last pay period)			Value of gross output, RM million			% Value added/ value of gross output			% Value of gross output/ state GDP		
	2010	2015	% Change	2010	2015	% Change	2010	2015	% Change	2010	2015	% Change	2010	2015	% Change
Penang	517	909	75.8%	9,219	11,143	20.9%	1,299	1,864	43.5%	47.8%	45.6%	-2.2%	2.5%	2.4%	-0.01%
Selangor	1617	2,779	71.9%	20,630	25,912	25.6%	2,555	4,428	73.3%	44.9%	48.5%	3.6%	1.4%	1.7%	0.24%
F.T. Kuala Lumpur	937	2,022	115.8%	13,318	20,169	51.4%	2,378	3,740	57.3%	48.6%	47.7%	-0.9%	2.1%	2.1%	0.01%
Malacca	275	418	52.0%	3,936	4,558	15.8%	508	761	49.8%	41.5%	51.0%	9.5%	2.1%	2.1%	0.05%
Johor	842	1,254	48.9%	7,729	9,967	29.0%	963	1,548	60.7%	41.8%	45.5%	3.7%	1.3%	1.5%	0.15%
Perak	642	911	41.9%	6,081	7,298	20.0%	636	1,013	59.3%	48.0%	46.5%	-1.5%	1.5%	1.6%	0.15%
Kedah	372	496	33.3%	3,342	4,479	34.0%	333	5171	55.1%	40.3%	45.5%	5.1%	1.2%	1.4%	0.13%
MALAYSIA	6,739	11,018	63.5%	77,742	101,056	30.0%	10,052	6,218	61.3%	45.8%	47.2%	1.4%	1.2%	1.4%	0.18%

Source: Economic Census 2011-16, Department of Statistics Malaysia.

Table 3.39 Principal statistics of hospital services by selected states, 2010 and 2015

	No. of establishments			No. of persons engaged (during December of last pay period)			Value of gross output, RM million			% Value added/ value of gross output			% Value of gross output (hospital services/total health services)			% Value of gross output/ state GDP		
	2010	2015	% Change	2010	2015	% Change	2010	2015	% Change	2010	2015	% Change	2010	2015	% Change	2010	2015	% Change
Penang	6,539	7,316	11.9%	6,539	7,316	11.9%	1,046	1,290	23.3%	45.5%	40.3%	-5.2%	80.5%	69.2%	-11.31%	70.9%	65.7%	-5.27%
Selangor	10,477	11,338	8.2%	10,477	11,338	8.2%	1,547	2,438	57.6%	39.0%	44.9%	5.9%	60.5%	55.1%	-5.49%	50.8%	43.8%	-7.03%
F.T. Kuala Lumpur	7,057	9,663	36.9%	7,057	9,663	36.9%	1,461	2,231	52.7%	47.4%	44.9%	-2.5%	61.4%	59.7%	-1.80%	53.0%	47.9%	-5.08%
Malacca	2,378	2,426	2.0%	2,378	2,426	2.0%	329	428	30.0%	31.3%	43.6%	12.3%	64.8%	56.2%	-8.57%	60.4%	53.2%	-7.19%
Johor	2,704	3,901	44.3%	2,704	3,901	44.3%2	514	749	45.8%	34.0%	39.6%	5.6%	53.4%	48.4%	-4.95%	35.0%	39.1%	4.15%
Perak	2,702	3,244	20.1%	2,702	3,244	0.1%	326	528	62.0%	38.6%	37.5%	-1.1%	51.3%	52.2%	0.85%	44.4%	44.5%	0.02%
Kedah	1,390	1,921	38.2%	1,390	1,921	38.2%	186	253	36.3%	34.1%	37.4%	3.3%	55.7%	49.0%	-6.75%	41.6%	42.9%	1.30%
MALAYSIA	37,273	46,362	24.4%	37,273	46,362	24.4%	5,995	9,007	50.2%	41.0%	42.4%	1.5%	59.6%	55.5%	-4.10%	47.9%	45.9%	-2.07%

Source: Economic Census 2011–16, Department of Statistics Malaysia.

Healthcare facilities

The number of private hospitals dropped from 26 in 2008 to 19 in 2016, while the number of public hospitals stayed the same (Table 3.40), with a total of six in both Penang Island and Seberang Perai. Both public and private hospital distribution can be seen in Figure 3.33. There is at least one public hospital in each district (Seberang Perai Tengah district has two), but the private hospitals are mostly concentrated in Timur Laut; only a handful are in Barat Daya, Seberang Perai Tengah, and Seberang Perai Utara. The bed strength of both private and public hospitals were nearly similar in 2016 (Table 3.40). Public primary care facilities had been stagnant throughout this aforementioned period, while private clinics had a moderate increase, and greatly outnumbered public facilities.

Table 3.40 Number of healthcare facilities in Penang, 2008–16

Type of facilities	2008	2009	2010	2011	2012	2013	2014	2015	2016
Public hospitals	6	7	7	7	6	6	6	6	6
Private hospitals	26	27	26	23	23	23	20	17	19
Total hospitals	**32**	**34**	**33**	**30**	**29**	**29**	**26**	**23**	**25**
Public beds	1,930	2,677	2,677	2,677	1,947	1,947	1,947	2,046	2,130
Private beds	1,937	2,084	2,053	2,022	2,042	2,276	2,179	1,644	2,176
Total beds	**3,867**	**4,761**	**4,730**	**4,699**	**3,989**	**4,223**	**4,126**	**3,690**	**4,306**
Health clinics (public)	26	26	27	29	29	30	30	30	30
Community clinics (public)	62	62	62	60	60	60	60	60	60
Maternal and child health clinics (public)	6	6	6	6	6	6	6	6	6
Medical clinics (private)	-	-	-	477	473	480	491	508	525
Dental clinics (private)	-	-	-	114	121	125	127	139	144

Source: Health Indicators 2008–17, Department of Statistics Malaysia.

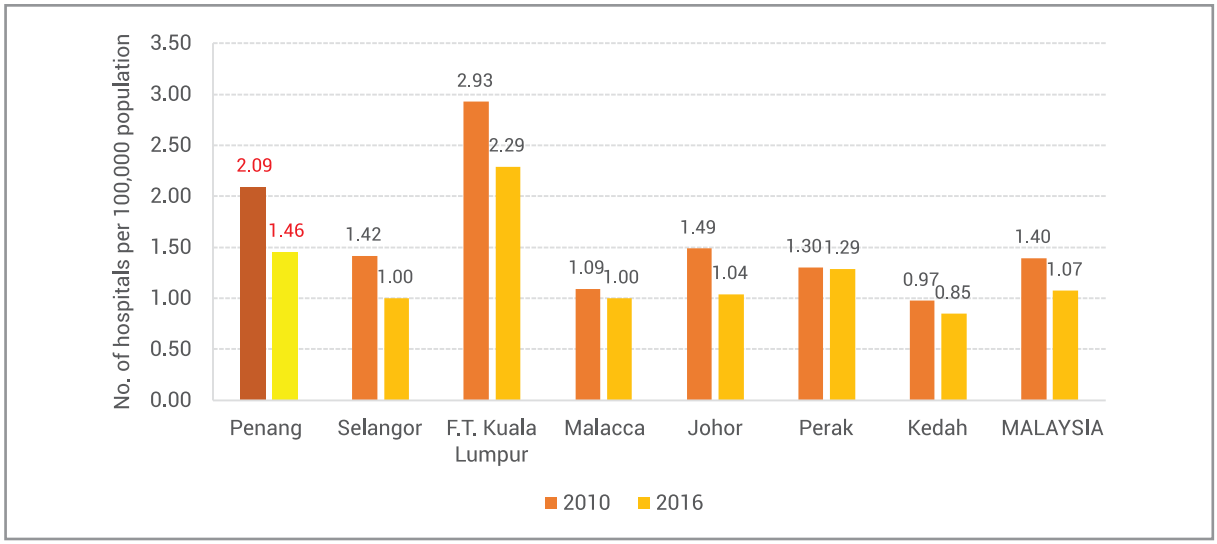
Figure 3.33 Hospital distribution in Penang, 2017

Source: Penang Institute.

Penang has relatively more hospitals per population compared to other states. In 2016, there were 1.46 hospitals per 100,000 population in Penang, while the national average was only 1.07 (Figure 3.34). Only Kuala Lumpur had more, at 2.29. However, the number of hospitals per 100,000 population dropped in all states from 2010 to 2016, mainly due to a reduction of private hospitals.

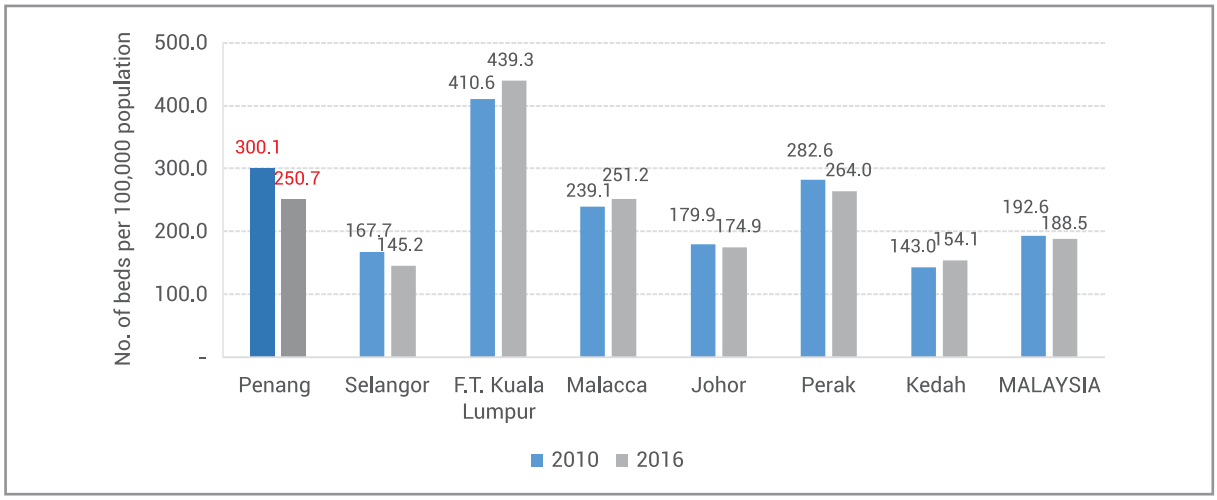
The number of beds are generally close correlated to the number of hospitals. In 2016, Penang had 250.7 beds per 100,000 population, lower than the frontrunner Kuala Lumpur (439.3), as well as Perak (264.0) and Malacca (251.2) (Figure 3.35). Penang used to have relatively more beds in 2010. While Penang recorded a decline in the number of beds per 100,000 population in 2010–16, Kuala Lumpur, Malacca, and Perak had increases instead. This trend should worry locals who want to use Penang's private healthcare services, given that increasingly more beds may be in greater demand by medical travellers in the coming years.

Figure 3.34 Number of hospitals per 100,000 population, 2010 and 2016



Source: Health Indicators, Ministry of Health Malaysia, Department of Statistics Malaysia and authors' calculations.

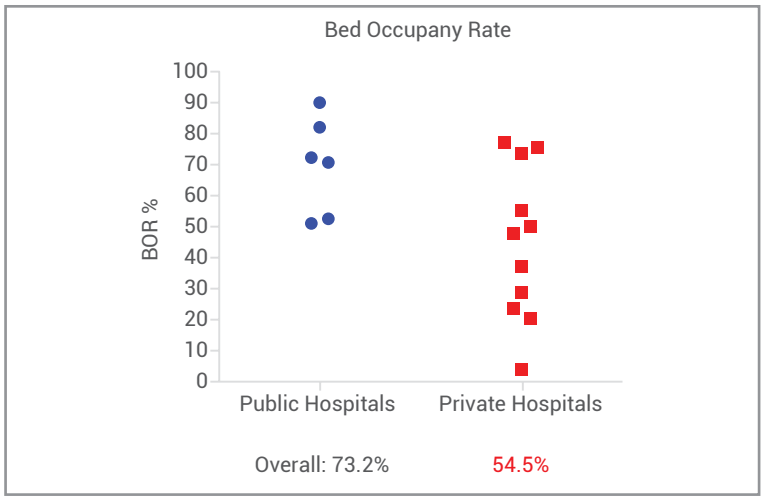
Figure 3.35 Number of beds per 100,000 population, 2010 and 2016



Source: Health Indicators, Ministry of Health Malaysia, Department of Statistics Malaysia and authors' calculations.

There are currently only six public hospitals in Penang, and inpatient departments are rather crowded. In 2016, the bed occupancy rate (BOR) for Hospital Pulau Pinang was at 72.4%, Hospital Seberang Jaya at 82.42%, Hospital Bukit Mertajam at 70.91%, and Hospital Kepala Batas at 90.23%[23] (Figure 3.36). The BOR for the two non-specialist hospitals Balik Pulau and Sungai Bakap were 52.66% and 51.29%, respectively. However, private hospitals in Penang had a large range of BOR, averaging at 54.5%. This indicates that private hospitals still have the capacity to take in more patients, especially health travellers. Otherwise, the beds would be considered under-utilised.

Figure 3.36 Bed occupancy rates in Penang by sector, 2016



Source: Health Facts 2016, Department of Health Penang.

[23] According to the Ministry of Health's Annual Report 2014, Hospital Seberang Jaya was categorised as major specialist hospital while Hospital Bukit Mertajam and Hospital Kepala Batas were minor specialist hospitals.

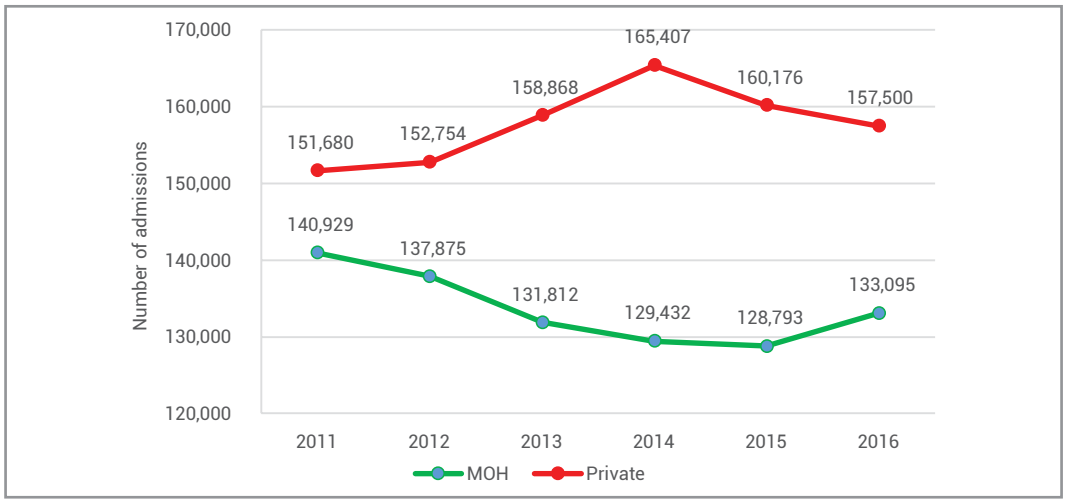
Healthcare demand and utilisation

Since 2010 (when such data have been available) private hospitals in Penang have had more inpatients than public hospitals (Figure 3.37). The gap was widest in 2014, where private hospitals had about 36,000 more inpatients than all six public hospitals combined. However, the trend has started going the opposite direction since 2014, with a noticeable decrease in the number of inpatients for private hospitals but a gradual increase for public hospitals – perhaps a result of the difficult economic situation during this period.

Nonetheless, Penang is the only state with more private hospital admissions than public hospitals (Figure 3.38). Kuala Lumpur and Penang both had the largest private hospital admission rates in 2016 at 92 per 1,000 population, compared to the average of 34 per 1,000 population in the country. As for public hospital admissions, Penang only had a rate of 77 per 1,000 population, lower than the national average of 86 per 1,000 population.

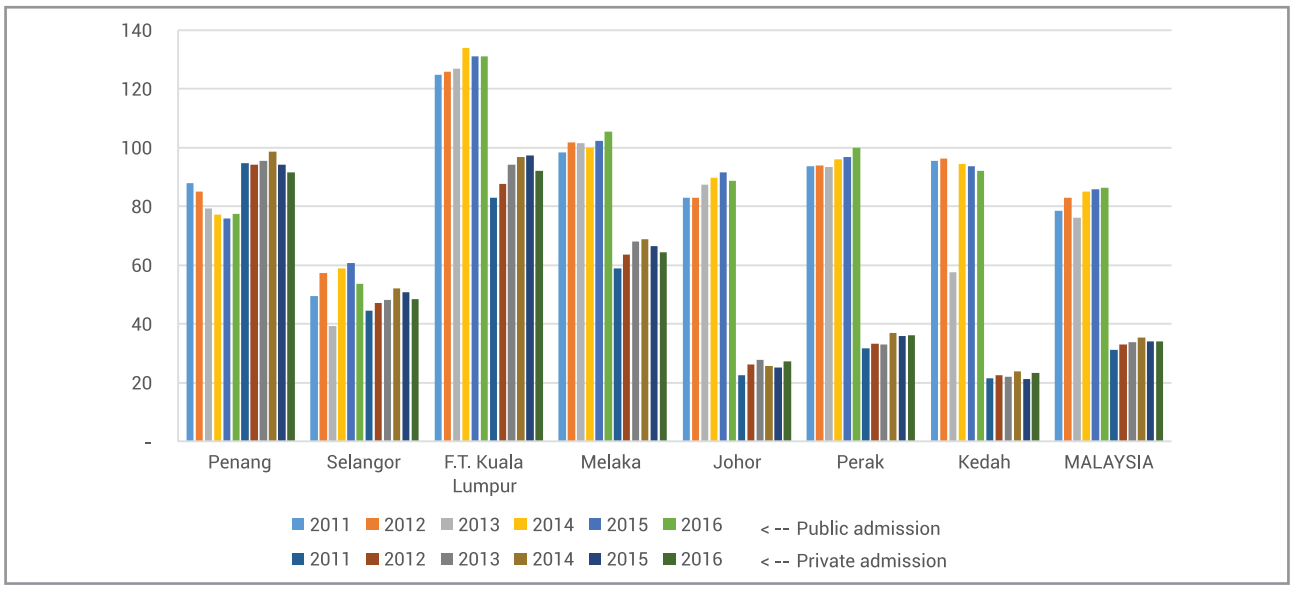
As for outpatient attendance, the only reliable data available are for government hospitals. Attendance for public hospitals increased 12.3% from 1,453,359 in 2011 to 1,631,735 in 2016 (Figure 3.39). The increase is also reflected in the population-adjusted figures, which peaked in 2015, with about 962 people going to government hospitals out of 1,000 people. Day care is a form of hospital admission that encapsulates day procedures. The annual figures for day care attendance hovered around 50,000 to 58,000 (or 30 to 35 per 1,000 population) from 2012 to 2016 (Figure 3.40).

Figure 3.37 Hospital admissions in Penang by sector, 2011–16



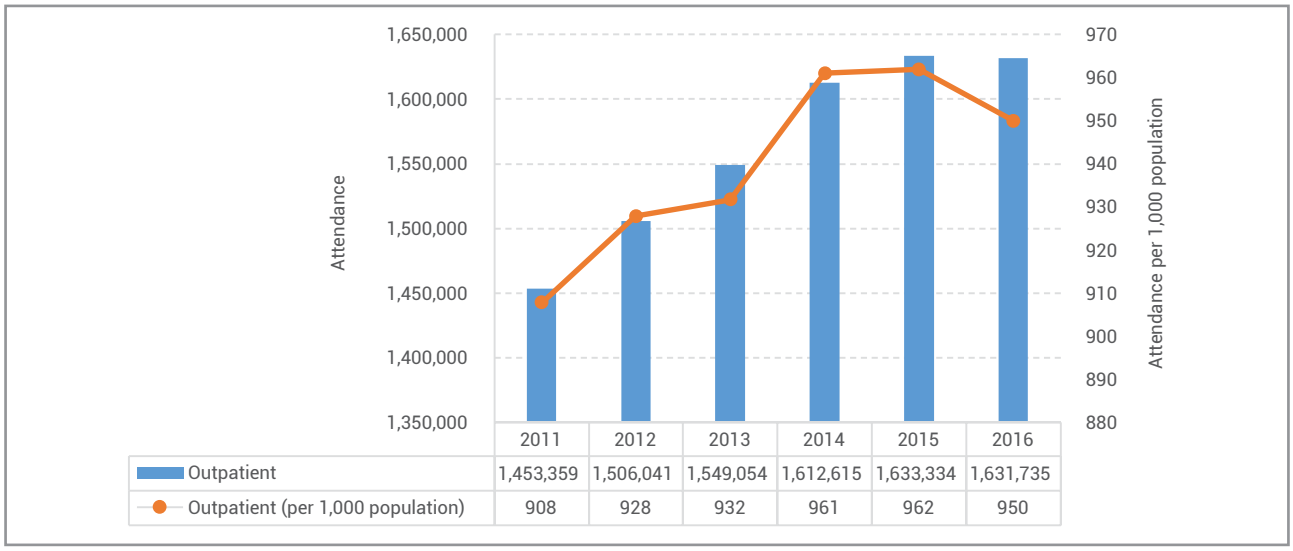
Source: Health Indicators, Ministry of Health Malaysia.

Figure 3.38 Hospital admissions per 1,000 population by sector and selected states, 2011–16



Source: Health Indicators, Ministry of Health Malaysia, Department of Statistics Malaysia and author's calculation.

