Malaysia Economic Monitor
The Quest for Productivity Growth
DECEMBER 2016
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**ABBREVIATIONS**

<table>
<thead>
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<th>Abbreviation</th>
<th>Full Form</th>
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<tr>
<td>11MP</td>
<td>11&lt;sup&gt;th&lt;/sup&gt; Malaysia Plan</td>
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<td>AFC</td>
<td>Asian Financial Crisis</td>
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<td>ASEAN</td>
<td>Association for Southeast Asian Nations</td>
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<td>ATM</td>
<td>Automatic Teller Machine</td>
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<td>BNM</td>
<td>Bank Negara Malaysia</td>
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<td>BR1M</td>
<td>1 Malaysia People’s Aid (Bantuan Rakyat 1 Malaysia)</td>
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<tr>
<td>CEIC</td>
<td>Census and Economic Information Center</td>
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<td>CPI</td>
<td>Consumer Price Index</td>
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<td>DOSM</td>
<td>Department of Statistics Malaysia</td>
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<td>E&amp;E</td>
<td>Electrical and Electronics</td>
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<td>EAP</td>
<td>East Asia and Pacific</td>
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<td>EPU</td>
<td>Economic Planning Unit</td>
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<td>EU</td>
<td>European Union</td>
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<td>FDI</td>
<td>Foreign Direct Investment</td>
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<td>GDP</td>
<td>Gross Domestic Product</td>
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<td>GFC</td>
<td>Global Financial Crisis</td>
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<td>GLC</td>
<td>Government-linked Companies</td>
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<td>GST</td>
<td>Goods and Services Tax</td>
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<td>IT</td>
<td>Information Technology</td>
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<td>MICs</td>
<td>Middle-Income Countries</td>
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<td>MOF</td>
<td>Ministry of Finance</td>
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<td>MRT</td>
<td>Mass Rapid Transit</td>
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<td>NFPCs</td>
<td>Non-Financial Public Corporations</td>
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<tr>
<td>OECD</td>
<td>Organisation for Economic Cooperation and Development</td>
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<tr>
<td>q/q</td>
<td>Quarter-on-Quarter</td>
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<tr>
<td>R&amp;D</td>
<td>Research and Development</td>
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<tr>
<td>saar</td>
<td>Seasonally Adjusted Annual Rate</td>
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<td>SMEs</td>
<td>Small and Medium Enterprises</td>
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<td>TFP</td>
<td>Total Factor Productivity</td>
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<td>TFPQ</td>
<td>Production TFP</td>
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<td>TFPR</td>
<td>Value-Added TFP</td>
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<tr>
<td>US$</td>
<td>United States Dollars</td>
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<tr>
<td>WDI</td>
<td>World Development Indicators</td>
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<td>y/y</td>
<td>Year-on-Year</td>
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EXECUTIVE SUMMARY

RECENT ECONOMIC DEVELOPMENTS AND OUTLOOK

Malaysia’s economic growth has slowed down but remains resilient to external headwinds. The economic growth rate slowed from 5 percent in 2015 to 4.2 percent, year on year (y/y), in the first three quarters of 2016. Private consumption growth slowed down due to a softening labour market and households’ ongoing adjustment to a context of fiscal consolidation. Public investment in infrastructure is offsetting moderation in investment in the oil and gas sector. Stable commodity prices and the solid performance of manufacturing exports increased total exports by 12.2 percent (saar, q/q) in 3Q 2016.

The gross domestic product (GDP) growth rate is projected to reach 4.2 percent in 2016, with slow improvement moving forward. Private consumption is expected to continue driving economic growth, supported by low unemployment, government income-support measures and a reduction in the overnight policy rate in July. Private investment growth is expected to moderate, as commodity prices and global economic activity remain subdued. The GDP growth rate is projected to remain broadly constant at 4.3 percent in 2017 before rising to 4.5 percent in 2018, as commodity prices recover and the global economy accelerates.

The fiscal consolidation process remains on track despite lower oil-related revenues. The fiscal deficit widened in the first half of 2016, but expenditure consolidation and disbursement of Petronas dividends in the second half reversed this trend. After achieving its 2015 fiscal deficit target of 3.2 percent of GDP, the government is now on track to achieve its 2016 target of 3.1 percent. As stagnant oil prices continue to limit revenue growth, a continued reduction in the government’s operating expenditures will remain necessary for it to reach its 3.0 percent fiscal deficit target for 2017. Overall, the government continues to shift from untargeted to targeted transfers and benefits, while maintaining its support for infrastructure development.

The current-account surplus is projected to narrow in 2016. A weak global economic climate is expected to keep overall export growth stagnant in 2016 despite the stabilisation of commodity prices. However, a well-diversified export base, especially in the manufacturing sector, continues to bolster the trade balance. Meanwhile, a sharp contraction in imports, particularly intermediate inputs and consumer goods, is boosting the contribution of net exports to GDP. Against this backdrop, the current-account surplus is expected to narrow from 3.0 percent of GDP in 2015 to 1.8 percent in 2016, then widen to 2.0 percent in 2017, as commodity prices are expected to slightly increase.

Monetary policy and credit growth continue to support economic growth. The inflation rate is projected to reach 2-2.5 percent in 2016, as the effect of the goods and services tax (GST) introduced in 2015 diminishes. Credit growth has slowed but there is ample liquidity in the financial system to support economic activity.

External developments pose the greatest risk to Malaysia’s growth trajectory. Uncertainty regarding the impact of potential US fiscal stimulus policies on global trade, energy prices, financial flows and exchange rates is a major source of external risk, as evidenced with the recent financial outflows from emerging markets and its impact on the value of the ringgit. Bank Negara Malaysia (BNM) has introduced measures to curb ringgit trading in offshore markets while developing and deepening onshore foreign exchange future markets.

Uncertainty in global financial markets could adversely affect business and investor sentiment. If global risks materialise, tighter financial conditions, a weakening Malaysian ringgit and further fiscal consolidation could undermine consumer confidence, reducing household spending and slowing economic growth. In case of a pronounced economic slowdown, targeted social assistance could help shore up consumption among the most vulnerable households.

Malaysia’s macroeconomic management is solid, but will continue to face challenges arising from external developments and risks. Exchange-rate flexibility should remain the primary mechanism for
absorbing external economic shocks. Monetary policy will continue to operate in an environment of financial volatility driven likely by the acceleration in the normalisation of US monetary policy.

Continuing good performance on fiscal outcomes, in large part thanks to the introduction of GST, is important in building confidence in the policy framework. This could be supported by further mobilising and diversifying fiscal revenues, including by broadening the base for the personal income tax and removing some exemptions in the GST. Also, raising efficiency of operational expenditure (i.e. improving the targeting of social assistance) and development expenditures (i.e. greater inter-agency coordination) could provide some additional fiscal space.
THE QUEST FOR PRODUCTIVITY GROWTH

Factor accumulation has driven Malaysia’s robust economic growth over the past 25 years. Malaysia’s labour and real capital stocks each grew at an annual rate of 2.0 percent during the period, similar to that of high-income countries. Investment in infrastructure and private sector development contributed to physical capital formation, while a growing working-age population boosted the human capital stock. Meanwhile, total factor productivity (TFP) grew at a broadly stable rate of around 1.8 percent, indicating the economy’s flexibility and expanding range of investment opportunities.

While significant, Malaysia’s productivity growth over the past 25 years has been below those in several global and regional comparators. While Malaysia, Korea and Singapore have experienced similar rates of factor accumulation during the period, TFP growth in Malaysia averaged 1.8 percent, compared to 2.2 percent in Korea and Singapore. Similarly, while labour productivity growth in Malaysia has been fairly stable and more robust than in other emerging economies, it has failed to keep pace with growth rates in Hong Kong, Korea, and Singapore.

Productivity growth in Malaysia has declined since the 2008 global financial crisis, due in part to weakening external demand. The 1998 and 2008 economic crises substantially slowed the growth of labour productivity in Malaysia. While productivity growth rebounded following the 1998 crisis, robust employment creation in the wake of the 2008 crisis has not been sufficient to return labour productivity growth to its pre-crisis levels. The Enterprise Surveys show that large firms have led the slowdown in labour productivity growth. Given the large proportion of exporting and manufacturing firms among large firms, this trend seems to reflect a substantial post-crisis decline in global demand for manufactures, a risk to which the Malaysian economy is particularly exposed.

As factor accumulation is expected to slow, accelerating productivity growth is the main path for Malaysia to achieve convergence with high-income economies. With headwinds inhibiting capital accumulation and an aging population slowing the growth of the labour force, accelerating productivity growth will become increasingly important. A combination of rising TFP, greater female labour-force participation, and continued investment in physical and human capital will be necessary for Malaysia to catch up with the income level of high-income economies by 2050. The government’s productivity targets established under the 11th Malaysia Plan reflect these objectives.

Malaysia has performed relatively well on key aspects of productivity. Data from the Enterprise Surveys shed light on the relationship between several major drivers of productivity, including infrastructure quality, workforce education, technical and non-technical innovation, and allocative efficiency.

- **Malaysia has performed well in terms of the quality of its infrastructure.** While many middle-income countries are closing their infrastructure gaps, Malaysia’s logistics services are especially strong by the standards of comparable countries. This is reflected at the firm level by the relative infrequency of power outages and water shortages.

- **While the Malaysian workforce is broadly well educated, a relatively large share of firms reported having difficulty finding workers with specific skills.** About 81 percent of Malaysian workers have completed secondary school, a higher rate than in comparator countries, including high-income and OECD economies. However, some firms have reported challenges in acquiring specific labour skills, and these firms tend to have lower productivity levels.

- **Malaysian firms are mostly engaged in non-technical forms of innovation.** Data from the Enterprise Surveys indicate that more innovative firms also tend to be more productive. 44 percent of Malaysian firms invest in organisational and commercial innovation, including improved distribution systems, marketing methods and business administration compared to 32 percent in ASEAN countries. However, only 17 percent of Malaysian firms invest in developing new technologies compared to 27 percent in ASEAN countries.

- **Regulatory burdens seem overall fine but are perceived by the private sector as main business
environment obstacles to firm-level efficiency. While complying with regulations requires only 3 percent of managers’ time in Malaysia compared to 11 percent in high income economies and OECD countries, regulation-related challenges are among the most important business constraints cited by Malaysian firms. These include the prevalence of informality and corruption, as well as the burdens imposed by licensing, tax and labour regulations, among others.

A high degree of variability in productivity levels may reflect that resources are misallocated across firms. New data from the 2016 Enterprise Surveys indicate that manufacturing firms in Malaysia exhibit a greater degree of TFP variability than manufacturing firms in comparator countries. Much of the variability in TFP appears to be the result of productivity differences between large and small firms, as the former are estimated to be almost 10.4 times more productive than the latter. This seems mainly explained by the relatively poor performance of non-exporting small firms. Reducing this misallocation of resources to match the most efficient economy analysed (U.S. economy in 1997) could boost aggregate productivity by as much as 23 percent.

The results show that more productive firms face larger distortions, mainly in output markets, where they sell their goods and services. While misallocation in factor markets (capital and labour) does not seem to be the main reasons holding productivity growth, misallocation in output markets, where firms sell their final products and services, does. Some of the main reasons that can explain the distortion in output markets are competition, the role of GLCs, asymmetric tax or subsidy structures and regulations. Overall, this finding underscores the importance of accelerating domestic reforms to boost productivity.

Further efforts are needed to operationalise the productivity agenda in Malaysia’s policy making. The existing institutional architecture has sustained consistent productivity growth for more than two decades. However, Malaysia’s existing institutional and policy arrangements may be reinforced to refocus attention on productivity growth. First, in the absence of more granular data and newer analytical tools on productivity it will be difficult to operationalise policy making to raise productivity growth. Particularly relevant is the need of deepening the measurement of productivity in the services sector as they are key to raise efficiency of the domestic economy. Second, improving productivity will require close collaboration between the public and private sectors, which calls for regular consultations between firms, regulators, consumers and policymakers to inform the design, implementation and monitoring of economic policies. Organising regular discussions around issues relevant to productivity, such as infrastructure, workforce skills, innovation and allocative efficiency, could help policymakers develop cross-cutting strategies to complement deeper sub-sector analyses.

A large body of work conducted by the World Bank shows policies that could serve to accelerate productivity growth. The main findings of the report are in line with many of the challenges identified in previous World Bank reports, which reinforce existing policy recommendations in the different areas that influence productivity:

- Overcoming skills gaps could be reinforced through strengthened training programs. A stronger coordination with the private sector (i.e. inputs in the design of curricula, provision of apprenticeship opportunities) could improve the effectiveness of the existing training interventions and alleviate skill mismatches in the labour market. A more intense use of labour market information to inform skill development policies and programs, and a stronger focus on effectiveness and efficiency of spending could lead to improvements in the skills of the Malaysian workforce.

- Maintaining high quality of infrastructure may be reinforced by strengthened planning and implementation capacities and continue improvements on trade facilitation. Maintaining infrastructure strategies that focus on supporting trade are key for productivity gains. Also, infrastructure development can be reinforced by defragmenting the appraisal and planning process for public investment, bolstering inter-agency collaboration. Similarly important is to continue improving trade facilitation, particularly customs clearance, to respond to emerging
challenges and maintain the competitive edge over other middle income countries.

- **Building innovation capacity calls for strengthening the R&D ecosystem and facilitating technology absorption.** For large manufacturing exporters suffering from global weak demand and maturing supply chains the issue is finding ways to prevent continuing deterioration in productivity by facilitating them to upgrade technological capability, mainly through technical innovation. This would likely require to improve access to skills/talents (likely including temporary movement of professionals) and more liberal investment policies (such as relaxing domestic content requirement) to allow firms to deploy cutting edge production technology with minimal restrictions. It is also important to ensure that smaller firms access new technology, for instance through supplier development programs to link them to multinationals and broader participation on government R&D programs.

- **Addressing distortions in output markets where firms sell their goods and services may be achieved by reviewing policies that hamper competition.** To overcome inefficiencies in output markets, Malaysia can explore to strengthen its competition policy and adopt competitive neutrality in regulatory stance, particularly with respect to GLCs operations. From the regulatory perspective, easing existing policies to further open markets for further foreign private sector participation, mainly in the services sectors, would also help to boost productivity.

Accelerating productivity in Malaysia will in large part depend on raising productivity of SMEs. This will require better equipping SMEs to raise their competitiveness while ensuring a strong enabling environment to realise their potential. To achieve this, the SME Masterplan for 2012–2020 aims to further facilitate business formation, encourage greater formalisation, stimulate the development of high-growth companies, and boost the productivity of SMEs across all sectors. It also proposes to foster innovation within SMEs, upgrading SME management and worker competencies, while ensuring access to finance of creditworthy SMEs.

Reinforcing the role of factors accumulation, such as female labour force participation, will continue to be needed to complement productivity gains. Raising female labour force participation to the level expected given Malaysia’s economic development could raise income per capita by 23 percent. This could be further reinforced by avoiding a misallocation of talent due to segregation of women into certain fields of study, industries, and types of jobs (i.e. entrepreneurs and managers). Ensuring that married women remain in the workforce calls for measures that help men and women balance responsibilities, including flexi-work arrangements, expanded childcare options, and incentives for female participation in all educational fields and job types.
Recent trends in the Malaysian economy

GDP grew by 4.3 percent (y/y) in 3Q 2016...

- GDP, q/q saar, annual, and Y/Y %

The current-account surplus rose to 1.9 percent of GDP...

- Balances, % of GDP (last four quarters)

GDP growth is expected to average 4.2 percent in 2016...

- Annual GDP growth, %

...driven by private consumption.

- Contribution to GDP, y/y, %

...as the ringgit and other regional currencies weakened.

- Currency/ US$, Rebase Jan 2013 = 100

...and fiscal consolidation is expected to continue through 2017.

- % of GDP
The quest for productivity growth

Capital accumulation has driven Malaysia’s growth in recent decades...
Sources of growth, annual growth rate, %

- Exporting firms have led the recent decline in labour productivity in Malaysia...
  Annual labour productivity growth, %, 2012-2014

- Reducing economic distortions to the level of the most efficient country could boost productivity in Malaysia...
  TFP gains from reducing economic distortions, %

- ...while the contribution of TFP has been modest by the standards of comparable countries.
  Source of growth, annual growth rate, %, 1990-2014

- ...and Malaysian manufacturing firms exhibit greater TFP variability than firms in comparator countries.
  Manufacturing firms TFP, %, 2012-2014

- ...but to achieve convergence, productivity gains must be augmented by the improved performance of traditional growth engines.
  Share of Malaysia’s GDP/capita relative to high-income economies, %

Malaysia Economic Monitor December 2016 II 7
1. RECENT ECONOMIC DEVELOPMENTS AND OUTLOOK

Domestic demand continues to drive GDP growth

1. **Malaysia’s economy grew at a rate of 4.3 percent (y/y) in 3Q 2016, supported by strong domestic demand (Figure 1).** The continued expansion of the services and manufacturing sectors drove an increase in private consumption and continued expansion private investment, and accelerating economic activity in 3Q pushed the GDP growth rate for the first three quarters of 2016 to 4.2 percent (y/y). Public consumption and investment growth moderated and public investment declined in 3Q 2016 after rising substantially in the second quarters, as the government consolidated its financial position in an effort to achieve its fiscal deficit target. Export growth remained stagnant, due primarily to weakening demand for manufacturing exports, but a contraction in imports resulted in a positive contribution of net exports to GDP growth (Table 1).

2. **Private consumption remains the primary engine of economic growth (Figure 2).** Stable labour market conditions enabled private consumption to grow by 3.0 percent in 2Q 2016 and by 1.0 percent in 3Q 2016 (q/q, saar). In addition, the government implemented measures in June 2016 to boost disposable income in advance of the holiday season, and increases in the minimum wage and in civil servant salaries took effect in July. Reflecting the gradual improvement of private consumption, the Malaysian Institute of Economic Research Consumer Sentiment Index remained buoyant at an average of around 75 for the first three quarters, up from 68.2 in 2015.

