Outlook and Policy in 2018

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THE INTERNATIONAL ECONOMIC OUTLOOK

Synchronous uptrend in growth for most major economies in 2018

The global economy is forecast to expand at a faster pace in 2018, building on the strong positive momentum from the previous year. Growth will be driven primarily by private consumption and further lifted by investment activity in the advanced economies. In Asia, trade activity will continue to expand, albeit at a more moderate pace compared to 2017. This outlook will be further lifted by policy support, both on the monetary and fiscal fronts. Although global monetary policy is likely to continue on a path of gradual normalisation, financing conditions should remain relatively accommodative. Furthermore, additional spending on infrastructure in economies such as Thailand, Korea and the Philippines should provide impetus to regional growth. Given the broadly positive outlook, the assessment is for the trajectory of the current expansion to be sustained.

The strength of investments in the advanced economies is likely to persist through 2018. Business sentiment remains buoyant and profits have been strong in the improved global demand environment. Economic data showed that the need to upgrade existing capital stock remains. In addition, the recently passed Tax Cuts and Jobs Act in the US is likely to encourage further investment in the near term, as businesses benefit from corporate tax cuts and increased deductions for capital spending. In PR China, ongoing policy reforms to rebalance the economy are expected to lead to more moderate growth. Nevertheless, economies in the Asian region will, through trade channels, continue to benefit from the domestic demand strength in the advanced economies.

Growth in other emerging economies from Asia, Middle East, and Latin America is also projected to pick up. For commodity exporters, higher prices, notably for crude oil, will support a rebound in domestic demand following several years of below-trend growth. Furthermore, activity in several economies is projected to recover from the negative impact of reform policies in 2016 and 2017, with an example being India in the aftermath of demonetisation and GST implementation.

Risks to the global growth outlook are poised to become more broadly balanced. This is in contrast to the high prevalence of downside risks assessed in the past few years. On the upside, in the advanced economies, there is potential for investments to pick up further, and wages to rise as labour markets tighten. This would have positive bearing on both business and household spending, and generate more spillovers to the global economy through trade. In addition, the US administration's recent plans to increase spending on disaster relief and infrastructure in the 2018-19 fiscal years may also lend some upside risk to the outlook. Nevertheless, some downside risks from 2017 remain. Firstly, there is uncertainty regarding the impact of synchronised monetary policy normalisation across major economies. The global economy is shifting away from unprecedented levels of accommodative monetary conditions. Financial markets may correct abruptly if policy actions become misaligned from investors' expectations. Secondly, inward-looking trade policies remain a threat to global trade. Risks emerge mainly from protectionist measures by the US administration, and uncertainty in Europe amid pending new UK-EU trade agreements and the formation of key governments. Finally, geopolitical risks in relation to domestic conflicts, terrorism attacks and territorial disputes remain, which could affect sentiments in the global financial markets and dampen economic activity.

THE MALAYSIAN ECONOMY

In this positive environment, Malaysia is projected to remain firmly on a steady growth path to grow by 5.5% – 6.0% (2017: 5.9%).

The Malaysian economy is projected to expand by 5.5% - 6.0% in 2018

Malaysia's strong economic fundamentals, diversified structure and inherent dynamism have always been key factors to deliver economic growth. For 2018, growth prospects are further lifted by strengthening global economic conditions. Growth will be underpinned by continued expansion in private sector activity. The strong growth momentum will also be supported by the continued positive spillovers from the external sector to the domestic economic activity. Malaysia's trade performance will benefit from favourable global demand, exposure to the global technology cycle and new export production capacity. On the domestic front, continued income and employment growth will sustain household spending, amid the continuation of Government measures and improving consumer sentiments. Private investment activity is also projected to be sustained by capital spending for ongoing and new projects amid elevated business sentiments. On the other hand, public sector spending is expected to moderate given the continuation of fiscal consolidation efforts and the near completion of several major projects by public corporations.

The economic outlook is also characterised by some upside risks emanating from both external and domestic factors. Stronger-than-expected global demand will improve the prospects for export-oriented industries. This can translate into higher revenue and profits for businesses and higher income for households, further reinforcing business and consumer sentiments. The potential increase in minimum wage and faster-than-expected pickup in existing and new production facilities in various industries including oil & gas, resource-based manufacturing and E&E will also support the better growth outlook. Nonetheless, downside risks to growth remain. Unfavourable monetary and regulatory policy shifts in the advanced economies, rising trade protectionism by major trading partners and a sharper-than-expected growth moderation in PR China, on the other hand, may impact the strength of Malaysia's exports to the major trading partners. A re-emergence of volatile commodity prices or abrupt corrections in the international financial markets could also weigh down sentiments, dampening the strength of domestic economic activity.

Malaysia remains well positioned to weather these headwinds should the downside risks materialise. Past experiences have demonstrated that Malaysia has the economic and financial adaptability to manage these risks. The strategic policy imperatives and structural reforms that were undertaken over the years have endowed the Malaysian economy with multiple sources of growth, ample buffers and robust policy frameworks. Going forward, the positive economic environment will provide policymakers with ample policy space to continue with the necessary reforms. The domestic financial markets are resilient and well positioned to intermediate large swings of capital flows in the event of heightened financial market volatility, thus preserving orderly market conditions that are supportive of the real economy. Fundamentally, policymakers have the tools, capacity and flexibility to undertake the necessary measures to steer the economy on a steady growth path.

Domestic Demand Remains the Anchor of Growth

In 2018, the Malaysian economy is projected to expand by 5.5% – 6.0%. Private sector expenditure will remain the key driver of growth, underpinned mainly by continued growth in wages and employment, business optimism and favourable demand. Public sector expenditure is expected to decline due to the contraction in public investment amid more moderate growth in public consumption. The external sector is expected to benefit from better global growth, and is likely to generate positive spillovers to domestic economic activity.

Private consumption growth is projected to remain sustained at 7.2% in 2018. The key factors that will support consumption spending during the year include continued growth in employment and income, lower inflation, and improving sentiments. In particular, robust export performance is expected to support wages in the export-oriented industries amid continued growth in domestic economic activity. The continued Government measures will also increase household disposable income in 2018. These measures include the

Table 1

Real GDP by Expenditure (2010=100)

	2017*p*	2017*p*	2018*f*	2017*p*	2018*f*
	% of GDP	Annual change (%)		Contribution to growth (percentage point)	
Domestic Demand[1]	**92.2**	**6.5**	**5.7**	**6.0**	**5.3**
Private sector expenditure	71.2	7.5	7.6	5.3	5.4
Consumption	*53.7*	*7.0*	*7.2*	*3.7*	*3.8*
Investment	*17.4*	*9.3*	*9.1*	*1.6*	*1.6*
Public sector expenditure	21.0	3.3	-0.9	0.7	-0.2
Consumption	*13.0*	*5.4*	*0.6*	*0.7*	*0.1*
Investment	*8.0*	*0.1*	*-3.2*	*0.0*	*-0.3*
Change in Stocks	**0.0**			**0.0**	**0.0**
Net Exports of Goods and Services	**7.8**	**-1.1**	**5.5**	**-0.1**	**0.4**
Exports	72.9	9.6	8.8	6.7	6.4
Imports	65.1	11.0	9.1	6.8	5.9
Real Gross Domestic Product (GDP)	**100.0**	**5.9**	**5.5 ~ 6.0**	**5.9**	**5.5 ~ 6.0**

[1] Excluding stocks
p Preliminary
f Forecast

Note: Figures may not necessarily add up due to rounding

Source: Department of Statistics, Malaysia and Bank Negara Malaysia

continuation of *Bantuan Rakyat 1Malaysia* cash transfers, individual income tax reduction by two percentage points on taxable income between RM20,000 to RM70,000 per annum, and the special payment to all civil servants and retirees.

In 2018, labour market conditions are expected to remain favourable and supportive of growth. This is underpinned by continued strong economic activity and improving hiring sentiments. Employment is expected to remain expansionary, and job growth will be sufficiently robust to absorb new entrants into the labour force. As such, unemployment rate is expected to be relatively unchanged (3.2% - 3.5%; 2017p: 3.4%). Effective 1 January 2018, Malaysia has implemented the Employment Insurance System (EIS) and the Employers Undertaking (EU). These would be followed with a review of the minimum wage later in the year. While these reforms may entail some short-term adjustments, these measures are necessary to put Malaysia's labour market on a more competitive, resilient and flexible path going forward.

Private investment growth is projected to be sustained at 9.1% in 2018, supported by ongoing and new capital spending in both the manufacturing and services sectors, and strengthened by continued positive business sentiments. Mining investment, while remaining moderate, is estimated to exert a lesser drag to growth following the improvement in commodity prices. Investments in the export-oriented industries (for example, the E&E and resource-based industries) would continue to benefit from the expected expansion in global growth. By type of asset, investments in machinery and equipment (M&E) are expected to receive further impetus from the recent Government measures to encourage automation and innovation. Investments in structures would be supported mainly by ongoing multi-year projects in the broad property sector.

Public consumption is expected to register a marginal expansion of 0.6% in 2018 on account of more moderate growth in emoluments amid prudent spending on supplies and services. This is in line with the Government's commitment to reprioritise and rationalise non-critical expenditure.

Public investment is projected to decline by 3.2% due to lower capital spending by public corporations following the near completion of large-scale projects. Investment by the General Government is expected to increase, reflecting mainly higher investment to improve public infrastructure and transportation network.

Continued Expansion across All Economic Sectors

All economic sectors are projected to expand in 2018. The services and manufacturing sectors remain the key drivers to overall growth.

Table 1

Real GDP by Sector (2010=100)

	2017*p*	2017*p*	2018*f*	2017*p*	2018*f*
	% of GDP[1]	Annual change (%)		Contribution to growth (ppt)	
Services	54.4	6.2	6.1	3.4	3.3
Manufacturing	23.0	6.0	5.9	1.4	1.4
Mining and quarrying	8.4	1.1	1.8	0.1	0.2
Agriculture	8.2	7.2	3.6	0.6	0.3
Construction	4.6	6.7	7.3	0.3	0.3
Real GDP	**100.0[1]**	**5.9**	**5.5 ~ 6.0**	**5.9[1]**	**5.5 ~ 6.0**

[1] Figures may not necessarily add up due to rounding and exclusion of import duties component
p Preliminary
f Forecast

Source: Department of Statistics, Malaysia and Bank Negara Malaysia

The **services** sector is expected to record sustained expansion. The *wholesale and retail trade*, *food & beverages* and *accommodation sub-sectors* are anticipated to benefit from favourable labour market conditions. Similarly, growth in the *information and communication* sub-sector is expected to remain strong, reflecting sustained demand for telecommunication and computer services. In the *transport and storage* sub-sector, growth will be driven by continued strength in trade activity.

Growth in the **manufacturing** sector is projected to be sustained. In the export-oriented industries, growth will be supported mainly by continued demand for chemical-related products in the primary-related cluster. Production of E&E products will be sustained, in line with the expected normalisation in global semiconductors demand. Growth will also be supported by new production capacity in the resource-based industries such as petrochemicals and rubber gloves. In the domestic-oriented industries, growth will be driven by higher production of construction-related materials for new and on-going infrastructure projects as well as continued strength in demand for food-related products.

The **construction** sector is expected to record a stronger growth. This will be driven primarily by large new and existing multi-year civil engineering projects. These projects are mainly in the transportation and utilities segment.

In the commodities sector, the **mining** sector is projected to register higher growth, reflecting the continued pickup of natural gas production from the new gas fields and production facilities. The **agriculture** sector is expected to register a more moderate growth. This mainly reflects the normalisation in crude palm oil production growth following the exceptional post-El Niño rebound in 2017.

Potential Output and the Output Gap of the Malaysian Economy

Potential output is the maximum level of output that an economy can produce given its existing resources – comprising capital, labour and technology – without generating inflationary pressures. Output beyond this potential indicates the possible presence of inflationary pressures, while the converse reflects disinflationary pressures. Given the Bank's objective of maintaining price stability[1], the potential output, and the level of actual output in relation to potential (also known as the output gap[2]), are important indicators of inflation.

The Bank estimates that Malaysia's potential output expanded by 5.4% in 2017 (2016: 5.3%; 2010-2015 average: 5.0%), following higher capital expenditure in the private and public sectors. The faster pace of capital expansion was in line with higher demand for existing resources, as robust global growth resulted in spillovers to the domestic economy. The stronger demand conditions were reflected in higher capacity utilisation in the manufacturing sector during the year (average MIER capacity utilisation rate in 2017: 82.6%; 2016: 77.5%).

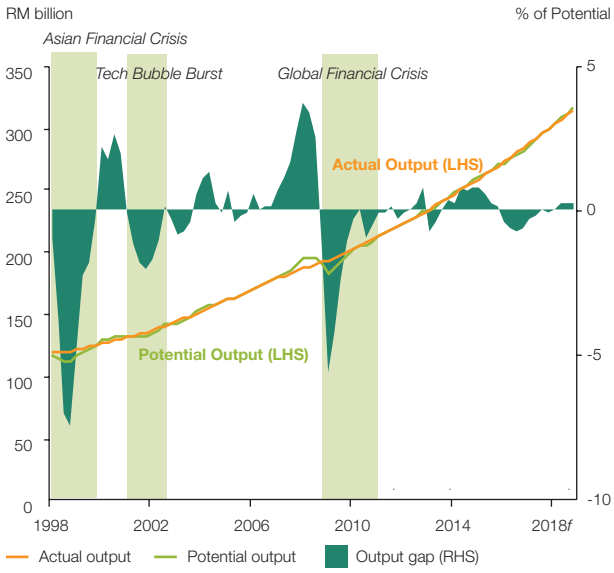
Despite faster GDP growth (2017: 5.9%; 2016: 4.2%), the output gap remained negligible during the year (2016: -0.6%), as the faster growth was accompanied by concurrent improvements in potential output. The increase in inflation to 3.7% (2016: 2.1%) in 2017 was mostly accounted for by cost factors (in particular, higher domestic fuel prices and the recovery in global commodity prices) and is expected to moderate going forward.

Looking ahead, the output gap is expected to turn marginally positive in 2018, in line with the continued growth momentum within the economy. Continued growth in the labour force and capital deepening will, however, result in an increase in potential output, thereby mitigating the build-up of demand-driven inflationary pressures.

Over the longer time horizon, there are ongoing policy measures that will boost potential output and hence sustain economic growth at a higher level. Some of these policies aim to boost labour force participation and encourage more efficient utilisation of capital. For example, these include policies to increase the participation of women in the workforce and to promote sharing economy activities that will unlock previously idle assets. In addition, Government initiatives to accelerate the development of the digital economy will increase productivity. Among others, this includes the implementation of the Digital Free Trade Zone (DFTZ), which will provide a consolidated digital platform for Small and Medium Enterprises (SMEs) to gain access to global markets. Such reforms will secure the long-term sustainability and quality of growth for the Malaysian economy.

Chart 1: Actual and Potential Output

Output gap to turn marginally positive in 2018



Year	Annual Growth in Potential Output (%)
2016	5.3
2017*e*	5.4
2018*f*	5.0 ~ 5.5

e Estimate
f Forecast

Source: Department of Statistics, Malaysia and Bank Negara Malaysia estimates

[1] Central Bank of Malaysia Act 2009.
[2] More formally, the output gap is defined as $\frac{\text{(Actual output-Potential output)}}{\text{Potential output}} \times 100\%$

EXTERNAL SECTOR

Malaysia's exports and current account surplus to remain firm in 2018

The external sector is projected to remain resilient amid further strengthening in the global economy in 2018. Malaysia's export performance will be supported by favourable demand from major trading partners, continued expansion in the global technology upcycle and broadly sustained commodity prices. Gross exports and gross imports are projected to grow at above-average trends, albeit at a more sustainable pace of 8.4% and 8.6%, respectively. Amid continued strength in trade activity, the goods surplus of the current account is expected to increase. Deficits in the services and income accounts, however, will continue to weigh on the current account balance. Overall, Malaysia's current account balance is expected to register a surplus of 2.0 - 3.0% of GNI.