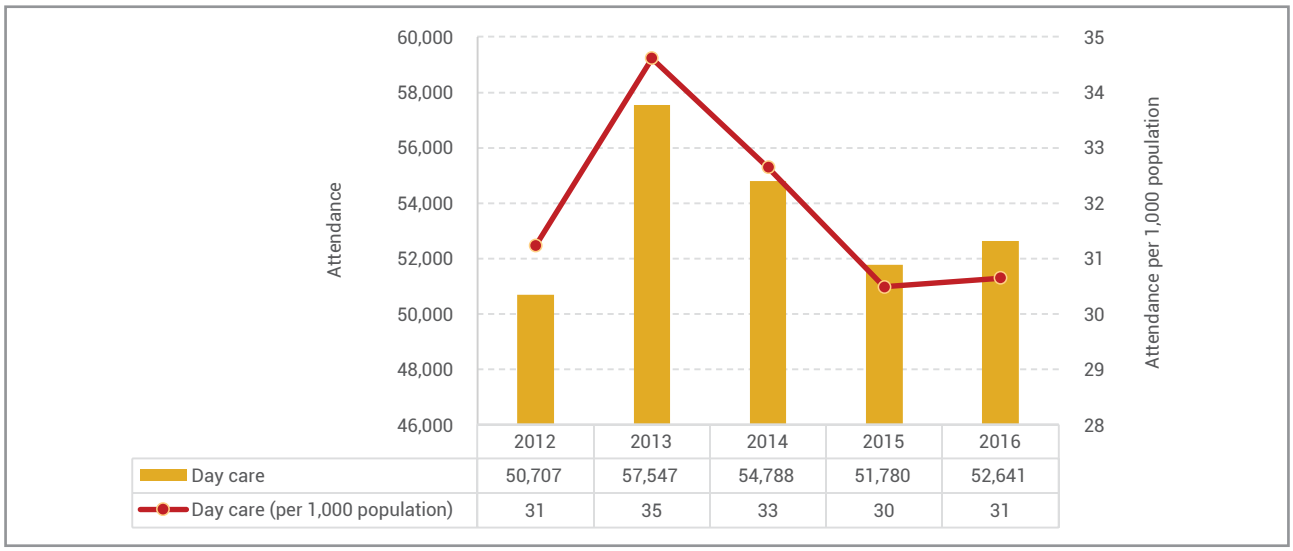
Figure 3.39 Outpatient attendance of government hospitals in Penang, 2011–16



	2011	2012	2013	2014	2015	2016
Outpatient	1,453,359	1,506,041	1,549,054	1,612,615	1,633,334	1,631,735
Outpatient (per 1,000 population)	908	928	932	961	962	950

Source: Health Indicators, Ministry of Health Malaysia, Department of Statistics Malaysia and author's calculation.

Figure 3.40 Day care attendance of government hospitals in Penang, 2012–16



	2012	2013	2014	2015	2016
Day care	50,707	57,547	54,788	51,780	52,641
Day care (per 1,000 population)	31	35	33	30	31

Source: Health Indicators, Ministry of Health Malaysia, Department of Statistics Malaysia and authors' calculation.

Public admissions to government hospitals in Penang declined slowly beginning in 2012 (137,875), bottoming out in 2015 (128,793) before rising in 2016 (133,095) (Table 3.41). The general medicine department had the most inpatients (32,434) in 2016, follow by obstetrics and gynaecology (O&G, 29,132). Across the board, there has been a decline in admissions in all respective departments except general medicine, which saw an increase instead.

In terms of major communicable diseases reported in Penang, dengue fever is a major health threat, peaking in 2015 with 5,830 incidents (Table 3.42). There were more hand, foot, and mouth cases than dengue fever in 2016 (3,019 cases), while tuberculosis and food poisoning are constant public health issues in Penang (with each more than 1,000 cases every year).

On non-communicable diseases, diabetes incidences is used as a reference (Table 3.43). It is found that 97.2 person out of 1,000 population (or approximately 1 in 10) had diabetes health issues in 2016. About half of the patient load came from Timur Laut alone. The district had also the highest incidence rate at 129.3 per 1,000 population, compared to the neighbouring Barat Daya, whose incidence rate stood at 63.5 (Table 3.43).

Table 3.41 Admission to government hospitals in Penang by discipline, 2012–16

Department	2012	2013	2014	2015	2016
General medicine	27,406	27,702	28,541	30,278	32,434
General surgery	14,633	14,007	13,256	12,636	12,570
Orthopaedics	12,030	12,377	10,235	9,962	9,325
O&G	31,365	29,196	29,978	28,244	29,132
Paediatrics	27,797	17,373	16,648	14,840	25,503
Others	24,644	31,154	30,774	32,833	24,131
Total	**137,875**	**131,809**	**129,432**	**128,793**	**133,095**

Source: 2016 Annual Report, Penang State Health Department, Malaysia.

Table 3.42 Number of cases for major communicable diseases reported in Penang, 2012–16

Disease	2012	2013	2014	2015	2016
Dengue fever/Dengue hemorrhagic fever	791	1,053	3,141	5,830	2,756
Tuberculosis (all forms)	1,245	1,230	1,252	1,283	1,385
Measles	245	153	53	11	7
HIV infections (all forms)	137	111	110	103	105
Food poisoning	360	556	2,227	497	609
Hepatitis B	40	21	13	33	20
Syphilis (all forms)	87	95	57	63	57
Malaria	37	39	37	17	3
Hand, foot and mouth disease	1,579	1,205	1,449	758	3,019
Typhoid and paratyphoid fever	2	6	6	8	4
Leptospirosis	128	98	192	140	43
Influenza	216	785	380	642	-

Source: 2016 Annual Report, Penang State Health Department, Malaysia.

Table 3.43 Diabetes patient load in Penang by district, 2016

District	Attendance of diabetes patients	Active patients in district until 2016	Newly registered case of Type 2 DM	Incident per 1,000 population
Timur Laut	71,556	15,238	1,989	129.3
Barat Daya	14,285	4,489	703	63.5
Seberang Perai Utara	33,489	9,849	1,313	104.3
Seberang Perai Tengah	31,610	8,027	1,236	77.4
Seberang Perai Selatan	16,230	3,997	656	76.8
Total	**167,170**	**41,600**	**5,897**	**97.2**

Source: 2016 Annual Report, Penang State Health Department, Malaysia.

Healthcare workforce

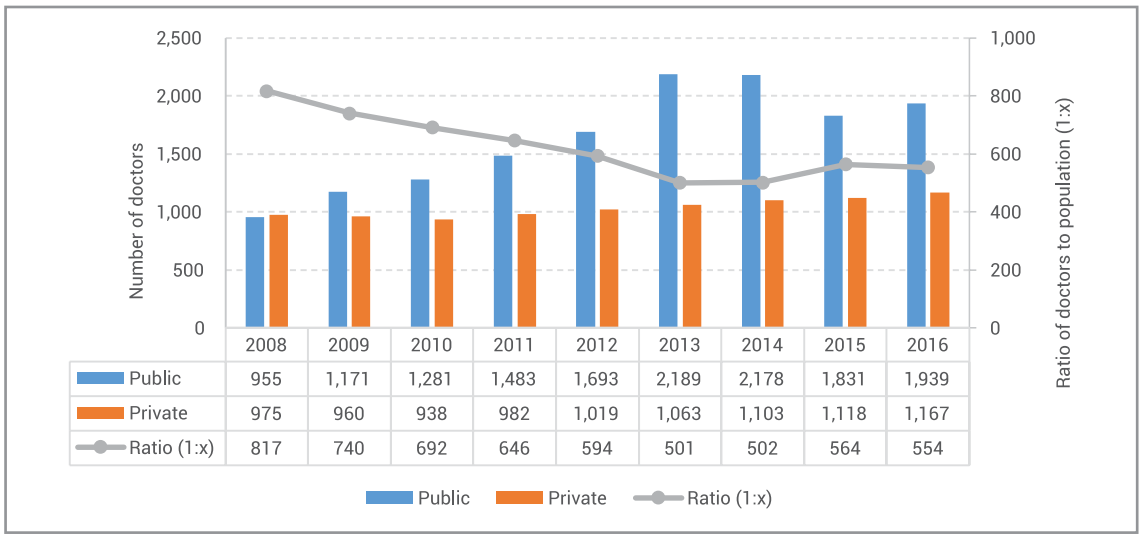
Figures 3.41 (a) to (c) show the healthcare workforce (doctors, nurses, and pharmacists) in Penang from 2008 to 2016. The three respective categories of health practitioner to population ratio has been improving throughout this period. For example, the doctor to population ratio in Penang was at 1:817 in 2008, before improving eight years later to 1:554 (Figure 3.41a) – lower than the national average of 1:632 in 2016. The distribution pattern of doctors in Penang suggests a rise in the number for doctors in both the public and private sectors. In 2013, the ratio of doctors in public and private sectors was almost 2 to 1.

However, there are more nurses in the private sector than the public sector (Figure 3.41b), possibly reflecting the healthcare demand (or patient load) trend such as the one shown in Figure 3.37. Yet, private healthcare providers are often heard lamenting the shortage of qualified nurses because of brain drain to other states or countries[24]. In 2016, there were 3.35 nurses to assist a doctor in the private sector in Penang, compared to only 1.83 nurses to a doctor in the public sector. This suggests a significant difference between both sectors; the public sector must hire more nurses to meet the World Health Organization's recommendation of having at least 2.5 nurses assisting one doctor at all times.

Penang had more pharmacists in the private sector than the public sector in 2008, but this is no longer the case as of 2016 (Figure 3.41c). The ratio of pharmacists to the Penang population was 1:2,013 in 2016, lower than the national average of 1:3,013. Regardless of sector differences, a typical core healthcare workforce team in Penang was 1 lead doctor with 2.4 nurses, and 3.6 doctors for every pharmacist.

Figure 3.41 Healthcare workforce in Penang, 2008–16

a) Number and ratio of doctors to population in Penang

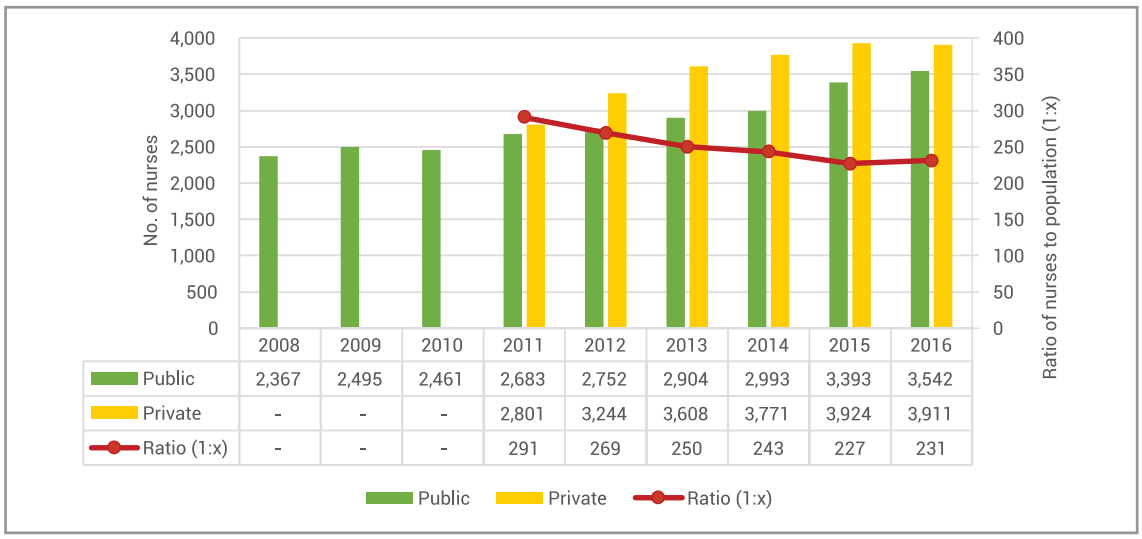


	2008	2009	2010	2011	2012	2013	2014	2015	2016
Public	955	1,171	1,281	1,483	1,693	2,189	2,178	1,831	1,939
Private	975	960	938	982	1,019	1,063	1,103	1,118	1,167
Ratio (1:x)	817	740	692	646	594	501	502	564	554

Source: Health Indicators, Ministry of Health Malaysia.

[24] "Malaysia to face a nursing shortage by 2020", MIMS Today, 6 January 2017, https://today.mims.com/malaysia-to-face-a-nursing-shortage-by-2020

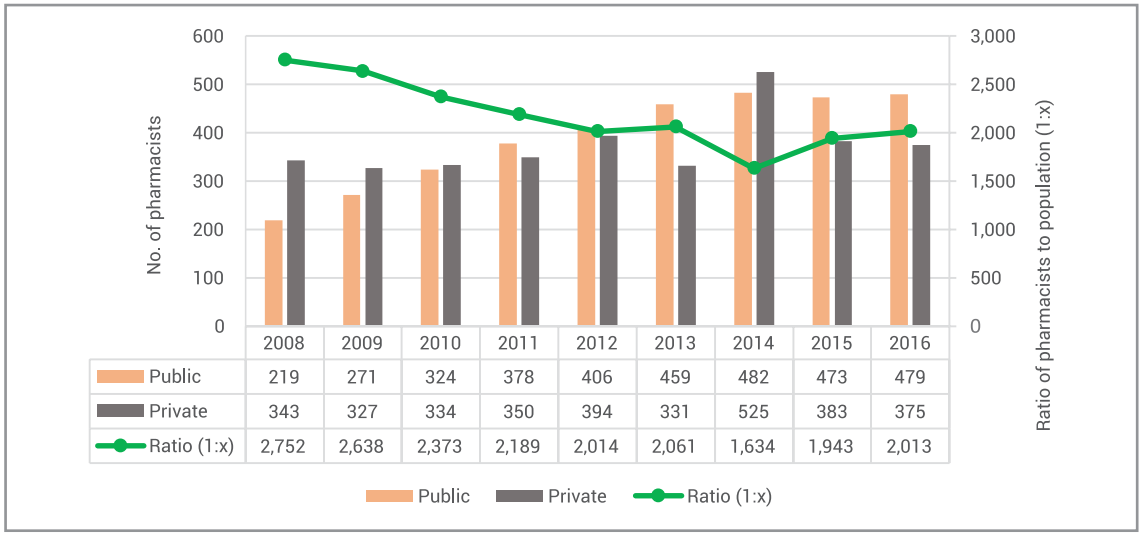
b) Number and ratio of nurses to population in Penang



	2008	2009	2010	2011	2012	2013	2014	2015	2016
Public	2,367	2,495	2,461	2,683	2,752	2,904	2,993	3,393	3,542
Private	-	-	-	2,801	3,244	3,608	3,771	3,924	3,911
Ratio (1:x)	-	-	-	291	269	250	243	227	231

Source: Health Indicators, Ministry of Health Malaysia.

c) Number and ratio of pharmacists to population in Penang



	2008	2009	2010	2011	2012	2013	2014	2015	2016
Public	219	271	324	378	406	459	482	473	479
Private	343	327	334	350	394	331	525	383	375
Ratio (1:x)	2,752	2,638	2,373	2,189	2,014	2,061	1,634	1,943	2,013

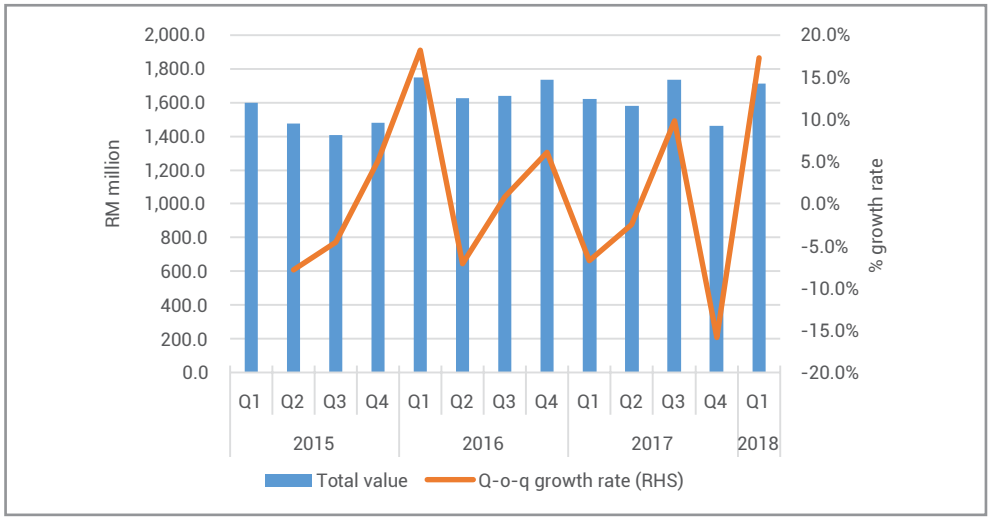
Source: Health Indicators, Ministry of Health Malaysia.

3.3 Construction sector

Residential and non-residential construction propel growth

As the third-smallest sector in Penang, the value-add of the construction sector grew at 10.4% in 2016, contributing about 3% to the state's GDP according to the Department of Statistics. The total value of completed construction work increased by 5.8% y-o-y to RM1.7 billion in the first quarter of 2018, up from RM1.6 billion in the same period in 2017. While the civil engineering sub-sector is the key driver of Malaysia's construction sector, Penang's construction sector is predominantly driven by residential and non-residential buildings, as well as leading civil engineering and special trade activity sub-sectors. More than 42% of the total value of construction work done have been attributed to non-residential construction, with a growth rate of about 33% y-o-y for Q1 2018, followed by 41% or RM703.6 million in residential construction (Q1 2018: 2.6%).

Figure 3.42 Total value of construction work done in Penang, Q1 2015–Q1 2018

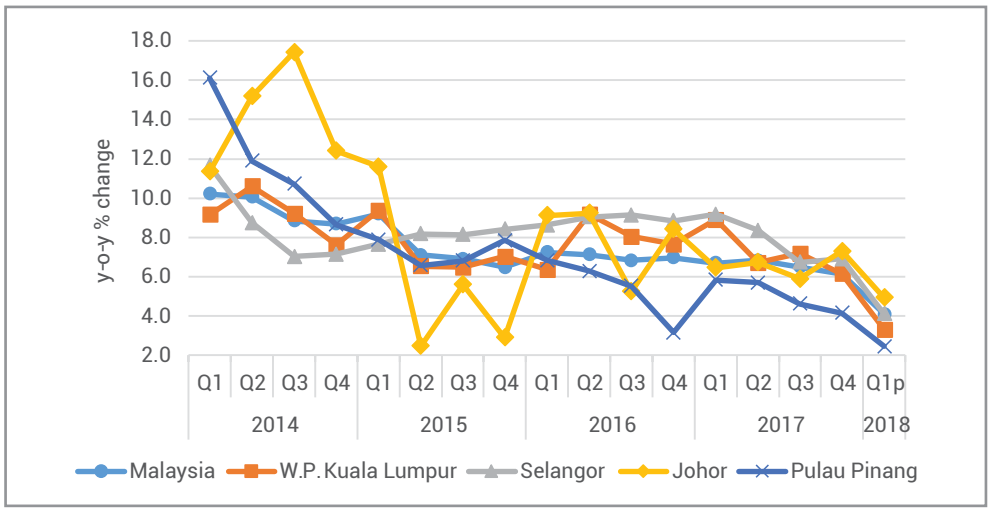


Source: Quarterly Construction Statistics, Department of Statistics, Malaysia.

For the first quarter of 2018, Malaysia's HPI expanded at its slowest pace since 2010 after peaking in 2012. In the first quarter of 2018, the HPI increased 4.1% y-o-y compared to 6.7% in Q1 2017. Some cooling measures undertaken by Bank Negara Malaysia (BNM) from increasing property prices include strict financing requirements and rising lending rates. These measures are aimed at curbing speculative activity and preventing excessive borrowing. For instance, the maximum loan-to-value (LTV) ratio of 70% is imposed by BNM on borrowers with more than two outstanding housing loans.

With the exception of Sabah, Sarawak, Kelantan, and Pahang, all states had declines in the growth rate of house prices. Among the most developed cities in Malaysia, Penang's HPI showed the lowest growth rate of 2.5% in the first quarter of 2018, followed by Kuala Lumpur (3.3%) and Selangor (4.1%) (Figure 3.43). Specifically, Penang's HPI stood at 191.8 at base year 2010 during the first quarter of 2018 (Q1 2017: 187.2). In addition, its average house price increased by 2.4% to RM430,041 in Q1 2018, an increase from RM419,802 in Q1 2017.

Figure 3.43 Percentage change of house price index in selected states in Malaysia, Q1 2014–Q1 2018



Note: P=preliminary
Source: National Property Information Centre (NAPIC, 2018c).

In terms of the type of residential houses, the HPI of all houses except semi-detached units grew at a sluggish pace, with high-rise units recording a negative growth of -1.9% (Figure 3.44). The average price of a terraced house increased marginally at 3% to RM476,760 in Q1 2018, with Seberang Perai experiencing a higher growth rate of 6.1% compared to 0.5% for terraced units on Penang Island. The average price of a terraced unit on Penang Island is three times higher than the average price in Seberang Perai, where a terraced unit on Penang Island is priced at about RM943,000 while a unit in Seberang Perai sells at about RM307,000. Anecdotal evidence shows that houses on Penang Island are relatively more expensive than the houses in Seberang Perai, likely due to the limited land available on the island.