3. **Private investment grew steadily and was primarily focused on the services and manufacturing sectors.** Private investment growth in 2016 remained robust at 5.6 percent in 2Q and 4.7 percent in 3Q (y/y), supported by higher capital expenditures in the manufacturing and services sectors. Steady business sentiment has facilitated private investment growth, though investors became increasingly cautious in 3Q 2016 as the approval of the U.K. ‘s referendum on withdrawal from the EU (known as “Brexit”) increased global economic uncertainty. Investment in the manufacturing sector remained focused on the electrical and electronics
(E&E) subsector, with the transport and storage subsector and the tourism subsector leading investment in the services sector.

4. **On the supply side, all major economic sectors expanded in both 2Q 2016 and 3Q 2016, with the exception of agriculture.** Growth in the services sector was driven largely by subsectors closely related to household spending, such as retail and food and beverages. The E&E subsector led the growth of manufacturing, while investment in transportation and utility infrastructure spurred growth in the construction sector. The contribution of the extractive industries to growth remained broadly stable during the last two quarters due largely to rising crude oil and natural gas production. However, the agricultural sector continued to contract due to the lingering effects of adverse weather conditions generated by El Niño.

### Table 1: GDP Growth Decomposition (saar, q/q, %)

<table>
<thead>
<tr>
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</tr>
</thead>
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<td>6.0</td>
<td>5.7</td>
<td>3.8</td>
<td>3.5</td>
<td>5.0</td>
<td>5.0</td>
<td>4.2</td>
<td>2.7</td>
<td>6.1</td>
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<td>Private Sector</td>
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<td>10.2</td>
<td>-0.8</td>
<td>0.8</td>
<td>9.8</td>
<td>6.0</td>
<td>12.2</td>
<td>3.0</td>
<td>1.0</td>
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<td>-1.1</td>
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<td>17.6</td>
<td>17.0</td>
<td>-13.8</td>
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<tr>
<td>Gross Fixed Capital Formation</td>
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<td>-20.9</td>
<td>16.4</td>
<td>14.3</td>
<td>3.7</td>
<td>-5.7</td>
<td>2.0</td>
<td>-2.5</td>
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<td>Exports of Goods &amp; Services</td>
<td>5.0</td>
<td>-1.9</td>
<td>-8.6</td>
<td>22.6</td>
<td>5.7</td>
<td>0.6</td>
<td>-17.2</td>
<td>-3.2</td>
<td>12.2</td>
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<tr>
<td>Imports of Goods &amp; Services</td>
<td>4.0</td>
<td>-0.1</td>
<td>-15.3</td>
<td>26.8</td>
<td>8.5</td>
<td>1.2</td>
<td>-9.8</td>
<td>-12.7</td>
<td>7.0</td>
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<tbody>
<tr>
<td>Sectoral Agriculture</td>
<td>2.1</td>
<td>-2.8</td>
<td>46.6</td>
<td>-16.0</td>
<td>-11.2</td>
<td>1.2</td>
<td>-22.6</td>
<td>22.8</td>
<td>-6.9</td>
</tr>
<tr>
<td>Extractive Industries</td>
<td>3.5</td>
<td>0.9</td>
<td>-0.6</td>
<td>-1.2</td>
<td>-4.9</td>
<td>4.7</td>
<td>8.8</td>
<td>7.6</td>
<td>3.9</td>
</tr>
<tr>
<td>Manufacturing</td>
<td>6.2</td>
<td>3.2</td>
<td>6.4</td>
<td>4.2</td>
<td>6.0</td>
<td>4.9</td>
<td>1.8</td>
<td>4.9</td>
<td>4.1</td>
</tr>
<tr>
<td>Construction</td>
<td>11.7</td>
<td>40.7</td>
<td>-26.3</td>
<td>28.5</td>
<td>0.1</td>
<td>8.2</td>
<td>42.4</td>
<td>-23.4</td>
<td>24.5</td>
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<tr>
<td>Services</td>
<td>6.6</td>
<td>6.3</td>
<td>-0.1</td>
<td>5.6</td>
<td>8.0</td>
<td>5.1</td>
<td>7.0</td>
<td>2.2</td>
<td>7.5</td>
</tr>
</tbody>
</table>

Source: DOSM, World Bank staff calculations

5. **Inflation continued to moderate as the base effect of the introduction of the GST in 2015 gradually diminished** (Figure 3). After peaking in February 2016, headline inflation trended downwards due to the diminishing base effect of the GST combined with low oil prices (Figure 4). Thus far, the announcement that cooking-oil subsidies would be eliminated in November has not put significant upward pressure on prices. As of October 2016, headline inflation stood at 1.4 percent (y/y), with no indication of second-round effects. The producer price index for local production in October stood at 0.1 percent (y/y) as commodity prices in general, and energy prices in particular, remained low.
6. There are modest indications of a softening labour market. Though it remains low, the unemployment rate rose from 3.4 to 3.5 percent between the first and third quarters of 2016, remaining above the 2010-2015 average of 3.1 percent. Meanwhile, the labour-force participation rate fell from 67.8 percent in July 2016 to 67.6 percent in September (Figure 5). The rise in the unemployment rate was due to an increase in the rate of new entrants into the labour market relative to the rate of job creation, and a declining trend in job vacancies demonstrated firms’ cautious approach to hiring. (Figure 6). Between March to September 2016, the labour force grew by 0.86 percent (y/y), while employment grew by 0.55 percent. However, indications of a broad-based retrenchment are limited and largely confined to specific sectors, particularly oil and gas and financial services.

Source: CEIC, DOSM, World Bank staff calculations
Note: Core inflation excludes transportation and food prices; the producer price index is for local production.

Source: CEIC, DOSM, World Bank staff calculations
Note: Series are seasonally unadjusted, 3-month moving averages
The current-account surplus increased as imports contracted

7. The contraction of imports pushed the current-account surplus to 1.9 percent of GDP in 3Q 2016 (Figure 7). In 2Q 2016, the current-account surplus narrowed to 0.6 percent of GDP as imports of goods and services grew by 3.4 percent (y/y), outpacing exports of goods and services, which grew by 1.3 percent (y/y). Export growth was bolstered by steady demand for E&E exports, particularly semiconductors exported to the U.S. (Figure 8), while a modest rebound in global commodity prices mitigated the contraction of commodity exports. In 3Q, the current account surplus widened as imports of goods and services contracted by 1.2 percent (y/y), more than offsetting a 0.9 percent (y/y) decline in exports of goods and services. Falling domestic demand for intermediate and consumer imports drove the contraction in imports, while a decrease in major manufacturing exports contributed to subdued external demand (Table 2).
The government is tightly controlling operating expenditures as part of its fiscal consolidation program.  

8. The government’s fiscal consolidation program remains on track to achieve its objectives for 2016. During the first half of 2016 the fiscal deficit widened to 5.6 percent of GDP due to a combination of frontloaded public spending, especially economic spending, and a modest shortfall in revenue caused in part by lower-than-expected GST collections and delayed dividend payments from the national oil and gas company, Petronas. In response, the government tightened control over its operating expenditures, which, combined with improved GST collection and dividend payments from Petronas in the second half of 2016, accelerated progress toward the government’s 2016 fiscal deficit target of 3.1 percent of GDP (Table 3).  

9. Despite rising GST collections, overall public revenues are expected to decline to 16.9 percent of GDP in 2016. Public revenues are projected to fall by 3.0 percent from 2015, a sharper drop than the government had initially projected (Figure 9). This is primarily the result of lower petroleum income tax revenue, which is expected to slide from 1.0 percent of GDP in 2015 to 0.7 percent in 2016. Meanwhile, a reduction in Petronas dividend payments contributed to a decrease in investment income from 2.2 percent of GDP in 2015 to 1.3 percent in 2016. Falling petroleum-related revenue is being partially offset by higher GST collection, which is projected to rise from 2.3 percent of GDP in 2015 to 3.0 percent in 2016 as it completes its first full year of implementation and as the number of companies registered for the tax increases (Figure 10).  

Figure 9: Both public revenues and operating expenditures for 2016 are below initial projections.  

![Figure 9: Both public revenues and operating expenditures for 2016 are below initial projections.](image1)

Revenue and OE, RM billion  

<table>
<thead>
<tr>
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</thead>
<tbody>
<tr>
<td>Revenue</td>
<td>216.3</td>
<td>212.6</td>
<td>-1.7% (RM 3.7 bn)</td>
</tr>
<tr>
<td>Operating expenditure</td>
<td>210.7</td>
<td>207.1</td>
<td>-1.7% (RM3.6 bn)</td>
</tr>
</tbody>
</table>

Source: Ministry of Finance (MOF), World Bank staff calculations  

Figure 10: Rising GST collection has mitigated the decline in petroleum-related revenue.  

![Figure 10: Rising GST collection has mitigated the decline in petroleum-related revenue.](image2)

Selected revenue items, % of GDP  

<table>
<thead>
<tr>
<th>Year</th>
<th>Petroleum-related revenue</th>
<th>GST</th>
<th>Corporate tax</th>
<th>Personnel tax</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>16.0</td>
<td>6.0</td>
<td>6.0</td>
<td>8.0</td>
</tr>
<tr>
<td>2010</td>
<td>16.0</td>
<td>6.0</td>
<td>6.0</td>
<td>8.0</td>
</tr>
<tr>
<td>2011</td>
<td>16.0</td>
<td>6.0</td>
<td>6.0</td>
<td>8.0</td>
</tr>
<tr>
<td>2012</td>
<td>16.0</td>
<td>6.0</td>
<td>6.0</td>
<td>8.0</td>
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<tr>
<td>2013</td>
<td>16.0</td>
<td>6.0</td>
<td>6.0</td>
<td>8.0</td>
</tr>
<tr>
<td>2014</td>
<td>16.0</td>
<td>6.0</td>
<td>6.0</td>
<td>8.0</td>
</tr>
<tr>
<td>2015</td>
<td>16.0</td>
<td>6.0</td>
<td>6.0</td>
<td>8.0</td>
</tr>
<tr>
<td>2016</td>
<td>16.0</td>
<td>6.0</td>
<td>6.0</td>
<td>8.0</td>
</tr>
</tbody>
</table>

Source: MOF, World Bank staff calculations  

Note: Petroleum-related revenues include the petroleum income tax, Petronas dividends, oil export duties, petroleum royalties and exploration fees  

10. Efforts to curb operating expenditures were instrumental in ensuring that the government’s fiscal consolidation remained on track. The government largely compensated for the decline in revenue by reducing the budget for operating expenditures (Figure 9). This entailed a sharp reduction in the procurement of supplies and services, as well as lower subsidies (Figure 11). Procurement spending is

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1 All figures for 2016 are estimates taken from the Economic Report 2016/ 2017.  
2 See the Budget Recalibration Announcement of January 2016.
estimated to be 13.9 percent below the government’s initial projection, due in large part to a reduction in public sector travel and transportation, official events and the refurbishment of public facilities. Subsidy spending is expected to be 2.0 percent below initial projections due to the removal of subsidies for flour and cooking oil during the year.3 The government continues to reduce untargeted subsidies, while protecting targeted transfers, particularly the 1 Malaysia People’s Aid (Bantuan Rakyat 1 Malaysia, BR1M) cash-transfer program. However, the wage bill, which constitutes 45 percent of operating expenditures, rose by around 4.4 percent, mainly due to government cash transfers in January and the increase in civil servant salaries in July. In addition, debt-service payments are expected to increase by 9.7 percent.

11. Rising capital expenditures by non-financial public corporations (NFPCs) are expected to boost public investment in 2016 (Figure 12). Capital expenditures by NFPCs rose from 7.7 percent of GDP in 2015 to 8.5 percent in 2016, driven by major ongoing projects such as the Pengerang Refinery, the Mass Rapid Transit (MRT) Line 1 and the Jimah Power Plant. Development spending also increased from 3.5 percent of GDP in 2015 to an estimated 3.6 percent in 2016, mainly due to investment in the transportation and housing sectors. Spending on the transport sector grew from 0.6 percent of GDP in 2015 to 0.7 percent in 2016 as the government continued to implement large-scale projects such as the Pan Borneo Highway and the West Coast Expressway. Housing sector expenditures rose from RM2.0 billion in 2015 to RM2.5 billion due to ongoing projects such as the 1 Malaysia People’s Housing, Civil Servants Housing and People’s Housing Programs.

12. The government’s financial position remains stable, and risks appear limited and manageable. As of June 2016, the government debt stock stood at 53.2 percent of GDP, below the statutory limit of 55 percent, though contingent liabilities in the form of guaranteed debt amounted to 13.1 percent of GDP. Ringgit-denominated loans represented around 95.9 percent of total borrowing, limiting the debt profile’s exposure to currency risks. Foreign demand for government debt remains steady, and non-resident holdings of government debt represented 34.0 percent of total government debt at the end of 2Q 2016. Additionally,

3 In March 2016, the government eliminated subsidies on 25kg bags of wheat flour. In November, it announced the removal of subsidies on cooking oil, with the exception of 1kg bottles.
the current maturity profile suggests that refinancing risk are limited, as only 8.1 percent of government debt is expected to mature in 2016 and the average maturity is 9.7 years.

| Table 3: Summary of the Federal Government Financial Accounts (RM billions) |
|---------------------------------|--------|--------|--------|--------|
|                                  | 2014   | 2015   | 2016   | 2017   |
|                                  | Actual | Initial¹ | Estimate² | Forecast³ |
| Total revenue                    | 220.6  | 219.1   | 216.3   | 212.6   | 219.7   |
| Operating expenditure            | 219.6  | 217.0   | 210.7   | 207.1   | 214.8   |
| Development expenditure          | 39.5   | 40.8    | 45.0    | 45.0    | 46.0    |
| Overall balance                  | -37.4  | -37.2   | -38.7   | -38.7   | -40.3   |
| % of GDP                         | -3.4   | -3.2    | -3.1    | -3.1    | -3.0    |

Source: DOSM, MOF, World Bank staff calculations
Note: ¹Based on 2016 Budget Recalibration, ²Based on 2016/2017 Economic Report

The domestic financial system remains stable overall

13. Given the growing uncertainty over the global economic outlook, the central bank (Bank Negara Malaysia, BNM) lowered the overnight policy rate from 3.25 percent to 3.00 percent in July 2016. Modest inflationary pressures facilitated this decision, as the BNM revised its 2016 inflation projection from 2.5-3.5 percent to 2-3 percent. The positive assessment of the prudential measures that the central bank introduced to strengthen lending standards, contain speculative activities and otherwise reduce the risk of financial imbalances, lent further support to its decision to raise the policy rate.

14. Credit growth continued to moderate in 3Q 2016. The growth rate of outstanding loans in the banking system fell from 6.4 percent (y/y) at the end of the first quarter to 4.2 percent (y/y) at the end of the third. Outstanding loans to private firms grew by 2.0 percent (y/y) in 3Q 2016, down from 3.8 percent (y/y) in the previous quarter (Figure 13). The growth rate of outstanding loans to the manufacturing, utilities and transportation sectors declined for two consecutive quarters. The growth rate of outstanding loans to small and medium enterprises (SMEs) also fell from 9.2 percent (y/y) in 2Q to 8.2 percent (y/y) in 3Q, though it continued to outpace average loan growth. Moreover, loan applications pivoted from a 2.1 percent (y/y) increase during the second quarter to a 9.3 percent (y/y) contraction during the third, underscoring the overall moderation in bank lending. The contraction in loan applications was driven by firms in the real estate, finance and retail sectors, and working capital loans recorded the sharpest drop in applications.
15. Household credit growth slowed, while demand for home financing remained robust (Figure 14). The growth rate of outstanding household debt continued to fall, dropping from 6.2 percent (y/y) in 2Q to 5.8 percent (y/y) in 3Q, due largely to a decline in passenger cars loans, purchase of securities loans, and credit cards. Residential property financing continued to drive credit growth, expanding by 10.2 percent in 2Q (y/y) and 9.7 percent in 3Q (y/y), reflecting strong demand for affordable housing (Box 1). Concurrently, the number of borrowers with at least three outstanding housing loans—a proxy for speculative housing purchases—grew by 1.7 percent (y/y) in 3Q, down from 1.9 percent (y/y) in 2Q, and they accounted for just 2.8 percent of all housing-loan borrowers. The share of total household debt among vulnerable households also declined to 22.6 percent of total household lending.

**Box 1: Meeting the Demand for Affordable Housing, Lessons from the International Experience**

According to a study by Global Findex, 10 percent of the world’s adult population reported having a mortgage through a financial institution. While in some countries as much as half of the population reported having a mortgage, in other countries housing finance remains scarce. This raises important questions as to what determines disparities in mortgage lending across countries.

Variations in the income level, accumulated wealth and employment conditions of households in different countries can have a major impact on their ability to access mortgage lending. Most of the home financing products currently available are designed for borrowers with a stable income source and enough capital to cover a down payment of around 20 percent of the value of the property, and who are willing to commit at least 30 percent of their income to their mortgage for 15-20 years or more. High housing costs can also prevent low-income households from buying a property. While the international benchmark for the price-to-income ratio is 3:1, in some countries this ratio can reach as high as 30:1. As a result, ensuring an adequate supply of affordable housing remains a challenge, particularly in countries

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4 Households with a monthly income of less than RM3,000.
5 Global Findex is the World Bank’s financial inclusion database.
6 The price to income ratio is the basic affordability measure for housing in a given area. It is generally the ratio of median house prices to median households’ disposable incomes.
that have yet to develop home-financing products that reflect the unique needs and circumstances of lower-income households.