Exports to benefit from favourable external demand

Malaysia's gross export growth will be supported by demand from Malaysia's key trading partners, such as the US, EU and regional economies. Broad-based improvement in forward looking indicators such as business confidence indices of major trading partners, manufacturing production indices in the advanced and regional economies and the US Technology Pulse index suggest continued strength of manufactured exports in the early quarters of 2018. In particular, continued investments in the advanced economies will lend support to the global electronics upcycle as the boost from smartphone demand eases. Malaysia's semiconductor exports (2017: 19.0% share of gross exports) will strongly benefit from the increasing pervasiveness of semiconductors used in automobiles and consumer electronics such as connected devices and smart appliances. Insights from the Bank's regional economic surveillance suggest that exports of semiconductors for the automotive market is likely to remain firm on account of rising semiconductor content per vehicle and growing demand for advanced vehicle safety, infotainment and comfort systems. For non-E&E exports such as petroleum, chemical and metal products, growth will be supported by steady demand from most regional countries. PR China's (2017: 13.5% share of gross exports) rebalancing efforts, however, may weigh down export of these products.

Table 4.1

External Trade

	2012-2016 *average*	2017*p*	2018*f*
	Annual change (%)		
Gross exports	**2.5**	**18.9**	**8.4**
of which:			
Manufactured	5.0	18.9	9.5
Agriculture	-5.4	10.9	3.5
Minerals	-5.7	23.9	3.7
Gross imports	**4.1**	**19.9**	**8.6**
of which:			
Capital goods	4.9	15.3	3.4
Intermediate goods	0.8	20.0	5.8
Consumption goods	10.5	6.1	2.5
Trade balance (RM billion)	**85.9**	**97.2**	**104.2**

p Preliminary
f Forecast

Source: Department of Statistics, Malaysia and Bank Negara Malaysia

Increase in domestic productive capacity to support export growth

Capacity expansions particularly in the export-oriented manufacturing and mining sectors are also expected to support export growth. Of note would be the commencement of several approved investments, including the relocation of a sizeable E&E production line to Malaysia, which will contribute to the exports of high-value wireless communication chips. Firms in the resource-based manufacturing industries, such as petrochemicals and rubber gloves, have announced operationalisation of new manufacturing plants. The anticipated pickup in crude oil and LNG production from existing and recently commenced facilities will also provide some support to commodity export volume growth. Arising from these developments, growth in Malaysia's manufacturing exports is expected to remain at above-average trend, although the pace is expected to ease. In tandem with the performance in manufacturing exports, imports of intermediate inputs will continue to expand to cater for export-oriented manufacturing production.

Imports supported by continued expansion in domestic demand

Imports of intermediate inputs for domestic production[1] will be supported by sustained private sector spending.

[1] Using the 2010 input-output tables published by the Department of Statistics, Malaysia, 51.7% share of total gross imports are intended for domestic use.

Similarly, consumption imports will also expand, reflecting steady household demand for imported apparel, food and beverages. The decline in capital spending by public corporations, however, will partly weigh on capital imports as major projects are near completion. The moderation in capital import growth also reflects the high base in 2017, on account of the delivery of an oil and gas platform in the first quarter of 2017.

More moderate commodity price growth

Export prices of major commodities are expected to diverge in 2018, after the synchronous and strong rebound in 2017. Mineral prices will continue to increase, but at a smaller magnitude compared to 2017. The relatively smaller price increase will contribute to slower crude oil export growth. Similarly, slower increase in LNG price will also result in a more moderate expansion in LNG exports. In contrast, major agriculture export prices, particularly crude palm oil (CPO) is likely to decline reflecting elevated inventory levels as the recovery in CPO output continues post-El Niño. The slower growth in commodity prices will also be reflected in the lower exports of resource-based manufactured exports (e.g. petrochemicals and oleochemicals) and intermediate imports (e.g. fuel and lubricants) which use these raw commodities as feedstock.

On balance, Malaysia's export outlook will remain firm, supported by continued strength in export volumes amid a moderation in export price growth. Of importance, while the pace of overall export and import expansion is expected to moderate, it continues to exceed the recent five-year average performance. Consequently, the goods surplus in the Balance of Payments is forecast to rise to RM120.5 billion.

The services account is projected to record a marginally higher deficit of RM23.2 billion, owing to higher net transport payments, as local firms continue to rely on foreign freight providers to transport goods. In addition, payments for professional and technical services are also expected to rise as firms engage in foreign expertise to facilitate construction of high-end commercial projects and civil engineering projects which use complex technologies. The travel account, which is the largest services account in surplus, will increase on expectations of higher tourist arrivals and rising per capita spending. Tourism Malaysia targets tourist arrivals to edge up to 33.1 million in 2018, from 25.9 million in 2017.

The income accounts are also projected to record a wider deficit. The primary income deficit will increase to RM39.1 billion as locally-incorporated multinational corporations are expected to continue to earn sizeable profits, especially in the manufacturing sector, in tandem with improved global demand. This will more than offset the increase in income accrued to Malaysian firms investing abroad, particularly in the mining sector which accounts for more than one-third of investment income receipts. The secondary income account is expected to register a larger deficit of RM19.3 billion due to higher outward remittances by foreign workers.

Table 4.2

Current Account of Balance of Payments[1]

Item (Net)	2017*p*	2018*f*
	RM billion	
Goods	118.1	120.5
Services	-23.1	-23.2
Primary income	-36.1	-39.1
Secondary income	-18.6	-19.3
Current account balance	**40.3**	**38.9**
% of GNI	*3.1*	*2.0 ~ 3.0*

[1] The data are compiled in accordance with the Sixth Edition of the International Monetary Fund (IMF)'s Balance of Payments and International Investment Position Manual (BPM6)

p Preliminary

f Forecast

Note: Figures may not necessarily add up due to rounding

Source: Department of Statistics, Malaysia and Bank Negara Malaysia

INFLATION OUTLOOK

Headline inflation to moderate in 2018 due mainly to a smaller contribution from global cost factors

Headline inflation is expected to average between 2.0% – 3.0% in 2018 (2017: 3.7%). While global energy and commodity prices are expected to trend higher in 2018, the higher base in 2017 will result in a smaller contribution to headline inflation. In addition, a stronger ringgit exchange rate compared to 2017 will partially offset the impact of higher global energy and commodity prices. It will also contain increases in import costs. Given the dependency of domestic inflation on the trajectory of global oil prices, there remains a high degree of uncertainty surrounding the inflation projection. Underlying inflation, as measured by core inflation, is also expected to moderate in

2018, due to smaller cost pass-through to retail prices compared to the previous year. Inflationary pressures from domestic demand factors will be contained by improving labour productivity and ongoing investments for capacity expansion.

Global oil prices are expected to be higher in 2018 supported by continued tightness in the global oil market as the global oil output cuts agreement between Organization of the Petroleum Exporting Countries (OPEC) and several non-OPEC producers, notably Russia, has been extended to end-2018. Oil prices will also be supported by higher global oil demand amid improvements in global economic growth. The IMF projects crude oil prices to average at USD60 per barrel in 2018[2], an 11.7% increase compared to 2017 (2017: +23.1%). While the higher global oil prices will lead to higher domestic fuel prices in 2018, the higher base of domestic fuel prices in 2017 and a stronger ringgit exchange rate in 2018 could result in a smaller contribution of domestic fuel prices to domestic headline inflation.

Similar to global oil prices, other external cost factors are also expected to register some increases. Higher global demand for food amid sufficient supply is expected to lead to slight increases in food prices during the year. In addition, the weighted inflation rate of Malaysia's import partners is projected to increase slightly in 2018, following the continued cyclical recovery in global demand. However, in some major economies, the risks of higher-than-expected inflation remain due to the tighter labour market conditions, which may lead to accelerations in wage growth and hence, inflationary pressures.

These smaller increases in external cost factors, combined with a stronger ringgit exchange rate are expected to result in a relatively subdued cost environment for firms. Against the backdrop of sustained growth in domestic demand, however, some firms that have not fully passed on the higher costs faced in previous years could continue to raise retail prices in 2018. Nevertheless, the extent of such increases in prices is expected to be smaller. The Bank's Regional Economic Surveillance (RES) team reports that amid stronger competition, firms are finding it more challenging to pass on higher costs to retail prices as consumers are now more price-sensitive.

Continued expansion in demand conditions is expected to lead to a marginally positive output gap in 2018. However, price pressures arising from demand factors are expected to be limited, contained by improving labour productivity and ongoing investments for capacity expansion. In the labour market, the unemployment rate is expected to remain relatively stable as the high employment growth will be matched by the expansion in the labour force. In addition, wage growth is expected to remain stable. The Malaysian Employers Federation (MEF)[3] reports that employers expect salary increments to average at approximately 5.5% in 2018 (2017: 5.5%). The tightness in capital stock seen in 2017 is also not expected to persist, following the expansion in firms' productive capacity. Private investment grew by 9.3% in 2017 (2016: 4.3%) and is expected to be sustained in 2018, further expanding firms' productive capacity.

The inflation outlook is, however, subject to two key risks. Externally, stronger-than-anticipated increase in global oil prices could lead to headline inflation averaging higher. Global oil price movements remain uncertain, subject to geopolitical risks and developments in the US shale oil industry. Domestically, stronger-than-expected growth in demand could support larger cost pass-through to prices, and risk stronger demand-driven price pressures.

MONETARY POLICY

Monetary policy in 2018 will focus on ensuring the sustainable growth of the Malaysian economy with price stability

The global economy is seeing stronger growth prospects compared to a year ago. Growth is expected to continue to be broad-based, entrenched and synchronised across regions. The stronger global economic activity will be underpinned by more robust investments in the

[2] The IMF projection was published in IMF World Economic Outlook in January 2018. The price is the average price of Dated Brent, West Texas Intermediate (WTI) and Dubai Fateh crude oil, equally weighted.

[3] Refers to the MEF Salary Survey for Executives and Non Executives 2017. The salary increment figures used are simple averages of employers' expectations of salary increments for both executives and non-executives.

advanced economies. Asian economies, including Malaysia, will continue to benefit from sustained strength in global trade even as it is projected to moderate from the strong growth recorded in 2017.

At this juncture, upside potential to the global growth outlook marks a distinction from past years, which had been dominated by downside risks. The considerable improvement in the upside potential is influenced mainly by the prospects of higher wage growth in the advanced economies and greater positive spillovers from stronger growth in the advanced economies to the global economy through trade. However, the potential upsurge of uncertainties surrounding geopolitical developments, repercussions from trade tensions, global oil and commodity prices, and shifts in capital flows amid ongoing monetary policy normalisation in the major economies weigh on the outlook. A key concern is that the international financial markets could experience renewed volatility, which may be triggered by a deviation from the expected path of monetary policy normalisation in the advanced economies, escalation of geopolitical risks and correction in overvalued financial assets globally. Overall, taking all these factors into account, risks to the global growth outlook are now balanced.

The Malaysian economy is expected to experience sustained growth momentum in 2018 within the range of 5.5% - 6.0%, after the remarkable pace of economic expansion in 2017. Domestic demand will continue to drive growth, underpinned by favourable income and employment conditions, and new and ongoing infrastructure projects and capital spending. Export growth will moderate[4], but remain above long-term averages[5]. The domestic economy will continue to benefit from positive spillovers from the external sector, particularly given ongoing investments by firms to expand their productive capacity in meeting the global demand.

Improving consumer and business sentiments also provide indication of more robust private expenditure growth. However, it is also important to note that consumer sentiments have yet to reach the optimism threshold[6], and this may weigh on the outlook for private consumption. The subdued consumer sentiments may in part be a reflection of the distributional issues of growth and income, which need to be addressed by structural policies. The Monetary Policy Committee (MPC), however, is cognisant of the importance of monitoring how monetary policy actions could interact with such issues. On balance, given the optimism on the global growth outlook and sustained domestic demand, the overall outlook is for domestic growth to remain firmly on a steady growth path.

Headline inflation is projected to average lower, within the range of 2.0% – 3.0% in 2018. The lower inflation compared to 2017 is due mainly to a smaller contribution from global energy and commodity prices. A stronger ringgit exchange rate compared to 2017 will also mitigate import costs. Inflationary pressure from domestic demand factors will be contained by improving labour productivity and ongoing investments for capacity expansion. The inflation outlook, however, depends on the trajectory of global oil prices, which remains highly uncertain.

Given the continuing positive macroeconomic outlook and firm growth path, the MPC decided to normalise the degree of monetary accommodation at the January 2018 MPC meeting. The MPC raised the Overnight Policy Rate (OPR) by 25 basis points to 3.25%. This is aligned with the focus of monetary policy for the year, which is to ensure that the monetary policy stance is appropriate for sustainable growth prospects moving forward. The MPC also recognises the need to prevent the build-up of risks that could arise from interest rates being too low for a prolonged period of time, even as the risks of financial imbalances currently remain contained.

The current level of the OPR will continue to support the Malaysian economy. The MPC will monitor closely the evolving economic outlook, including the impact of the OPR adjustment in January 2018. The Bank's monetary operations will continue to ensure that domestic liquidity in the financial system will remain sufficient to support the orderly functioning of the domestic financial markets.

[4] The expected moderation in export growth is in part due to the high base in 2017 and dissipating support from commodity prices.

[5] Refers to the 5-year average (2012-2016: 2.5%) and 10-year average (2007-2016: 3.3%).

[6] The Malaysian Institute of Economic Research (MIER) Consumer Sentiments Index as at 4Q 2017, Nielsen Consumer Confidence Index as at 3Q 2017 and Mastercard Index of Consumer Confidence as at 2H 2017, were all below the optimism thresholds.

FISCAL POLICY

Lower fiscal deficit target of 2.8% of GDP in 2018

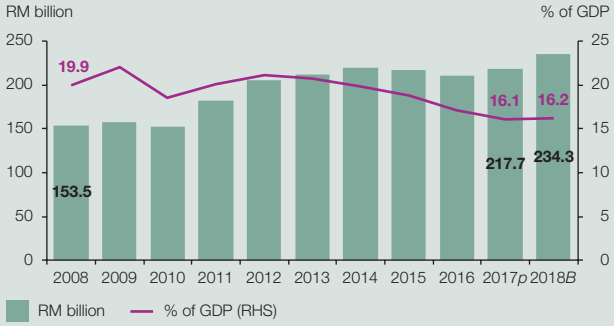
Fiscal policy in 2018 will continue to focus on strengthening the Government's fiscal position, while ensuring sustainable and more inclusive economic growth. In consonance with a robust growth environment, the Federal Government's fiscal deficit is expected to narrow further to 2.8% of GDP in 2018 (2017: -3.0%; from a peak of 6.7% of GDP in 2009), supported by higher growth in revenue. This marks the ninth consecutive year of fiscal consolidation, which is a reflection of the Government's commitment towards fiscal reform.

Fiscal reforms over the past few years have ensured that the Government maintained its fiscal position on a consolidation path. This was achieved through initiatives to optimise both expenditures and enhance revenues. The moderation in growth of key operating expenditure items reflects the Government's efforts to rein in spending. The share of operating expenditure as a percentage of GDP declined to 16.1% in 2017 compared to 17.1% in 2016 due to subsidy rationalisation and a reduction in non-critical spending on grants and transfers. For 2018, the share of operating expenditure is expected to amount to 16.2% of GDP. The Government also continued to diversify its sources of revenue through the introduction of new measures which include a spectrum auction[7], vehicle entry permits and a tourism tax. Measures to enhance tax compliance were further reinforced by the Collection Intelligence Arrangement (CIA) through integrated information sharing across the Inland Revenue Board, Royal Malaysian Customs Department and the Companies Commission of Malaysia.