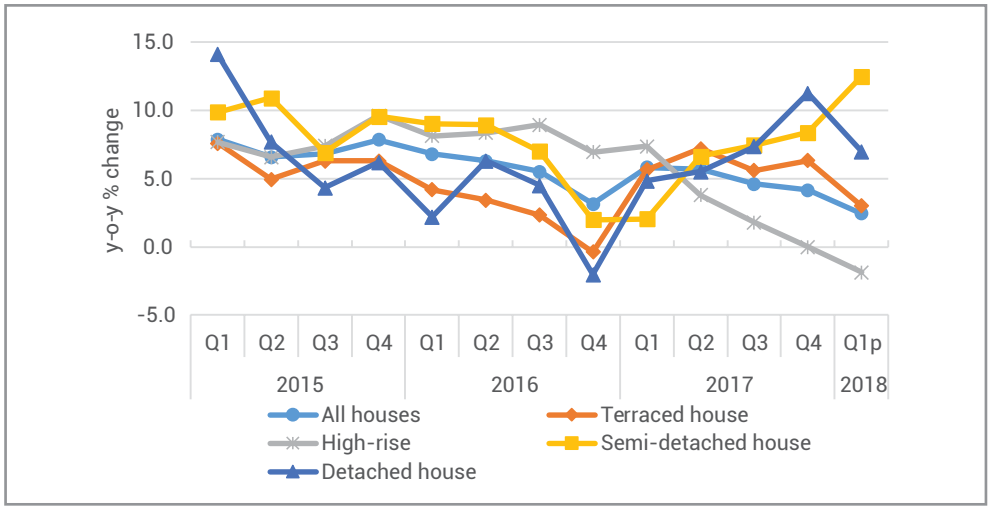
Meanwhile, semi-detached units have been steadily growing since Q4 2016, from 179.9 points to 206.2 points in Q1 2018 – an increase of 12.5% y-o-y. On average, a semi-detached unit in Penang was priced at RM648,726 in Q1 2018. The average price of high-rise units, on the other hand, declined by 1.9%. However, this decline is only seen in other major cities like Kuala Lumpur, Selangor, and Johor from Q2 2018.

Weaker demand and supply of residential units

The available residential houses had generally been moderated in the past year. During the first quarter of 2018, Penang's existing housing stock softened to 3.7% compared to 21.2% in Q1 2017. This comprised an increase of 1,236 newly completed units, where a majority of these housing units were located in Seberang Perai Utara, with two-to-three-storey terraced houses having the most number of completed units. Among residential properties, town houses had the highest rate of growth of 12.2% compared to condominiums and apartments (11.3%), low-cost houses (3.5%), and low-cost flats (3.5%). Out of 502,176 available residential units, Timur Laut accounted for slightly more than one-third of total available units in Q1 2018, with flats, condominiums, and apartments occupying the largest share.

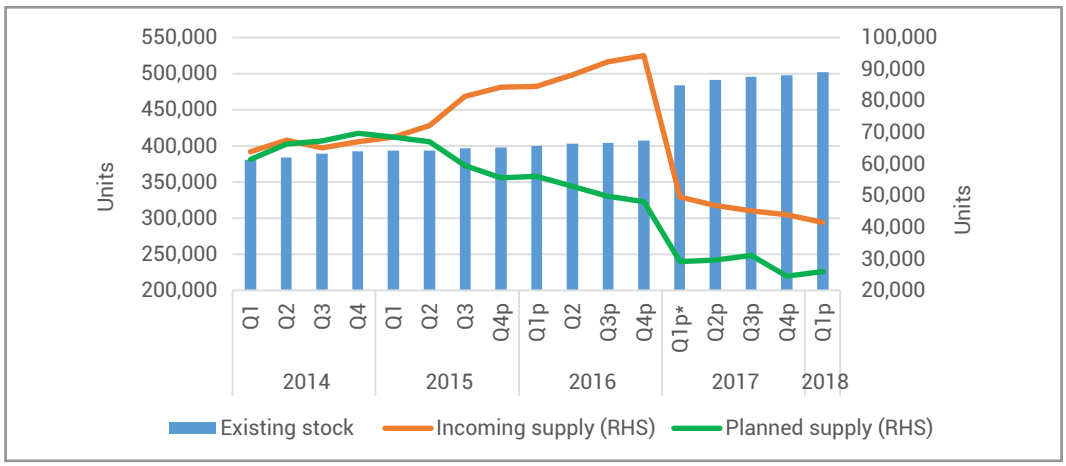
The growth in available residential units is offset by the slowdown in new residential units. As can be seen in Figure 3.45, while the supply of incoming residential units peaked in 2016, it has declined persistently since 2017 due to the shrinking supply of town houses, flats, low-cost flats, and single-storey terraced houses. During the first quarter of 2018, incoming supply, which were under construction, reduced by 16.2% y-o-y basis. With the exception of Seberang Perai Selatan, all districts recorded a decrease in incoming supply, with Barat Daya registering the biggest drop (31.8%), followed by Seberang Perai Utara (29.9%) and Seberang Perai Tengah (19.9%).

Figure 3.44 Percentage change of house price index by type of houses in Penang, Q1 2015–Q1 2018



Note: P=preliminary
Source: National Property Information Centre (NAPIC, 2018c).

Figure 3.45 Supply indicators of residential property in Penang



*Notes: * For existing stock, the data were revised in Q1 2017 to include projects that have been completed and issued with Certificate of Completion and Compliance (CCC) in prior years but have only been captured in the current study period. For incoming supply, the data were revised in Q1 2017 to exclude projects that have since been completed and issued with CCC. Adjustments were also made to reflect the actual number of units built on-site (differing from total units in the initial plan). For planned supply, the data were revised in Q1 2017 to exclude projects with lapsed building plan approvals. Adjustments were also made to reflect projects that have since revised their building plans.*
P=preliminary
Source: National Property Information Centre (NAPIC, 2018g).

Condominiums and apartments are the most popular residential type to be built by property developers as recorded in the first quarter of 2018, and Seberang Perai Selatan emerged as the only district with a significant increase in the supply of condominiums and apartments, including affordable housing units. The increase is in line with the development of Batu Kawan, which will potentially support Penang's engine of growth. For new approvals, the planned supply also revealed a sluggish trend with a deceleration rate of 11% in Q1 2018. The new approvals were primarily seen in Seberang Perai Utara and Seberang Perai Selatan, where a majority of the construction consisted of flats and two-to-three-storey terrace houses, respectively.

The demand for houses languished as the number of unsold residential units continue to rise. Based on the number of residential units launched, the number of unsold units increased by 41.4% to 2,478 units as of Q1 2018 (Q1 2017: 1,753 units), with a total value of unsold units amounting to RM2.1 billion in Q1 2018 – an increase of about 24% from RM1.7 billion in Q1 2017. Seberang Perai Tengah had the largest number of unsold units in Penang (43.8%), followed by Timur Laut (20.6%) and Barat Daya (16.4%). More than half of the unsold units were condominiums and apartments, the majority of which are located in Timur Laut and Barat Daya. Meanwhile, unsold two-to-three-storey semi-detached units were more substantial in Seberang Perai Selatan than other districts.

In contrast, the number of transacted residential units improved marginally at 2.3% in the first quarter of 2018 compared to a 7.2% contraction in Q1 2017. A total of 2,951 residential properties valued at RM1.2 billion were transacted, accounting for nearly 58% of total property transaction value in Penang. The expansion was predominantly attributed to the increase in residential properties valued between RM200,000 and RM250,000, with an increase of over 30% y-o-y during Q1 2018. This is also likely due to the upswing of affordable housing development priced between RM150,000 and RM300,000, where 11,152 affordable housing units were reportedly under construction in 2017 (See Box 3.6). Of these, 84% are being built in Penang Island while the remaining units are located in Seberang Perai, with a greater concentration in Seberang Perai Utara. The growth of residential properties valued above RM1,000,000 transacted, on the other hand, increased by 1% during the period compared to 16.2% in Q1 2017.

Looking at the supply of the residential market, the existing residential stock is expected to grow marginally due to the slowdown in incoming and new supply of residential units. Property developers are more cautious in investing new residential projects in response to the bearish trend of accumulative unsold residential units. Developers will have to strategically review future development plans to match the demand of homebuyers along with better resource and investment allocation.

Box 3.6 Bridging the housing gap: Penang's affordable housing scheme

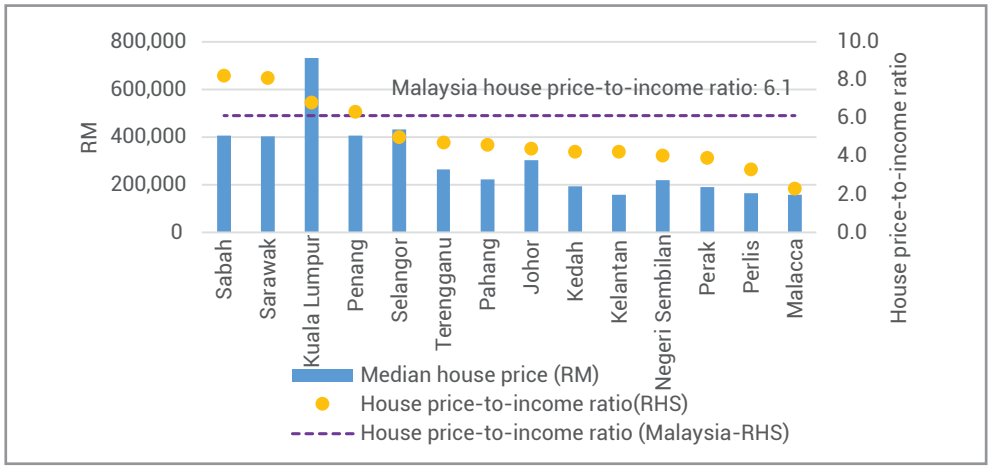
by Ong Wooi Leng, Socioeconomics & Statistics Programme

Introduction

Given that the increase in house prices is outpacing income growth, many Malaysians experience various challenges to purchasing a home. As reported by BNM, using the median multiple approach applied by Demographia International (2018), houses in Malaysia were severely unaffordable with a price-to-income ratio of 6.1 in 2016[25]. With a median household income of RM62,736 per year, this means that the median price for a house was more six times higher than the median household income, where a typical affordable house price should not be more than fourfold compared to one's median annual household income.

Interestingly, the mismatch of supply-demand houses is found to be more critical in Sabah and Sarawak compared to Kuala Lumpur and Penang. Sabah and Sarawak respectively recorded price-to-income ratios of 8.2 and 8.1 (Figure 3.46), with median monthly household incomes of RM4,110 and RM4,163 – slightly lower than the income in Terengganu (RM4,694) and Perlis (RM4,204). Meanwhile, the price-to-income ratios for Kuala Lumpur and Penang respectively were 6.8 and 6.3, marginally above the national average.

Figure 3.46 House price-to-income ratio by states in Malaysia, 2016



Source: Author's own calculation based on data from the National Property Information Centre (NAPIC) and Department of Statistics, Malaysia.

In Penang, high-rise units appear to be more affordable compared to other types of housing properties such as terraced, semi-detached, and detached houses, even though the price-to-income ratio for high-rise properties were slightly beyond the severely unaffordable threshold of 5.1. Condominiums and apartments, in particular, are severely unaffordable on Penang Island, with Timur Laut and Barat Daya respectively recording house price-to-income ratios as high as 8.6 and 8.0, compared to Seberang Perai Tengah (2.4) and Seberang Perai Utara (3.1). This has resulted in government intervention by ensuring an adequate supply of houses in meeting the housing needs of households on Penang Island.

Supply of affordable homes in Penang

Although the average house price has moderated in recent years, many households are still facing financial difficulties in owning a house in Penang. Due to the continued demand for houses, particularly from middle-income households, the Penang state government has intervened in the development of

[25] "Median multiple is a method used by Demographia International (2018) and Ng (2017) to measure housing affordability in the country. It is calculated by dividing median house price with median annual household income, and it is also known as house price-to-income ratio. A ratio falling below 3.0 signifies that the houses are affordable, 3.1–4.0 means that the houses are moderately affordable, 4.1–5.0 shows that the houses are seriously unaffordable, and 5.1 and above indicates that the houses are severely unaffordable.

residential property through a collaboration with private property developers to strategically bridge the affordable housing gap in Penang.

Penang's affordable housing scheme is divided into three major categories: Type A (houses priced RM42,500 and below), Type B (houses priced not more than RM75,000), and Type C (houses priced up to RM300,000). In general, a household with an income of not more than RM10,000 per month is eligible to apply for an affordable home corresponding to the level of household income.[26]

Based on the latest data provided by the Penang State Housing Department from 2010–17, all completed affordable homes involved Types A and B, where the number of Type A housing units were proportionately higher than Type B (Table 3.44). Meanwhile, 11,152 Type C homes are still under construction as of April 2018; these are largely being built by private property developers, with the majority being built on the island. Among the projects that are expected to be completed by 2018 include Taman Gema Intan at Jelutong, Taman Ria at Teluk Kumbar, Dua Residensi and One Foresta at Bayan Lepas, and Jiran Residensi at Butterworth.

Table 3.44 Supply indictors of affordable housing in Penang, 2010–17

		Existing stock			Incoming supply			Planned supply		
		Public	Private	Total	Public	Private	Total	Public	Private	Total
Penang Island	Type A	204	4,264	4,468	0	1,880	1,880	0	1,610	1,610
	Type B	510	5,124	5,634	667	2,145	2,812	1,753	1,473	3,226
	Type C	0	0	0	348	9,018	9,366	2,569	4,051	6,620
Seberang Perai	Type A	195	4,696	4,891	0	1,091	1,091	1,098	2,384	3,482
	Type B	0	738	738	502	249	751	5,591	0	5,591
	Type C	0	0	0	725	1,061	1,786	11,533	186	11,719
Grand total	**Type A**	**399**	**8,960**	**9,359**	**0**	**2,971**	**2,971**	**1,098**	**3,994**	**5,092**
	Type B	**510**	**5,862**	**6,372**	**1,169**	**2,394**	**3,563**	**7,344**	**1,473**	**8,817**
	Type C	**0**	**0**	**0**	**1,073**	**10,079**	**11,152**	**14,102**	**4,237**	**18,339**

Source: Ministry of Higher Education, Malaysia.

Looking at the median household income of Penang residents, the supply of affordable homes is important to reflect the level of household income in each district. According to the Household Income Survey 2016, households on Penang Island earned more than those living in Seberang Perai. As such, more Type C affordable homes would be needed for households with greater monthly household income, such as in Timur Laut.

While the supply of new low-cost affordable homes will continue to consistently increase in both Penang Island and Seberang Perai, approvals for new affordable home projects are estimated to increase substantially in Seberang Perai. In 2017, more than 20,000 low- and medium-cost affordable housing units were planned for Seberang Perai, with about 88% to be developed by public developer Penang Development Corporation (PDC) Properties. Of this, more than 8,000 medium-cost affordable homes are planned for Bandar Cassia in Seberang Perai Selatan. This may be because of the state's next phase of development focus, where commercial and industrial clusters in the region are expected to attract more workers in the near future.

Demand for affordable houses

Demand for affordable homes continue to be robust, underpinned by the slow growth in household income and rising house prices. The number of applications for affordable homes on Penang Island is

[26] Households earning not more than RM2,500 are entitled to Type A home application, households earning not more than RM3,500 are eligible for Type B application, households earning not more than RM6,000 are eligible to purchase Type C1 houses at a maximum price of RM150,000, households earning not more than RM8,000 are allowed to purchase Type C2 houses priced not more than RM200,000, and households earning not more than RM10,000 are eligible to apply for Type C3 (not more than RM300,000) affordable houses.

far greater compared to applications for affordable homes in Seberang Perai. From 2008–17, more than 70% of total applications were for affordable units in Timur Laut and Barat Daya. Likewise, a majority of applications for higher-cost affordable homes (Type C) trended towards affordable units in Timur Laut.

One key reason is that the majority of households living on Penang Island are eligible for Type C affordable homes rather than Types A and B low-cost affordable homes. According to the 2016 Household Income Survey, Timur Laut and Barat Daya had the most households with monthly incomes falling in the RM5,000–10,000 bracket, comprising over half of total households in the respective district. In comparison to Seberang Perai, about a quarter of total households on Penang Island earned not more than RM4,000 a month. However, more than 35% of households in Seberang Perai fall into this income bracket, with Seberang Perai Selatan registering the highest proportion of low-income households.

Therefore, more applications for Type C affordable homes are likely to be seen in Penang Island while more applications for low-cost affordable homes in Seberang Perai are forecast, with the assumption that there exists a low level of residential mobility intention among households.

Conclusion

It is a challenge for the state government to provide sufficient affordable houses that cater to the needs of all household segments. The socio-economic background of homebuyers is necessary to take into consideration before planning for an affordable home project. Age, occupation, housing types, location, connectivity, and environment may be included in homebuyers' decision. To strengthen the state's affordable housing scheme, it is important for policymakers to look into the socio-economic status of homebuyers by introducing strategies that match the preferences of homebuyers and avoid any unsold affordable units.

Slowdown in non-residential property

As of the first quarter of 2018, the total incoming supply of non-residential properties declined sharply at 44.3% to 4,217 units, down from 7,568 units in Q1 2017. This was mainly due to the drastic drop in construction activity in commercial[27] (44.3%) and industrial properties (39.9%). Non-residential properties priced below RM100,000 reported the highest growth rate at about 49%, compared to properties at other price ranges, totaling at RM22.3 million in Q1 2018. This was followed by properties priced between RM50,000 and RM100,000 (35.1%), and RM300,000 and RM400,000 (20.3%). Commercial property and development land had particularly high numbers of units being transacted compared to industrial and agricultural projects. About 340 units commercial and development properties were transacted in Q1 2018.

Among the commercial properties, Penang had only four purpose-built office (PBO) units under construction, with three being supplied by private property developers, while the shop segment, which were under construction, dipped at about 64%, or slightly more than 1,900 units. Small office/home office (SOHO) and serviced apartments continued to increase at 2.2% and 31.2%, respectively, amounting to more than 4,000 units as of the first quarter of 2018; the majority of these commercial units are located in Timur Laut. In particular, shop units and office lots in Timur Laut accounted for the majority of transacted units in Penang, comprising 45 units and 34 units, respectively, valued at RM43 million.

For industrial properties, incoming supply plunged to 181 units, primarily situated in Seberang Perai Tengah, with semi-detached having the most units, followed by detached. In the first quarter of 2018, semi-detached projects continued to gain popularity compared to terraced units. Many new approvals were issued to projects with plans to build semi-detached industrial units, even though the demand for terraced industrial units are higher. Although Barat Daya had the fewest industrial properties sold, it made up the highest value of transactions in

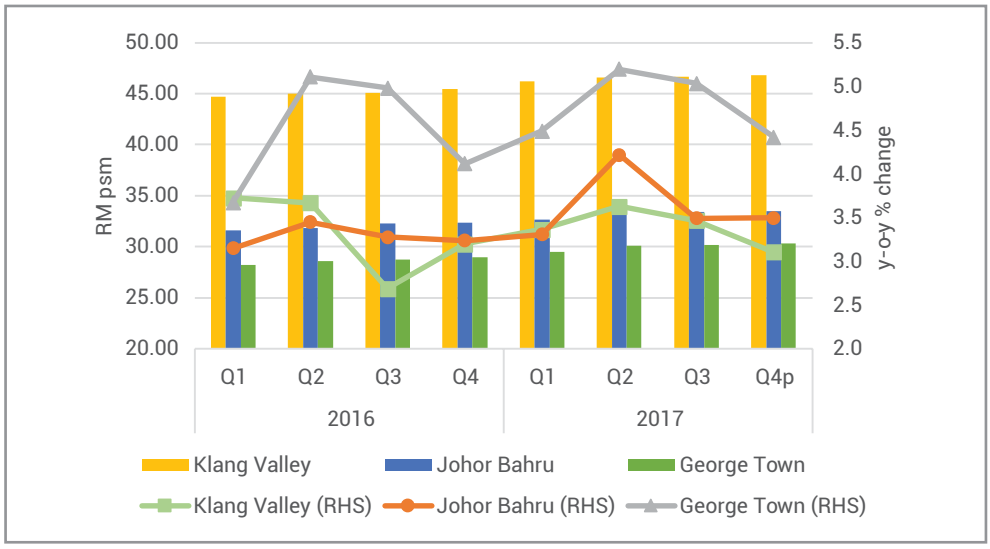
[27] Including purpose-built offices (PBO), shopping complexes, small office-home offices (SOHO), serviced apartments, and shops.

Penang, with detached factories accounting for 88% of total sales in the district (RM80.5million) during Q1 2018.

In comparison to the proportion of PBO units among major cities, George Town's rental prices for a PBO unit, on average, grew higher than the rest of the country, seeing a 4.4% y-o-y increase in the last quarter of 2017 compared to Johor Bahru (3.5%) and Klang Valley (3.1%) (Figure 3.47). The PBO rental index had been consistently growing at a higher rate than in Klang Valley and Johor Bahru. However, the average rental prices of a PBO unit in George Town remained the lowest among the three cities, charging only RM30.28 per square meter (psm) as compared to RM46.84 psm in Klang Valley and RM33.48 psm in Johor Bahru.