Governments have tried to address this issue from both the demand and supply sides. On the demand side, policymakers have designed targeted mortgage subsidies in the form of down-payment assistance and interest-rate subsidies designed to lower the cost of borrowing. However, these schemes typically exclude households that are not already served by credit markets, as low-income households often fail to meet income eligibility and savings criteria.

Governments have developed another scheme in which workers contribute a share of their wages to a national housing fund. Once his or her contribution has reached a certain amount, a worker becomes eligible to request a loan either from the fund itself or from a financial institution. However, these schemes are necessarily limited to formal sector workers and tend to exclude a large share of lower-income households. In the East Asia and the Pacific (EAP) region, subsidised home-buying schemes are the most common demand-side interventions (Table 4).

Supply-side interventions aimed at increasing the availability of housing to certain segments of the population include subsidies and other incentives for developers to build more affordable housing as a share of all new housing units in a particular area. However, studies have shown that developers tend to increase the market price for regular housing units in order to compensate for the discounted price of the affordable units. In many cases a lack of proper screening enables higher-income individuals to purchase the affordable units and then sell or rent them at commercial rates. In some cases, governments may create a dedicated public rental housing scheme for low-income households. However, these initiatives typically meet only a fraction of the total estimated demand, and subsidised rents may discourage private sector developers from providing public rental units.

Housing programs in Hong Kong and Singapore are among the world’s leading models for promoting affordable housing finance through subsidised schemes targeted to low-income households. In Singapore, more than four out of five residents own a house built by the Housing and Development Board. In Hong Kong, private banks are the main provider of housing finance. Both cities have also benefited from competent and effective housing authorities.

Table 4: Summary of Key Affordable Housing Policies in EAP

<table>
<thead>
<tr>
<th>Country</th>
<th>Subsidised home-buying schemes</th>
<th>Compulsory savings schemes</th>
<th>Public rental schemes</th>
<th>Cross-subsidy schemes</th>
<th>Housing upgrade schemes</th>
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<tbody>
<tr>
<td>China</td>
<td>x</td>
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<td>Thailand</td>
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<td>Vietnam</td>
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</table>

Source: World Bank

More recently, community groups, non-profit organisations and microfinance institutions have begun creating innovative partnerships with local governments and private firms to provide affordable housing to low-income households. They have developed specialised loans for home construction and upgrading, and for securing land titles. These programs target households that lack proof of income, formal identification and access to formal financial services.
As governments explore an expanding range of options to increase housing affordability, they must avoid offering incentives that encourage speculation or excessively risky behaviours in the housing market. Innovative affordable-housing programs should be backed by macroprudential policies, such as higher stamp duties and lower loan-to-value ratios for borrowers who already own two or more properties, to ensure that financial risks remain in check. Additionally, given the complexity of the housing market, affordable-housing programs should be designed and implemented through close collaboration between governments, the private sector and households.

Source: Authors

16. Financial indicators continue to underscore the resiliency of the banking system. The banking system remains well-capitalised, and its capital position is above the statutory minimum. As of 3Q 2016, the common equity tier-1 capital ratio stood at 13.3 percent, up from 13.4 percent in 2Q. The tier-1 capital ratio was at 14.2 percent, down slightly from 14.3 percent in 2Q 2016 and the total capital ratio was 16.7 percent, also down slightly from 16.8 percent in 2Q. The banking system’s net impaired loans rate remained low at 1.3 percent in 3Q, unchanged from 2Q. Inter-company obligations continued to represent more than 40 percent of total external borrowing, minimising funding and rollover risk. Liquidity in the banking system remained ample, and the liquidity coverage ratio rose from just under 125 percent in 2Q to 127 percent in 3Q, far above the statutory minimum of 70 percent.

Rising global uncertainty is leading to increased volatility in the domestic financial market

17. The weakening of the ringgit has been closely correlated with the volatility of both global financial markets and global oil prices. So far, this year the ringgit has weakened by 3.9 percent against the U.S. dollar, similar to trends in other regional currencies (Figure 16). Fluctuations in global crude oil prices, which ranged from US$42 to US$49 per barrel over the last six months further destabilised investor sentiment. International reserves remained broadly stable at US$96.4 billion in November 2016, which is 1.2 times the value of short-term external debt and sufficient to cover 8.3 months of retained imports.

18. Volatility and uncertainty in the financial market resulted in net portfolio outflows. Portfolio flows were already on a downward trend, and a net inflow of RM13.1 billion in 1Q 2016 shifted to a net outflow of RM10.6 billion in 3Q (Figure 15). Due to growing uncertainty over the timing of the normalisation of U.S. monetary policy, combined with the volatility of global oil prices, an inflow by non-resident investors of RM4.8 billion in 2Q was followed by an outflow of RM3.5 billion in 3Q. Domestic institutional investors’ acquisition of financial assets abroad contributed to portfolio outflows. As a result, outflows by domestic investors increased from RM4.7 billion in 2Q to RM 7.1 billion in 3Q. Nevertheless, non-resident holdings of government securities remained stable at 34 percent of total Malaysian Government Securities (MGS), Government Investment Issues (GII), and Sukuk Perumahan Kerajaan (SPK) at the end of 3Q. Foreign direct investment (FDI) has remained steady, with RM15.0 billion in inflows recorded in 1Q 2016. Year-to-date, FDI has amounted to RM30.4 billion. Multinational corporations injecting liquidity into their Malaysian operations, particularly in the manufacturing and services sectors, have continued to drive FDI inflows.

7 Crude oil, Brent.
Recent external developments have exacerbated the volatility of the financial market. Following the outcome of the U.S. presidential election in November, all of Malaysia’s asset markets recorded a marked decline. Uncertainty regarding the prospective normalisation of interest rates by the U.S. Federal Reserve was compounded by questions regarding the potential US fiscal stimulus and trade policies, and how they might affect the global economy in general and Malaysia in particular. In the wake of the U.S. presidential election the ringgit depreciated by 5.8 percent, reaching its lowest level of the year at RM4.4660 per U.S. dollar. Also, between November 9 and November 30, the FTSE Bursa Malaysia Kuala Lumpur Composite Index declined by 2.7 percent, and the yields on 3, 5 and 10-year Malaysian government securities rose by 88, 73 and 76 basis points, respectively.

The BNM has reinforced rules against offshore currency trading while adopting measures to deepen onshore financial markets. The BNM has reiterated previous rules forbidding trading on the off-shore non-deliverable forward market, by requiring institutions to sign an attestation form. Subsequently, the BNM’s Financial Markets Committee also announced measures to develop the onshore foreign exchange market to allow greater flexibility for market participants to hedge their foreign currency exposures and for foreign investors to access the onshore foreign exchange market. The BNM also announced that exporters must convert at least 75 percent of their export proceeds to ringgit, subject to some exemptions. The BNM has

8 The Foreign Exchange Administration, established in 2005, ensures that the “repatriation and utilisation of funds from the ringgit or foreign currency accounts is done through licensed onshore banks.” The ringgit is a non-internationalised currency, and thus any offshore trading, such as trading on the non-deliverable forward market, is not recognised by the authorities. On 13 November 2016, the central bank announced that clients of licensed banks in Malaysia are required to sign an attestation form to ensure transactions are not facilitating the offshore ringgit non-deliverable forward (NDF) market.

9 Under the export conversion measure, exporters must convert up 75 percent of their export proceeds to ringgit and need to request approval from BNM should they wish to hold lower balances. Exporters can retain up to 6 months of foreign currency obligations in FX and the converted export proceeds can be placed in a special deposit account at a rate of 3.25 percent per annum. Reconversion of proceeds (dollar to ringgit and again to dollar) would be done on the prevailing spot rate. Part of the reason for this move is that there has been a declining trend in the amount export proceeds converted to ringgit. Within the last five years, the amount of proceeds converted was less than 1 percent of total net exports compared to 28 percent of total net exports in the previous five years.
reiterated that it will not adopt a fixed exchange-rate regime and that it is not considering any capital controls.

21. Recent measures need to strike a balance between development of domestic financial markets and potential impact on uncertainty and the real economy. Recent measures reinforce the development of the onshore hedging markets in line with the BNM’s long term objectives. The BNM has engaged with market participants to address any queries and has established communication lines for market participants to seek clarification in order to manage the implementation of the measures and help facilitate the transition and adjustment process. In addition, the measures requiring the conversion of at least 75 percent of export proceeds to ringgits may have an overall impact on the economy, particularly to the real sector. Some exporters, including multinational corporations, have expressed their concerns that it could lead to higher cost of doing business and affect their operations. Also, the financial sector is required to set up a remunerated facility. It will be important for the BNM to continue to actively work with main stakeholders to overcome implementation challenges and ease potential increase of cost of doing business.

Growth is expected to meet government projections in 2016 and accelerate slightly in 2017

22. The GDP growth rate is expected to slow to 4.2 percent in 2016, reflecting subdued external demand (Table 5). A strong labour market and a range of income-support policies, including cash transfers, reduced contributions to the Employees’ Provident Fund, an increase in the minimum wage and higher civil servant salaries, have contributed to growth by supporting robust private consumption. In addition, the BNM’s recent reduction in its overnight policy rate provided some relief to indebted households. Private investment growth has been steady and driven by capital spending on major government-led infrastructure projects, while low commodity prices have dampened investment in the oil and gas sector, particularly during the first half of the year. Export growth is projected to remain stagnant in a context of low commodity prices and a weakening growth outlook among Malaysia’s main trading partners. The World Bank’s growth estimate for 2016 is in line with consensus estimates, which indicate a moderate deceleration since the second half of 2015 (Figure 17).

Table 5: GDP growth is projected to slow to 4.2 percent in 2016…

<table>
<thead>
<tr>
<th>Growth Rates (y/y, %)</th>
<th>2015</th>
<th>2016f</th>
<th>2017f</th>
<th>2018f</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP</td>
<td>5.0</td>
<td>4.2</td>
<td>4.3</td>
<td>4.5</td>
</tr>
<tr>
<td>Domestic demand</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(including stocks)</td>
<td>5.9</td>
<td>4.6</td>
<td>4.5</td>
<td>4.6</td>
</tr>
<tr>
<td>Final consumption</td>
<td>5.7</td>
<td>5.4</td>
<td>5.0</td>
<td>5.1</td>
</tr>
<tr>
<td>Private sector</td>
<td>6.0</td>
<td>5.7</td>
<td>5.2</td>
<td>5.3</td>
</tr>
<tr>
<td>Public sector</td>
<td>4.4</td>
<td>4.3</td>
<td>4.2</td>
<td></td>
</tr>
<tr>
<td>Gross Fixed Capital Formation</td>
<td>3.7</td>
<td>3.1</td>
<td>3.0</td>
<td>3.5</td>
</tr>
<tr>
<td>External demand</td>
<td>-3.8</td>
<td>0.3</td>
<td>2.4</td>
<td>2.6</td>
</tr>
<tr>
<td>Exports of Goods &amp; Services</td>
<td>0.6</td>
<td>-0.7</td>
<td>2.8</td>
<td>0.9</td>
</tr>
<tr>
<td>Imports of Goods &amp; Services</td>
<td>1.2</td>
<td>-0.8</td>
<td>2.9</td>
<td>0.7</td>
</tr>
</tbody>
</table>

Table 6: …before rebounding modestly in 2017 and 2018.

<table>
<thead>
<tr>
<th>Contribution to GDP Growth [percentage points]</th>
<th>2015</th>
<th>2016f</th>
<th>2017f</th>
<th>2018f</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP</td>
<td>5.0</td>
<td>4.2</td>
<td>4.3</td>
<td>4.5</td>
</tr>
<tr>
<td>Domestic demand</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(including stocks)</td>
<td>5.3</td>
<td>4.2</td>
<td>4.3</td>
<td>4.4</td>
</tr>
<tr>
<td>Final consumption</td>
<td>3.7</td>
<td>3.6</td>
<td>3.3</td>
<td>3.4</td>
</tr>
<tr>
<td>Private sector</td>
<td>3.1</td>
<td>3.0</td>
<td>2.8</td>
<td>2.8</td>
</tr>
<tr>
<td>Public sector</td>
<td>0.6</td>
<td>0.6</td>
<td>0.6</td>
<td>0.6</td>
</tr>
<tr>
<td>Gross Fixed Capital Formation</td>
<td>1.0</td>
<td>0.8</td>
<td>0.8</td>
<td>0.9</td>
</tr>
<tr>
<td>Change in Stocks</td>
<td>0.6</td>
<td>-0.2</td>
<td>0.0</td>
<td>0.0</td>
</tr>
</tbody>
</table>

Source: World Bank staff calculations
23. GDP growth is expected to accelerate modestly over the near term, rising to 4.3 percent in 2017 and 4.5 percent in 2018 as commodity prices recover (Table 6). Domestic demand, led by private consumption, is projected to continue to anchor growth. Income-support measures, including increased cash transfers and additional financial support for civil servants, would help to sustain private consumption in the near term, while major transportation infrastructure projects and affordable housing programs are expected to shore up investment in the construction sector. Rising global commodity prices could also contribute to export growth and increase public revenue, easing fiscal constraints. Capital expenditures, particularly in the oil and gas sector, could also benefit from higher commodity prices. External headwinds are expected to continue to affect Malaysia’s economic outlook over the medium-term, especially the slow projected recovery of global commodity prices, lingering uncertainty regarding the ramifications of the U.K.’s “Brexit” referendum and the U.S. presidential election, China’s ongoing economic rebalancing and the anticipated normalisation of U.S. monetary policy.

24. Global economic growth is expected to fall to just 2.4 percent in 2016, its lowest rate since the global financial crisis (Figure 17).\(^\text{10}\) This reflects the continued weakening of GDP growth in advanced economies in a context of heightened policy uncertainty, tepid investment, low inflation and sluggish productivity growth. GDP growth in the United States is estimated to slow markedly, from 2.6 percent in 2015 to an estimated 1.9 percent in 2016. Similarly, growth in the euro area is estimated to decline from 2.0 percent in 2015 to 1.6 percent in 2016, while Japan’s growth rate is expected to stabilise at 0.7 percent in 2016. China’s 2016 growth rate is still expected to reach 6.7 percent despite the resurgence of concerns about the real estate market, as the focus of economic activity gradually shifts from manufacturing to services. Emerging markets and developing economies are expected to grow at an aggregate rate of 3.4 percent, broadly in line with previous expectations.

25. Global growth is projected to accelerate to 2.8 percent in 2017, as momentum shifts from advanced economies back towards emerging markets and developing economies (Figure 18). The anticipated stabilisation of commodity prices, spurred by rising demand among commodity importers, should improve growth prospects for commodity exporters. The aggregate growth rate for emerging markets and developing economies is projected to accelerate to 4.3 percent in 2017 and 4.6 percent in 2018-2019. Nonetheless, weak investment and slow productivity growth pose a challenge to developing economies’ medium-term prospects. Growth in advanced economies is expected to recover marginally, rising to an average rate of 1.7 percent in 2017-2019. Recent political developments have greatly increased policy uncertainty, clouding projections from 2017 onward.

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\(^\text{10}\) Unless noted otherwise, all GDP forecasts are taken from the June 2016 Global Economic Prospects (World Bank, 2016). As the scope arising from the outcome of the US Presidential Election has not yet been clearly defined at the point of publication, they are not included in the baseline projections.
Domestic demand is expected to continue driving Malaysia’s GDP growth in 2017

26. **Private consumption is expected to remain the principal engine of economic growth in 2017 albeit at a slightly more moderate pace.** The growth rate of private consumption is expected to remain stable at 5.7 percent in 2017, despite a modest deceleration in the labour market and ongoing cost-of-living adjustments due to the impact of the removal of subsidies. This will be partially offset by the public income-support programs described above, as well as the introduction of incentives to generate additional household income through ride-sharing services such as Uber and Grabcar.

27. **Private investment is projected to expand in 2017, driven by the extractive industries and manufacturing.** In a context of uncertain global growth, the anticipated recovery of global commodity prices could help to bolster investor confidence. Meanwhile, investment in the manufacturing sector, particularly E&E, is expected to remain strong despite the current weakness in external demand. The government’s affordable-housing programs are also expected to boost construction activity. As a result, the growth rate of gross fixed capital formation is projected to accelerate from an estimated 3.1 percent in 2016 to 3.6 percent in 2017.

28. **Public expenditure is expected to grow steadily, in line with the growth of public revenue.** The government wage bill is expected to drive a 4.2 percent increase in public spending in 2016, broadly consistent with revenue growth. Public investment is also expected to rise as the government increases spending on infrastructure and education, and as NFPCs continue to invest in major infrastructure projects.

29. **Inflation is expected to remain low and stable in 2017 at between 2 and 3 percent, the same range observed in 2016.** The anticipated recovery of global oil prices and the gradual removal of selected subsidies could potentially put upward pressure on inflation. However, no second-round effects are currently anticipated, as wage pressures remained contained.

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11 These assumptions are included in the 2017 budget documents. The BNM will announce its inflation forecast in its 2017 Annual Report, which is expected to be released in March.
30. The current-account surplus is projected to widen from an estimated 1.8 percent of GDP in 2016 to 2.0 percent in 2017. This projection hinges on the expectation of a gradual recovery in global trade that boosts demand for the exports of large emerging economies, as well as the anticipated stabilisation of commodity prices. The growth of Malaysian exports is projected to accelerate next year as commodity prices stabilise, and steady external demand for semiconductors is expected to support the E&E sector. Even a marginal uptick in economic activity among advanced economies would boost external demand, though the global trade outlook remains highly uncertain and vulnerable to a potential slowdown or stalling of trade liberalisation. After contracting by 0.7 percent in 2016, Malaysian exports are projected to grow by 2.8 percent in 2017.