As outlined in the 2018 Budget, fiscal resources in 2018 will prioritise infrastructure projects with large multiplier effects, capacity building programmes and initiatives to raise productivity. These include public infrastructure projects such as highways, railways and urban public transportation[8]. In fortifying the fourth industrial revolution (Industrial Revolution 4.0) and the digital economy, the Government will continue to promote measures to incentivise innovation and automation[9], which are necessary to increase Malaysia's competitiveness. Emphasis has also been placed on human capital development through the enhancement of various active labour market programmes[10] consistent with the

Chart 4.1: Federal Government Operating Expenditure

Federal Government operating expenditure as a percentage of GDP has gradually declined since 2012



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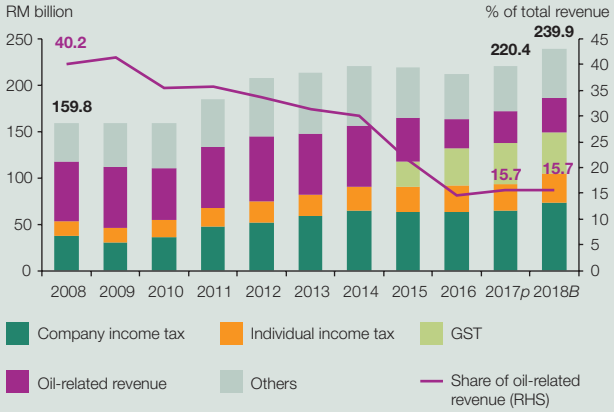
Source: Ministry of Finance, Malaysia

Chart 4.2: Federal Government Revenue

Share of oil-related revenue has declined following revenue diversification measures



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Source: Ministry of Finance, Malaysia

[7] A spectrum auction is a process where the government auctions the right to companies to use specific radio frequencies or radio waves, for various purposes including telecommunications, aeronautics, and industrial use. A well-designed auction could efficiently allocate resources to the parties that value them the most, while generating government revenue in the process.

[8] Public infrastructure projects include the Pan Borneo Highway, East-Coast Rail Link (ECRL), High Speed Rail (HSR) and Mass Rapid Transit Line 2 (MRT2).

[9] These include matching grants under the Domestic Investment Strategic Fund to enhance smart manufacturing facilities and the Green Technology Financing scheme to promote investment in the green technology industry.

[10] Examples include the implementation of the Technical Vocational Education Training (TVET) Masterplan, establishment of Science, Technology, Engineering, and Mathematics (STEM) centres, and apprenticeship programmes and open interviews under 1Malaysia Training Scheme (SL1M).

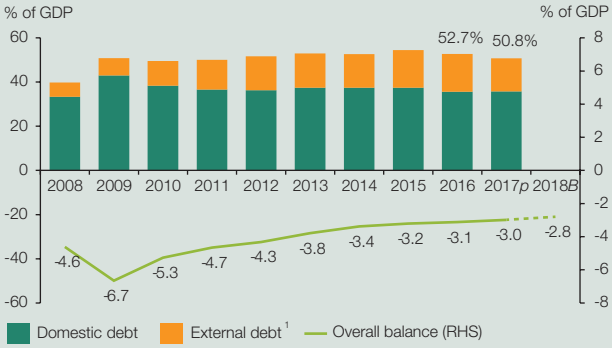
aspirations of *Transformasi Nasional 2050*[11], such that resources are concentrated on developing future-relevant skills.

In ensuring inclusive economic growth, the Budget also lends support towards the lower- and middle-income segments through welfare enhancement programmes and fiscal transfers[12]. These programmes will provide support to private consumption spending given the higher marginal propensity to consume of these segments. To sustain the capacity of the underserved groups to cope with the higher cost of living, socio-economic assistance is also dispersed through various programmes, including affordable housing[13] and educational support[14].

The Government has indicated its commitment to the fiscal consolidation plan of achieving a near-balanced budget over the medium term. Towards this end, the adoption of the Medium Term Fiscal Framework since 2015 could enhance communication and increase transparency on the direction of fiscal policy. However, further enhancement of the Medium Term Fiscal Framework is critical. This is to ensure that spending on various programmes and projects, particularly those extending beyond the annual planning horizon will remain within the budgeted expenditure. This will provide fiscal flexibility and support the Fiscal Policy Committee in ensuring the sustainability of public finance and the effectiveness of the Government's fiscal policy.

Chart 4.3: Federal Government Fiscal Balance and Debt

This year marks the ninth consecutive year of fiscal consolidation



1 External debt comprises foreign currency debt (offshore borrowing) and non-resident holdings of RM-denominated debt (MGS, GII, T-bills and *Sukuk Perumahan Kerajaan*)
p Preliminary
B Budget

Source: Ministry of Finance, Malaysia

Table 4.3: Federal Government Finance

	RM billion		Annual change (%)	
	2017*p*	2018*B*	2017*p*	2018*B*
Oil price (USD/barrel)	50	52		
Revenue	220.4	239.9	3.8	8.8
Total expenditure	262.6	280.3	4.1	6.7
Operating expenditure	*217.7*	*234.3*	*3.6*	*7.6*
Gross development expenditure	*44.9*	*46.0*	*6.9*	*2.5*
Loan recoveries	1.9	0.6		
Overall balance	**-40.3**	**-39.8**		
% of GDP	**-3.0**	**-2.8**		
Sources of financing:				
Net domestic borrowing	40.8	-		
Net external borrowing	-0.3	-		
Realisable assets[1] and adjustments	-0.1	-		

1 A negative (-) sign indicates a build-up in assets
p Preliminary
B Budget
Note: Numbers may not add up due to rounding

Source: Ministry of Finance, Malaysia

[11] *Transformasi Nasional 2050* (TN50) is an initiative to plan for the future of Malaysia for the year 2020 to 2050.

[12] Welfare enhancement programmes and fiscal transfers include *Bantuan Rakyat 1Malaysia* (BR1M) and a 2 percentage point reduction in income tax for the chargeable income tax band between RM20,000 and RM70,000.

[13] Affordable housing schemes include the People's Housing Programme (PPR), *Rumah Mesra Rakyat*, PR1MA and PPA1M.

[14] The Government announced matching grants of RM500 for contributors between 7 and 12 years old under *Skim Simpanan Pendidikan Nasional 1Malaysia* (SSPN1M).

The Living Wage: Beyond Making Ends Meet

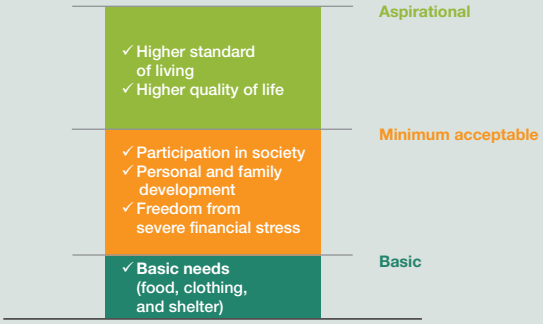
By Eilyn Chong and Farina Adam Khong

Introduction

The concept of a 'minimum acceptable' standard of living goes beyond being able to afford the necessities, such as food, clothing, and shelter[1]. This standard of living should include the ability to meaningfully participate in society, the opportunity for personal and family development, and freedom from severe financial stress. At the same time, it should reflect needs, not wants. It does not capture the cost of lifestyle, which is the spending to fulfil the desires for an aspirational living standard (Figure 1).

Figure 1: Different Concepts of Living Standard

The living wage is the wage level that could afford the minimum acceptable living standard



Source: Bank Negara Malaysia

In recent years, many low-wage employees across countries have found it difficult to attain a minimum acceptable living standard. Such development has prompted calls for a living wage – a wage level that could afford such a living standard. This article discusses the motivation of introducing the living wage; the estimation of a representative living wage level for Kuala Lumpur; international experiences in adopting a living wage; and the potential impact on the economy, employers, and employees. While living wage is the standard terminology used in the literature to describe the level of income needed for a household to afford a minimum acceptable standard of living, in practice, this standard of living could be achieved through various sources of income besides wages, such as non-wage work benefits and social assistance. For simplicity, this article will use the term 'living wage' to mean income from all sources; i.e. from wages, benefits, and other non-wage incomes.

In 2016, a typical family of two working adults and two children in the United States (US) needed to work nearly four full-time minimum wage jobs to earn a living wage (Glasmeier and Nadeau, 2017). In 2017, more than one-fifth of the employees in the United Kingdom (UK) were still earning below the living wage (IHS Markit, 2017).

In Malaysia, the bottom 40% of households by income experienced a notable increase in average monthly income of 6% per year between 2014 and 2016. Yet, this 6% growth did not amount to much because of the low base. In absolute terms, the monthly income for this group grew from RM2,537 to RM2,848, which is equivalent to a small average increase of about RM150 per year relative to other income groups[2]. After accounting for the increase in the cost of living, households in the bottom 40% experienced a 3.8% growth in real income. For some households, especially the ones with additional dependants, the small increase in income may suffice to keep up with the increase in the price of basic necessities but falls short of achieving a minimum acceptable standard of living[3].

[1] The World Bank calculates the global poverty line based on the costs of basic food, clothing, and shelter.
[2] The middle 40% of households by income and top 20% experienced an average increase of RM420 per year and RM892 per year respectively. Source: Report of Household Income and Basic Amenities Survey 2016, Department of Statistics, Malaysia.
[3] For example, the increase in income may not be able to keep up with the increase in expenditure associated with the expansion in family size.

As Malaysia moves closer towards becoming a high-income nation, it is timely to aspire for all citizens to attain at least a minimum acceptable living standard. The provision of a living wage can be a step towards that goal. Using the living wage as a benchmark to assess the adequacy of current wages and social assistance, international experiences suggest that it has the potential to inform, challenge, and enhance policies towards the goal of achieving a minimum acceptable living standard. As such, a significant amount of consideration is needed in calculating a representative living wage level.

The motivations for a living wage

A range of market imperfections, such as unequal market power and labour immobility, may depress wages in favour of large employers. Support for a living wage was particularly strong during the British Industrial Revolution in the 18th century, in response to the low pay and bad working conditions for manual workers. The more recent calls for a living wage over the past two decades reflect renewed efforts to enable workers to afford a minimum acceptable standard of living, amid a large number of underpaid full-time workers seeking social assistance (International Labour Organization, 2014). An increased concentration of wealth in the hands of those with higher incomes amid robust economic growth, has led to widening inequality in many advanced economies. In these economies, the resultant income inequality was one of the central concerns that motivated the need for a living wage framework.

Modern society recognises that the minimum acceptable living standard is beyond just affording the necessities, but should also provide for social participation and financial security. On social participation, the acceptable minimum includes being able to afford a trip to visit family and friends during festive seasons, and having the ability to occasionally purchase gifts for family members, such as during birthdays or visits. In addition, financial strains should not be a source of persistent stress. Figure 2 summarises some motivations that prompted the advocacy for a living wage in several countries.

Apart from allowing employees to afford a minimum acceptable standard of living, the living wage may also yield positive spillovers to the broader economy. These include reductions in employee turnover rates and improvements in employees' morale and productivity[4].

Figure 2: Motivations for a Living Wage in Canada, New Zealand and the United Kingdom

The minimum acceptable living standard should also provide for social participation and financial security

Source: Living Wage Canada; Living Wage New Zealand; and Living Wage Foundation, United Kingdom

[4] Several studies in the US show that employee turnover rates in firms fell significantly following the implementation of the living wage, resulting in improved productivity (Brenner and Luce, 2005; Reich, Hall and Jacobs, 2005; Fairris, 2005). A study in the US also finds that paying the living wage raised employees' morale and boosted productivity (Brenner and Luce, 2005).

Differences between a living wage, a minimum wage, and an aspirational income

In practice, a living wage differs from a minimum wage in several aspects. First, a living wage is typically not a statutory requirement for the economy unlike a minimum wage[5]. Second, a living wage refers not just to the existence of a minimum level of remuneration, but also to a minimum acceptable standard of living (International Labour Organization (ILO), 2014). Therefore, the living wage rates are usually higher than the minimum wage rate, especially when the latter has been less frequently updated in line with living cost increases. Third, while the determination of a living wage is based primarily on cost of living concerns, the minimum wage may consider additional factors given that it is a legislated requirement, such as its effect on employment and job creation (ILO, 2014).

In terms of affording a certain standard of living, the living wage is meant to sustain the socially acceptable minimum standard of living, beyond the basic necessities such as food, clothing, and shelter. An aspirational income goes beyond that: it could fulfil a desired lifestyle beyond the socially acceptable minimum, including spending on the latest gadgets or travels abroad.

Estimating a representative living wage in Kuala Lumpur

An important process of developing a living wage framework is estimating a wage level that is representative of a minimum acceptable living standard. While a wide range of methods may be used to estimate the living wage, these methods generally follow a standard approach as outlined in the flowchart (Figure 3). The first step is to ascertain whether there are significant variations in prices and living standards across location and household composition, which would make a case for developing different estimates of a living wage. The next step is to derive a representative basket of goods and services. Information is often drawn from a combination of publicly recognised standards on basic needs, expert opinion, public feedback, and data on household expenditure. Due to the diversity of households' needs, it is imperative to consult households of different profiles, to ascertain what items are deemed as necessities, and to distinguish these from items that are regarded as aspirational. Public consultations are often undertaken through focus group discussions, as was extensively done in the UK for 11 types of households (Bradshaw et al., 2008).

Figure 3: A Standard Approach in Calculating a Representative Living Wage

The standard approach used to estimate the living wage involves these four steps

1 Ascertaining whether there are significant variations in prices and living standards across location and household composition

2 Deriving the representative basket of goods and services that reflects a minimum acceptable living standard

3 Estimating the cost of the representative basket of goods and services

4 Periodically updating the living wage estimates

Source: Bank Negara Malaysia

[5] The UK government introduced a mandatory National Living Wage, which is a higher minimum wage rate for workers over 25 years old. The rate of the National Living Wage is lower than the estimated Real Living Wage Rate calculated by the UK's Living Wage Foundation.

The next step is to compute the total costs for the representative basket given prevailing price levels. Official price statistics are typically used for this purpose. These estimates and the underlying assumptions would be validated through the focus group discussions. Finally, the living wage estimates are periodically updated to account for inflation. The estimates would also be revisited to consider changes in social norms, given that rising urbanisation could materially influence the composition of households' consumption basket. For instance, in the UK, households have recently indicated the greater difficulty of living near their workplaces due to limited housing options, resulting in an increase in the mileage required to travel to work and for other social activities (Davis, Hill, Hirsch and Padley, 2016).

To derive provisional estimates of a living wage in Kuala Lumpur in 2016, the standard approach is applied using three illustrative household types: single adult, couple without children, and couple with two children. First, a broad representative consumption basket that reflects the average consumption pattern for each type of household in Kuala Lumpur was constructed. Next, the cost of these baskets was estimated using data available from various sources, such as the Department of Statistics Malaysia (DOSM), Ministry of Domestic Trade, Co-operatives and Consumerism (KPDNKK), and the National Property Information Centre (NAPIC). Subsequently, representatives from the three household types were consulted through focus group discussions to identify the basket of goods and services that best reflect their interpretation of a minimum acceptable living standard. They were also asked to estimate the budget required to obtain the representative basket. The internal estimates were validated against findings from the focus group discussions.

Table 1: Provisional Living Wage Estimates in Kuala Lumpur for 2016

In Kuala Lumpur, the provisional estimates of a living wage range between RM2,700 and RM6,500 per month

	 ***Single adult***	 ***Couple, without child***	 ***Couple, with two children***
Estimates of a living wage in Kuala Lumpur (RM/month)	***2,700***	***4,500***	***6,500***
Key assumptions on the representative basket of goods and services	• Rents a room • Eats out more often, cooks occasionally • Drives less, uses more public transport	• Rents a one-bedroom apartment • Eats out half of the time • Owns two vehicles (a motorcycle and a car)	• Rents a three-bedroom apartment • Cooks most of the time, eats out during weekends • Owns two vehicles • Pays for private extra classes and childcare

Note: The estimates above are provisional and subject to further revision as the underlying assumptions and cost estimates are refined. Single-adult households include adults who live alone and those who live together with non-related members of a household.

Source: Bank Negara Malaysia estimates using data from Household Expenditure Surveys 2014 and 2016, Department of Statistics, Malaysia, Ministry of Domestic Trade, Co-operatives and Consumerism, and the National Property Information Centre

Table 1 presents the living wage estimates in Kuala Lumpur, derived based on the specific assumptions and price levels that prevailed at the point of estimation in 2016. The estimates range between RM2,700 and RM 6,500 per month[6]. The basket of goods and services includes items that reflect the typical purchases of households in Kuala Lumpur, which are validated through the focus group discussions. Assumptions made include the following:

- Food, housing, and transport constitute the largest expenditure shares in the representative basket for these three household types;
- Due to the hectic lifestyle in the city, households are assumed to regularly eat out more often in inexpensive eateries. The frequency of eating out falls as the family size grows due to the higher cost involved;
- Single-adult households are assumed to primarily utilise public transportation, while couples are assumed to own an entry-level locally produced car[7];
- Allocation is also provided for recreation, such as sport equipment and movies, one inexpensive domestic holiday trip per year, and festive season travel and celebration;

[6] Households with more than two people are assumed to share some expenses, such as utilities. Thus, the living wage estimates for larger households are not multiplicative of the estimate for single-adult households.