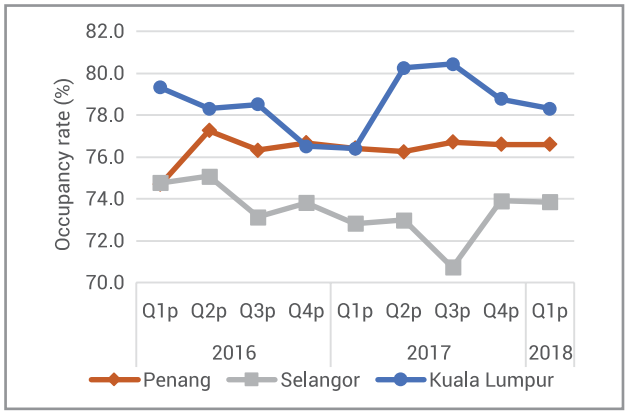
In terms of the take-up rate for PBO, Penang has a stable rate of occupancy in privately owned office space, hovering at 76% from Q3 2016 to Q1 2018, compared to Selangor and Kuala Lumpur (Figure 3.48). This is partly due to the fact that the existing office spaces remained constant for the past year, with a total of 822,040,000 square meters as of Q1 2018 (Selangor: 3,403,520 square meters; Kuala Lumpur: 8,394,700 square meters). The occupancy rate for retail spaces in shopping complexes, on the other hand, remained weak in Penang, compared to Kuala Lumpur and Selangor (Figure 3.49). The rate lingered below 75% in Penang while Kuala Lumpur and Selangor recorded rates of as high as 85%. Penang's occupancy rate has been improving since Q1 2017.

Figure 3.47 Average rental price and annual growth of PBO units in major cities, Malaysia



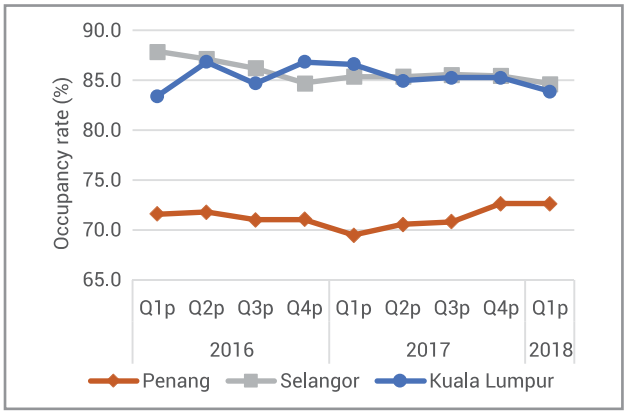
Note: P=preliminary
Source: National Property Information Centre (NAPIC, 2018f).

Figure 3.48 Occupancy rate for office space by major cities in Malaysia (%)



Note: P=preliminary
Source: National Property Information Centre (NAPIC, 2018a).

Figure 3.49 Occupancy rate for retail space by major cities in Malaysia (%)



Note: P=preliminary
Source: National Property Information Centre (NAPIC, 2018a).

Demand for commercial properties continued to be unsatisfactory during the first quarter of 2018. With 125 launched units, 60% units, worth about RM 40 million, were unsold during this period. All unsold units were located in Seberang Perai Utara. In the same period last year, only 40% of units were not taken up despite about a much bigger launch of about 665 shop units. Furthermore, the demand for serviced apartments was weaker than the shop category. Out of 206 units of serviced apartments launched, only five were unsold in Q1 2017; but in Q1 2018, only 37% or 132 units, valuing at nearly RM 48million, (total units launched: 360 units) were sold. All unsold units were in Seberang Perai Tengah.

Although the value of completed non-residential construction activity increased sharply by 32.7% to RM732.5 million in Q1 2018 (Q1 2017: RM552,016), the non-residential property market is expected to experience a moderate hike in 2018 due to the completion of shopping areas at Batu Kawan in Seberang Perai Selatan. This is likely to boost the rental rate for shops and the occupancy of retail spaces in 2019 within this area. But this is also dependent on market demand, and it is expected that the speed of building non-residential property will slow down as a result of available unsold commercial units.

3.4 Agriculture Sector

As the country continues to grow, the agriculture sector has diminished to make way for Malaysia's transformation into an industrialised economy. Although the agriculture sector contributes very little to Penang's GDP (2%), it plays an important role in the state economic development, functioning as a food supplier, employment provider, export earner, and provider of raw materials for agro-based industries. It is also one of the main economic pillars of the Northern Economic Corridor Region (agriculture, manufacturing, and tourism). In spite of the opportunities, Penang's agriculture industry faces an array of challenges resulting from resource constraints (land and labour), heavy dependence on imported raw materials, and vulnerability to climate change and disease.

3.4.1. Crops sub-sector

Overall crop land use decreased from 2001 to 2016, especially for coconut, vegetables, spice crops, and fruits (Table 3.45). After industrial crops (rubber, oil palm, coconut, and cocoa), paddy fields have the highest percentage of total agricultural land in Penang. The paddy and rice industry in Malaysia has always been given special treatment owing to the strategic importance of rice as a staple of the country. It is also the third-most-important crop after rubber and palm oil. Seberang Perai, as one of the eight major granary areas and the hub of paddy production in Peninsular Malaysia, is a significant contributor with its relatively high productivity to the domestic production of the country.

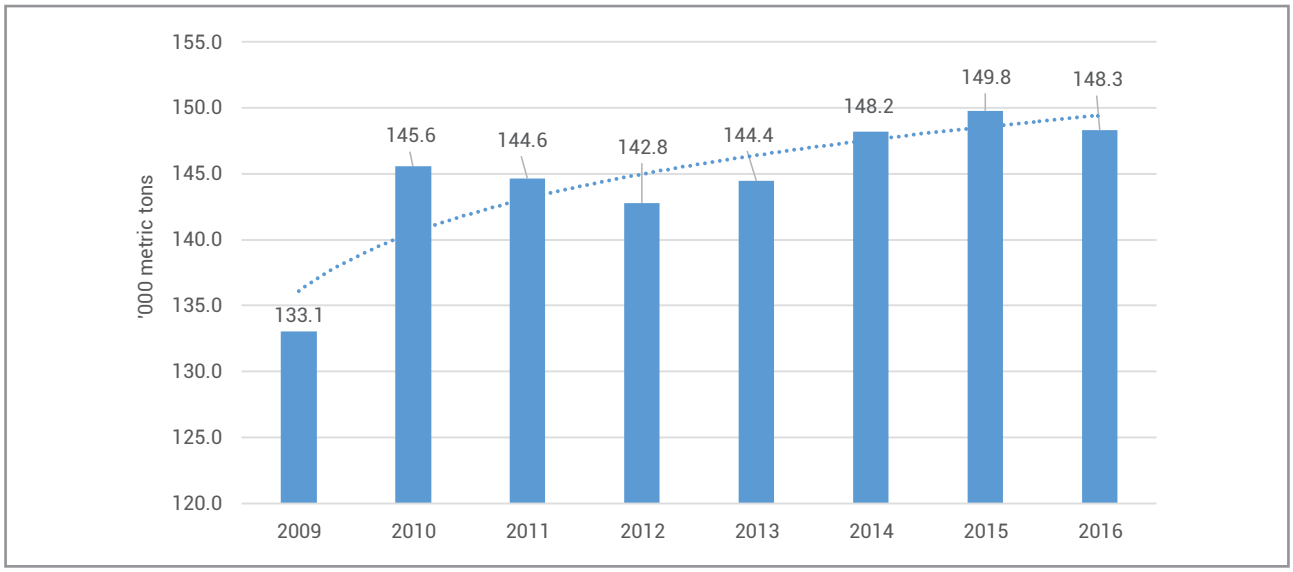
Table 3.45 Crop land use in Penang (hectares), 2001–16

Crops	2001	2006	2011	2016
Paddy	13,448.0	12,782.0	12,782.0	12,782.0
Fruits	6,830.0	6,812.0	6,921.1	4,715.7
Rubber	12,758.0	11,177.0	10,837.6	NA
Oil palm	12,988.0	13,962.0	13,864.6	14,135.0
Coconut	2,339.1	2,195.0	1,991.8	329.1
Cocoa	103.5	10	8.2	NA
Vegetables	1,718.0	481	477.2	715.4
Cash crops	NA	269	236.9	216.5
Spice crops	318.0	167.9	251.0	138.3
Sugar cane	NA	NA	37.3	42.9
Others	74.2	50.4	32.2	NA
Total	**50,576.8**	**47,906.2**	**47,439.8**	**33,074.9**

Note: NA=Not available.
Source: Derived from the data provided by Department of Agriculture, Penang; Penang in Numbers 2014/2015 and 2015/2016; Malaysian Palm Oil Berhad (MPOB); and Rubber Industry Smallholders Development Authority (RISDA).

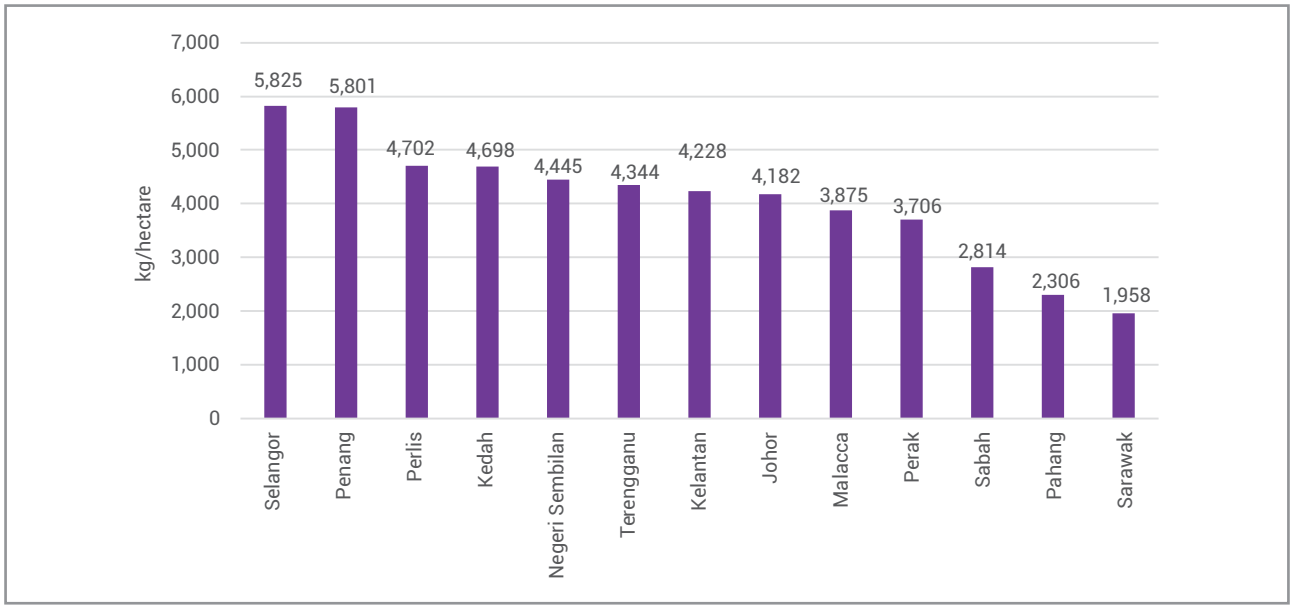
In 2016, Penang produced approximately 148,290 metric tons of paddy, up from 133,050 metric tons in 2009 (Figure 3.50). In 2016, paddy production decreased by about 1% compared to 2015, possibly due to weather conditions (high temperatures and low rainfall). Penang's rice yield is the second-highest in the country after Selangor (Figure 3.51), yet its rice production has not met domestic demand. Based on the national per capita rice consumption of about 82.3 kg per year[28] and a total population of 1.7 million, Penang's rice needs in 2016 were estimated to be around 141,366.7 metric tons. With a total rice production of 88,974 metric tons in 2016, Penang's rice self-sufficiency level (SSL) was roughly 63%, with imports filling in the remainder of market demand. Nevertheless, with the increase in per capita income and changes in consumption patterns and lifestyle, rice consumption is expected to drop in the future.

Figure 3.50 Paddy production in Penang, 2009–16



Source: Department of Agriculture, Penang.

Figure 3.51 Average yield of paddy by state, 2016



Source: Department of Agriculture, Penang.

[28] Gain Report: Grain and Feed Annual (2017). Retrieved from: https://gain.fas.usda.gov/Recent%20GAIN%20Publications/Grain%20and%20Feed%20Annual_Kuala%20Lumpur_Malaysia_3-27-2017.pdf

Although the rice industry in Penang shown a positive growth, it still faces many challenges including economic, social, technology, and infrastructure. For instance, urbanisation, industrialization, and expansion of residential areas have resulted in limited available farm land. Promising and attractive employment in the industrial sector led to an acute labour shortage. Furthermore, the lack of modern farming machines, rice processing equipment, and rice by-product reprocessing facilities to maximise their full economic potential resulted in slower production growth.

The agriculture sector in Malaysia has always been geared towards the production of export commodities such as palm oil, rubber, and cocoa. However, the food industry, other than paddy, has not received adequate support, as the government is more interested in developing export crops. Hence, the potential downstream sectors for the agro-food industry such as fruits, vegetable, and livestock did not develop, which explains Malaysia's heavy dependency on imported fruits, vegetable, feed stuff, dairy products, and processing food items.

As there is high demand for land in other sectors, the fruit industry faces intense competition. Although the planted area of fruits in Penang decreased by about 34% in 2016 compared to 2009, its production increased by nearly 29% (Table 3.46), meaning that there has been an increase in average yield per hectare (productivity) in Penang. The fruits industry is suffering from high cost of production, inconsistency in supply, market access, and poor food safety and quality standards. The increasing cost of production is mostly due to labour shortage, dependency on imported raw materials, and limited land area for fruit cultivation.

Despite the growing vegetable sector, Malaysia is still a net importer of vegetables as domestic production is unable to meet growing domestic demand. Growing health concerns as well as the rise of vegan/vegetarian culture are expected to contribute more to the growth of demand for vegetables.

In Penang, the cultivated area of vegetables is about 2% of total agricultural land use. Despite the limited land allocated to the agricultural sub-sectors, the vegetable industry has managed to grow in size. The planted area of vegetables has seen an average annual growth rate of about 6% between 2009 and 2016. Along with the growing planted area, Penang's vegetable production has also increased by about 8% within the same period (Table 3.47).

Table 3.46 Fruits production and planted area in Penang, 2009–16

Year	Production ('000 metric tons)	Growth rate (%)	Planted area (hectares)	Growth rate (%)
2009	76.5	-	7,149.8	-
2010	77.4	1.2	6,926.2	-3.1
2011	80.5	4.0	6,921.1	-0.1
2012	92.6	15.0	6,085.1	-12.1
2013	67.6	-27.0	6,706.4	10.2
2014	85.9	27.1	5,602.3	-16.5
2015	91.0	5.9	4,816.1	-14.0
2016	98.6	8.4	4,715.7	-2.1

Source: Department of Agriculture, Penang.

Table 3.47 Vegetable production and planted area in Penang, 2009–16

Year	Production ('000 metric tons)	Growth rate (%)	Planted area (hectares)	Growth rate (%)
2009	28.0	-	489.4	-
2010	29.0	3.4	477.2	-2.5
2011	31.6	9.1	477.2	0.0
2012	33.8	7.3	600.6	25.9
2013	50.7	49.9	601.1	0.1
2014	42.4	-16.4	690.6	14.9
2015	43.9	3.5	712.3	3.1
2016	44.0	0.2	715.4	0.4

Source: Department of Agriculture, Penang.

Overall, the agriculture sector in Malaysia and Penang is hindered by fragmented small-scale farmers, rising demand, and cost of production. Malaysia also has to compete with other countries such as China and Thailand in the international market. China benefits from lower production and shipping costs compared to producers in Malaysia. China's agricultural industry has also influenced the major global export markets, such as Japan, South Korea, Taiwan, Hong Kong and Singapore. Furthermore, climate change, lack of freshwater, and spread of diseases should be dealt with in order to have a sustainable growth.

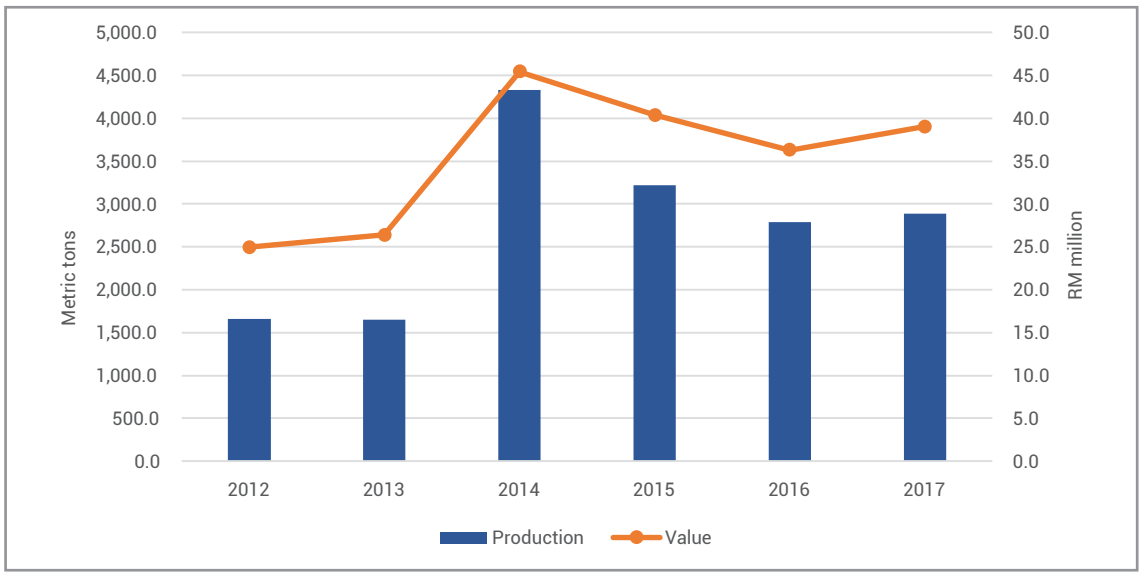
3.4.2 Livestock sub-sector

The livestock industry is Malaysia's largest source of protein. In 2016, this industry contributed around 11.6% to the GDP of the agriculture sector in Malaysia, 0.9% more than 2015. The contribution of the livestock sector to the economy is relatively small, yet the sector has grown gradually over the years.

According to the Department of Veterinary Services (DVS) Penang, there were 1,456 livestock breeders in Penang in 2017, a decrease of 2.5% over the previous year. The livestock population also dropped by 15% from 13.3 million in 2016 to 11.3 million in 2017.

The livestock sector is divided into two main categories: ruminants including cattle, sheep, goat, and buffalo, and non-ruminants encompassing chicken, duck, pig, and egg. Beef is produced from beef cattle, buffaloes, and cull dairy cattle. The beef production in Penang has seen a significant rise during 2012–17. Within this period, beef production grew from 1,662.2 metric tons in 2012 to 2,891.6 metric tons in 2017, an increase of 3.6%. Its value also increased by 7.5% (Figure 3.52). The incremental increase in demand for beef is still well above production. As projected by the 11th Malaysian Plan, by 2020 the demand for beef/buffalo meat is expected to increase to 12,400 metric tons, while the production may only increase to 3,020 metric tons. This enormous gap between supply and demand might explain the 36.3% SSL of the beef and buffalo sector in 2015.

Figure 3.52 Production and value of beef/buffalo in Penang, 2012–17

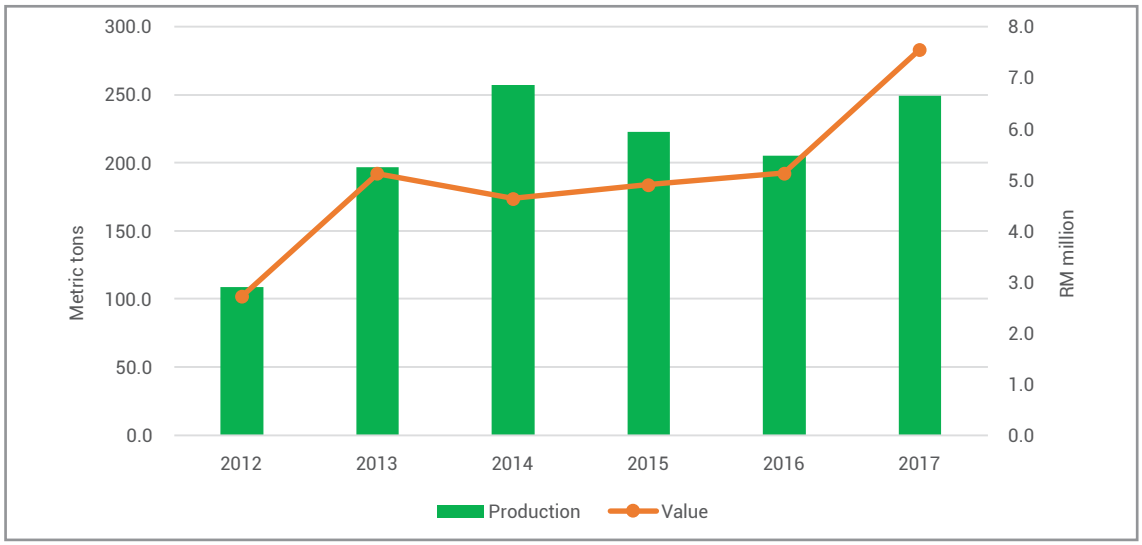


Source: Department of Veterinary Services, Penang.

The goat/sheep industry in Penang and Malaysia is still in its infancy. Despite an extensive growth in goat/sheep meat production from 108.5 metric tons in 2012 to 249.1 metric tons in 2017 (Figure 3.53), total production is still well below the 1,630 metric tons in projected demand. According to the latest available data released by the DVS in 2015, Penang's goat/sheep industry has the lowest SSL (14.9%) compared to other commodities such as beef (36.3%), chicken (118.9%), pork (265.8%), and eggs (76%). Malaysia has been filling the supply gap through imports from Australia, New Zealand, and South Africa. This is often due to the lack of entrepreneurship and government intervention in the sector.