31. Monetary policy is expected to remain accommodative and supportive of economic growth. At its most recent meeting in November 2016, the BNM’s monetary policy committee decided to keep the overnight policy rate at 3.00 percent. The committee acknowledged the uncertainty generated by financial market volatility and the threat of increased protectionism, and acknowledged that global financial conditions are vulnerable to both market and policy risks. The committee added that while rising uncertainty could result in periodic volatility in the region’s financial and foreign-exchange markets, the domestic banking system has ample liquidity and the BNM will continue to provide liquidity as needed to ensure the orderly functioning of the national foreign-exchange market. While the risk of destabilising financial imbalances has been contained, the committee will continue to monitor these risks to ensure the sustainability of the country’s overall growth trajectory.

32. The fiscal deficit is projected to narrow to 3.0 percent of GDP in 2017 (Figure 19). The 2017 budget assumes an average oil price of US$45 billion per barrel, as well as broadly stable macroeconomic conditions, including a GDP growth rate of 4-5 percent and an inflation rate of 2-3 percent. While oil prices are estimated to have averaged US$30-35 per barrel in 2016, they are expected to recover next year, and the government is projecting an increase in petroleum tax revenue equal to 0.8 percent of GDP. Additional revenues will ease constraints on operating expenditures and development spending, especially in the transportation and education sectors.

Figure 19: The fiscal deficit is expected to continue narrowing, reaching 3.0 percent of GDP in 2016.

Figure 20: The shift from untargeted to targeted fiscal transfers is expected to continue.

Source: MOF, World Bank staff calculations
33. Government revenue is projected to increase by 3.4 percent between 2016 and 2017, due largely to rising oil and gas prices. The government expects petroleum income tax revenue to rise from 0.7 percent of GDP in 2016 to 0.8 percent in 2017 as oil prices gradually recover. However, this is expected to be partially offset by lower dividend payments from Petronas, which are projected to fall from RM16 billion in 2016 to RM13 billion in 2017, and a decline in total investment income from 1.9 percent of GDP in 2016 to 1.3 percent in 2017, reflecting lower profits among government-linked companies. The government is also projecting a slight increase in corporate income tax from 5.03 percent of GDP in 2016 to 5.09 percent in 2017 due in part to an anticipated increase in corporate tax collection from oil and gas companies.

34. Cutting spending on selected operating expenditure items will continue to be the focus of the government’s fiscal consolidation efforts next year. The shift from untargeted subsidies to more targeted forms of social spending is expected to drive the overall reduction in operating expenditures in 2017 (Figure 20). Total subsidy spending is projected to decline by 9.0 percent to RM 22.4 billion, while the total value of transfers executed through the BR1M program is expected to rise from RM 5.4 billion in 2016 to RM 6.8 billion in 2017. Subsidies to lower-income groups such as fishermen, paddy-rice farmers and smallholder rubber producers will remain in place. Since 2015 the authorities have reduced grants to universities, development agencies and other statutory bodies, and continuing this trend could generate a substantial fiscal savings. Between 2015 and 2017, grants to statutory bodies are projected to decline by approximately 39.3 percent. The 2017 budget will also provide additional income support to civil servants, primarily by increasing pension payments from RM 19 billion in 2016 to RM 21.8 billion in 2017, a 14.6 percent increase in a single year. As a result, the wage bill is projected to rise by 6.8 percent (Figure 21).

Figure 21: Additional income-support measures will increase the wage bill.

Salaries and pensions in RM billions (left) and the wage bill in % of total operating expenditures (right)

![Graph showing additional income-support measures increasing the wage bill]

Figure 22: Development expenditures in 2017 will concentrate on the education and transportation sectors.

Selected sectors in % of total development expenditures

![Graph showing development expenditures with focus on education and transportation]

Source: MOF, World Bank staff calculations
35. The education and transportation sectors will be the focus of development spending in 2017 (Figure 22). While overall development expenditures will remain at their current level of around RM 46 billion, spending on education12 and transportation will rise from 0.7 percent of GDP in 2016 to 0.8 percent in 2017. The authorities are striving to improve transportation access to underdeveloped areas of the country, such as the east coast of Peninsular Malaysia and the Sabah and Sarawak regions. Key infrastructure projects include the East Coast Rail Line, the Pan Borneo Highway and upgrades to the East Coast Railway. NFPCs will continue to play a vital role in implementing infrastructure projects, although their precise share in total investment expenditures cannot currently be determined.

36. Medium-term fiscal consolidation may require a second wave of reforms in the public sector. Thus far, the government’s fiscal consolidation efforts have focused on reducing operating expenditures, especially untargeted subsidies and transfers, and introducing the GST. However, fiscal consolidation will become increasingly difficult over the medium term as stable oil and gas prices limit revenue growth and significant headwinds limit overall economic activity. As the scope for further reducing operating expenditures narrows and GST collection plateaus, the government may consider additional reforms to raise revenue and improve public sector efficiency. Containing the growth of the wage bill will be necessary to alleviate expenditure pressures, create fiscal space and sustain the broader fiscal consolidation effort. The government could review its hiring and retention policies, and it may consider reforming the civil service pension system to move toward a fully contribution-financed model. In addition, gradually eliminating GST exemptions and broadening the coverage of the personal income tax could expand and diversify the revenue base while also making the tax structure more progressive.

37. Enhancing the efficiency of development expenditures through improved project planning and implementation systems could boost the productivity of public investment and increase its fiscal multiplier effect. Public expenditure efficiency is especially important given the government’s narrowing fiscal space and the key role that development spending plays in supporting domestic demand and alleviating economic bottlenecks. Further consolidating the investment appraisal and planning processes for public investment and bolstering interagency collaboration and coordination could strengthen the impact of public investment. Greater use of data modelling and initiatives designed to build modelling capacity across agencies could improve the planning process and facilitate decision-making (Box 2).

**Box 2: Strengthening Public Sector Management in Response to an Economic Slowdown, an International Perspective**

As countries around the world face slower growth and widening fiscal deficits, policymakers are striving to further improve public expenditure efficiency. If the government’s fiscal position is strong, using countercyclical spending to boost consumption may be an effective policy response to faltering growth. Fiscal impulse policies could include raising the minimum wage, boosting civil service salaries and increasing social transfers. If the government’s fiscal space is limited, however, such policies may not be sustainable, and policymakers may instead focus on increasing the efficiency of public spending and curbing ineffective or low-priority expenditures. However, the public expenditure process involves numerous stakeholders, some of whom may have strong incentives to preserve the status quo. Faced with this challenge, many countries have used independent spending reviews to identify potential fiscal savings.

Spending reviews can consider efficiency from a government-wide perspective, or they can adopt a sector-specific approach. The former tend to recommend systemic human resource and public financial management measures, such as freezing civil service hiring or cutting unproductive subsidies across sectors. Sector-specific analyses typically diagnose unique sectoral issues, such as the high cost of...

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12 The increase in education spending is focused on enhancing technical and vocational education and training programs, rehabilitating 120 existing schools and completing the construction of 227 new schools.
pharmaceutical procurement in the health sector or chronic teacher absenteeism in the education sector, and develop recommendations accordingly. The experience of OECD countries shows that in both cases the success of reform measures depends on the institutional arrangements for conducting spending reviews, as well as a firm political commitment and a strong sense of ownership among stakeholders.

Spending Reviews in OECD Countries

i. United Kingdom: The 2010 Comprehensive Spending Review. The objective of the review was to save £81 billion over four years and return public spending as a share of GDP to its 2006-07 level. The approach consisted of scaling back or eliminating selected policies, projects and agencies, while increasing the efficiency of others. Decisions were implemented upon endorsement by the Chancellor and reflected in annual budget plans. The reforms announced in 2010 included welfare cuts, a public sector pay freeze, efficiency improvements, policies to reduce debt-service costs, and measures to protect or even increase spending on high-priority or growth-enhancing sectors, such as education and transportation. The Cabinet’s new Public Expenditure Committee collaborated directly with the Prime Minister, the Deputy Minister, the Chancellor and the Chief Secretary to the Treasury to coordinate the reform program. Each ministry prepared spending plans and policy options, and the Treasury proposed its own alternatives. The public was also invited to submit ideas online. An Efficiency and Reform Group was created to detect and implement efficiency reforms in partnership with the Treasury and the line ministries.

ii. Ireland: The 2011 Comprehensive Review of Expenditure. This review was designed to (i) achieve the government’s expenditure-side fiscal consolidation objectives, (ii) realign spending with government priorities, and (iii) assess new ways of advancing public policy goals. The review served as the basis for setting multiannual expenditure ceilings for 2012, 2013 and 2014. Resource allocation was based on expenditure reports prepared by individual line ministries, which were reviewed by a high-level steering committee chaired by the Secretary General of the Department of Public Expenditure and Reform. The reports represented a line-by-line examination of public services designed to refocus public sector efforts and achieve better value for money. Each line ministry was responsible for evaluating every budgetary program under its purview and establishing internal administrative arrangements to ensure timely reporting. A standard approach was developed for prioritising programs, which involved assessing each program against three criteria: its rationale, its objectives and relevance, and its effectiveness and efficiency. The authorities reported a savings of €7.8 billion to the OECD Working Party of Senior Budget Officials. The Irish government has since announced that this was not intended to be an isolated exercise but to become a cornerstone of budget planning.

iii. The Netherlands: The 2010 Comprehensive Expenditure Review. A spending review was initiated in late 2009, just before the national elections. It addressed 20 subject areas encompassing 80 percent of total government expenditure and was designed to form the basis of a four-year plan. A task force comprising staff from the relevant ministry and from the Ministry of Finance reviewed each subject area. A senior official not responsible for the policy under review chaired each task force. Their objective was to independently formulate reform options that could yield a fiscal savings equal to at least 20 percent of current spending over four years. Overall, the potential savings generated by the proposed reform options were estimated at €35 billion per year, or about 12 percent of central government spending, including social security. Some of the suggested cuts were incorporated into political campaign platforms and, after the government was formed, these

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reforms became part of the coalition agreement. This initiative revived the Netherlands’ longstanding tradition of spending reviews.

Lessons from the international experience

Spending reviews typically work best when they adopt a multiyear perspective, as this approach allows for more ambitious savings measures in support of medium-term fiscal targets. By contrast, annual spending reviews may lead to reform fatigue or encourage the perception that reform efforts can be renewed if targets are missed. All three countries in the examples above, the United Kingdom, Ireland and the Netherlands, now use multi-year reviews. A medium-term perspective allows for deeper structural reforms, as it provides adequate time to phase out programs, activities or fiscal transfers that could not be eliminated in a single year. This approach is preferable to temporary solutions or half-measures, such as decreasing program budgets while keeping the number of programs intact. The optimal strategy for increasing public sector efficiency is to boost the productivity of high-priority activities while phasing out less important policies and programs. This process requires a relatively long time horizon, and adopting a multiyear perspective allows managerial and programmatic changes, such as improved beneficiary targeting, to deliver meaningful efficiency gains.

Spending review teams work best when they combine external expertise with internal knowledge of the government. Different participants in the expenditure review process have different strengths and weaknesses. For example, the President or Prime Minister’s office can provide vital political leadership, but its fiscal expertise may be more limited than that of the Ministry of Finance, which in turn may lack the detailed sector-level knowledge of the line ministries. While line ministries typically have the most extensive understanding of their respective sectors, they may be biased to the status quo and subject to incentives that are inconsistent with an objective review process. The involvement of the legislature can provide legitimacy to the review process, but lawmakers may attempt to protect programs that serve their political interests regardless of their relative efficiency. Harnessing the strengths of these and other stakeholders, while neutralising their weaknesses, is critical to the success of the spending review.

A major challenge in conducting an expenditure review is to follow through with all necessary steps following the initial review and program identification stage. This includes discussing and agreeing upon the conclusions with the government, passing any necessary legislation, building public support for reform, and planning and implementing the reform process. It is important to allocate sufficient time and resources to complete each of these steps. Multi-stakeholder communication and outreach is critical at all stages of the spending review.

Source: Authors

An uncertain external environment is a key source of risk to Malaysia’s economic outlook

38. The Malaysian economy faces a number of risks arising from external circumstances. Many of these stem from uncertainty regarding the potential US fiscal stimulus and trade policies and their prospective impact on global economic growth, trade and financial markets. In the short run, a more expansionary U.S. fiscal policy could temporarily boost export growth in Malaysia. However, this is expected to coincide with an uneven expansion in the euro area, persistently slow growth in Japan and China’s ongoing economic rebalancing. In the medium term, however, a more protectionist stance by the U.S. could negatively impact Malaysia’s key export sectors, inhibiting investment and impeding diversification. Also, the uncertain future of the Trans-Pacific Partnership could delay the pace of certain policy reforms in Malaysia.
39. Malaysia's monetary policy will continue to operate under an environment of volatility from external financial markets. Indications of emerging policy changes in the U.S. have already caused the ringgit to depreciate significantly against the U.S. dollar, increased financial outflows and widened the spread of Malaysian bonds against U.S. securities. The trajectory of these trends will depend largely on the actual policies implemented in the U.S. Given these developments, going forward, the BNM could face additional considerations/challenges when undertaking further monetary easing. Nevertheless, the deep and diversified domestic financial markets and a strong banking system would continue to provide buffers in times of higher financial volatility, preserving monetary policy space. The authorities may consider continuing to allow the ringgit to depreciate in order to adjust to the new economic environment. Given Malaysia's relative trade openness and financial liberalisation, the authorities should continue to pursue a targeted communications strategy designed to maintain market stability and reassure investors. Longer-term initiatives, such as the development of onshore hedging options and the extension of trading hours in the onshore market, could further reinforce market stability. The weakening of the ringgit may increase imported inflation, and it will be important to ensure that second-round effects are contained.

40. External pressure may limit the scope for countercyclical fiscal policy. A further widening of the Malaysian bond spread could increase the government's debt-service obligations, though the relatively long average maturity of existing debt, most of which is ringgit-denominated, mitigates this impact. Overall, a clear commitment to fiscal consolidation and responsible macroeconomic management, as well as the presence of large domestic public financial institutions, substantially mitigates rollover risks for government debt. Energy markets are inherently volatile, and a shift in U.S. energy policy could put downward pressures on energy prices.

41. Adverse external developments could undermine domestic sentiment and exacerbate existing risks. A weakening ringgit in the context of an ongoing fiscal consolidation process could prompt households to adjust their budgets to reflect an increased cost of living. Meanwhile, a further softening in the labour market could affect overall consumer confidence, slowing the growth of private consumption. Tighter financial conditions in response to financial market volatility and/or a faster-than-anticipated tightening of U.S. monetary policy could also erode private consumption and weaken the property market. The failure of commodity prices to meet expectations could negatively affect business sentiment, especially in the oil and gas sector, and the resulting decline in revenue from the extractive industries could tighten fiscal policy constraints. As Malaysia's next general election cycle draws closer, political uncertainty and the contentious public discourse surrounding the state-owned enterprise 1Malaysia Development Berhad could further impact investor confidence.

42. Malaysia’s more limited policy space underscores the importance of targeted responses and structural reforms. The country’s macroeconomic management has been proactive and effective, but growing external uncertainty calls for flexible and adaptive policies. Should external conditions worsen, improvements in the efficiency of social assistance programs, including a shift toward more targeted social policies, could provide immediate support to vulnerable households. Accelerating structural reforms to enhance public sector performance and boost the productivity of public spending will be vital to sustain robust growth in an adverse external environment.
2. THE QUEST FOR PRODUCTIVITY GROWTH

Productivity is the main driver of Malaysia’s economic development, though productivity growth has slowed over the past decade.

43. TFP accounts for the majority of cross-country differences in per-capita GDP and economic growth rates. TFP measures the efficiency with which factors of production are used to produce goods and services, and it is often interpreted as an indicator of an economy’s relative technological development. The prominent role of TFP—as opposed to physical and human capital accumulation—in explaining differences in income levels across countries also sheds light on the divergence of growth rates between countries since the industrial revolution. For example, TFP explains why capital flows from developed to developing countries are relatively low despite the diminishing returns to capital in high-income countries. It also explains why investment in physical and human capital does not necessarily lead to sustained economic growth.¹⁴

44. Productivity growth has slowed worldwide since the global financial crisis (Figure 23). Global TFP growth accelerated between the 1990s and mid-2000s. Internal World Bank estimates show that global TFP grew at an average rate of 0.6 percent during this period, before contracting during the 2008-2009 global financial crisis (Box 3). The worldwide slowdown in productivity growth following the crisis has been broad-based, affecting a diverse range of economies across all world regions, albeit being less pronounced in middle income and lower middle income economies (Figure 24). Moreover, global productivity has yet to recover to its pre-crisis level.

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45. In the United States and many other OECD countries, the slowdown in TFP growth began before the global financial crisis. This suggests that structural factors—beyond the disruptions in international trade and credit markets associated with the crisis—have driven the downturn in TFP growth. A growing body of research has explored the factors that drove this slowdown, though there is no consensus among academics as to its leading causes. One possible explanation is that recent technological innovations have not had the same long-term transformative impact on productivity as those of the second industrial revolution, such as electric lighting and machinery, the internal combustion engine, the telephone, and commercial air travel. This hypothesis posits that more recent technological advancements, such as personal computers, electronic databases, email and cellular communications, had already exhausted most of their productivity-enhancing potential by the middle of the last decade. Another possible explanation is reduced market dynamism, as evidenced by the widening heterogeneity of firm performance and the slower pace of labour reallocation. According to this hypothesis, regulatory costs and other market frictions have trapped resources in low-productivity firms.

46. Technological innovation is less able to explain TFP growth trends in developing countries, which are still in the process of adopting existing technologies. Productivity growth in developing countries largely depends on the ability of firms to acquire advanced technologies and adapt them to their local context, rather than on the rate at which new technologies are created. However, restrictions on trade and capital flows, limited investment in local research and development, and insufficient efforts to strengthen workforce skills and align them with market demand may be slowing the rate of technology transfer between developed and developing countries.

Box 3: Could the Global Productivity Slump be a Measurement Error?