[7] An entry-level car is typically small and designed for low-cost operation. An example would be Perodua Axia.

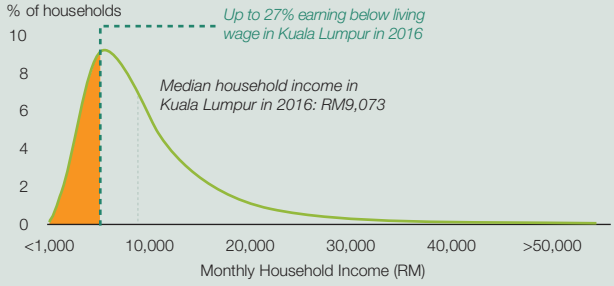
- The estimates also include contributions to the Employees Provident Fund (EPF), income tax payable, and savings that could be used to meet an emergency spending, including an unexpected healthcare bill; and
- A minimum sum is allocated to education and healthcare as these services are provided nearly free-of-charge by the Government.

There are important caveats to these estimates. The estimates are provisional and subject to further revision as the underlying assumptions and cost estimates are refined. The representative baskets of goods and services constructed in this article are based on the findings from focus group discussions conducted in Kuala Lumpur in 2016 by Bank Negara Malaysia. It is likely that these estimates would be considerably different in other parts of Malaysia due to variations in consumption patterns and prices, which have to be further validated through additional focus group discussions with households that reside in these areas. For instance, urban households have relatively greater access to public transportation to meet their minimum transportation needs, while rural households may need to own a private vehicle. In terms of cost variations by location, one that stands out is housing costs (either owner-occupied costs or rental) are likely to be cheaper in rural areas and the less urbanised states. The estimates of a living wage in Kuala Lumpur are also likely to evolve over time due to inflation and lifestyle changes, and would only remain relevant if the representative baskets are updated periodically.

The living wage estimates in Kuala Lumpur for the three illustrative household types are below the median income in Kuala Lumpur of RM9,073[8]. As shown in Figure 4, up to 27% of households in Kuala Lumpur were earning below the living wage. In terms of household type, a larger share of single-adult households and couples with two children were earning below the estimated living wage in 2016, compared to couples without children. The finding for single-adult households is consistent with the fact that graduates with a first degree or diploma earn on average, starting salaries of RM2,207 and RM1,346 per month respectively[9]. Among households earning below the living wage, close to 70% consisted of just one employed household member. Those earning below the living wage were mostly secondary school graduates with low- to mid-skilled jobs, while those earning above the living wage were mostly tertiary graduates with high-skilled jobs (Figure 5). Indeed, the median monthly salaries in 2016 for managers and professionals in Malaysia – RM5,500 and RM4,450 respectively – are well above the living wage estimates for a single-adult household (Figure 6). These findings underscore the importance of creating a high-skilled workforce in Malaysia that is equipped with the necessary competencies for higher-paying jobs.

Figure 4: Income Distribution of Households in Kuala Lumpur

Up to 27% of households in Kuala Lumpur were earning below the living wage

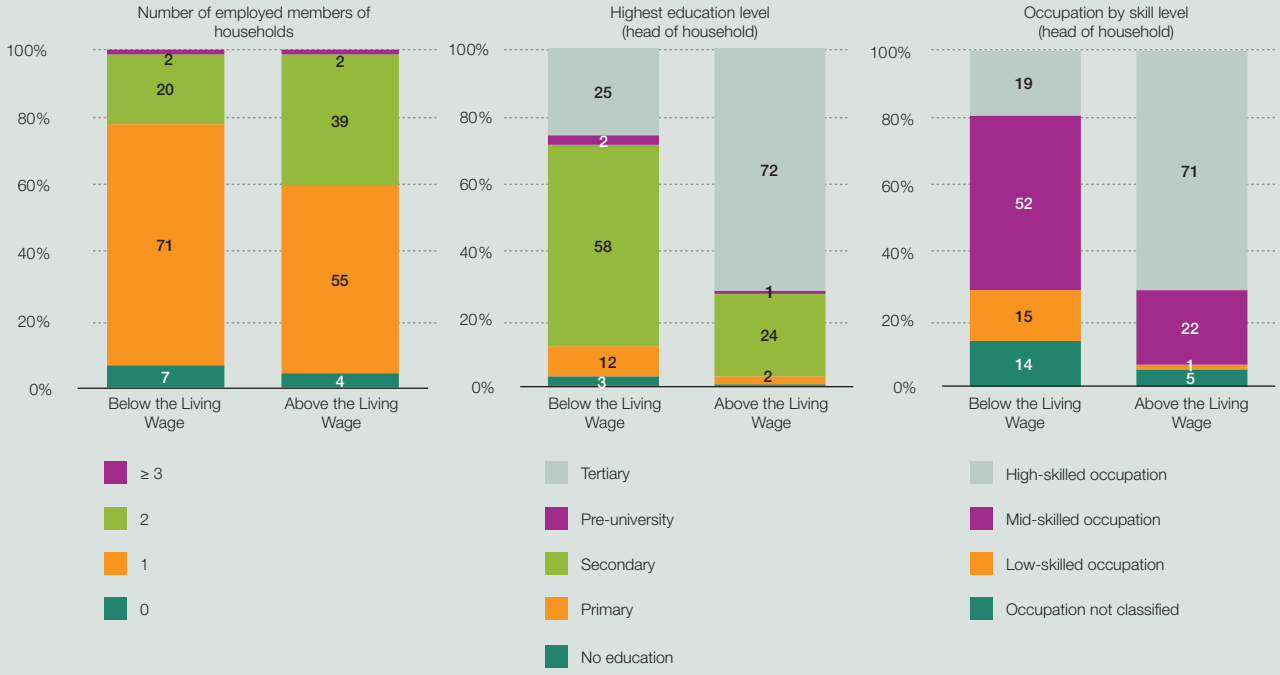


Source: Bank Negara Malaysia estimates using Household Income and Expenditure Survey 2016, Department of Statistics, Malaysia

[8] Source: Report of Household Income and Basic Amenities Survey 2016, Department of Statistics, Malaysia.
[9] Source: Ministry of Higher Education and Bank Negara Malaysia estimates.

Figure 5: Profile of Households in Kuala Lumpur Earning Below and Above the Living Wage

Households earning below the living wage were mostly secondary school graduates with low-to mid-skilled jobs

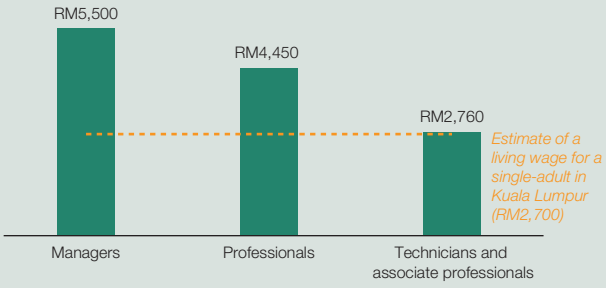


Note: Occupations are categorised by skill level according to the Malaysia Standard Classification of Occupations 2013 (MASCO 2013). High-skilled occupations include managers, professionals, and technicians and associate professionals; mid-skilled occupations include clerical support workers, service and sales workers, skilled agricultural, forestry, livestock and fishery workers, craft and related trades workers, and plant and machine-operators and assemblers; and low-skilled occupations include elementary occupations.

Source: Bank Negara Malaysia estimates using Household Income and Expenditure Survey 2016, Department of Statistics, Malaysia

Figure 6: Median Monthly Salaries and Wages in 2016 for High-Skilled Occupations in Malaysia

The median monthly salaries for high-skilled occupations are higher than the living wage estimate for a single-adult household in Kuala Lumpur



Source: Salaries & Wages Survey Report Malaysia 2016, Department of Statistics, Malaysia

International experiences in operationalising a living wage

Contemporary living wage movements are often spearheaded by civil society organisations, consisting of unions, community- and faith-based groups, academics, and employers (Heery, Hann and Nash, 2017). They are also often the ones undertaking the estimation of the living wage rate. Formal institutions may also oversee the estimation, as in the case of Europe, where the European Commission funded a project to develop estimates of reference budgets that are necessary to reach an acceptable standard of living[10].

In Canada, New Zealand, and the UK, civil society organisations play an active role in advocating public and large private employers to voluntarily pay living wages in return for accreditation, which could be in the form of a plaque, the Living Wage trademark, or a listing of the company's name on the Living Wage website. In the US, the living wage was initiated by the public sector, with ordinances being passed in more than 140 cities and counties, aimed at employees of private businesses that have service contracts with the local governments. Thus, the living wage does not cover low-income workers who are not under the jurisdiction of living wage ordinances. However, the enforcement of living wage ordinances in the US has arguably been weak (Luce, 2004)[11]. In some cities, the ordinances were eventually repealed (Holzer, 2008)[12]. Like the US, several local governments in South Korea have also established the living wage ordinance for its employees and workers of organisations that are funded by the local governments. While there have been efforts to estimate a living wage especially in the cities, the push for a living wage for private sector employees in Asia has not been as prevalent as in Canada, New Zealand, and the UK[13].

Macroeconomic and distributional impact of a living wage

Unlike a minimum wage, the living wage is not widely implemented and has mainly been confined to a few advanced economies. Empirical studies based on US cities[14] found that paying a living wage brings benefits for both employees and employers[15]. The impact on employment also appears to be more modest than the theoretical predictions of a binding wage floor[16].

Nevertheless, it is worth cautioning against broad-brush applications based on the conclusions from these studies. Macroeconomic effects are likely to vary across countries due to differences in labour market characteristics and the prevailing economic environment. Paying a living wage, for example, would be easier during an economic boom, when employers are less compelled to minimise labour costs.

In addition, a living wage could only be effective if it is set at a realistic and sustainable level. It is imperative to carefully derive living wage estimates that balance between ensuring employees can afford a minimum living standard, and the capability of employers to pay wages that commensurate with employees' productivity. Setting a living wage rate that is too high could lead to the risk of employers passing on the additional wage cost to consumers through higher prices of goods and services. Wage pressure on employers could also intensify if high-wage workers insist on maintaining the same wage differential with low-wage workers as before. The benefits of the living wage may be offset if the wage pressure eventually translates to an even faster increase in inflation and cost of living.

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[10] Further information is available on the European Reference Budgets Network (http://www.referencebudgets.eu/).
[11] State and federal laws do not require employers to routinely provide details to the government on hours worked and pay.
[12] For instance, the living wage ordinance in Omaha, Nebraska was rescinded in August 2001 after the election of a new council majority who were committed to repealing the law (Luce, 2004).
[13] Amid the rise in international trade, ethical initiatives in importing countries have led to the promotion of living wage for garment workers in exporting countries in Asia (Hirsch and Valadez, 2017).
[14] Unsuccessful living wage laws in some cities in the US also provide a control group or counterfactual for estimating the effects of living wage laws.
[15] See Brenner and Luce (2005), Reich et al. (2003), and Sokol et al. (2006).
[16] See Brenner and Luce (2005), Lester (2011) and London Economics (2009). Theory predicts that a wage floor that exceeds the market wage level will lead to retrenchments. This prediction, however, assumes that all workers are the same and have a fixed productivity, and that employers could only respond by reducing the number of workers. Additionally, the prediction also relies on the assumption that the existing wage level is at the equilibrium. However, if the prevailing wage level is below the equilibrium due to, for instance, labour market imperfections, mandating a higher wage level could lead to more employment.

Furthermore, the living wage could inadvertently harm the intended beneficiaries in the near term[17]. For instance, employers could respond to the living wage by employing more high-skilled workers at the expense of low-skilled ones, who could be the group of people earning below the living wage, before they could upskill themselves (Hirsch and Valadez, 2017). An environment of strong growth, however, could sustain labour demand and reduce the possibility of labour retrenchment of low-skilled workers.

The need for corresponding productivity improvements

The possibility of adverse outcomes from the implementation of the living wage underscores the importance of a corresponding increase in productivity and movement towards a high-skilled workforce. Productivity improvements and higher value-added output make paying a living wage more affordable for employers, thereby enabling them to sustain the living wage in the long run. A high-productivity, high value-added economy will promote a supportive environment that could mitigate the risks of retrenchment and labour substitution.

The Malaysian economy faces the challenge of modest productivity growth relative to its peers. Based on data from the International Labour Organization, between 2011 and 2017, Malaysia's growth of GDP per person employed – a measure of labour productivity – is only 1.7%, less than half of the average labour productivity growth in upper-middle income economies (3.8%)[18]. Persistently weak productivity growth risks lower wage growth, which could ultimately hamper the ability of households to afford at least a minimum acceptable living standard.

The move towards productivity-led wage growth relies on wide-ranging support from all parts of the economy. Governments can foster a conducive environment for employers to improve productivity by ensuring the availability of good institutional support, minimal regulation on productive investment activities, and the affordability of training and higher-level education. Employers can train existing employees and provide incentives for them to upgrade their skills. Higher morale and lower turnover rates that come with the living wage could, in turn, set off a virtuous cycle of higher wages, and higher productivity. Employees need to also recognise the importance of self-improvement to achieve a higher wage level that can sustain a minimum acceptable living standard, and take the initiative to upskill.

Conclusion

As Malaysia develops into a progressive high-income nation, all segments of society should reap the benefits and not be dislocated in the process. It is thus important that Malaysia overcomes the challenge of modest productivity growth, and strives towards creating high-productivity, high-paying jobs that could afford a minimum acceptable living standard. The living wage can be a tool to potentially inform, challenge, and enhance policies towards that end.

If successfully adopted, the living wage can bring benefits to both employees and employers, with limited negative consequences on the economy. This relies on a few pre-requisites. The living wage estimates have to be representative and reasonable enough to guide employers towards paying fair wages to employees. The living wage also has to be accompanied by greater productivity, and this requires collective effort from employers, employees, civil societies, and the public sector.

[17] See for example, Neumark and Adams (2003).

[18] For international comparison, the GDP component of this measure is the GDP that is converted to 2011 constant international dollars using purchasing power parity rates. This estimate of average labour productivity growth in 2011-2017 is close to the average based on the labour productivity data published by the Department of Statistics, Malaysia (2.3%).

References

Bradshaw, Jonathan, Sue Middleton, Abigail Davis, Nina Oldfield, Noel Smith, Linda Cusworth, and Julie Williams, "A Minimum Income Standard for Britain: What People Think," 2008.

Brenner, Mark and Stephanie Luce, "Living Wage Laws in Practice," *Political Economy Research Institute*, 2005.

Davis, Abigail, Katherine Hill, Donald Hirsch, and Matt Padley, *A Minimum Income Standard for the UK in 2016*, Joseph Rowntree Foundation, 2016.

Department of Statistics, Malaysia, *Report of Household Expenditure Survey 2014*, 2015.

——, *Report of Household Expenditure Survey 2016*, 2017.

——, *Report of Household Income and Basic Amenities Survey 2016*, 2017.

Fairris, David, "The Impact of Living Wages on Employers: A Control Group Analysis of the Los Angeles Ordinance," *Industrial Relations: A Journal of Economy and Society*, 2005, *44*.

Glasmeier, Amy K. and Carey A. Nadeau, "Results from the 2016 Data Update," Retrieved from http://livingwage.mit.edu, 2017.

Heery, Edmund, Deborah Hann, and David Nash, "The Living Wage campaign in the UK," *Employee Relations*, 2017, *39* (6), 800–814.

Hirsch, Donald and Laura Valadez, *The Living Wage*, Agenda Publishing, 2017.

Holzer, Harry J., "Living Wage Laws: How Much Do (Can) They Matter?," IZA Discussion Papers 3781, Institute for the Study of Labour (IZA), 2008.

IHS Markit, "Living Wage Research for KPMG - 2017 Report," Technical Report, KPMG, 2017.