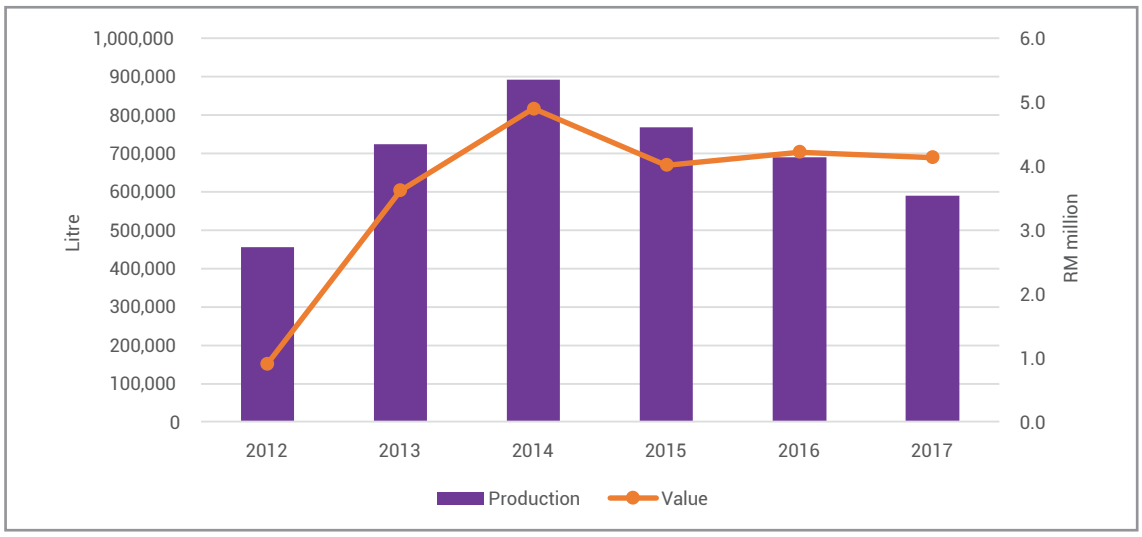
The fresh milk industry in Penang is often sidelined. As illustrated in Figure 3.54, the production and value of fresh milk increased by about 29.5% and 354.9%, respectively, in 2017 compared to 2012. Although the quantity and value of fresh milk experienced a significant increase within the past five years, there is still a huge gap between supply and demand. In 2017, the production of fresh milk was nearly 0.6 million litres while demand was estimated to be 92.6 million litres. By 2020, fresh milk output (0.7 million litres) is expected to continue trailing demand (107.2 million litres). The increasing awareness among the population regarding the nutritional benefits of fresh milk, paired with the increasing consumer preference for dairy products, has been fueling the rise in demand for fresh milk.

Figure 3.53 Production and value of goat/sheep meat in Penang, 2012–17



Source: Department of Veterinary Services, Penang.

Figure 3.54 Production and value of fresh milk in Penang, 2012–17

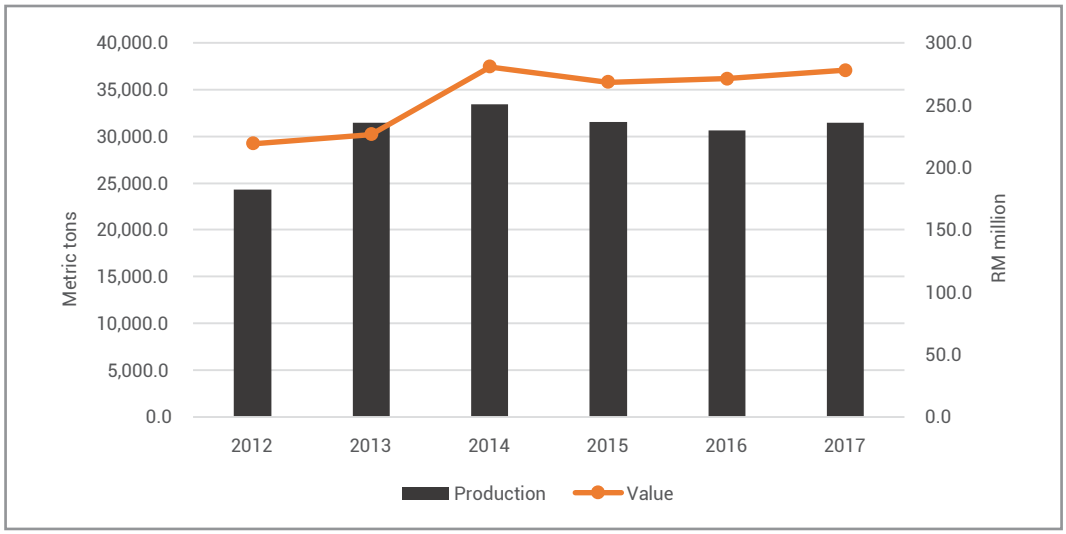


Source: Department of Veterinary Services, Penang.

In the non-ruminant sector, the production of pork and chicken in Malaysia and Penang has always been above domestic demand. Over the past five years, the production and value of pork increased by 29.3% and 27%, respectively (Figure 3.55). In 2015, the output of 31,577.5 metric tons of pork meat has enabled Penang to achieve an SSL of 265.8%. This figure solidifies the pork industry in Penang as the most self-sufficient when compared to other commodities, allowing Penang to be a net exporter of pork. By 2020, the output of pork meat is forecast to reach 31,890 metric tons while the demand will grow to 13,620 metric tons.

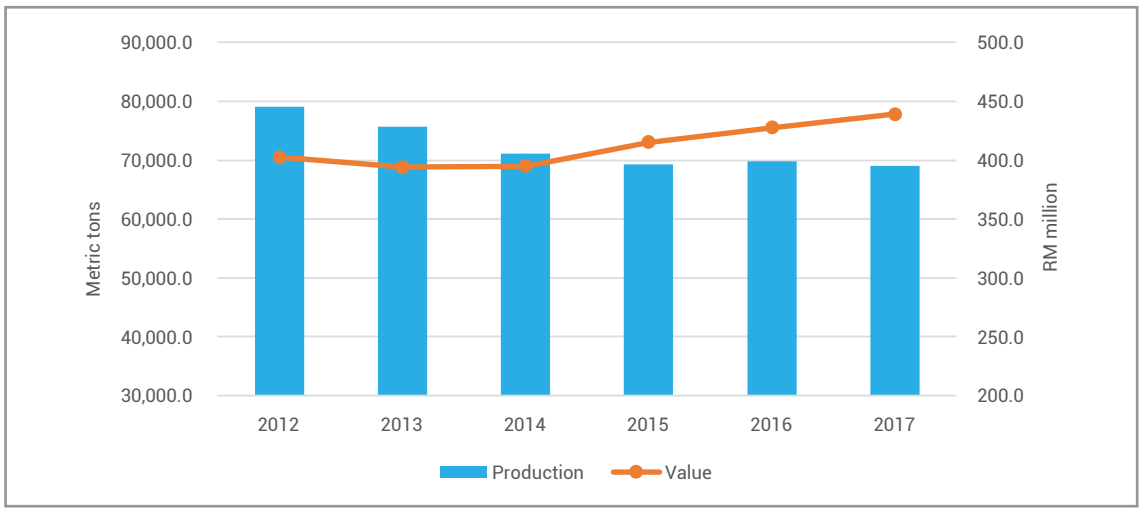
In 2017, Penang's chicken/duck production dropped by about 12.6% compared to 2012, yet its value increased by approximately 9% within the same period (Figure 3.56). The production of poultry meat has had a steady output with minor fluctuations over the last three years (2014–17). Despite the negative growth, Penang's poultry sector caters well to domestic demand, with an SSL of 120% in 2015.

Figure 3.55 Production and value of pork in Penang, 2012–17



Source: Department of Veterinary Services, Penang.

Figure 3.56 Production and value of chicken/duck in Penang, 2012–17



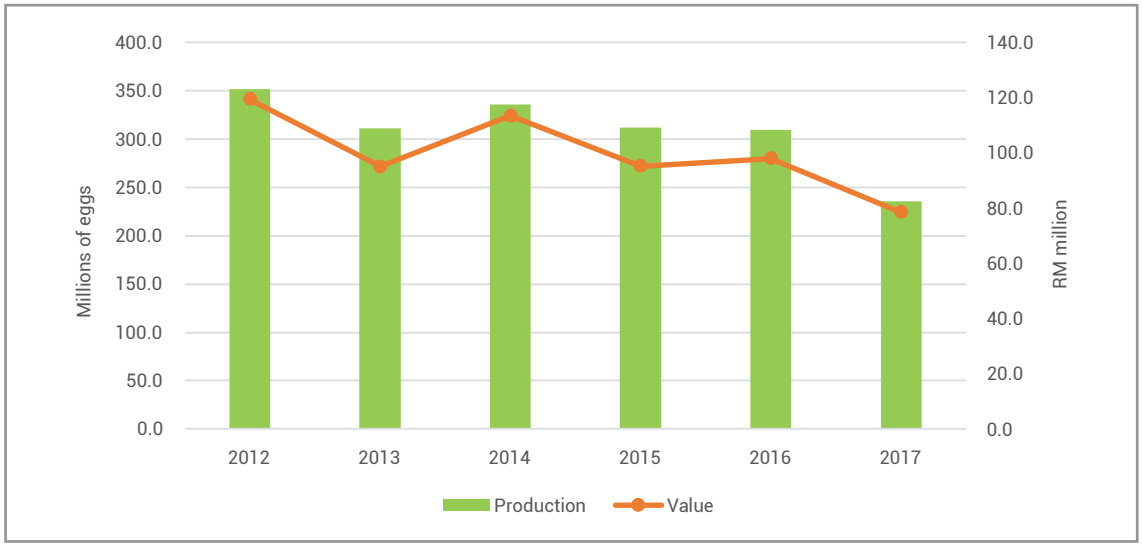
Source: Department of Veterinary Services, Penang.

Furthermore, the production and value of egg (chicken/duck) dropped significantly by 32.9% and 34.3%, respectively, in 2017 compared to 2012 (Figure 3.57). By 2020, Penang is forecast to have a domestic demand of 514.2 million eggs, while output is expected to reach 335.2 million eggs.

Overall, rapid economic and population growth in Malaysia and Penang led to an increase in demand driven consumption of livestock products. While the non-ruminants industry responded by enhancing its domestic supply, the ruminants sector faced stresses on its production system. The non-ruminants sector is well developed and commercialised with modern technology and the involvement of the private sector, while the ruminants sector is lagging behind in terms of technology and production. Despite making some progress, the ruminants sector is unable to produce enough to meet domestic consumption.

Problems that runs through the ruminants are a lack of land resources, high feed prices, cheaper import substitutes, lack of private sector involvement, lack of modern technology, and low number of quality breeds, expertise, and workforce.

Figure 3.57 Production and value of egg (chicken/duck) in Penang, 2012–17



Source: Department of Veterinary Services, Penang.

3.4.3 Fisheries sub-sector

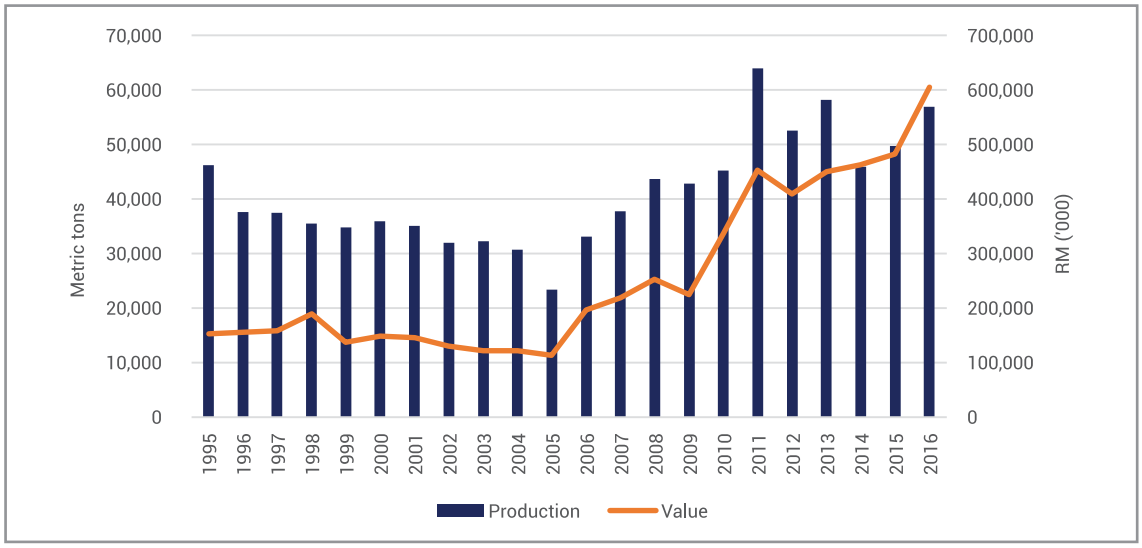
For many years, the fisheries industry in Penang has played important role in poverty reduction, especially among coastal communities, as well as in achieving food security. In line with population growth and increases in consumption of animal protein associated with changes in lifestyle and rising incomes, demand for aquatic food products is expected to increase.

Fishing in Penang remains a means of livelihood for traditional fishermen. In 2016, the fisheries sector provided direct employment to 4,973 fishermen, 444 culturists, and 1,872 workers who were involved in the aquaculture industry. Out of 7,289 people working in the fisheries sector, 6,124 (84%) are local. In 2016, Penang's food fish sector, which consists of marine capture fisheries, aquaculture fisheries, and inland fisheries, produced about 87,283 metric tons, valued at RM1.26 billion. However, domestic demand for fish exceeds local supply. In 2016, Penang's food fish production reached the highest wholesale value in the country. Marine capture, aquaculture, and inland fisheries contributed about 65.3%, 34.6%, and 0.05% to the state's total food fish production in 2016, respectively.

Marine capture fisheries

As illustrated in Figure 3.58, Penang's marine capture fisheries declined significantly by about 49% from 46,177 metric tons in 1995 to 23,450 metric tons in 2005, due mainly to overfishing. After years of steady decline in marine fisheries production, the quantity of marine fish landings began to increase to a high of 63,972 metric tons in 2011, and was reportedly around 57,013 metric tons in 2016. The wholesale value of captured fisheries increased dramatically from RM152.6 million in 1995 to RM605.4 million in 2016. It is projected that the marine captured fishery production would increase at a rate of 10% per year until 2020.

Figure 3.58 Marine landing fish production and value in Penang, 1995–2016



Source: Department of Fisheries, Malaysia.

In the west coast of Peninsular Malaysia, overfishing is mostly caused by trawl fishing. Trawling is destructive, as trawl gears drag their nets along the seabed, not only catching juvenile fish but also destroying their breeding or spawning grounds. In Penang, the greatest contributions to total landings were made by drift/gill nets (56%) followed by trawl nets (31%) (Figure 3.59).

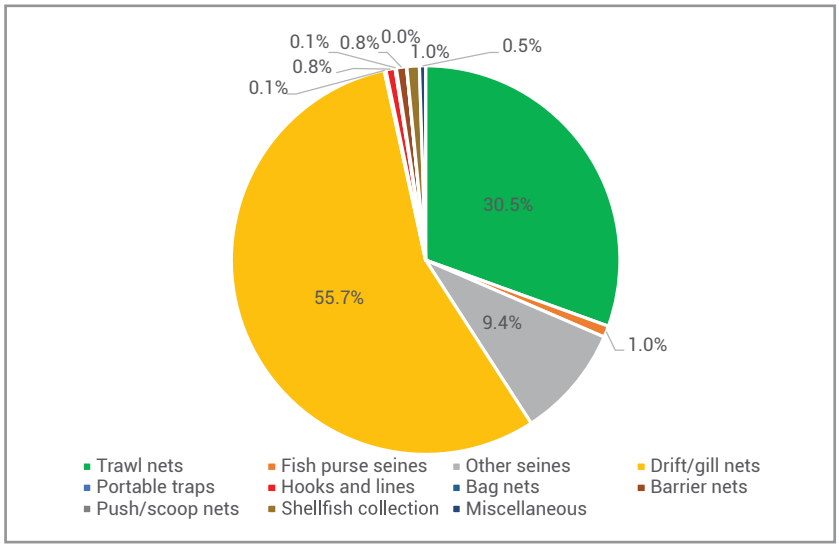
Aquaculture sector

Production from marine capture fisheries in the west coast of Peninsular Malaysia may become unreliable since many fish stocks have been overexploited, and various means of increasing production through aquaculture are being explored. The aquaculture sector in Malaysia is diverse in terms of species and culture systems. In Penang, aquaculture products come through two culture systems: freshwater comprising ponds, cement tanks, and canvas tanks; and brackish water including ponds, cages, cockles, mussels, and oysters.

Over the last two decades (1995–2016), Penang's aquaculture sector has grown at an average annual growth rate of 5.5% and 20% in production and value, respectively (Figure 3.60). In fact, the percentage contribution of aquaculture to total fish production shows an increasing trend and, as predicted by the Department of Fisheries (DOF) Malaysia, the overall aquaculture production in Penang will continue to increase at a rate of 10% per year until 2020. However, Penang's total aquaculture production dropped significantly by about 55.6% in 2016 compared to 2014, mostly due to the 2015/2016 El Niño event, and diseases. Penang is currently the third-largest producer of aquaculture products in the country, after Sabah and Perak. The aquaculture industry is the main income earner of Penang's fisheries sector, followed by marine-captured fish products. The industry can be the main driving force to enhance the economy of the state.

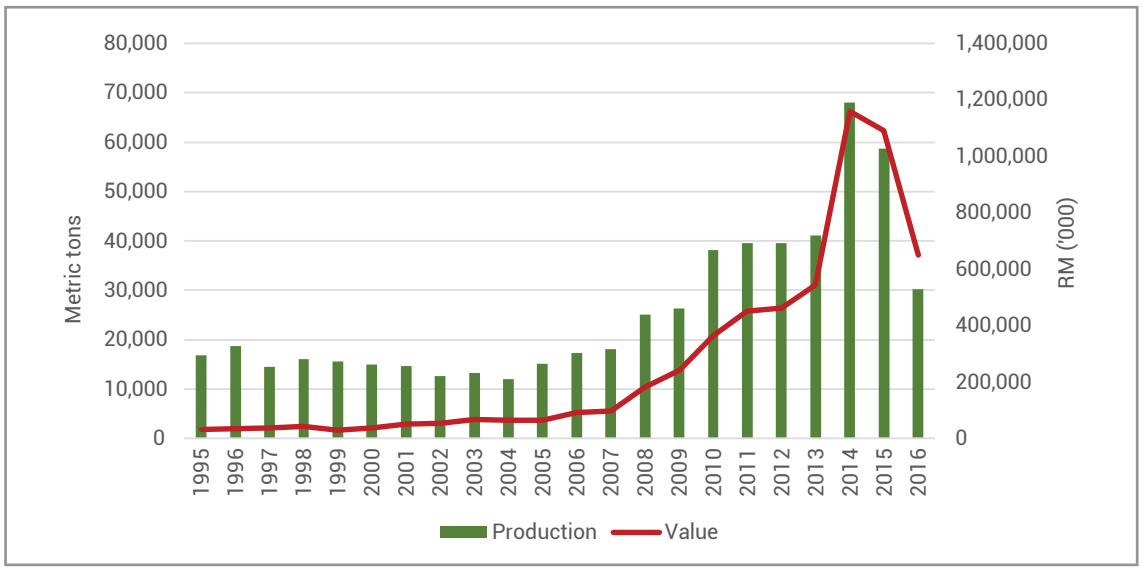
In 2016, Penang's aquaculture production gained the highest wholesale value in the country. Brackish water ponds and cages constitute the majority of Penang's aquaculture and have the highest number of culturists. Fisheries from brackish water have been contributing about 32.4% of the total fish production and about 51.1% of its value in Penang. Sea bass and snapper recorded the highest production, followed by shrimp, cockle, and other brackish water cages species, such as grouper and mackerel. Brackish water aquaculture is one of the most economically valuable fisheries in Penang.

Figure 3.59 Landing of marine fish by fishing gear group, Penang, 2016



Source: Department of Fisheries, Malaysia.

Figure 3.60 Aquaculture production and value in Penang, 1995–2016



Source: Department of Fisheries, Malaysia.

Shrimp culture in brackish water pond contributes most in terms of value. Although Penang's shrimp production dropped dramatically by 58.7% in 2016 compared to 2015, its value was the second-highest in the country. In 2016, Penang produced 4,323.7 metric tons of Hawaiian white shrimp valued at RM116.4 million. In fact, shrimp aquaculture is a high-income venture for farmers and has a very high export value. Since returns from shrimp aquaculture can be forecasted, it provides farmers a higher and more stable income than fishing or other agricultural activities such as rice farming and oil palm plantation (Kharas et al., 2010). However, unplanned and unsustainable development of shrimp farms may have serious environmental costs such as habitat destruction and displacement of traditional livelihoods. Therefore, organic aquaculture practices and best management practices would enhance the sustainable development of shrimp aquaculture.

Being rich in natural mudflats has made Penang a suitable breeding area for the cockles. Penang is the fourth-largest cockle producer in the country after Perak, Selangor, and Johor. Cockle culture is the fifth-largest income earner for Penang's aquaculture industry.

In the non-food fish sector (ornamental fish and aquatic plants), ornamental fish is the main contributor with a value of approximately RM23.8 million in 2016. Penang is the third-largest producer of ornamental fish in the country, trailing Johor and Perak. Penang is one of the largest centres for breeding and export of different domesticated strains of Discus fish.

4 Environment

Rapid economic development, population growth, rapid urbanisation, limited land area, and industrial expansion have resulted in different environmental challenges for Penang, such as air and water pollution, hill cutting, floods, and solid waste management. There is an urgent need for sustainable management of the environmental resources of the state.