The recent slowdown in global productivity growth has attracted the attention of academics and policymakers around the world. In most OECD countries, the productivity growth rate fell from an average of 2.3 percent in 1995-2004 to 1.1 percent in 2005-2014. More recently, major emerging economies, including China, India and Brazil, have also experienced slowing productivity growth, making this a truly global phenomenon that affects a majority of the world’s economic output. However, some researchers have suggested that the observed decline in productivity growth could be at least in part the result of a measurement error. This hypothesis suggests that productivity data fail to fully capture changes in global output for two main reasons. First, economic statistics do not accurately reflect recent improvements in the quality of information technology (IT) products, resulting in overestimated inflation rates and GDP deflators. Second, GDP estimates do not capture the emergence of free non-consumable IT services, such as search engines, social networks and global positioning systems, which provide utility to consumers, but are not reflected in consumer prices. If these two factors were appropriately incorporated into economics statistics, the argument holds, the observed productivity slump would disappear.

Though it may initially appear plausible, the data pose considerable challenges to the “mismeasurement hypothesis.” Crucially, there is no correlation between the size of a given country’s productivity slowdown and the IT intensity of its economy. This calls the validity of the hypothesis into question, as one would expect the share of “missing” output, and thus the drop in measured productivity growth, to be larger in more IT-intensive economies.

U.S. economic data cast further doubt on the mismeasurement hypothesis. Had productivity growth not decelerated after 2004, total U.S. GDP would be approximately US$3 trillion higher than its current value. However, even the largest estimate of the value of free services provided by internet-linked digital

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15 IT intensity can be measured either as the share of value added by IT-related industries or by broadband penetration rates. No correlation to changes in productivity growth rates is found for either metric.
technologies is not more than US$850 billion, less than a third of the “missing output” associated with the productivity slump. Moreover, the mismeasurement hypothesis would imply that the growth in real value added from IT-related industries between 2004 and 2015 was almost 6 times as large as what the data show (US$608 billion), and that labour-productivity growth in the sector was approximately 415 percent instead of 80 percent, which seems highly unlikely (Syverson, 2016).

Finally, it is important to note that the mismeasurement of IT productivity would not, by itself, be sufficient to account for the observed drop in productivity growth. Rather, there would need to be a systematic difference in the degree of mismeasurement before and after 2004 that could explain the apparent change in productivity trends. Moreover, while economic statistics may certainly underestimate the value of free IT products, their consumption requires the purchase of complementary goods and services such as internet connections or cellular data, which are included in GDP calculations, and which are likely to at least partially reflect the value of the “free” services. Consequently, the global productivity slump appears to in fact be a reality, and not an illusion created by the data.

Source: Authors

Measures to improve productivity are increasingly pivotal to Malaysia’s transition to high-income status

47. Between 1990 and 2014, Malaysia enjoyed a period of solid growth driven by factor accumulation (Box 4). High rates of investment in infrastructure and private sector development, combined with rising female labour-force participation and a growing working-age population, pushed the average annual GDP growth rate to 5.8 percent between 1990 and 2014. Despite several successive years of negative TFP growth in the wake of the 1998 Asian financial crisis (AFC), Malaysia has maintained a steady annual TFP growth rate due to the flexibility of its economy and expanding investment in new sectors.

48. The need to accelerate productivity growth has become more pressing as traditional growth engines have slowed. While economic growth in Malaysia has been resilient in recent years, structural constraints are emerging as capital accumulation faces headwinds associated with declining oil and gas output. Since 1990, growth in the mining sector has gradually decelerated from an average of 5.3 percent from 1990 to 1999 to 0.8 percent from 2010 to 2014.16 Moreover, labour force growth is expected to slow in line with demographic trends, and the share of the population over the age of 65 is expected to exceed 7 percent by 2030.17 In this difficult context, faster productivity growth will be necessary to ensure a sustainable growth trajectory that allows Malaysia to reach high-income status.

49. A growing working-age population contributed to Malaysia’s growth over the last 25 years, but as the demographic transition reduces the availability of labour, increased productivity will be vital to sustain growth. Although Malaysia’s demographic transition is at an earlier stage than it is in many other Association of Southeast Asian Nations (ASEAN) countries, over the long term, an expanding workforce supported by capital accumulation will not be sufficient to sustain growth. By 2050, the age structure of Malaysia’s population is expected to be similar to that of Singapore in 2000, but human capital in Malaysia is expected to still be smaller on a per capita basis. As a result, Malaysia’s labour-productivity growth potential is greater than that of other ASEAN countries. Nevertheless, Malaysia is entering a demographic transition that will constrain the growth of human capital over the long term. While an increasing average life expectancy will strengthen incentives to invest in education, with a positive effect on overall productivity growth, the limited availability of high-quality educational services is a key constraint on human capital formation. This makes education a prime area for productivity-enhancing public investment.

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16 Based on GDP by economic activity.
17 World Bank East Asia and Pacific Regional Report 2016 – “Live Long and Prosper”. A population is defined as “aging” when the share of the total population over the age of 65 exceeds 7 percent.
Box 4: The Recent Evolution of Productivity Analysis

For several decades, physical and human capital accumulation were regarded as the main determinants of economic growth and development. However, a growing body of empirical research has led academics and policymakers to conclude that TFP—rather than factor accumulation—explains the bulk of cross-country differences in per-capita income.18

Given the prominent role of TFP, sectoral and economy-wide productivity aggregates have become central topics in both academic and policy circles. Moreover, there has been a renewed interest in analysing the productivity of individual firms, due in part to the following developments:

i. Productivity analysis has become an increasingly important policymaking tool. While policymakers continue to focus on macroeconomic aggregates, recent research has revealed the importance of using microeconomic and firm-level data to (i) improve the targeting efficiency and effectiveness of economic policies, (ii) more accurately predict the effects of sectoral shocks and policy reforms on aggregate economic variables, and (iii) better understand changes in macroeconomic variables by tracking their evolution at the firm level.

ii. Over the last two decades, access to so-called “micro data” has increased dramatically. Historically, only a few large-scale firm-level datasets were available, and researchers typically needed special access to analyse them. However, a growing number of countries now conduct micro-level censuses of manufacturing firms, which allows for a deeper analysis of firm-level productivity. However, the availability of micro data remains limited in poor countries, and improved data collection will be necessary to allow for greater micro-level analysis.

Increasing economic productivity is essential to reduce poverty and promote shared prosperity. While much of the poverty reduction generated by increased productivity is associated with structural transformation, recent experience shows that not all transitions out of poverty involve changes in the type of work undertaken. In Bangladesh and Vietnam, for example, increased productivity and income levels within sectors, rather than shifts in employment between sectors, have driven poverty reduction. Productivity gains have also lowered prices for food and various goods commonly consumed by households in the bottom 40 percent of the income distribution, increasing their purchasing power and economic wellbeing.

Source: Authors

50. Recognising these challenges, the government incorporated several productivity targets into the 11th Malaysia Plan. From 2016 to 2020, the government aims to increase the TFP growth rate to 2.3 percent per year (Figure 25). The target for labour productivity growth is 3.7 percent per year, driven by services sector which contributes to more than 70 percent to the overall labour productivity growth target. The construction sector is targeted with the highest labour productivity growth (9.6 percent), followed by services (4.1 percent), agriculture (3.6 percent) and manufacturing (2.6 percent) (Figure 26). In addition, as part of its strategy to boost productivity, the government is set to introduce wide-ranging initiatives to address productivity issues at national, industry and enterprise levels.

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51. This section of the report aims to provide a comprehensive and granular analysis of productivity trends in Malaysia. The findings and analysis focus primarily on private sector productivity (see Box 5 for a discussion of public sector productivity). The report is divided into three parts. The first part presents a macro overview of the evolution of productivity in Malaysia, including the contribution of productivity and employment creation to value-added growth per worker. The analysis is complemented by a broad scenario analysis of Malaysia’s long-term growth trajectory under various productivity and investment trend scenarios. The second part examines the recently concluded World Bank Enterprise Surveys for ASEAN countries, which present areas that correlate positively with productivity and benchmark them against selected comparator countries. Finally, the third part utilises a panel data sample of manufacturing firms in Malaysia based on the 2005, 2010 and 2014 economic census and survey, identifies the main characteristics of productivity growth in manufacturing and assesses the impact that resource misallocation plays in productivity growth.
Box 5: Measuring and Improving Public Sector Productivity

Public sector productivity is crucial to successful development outcomes and sustained increases in living standards. On average, the public sector accounts for approximately 20 percent of employment, often exceeding the share of employment in the manufacturing sector. In Malaysia, the public sector accounts for approximately 11 percent of employment. Moreover, many government services, including education, health, public security and infrastructure investment, directly impact economy-wide productivity, and well-managed fiscal and regulatory frameworks are fundamental to investment and growth.

Measuring productivity in the public sector presents particular challenges. Broadly speaking, productivity refers to the rate at which inputs are converted into outputs. However, the public sector’s primary outputs are public goods and services, as well as transfer payments, which are often difficult to assess in terms of quality, tend to lack market prices, and can be hard to compare across sectors or over time. For example, it is difficult to assess the value of a medical procedure in 1966 against the same procedure in 2016, or to compare them to the benefits of a street patrol by a police officer. Also, the impact of public sector policies and programs may take months or even years to materialise, further complicating the analysis of trends over time.

The productivity of individual government agencies can be assessed, albeit imperfectly, by analysing the inputs they use and the outputs they produce. Several OECD countries have piloted different approaches to measuring public sector productivity using sector-specific output measures. However, different countries may use different evaluative methods even within the same sector. For example, the United Kingdom, Sweden, France, Spain, Italy and Latvia use quality-adjusted output measures to evaluate education spending, while Australia, New Zealand, Germany and the Czech Republic quantify spending without adjusting for quality, and Canada, the United States, Denmark, Korea and Japan benchmark outputs with inputs.

Notwithstanding these measurement challenges, public sector productivity is inextricably linked to individual and organisational performance. High rates of productivity require sound planning, commitment and focused effort. Policymakers can boost public sector productivity through:

(i) **Performance-based budgeting**: Performance-based budgeting constrains input resources in the aggregate for a set of outputs. In other words, what can vary is the types and combination of inputs used, while the output and results from the use of resources are fixed. This is much more likely to result in high productivity than traditional budgeting, which constrains input types and allows the outputs to vary.

(ii) **Performance-based remuneration and other human-resource management tools**: Governments often use performance-based incentives to stimulate worker productivity, although the effectiveness of this strategy is subject to debate. Studies have shown that incentives can increase productivity among skilled workers. However, workers do not respond solely to monetary factors, and factors such as organisational mission, career-development prospects, or upward and lateral mobility are equally important.

(iii) **Institutional and stakeholder alignment**: Removing barriers to collaboration across government agencies, promoting transparent information flows, developing strong agency leadership, reducing managerial turnover, and creating an appropriate division of labour between central and local governments can enhance public sector efficiency.

Source: Authors
TFP has grown steadily in Malaysia, but it remains lower than in many high-income countries.

52. Factor accumulation has driven Malaysia’s economic growth over the past 25 years (Figure 27). Estimates based on the Solow growth model indicate that Malaysia’s labour and capital stocks grew at an annual rate of approximately 2.0 percent between 1990 and 2014. Meanwhile, the annual TFP growth rate was significantly lower at 1.8 percent. While TFP growth has accelerated moderately over the years, the pace of growth has been broadly slower than that of both the labour and capital stocks. Furthermore, TFP growth during this period, could be even lower, at around 1.0 percent, assuming a higher capital stock to income.\(^1^9\)

53. TFP in Malaysia has grown more slowly than in comparable countries (Figure 28). As a result, Malaysia has been unable to close the gap with peer countries and higher-income economies in the EAP region. While the economic growth of many regional comparators was also driven mainly by capital accumulation, higher-income EAP economies have typically exhibited higher TFP growth rates. For example, while Malaysia, Singapore and Korea experienced similar labour and capital growth rates, TFP grew more rapidly in Singapore and Korea, rising at an annual rate of 2.2 percent, compared to 1.8 percent in Malaysia. A similar pattern can be observed when comparing TFP growth in Malaysia to the EAP regional average, as well as the averages for both upper-middle-income and middle-income countries worldwide.

54. The contribution of TFP to Malaysia’s economic growth has increased steadily over time, but at a slower pace than in other regional countries. With the exception of three crisis periods,\(^2^0\) TFP has consistently made a positive contribution to economic growth in Malaysia. From 1990 to 2014, TFP represented around 31 percent of Malaysia’s total economic growth, while the rising stocks of capital and labour contributed around 35 and 34 percent, respectively. The 1998 AFC caused a marked drop in TFP’s contribution to growth.

\(^{1^9}\) The estimation using the Solow growth model for the comparison exercise was based on the general assumptions of share of capital to income (\(a\)) is 30 percent and the depreciation rate of capital is 6 percent, which allows for cross-country comparison. However, it is acknowledged that estimation using a higher (\(a\)) of 50 percent, which could be more indicative of the economy, suggests that TFP growth could be lower.

\(^{2^0}\) These include the 1998 AFC, the 2011 telecommunications bubble and the 2008 global financial crisis.
in Malaysia, but it has since largely recovered. Nevertheless, TFP growth rates in other regional countries affected by the AFC, such as Korea, Thailand and Indonesia, rebounded faster than in Malaysia. In addition, TFP contributed more to growth in these countries during the post-crisis period (2009-2014) than it did in Malaysia.

Labour productivity in Malaysia is on a downward trend and trails regional comparators

55. Labour productivity, especially in the services sector, has been the main driver of value-added growth in Malaysia. From 1990 to 2014, labour productivity was responsible for an estimated 72 percent of value-added growth, while rising employment accounted for 11 percent.21 The services sector was the primary driver of enhanced labour productivity and employment creation.

Box 6: Measuring TFP and Labour Productivity

TFP is commonly measured through growth-accounting models, which examine how much of an observed rate of change in output is not accounted for by the rate of change of combined inputs, such as capital and labour stocks. Thus, the growth-accounting approach identifies TFP growth as a residual. However, accuracy remains a challenge, as different assumptions can lead to very different estimates. Moreover, assessing TFP growth can be problematic when it reflects factors other than technological change, such as increasing returns to scale, mark-ups due to imperfect competition or gains from the reallocation of inputs between sectors.

Labour productivity is another important and widely used productivity indicator, as it is also strongly correlated with changes in living standards. Labour productivity measures gross output or gross value added per unit of labour input, which indicates how efficiently labour is used in production. One advantage of assessing labour productivity is that it is relatively easy to calculate and intuitively understand. However, as changes in labour productivity result from the combined effects of different factors, such as technological change and capital accumulation, as well as the capacity of workers and the intensity of their efforts, it can be difficult to isolate the contribution of each variable.

Source: Authors

56. Labour productivity growth has trended downward since the 2008 global financial crisis. While a period of strong productivity growth followed the 1998 AFC, robust employment creation in the wake of the global financial crisis has not been accompanied by a similar recovery in labour productivity. Indeed, the growth of labour productivity in both the industrial and services sectors has been slowing since 2008.

57. Over the past 25 years, labour productivity has grown more slowly in Malaysia than in many regional comparator countries (Figure 29). At 2.65 percent, Malaysia’s labour productivity growth rate is higher than those of Peru, Brazil, Chile and Mexico and comparable to those of Indonesia and Turkey (Figure 30). However, labour productivity growth rates among regional comparators such as Singapore (3.95 percent), Korea (3.39 percent), Hong Kong (3.15 percent) and Thailand (3.08 percent) have surpassed that of Malaysia. Moreover, unlike Malaysia, other regional countries did not experience a marked reduction in labour productivity growth following the global financial crisis. Yet Malaysia experienced stronger employment creation than these countries.

21 Estimates for labour productivity were calculated using the Shapley decomposition method. This method decomposes per-capita growth output into four parts: productivity growth, employment growth, labour force growth and changes in the working age population. The method also calculates different sectors’ contributions to aggregate productivity and employment growth. The method sheds light on the respective roles of productivity and employment creation in driving overall economic growth.
Employment in more productive sectors, such as manufacturing, has declined in recent years. Disaggregating value-added growth by subsector reveals two distinct trends during the pre-AFC (1990-1998) and post-AFC (1999-2014) periods. Before the AFC, employment grew rapidly in sectors with higher labour productivity growth, such as manufacturing and finance (Figure 31). Overall, most sectors in the economy, except agriculture and mining, experienced positive value-added growth during this period. Following the AFC, increased value addition per worker contributed to employment growth in key services subsectors, including wholesale and retail trade and finance. However, while labour productivity growth in the manufacturing sector also increased, this did not translate into employment growth, and indeed employment in the manufacturing sector has declined since the crisis (Figure 32).22

58. Employment in more productive sectors, such as manufacturing, has declined in recent years. Disaggregating value-added growth by subsector reveals two distinct trends during the pre-AFC (1990-1998) and post-AFC (1999-2014) periods. Before the AFC, employment grew rapidly in sectors with higher labour productivity growth, such as manufacturing and finance (Figure 31). Overall, most sectors in the economy, except agriculture and mining, experienced positive value-added growth during this period. Following the AFC, increased value addition per worker contributed to employment growth in key services subsectors, including wholesale and retail trade and finance. However, while labour productivity growth in the manufacturing sector also increased, this did not translate into employment growth, and indeed employment in the manufacturing sector has declined since the crisis (Figure 32).22

While the analysis does not identify the underlying factors behind this development, one possible reason that manufacturing sector has not seen higher employment growth while experiencing higher labour productivity is the increase in automation in the sector, which reduces demand for unskilled employment.
Long-term GDP growth projections highlight the key role of productivity in closing the gap with high-income economies

59. Achieving the government’s productivity target would bring the share of Malaysia’s GDP per capita closer to that of high-income economies by 2050. The scenario analysis presented in Table 7 shows that under a baseline scenario where productivity, investment and the structure of the labour force remain unchanged, the projected ratio of Malaysia’s GDP per capita to the average GDP per capita of high-income economies would rise from its current level of about 22 percent to about 29 percent in 2050. Increasing the annual TFP growth rate to the target of 2.3 percent set forth in the 11th Malaysia plan would boost the ratio to approximately 40 percent of the projected average for high-income countries.