International Labour Organization, "General Survey on Minimum Wage Systems," International Labour Conference 103rd Session, 2014.

Lemos, Sara, "A Survey of the Effects of the Minimum Wage on Prices," *Journal of Economic Surveys*, 2008, *22* (1), 187–212.

Lester, T. William, "The Impact of Living Wage Laws on Urban Economic Development Patterns and the Local Business Climate: Evidence From California Cities," *Economic Development Quarterly*, 2011, *25* (3), 237–254.

Living Wage Aotearoa New Zealand, http://www.livingwage.org.nz/. Accessed: 2 January, 2018.

Living Wage Canada, http://www.livingwagecanada.ca/. Accessed: 2 January, 2018.

Living Wage Foundation United Kingdom, http://www.livingwage.org.uk/. Accessed: 2 January, 2018.

London Economics, "An Independent Study of the Business Benefits of Implementing a Living Wage Policy in London," *Final Report for GLA Economics*, 2009.

Luce, S., *Fighting for a Living Wage*, Cornell University Press, 2004.

Neumark, David and Scott Adams, "Do Living Wage Ordinances Reduce Urban Poverty?," *Journal of Human Resources*, 2003, *38* (3).

Reich, Michael, Peter Hall, and Ken Jacobs, "Living Wage Policies at the San Francisco Airport: Impacts on Workers and Businesses," *Industrial Relations: A Journal of Economy and Society*, 2005, *44* (1), 106–138.

Sokol, Martin, Jane Wills, Jeremy Anderson, Marg Buckley, Yara Evans, Claire Frew, and Paula Hamilton, "The Impact of Improved Pay and Conditions on Low-Paid Urban Workers," *The Case of the Royal London Hospital, Queen Mary College, London*, 2006.

Wadsworth, Jonathan, "Did the National Minimum Wage Affect UK Prices?," *Fiscal Studies*, 2010, *31* (1), 81–120.

Complexity and Growth: Malaysia's Position and Policy Implications

By Brenda Cheah Wenn Jinn and Mohd Shazwan Shuhaimen

Introduction

The favourable global environment presents a timely opportunity for Malaysia to undertake important structural reforms. While higher growth can be achieved through capital accumulation and productivity gains, for an emerging economy such as Malaysia, technological advancement and innovation are critical to expand the country's production frontier and lift long-term growth potential. A study by Hausmann et al. (2013) looks into the role of technology and innovation as a fundamental predictor of future growth, namely, through economic complexity. Economic complexity expresses a country's overall productive capabilities through its cumulative know-how, skills and technological endowment. It is, therefore, a useful indicator to track structural change. This article serves as a primer on the key concepts of economic complexity. It then proceeds to showcase the evolution of Malaysia's economic complexity and its position relative to regional peers. The article also outlines several strategies to increase Malaysia's complexity, by utilising Hausmann et al.'s pioneering product space and feasibility maps which lay out the ease of diversifying into more complex products. The article concludes with an estimation of Malaysia's potential GDP growth based on our ability to converge to the income levels of countries with similar economic complexity.

Understanding Economic Complexity

'Economic complexity' is a summary measure of the productive capabilities within a country, as reflected by the diversity and complexity of products it makes and exports. Complex economies tend to be characterised by the prevalence of a vast amount of skills and knowledge which are the necessary pre-conditions for the production of highly diversified and complex range of products. Less complex economies, in contrast, can only make fewer and more elementary products on account of their limited skills and knowledge base. Because greater levels of complexity entail the creation of high-skilled jobs and a more sophisticated supporting ecosystem, more often than not, complex economies enjoy higher per capita GDP.

Sectoral diversification is an important means to enhance economic complexity. As a country diversifies its production base, individuals and firms amass a large amount of knowledge and expertise, thus increasing sophistication and income levels over time. An advanced economy like Japan can manufacture diversified and complex products, ranging from chemicals to robotics and autonomous cars, as a result of continuous innovation and technological advancement over the years.

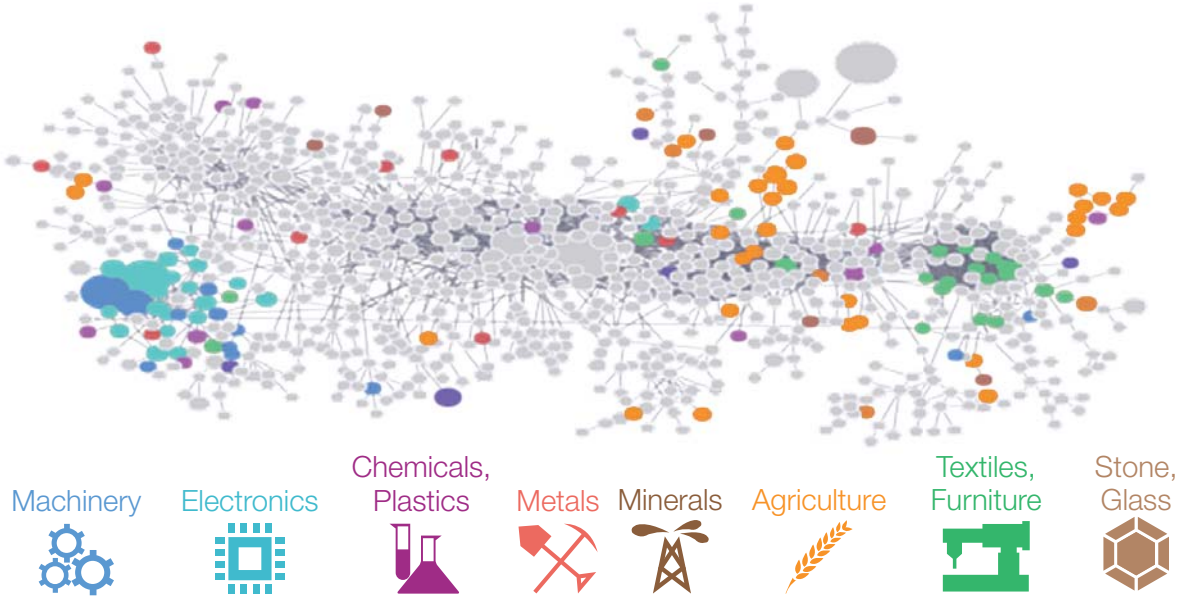
A country's degree of economic complexity can be measured using the Economic Complexity Index (ECI). The ECI is calculated by taking into account the number of export products a country has comparative advantage in (*product diversity*), and the number of countries that make those products[1] (*product complexity*). The complexity of specific products that a country makes is represented by the Product Complexity Index (PCI). Based on the PCI, the most sophisticated products are machinery and chemicals (e.g. steam turbines, photographic chemicals), while the least complex products are mainly raw commodities (e.g. tin ores, cotton). The ECI and PCI are measured as the standard deviation above or below the world average (denoted by positive or negative values, respectively). Key to analysing economic complexity is the 'product space' map, a pioneering tool developed by Hausmann et al. that illustrates the country's product mix and ease of future diversification to raise overall economic complexity (*Details in Insight Box 1: The Product Space*).

[1] A product that is made by only few countries can be considered a 'complex' good, as this reflects the need for more advanced capabilities to produce them (e.g. X-ray machines).

Insight Box 1: The Product Space

Chart 1: The Product Space

The product space depicts the diversity of products made and the ease of diversification into different, more complex products



Source: The Atlas of Economic Complexity

The product space visualises the universe of products that a country can export. Every dot or node represents a different export product. The different colours represent the broader industry that these products are in. Nodes that are coloured in the product space indicate the products that a country has comparative advantage in exporting, while nodes that are greyed represent products that a country has limited exposure in. Two key features of the product space illustrate a country's level of economic complexity. Firstly, the diversity of products can be seen from the number of coloured dots across the product space. The greater the number of dots in different colours, the more diverse a country's export products. Secondly, the location of the product nodes (i.e. dots) matters. A high number of products located at the centre of the product space reflects its high connectivity to a multitude of goods. In addition, the product space also provides insights on the ease of diversification into new and more complex products. The ease in which a country increases its complexity depends on how tightly connected the country's product space is, and is represented by the distance between the product nodes. The closer the product nodes, the easier it is to increase complexity. Products that are tightly connected share most of the requisite capabilities. Thus, firms can easily diversify from one product to another by leveraging on existing capabilities. Conversely, a sparse product space suggests greater difficulty in raising complexity as producers have insufficient pre-existing capabilities to make new products. They would need to acquire vast knowledge and skills to make these products, which will take considerable time and effort.

Evolution of Malaysia's Economic Complexity

Over the last two decades, Malaysia's economic complexity has improved from +0.39 in 1996 to +0.82 in 2016 (Chart 2), making it the 29th most complex economy in the world. The increase not only reflects Malaysia's ability to produce more varied and complex goods over time, but that Malaysia has been able to grow its complexity at a faster pace compared to the rest of the world.

Chart 2: Trend in Malaysia's Economic Complexity Index

Malaysia's economic complexity has improved over the past two decades

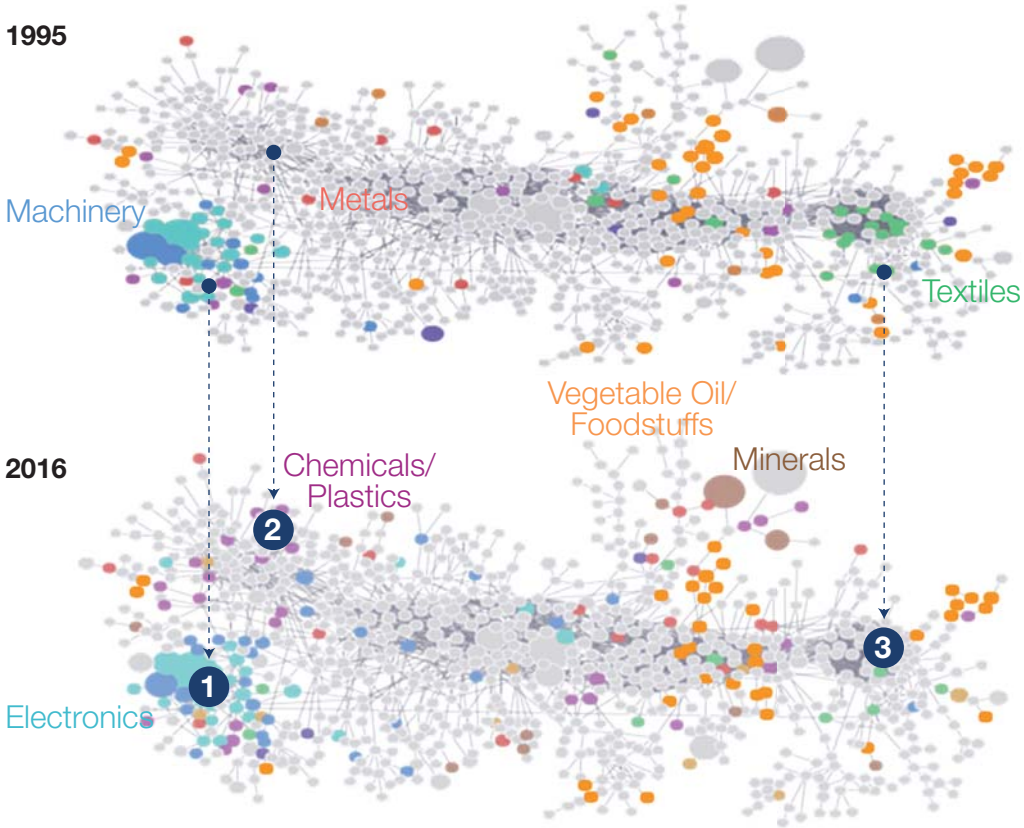
Source: The Atlas of Economic Complexity

The evolution in Malaysia's product space over time reveals three key developments (Chart 3). These include:

1. Greater linkages in the machinery and electronics cluster (*represented by denser blue dots*),
2. Development of new products, such as chemicals and plastics (*emergence of new purple dots*); and
3. Hollowing out from low-complex products, such as textiles (*reduction in green dots*), which frees up resources to develop comparative advantage in more complex goods.

Chart 3: Snapshot of Malaysia's Product Space in 1995 and 2016

Higher economic complexity supported by sectoral diversification into more complex products

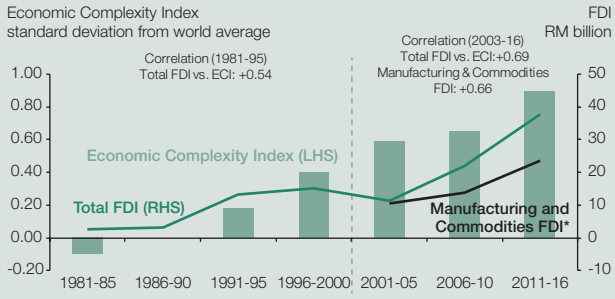


Source: The Atlas of Economic Complexity

The increase in Malaysia's economic complexity can be traced back to the rapid industrialisation phase in the 1980s and 1990s. During this time, the composition of Malaysia's exports shifted from mainly commodities to manufactured exports[2] (1975: 22% share of exports; 1995: 80%). Comprehensive policy initiatives were undertaken to enhance the supporting business ecosystem to ensure an environment conducive for the manufacturing sector to flourish[3]. These include improving training and skills development, financing support, physical infrastructure, and regulations pertaining to trade and investment activity. Of significance were the enactment of the Promotion of Investments Act 1986 and reduction in trade barriers that facilitated production, trade and investment activities. Buoyed by a favourable business climate, foreign direct investment (FDI) in the manufacturing and mining sectors surged. These FDIs were a critical game-changer in Malaysia's development as they provided impetus to job creation and productivity in addition to the country's economic complexity (Chart 4).

Chart 4: Foreign Direct Investment (FDI) and Economic Complexity Index (ECI) in Malaysia

FDI provided impetus to Malaysia's economic complexity



*Official data for FDI by sector only available from 2003 onwards

Source: The Atlas of Economic Complexity, United Nations Conference on Trade and Development (UNCTAD), Department of Statistics, Malaysia

This was particularly evident in the machinery and electronics cluster. In the 1990s, there was a gradual transition from basic testing and assembly services for integrated circuits to the more complex production of office and computer equipment. This transition allowed both multinational and domestic manufacturers to develop and hone the necessary knowledge and skills to achieve global production standards. The growth in capabilities catalysed the subsequent diversification into even more complex electronic products, particularly for semiconductors in the fast-growing consumer and automotive segments[4]. Home-grown manufacturers are now more integrated into the E&E global value chain and are capable of producing parts and components independently for international brands, such as Apple, Samsung, Intel, BMW and Airbus.

Over the years, Malaysia's ability to produce more complex chemical, plastic and rubber products reflects the expansion in downstream activities in the mining and agriculture sectors. The establishment of large local and foreign corporations in these sectors spurred Malaysia's manufacturing capabilities in downstream products, such as petrochemicals, oleochemicals and rubber gloves. Refineries and gas pipelines were constructed for production purposes, further supported by the availability of feedstock inputs given the country's endowment of natural resources[5]. Going forward, Malaysia's downstream production in the oil and gas industry is poised to benefit from the Refinery and Petrochemical Integrated Development (RAPID) operations which are nearing completion.

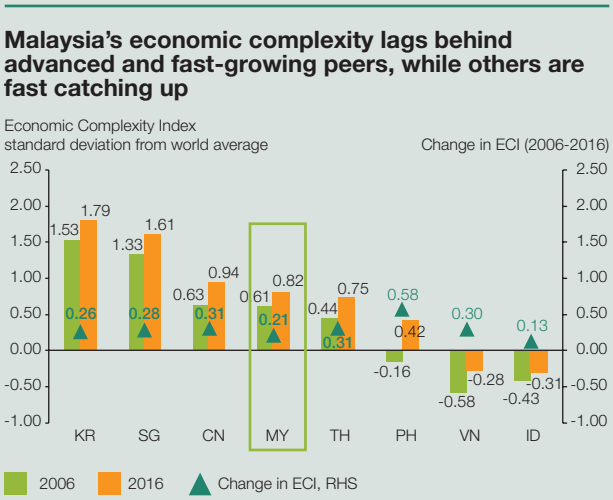
[2] For a more detailed account, please refer to the Box Article on 'The Changing Structure of Malaysia's Exports' in Bank Negara Malaysia's Annual Report 2011.
[3] Yusoff et al. 2000. Globalisation, Economic Policy and Equity: The Case of Malaysia; Wong 2013. The Malaysian Electrical and Electronics (E&E) Industry: At an Inflexion Point.
[4] For a more detailed account, please refer to the Box Article on 'Shifting Shapes, Turning Tides: The Evolution of Malaysia's Electronics and Electrical (E&E) Industry' in Bank Negara Malaysia's Annual Report 2015.
[5] Foo 2015. The Malaysian Chemicals Industry: From Commodities to Manufacturing.