4.1 Pollution

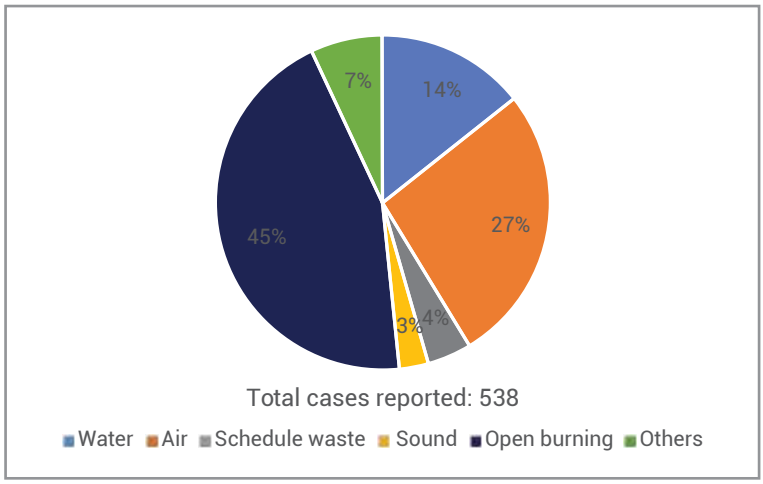
There are different types of pollution from different sources reported in Penang (Figure 4.1). Pollution cases reported in Penang decreased by about 3% from 555 cases in 2016 to 538 cases in 2017. Open burning, air pollution, and water pollution are the major pollutions in Penang, and can have a measurable effect on both the environment and human health.

4.1.1 Air pollution

The Air Pollution Index (API) system, which is a simple and generalised way to describe the air quality, includes five main air pollutants which could cause potential harm to human health if they reach unhealthy levels. The air pollutants included in Malaysia's API are ozone (O_3), carbon monoxide (CO), nitrogen dioxide (NO_2), sulphur dioxide (SO_2), and particulate matter with a diameter of less than 10 microns (PM_{10}). API levels of up to 50 is considered good, between 51 and 100 moderate, 101 and 200 unhealthy, 201 and 300 very unhealthy, and 300 and above hazardous.

The air quality of Penang is monitored at four stations: Perai, Seberang Jaya, USM, and Balik Pulau[29]. As presented in Table 4.1, the air quality pattern has improved since 2012, as the number of days with good API levels increased and the number of unhealthy days reduced significantly. In 2015 there was a different pattern, mostly due to transboundary pollution such as the haze. In 2016, the overall air quality in Penang was good with only two days of unhealthy air quality. The air quality improved further in 2017. On average, the air quality was good 77.6% of the time, moderate 20.2%, and 1.3% at an unhealthy level.

Figure 4.1 Types of pollution reported in Penang, 2017



Source: Department of Environment, Penang.

[29] Balik Pulau is the newest station as of 13 April 2017.

Table 4.1 Air quality status in Penang, 2012 - 2017

Station	Air quality level	Air quality status (day/year)					
		2012	2013	2014	2015	2016	2017
Perai	Good	305	340	150	151	242	312
	Moderate	60	23	213	202	124	48
	unhealthy	0	0	2	12	0	2
Seberang Jaya	Good	229	246	141	32	96	244
	Moderate	136	117	216	317	270	114
	Unhealthy	0	0	8	15	0	1
	Very unhealthy	0	0	0	1	0	0
USM	Good	319	272	107	78	173	49
	Moderate	46	91	249	272	191	51
	Unhealthy	0	0	9	14	2	0
	Very unhealthy	0	0	0	1	0	0
Balik Pulau	Good	-	-	-	-	-	247
	Moderate	-	-	-	-	-	9
	Unhealthy	-	-	-	-	-	1
	Very unhealthy	-	-	-	-	-	0

**The data for USM is from 1 January to 13 April 2017; Balik Pulau began collecting data from 13 April to 31 December 2017.*
Source: Department of Environment, Penang.

Some of the most excessive sources of air pollution include emission from vehicles, industrial emissions, and open burning – meaning that air pollution is mostly the result of human activities.

4.1.2 Water pollution

The water quality of rivers has always been an area of concern for various authorities, government agencies, and the public at large. The Water Quality Index (WQI) is a tool to assess the quality of river water and to indicate the corresponding suitability in terms of water uses according to the National Water Quality Standards (NWQS) for Malaysia. In Malaysia, the WQI is computed based on six main physico-chemical parameters, namely pH, biochemical oxygen demand (BOD), chemical oxygen demand (COD), ammoniacal nitrogen (NH_3N), suspended solids (SS), and dissolved oxygen (DO). WQI levels of between 81 and 100 is considered good, 60 and 80 moderate, and 0 and 59 unhealthy. WQI can also be used as a water pollution indicator by providing feedback on water quality to policymakers and environmentalists.

As presented in Table 4.2, over the past five years the overall river basin water quality in Penang has been moderately polluted. Industrial effluent and public apathy have the main causes of water pollution, mostly due to a lack of enforcement. The overall WQI increased slightly by 0.8% in 2016 compared to 2015. In 2016, the water quality of Sungai Jejawi and Sungai Pinang improved, while Sungai Juru, Sungai Keluang, Sungai Perai, Sungai Kerian, and Sungai Bayan Lepas were found to be slightly more polluted compared to 2015.

Table 4.2 River Basin WQI in Penang, 2012–16

Rivers	2012	2013	2014	2015	2016
Juru	63	63	62	63	61
Pinang	60	64	62	58	64
Jejawi	71	73	69	57	71
Keluang	83	81	79	84	76
Perai	56	58	67	63	59
Kerian	70	86	81	84	83
Bayan Lepas	70	73	69	70	69

Source: Department of Environment, Penang.

The Marine Water Quality Index (MWQI) is used to assess the status of marine water quality. Marine water quality monitoring plays a key role in assessing the degree of pollution from land- and sea-based sources that can threaten the marine resources. In Malaysia, the MWQI is calculated based on seven main parameters, namely DO, nitrate (NO_3), phosphate (PO_4), unionised ammonia (NH_3), faecal coliform, oil and grease (O&G), and total suspended solids (TSS). The resulting MWQI with a rating of between 0 to 100 would define the category of the marine water quality, ranging from "Excellent" to "Poor".

In 2016, a total of 14 coastal, 7 estuaries, and 8 island stations were monitored in Penang. The MWQI monitoring results for coastal areas classified 3 stations as Good, 10 stations as Moderate, and 1 station as Poor. Some areas such as Gurney Drive and Jelutong had seen significant improvements in MWQI in 2016 compared to 2015. In 2016, the overall marine water quality in Penang remained moderately polluted (Table 4.3). In terms of marine water quality status for estuaries in 2016, five stations were classified as Moderate and two stations as Poor. The most polluted estuaries were Kuala Sungai Jawi and Kuala Sungai Kerian (Table 4.4).

Table 4.3 Marine water quality status for coastal areas in Penang, 2015–16

Area	MWQI value		Category (2016)
	2015	2016	
Gertak Sanggul	53.11	53.91	Moderate
Kawasan Perindustrian Bayan Lepas III	53.88	50.05	Moderate
Pantai Bersih	52.63	76.02	Moderate
Pantai Miami	69.18	61.60	Moderate
Pantai Pasir Panjang	70.46	63.77	Moderate
Batu Feringgi (Casuarina)	66.07	79.68	Moderate
Luar Pantai Teluk Bahang	65.36	88.10	Good
Persiaran Gurney	48.03	83.66	Good
Rumah Pam Baru Perai	52.80	66.44	Moderate
Rumah Pam Lama Perai	55.26	61.75	Moderate
Selat PP Selatan (Jelutong)	49.68	60.39	Moderate
Tanjung Bungah	61.82	83.73	Good
Teluk Tempoyak	52.55	51.15	Moderate
Batu Maung	52.83	46.69	Poor

Note: The MWQI is classified into four categories, namely Excellent: 90–100, Good: 80 – <90, Moderate: 50 – <80, and Poor: 0 – <50.
Source: Department of Environment, Malaysia.

Table 4.4 Marine water quality status for estuary in Penang, 2015–16

Area	MWQI value		Category (2016)
	2015	2016	
Kuala Sungai Jawi	49.63	45.56	Poor
Kuala Sungai Juru	59.40	70.61	Moderate
Kuala Sungai Kerian	60.38	34.21	Poor
Kuala Sungai Pinang	47.28	58.39	Moderate
Kuala Sungai Perai	56.22	64.89	Moderate
Kuala Sungai Tengah	67.81	65.19	Moderate
Kuala Sungai Pinang (Balik Pulau)	46.17	60.11	Moderate

Note: The MWQI is classified into four categories, namely Excellent: 90–100, Good: 80 – <90, Moderate: 50 – <80, and Poor: 0 – <50.
Source: Department of Environment, Malaysia.

4.2 Waste management

Managing waste more efficiently is a core component of sustainability. Rapid economic development, industrialisation, and population growth have caused remarkable increases in the quantity and types of solid waste generated in Penang. However, substantial amounts of solid waste can be recycled and reused if separated.

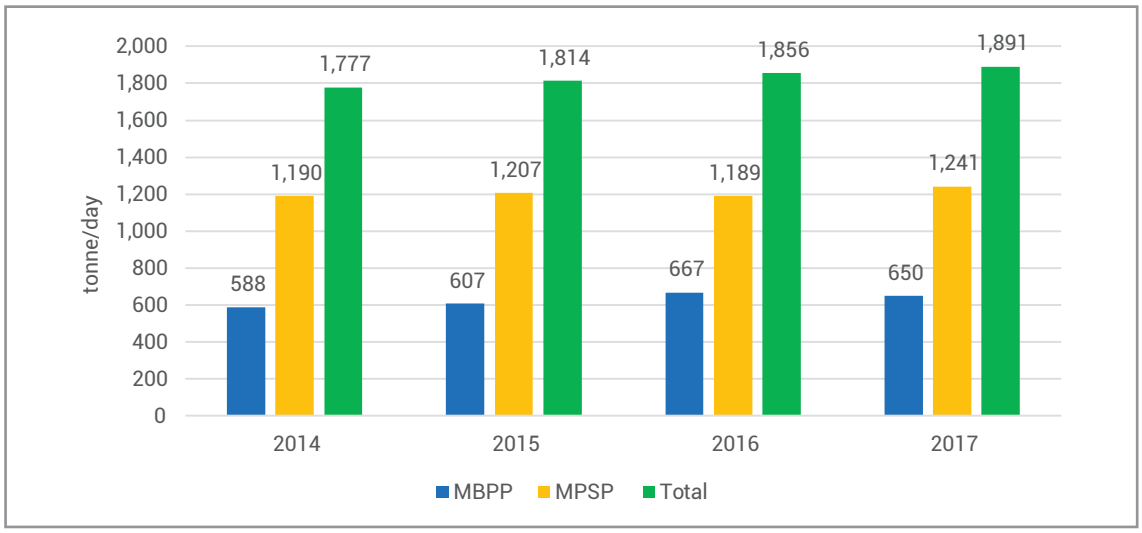
Municipal solid waste (MSW) consists of all types of solid waste generated by households and commercial establishments. Wastes that come from households and public areas, including residential buildings, litter bins, streets, marine areas, and parks, are known as domestic solid waste. Commercial solid waste comes from shops, restaurants, hotels, offices, and markets in private housing estates, while other waste which is produced by all industries, except construction, hazardous, or other special waste; would be classified as industrial solid waste (Kadir and Abidin, 2016).

In Penang, MSW is commonly disposed of through landfills. However, this method is not sustainable and introduces other environmental problems such as surface and groundwater pollution; soil contamination; air pollution through burning of wastes; spreading of diseases by different vectors like birds, insects, and rodents, odour in landfills; and uncontrolled release of methane (Samsudina and Don, 2013).

4.2.1 Solid waste disposal and recycling

In 2017, the total waste disposed at Penang's landfills in Penang was 1,891.2 metric tons per day (650 metric tons on Penang Island and 1,241.2 metric tons in Seberang Perai), an increase of 1.9% over 2016. The growth rate of total solid waste disposal remained steady over the last four years (Figure 4.2). With a population of about 1.7 million in 2017, the disposal rate of domestic waste was 0.8 kg per capita per day, compared to 0.7 kg per capita per day in 2016. The relatively stable domestic waste disposal rate in recent years reveals that the growth in domestic waste has generally been in line with population growth. In addition, rising domestic waste correlates with consumption activities.

Figure 4.2 Waste disposed at landfills in Penang, 2014–17



Source: Penang Island City Council (MBPP) and Seberang Perai Municipal Council (MPSP).

Based on a waste characterisation study conducted by USM in June 2014, the composition of MSW at the Pulau Burung landfill indicated that food waste accounts for about 40% of overall waste, followed by plastic-based waste (22.8%) and papers (13.4%) (USM, 2014). In Penang, hotels are the main generators of food waste (Khor, 2016). Food waste or decomposable waste has a high water content, resulting in high proportions of moisture in the waste. In addition, food waste disposed in municipal sanitary landfills would release greenhouse gasses, causing environmental and health problems due to high chemical oxygen demand (Kapoor et al., 2016).

Hence, strategies need to be applied to reduce, reuse, and recover waste. Food waste can be recycled into new products. For instance, some food waste can be used as low-cost feed stock for bioprocesses or to produce a high-value fertilizer. Penang has introduced different programmes and initiatives to reduce the amount of food waste sent to the landfill. In 2011, a food composting programme introduced Bio-Regen food waste machines to convert food waste into bio-liquid soil enhancers; Penang is the only state in Malaysia with this technology. In addition, the Penang State Food Waste Challenge Incentive Programme was introduced in 2017 to incentivise hotels and factories to install a proper food waste management system. The campaign "Makan Sampai Habis" was also launched to educate people about the importance of minimising food wastage.

Rapid economic development and population growth, changing consumption habits, insufficient infrastructure and expertise, and land scarcity make the management of MSW become one of the most critical environmental issues in Penang. Integrated waste management would help reduce harm to the environment. This includes waste reduction methods to achieve maximum economic and environmental return, such as recycling, reusing, and composting. This would help save space at the landfill while reducing the tipping fee. Since 1993, different recycling programmes were launched in Penang to reduce the volume of solid waste sent to the landfill, such as a recycling campaign and waste separation at the source. There are about 49 recycling agents registered with the Penang Island City Council (MBPP) and 42 unregistered recycling agents on the Penang Island. As presented in Table 4.5, the quantity of recycled waste in 2017 was 445,452.7 metric tons, an increase of 9% compared to 2016. In 2017, the overall recycling rate was about 39.2%, an increase of 1.6% from 37.6% in 2016. Records from the Seberang Perai Municipal Council (MPSP) show that 86% of recycled items, based on weight, comprise paper products, followed by construction waste (5.9%) (Figure 4.3). Paper products also make up the major recycled items on the island (62.5%), followed by plastic (26.3%)[30].

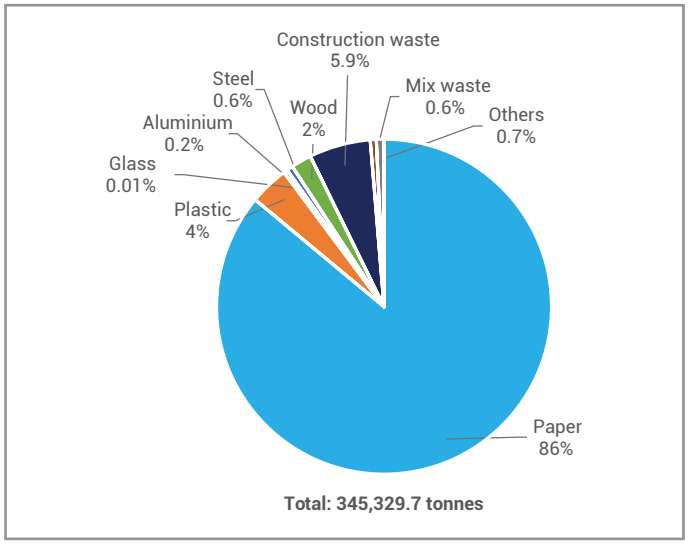
Table 4.5 Total waste generation in Penang, 2014–17

	Waste disposed at landfill (metric tons)			Recycling (metric tons)			Total waste generation (metric tons)	Recycling rate (%)
	MBPP	MPSP	Total	MBPP	MPSP	Total		
2014	214,609.0	434,175.0	648,784.0	80,233.4	233,791.0	314,024.4	962,808.4	32.62
2015	221,576.0	440,460.0	662,036.0	84,100.0	289,259.0	373,359.0	1,035,395.0	36.06
2016	243,563.4	434,008.5	677,571.9	86,464.0	322,189.5	408,653.5	1,086,225.4	37.62
2017	237,239.9	453,035.2	690,275.1	100,123.0	345,329.7	445,452.7	1,135,727.7	39.22

Source: Penang Island City Council (MBPP) and Seberang Perai Municipal Council (MPSP).

[30] Considerable amounts of waste were unaccounted for, and several specific items are not included in the statistics on the composition of solid waste on the island.

Figure 4.3 Composition by weight of recycled items for MPSP, 2017

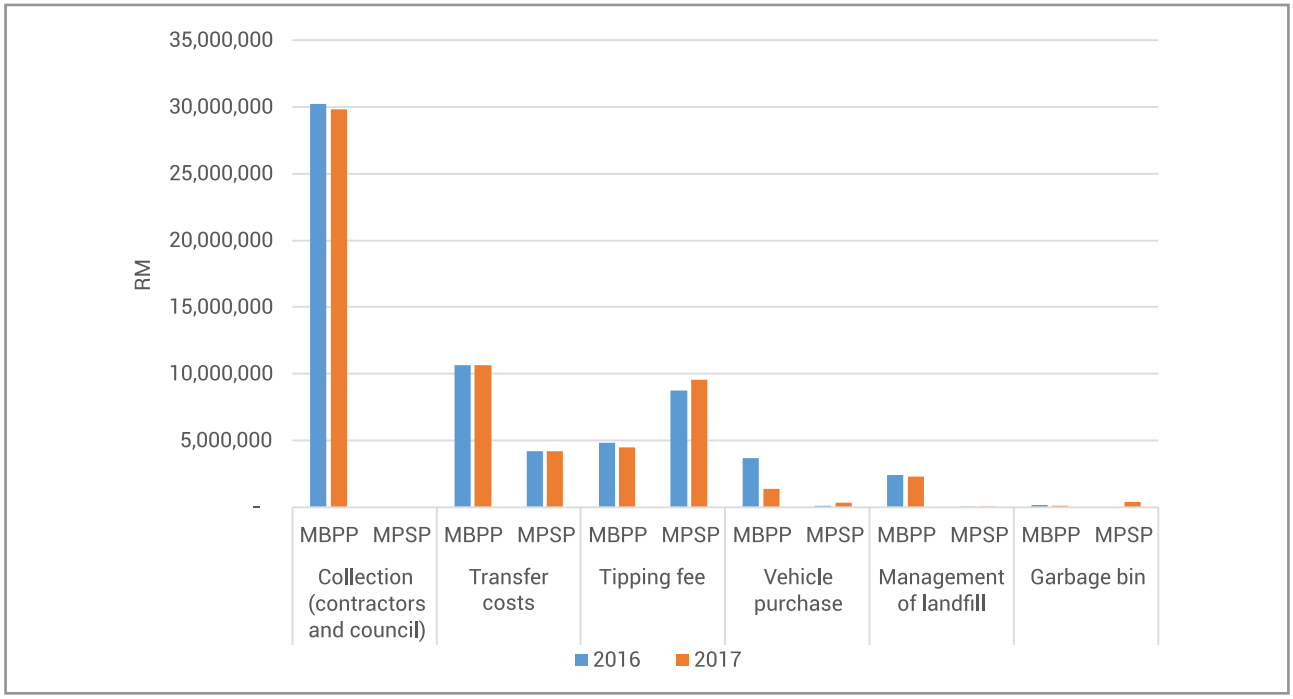


Source: Seberang Perai Municipal Council (MPSP).

4.2.2 Solid waste management costs

In 2017, solid waste management (SWM) cost recorded by MPSP and MBPP was about RM17.3 million and RM48.9 million respectively, covering collection, transport, tipping fee, management of landfill, garbage bins, land rental, and vehicle purchase costs. Nearly half of SWM costs is accounted for by the cost of collection (Figure 4.4). Separating waste into categories such as recyclable and non-recyclable wastes can increase the collection value and reduce the collection frequency and, therefore, the collection cost. The total SWM cost in Penang decreased by about 1.8% (RM66.2 million) in 2017 compared to 2016 (RM67.4 million), mainly due to a reduction in the purchase of vehicles.