60. In order for its GDP per capita to converge with that of high-income countries, Malaysia would need to complement rising TFP growth with significant improvements in traditional growth drivers (Figure 33). The scenario analysis is extended to include additional government targets considered in the 11th Malaysia plan, such as boosting female participation in the labour force and reducing labour’s relative contribution to GDP growth. Including these targets on traditional growth drivers, income per capita in 2050 would represent around 48 percent of the projected average GDP per capita of high-income countries in 2050. Closing the gap entirely would require moving beyond existing targets and accelerating investment and human-capital growth (Figure 34). Alternatively, reducing resource misallocation in the Malaysian economy to U.S. levels would increase TFP growth by an additional 0.1-0.4 percentage points.

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23 This scenario analysis is based on a Solow-Swan long-term growth forecasting model developed by the World Bank. The components of growth are savings, investment and productivity, but the model also includes human capital, demographics, the external accounts and labour-force participation.
**Table 7: Summary of Baseline and Alternative Long-Term Growth Scenarios**

<table>
<thead>
<tr>
<th></th>
<th>Baseline (Long-term average)</th>
<th>Scenario 1 (Improvement in TFP)</th>
<th>Scenario 2 (11MP goals)</th>
<th>Scenario 3 (11MP goals and more)</th>
</tr>
</thead>
<tbody>
<tr>
<td>TFP growth</td>
<td>1.8%</td>
<td>2.3%</td>
<td>2.3%</td>
<td>2.3%</td>
</tr>
<tr>
<td>Female labour-force participation</td>
<td>47%</td>
<td>Same as baseline</td>
<td>59%</td>
<td>59%</td>
</tr>
<tr>
<td>Share of labour in GDP growth</td>
<td>34%</td>
<td>Same as baseline</td>
<td>16%</td>
<td>16%</td>
</tr>
<tr>
<td>Investment as a share of GDP</td>
<td>23%</td>
<td>Same as baseline</td>
<td>Same as baseline</td>
<td>29%</td>
</tr>
<tr>
<td>Human capital index</td>
<td>1.2</td>
<td>Same as baseline</td>
<td>Same as baseline</td>
<td>1.3</td>
</tr>
</tbody>
</table>

Source: DOSM, World Development Indicators, Penn World Tables, World Economic Forum, World Bank staff calculations

Note: The baseline investment to-GDP ratio is based on the post-AFC average. The ratio for scenario 3 represents the 1990-2014 average. The share of labour in GDP growth is based on internal estimates from the growth-accounting model under the assumption that $\alpha = 30$ percent.
The recent decline in productivity is mainly concentrated among large, exporting firms

61. This section draws on the results of the most recent World Bank Enterprise Surveys for Malaysia. The survey covered formal firms with five or more employees in the manufacturing sector and in the main services subsectors.24 Together, manufacturing and services represented 76.4 percent of Malaysia’s GDP in 2014. Other sectors, such as agriculture, extractive industries, public utilities, government services, healthcare and financial services are not included in the analysis.

62. As similar Enterprise Surveys are conducted around the world using a standard methodology, the results for Malaysia can be benchmarked against the performance of other countries (Box 7). The Enterprise Surveys typically focus on emerging and developing economies, and data are only available for a small number of high-income countries. The following analysis compares Malaysia against selected high-income and OECD economies,25 other ASEAN economies26 and China.

<table>
<thead>
<tr>
<th>Box 7: The Scope of the World Bank Enterprise Surveys and Available Productivity Measures</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Enterprise Surveys collect data on labour productivity (defined in terms of sales per worker or sales over total cost of labour) from both manufacturing and services firms. TFP, however, is only estimated for manufacturing firms. These TFP estimates are revenue-based (sales are measured in local currency rather than by unit), and thus they cannot separate production efficiency from the effect of market power.</td>
</tr>
<tr>
<td>The Enterprise Surveys are usually conducted on a regional basis every 4-5 years. While the surveys for Malaysia and the other ASEAN economies was collected at approximately the same time, data for other comparators come from different years. The data for China are from 2012, while data for high-income and OECD economies were collected between 2010 and 2015.28</td>
</tr>
<tr>
<td>Source: Authors</td>
</tr>
</tbody>
</table>

63. Results from the Enterprise Surveys reveal that marginal labour productivity in Malaysia deteriorated between 2012 and 2014. The decline in labour productivity during this period was driven both by decreased sales and continued employment creation. Between 2012 and 2014, employment grew at a rate of 2.8 percent per year, exceeding the 0.2 percent annual growth rate of real sales,29 resulting in a 0.7 percent annual reduction in labour productivity measured as real sales per worker (Figure 35). The decline in labour productivity occurred in a context of limited international sales growth, and during the period both sales and labour productivity fell across ASEAN economies.

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24 These include retail and wholesale trade, automotive repair, hotels and restaurants, transportation, storage, communications, construction, and IT.
25 These include Chile, Croatia, Czech Republic, Estonia, Israel, Latvia, Lithuania, Mexico, Poland, Slovak Republic, Slovenia, Sweden, Turkey and Uruguay.
26 These include Cambodia, Indonesia, Lao PDR, Myanmar, the Philippines, Thailand and Vietnam.
27 See the appendix for further details on the estimation methodology.
28 For further details, see: www.enterprisesurveys.org.
29 Expressed in constant 2009 ringgit.
Figure 35: Between 2012 and 2014, real annual sales growth in Malaysia was very modest, and a faster employment growth rate led to a moderate decrease in labour productivity.

Real employment growth; real annual sales growth; labour productivity growth, %

![Chart showing real employment growth, real annual sales growth, and labour productivity growth in Malaysia, High-income & OECD, ASEAN, and China for 2012-2014]

Source: World Bank Enterprise Surveys

64. The slowdown in labour productivity was most severe among large firms. Overall, small firms, with 5 to 19 employees, performed significantly better than larger firms in terms of labour productivity growth (Figure 36).30 There is a large overlap between firms that are large, firms that export and firms in manufacturing. For example, almost 60 percent of large firms are exporting manufacturing firms. As a result, declining sales among exporters due to weakening external demand appears to have a disproportionate impact on large firms.31 Indeed, the labour productivity growth of Malaysia’s non-exporters compared favourably to that of other ASEAN economies and China. While productivity growth was modest among non-exporters in Malaysia, it was deeply negative among non-exporters in the other ASEAN countries and China (Figure 37). Moreover, younger firms in Malaysia tended to perform better than older firms.

Figure 36: The recent decline in labour productivity in Malaysia was driven by large firms...

Annual labour productivity growth, %, 2012-2014

![Chart showing annual labour productivity growth in Malaysia, High-income & OECD, ASEAN, and China for small (<20), medium (20-99), and large (>100) firms]

Source: World Bank Enterprise Surveys

Figure 37: ...and exporters.

Annual labour productivity growth, %, 2012-2014

![Chart showing annual labour productivity growth in Malaysia, High-income & OECD, ASEAN, and China for exporters and non-exporters]

Source: World Bank Enterprise Surveys

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30 Medium size firms: 20-99 employees and Large firms: 100 above employees
31 Exporting firms are defined as firms that export at least 10 percent of their sales.
65. Productivity in Malaysia’s services subsectors have outperformed the manufacturing sector. While labour productivity among services firms grew at a rate of 1.7 percent per year, it contracted at a rate of 14.6 percent per year among manufacturing firms (Figure 38). All manufacturing subsectors experienced a decrease in both sales and labour productivity, and the decline in labour productivity was significantly greater in Malaysia than in comparator countries. Conversely, firms in Malaysia’s services subsectors significantly outperformed their counterparts in other ASEAN economies and in China (Figure 39).

66. A geographic analysis confirms these findings. Overall labour productivity declined in Central Malaysia, which has a high concentration of large manufacturing firms (Figure 40). Between 2012 and 2014, labour productivity in Central Malaysia contracted by 4.2 percent, in line with the survey findings. Meanwhile, labour productivity growth was positive in other parts of the country. Labour productivity grew fastest in North and South Malaysia at annual rates of 2.3 percent and 1.7 percent, respectively, during the period.
Non-exporting firms contribute the least to overall manufacturing productivity in Malaysia.

67. Manufacturing firms in Malaysia have a higher median level of TFP than their counterparts in other ASEAN countries and in China. The median TFP of Malaysian manufacturing firms is comparable to that of firms in high-income and OECD economies (Figure 41). However, this is only true for medium and large manufacturing firms. Small Malaysian manufacturing firms underperform against small firms in comparator countries.

68. TFP levels vary significantly across Malaysian firms (Figure 42). Manufacturing firms in the top 25 percent of the TFP distribution are 11.6 times more productive than those in the bottom 25 percent. By contrast, this gap is just 2.5 in high-income and OECD economies, 3.1 in other ASEAN economies and 3.6 in China. Moreover, the best-performing large firms in Malaysia outperform the best-performing small firms in high-income and OECD comparators. Conversely, the TFP of the worst-performing Malaysian small firms was markedly lower than that of small firms in comparator countries.

Figure 41: Manufacturing firms in Malaysia have a wider TFP range than manufacturing firms in comparator countries...

![Graph showing TFP distribution across countries.]

Source: World Bank Enterprise Surveys

Figure 42: ...and much of this variability is explained by differences between large and small firms.

![Graph showing TFP distribution by firm size across countries.]

Source: World Bank Enterprise Surveys

69. Exporting firms in the manufacturing sector have higher TFP levels than non-exporters. TFP is positively correlated with the share of exported sales among manufacturing firms. Conversely, there is no conclusive relationship between the TFP of manufacturing firms and their share of imported inputs, although firms that import at least a portion of their inputs tend to have lower levels of labour productivity, particularly large firms (Figure 43). Many more firms use imported inputs in Malaysia than in comparator countries.

70. The relatively poor performance of less-productive non-exporting firms reduces the manufacturing sector’s overall TFP. The median TFP of non-exporters in Malaysia is lower than that of non-exporters in comparator countries. This is mainly due to the variability of TFP between manufacturing firms in Malaysia, which is especially pronounced among non-exporters (Figure 44). This suggests that traditional market mechanisms may not be forcing unproductive manufacturers from the domestic market.
Labour productivity growth in the services sector varies across firms’ size in Malaysia (Figure 45). In Malaysia, smaller firms in the services sector have seen a positive labour productivity growth, while medium and large firms in the services sector have experienced negative growth in labour productivity. Similar trend was observed in ASEAN and China whereby labour productivity growth was negative for medium and large firms.

Box 8: The Scope of the World Bank Enterprise Surveys and Available Productivity Measures

The services sector in Malaysia accounts for about 51 percent of the total GDP and 60 percent of the total employment (World Development Indicators, World Bank). Given its large size understanding the level and growth of productivity in the services sector in Malaysia and its determinants is key, as even a modest improvement in the sector’s productivity can have a substantial impact on the overall economy.

However, methodological and data problems with measuring productivity in the sector pose a major challenge. For example, in the past, the productivity slowdown observed in Europe and the US in 70s and 80s was explained by the rising share of services in GDP. The prevailing view was that due to their highly labour intensive nature, services sectors offered little scope for productivity improvement. However, it is now being recognised that the observed low productivity growth in services sectors may have been due to problems with productivity measurement (see for example, Griliches 1992, Sichel 1997). Indeed, there are several challenges in the definition of output and inputs in services compared to manufacturing.

First, unlike goods, services are intangible in nature. This means that unlike a good, which is inseparable from its technical components that allow its existence, a service is unsubstantiated, evanescent and perish the very moment it is produced, which makes it difficult to identify, let alone measure, the unit of output. For example, what is the output of a consulting firm, insurance company or educational institute?
Second, productivity measurement requires that output and inputs be separate and distinct. Unlike goods, production of many services entails interactivity or participation of the consumer. In fact, some studies even suggest including consumer as an input in the production function (Oi 1992, Martin et al. 2001). Such interactivity poses a number of problems for productivity estimation. For instance, productivity of the service provider may depend on the quality of the consumer, as is the case with good students influencing the performance of teachers and schools (Djellal and Gallouj 2013). Interactivity also renders the service highly heterogeneous (depending on the level of customer participation), making it harder to define and measure output.

Third, public services pose additional problems in productivity estimation as there is often absence of market price, and some services are public goods in nature, such as defense and justice, which are collectively consumed. Many public services are provided free or at highly subsidised prices and often data on prices are not available. As a result, productivity estimation becomes complex due to difficulty in measuring value of output, aggregating output across multiple services, and identifying improvements in the quality of services.

Fourth, productivity increases due to improvements in the quality of goods and services are particularly difficult to measure in the case of services where quality improvement is indeed the main source of productivity gains. For example, the number of banking transactions performed by the individual in a month may not have changed much over time but the convenience of making the transactions seems to have improved dramatically with online systems and ATMs.

Fifth, measurement of inputs used for service production also suffers from some of the above problems. For example, services provided by doctors and lawyers are highly skill intensive. Yet, there is no standardised skilled worker, which translates into much higher degree of heterogeneity in inputs in services compared to manufacturing.

Sixth, in order to compare productivity differences, price movements and volume movements need to be isolated. That requires appropriate price deflators to measure real productivity improvement. However, for many services, appropriate price deflators do not exist either due to data limitations or difficulties to identify the unit of output. For example, what is unit of output of insurance industry?

Solutions have been proposed in the literature to cope with the above problems, but they are still conceptually and methodologically too diverse. Measuring productivity in services should start with collecting new primary data using innovative methods to capture quality and customer satisfaction.

Source: Authors
72. **Firms in the services sector appears to be less productive than manufacturing firms.** Labour productivity of services firms relative to manufacturing firms is smaller relative to comparator countries, and the trend is prevalent across all firms size (Figure 46). In addition, similar with the manufacturing sector, there is an especially large variation in labour productivity across firm size, with medium and larger firms experiencing larger variation.

The four components of productivity are education, innovation, infrastructure and efficiency.

73. **Innovation increases value addition through the creation and adaptation of new technologies, products and production processes.** Innovation requires investment in R&D, as well as in the human capital necessary to develop and utilise innovations. Cross-country studies have found the elasticity of TFP to domestic and foreign investment in R&D to be around 0.15 and 0.45, respectively. This suggests that domestic R&D and the ability to adopt foreign technologies both play an important role in productivity growth.

74. **Education builds human capital and supports the development of new ideas.** An effective education system should provide universal primary and secondary education and promote both higher education and industry-specific technical training. Cross-country studies indicate that the elasticity of TFP with respect to years of schooling is significantly positive, especially among middle-income countries.

75. **Efficiency reflects the appropriateness of the allocation of capital and labour across firms.** Capital and labour should be allocated to higher value-added economic activities within and across sectors. Excessively rigid market, labour and trade regulations have impeded resource allocation in many developing countries, hindering enterprise creation and expansion and slowing the adoption of new technologies. Hsieh and Klenow (2009) show that a more efficient allocation of capital and labour in China and India could increase...
TFP in the manufacturing sector by around 50 percent, while Chanda and Dalgaard (2005) find that trade openness is positively correlated with TFP growth in 69 developing and developed countries.

**76. Infrastructure, both physical and institutional, can provide a business-friendly environment conducive to economic growth.** Physical infrastructure includes utilities, transportation and communications systems, and other public goods. Institutional infrastructure includes the quality of public service delivery, the absence of corruption, public security, the enforcement of property rights and macroeconomic stability. Studies show that a growing stock of properly managed public infrastructure is positively associated with TFP growth. Moreover, high-quality institutions that adhere to the rule of law, ensure bureaucratic quality and limit corruption are positively correlated with both the level and growth rate of TFP.

**Box 9: Some Potential Drivers of Productivity**

In economic theory, productivity is defined as a ratio of output over input. In practice, it represents how efficiently input resources such as capital and labour are allocated to produce economic output. Productivity is mainly driven by four interrelated components: innovation, education, efficiency, and infrastructure (physical and institutional) (Kim, Loayza, and Meza-Cuadra 2016).

**Innovation** includes creating and adopting new technologies, products, and processes which can lead to higher value-added economic activities. Innovation requires investment in research and development (R&D) and competent scientists and engineers to create state-of-art technologies, but also requires strengthening human capacity to be able to learn existing technologies, products, and processes, and apply and/or develop them into new products and processes for business needs. A cross-country study shows that the elasticity of total factor productivity is around 0.15 and 0.45 with respect to domestic and foreign R&D expenditure, respectively, during 1980—1998 in 16 OECD countries (Guellec and van Pottelsberghe De La Potterie 2002, 2004). This result suggests that domestic R&D investment is important, but the preparedness to adopt foreign technologies is also important and could have a higher impact on productivity growth.

**Education** develops human capacity by teaching knowledge and skills, promoting generation of new ideas, and providing an environment for research and development in schools and industries (Nelson and Phelps 1966). For this reason, an effective education system that provides primary and secondary education to everyone and promotes higher education in universities and continuous training in industries is key. Cross-country studies show that the elasticity of total factor productivity with respect to years of schooling is significantly positive especially for middle-income countries (Miller and Upadhyay 2000; Benhabib and Spiegel 2005; Coe, Helpman, and Hoffmaister 2009).

**Efficiency** means how effectively and timely capital and labour are allocated across firms. Capital and labour need to be reallocated to higher value-added economic activities within and across sectors for productivity growth. For this renewal, flexibility of resource allocation and use is important. However, rigidity of market, labour and trade regulations has been an obstacle in many developing countries, and impeded enterprises from starting and expanding a business and adopting new technologies. Hsieh and Klenow show that efficient allocation of capital and labour could increase total factor productivity in manufacturing sector in China and India by around 50 percent (2009). Chanda and Dalgaard show that trade openness is positively correlated with total factor productivity growth across 69 developing and developed countries (2005).