While downstream activities expanded in the past two decades, the product space also shows that Malaysia continues to export raw mineral and agriculture products (*brown and orange dots, respectively*). The centre of the product space also remains relatively sparse, which suggests that Malaysia has yet to develop comparative advantage in some products. These indicate opportunities for further downstreaming in the commodities sector and the development of comparative advantage in new products.

Comparing Malaysia's Economic Complexity to Regional Peers

While Malaysia's economic complexity has grown over the years, the country remains behind advanced and fast-growing regional peers (Chart 5). Among the selected regional countries, Korea is deemed the most complex economy with an ECI of +1.79 in 2016. This is followed by Singapore (+1.61) and PR China (+0.94).

Chart 5: Economic Complexity Index (Malaysia and Selected Regional Countries)



Note: CN = PR China, ID = Indonesia, JP = Japan, KR = Republic of Korea, MY = Malaysia, PH = Philippines, SG = Singapore, TH = Thailand, VN = Vietnam

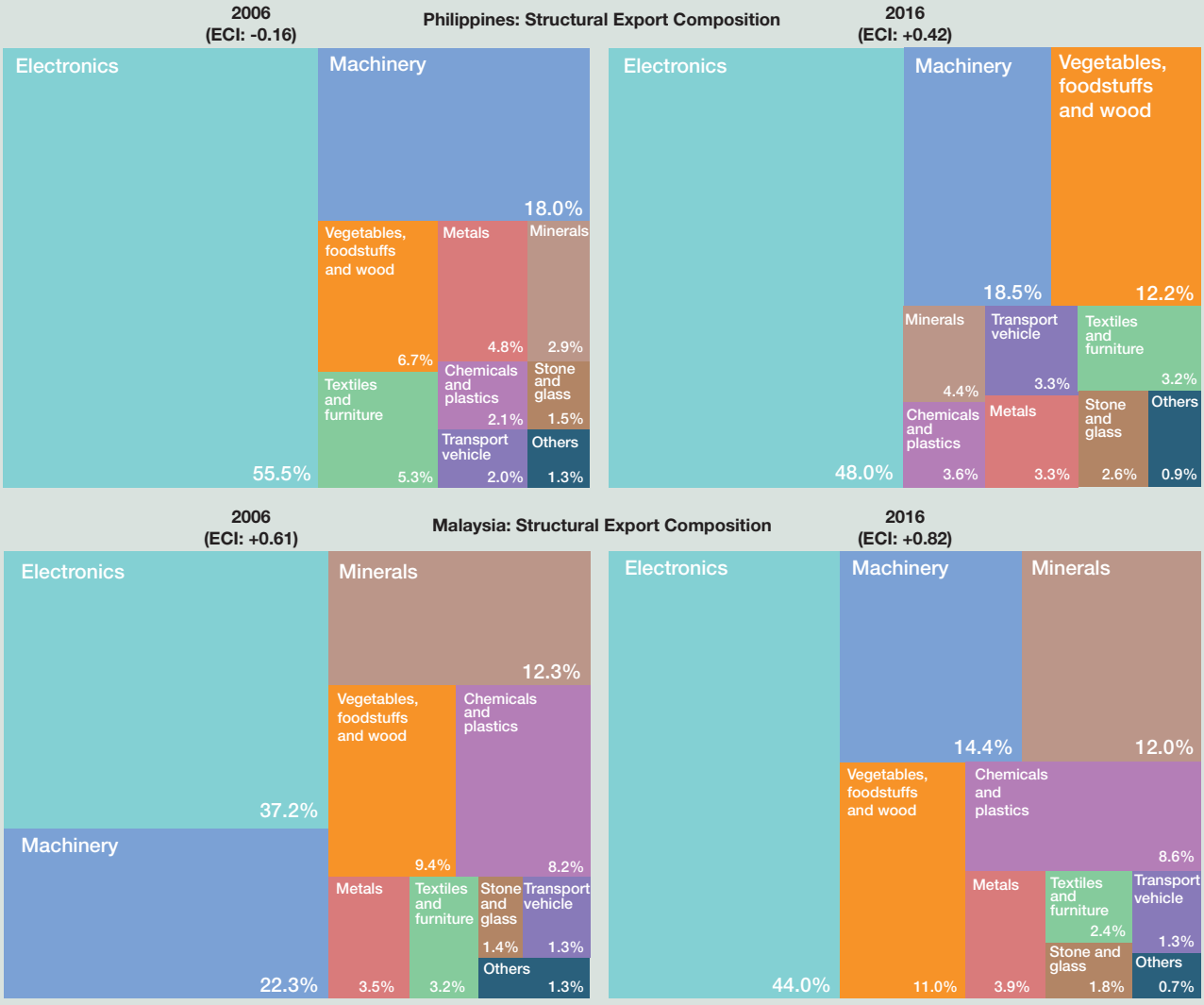
Source: The Atlas of Economic Complexity

Looking at the change in ECI over the recent decade, most regional countries have accomplished greater complexity gains than Malaysia's improvement of +0.21. This suggests that these countries experienced more substantial diversification in their product mix or have ventured faster into highly complex products. Of note, Philippines' economic complexity improved the most in the region by +0.58. This resulted in a shift in its level of complexity from below global average to above global average within ten years. Chart 6 compares the structural changes in the export composition of the Philippines and Malaysia over the last decade. Starting from a lower level of ECI, the greater complexity gains was attributed to the product mix in the export basket of the Philippines which had become more varied. The country lowered its exposure in electronic products, reflected by the decline in its share from 55% in 2006 to 48% in 2016. Conversely, there was greater focus in more complex chemicals, plastics and transport vehicles as the share of these products increased from 4% to 7%. The share of agriculture products also rose from 7% to 12%. More importantly, within the agriculture sector, there was a diversification away from less complex items such as bananas (PCI: -2.28) into the more complex wood carpentry (PCI: +0.09).

In contrast, the improvement in Malaysia's ECI is relatively slower as the export mix diversified by a smaller extent and the entry into new products has yet to materialise significantly. The profile of the products exported offers some insights. Firstly, Malaysia's concentration in electronic products (PCI: +0.76) rose from 37% to 44% share of total exports over the last decade as the country remains firmly plugged in the global value chain. At the same time, exposure in the machinery cluster, which has a higher PCI of +1.00, halved from

Chart 6: Snapshot of the Structural Export Composition of the Philippines and Malaysia (% share of total exports)

Improvement in Malaysia's ECI is relatively slower than Philippines



Note: Figures may not necessarily add up due to rounding

Source: The Atlas of Economic Complexity

22% to 14% share. Within the machinery cluster, while firms shifted their focus away from PC and parts (PCI: +0.64) in line with the global technological shift towards internet-enabled devices, progress in growing the more complex medical and scientific instruments base (PCI: +0.94) remains fairly limited at 4% share of total exports. Finally, Malaysia had only managed to expand incrementally into the more complex chemicals and plastics, as reflected by the small increase in its exports share from 8.2% in 2006 to 8.6% in 2016.

Strategies to Increase Economic Complexity

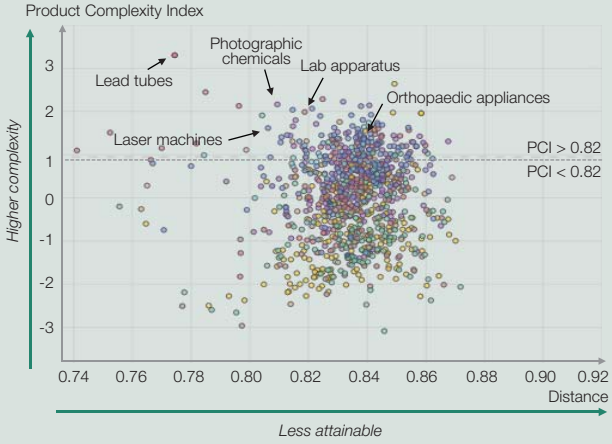
The emergence of overarching megatrends such as technological disruptions, rapid urbanisation and climate change requires countries to rethink their current growth strategies and adapt to new realities. In this regard, there is room for Malaysia to further diversify its product mix and deepen its product complexity in order to maximise the opportunities for the nation in the highly-dynamic global environment. As identified earlier, Malaysia's current product space is relatively sparse at the centre, which suggests room for the country to develop comparative advantages in some of these products.

These are products that are 'rich in complexity' as they are situated at the centre of the product space with tightly connected nodes. Malaysia could leverage on the vast experience and significant productive capabilities it has developed over the years particularly in the electronics and commodity sectors, and increasingly the chemical and plastics industries to diversify into new, more complex products.

The product feasibility map presents a useful tool to identify the range of potential product diversification options and its feasibility (Chart 7). The map demonstrates how attainable it is to produce certain products, given existing capabilities (horizontal axis) and the corresponding product complexity (vertical axis). Increasing Malaysia's complexity would require diversifying into more complex products with PCIs that are above Malaysia's current ECI of +0.82. Such products include *lead tubes*, *laser machines, photographic chemicals* to *laboratory apparatus* and *orthopaedic appliances*. They are also of high complexity and could catalyse production in other more complex products. Based on the map and experience in other countries, it is relatively easier for Malaysia to diversify into *lead tubes, laser machines* and *photographic chemicals* in the near term as they are more closely connected to existing products that Malaysia currently manufactures.

Chart 7: Product Feasibility Map for Malaysia

The product feasibility map indicates the range of potential product diversification for Malaysia



Source : The Atlas of Economic Complexity

To enable further diversification and ventures into more complex industries, focus should be directed towards modernising and augmenting the supporting ecosystem of pertinent industries. The strategy should centre on four key pillars which are proven enablers of rapid diversification in the past: talent, financing, infrastructure and regulations.

Firstly, a sustainable supply of a well-educated and experienced talent pool forms the bedrock for the diffusion of knowledge within and across industries. The emergence of new trends such as Industry 4.0 would have significant consequences on the labour market, requiring an adaptable workforce that can be reskilled and retooled. While institutions were created in the past to address skills shortages, they should now proactively embed joint industry-academia element in new and existing course and training curricula, and research programmes. This will ensure that the talent produced matches the dynamic needs of industries, anchored firmly with strong research skills to drive innovative change. To cater to Industry 4.0, some progress have been made to encourage such industry-driven research and training partnerships in Malaysia. Notable examples include the establishment of Collaborative Research in Engineering, Science and Technology (CREST) in 2012, and more recently the launch of MIMOS-NCIA Advanced Competency Development Centre in 2017. Currently, these efforts are focused primarily on the E&E sector. Extension of such initiatives to the non-E&E and commodity industries, which account for a larger share of exports at 62%, and 23% of total employment[6] in 2017, would upskill a greater share of the labour force. Efforts

[6] Employment in the non-E&E sector is estimated by applying its ratio of employment in the manufacturing sector using the Department of Statistics, Malaysia's Monthly Manufacturing Survey for establishments.

to attract and retain the existing base of high-skilled talent is equally important. In addition to the current efforts by the Government, the private sector can also play a role by ensuring that labour remuneration, including wages and salaries are commensurate with productivity levels.

Secondly, both regulators and private sector players must work closely to encourage more widespread use of alternative financing platforms, such as crowdfunding, peer-to-peer lending and venture capital. This could be an important source of funds for businesses, particularly SMEs, that are involved in innovative or new growth areas which entail higher risks[7]. Bank-based financing may not be the best means to finance these activities. For comprehensive credit risk assessment, banks would require an established credit history and collateral, which start-ups in new growth areas often lack. Multiple policy priorities have been identified to further promote alternative finance. These include, among others, enhancing institutional arrangements to coordinate, streamline and anchor policies in developing alternative finance, and improving the quality, coverage and credibility of alternative financing data to support credit decisions.

Thirdly, user-friendly physical infrastructure remains a critical component of the industrial ecosystem. With the increasing utilisation of digital platforms for the efficient sharing of knowledge and information, more attention should be placed on upgrading virtual and digital infrastructures in Malaysia. This could encompass the integration of big data analytics into national databases, greater use of remote desktops and improving broadband connectivity. Leveraging on existing initiatives to maximise the potential of digital platforms in Malaysia, it is critical to accelerate the integration of private sector data into the National Data Ocean Platform by MAMPU. The pooling of a broader set of data (e.g. consumer preferences revealed through search engine database), complemented by the use of data analytics can create valuable insights for more informed business analyses and decisions to enhance product range, quality and sophistication.

Finally, the regulatory environment will need to adapt to and leverage on the rapid technological change taking place. Ongoing efforts to reduce regulatory redtapes and reorientate incentives (e.g. taxes, subsidies) will encourage quality investments in more innovative and complex industries, particularly those that involve downstreaming and R&D activities, and also technology transfers. In the past, the implementation of the upstream petroleum income tax at 38% in the mining sector had incentivised diversification into the more complex downstream petroleum products. Taking into account the market structure and firms' operating environment, similar strategies could be considered to spur the crude palm oil (CPO) industry to accelerate expansion in downstream activities by reviewing the corporate tax on CPO firms' upstream revenues. Intellectual property rights and certification standards can also be strengthened to foster a safe environment for innovation.

The intended outcome of these strategies is to foster the agility, efficiency and sophistication of local players to push frontiers and remain relevant in a fast-changing environment. Solid public-private coordination and collaboration would ensure that these objectives are achievable.

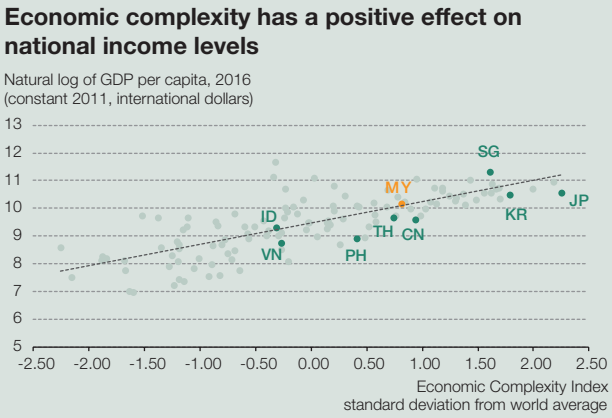
Economic Complexity and the Impact on Malaysia's Economic Growth Prospects

As economic complexity reflects the capabilities embedded in the productive structure of an economy, Hausmann et al. finds that economic complexity has a positive effect on income levels (Chart 8). The gap between a country's complexity and its level of per capita income could be used to predict future GDP growth. If a country's income level is lower than average at a given ECI, income is likely to grow at a faster pace going forward. This is because the country already possesses the necessary productive capabilities to easily diversify into more complex products within a short time-frame. This will allow the country's income to converge to the levels that are consistent with other countries possessing similar levels of economic complexity.

Given the marginal gap between Malaysia's current GDP per capita and complexity, the study projects Malaysia's real GDP to grow by 4.8% up to 2025 (lower compared to the 1990-2017 long-run average of 5.9%). With this projected growth rate and assuming a stable population growth of 1.3% (2017 rate), Malaysia is expected to achieve a per capita income level of about USD11,900 by 2020, which remains slightly below the latest high-income threshold of USD12,236 as defined by

[7] Refer to the Box Article on 'The Role of Alternative Finance to Fund the Needs of a New Economy', Bank Negara Malaysia's Financial Stability and Payment Systems Report 2016.

Chart 8: Economic Complexity Index and GDP Per Capita (2016)



Note: CN = PR China, ID = Indonesia, JP = Japan, KR = Republic of Korea, MY = Malaysia, PH = Philippines, SG = Singapore, TH = Thailand, VN = Vietnam

Source : The Atlas of Economic Complexity, The World Bank

the World Bank. In other words, by this technique, Malaysia's present level of economic complexity is currently insufficient to propel the economy to sustainably achieve high income status by 2020. Therefore, it is imperative that Malaysia implements the necessary strategies that will improve its overall complexity not only to remain competitive against regional peers, but also to meet its high-income aspirations.