Figure 4.4 Solid waste management (SWM) costs incurred by MBPP and MPSP, 2016–17



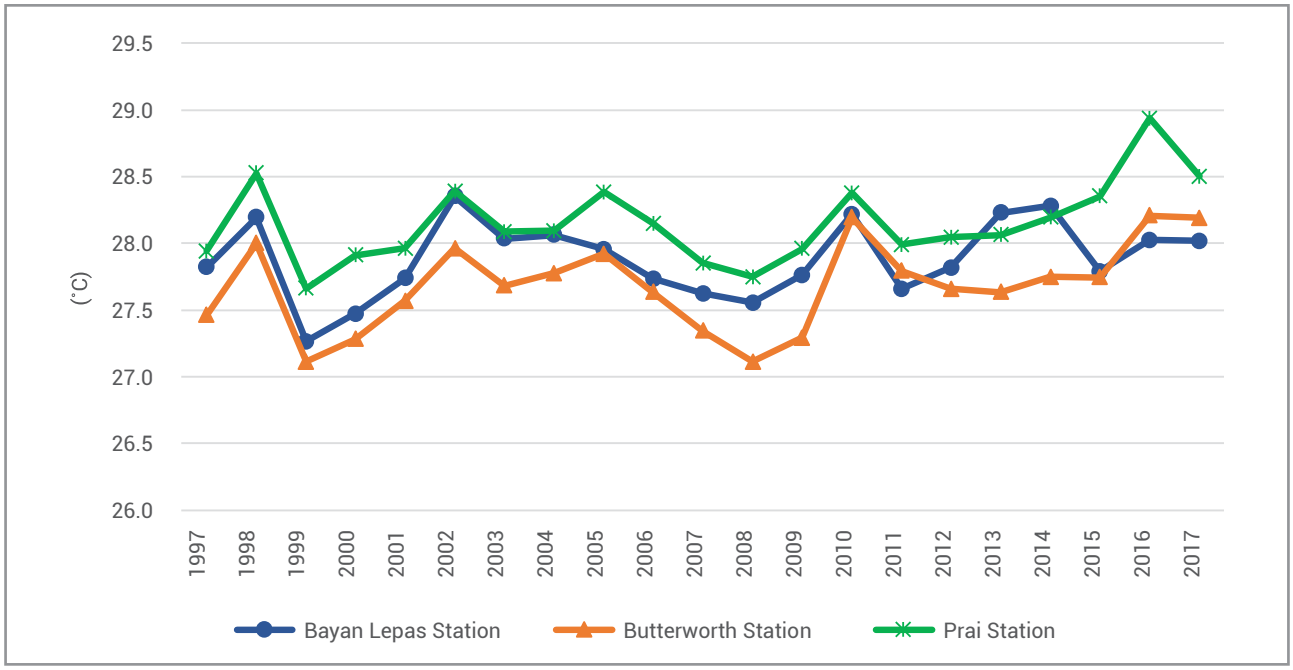
Note: The MPSP took over the services of private contractor waste collectors in 2013. The council waste collection cost data for MPSP is not available.
Source: Penang Island City Council (MBPP) and Seberang Perai Municipal Council (MPSP).

4.3 Climate change

The main cause of global warming and climate change is greenhouse gas pollution or carbon emissions, which are mainly derived from energy consumption, transportation systems, and waste decomposition. Penang is already facing many challenges caused or worsened by climate change, such as floods caused by extreme events and increased fish mortality as a result of higher water temperatures. Previous studies indicate that climate change will change rainfall patterns, increase temperatures, raise the sea level, increase soil salinity, change the level of soil moisture, and increase the severity and frequency of extreme weather events (Ercan et al., 2013; Kwan et al., 2013). These changes will pose risks to the economy, environment, and human basic needs such as food, water, health, and shelter (Vaghefi et al., 2016; Anang et al., 2017).

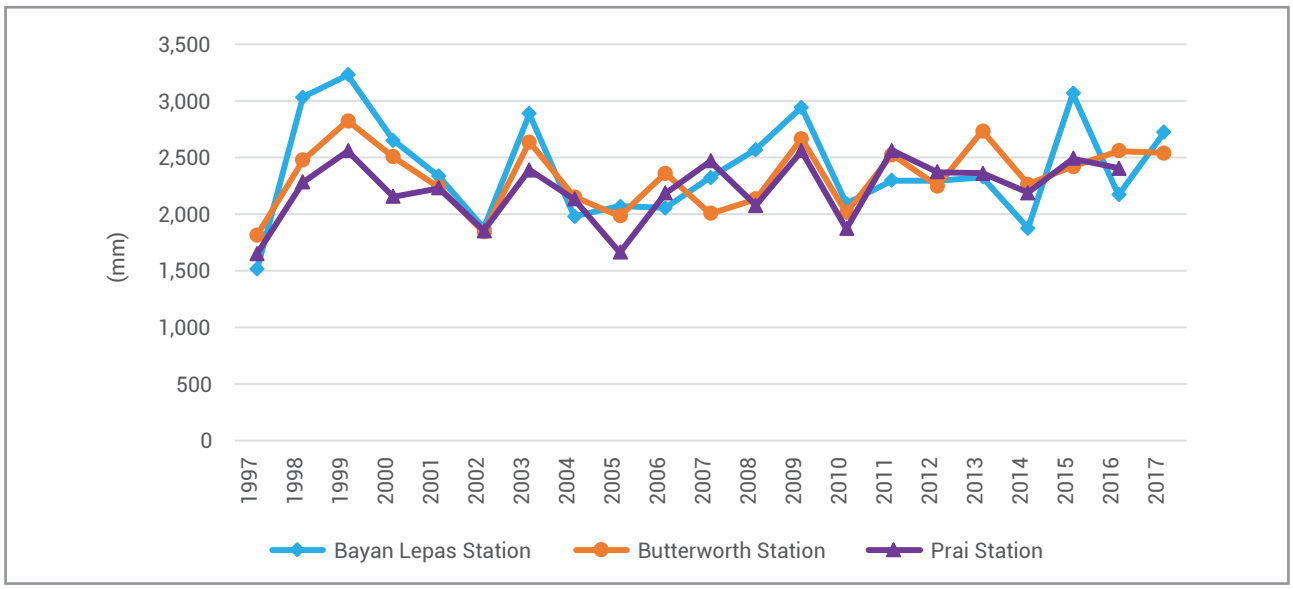
Rainfall and temperature are major parameters that determine the climatic conditions of a region. The historical data from three weather stations in Penang indicate that, over the past 20 years, the average temperature in Penang has increased by 0.09˚C per year, with the mainland experiencing higher average temperatures than the island (Figure 4.5). This is most likely due to the increase in greenhouse gas concentrations. Growing industrialisation and the increasing use of fossil fuels are affecting regional and global temperatures, which in turn influence overall rainfall patterns. Figure 4.6 shows the long-term variation in rainfall trends in Penang. On average, an annual rainfall of 2,633 mm was recorded for Penang in 2017, 253.2 mm more than 2016. In 2017, the driest weather was in February when an average of about 73 mm of rainfall occurred, while the wettest weather was recorded in September with an average rainfall of about 475 mm.

Figure 4.5 The average annual temperature in Penang, 1997–2017



Source: Malaysian Meteorological Department.

Figure 4.6 The average annual rainfall in Penang, 1997–2017



Note: Data for 2017 are not available for Prai Station.
Source: Malaysian Meteorological Department.

Extreme events, such as droughts and flooding, are increasingly linked to global warming and climate change. It is possible that, in a warmer climate, heavy rainfall will increase and be produced by fewer more extreme events. This may cause longer dry spells and a higher risk of flooding (Pohl et al., 2017). For instance, unpredictable weather patterns, coupled with unusually heavy rainfall in November 2017, resulted in one of the worst floods in Penang's history. The average rainfall from five rainfall stations in Penang on 4 and 5 November alone was 278 mm; however, the average rainfall in the month of November 2017 was about 450 mm. A total of 159 areas were affected by the floods, 68 of which had never been flooded before. It should be noted that most of the areas affected were in the Barat Daya and Timur Laut districts (Table 4.6). According to the Penang Social Welfare Department, 7,498 flood victims from 1,728 families were housed in 61 relief centres. Seberang Perai Utara was the worst-hit flood area with 4,549 victims as of 6 November 2017.

The November floods had a major impact on the agricultural and fisheries sectors. In the crops sub-sector, 2,626 farmers and 3,464.4 hectares of agricultural land were affected by the floods. Paddy fields were affected the most since they are usually located in low-lying areas. As reported by the Department of Agriculture of Penang, total economic losses caused by floods to the crop sub-sector were estimated to be about RM5.7 million. Furthermore, according to the Department of Fisheries, a total of 164 culturists and inland fishermen were affected by typhoon and floods. About 149 ponds, 135 tanks, and 4,415 cages were damaged. The fisheries sector suffered a total loss of about RM57.5 million.

Table 4.6 Flood hotspots and their corresponding rainfall amounts by district on 4–5 November 2017 in Penang

	Timur Laut	Barat Daya	Seberang Perai Utara	Seberang Perai Tengah	Seberang Perai Selatan
Number of affected areas	41	43	35	35	5
Rainfall (mm/15 hours)*	289	237	372	327	165

*Note: *The rainfall data is gathered from five rainfall stations including Sungai Pinang Station at Jalan P. Ramli, Taliar Besar Sungai Pinang Station, Pajak Song Station, Cherok Tok Kun Station, and Simpang Empat Station.*
Source: Department of Irrigation and Drainage, Penang.

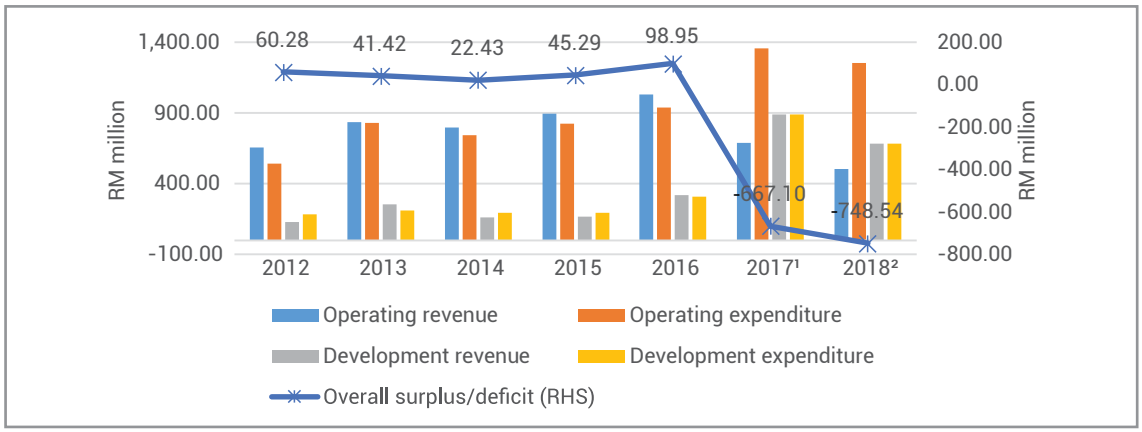
5 State Financial Performance

5.1 Financial position

The Penang state government continues to enhance the economy of Penang through entrepreneurial and welfare thrusts that promote 3Ps partnership – public sector, private sector, and people – in most economic and social development projects. The concept of the competency, accountability and transparency (CAT) governance remains as the state's charter to further elevate the performance of its public services. The government is also committed to allocating effective provisions for various socio-economic development projects that synergise pro-job, pro-growth, and pro-poor for the well-being of the people of Penang.

Based on the actual financial statement, the state government registered a surplus of more than double at RM99 million in 2016 compared to RM45.3 million in 2015, making it the largest increase since 2012 (Figure 5.1). In 2017, the fiscal deficit was estimated to be RM667.1 million. However, compared to the 2016 budget, this deficit would be a massive rise of 128.4% from RM292 million in 2016. Looking at the Penang's financial history, the state government has had actual fiscal surpluses since 2008 – except for 2010 – despite having a fiscal deficit budgeted every year.

Figure 5.1 Penang state financial position, 2012–18



Notes: 1 Revised estimate.
2 Budget estimate.
Source: Penang State Financial Statements, 2012–16 and Penang State Budgets, 2017–18.

In 2017, total revenue increased by an estimated 16.9%, primarily attributed to a significant increase in development revenue. The operating revenue was expected to record a negative growth rate of 33.3%, with a larger decrease in non-revenue receipts – comprising returned expenditure and receipts from federal government agencies – and a 22.6% decline in non-tax revenue, including receipts from goods sold, licenses and permits, and dividends. In contrast, development revenue was budgeted to increase to RM887.4 million in 2017, up from RM317.2 million in 2016, with a threefold increase in transfers from the operating expenditure account to RM790 million in 2017.

The total expenditure for 2017 was also estimated to increase considerably by nearly 80%, from RM1.25 billion in 2016 to RM2.24 billion in 2017 (Table 5.1). The allocation for development expenditure increased significantly to RM887.4 million, which accounted for nearly 40% of the total state expenditure in 2017. Although the operating expenditure was estimated to increase at 44% in 2017, its share decreased significantly to about 60%, signifying a balanced budget while advancing public sector operations effectively.

The state government has allocated significant funding to development projects such as the upgrading of water treatment plants and catchment areas by the Penang Water Authority (PBAPP), and infrastructure development in Seberang Perai area by PDC. Other major projects include road expansion projects, flood mitigation projects, telecommunication upgrades through smart applications, affordable housing, human capital through education, and others[31].

5.2 Revenue

State revenue consists of operating revenue and development revenue. According to the 2017 Penang state budget, RM1.6 billion in estimated revenue is to be collected in 2017, reflecting an increase of about 17% from the actual state revenue in 2016 (Table 5.2). Of this, development revenue made up about 56% of the state revenue collection and the remaining 44% accounted for operating revenue.

Table 5.1 Penang state finance position, 2016–18

	RM million			Change (%)		
	2016	2017*	2018**	2016	2017*	2018**
Operating revenue	1,029.85	687.41	503.76	*14.7*	*-33.3*	*-26.7*
Operating expenditure	940.63	1,354.51	1,252.30	*13.9*	*44.0*	*-7.6*
Operating balance	**89.22**	**-667.10**	**-748.54**	-	-	-
Development revenue	317.19	887.44	684.97	*88.4*	*179.8*	*-22.8*
Development expenditure	307.46	887.44	684.97	*57.8*	*188.6*	*-22.8*
Development balance	**9.73**	**0.00**	**0.00**	-	-	-
Total revenue	1,347.04	1,574.85	1,188.74	*26.4*	*16.9*	*-24.5*
Total expenditure	1,248.09	2,241.95	1,937.28	*22.3*	*79.6*	*-13.6*
Overall balance	**98.95**	**-667.10**	**-748.54**	-	-	-

*Notes: * Revised estimate.*
*** Budget estimate.*
Source: Penang State Financial Statement, 2016 and Penang State Budgets, 2017–18.

[31] Penang State Government (2017), Penang Budget Speech 2017. Retrieved from https://www.penang.gov.my/dmedia/359629-bajet-tahun-2017-negeri-pulau-pinang

Table 5.2 Breakdown of state government revenue, 2016–18

	RM million			Change (%)			Share (%)		
	2016	2017*	2018**	2016	2017*	2018**	2016	2017*	2018**
Operating revenue	1,029.85	687.41	503.76	*14.7*	*14.7*	*-26.7*	*76.5*	*43.6*	*42.4*
Development revenue	317.19	887.44	684.97	*88.4*	*88.4*	*-22.8*	*23.5*	*56.4*	*57.6*
Total revenue	**1,347.04**	**1,574.85**	**1,188.74**	***26.4***	***26.4***	***-24.5***	***100.0***	***100.0***	***100.0***

*Notes: * Revised estimate.*
*** Budget estimate.*
Source: Penang State Financial Statement, 2016 and Penang State Budget, 2018.

In terms of growth rates, revenue for development purposes was estimated to more than double the development revenue collected in 2016. This is primarily attributed to the increase in estimated transfers disbursed from operating expenditure, which was a more than threefold increase from RM245 million in 2016 to RM790 million in 2017. In contrast, operating revenue collection was anticipated to decline by 33.3% to RM687.4 million in 2017.

Operating revenue

Operating revenue comprises tax revenue, non-tax revenue, and non-revenue receipt. With RM687.4 million in revenue budgeted in 2017, non-tax revenue made up the largest share of total operating revenue collection in Penang (65.3%), followed by tax revenue (20.2%) and non-revenue receipt (14.5%).

Non-tax revenue remains the main source of state government revenue. It was projected to decrease 22.6% to RM448.9 million in 2017 (2016: -2%; RM579.8 million). As can be seen in Table 5.3, receipts from goods sold, constituting the largest share of total state revenue (39.8%), was estimated to decrease considerably by nearly 30% to RM273.4 million in 2017 (2016: -7.6%; RM388.8 million). While the collection of special land ownership remains to contribute most of the non-tax revenue, the collection was expected to shrink by nearly 28% to RM205 million in 2017 (2016: RM284.5 million). Services payment receipts were estimated to make the second-largest share of non-tax revenue, with a positive growth rate of 7.8% in 2017. This was partly due to the increase in the collection of land transfer registration fee from RM32.2 million in 2016 to RM41.4 million in 2017.

Meanwhile, the share of estimated investment income increased to 9.2% in 2017 (2016: 6.9%). This component, however, was estimated to decrease by 10.9% to RM63 million in 2017, largely to the result of a decrease in interest earned from fixed deposits. Likewise, licenses and permits were estimated to decrease by 17% to about RM11 million in 2017 (2016: RM13.2 million). Nonetheless, the reduction in estimated non-tax revenue is also underpinned by continued efforts made by the state government in collecting fines and penalties. This had been projected to increase by 11.5% to RM7.4 million in 2017 (2016: RM6.6 million), representing the smallest share in non-tax revenue. This is because of an increase in back debt revenue collection as a result of late payments made for quit rent, drainage, and irrigation tax, with the value doubling to RM4.8

Table 5.3 State government operating revenue, 2016–18

	RM million			Change (%)			Share (%)		
	2016	2017*	2018**	2016	2017*	2018**	2016	2017*	2018**
Tax revenue	**133.11**	**138.94**	**134.77**	***3.3***	***4.4***	***-3.0***	***12.9***	***20.2***	***26.8***
Direct tax	117.61	121.94	118.77	*2.6*	*3.7*	*-2.6*	*11.4*	*17.7*	*23.6*
Indirect tax	15.50	17.00	16.00	*8.7*	*9.7*	*-5.9*	*1.5*	*2.5*	*3.2*
Non-tax revenue	**579.80**	**448.93**	**273.64**	***-2.0***	***-22.6***	***-39.0***	***56.3***	***65.3***	***54.3***
Licenses and permits	13.23	10.97	14.35	*15.5*	*-17.0*	*30.7*	*1.3*	*1.6*	*2.8*
Service payments	80.09	86.31	80.99	*-2.3*	*7.8*	*-6.2*	*7.8*	*12.6*	*16.1*
Receipts from goods sold	388.83	273.42	103.63	*-7.6*	*-29.7*	*-62.1*	*37.8*	*39.8*	*20.6*
Rentals	7.96	7.89	7.08	*7.2*	*-1.0*	*-10.2*	*0.8*	*1.1*	*1.4*
Investment income	70.62	62.94	60.35	*7.9*	*-10.9*	*-4.1*	*6.9*	*9.2*	*12.0*
Fines and penalties	6.63	7.40	7.25	*40.0*	*11.5*	*-2.0*	*0.6*	*1.1*	*1.4*
Local contributions	12.44	0.00	0.01	*-*	*-100.0*	*245.8*	*1.2*	*0.0*	*0.0*
Non-revenue receipts	**316.93**	**99.54**	**95.35**	***79.1***	***-68.6***	***-4.2***	***30.8***	***14.5***	***18.9***
Returned expenditure	42.35	2.04	0.34	*245.0*	*-95.2*	*-83.4*	*4.1*	*0.3*	*0.1*
Receipt from federal government agencies	274.58	97.50	95.01	*66.7*	*-64.5*	*-2.6*	*26.7*	*14.2*	*18.9*
Total operating revenue	**1,029.85**	**687.41**	**503.76**	***14.7***	***-33.3***	***-26.7***	***100.0***	***100.0***	***100.0***

*Notes: * Revised estimate.*
*** Budget estimate.*
Source: Penang State Budgets, 2017 and 2018.

Tax revenue collection is the second-largest component in state revenue, accounting for about 20% of the total state revenue, with an estimated growth rate of 4.4% in 2017. Tax revenue collection at the state level is limited to quit rent, arrears, irrigation, drainage, and entertainment. A large proportion of the projected RM139 million in tax revenue collected is made up of direct tax – predominantly quit rent – which constitutes about 88% of the collection, followed by indirect tax – namely entertainment duties (12.2%) (Table 5.3). Tax collection from quit rent and entertainment activities – largely through cinemas in the state – were expected to increase in 2017 at 3.4% and 9.7%, respectively, in 2017, both growing at a faster rate than in 2016. In particular, quit rent constitutes RM120.8 million while entertainment levies are RM17 million.

Within operating revenue, non-revenue receipts make up the smallest chunk in state revenue, covering only two sub-components: returned receipts from the expenditure account and receipts from federal government agencies. With a total of RM99.5 million, the latter consistently leads in non-revenue receipts, comprising 98%, while the former accounts for the remaining 2%. However, non-revenue receipts were estimated to decelerate substantially at about 69% in 2017 due to lower receipts in returned expenditure and federal government funding (Table 5.3). Specifically, the receipts received from the federal government is expected to include receipts based on population size (RM25 million), 10% service charge on federal projects (RM20 million), receipts to support 50% of operating expenditure of government offices (RM30 million), and other receipts (RM10 million) given for state road repairs, the state museum, and the state library, to name a few. Despite Penang being one of the country's major economic drivers, it received the third-lowest funding from the federal government, trailing Perlis and Malacca.

[32] The local contribution has been made available since 2015. This comes in the form of donations to the state government from companies, voluntary organisations, and individuals. The figures vary over the years. For instance, about RM71,529 was received in 2015, which then increased to RM12.4 million in 2016. This contribution is estimated to decline to RM7,020 in 2018. The large variation was mainly due to the inconsistent contributions from the companies.

Development revenue

Development revenue is basically collected from three main sources: state source, federal loans, and federal grants. In 2017, the total development revenue was estimated to more than double to RM887.4 million, from RM317.2 million in 2016 (Table 5.4). State source remains the key contributor to the development income, which was estimated to represent 98.5% of the total development income, followed by federal grants – given based on overall state economic development (1.5%) – consistently set at RM13.5 million per year since 2012.