**Infrastructure**, both physical and institutional, provides a friendly environment and policies that lead to economic prosperity (North 1990). Physical infrastructure includes water, sanitation, transport, energy, and telecommunications. Institutions include quality of public service delivery, absence of corruption, protection of citizens and properties, and macroeconomic stability. Empirical studies show that a growing
Improved education seems to coexist with skill mismatches

77. Workers in Malaysian firms are more educated, on average, than firms in comparator countries (Figure 47). In Malaysia, 81 percent of surveyed employees had completed secondary education, compared to 76 percent in high-income and OECD economies, 71 percent in ASEAN economies and 66 percent in China. The share of workers with secondary education was especially high among Malaysian manufacturing firms, while the share among firms in the services sector was similar to that of comparator countries. Within Malaysia’s manufacturing sector, the average education level among production workers was similar to that of their counterparts in comparator countries (Figure 48).

Figure 47: Malaysia manufacturing firms have a larger share of workers with secondary education...

Figure 48: …but the average education level among production workers is similar to that of other countries.

78. Malaysian firms also reported lower vacancy rates than firms in other ASEAN countries. In Malaysia, only 14 percent of surveyed firms reported having vacancies in the last two years, compared to 25 percent of surveyed firms in other ASEAN countries. Furthermore, vacancies in other ASEAN countries represented, on average, 17 percent of the firm’s current size, while in Malaysia vacancies represented just 11 percent. This low vacancy rate may indicate that the Malaysian labour market is less dynamic than others in the region (Figure 49). Medium-sized firms in Malaysia reported higher vacancy rates than firms in other ASEAN countries, while large Malaysian firms reported significantly lower vacancy rates.

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Source: Authors

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The vacancy rate is calculated as the number of vacancies divided by firm size. Comparable statistics are not available for China or for high-income and OECD economies.
Despite their lower vacancy rates, Malaysian firms were more likely to face difficulties in identifying workers with specific skills. Among firms with vacancies, between 79 and 85 percent reported that finding workers with the necessary technical, managerial, or foreign languages skills was either difficult or very difficult (Figure 50). Small domestic firms were more likely to report such difficulties than large firms with at least 10 percent foreign ownership. Consequently, firms that reported having vacancies within the past two years experienced lower rates of labour productivity while trying to fill these vacancies. After controlling for several firm characteristics, those that reported hiring problems had much lower labour productivity levels than those that did not.34

### Box 10: Exploring Alternative Evidence of Skills Mismatches in the Labour Market in Malaysia

We provide some alternative measures on the labour market in Malaysia, to complement results obtained using the Enterprise Surveys. Education levels among the Malaysian labour force have increased considerably over the last decades, although tertiary school enrolment is still well below the OECD average. The share of the workforce with tertiary education remarkably increased from 1990 to 2014: among Malaysian workers between age 25 and 35, only 3 percent had completed a university degree in 1990, while the corresponding share was 17 percent in 2014.35 Tertiary school enrolment in 2013 was slightly higher (38 percent) than the average for upper middle income countries (37 percent), but still low compared to the OECD average (70 percent).

Some recent trends in the labour market confirm that skill mismatches could represent an obstacle in the road leading Malaysia to the high income status. Analysis from the 2011 round of the National Economic Return Survey shows that a large number of Malaysian firms report skill deficits in the labour force. More
There is also evidence that firms that innovate, export and invest in R&D are generally more likely to report skill deficits among their labour force. These findings are in line with the evidence emerging from a Grant Thornton International Business Report survey, according to which the percentage of Malaysian firms reporting to have difficulties in finding talent (62 percent) is slightly lower than in Australia and Canada (68 and 65 percent, respectively), but higher than in Japan and Singapore (56 percent in both).

The skill mismatches emerging in the labour market are not the result of government underspending in the education and training system. In fact, spending on education and skills development programs more broadly is relatively generous. In 2013 the Malaysian Government spent RM54 billion or 6 percent of GDP on education and training, 22 percent of which was on public universities. In the same year, Malaysia spent just over RM4.1 billion on post-secondary vocational and technical education.

The National Economic Return Survey shows that more than two-thirds of registered firms incur in training expenditures and firms that train are also reporting greater skill deficits. This is suggestive evidence that firms resort to training as a way to overcome skill deficits. Overall, initial analysis shows that training is positively correlated with worker productivity after controlling for firm/worker characteristics, and outside training leads to substantially higher productivity gains than in-house training.

The Survey also shows that firms experiencing growth and/or talent shortages are more likely to recruit new workers. In general, there are relatively more openings for professional and technical people, which are also the occupations where more training occurs. Hence, firms are aligning their skills enhancement policies on both the intensive and extensive margins.

Source: Authors

80. Malaysian firms are less likely to train their workers than firms in other countries. Only 19 percent of Malaysian firms provide formal worker training, slightly less than the ASEAN average and far below the rates of high-income and OECD economies and China (Figure 51). In addition, Malaysian manufacturing firms that provide training report offering it to only 44 percent of their workers, compared to 85 percent of workers in China, 60 percent in other ASEAN countries and 57 percent in high-income and OECD economies. Small firms are also much less likely to offer formal training than medium-sized and large firms. Only 11 percent of small firms in Malaysia train their workers, compared to 44 percent of medium-sized firms and 39 percent of large firms (Figure 52). SMEs that offer formal training tend to have higher rates of labour productivity (Figure 53) and TFP (Figure 54).

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36 High-flying firms are defined as firms that innovate, export and invest in R&D.
Malaysian firms are less likely to provide training and tend to train fewer workers. Firms that offer training, %; workers trained, %

Source: World Bank Enterprise Surveys

Small Malaysian firms are especially unlikely to train their workforce. Firms that offer training, %; workers trained, %

Source: World Bank Enterprise Surveys

Malaysian SMEs that provide training tend to have higher labour productivity... Median sales per worker, US$

Source: World Bank Enterprise Surveys

...as well as higher TFP relative to firms that do not offer training. Median TFP, %

Source: World Bank Enterprise Surveys
Malaysian firms perform well compared to other ASEAN economies in terms of non-technical innovation

81. Malaysian firms tend to focus more on non-technical innovation than on technical innovation and R&D. Compared to firms in other ASEAN economies, Malaysian firms are more likely to introduce non-technical innovations into their existing operations, including new or improved distribution, organisation and marketing methods (Figure 55). The percentage of Malaysian firms that used technical innovation to introduce a new or significantly improved process or production technique is significantly lower than in other ASEAN countries. In general, few Malaysian and ASEAN firms spend resources on R&D.

Box 11: How Competition Can Improve Productivity

The rivalry between firms trying to maximise profits or expand their market share is among the most fundamental economic forces. Though it is well established that competition fosters productivity and encourages economic growth, a more thorough understanding of the mechanisms through which this occurs can help policymakers design more effective pro-competition policies.

Competition helps motivate firm managers to improve their operations. Numerous studies, including a cross-country survey (Bloom and Van Reenen, 2010) covering more than 6,000 firms, have confirmed the positive relationship between performance-enhancing management practices and pro-competition policies. Competition encourages innovation, and this relationship is more pronounced in countries with strong intellectual property rights. The low profit margins associated with highly competitive markets can also lower the opportunity cost of production-disrupting interventions, making firms more likely to implement innovations even when doing so may temporarily slow the production process.

Finally, competition is associated with greater allocative efficiency. As intense competition drives the least productive firms from the market, they release labour and capital that more productive firms can employ. A study suggests that this effect alone accounted for 20 to 40 percent of total productivity growth in ten OECD countries between the 1980s and 1990s (Scarpetta et. al., 2002). Similarly, it is estimated that around 70 percent of productivity growth in Canada between 1979 and 1999 can be attributed to higher productivity firms gaining market share at the expense of less-productive firms (Baldwin and Gu, 2006).

Source: Authors

82. Malaysian firms that innovate tend to be more productive (Figure 56). Malaysian firms that have introduced technical innovations generally have higher levels of TFP, and firms that have introduced non-technical innovations usually have higher rates of labour productivity. Firms that invest in R&D or provide formal training to their workforce with the specific purpose of encouraging innovation also have higher rates of labour productivity. The increase in productivity associated with both technical and non-technical innovation is particularly significant for medium-sized firms. Large firms and exporting firms tend to be more innovative than small firms and non-exporting firms. In Malaysia, large firms are more likely to engage in all three types of innovation: non-technical, technical and R&D. A similar pattern is observed in the other ASEAN countries.
Overall, infrastructure services are conducive to productivity

83. The quality of Malaysia’s infrastructure stock and public services is relatively high compared to that of other countries (Figure 57). This reflects sustained public investment based on multiyear targets set forth in national economic plans, efforts to boost private investment in infrastructure through public–private partnerships, and infrastructure development initiatives by NFPCs. Over the last decade, other middle-income countries have also made significant efforts to increase their infrastructure stock and improve its quality. However, while the infrastructure gap between countries is narrowing, the same is not true for logistics performance. Malaysia continues to rank above many of its peer countries on the World Bank’s Logistics Performance Index (Figure 58), which includes the quality of trade and transport infrastructure and related services.37

37 The Logistics Performance Index reflects customs efficiency, the quality of trade and transport infrastructure, the ease of arranging shipments, the quality of logistics services and the ability to track consignments and delivery times.
Malaysian firms are less likely to experience a power outage than firms in comparator countries (Figure 59). Only 6 percent of Malaysian firms reported experiencing power outages on a monthly basis. However, manufacturing firms were much more likely than service firms to experience at least one power outage in a typical month, and a similar pattern is observed in comparator countries (Figure 60). Moreover, 7 percent of Malaysian manufacturing firms reported at least one water shortage in a typical month, a much higher share than in comparator countries.

84. **Malaysian firms are less likely to experience a power outage than firms in comparator countries (Figure 59).** Only 6 percent of Malaysian firms reported experiencing power outages on a monthly basis. However, manufacturing firms were much more likely than services firms to experience at least one power outage in a typical month, and a similar pattern is observed in comparator countries (Figure 60). Moreover, 7 percent of Malaysian manufacturing firms reported at least one water shortage in a typical month, a much higher share than in comparator countries.
85. The incidence of water shortages and power outages varies widely by region. Malaysia’s Northern Region reported the highest share of firms experiencing at least one outage in a typical month at 14 percent, followed by the East Coast at 11 percent (Figure 61). Moreover, 23 percent of manufacturing firms in the Northern Region reported at least one water shortage in a typical month, the largest share in the country; by contrast, only 7 percent of firms in the Central Region reported monthly water shortages (Figure 62).

86. Small firms and manufacturing firms that reported a higher incidence of power outages and water shortages tended to have lower rates of labour productivity. The relationship between deficiencies in physical infrastructure and labour productivity is limited, but small firms that experienced power outages tended to have lower rates of labour productivity. The same was true for manufacturing firms that experienced frequent power outages.

![Figure 61: Water shortages and power outages are most common in Malaysia’s Northern region…](source: World Bank Enterprise Surveys)

![Figure 62: …but their prevalence is still relatively low.](source: World Bank Enterprise Surveys)

Malaysian firms cite regulatory compliance as the most important obstacle to doing business

87. While firm managers identify regulatory compliance as a significant burden, objective indicators suggest that the administrative costs of compliance are relatively modest. For example, senior managers in Malaysia spend an estimated 3 percent of their time dealing with regulations, well below the average of 11 percent reported in high-income and OECD economies. Other indicators of the regulatory burden, such as the average number of meetings with tax officials and the number of days required to obtain an import or operating license, are also substantially lower in Malaysia than in comparator countries (Figure 63). However, Malaysia is the only country in the comparison group in which managers of manufacturing firms spend more time dealing with regulations than managers of services firms, and it is the only country in which larger firms tend to face a greater regulatory burden than smaller firms (Figure 64).
88. **Larger and more productive firms may be specifically targeted for inspection.** Regression analysis reveals that large firms whose management either had to spend more time dealing with regulations, or received more visits from government officials, or had to wait longer times for an import or operating license tended to have higher rates of labour productivity.

89. **Despite the apparently low administrative cost of compliance, Malaysian firms cite the regulatory burden as a main constraint on the business environment (Figure 65).** The top seven obstacles to doing business cited by Malaysian firms almost all deal with regulations and their effects on the economy. This includes informality and corruption, which may be a reaction to a heavy regulatory burden, as well as licensing, taxes and labour regulations. While access to finance was cited as a major obstacle by firms in comparator economies, only a small share of Malaysian firms identified it as their most important challenge (Figure 65).
90. Regulatory compliance appears to be more costly in certain sectors, such as chemicals. Firms in the chemicals sector report waiting an average of nine days to clear their exports through customs, almost double the time reported by firms in the food sector. Similarly, the senior management of firms operating in the chemicals sector spends 10 percent of their time dealing with regulations, compared to only 2 percent for firms in the retail sector. The chemicals sector also has the largest share of firms that report competing with informal firms (65 percent), well above the share in the retail sector (51 percent) and the national average (40 percent). The high costs imposed by the industry’s regulatory burden may be encouraging informality.

91. While a substantial number of Malaysian firms cite informal competition as a constraint on the business environment, the average rate of informal competition is similar to the rates of comparator countries. Thirty percent of Malaysian firms report informal competition as the most important constraint on the business environment, and informal competition is cited as the main obstacle among SMEs (Figure 66). However, the share of firms that compete with informal or unregistered firms is comparable to that of high-income and OECD economies and less than that of China and other ASEAN economies (Figure 67). The survey results do not indicate a significant relationship between informal competition and firm-level productivity.

Figure 66: Competition from informal firms is the most frequently cited obstacle among SMEs...

Figure 67: ...however, Malaysian firms are less likely to compete against informal firms than their counterparts in other ASEAN countries or China.

92. Overall, fewer firms in Malaysia (38 percent) than in ASEAN (50 percent) believe that firms need to pay bribes to get things done (Figure 68). Interactions with government officials that can potentially lead to requests for bribes are less likely among Malaysia firms (36 percent) of Malaysian firms have one such interaction in the last three years) than firms in ASEAN (66 percent), China (65 percent) and High-income and OECD economies (54 percent). However, for firms that do interact, bribe requests or payments are more

39 Tax rates are the most important obstacle for large firms, and licenses and permits appear among the top three obstacles for firms of all sizes.

38 The question does not ask directly about payments made by the firm. It instead asks: “It is said that establishments are sometimes required to make gifts or informal payments to public officials to “get things done” with regard to customs, taxes, licenses, regulations, services etc. On average, what percentage of total annual sales, or estimated total annual value, do establishments like this one pay in informal payments or gifts to public officials for this purpose?”

40 The question in the survey asked whether a bribe is requested when engaging in six transactions such as getting a water or electrical connection, requesting an operating or import license or a construction permit or when meeting with tax officials.
common in Malaysia than elsewhere. Overall, after taking into account basic firm characteristics, an environment in which firms pay higher bribes seems to be negatively correlated with both labour productivity and TFP for large firms (Figure 69).

Figure 68: Malaysian firms experience a higher incidence of bribery than firms in China and firms in high-income and OECD economies.

Figure 69: Exposure to bribes is negatively correlated with TFP among larger firms.

93. Though fewer firms pay for security in Malaysia than in comparable countries, among those who do pay, security costs represent a larger share of total sales. Only 22 percent of firms in Malaysia pay for security, compared to 66 percent in China, 55 percent in high-income and OECD economies, and 37 percent in other ASEAN economies (Figure 70). However, among those that pay for security, Malaysian firms spent 8 percent of their total annual sales on security, compared to 3 percent in other ASEAN countries, 2 percent in high-income and OECD economies and 1 percent in China (Figure 71). Higher security costs are associated with higher productivity among large firms, likely because the most profitable firms tend to pay more for security.

Figure 70: A smaller share of firms in Malaysia pay for security than in comparator countries...

Figure 71: ...yet among firms that pay for security, security costs are higher relative to firm sales.

Source: World Bank Enterprise Surveys
94. Fewer firms are fully financially constrained in Malaysia than in comparator countries. Data on financing sources and loan applications enable firms to be categorised as either credit unconstrained or as fully or partially credit constrained. At an aggregate level, 39 percent of Malaysian firms are either partially or fully credit constrained, similar to the share in high-income and OECD countries (Figure 72). However, a much smaller percentage of firms in Malaysia are fully credit-constrained, while a larger percentage of Malaysian firms are partially credit constrained. A greater share of large firms in Malaysia are either fully or partially constrained than in other ASEAN countries or in high-income and OECD economies (Figure 73). Internal analysis suggest that being financially constrained, either fully or partially, is associated with lower TFP among medium and large manufacturing firms.

Figure 72: The share of Malaysian firms that are credit constrained is similar to that of comparator countries.

Figure 73: Large firms in Malaysia are the most likely to be credit constrained.

A dynamic analysis of the manufacturing sector shows areas of resource misallocation

95. Successive national plans and business models have attempted to increase the productivity of Malaysia’s manufacturing sector. In 2015, Malaysia’s manufacturing sector accounted for approximately 23 percent of GDP and 80.5 percent of gross exports, and it employed 16.5 percent of employment. The sector’s ongoing shift toward higher-value-added products is crucial to Malaysia’s economic development and long-term competitiveness in global export markets. Under the 11th Malaysia Plan, the government aims to boost productivity in the manufacturing sector by promoting innovation and developing the necessary workforce skills to produce an expanding range of increasingly sophisticated products.