Conclusion

As a summary indicator of a country's overall productive capabilities, the concept of 'economic complexity' is an insightful tool towards understanding a nation's structural change and competitive advantage while serving as a useful guide to strategise future development. Over the last two decades, Malaysia has been successful in raising its level of complexity as a result of past structural reforms, supportive business ecosystem and greater presence of FDI. Despite these gains, other developing regional peers are fast catching up, and at its current pace, Malaysia may risk lagging behind its high-income aspiration targets. Therefore, it is imperative to accelerate efforts to further diversify the product mix and deepen product complexity. The product feasibility map presents a viable range of diversification options, leveraging on the knowledge and capabilities that the nation has developed over the years. Implicit to this is the realisation that a dynamic and robust manufacturing base remains a vital aspect in a complex economy. The key policy thrust should therefore be directed towards continuous and deeper structural reforms, particularly in modernising and augmenting the support system of the relevant industries. These include, among others, (i) extending the industry-academia element in research and training programmes beyond the E&E sector, (ii) promoting alternative finance via coordinated efforts among relevant institutions, (iii) elevating the digital National Data Ocean Platform, (iv) reviewing upstream tax to promote downstream activities in the palm oil industry, and (v) explicitly including complexity as an incentive criteria. This would encourage quality domestic and foreign direct investments in new complex growth areas, foster innovation and sophistication, create greater job opportunities and improve income prospects. Higher economic complexity would therefore enable Malaysia to compete and thrive in a fast-changing global environment, ultimately paving the way towards greater prosperity.

References

Foo, D.C.Y (2015), The Malaysian Chemicals Industry: From Commodities to Manufacturing, CEP Magazine: An American Institute of Chemical Engineers Publication, New York: American Institute of Chemical Engineers.

Hausmann, R., et al. (2013), The Atlas of Economic Complexity: Mapping Paths to Prosperity 2nd ed., Cambridge: MIT Press.

Wong, S.H. (2013), The Malaysian Electrical and Electronics (E&E) Industry: At an Inflexion Point, Jurutera: The Monthly Bulletin of the Institution of Engineers, Malaysia, Selangor: The Institution of Engineers, Malaysia.

Yusoff, M. B., Abu Hasan, F., Abdul Jalil, S. (2000), Globalisation, Economic Policy and Equity: The Case of Malaysia. Paris: OECD.

Unlocking Malaysia's Digital Future: Opportunities, Challenges and Policy Responses

By: Punithaa Kylasapathy, Tng Boon Hwa and Ahmad Haris Mohd Zukki

Introduction

The impact of digitalisation on the global economy has been significant but uneven, both within and across economies. The implications are vast and numerous, affecting economic development, simultaneous job creation and destruction, and income and social inequality. Policy debates are no longer about whether we should embrace digitalisation, but rather how economies can maximise their utilisation, while at the same time address the pitfalls. The rapid pace of advancement in digitalisation is clearly evidenced in global data flows expanding 45-fold (McKinsey Global Institute, 2016), while global merchandise trade only grew 1.5 times, from 2005-2016.

This article provides an overview of the digital transformation in its current phase, assesses the digital landscape in Malaysia and draws out key policy implications for Malaysia to successfully incorporate digitalisation as an integral part of its economic development strategy.

Understanding the Digital Economy

There has yet to be a consensus on the definition of the digital economy. Definitions instead evolve when new digital trends emerge and disrupt the status quo. Characterisations of the digital economy began in the 1980s with mass produced personal computers. This was followed by advanced computerised manufacturing in the 1990s and e-commerce and off-shoring in the 2000s (UNCTAD, 2017). The current digital trend is centred on integrating digital technologies into daily life and business operations. Schwab (2016) puts it succinctly by describing this phase of digitalisation as technologies that fuse the digital, physical and biological worlds and permeate across industries and economies. These are underpinned by a myriad of technological trends, in particular, the Internet of Things (IoT), Big Data Analytics, Artificial Intelligence (AI) and Cloud Computing (Table 1).

Table 1

Technological Trends Driving the Digital Economy

	Definition	Examples of Applications	Frontrunners
Big Data Analytics	Real time analysis using high volume of data	• Transaction analysis for targeted advertising • Traffic management	• IBM (USA) • Oracle (USA) • SAP (USA)
Internet of Things	Sensor-enabled objects connected via Internet	• Remote monitoring • Wearables and autonomous cars	• Google (USA) • Samsung (Korea) • Intel (USA) • Siemens (Germany)
Cloud Computing	Large data pool stored on the web instead of hardware	• Alternative for acquiring and managing IT infrastructure • Web-based applications	• Microsoft (USA) • Amazon (USA) • Alibaba (PR China)
Artificial Intelligence	Software that learns and adapts	• Image recognition for early risk detection and treatment in medicine • Develop and execute investment strategies	• NVIDIA (USA) • Google (USA) • Baidu (PR China) • IBM (USA)

A Macroeconomic Perspective of the Digital Landscape in Malaysia

In Malaysia, households, businesses and the Government alike have embraced digitalisation. From 2005-2016, internet users doubled to 21 million; mobile-cellular penetration doubled to 44 million subscriptions; and fixed-broadband users doubled to 3 million (International Telecommunication Union, 2016). As at 2015, 83% of Government services are provided via online platforms (MAMPU, 2016).

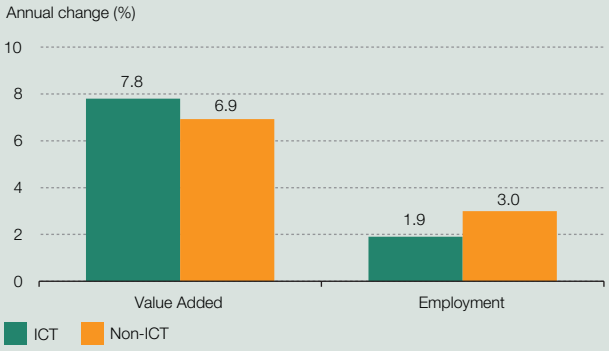
The pervasive nature of digital platforms makes it hard to capture the full extent of digitalisation in Malaysia. A useful start is the performance of the Information and Communication Technology (ICT)[1] sector, where technology intensity is high and digital activities are concentrated. As Chart 1 shows, from 2011-2016, the ICT sector's value-added growth outpaced that of non-ICT sectors (ICT: 7.8% vs non-ICT: 6.9%). Of note, e-commerce activities almost doubled over the same period (2016: RM74.6 billion; 2011: RM44.6 billion). This reflects the rising prominence of digital platforms and, more broadly, the role of technology in driving economic activity. Chart 1 also illustrates that while growth of value-added in ICT has outpaced non-ICT, in contrast, employment in ICT lags behind the non-ICT sectors. In one aspect, this suggests that ICT's productivity is higher vis-à-vis the non-ICT sector. On the other hand, it also potentially reflects the changing labour needs of the economy. Therefore, digital transformation and automation could render some segments of labour redundant and demand new skill requirements in jobs.

Given the pervasiveness of the ICT sector's development for the broader economy, it is necessary to evaluate the linkages between ICT and other sectors in the economy. This is done using the input-output Cumulative Production Structure (CPS) framework to estimate backward and forward linkages[2].

Chart 2 shows multipliers of the backward and forward linkages between ICT & Computer Services[3] and other sectors of the economy. Two key trends are observed: Firstly, the backward linkage multipliers have increased, showing that as the range of ICT and computer services have expanded significantly since 2005, so have the resources that it draws from other sectors in order to provide the services. Secondly, forward linkages have also increased. This reflects firms' increased use of internet, e-commerce and other online services as an integral aspect of their business operations.

Chart 1: Malaysia's Value-Added and Employment in ICT and non-ICT (Avg. Growth 2011-2016)

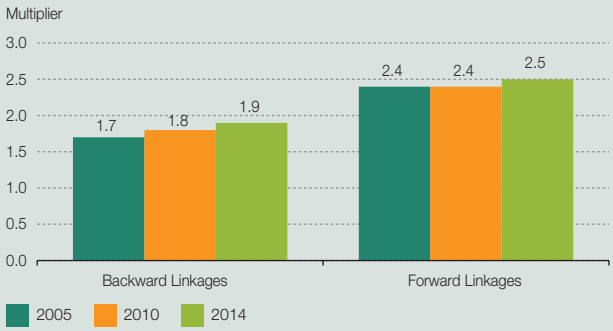
Higher productivity in ICT activities



Source: Department of Statistics, Malaysia (2017)

Chart 2: Backward and Forward Linkages between ICT & Computer Services and Other Sectors in Malaysia

Increasing spillovers from ICT to the broader economy



Source: Bank Negara Malaysia and Department of Statistics, Malaysia

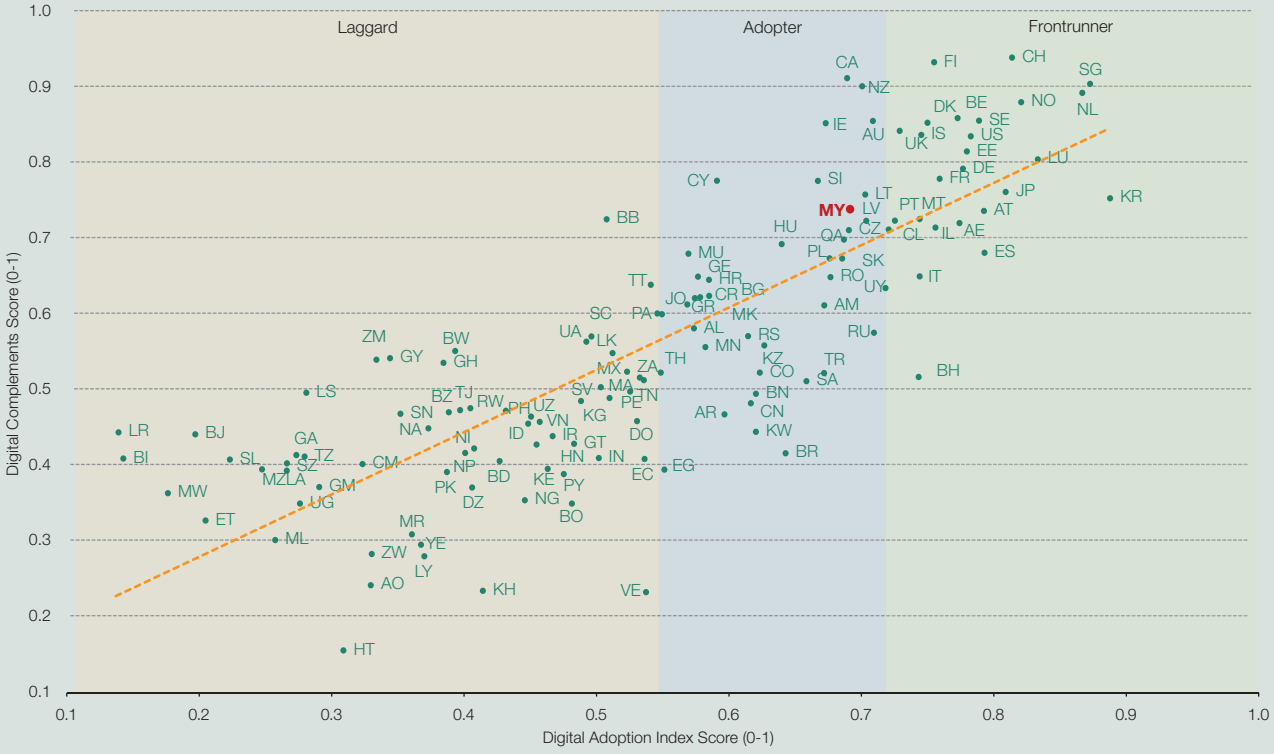
[1] ICT refers to value-added from ICT manufacturing, ICT services, ICT trade, content and media and other industries.
[2] "Backward linkage" describes the digital services sector's use of resources from other sectors as an input of production. "Forward linkages" describes other sectors' use of resources from the digital services sector as an input of production.
[3] This refers to services such as the internet, computer programmes and services provided via online platforms.

Malaysia's Competitive Positioning in the Global Economy

To analyse whether Malaysia's digital progress has kept pace on the global front, it is necessary to benchmark Malaysia with other countries. Chart 3 presents a summary of digital adoption and key complementary enablers that support digital activities. These measures are from the World Bank's Digital Adoption Index (DAI), which reflect accessibility and usage of digital services by consumers, businesses and the Government. Among the key complementary enablers are strong human capital, a facilitative regulatory environment for businesses to compete, governance standards and forward-looking organisations. Countries are classified as "frontrunners", "adopters" and "laggards"[4]. This analysis reveals Malaysia as an "adopter" country. While in some respect, this places Malaysia's digital progress as comparable with some advanced economies, the economy still lags notable "frontrunners" such as the United States, Estonia, South Korea, Japan and Singapore.

Chart 3: Digital Adoption and Complements Score Comparison

Malaysia as an "adopter" country lags behind "frontrunners"



Note: Selected "frontrunners" include United States (US), Estonia (EE), South Korea (KR), Japan (JP) and Singapore (SG). Selected "adopters" include Australia (AU), PR China (CN), Brazil (BR), Russia (RU) and Thailand (TH). Selected "laggards" include Mexico (MX), Vietnam (VN), Philippines (PH), Indonesia (ID) and India (IN).

Source : World Bank (2016)

[4] Frontrunners are the top 20%, adopters are the 20-50% and laggards are the bottom 50% of the DAI.

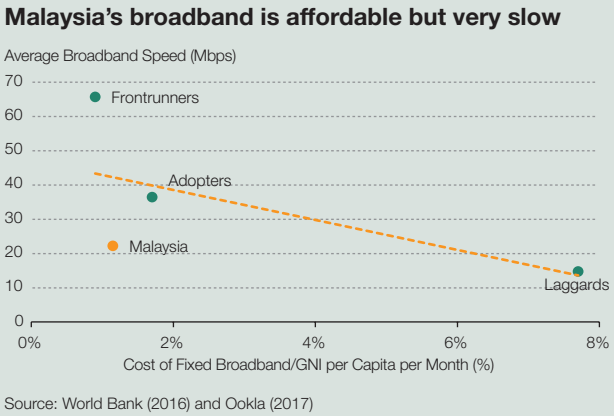
Malaysia must aspire to become a "frontrunner" on the digital front to fully unlock the economic benefits. E-commerce gives firms and consumers access to global markets. The migration to such platforms may also result in structurally lower prices, due to enhanced price discovery and the reduced reliance on intermediaries ("middlemen") to distribute goods and services. The Gig economy facilitates more flexible work arrangements, while online job platforms reduce demand-supply mismatches in the labour force. Capacity in Big Data Analytics and AI tap into previously unutilised information to yield new insights for decision making. Cumulatively, these technological developments will yield more efficient and productive economic outcomes. It is estimated that these technologies can contribute USD15 trillion-USD33 trillion per year to the global economy by 2025 (McKinsey, 2013). For Malaysia, transitioning the economy to "frontrunner" status can yield significant additional growth dividends of between USD100 billion-USD136 billion per year by 2025.

Delving deeper into the factors that propel economies to "frontrunner" status reveals that these economies have successfully addressed three key structural features to support their progression. Firstly, fast and affordable broadband. Secondly, talent tailored for digital progress. Thirdly, high digital adoption among consumers and businesses.

Fast Affordable Broadband

High broadband speed is vital for digital technologies such as the IoT, AI and Cloud Computing to thrive. A market structure that encourages competition among internet service providers ensures high quality and affordable broadband. Chart 4 shows that while broadband in Malaysia is relatively affordable, its average speed is more comparable to that of a "laggard" economy.