The state source is mainly driven by the contribution transferred from operating expenditure, with an increase of more than threefold to RM790 million in 2017 – a historic high made to the development fund. Apart from this, the state was also estimated to collect revenue from development projects, such as the selling of raw water valued at RM20.5 million. Others include recoveries of loans from MPSP, PBAPP, and PDC worth about RM8.9 million; and lastly through the selling or collecting of rentals of low-cost houses (RM2.5 million). In addition, about 6% of the total estimated development income were left over from the estimated development budget in 2016, which recorded as much as RM52 million.

The Penang state government has not borrowed funds from the federal government since 2015 (Figure 5.2), indicating that Penang is a financially self-sufficient state with high levels of efficiency in its financial management. Similarly, the state government did not apply for loans from the federal government for the 2017 financial year. According to the 2016 Auditor-General's Report, Penang had zero loan arrears to the federal government, while Pahang and Kedah had the highest amounts of loan arrears in Malaysia[33].

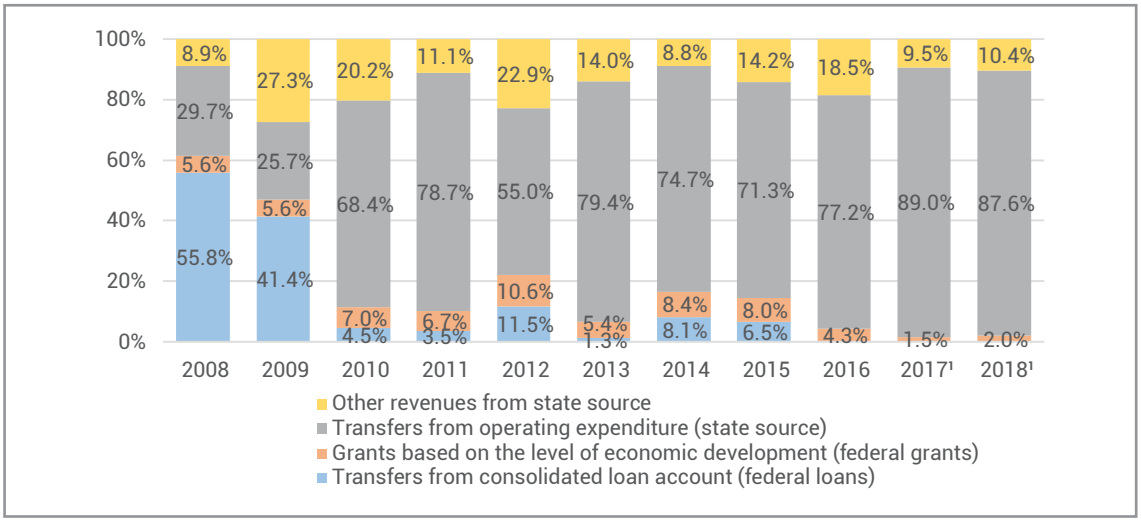
Table 5.4 Sources of development revenue, 2016–18

Sources of estimated income	RM million			% Change			% Share		
	2016	2017*	2018**	2016	2017*	2018**	2016	2017*	2018**
Federal loans	-	0.00	0.00	-	-	*0.0*	-	*0.0*	*0.0*
Federal grants based on economic development, infrastructure and security of life stage	13.52	13.52	13.52	*0.0*	*0.0*	*0.0*	*4.3*	*1.5*	*2.0*
State source	***303.67***	***873.92***	***671.46***	***115.8***	***187.8***	***-23.2***	***95.7***	***98.5***	***98.0***
Contribution to development fund (transferred from operating expenditure)	245.00	790.00	600.00	*104.2*	*222.4*	*-24.1*	*77.2*	*89.0*	*87.6*
Sale/rent-to-own of low-cost houses	2.63	2.50	2.50	*-9.1*	*-4.9*	*0.0*	*0.8*	*0.3*	*0.4*
Loan recoveries (PBAPP, MPSP, PDC)	6.64	8.86	10.06	*17.7*	*33.6*	*13.5*	*2.1*	*1.0*	*1.5*
Lease receipts (rental paid by PBAPP)	19.41	-	-	*59.1*	-	-	*6.1*	-	-
Transfers from trust fund	30.00	-	-	-	-	-	*9.5*	-	-
Raw water fee	-	20.50	20.00	-	-	*-2.4*	-	*2.3*	*2.9*
Remaining allocation from development fund	-	52.06	38.90	-	-	*-25.3*	-	*5.9*	*5.7*
Total development revenue	**317.19**	**887.44**	**684.97**	***92.0***	***179.8***	***-22.8***	***100.0***	***100.0***	***100.0***

*Notes: * Revised estimate.*
*** Budget estimate.*
Source: Penang State Financial Statement, 2016 and Penang State Budgets, 2017 and 2018.

[33] Debt to federal government: Penang, Selangor owe the least (2017, July 31). Free Malaysia Today. Retrieved from http://www.freemalaysiatoday.com/category/nation/2017/07/31/debt-to-federal-govt-penang-selangor-owe-the-least/

Figure 5.2 Share of the sources of development revenue, 2008–18



Note: [1] Budget estimate.
Source: Penang State Financial Statements, 2008–16 and Penang State Budgets, 2017–18.

5.3 Expenditure

State expenditure consists of operating and development expenditure. In 2017, it was estimated that the total state expenditure would increase by approximately 80%, nearly tripling the development expenditure in 2016 (Table 5.5). While growing at a slower pace than development expenditure, a significant portion of operating expenditure was anticipated to transfer to the development funds as part of development income. After subtracting the contribution to development funds from operating expenditure, it is found that the total operating expenditure decrease by an estimated 18.8% to RM564.5 million in 2017, down from RM695.6 million in 2016.

In addition, the Penang state government also aims to balance its allocation on infrastructure development and operation expenses. As can be seen in Table 5.5, the share of operating expenditure was expected to decrease significantly from 69.3% in 2016 to about 39% in 2017, while the share of development expenditure was estimated to vastly increase from 30.7% in 2016 to 61.1% in 2017. In comparison to the federal fiscal budget, the ratio of development to operating expenditure was 18:82 – where only 18% of the budget was allocated for development purposes, while operating expenditure accounted for the remaining 82% in 2017.

Table 5.5 Breakdown of state expenditure, 2016–18

	RM million			% Change			% Share		
	2016	2017*	2018**	2016	2017*	2018**	2016	2017*	2018**
Operating expenditure	940.63	1,354.51	1,252.30	*13.9*	*44.0*	*-7.6*	*75.4*	*60.4*	*64.6*
Development expenditure	307.46	887.44	684.97	*57.8*	*188.6*	*-22.8*	*24.6*	*39.6*	*35.4*
Total expenditure	**1,248.09**	**2,241.95**	**1,937.28**	***22.3***	***79.6***	***-13.6***	***100.0***	***100.0***	***100.0***
Contribution to development funds	245.00	790.00	600.00	*104.2*	*222.4*	*-24.1*	-	-	-
Operating expenditure (exclude the contribution to development funds)	695.63	564.51	652.30	*-1.5*	*-18.8*	*15.6*	*69.3*	*38.9*	*48.8*
Development expenditure	307.46	887.44	684.97	*57.8*	*188.6*	*-22.8*	*30.7*	*61.1*	*51.2*
Total expenditure (exclude contribution to development funds)	**1,003.09**	**1,451.95**	**1,337.28**	***11.4***	***44.7***	***-7.9***	***100.0***	***100.0***	***100.0***

*Notes: * Revised estimate.*
*** Budget estimate.*
Source: Penang State Financial Statement, 2016 and Penang State Budget, 2018.

Operating expenditure

Operating expenditure consists of three main components: emoluments, supplies and services, and fixed contributions – which makes up a total of over 90% of the total operating expenditure in 2017. Asset acquisition and other miscellaneous expenditure stood only at 1.5% and 1%, respectively. Operating expenditure was projected to decrease by 18.8% to RM565 million in 2017 due to a significant decrease in fixed contributions, after removing the contributions allocated to development funds.

Fixed contributions, accounting for nearly 40% of total operating expenditure, was estimated to have a negative growth rate of 42.9% from RM393 million in 2016 to RM225 million in 2017. About 78% or RM175.4 million were allocated to the State Finance Department, which would largely be disbursed as state grants. Meanwhile, about 18% of the total fixed contributions were undertaken by the Chief Minister's Office and State Secretariat amounting to about RM41 million in 2017, which encompassed state grants and include contributions made to the state library, state museum, and state sport council. Furthermore, the Chief Minister's Office and State Secretariat also disbursed scholarship, tuition fee assistance, and rewards standing at RM2.7 million in 2017. The State Welfare Department, State Mufti Office, and State Irrigation and Drainage Department were several of the recipients under this component.

Table 5.6 Operating expenditure, 2016–18

	RM million			% Change			% Share		
	2016	2017*	2018**	2016	2017*	2018**	2016	2017*	2018**
Emoluments	158.60	175.95	176.96	*11.0*	*10.9*	*0.6*	*22.8*	*31.2*	*27.1*
Supplies and services	135.13	149.67	158.54	*8.1*	*10.8*	*5.9*	*19.4*	*26.5*	*24.3*
Asset acquisitions	6.06	8.44	8.60	*-10.9*	*39.2*	*1.9*	*0.9*	*1.5*	*1.3*
Fixed contributions and charges/ payments (exclude contributions to development funds)	392.90	224.54	302.01	*-7.3*	*-42.9*	*34.5*	*56.5*	*39.8*	*46.3*
Other expenditures	2.94	5.91	6.19	*-61.1*	*101.1*	*4.7*	*0.4*	*1.0*	*0.9*
Total operating expenditure	**695.63**	**564.51**	**652.30**	***-1.5***	***-18.8***	***15.6***	***100.0***	***100.0***	***100.0***

*Notes: * Revised estimate.*
*** Budget estimate.*
Source: Penang State Financial Statement, 2016 and Penang State Budget, 2018.

Emoluments made up the second-largest share of the operating expenditure in 2017. Though a lower operating expenditure was tabled, the share of emoluments is expected to increase from 22.8% to 31.2%. This could be due to annual salary revisions resulting a bigger budget being tabled for emoluments. This is also an increase of 10.9% to RM176 million in 2017, up from RM159 million in 2016.

With the exception of the State Finance Department, all state departments were expected to expand in emoluments, with the Penang Veterinary Services and Penang Botanical Gardens having the largest growth rates of 25.8% and 24.2%, respectively. However, the Chief Minister's Office and State Secretariat still took up the largest share of the total emoluments (25.0%), followed by the State Public Works Department (17.2%), State Irrigation and Drainage Department (9.5%), and State Religious Office (7.6%) – which added to nearly 60% of total emoluments in 2017.

Supplies and services, which represented 26.5% of the total operating expenditure, were forecast to increase by 10.8% to RM150 million in 2017, up from RM135 million in 2016. This includes payments made to professional services, travelling and lodging, communication and utility, rentals and so forth. Out of RM150 million, the Chief Minister's Office and State Secretariat occupied the largest share of supplies and services of 45.2% due to the expenses made by the State Information and Communication Technology Division and State Legislative Office, which accounted for RM11.5 million and RM7.1 million, respectively. The biggest portion of expenses for supplies and services in the State Information and Communication Technology Division was made by rental and maintenance, whereas the latter had its largest share spent on professional services and hospitality. Meanwhile, the State Irrigation and Drainage Department and State Finance Department took up the second- and third-largest shares of total supplies and services in 2017, which made up 14.2% and 13.8%, respectively.

While the amount of asset acquisitions and other expenditure was projected to almost double compared to the previous year, these constituted only a small share of 2.5% in 2017.

Development expenditure

The development budget is disbursed based on the approved development projects, which are carried out by the responsible state development. The Chief Minister's Office and State Secretariat, State Finance Office, State Public Works Department and State Irrigation and Drainage Department made up about 98% of the entire development expenditure in 2017, reflecting the importance of these state departments towards development in the state. In contrast, the Penang Botanical Gardens and the State Forestry Department received the smallest development allocation of RM310,000 and RM1.9 million, respectively in 2017.

With RM887.4 million budgeted for development expenditure, nearly 80% of the estimated expenditure was being undertaken by the Chief Minister's Office and State Secretariat in 2017 (Table 5.7). This would be more than five times higher than the actual development expenditure in the previous year, with 86% being allocated to the PDC in the form of development loans. Water supply projects, land acquisition, and low-cost housing projects added up to another 10% of the department's expenses (Table 5.8).

The state government also recognises the importance of digital transformation in the public sector. RM6.7 million was disbursed by the Chief Minister's Office and State Secretariat for the development of a digital government in 2017, more than doubling the RM2.8 million recorded in 2016 (Table 5.8).

Table 5.7 Development expenditure by state department, 2016–18

State department	RM million			% Change			% Share		
	2016	2017*	2018*	2016	2017*	2018*	2016	2017*	2018*
Chief Minister's Office and State Secretariat	133.88	707.61	420.95	*99.3*	*428.5*	*-40.5*	*43.5*	*79.7*	*61.5*
Irrigation and Drainage	13.61	14.46	12.35	*2.6*	*6.2*	*-14.6*	*4.4*	*1.6*	*1.8*
Forestry	2.06	1.90	2.07	*12.5*	*-7.7*	*8.9*	*0.7*	*0.2*	*0.3*
Penang Botanical Gardens	0.57	0.31	0.81	*-63.5*	*-45.8*	*161.3*	*0.2*	*0.0*	*0.1*
Public Works	20.22	19.78	24.76	*1.5*	*-2.2*	*25.2*	*6.6*	*2.2*	*3.6*
Religious	8.04	8.55	12.71	*-3.8*	*6.4*	*48.7*	*2.6*	*1.0*	*1.9*
Finance	123.22	128.50	205.00	*60.2*	*4.3*	*59.5*	*40.1*	*14.5*	*29.9*
Veterinary Services	2.67	2.96	2.96	*-1.5*	*10.9*	*0.0*	*0.9*	*0.3*	*0.4*
Agriculture	3.18	3.37	3.37	*3.5*	*6.0*	*0.0*	*1.0*	*0.4*	*0.5*
Total development expenditure	**307.46**	**887.44**	**684.97**	***57.8***	***188.6***	***-22.8***	***100.0***	***100.0***	***100.0***

*Note: * Budget estimate.*
Source: Penang State Budget, 2018.

Table 5.8 Development expenditure by top four state development and selected development projects, 2016–18

	RM million			% Change			% Share		
	2016	2017*	2018*	2016	2017*	2018*	2016	2017*	2018*
Chief Minister's Office and State Secretariat	**133.88**	**707.61**	**420.95**	***99.3***	***428.5***	***-40.5***	***100.0***	***100.0***	***100.0***
Land acquisition	-	27.00	20.00	-	-	*-25.9*	-	*3.8*	*4.8*
Low-cost houses	10.45	12.49	13.84	*16.2*	*19.5*	*10.8*	*7.8*	*1.8*	*3.3*
Loans to PDC	70.00	609.00	300.00	-	*770.0*	*-50.7*	*52.3*	*86.1*	*71.3*
Water supply project	30.30	30.35	50.80	*116.4*	*0.2*	*67.4*	*22.6*	*4.3*	*12.1*
Penang Hill development	1.70	6.22	13.43	*-57.4*	*265.3*	*116.1*	*1.3*	*0.9*	*3.2*
Special economic projects	4.43	6.30	12.05	*-48.8*	*42.2*	*91.3*	*3.3*	*0.9*	*2.9*
Development of digital government	2.80	6.70	1.73	*300.5*	*139.0*	*-74.2*	*2.1*	*0.9*	*0.4*
State Finance Department	**123.22**	**128.50**	**205.00**	***60.2***	***4.3***	***59.5***	***100.0***	***100.0***	***100.0***
Development project/ special project by state authorities	107.95	110.00	186.50	*73.8*	*1.9*	*69.5*	*87.6*	*85.6*	*91.0*
Public Works Department	**20.22**	**19.78**	**24.76**	***1.5***	***-2.2***	***25.2***	***100.0***	***100.0***	***100.0***
Repair of bridges and state roads	13.87	7.64	6.98	*99.9*	*-44.9*	*-8.7*	*68.6*	*38.6*	*28.2*
State roads	1.83	4.93	9.97	*-70.7*	*168.6*	*102.4*	*9.1*	*24.9*	*40.3*
Repair and redesign state buildings	2.87	4.86	4.62	*-38.1*	*69.4*	*-5.1*	*14.2*	*24.6*	*18.6*
Department of Irrigation and Drainage	**13.61**	**14.46**	**12.35**	***2.6***	***6.2***	***-14.6***	***100.0***	***100.0***	***100.0***
Deepen and repair of rivers	3.13	4.55	4.35	*12.8*	*45.5*	*-4.4*	*23.0*	*31.5*	*35.2*
Flood mitigation	2.84	3.57	1.81	*-42.2*	*25.9*	*-49.4*	*20.8*	*24.7*	*14.6*

*Note: * Budget estimate.*
Source: Penang State Budget, 2018.

The State Finance Office constituted the second-largest share of development expenditure (14.5%), with an increase of 4.3% to RM128.5 million in 2017, up from RM123.2 million in 2016. This was mainly attributed to development projects, including special projects, approved by state authorities. It increased marginally by 1.9% to RM110 million in 2017 (Table 5.8). The Public Works Department followed with a RM19.8 million development budget, down by 2.2% over the previous year. The allocation would be disbursed specifically for the repairing of bridges and state roads, as well as the repairing and redesigning of state buildings, accounting for about 88% of total allocation in Public Works Department.

Under the Department of Irrigation and Drainage, the allocation for deepening and repairing rivers, and flood mitigation accounted for over RM8 million, or more than half of the department's development allocation. As there was a critical need to resolve flood-related matters, the state government increased the department's budget to deepen rivers and take flood mitigation measures by 45.5% to RM4.6 million and 25.9% to RM3.6 million, respectively.

5.4 Prospects for 2018

In 2018, the Penang state government continues to engage in various socio-economic development plans, and establish an innovative society through the state's economic catch-up plans in the areas of digital transformation and the fourth industrial revolution[34]. In relation to this, a larger fiscal deficit of RM748.5 million is expected to be recorded in 2018, accounting for about RM80 million more than the deficit budgeted for 2017. This is likely due to the fact that the slowdown in estimated revenue collection is outstripping the slowdown in estimated expenditure. Nonetheless, Penang state government has consistently recorded actual fiscal surpluses since 2008 except in 2010 owing to prudent spending.

Total revenue collection is forecast to decline by 24.5% to RM1.19 billion in 2018. In particular, operating revenue is estimated to decrease by 26.7% over 2017, with a significant reduction of nearly 40% in non-tax revenue – where receipts from goods sold is estimated to soften significantly due to the collection of special land ownership. Meanwhile, both tax revenue and non-revenue receipts are estimated to moderate by 3% and 4.2%, respectively, in 2018. The former is partly contributed to by a lower quit rent and entertainment tax collection, while the latter is attributed to a smaller contribution from operating expenditure account and receipts from federal government agencies.

Development revenue, on the other hand, is projected to reach RM685 million in 2018, down 22.8% from RM887 million in 2017 despite a marginal jump in its share of total revenue in 2018 (2017: 56.4%; 2018: 57.6%). The main source of development revenue is attributed substantially to the Penang state government, representing 98% of total development revenue, while only 2% is made up of grants from the federal government based on the level of economic development, infrastructure, and welfare of the people. A large share of the revenue is allocated from the transfer of the state operating expenditure account at RM600 million in 2018, which is a decrease of about 24% from the estimated 2017 budget.

Total expenditure is expected to decrease by 13.6% in 2018, with development expenditure (2018: -22.8%) shrinking at a faster rate compared to operating expenditure (2018: -7.6%). Though operating expenditure still makes up the largest share of total expenditure in 2018 (64.6%), the state government remains dedicated to allocating about 35% of total expenditure on welfare development projects. Unlike the previous federal government, as much as 83% of total expenditure has been budgeted for operational purposes and only 17% has been allocated for development projects in 2018.

In terms of operating expenditure, all categories are expected to grow positively in 2018 compared to 2017. Specifically, the component of fixed contributions – excluding the transfer to the development revenue account – is projected to expand at a rate of 34.5%, followed by supplies and services (5.9%), asset acquisition (1.9%), and emoluments (0.6%). In addition, the fixed contributions will remain the biggest expenses, representing about 46% of the entire operating expenditure, which include scholarships, educational aid, and grants.

Socio-economic development projects budgeted in 2018 include the provisions of: increasing the number of free bus services, upgrading public space, bicycle corridors, sport complexes, skills and human capital development, the Penang Art District, seed fund for upgrading Little India, Crush Aedes Totally (CAT), flood mitigation, and the Healthy Penang Programme, among others. Some of these initiatives would be a collaboration between public and private sectors such as a new sports complex, bike corridors, and an arts and culture street mall.

While many development initiatives have been budgeted in 2018, expenditure is estimated to record a fall of 22.8% to RM685 million in 2018 (2017: RM887 million). The largest cut is expected to be seen in the Chief Minister's Office and State Secretariat, with a negative growth rate of 40.5% in 2018, followed by the Department of Irrigation and Drainage (-14.6%). In Chief Minister's Office and State Secretariat, it is found that there will be a significant cut in loans allocated to the PDC, as well as allocations for digital development. Meanwhile, more allocations will be given to low-cost housing projects (RM13.8 million), water supply projects (RM50.8 million), Penang Hill development (RM13.4 million), and special economic projects (RM12.1 million).

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