Chart 4: Broadband Speed and Affordability Comparison



Source: World Bank (2016) and Ookla (2017)

Talent Tailored for Digital Progress

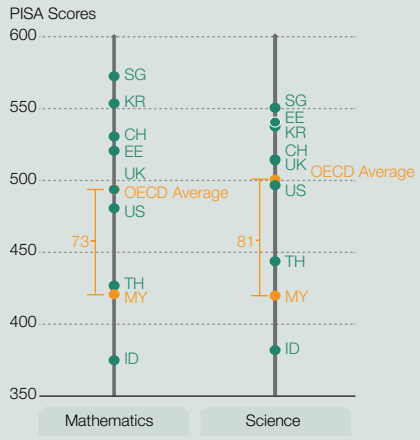
The digital transformation will have a polarising effect on the labour market, with both winners and losers. Labour with requisite skills to participate in this transformation will earn wage premiums between 10-16% (Lim, Wong, Rasep and Selvarajan, 2017). However, research shows that 54% of jobs in Malaysia, of which 80% are mid-skilled jobs, face a high-risk of being automated in the next 10-20 years (Ng, 2017), and that a vast majority of jobs within a decade will require ICT skills (Berg and Frey, 2016).

Developing requisite skills for the digital economy requires a strong foundation in technical subjects such as Science and Mathematics. Currently, Malaysia's standards in technical subjects are improving but still lag most advanced economies (Chart 5). Looking ahead, Chart 6 shows that Malaysia's universities will create substantially more graduates in the Arts and Social Sciences and less so in Science, Technology, Engineering and Mathematics (STEM) and technical fields. Left unaddressed, this development will perpetuate a skills mismatch as economic activity becomes more technologically and digitally advanced.

Chart 5: PISA Scores Comparison

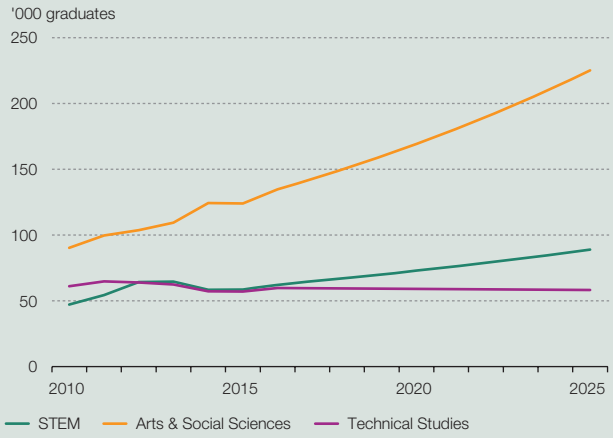
Chart 6: Projected Trend of Graduates

Talent transformation in Malaysia must adapt to thrive in the digital economy



Note: PISA refers to the Programme for International Student Assessment

Source: OECD (2014)



Note: STEM graduates refer to Science and ICT graduates

Source: Ministry of Higher Education and staff estimates

High Digital Adoption

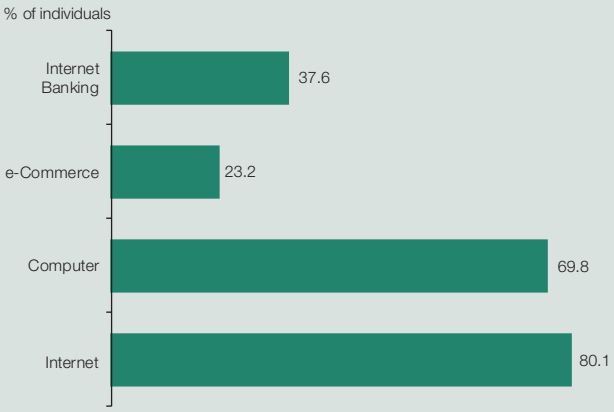
Digital adoption in Malaysia must improve to progress further in the digital economy. Although there is a rising trend in consumers' use of digital services such as e-commerce and internet banking, these figures still remain relatively low (Chart 7). Furthermore, the majority of internet usage in Malaysia is confined to the consumption of content (e.g. downloading movies/music, social media and games), rather than productive activities such as the creation of new content (e.g. mobile applications). For example, 81.2% of Malaysia's internet users download media and play games. In contrast, internet usage in more productive activities - professional networking (9.1%), content creation (11.8%) and learning from formal online courses (4.8%) - is substantially lower.

Malaysian businesses have not fully capitalised on the potential of e-commerce and use of websites for marketing. Only a minority have an online presence. Fixed broadband connectivity still lags behind advanced economies (Chart 8).

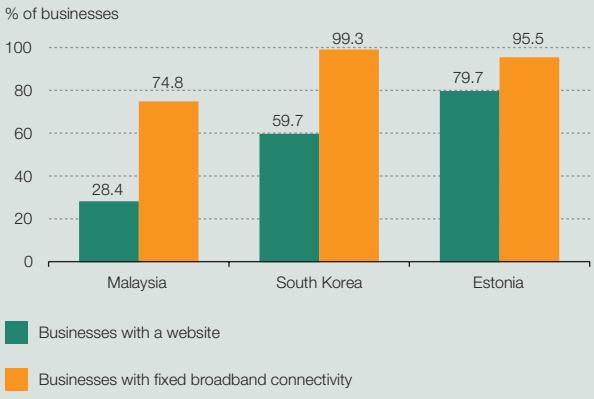
Chart 7: Consumer Digital Adoption (2017)

Chart 8: Business Digital Adoption (2015)

Digital adoption must improve to progress further in the digital economy



Source: Department of Statistics, Malaysia



Source: Department of Statistics, Malaysia and OECD

Policy Implications for Malaysia

Acknowledging the importance of the digital economy, the Government is undertaking concerted efforts to spur digital transformation. The Malaysia Digital Economy Corporation (MDEC) is tasked to spearhead Malaysia's Digital Hub and various Technopreneurship programmes to attract global and local tech start-ups. This resulted in related investments of RM16.3 billion in 2016. The Digital Free Trade Zone (DFTZ) initiative launched in 2017 under the National eCommerce Strategic Roadmap aims to boost SME export contribution to USD38 billion and create 60,000 jobs by 2025. To advance progress in Big Data Analytics, the ASEAN Data Analytics eXchange (ADAX) initiative trains companies and facilitates experimentation of new solutions. On talent, MDEC has developed university and industry-led partnerships to build the requisite expertise in data professionals and cybersecurity.

Lessons drawn from the recent experiences of "frontrunner" economies on digital adoption highlight some immediate policy priorities for Malaysia. Firstly, the education system must emphasise lifelong learning, stimulate more interest in STEM degrees and make ICT literacy skills mandatory (e.g. computational math, robotics, peer-to-peer learning). For instance, the Thomas Jefferson High School for Science and Technology in the US has research labs with experienced computer scientists across all subject areas (e.g. astrophysics and oceanic). As the skills requirements change, Government policy and firms must incentivise upskilling by providing and rewarding skills upgrade via Massive Open Online Courses. A coordinated national framework to continuously upskill the workforce, as adopted by Singapore's Skills Future Programme, will help at-risk workers be redeployed. Currently, only a mere 13% of existing workforce receive upskilling training (HRDF, 2016).

Secondly, a universal digital infrastructure is needed to encourage more digital adoption and participation. This infrastructure consists of high-speed network connectivity, a digital ID, an efficient digital payment network and open data systems. These building blocks allow secure digital identification and authentication for digital services delivery (including legal services to transfer property, telemedicine and financial services). This will reduce costs of services delivery. A notable case study is Estonia, through its public and private sector partnership to develop the "X-Road Initiative" (See box below).

Estonia's Digital Success – "X-Road Initiative"

Almost everything in an Estonian's life is seamlessly integrated digitally, from signing and sharing legal property documents, obtaining medical data records, setting up a company, obtaining banking services, participating in legislation, to the simplest of tasks such as paying for parking. The nation envisions being a borderless country. Anyone can apply for its e-residency digitally. This allows for value creation undertaken in any part of the world to register with Estonia and enjoy privileges such as access to the European Digital Single Market.

Their digital infrastructure, X-Road, leverages on a decentralised approach. A blockchain system allows for a common platform for various databases to openly share data through a unique digital ID. Private and public entities who wish to develop online solutions can apply to join X-Road and leverage on common system services (e.g. unique electronic ID) (Vassil,K. 2015). A fundamental premise is building societal trust through the empowerment of individual data ownership. Citizens can check on who has accessed their data. A demonstrated track record of innovations in cybersecurity also engenders trust in the system through the use of proprietary block chain technology, cybersecurity stress testing and data safe havens.

Having a secure payment system and an efficient financing mechanism are essential for an advanced digital economy. To accelerate the country's migration to e-payment, Bank Negara Malaysia has anchored strategies to displace cash and cheques, by encouraging online credit transfers and promoting wider adoption of debit cards. The Bank is also formulating the Interoperable Credit Transfer Framework (ICTF) to ensure seamless fund transfers between banks and e-money wallets, to drive greater adoption of mobile payments[5]. Peer-to-peer financing built on alternative credit scores and a vibrant venture capital ecosystem have been successful in financing digital start-ups, as evidenced in PR China and UK.

[5] Refer to Chapter on Cross-Sector Developments in the 2017 Financial Stability and Payment Systems Report for detailed discussions of the Bank's progress in payment system and fintech initiatives.

The private sector also plays an important role in stimulating innovation. This can be achieved through building partnerships to share data and resolve common concerns such as interoperability, common technical standards and cybersecurity. A good example is the establishment of the Industrial Internet Consortium, led by global major technology companies such as Intel, Cisco, AT&T, IBM and General Electric, which brought together industry players, academia and Government entities to modernise the manufacturing, healthcare, energy and agriculture sectors.

Thirdly, regulations must continue to be modernised to encourage innovation, investments and participation in the digital ecosystem. Privacy and cybersecurity issues must be addressed to engender trust. In the EU, the General Data Protection Regulation (GDPR)[6] has increased consumer control over data use to manage privacy concerns. All firms, including those outside the EU, who deal with EU citizens must obtain explicit consent on data use ("pre-ticked boxes or inactivity" do not qualify as consent), explain its use and uphold consumers' rights to have their private information be "forgotten". More importantly, consumers can transfer their data across online service providers (i.e. data portability), which spurs competition. While these principles emphasise greater accountability on firms, there are potential implications to the exports of services and cross-border data flows. These include higher cost of doing business from compliance and higher barriers to competition (e.g. the need for data localisation could impact non-EU service providers in cloud computing services). Thus, countries such as New Zealand and Switzerland have developed complementary legal frameworks on data protection to be mutually recognised as a jurisdiction with 'adequate' privacy laws.

Cybersecurity breaches have wide economic, social and sovereign implications. This is evidenced by cyber-attacks on the Bangladesh Bank's SWIFT system in 2016, Equifax (a major credit bureau in the United States) in 2017 and Ukraine's power grid in 2015. The global costs of cybercrime in 2014 was estimated to be between USD375 billion to USD575 billion, or about 0.6 percent of global GDP (McAfee, 2014). In Malaysia, cybersecurity breaches more than doubled in the last 8 years (2017: 7,962 cases; 2009: 3,564 cases) (MyCERT, 2018). A notable incident that occurred in 2014 involved a major data breach of more than 46.2 million mobile subscribers that resulted in a compromise of confidential personal information. Recognising the detriment of this threat, Malaysia plans to introduce cybersecurity laws to tackle the rising incidences of cybercrime. Practices such as mandatory reporting of breaches and stress testing of cybersecurity measures should be adopted to improve security standards and influence the development of a necessary market for cybersecurity insurance. Data is essential. Limited visibility on data breaches and the losses incurred prevent actuarial estimation of the cost of digital risks.

Regulations in the broadband market are critical for a competitive market structure to enable the provision of affordable and high quality digital infrastructure. These include adequate competition in the wholesale market and fair pricing mechanisms between the wholesale and retail markets. Fair access to infrastructure between incumbents and new players could spur investments. The Nationwide Fiberisation Plan (2017-2019) to enable high-speed broadband connectivity is a step in the right direction.

Conclusion

Digital technologies are now wide-spread and pervasive. New opportunities have emerged beyond e-commerce to robots and AI, which are quickly becoming indispensable in some industries. Malaysia has achieved some early success. Modernising regulations, empowering talent with future skills and universal access to world-class infrastructure will accelerate the pace of digitalisation and unlock the next frontier of productivity gains, higher income and social transformation. As a small open economy, Malaysia's competitiveness is no longer limited to its traditional physical factor endowments - land, capital and labour, but will be enhanced by its penchant for unlocking ideas and innovation in the digital economy. Malaysia will thrive with the opportunities that lie ahead with these digital frontiers.

[6] The regulation outlines that failure to comply would result in penalty to the firms of 4-10% of global revenue or €10-20 million, depending on the level of non-compliance.

References

Berger, T. and Frey, C. (2016). 'Structural Transformation in the OECD: Digitalization, Deindustrialization and the Future of Work', OECD Social, Employment and Migration Working Papers, OECD Publishing, Paris.

Bukht, R. and Heeks, R. (2017). 'Defining, Conceptualising and Measuring the Digital Economy' GDI Development Informatics Working Papers, no. 68, Global Development Institute, The University of Manchester, Manchester pp 1-24.

Department of Statistics, Malaysia, (2018). 'ICT Use and Access by Individuals and Households Survey Report, Malaysia, 2017', Department of Statistics Malaysia, Putrajaya.

____ (2017). 'Information and Communication Technology Satellite Account 2016', Department of Statistics Malaysia, Putrajaya.

____ (2017). 'Economic Census Survey 2016 Report on Usage of ICT by Businesses and e-Commerce for 2016', Department of Statistics Malaysia, Putrajaya.

Human Resource Development Fund (HRDF) (2016). 'Annual Report 2016', HRDF, Kuala Lumpur.

International Telecommunication Union (ITU), 2016, Country ICT Data, [online] Available at: https://www.itu.int/en/ITU-D/Statistics/Pages/stat/default.aspx [Accessed 7 Mar. 2018].

Lim, J., Wong, K., Rasep, R. and Selvarajan, S. (2017). 'Wage Premiums in the Digital Economy: Evidence from Malaysia' Conference Paper BNM Economic Research Workshop.

Malaysian Administrative Modernisation and Management Planning Unit (2016). 'The Malaysian Public Sector ICT Strategic Plan 2016-2020', MAMPU, Putrajaya.

McAfee, Inc and Center for Strategic and International Studies. (2014). 'Net Losses: Estimating the Global Cost of Cybercrime Report Economic Impact of Cybercrime II', McAfee Inc, Santa Clara.

McKinsey Global Institute, (2016). 'Digital Globalization: The New Era of Global Flows', McKinsey Global Institute, New York City.

_____ (2013). 'Disruptive technologies: Advances that will transform life, business, and the global economy' (Vol. 180) McKinsey & Company, New York City.

Mycert.org.my. (2018). MyCERT - The Malaysian Computer Emergency Response Team Incident Statistics. [online] Available at: https://www.mycert.org.my/statistics/2017.php [Accessed 6 Mar. 2018].

Ng, A. (2017). 'The Times They Are A-Changin': Technology, Employment and the Malaysian Economy', KRI Discussion Paper 28 April 2017, Khazanah Research Institute, Kuala Lumpur.

Organisation for Economic Cooperation and Development (OECD) (2016). 'Stimulating Digital Innovation for Growth and Inclusiveness', OECD, Paris.

_____ (2014). 'PISA 2012 Results in Focus' OECD, Paris.

Schwab, K. (2016). 'The Fourth Industrial Revolution' World Economic Forum, Geneva.

Stats.oecd.org. (2018). ICT Access and Usage by Businesses in 2015. [Online] Available at: https://stats.oecd.org/Index.aspx?DataSetCode=ICT_BUS [Accessed 6 Mar. 2018].

UNCTAD (2017). 'The New Digital Economy and Development', United Nations, New York and Geneva.

_____ (2017). 'Data protection regulations and international data flows: Implications for trade and development', United Nations, New York and Geneva.

Vassil, K. (2015). 'Estonian e-Government Ecosystem: Foundation, Applications, Outcomes', Background paper for the World Development Report 2016, The World Bank, Washington DC.

Woetzel, J., Seong, J., Wang, K., Manyika, J., Chui, M., Wong, W. (2017). 'China's Digital Economy a Leading Global Force', McKinsey Global Institute, New York City.

World Bank (2016). 'World Development Report 2016: Digital Dividends', The World Bank, Washington DC.

World Trade Organization (2018). 'WTO Statistics Database' [online] Available at: http://stat.wto.org/Home/WSDBHome.aspx?Language=E [Accessed 17 Mar. 2018].