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41 Fully credit-constrained firms cannot obtain any form of external financing. They typically fall into two categories: those that applied for a loan and were rejected, and those that did not apply either because of unfavorable terms and conditions or because they did not think their application would be approved. Partially credit-constrained firms include those that have external financing but were discouraged from applying for a loan from a financial institution and firms that have an external source of financing and applied for a loan that was partially approved or rejected. Firms that are not credit constrained experience no apparent difficulty in accessing credit or do not need credit. This category includes firms that have sufficient capital and do not require a loan, as well as firms that applied for a loan and had their application fully approved (Kuntchev et al. 2014).
96. This section examines the role of labour productivity and allocative efficiency in overall productivity growth. Firm-level labour productivity reflects the rate at which marginal labour input is transformed into marginal output. The labour productivity of manufacturing firms between 2005 and 2014 is benchmarked against data from 2005 and 2010.\footnote{2005 is the first year for which data are available, and 2010 represents the midpoint of the available panel data.} The benchmark years are chosen for the reason that 2005 is the start of the available data and, 2010 demarcates the mid period of the available panel data. The labour productivity medians are identified for the benchmark years. Labour productivity growth rates are calculated for the 2005-2010 and 2010-2014 periods, and firms are divided into groups above and below the productivity medians of the benchmark years (Box 12).\footnote{The main assumption is that firms which are above the median of the benchmark years should have higher labour productivity growth rates, and vice versa for ones below the median. If that were the case, labour productivity differences between firms would tend to persist over time, corroborating the findings of the literature (Syverson, 2011).}

**Box 12: Closing Productivity Gaps among Frontier and Laggard Firms**

The economic forces that shape productivity can be better understood by focusing on three types of firms: (i) global frontier firms, which are the most productive in the world; (ii) the most advanced domestic firms, which are the most productive in the national economy; and (iii) laggard firms, which have productivity levels well below those of both the global and domestic frontier firms.\footnote{OECD (2015).} Productivity growth among global frontier firms has remained relatively robust throughout the 21\textsuperscript{st} Century, despite the slowdown in average productivity growth in countries around the world. Labour productivity among global frontier firms in the manufacturing sector increased at an average annual rate of 3.5 percent throughout the 2000s, compared to an average annual growth rate of just 0.5 percent among non-frontier firms. This gap is even more pronounced in the services sector.

The widening gap in productivity growth between global frontier firms and all other firms raises important questions regarding: (i) the ability of the most advanced domestic firms to adopt the innovations developed by global frontier firms; (ii) the diffusion of innovations from national frontier firms to laggard firms; and (iii) the growing importance of “tacit knowledge” (difficult to transfer to others in writing or verbal ways) as a source of competitive advantage for global frontier firms.

There are three general channels through which a firm can expand its operations. Increasing its stock of labour and capital can be effective in the short run, but this strategy cannot be sustained indefinitely. Adopting new technologies and production processes can increase the productivity of its existing capital and labour, but this is subject to the limitations of existing technologies and their availability in the domestic economy. Finally, a more efficient allocation of resources can ensure that firms have both the amount and type of physical, financial and human capital that is most appropriate to their needs and circumstances.

Despite recent advancements in the analytical literature, the precise causes of persistent productivity differences across firms remain a subject of considerable debate. Syverson (2004) finds that a U.S. manufacturing plant in the 90\textsuperscript{th} percentile of the productivity distribution typically produces almost twice as much output with the same measured inputs as one in the 10\textsuperscript{th} percentile, even within the same narrowly defined industry. Hsieh and Klenow (2009) find even larger productivity differences in China and India.\footnote{Indian firms in the 90\textsuperscript{th} percentile were about 22 times larger than ones in the 10\textsuperscript{th} percentile in 1994, while Chinese firms were about 11.5 times larger in 2005.} Foster, Haltiwanger and Krizan (2001) discuss the significant impact of reallocating economic resources toward higher-productivity producers on aggregate firm productivity growth.

Source: Authors
Firm level productivity in Malaysia’s manufacturing sector has declined in recent years

97. Labour productivity in Malaysia’s manufacturing sector has declined over the past five years. Labour productivity grew at an average annual rate of 4.6 percent from 2005-2010, then contracted at an annual average rate of 2.1 percent from 2010-2015. Moreover, fewer firms exceeded the labour productivity median in 2014 than in 2010, underscoring the general decline in labour productivity growth (Figure 74). Overall, the gap between most- and least-productive firms failed to narrow, with firms above the median registering annual labour productivity growth rates of 9.4 percent and 2.8 percent during the 2005-2010 and 2010-2014 periods, respectively. Meanwhile, firms below the median experienced an even larger decline in their productivity growth rates (Figure 75). This could be driven by firms unwilling to reduce their labour force when demand falls. This decline in labour productivity in the short term would avoid to respond to cyclical fluctuations by firing workers, if the firm expects to be hiring in the future.

98. The drop in labour productivity in the manufacturing sector between 2010 and 2014 was especially pronounced in certain industries. Labour productivity growth rates fell in all major manufacturing industries, with some industries, including petroleum and chemical products and food and beverages, declining slightly more than the average. Falling labour productivity in the petroleum and chemical products industries may have been due in part to decreased global demand. Similarly, lower rates of labour productivity growth among firms in primarily export-oriented industries, such as machinery and E&E, was likely exacerbated by sluggish global demand.

99. The fact that the declining trend in labour productivity growth encompasses all major manufacturing industries suggests an unknown systemic cause. In the context of an overall slowdown in labour productivity growth, differences in labour productivity growth between firms above and below the median for each industry remained broadly similar across the two periods at 11.3 percentage points in 2005-2010 and 8.9 percentage points in 2010-2014. During 2010-2014, most industries registered labour productivity gaps above the sectoral average, except for the food and beverage, machinery and equipment, and E&E industries.
100. Young firms, or firms that had been in operation for fewer than six years, experienced the largest productivity decline in the 2010-2014 period (Figure 76). Firms of all ages registered lower labour productivity growth rates in this period, but the smallest decline was observed among older firms at 2.0 percent, followed by mid-aged firms at 2.4 percent and young firms at 6.2 percent. Despite the overall slowdown in labour productivity growth rates, the average gaps in labour productivity between firms above and below the median narrowed only slightly from 9.9 percentage points in 2005-2010 to 8.0 percentage points in 2010-2014 (Figure 77). While the productivity gap for older firms also narrowed, it remained larger than those of young and mid-aged firms. Indeed, the average labour productivity growth rate for older firms above the median in all industries during 2010-2014 was 3.9 percent, less than half the rate of 8.4 percent observed in 2005-2010. Also, mid-age firms above the median exhibited markedly slower labour productivity growth during 2010-2014.

Figure 76: Young manufacturing firms experienced the largest productivity decline in 2010-2014…

Labour productivity growth, %

Figure 77: …yet labour productivity gaps narrowed only slightly.

Labour productivity gap, ppt

Source: DOSM, World Bank staff calculations

101. Small manufacturing firms experienced higher labour productivity growth rates during the 2010-2014 period (Figure 78). Indeed, the growth rate for small firms during this period was comparable to that of large firms from 2005-2010. This may indicate that smaller firms are able to more easily adapt to changes in the economic environment. It may also reflect the relatively high growth rates of small firms at the top of the productivity distribution. While the labour productivity growth gap among small firms appears to have widened, the gap among medium-sized firms remained broadly constant, and among larger firms the gap narrowed (Figure 79). This seems to contradict the general consensus in the international literature that small firms tend to be less productive than larger ones due to their typically lower capital intensity and their concentration in less-productive industries.46

Source: DOSM, World Bank staff calculations

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46 For instance, Leung et al (2008) found a positive relationship between firm size and labour productivity at the aggregate level in both the manufacturing and non-manufacturing sectors in Canada.
On average, labour productivity growth among domestically owned firms increased in 2005-2010, then declined in 2010-2014 (Figure 80). Domestic firms also experienced a more significant gap in labour productivity growth, though it narrowed in the latter period (Figure 81). These findings may be influenced by the fact that domestic firms account for 84 percent of firms in the panel dataset, while foreign firms account for just 15 percent. In general, firms in traditional industries 47 experienced greater labour productivity growth than firms in non-traditional industries. 48 Small and medium-sized firms in the wood, paper products and furniture industries registered the highest labour productivity growth rates in 2010-2014. Large firms in the textile subsector also registered strong productivity growth during the period.

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47 Traditional industries refer to the wood, paper products, furniture industries, textile, apparel and leather industries.

48 Non-traditional industries include petroleum, basic chemicals and other allied chemical products, machinery and equipment, electronics and computer industries.
103. Firms that primarily serve the domestic market⁴⁹ experienced a smaller decline in labour productivity in 2010-2014 than export-oriented firms (Figure 82). This finding may reflect the fact that Malaysia’s economy outpaced global growth during 2005-2014. It also seems to corroborate earlier research, which found general evidence that the TFP of domestically focused firms was larger than that of export-oriented firms and that smaller domestically focused firms tended to be as efficient as export-oriented firms at the aggregate level during the period of FDI-intensive growth in the 1990s.⁵⁰ The labour productivity growth gaps among domestically focused and export-oriented firms are similar and appear to have narrowed slightly in 2010-2014 (Figure 83).

⁴⁹ Domestically focused firms export less than 10 percent of their total sales.
⁵⁰ Menon (1998); Orguchi et al. (2002).
Productivity gains from improved resource allocation

104. This section provides a quantitative analysis of the impact of resource misallocation on aggregate TFP. The analysis estimates how much larger the manufacturing sector would be if Malaysian manufacturing firms achieved the same level of allocative efficiency as their U.S. counterparts (Box 13). Panel data for 2005, 2010 and 2014 reveal the improvements in the productivity levels that a more efficient allocation of resources would have generated. The dataset for each year covers approximately 3,088 firms in 69 industries.\footnote{For further details on the methodology, see Annex II.}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure82.png}
\caption{Domestically focused manufacturing firms experienced a smaller decline in labour productivity growth during 2010-2014.}
\end{figure}

\begin{figure}[h]
\centering
\includegraphics[width=\textwidth]{figure83.png}
\caption{Domestically focused and export-oriented manufacturing firms exhibit similar labour productivity gaps.}
\end{figure}

\textbf{Box 13: The Impact of Resource Allocation on Productivity}

In any given country, the most advanced domestic firms may have productivity levels that approach those of global industry leaders. However, inadequate access to factors of production can prevent these firms from reaching their optimal size, which diminishes their impact on aggregate productivity. Moreover, the expansion of these firms can yield productivity spill-overs from the diffusion of advanced technologies, and can achieve their optimal size if distortions are removed from the economy.\footnote{OECD (2015).}

Much of the international literature has focused on the determinants of firm-level productivity, with an emphasis on the relationships between productivity growth and the diffusion of technology, R&D, human-capital formation, the international mobility of skilled workers and the integration of firms into global value chains. However, recent analytical work has documented persistent productivity differences between firms and explored whether economies are efficiently allocating inputs across heterogeneous producers.

Hsieh and Klenow (2009) analyse microdata from manufacturing establishments to measure TFP dispersion across Chinese and Indian firms, inferring the size of producer-level distortions that could potentially depress aggregate productivity in those economies. Their model indicates that in the absence of
105. Assessing TFP dispersion in Malaysia reveals widening distortions across manufacturing firms. Differences in the revenue-based TFP (TFPR), which measures value addition, demonstrate the inefficient allocation of resources across firms. All other things being equal, alleviating allocative inefficiencies in countries with greater differences in TFPR tend to yield greater productivity gains, though this is not always the case (Figure 84).\textsuperscript{54} Differences in TFPR of firms in 25\textsuperscript{th} percentile and 75\textsuperscript{th} percentile in Malaysia are estimated to be 2.8 times larger than those in Turkey (2.6), China (2.3) and India (2.2). Moreover, these differences tend to be most pronounced among high-productivity firms. Yet despite the greater dispersion of TFPR\textsuperscript{55} at the firm level, the hypothetical productivity gains that could be generated by reducing allocative inefficiency in Malaysia are estimated to be lower than those in India or China, which may reflect differences in market structures.

Examining production TFP (TFPQ), which measures productivity in terms of marginal output, reveals a similar pattern, although the results suggest that distortions are more significant among firms with productivity levels below the sample median (Figure 85).\textsuperscript{56}

\textsuperscript{53} In Hsieh and Klenow’s model, TFPR (revenue-based productivity) only varies across firms in a given industry if they face capital and/or output distortions.

\textsuperscript{54} Figure 84 plots the distribution of log TFPR, \log\left(\frac{\text{TFPR}_{ij}}{\text{TFPR}_{\bar{S}}}\right), as a measure of firm-specific distortions in Malaysia. The plot is demeaned to show the distance from the sector specific average. Therefore, by plotting the dispersions over time, we see that the dispersions of TFPR have worsened in the right tail. This suggests that more distortions are occurring to the firms with relatively high TFPRs (right tail). (See Appendix V for the methodological framework)

\textsuperscript{55} Standard deviation for TFPR for China was 0.63 in 2005, India 0.67 in 1994 and Malaysia 0.80 in 2016.

\textsuperscript{56} Figure 85 plots the distribution of TFPQ (physical productivity), \log\left(\frac{A_{Mi}M^{\frac{25}{2}}}{A_{\bar{S}}}\right). The TFPQ dispersions are getting slightly wider in 2014, suggesting that distortions across firms in the industries have worsened, particularly among the less productivity firms (left tail). (See Appendix V for the methodological framework)
More productive firms tend to face larger distortions. There is a clear correlation between firm-level productivity and distortions in allocative efficiency, and the positive relationship between TFPR and TFPQ in the manufacturing sector suggests that more productive firms face larger distortions. In other words, many of Malaysia’s most productive firms could be operating at an even higher level given an environment of greater allocative efficiency.

Distortions in factor markets do not appear to be correlated with firm-level productivity, but distortions in output markets do appear to be correlated. While distortions in factor markets (capital and labour) are high at every level of productivity, there does not seem to be any distinct correlation between the two (Figure 86). This suggests that more productive firms do not necessarily face higher factor markets distortions than less productive ones, and vice versa. By contrast, distortions in output markets appear to be positively correlated with productivity, suggesting that more productive firms, which generate more output, face higher output distortions (Figure 87). As a result, these firms produce below their optimal level. Therefore, eliminating output-market distortions, such as competition, the role of GLCs, asymmetric tax or subsidy structures and regulations, would likely shift the distribution of resources toward more productive firms, enhancing the aggregate productivity of the manufacturing sector.

Restuccia and Rogerson (2008) argue that distortions tend to have a greater impact on aggregate productivity if a positive relationship between TFPR and TFPQ exists.
108. Had Malaysia removed completely all distortions in the economy, productivity would now be an estimated 75 percent higher. Shifting resources toward more productive firms would have had a significant impact on both the manufacturing sector and the economy as a whole, as manufacturing accounts for almost one-quarter of GDP. Panel data from 2005, 2010 and 2014 reveal that while allocative efficiency across firms would have remained broadly stable over the period, productivity would have improved by 75-76 percent (Table 8). If Malaysia had increased efficiency to the level of U.S. manufacturers in 1997, its TFP would have increased by about 23 percent.

### Table 8: Summary of Potential Efficiency Gains

<table>
<thead>
<tr>
<th></th>
<th>Complete elimination of distortions</th>
<th>US level of efficiency in 1997</th>
</tr>
</thead>
<tbody>
<tr>
<td>2005</td>
<td>74.95</td>
<td>22.43</td>
</tr>
<tr>
<td>2010</td>
<td>75.95</td>
<td>23.13</td>
</tr>
<tr>
<td>2014</td>
<td>75.65</td>
<td>22.92</td>
</tr>
</tbody>
</table>

**Source:** World Bank staff calculations

**Note:** Capital wedge represents distortions in the capital market

**Source:** World Bank staff calculations

**Note:** Output wedge represents distortions in the output market

109. Malaysia’s level of resource misallocation is similar to that of upper-middle-income countries such as Turkey and China (Figure 88). All three countries appear to have better allocative efficiency than India, where the hypothetical TFP gains generated by perfect allocative efficiency are estimated to be much higher at around 128 percent. There is evidence that the reallocation of productive resources is accelerating in China, as less efficient state-owned enterprises are being scaled down or eliminated, while the reallocation process appears to be slower in India.

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58 Note that the comparisons of hypothetical TFP gains are made across different time periods: the starting point for China’s gains is 2005, while India’s is 1994. For further details, see Hsieh and Klenow (2009).

Improving allocative efficiency could increase Malaysia’s TFP by 0.1-0.4 percentage points (Figure 89). Reducing distortions to the level of the most efficient economy would boost productivity by 23 percent, the aggregate TFP of Malaysia’s manufacturing sector would increase, and the GDP growth rate would exceed the rate forecast in the 11th Malaysia Plan by 0.1-0.4 percentage points. The movement of resources from less-productive to more-productive manufacturing firms would drive the acceleration in GDP growth. Rising aggregate economic productivity would expand the contribution of TFP to overall growth from the 40 percent projected in the 11th Malaysia Plan to around 40.7-43.5 percent (Table 9). These simulations indicate that reducing or eliminating distortions would push the annual GDP growth rate to about 6 percent.

### Table 9: Hypothetical Contribution of the Different Factors of Growth with a Complete or Partial Elimination of Distortions

<table>
<thead>
<tr>
<th></th>
<th>11th Malaysia Plan (11MP) targets</th>
<th>11MP targets with full elimination of distortions</th>
<th>11MP targets with most efficient economy&lt;sup&gt;2&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital</td>
<td>2.6 (44.0)</td>
<td>2.6 (41.9)</td>
<td>2.6 (44.0)</td>
</tr>
<tr>
<td>Labour</td>
<td>0.9 (16.0)</td>
<td>0.9 (14.5)</td>
<td>0.9 (15.3)</td>
</tr>
<tr>
<td>TFP</td>
<td>2.3 (40.0)</td>
<td>2.7* (43.5)</td>
<td>2.4* (40.7)</td>
</tr>
<tr>
<td>GDP (%)</td>
<td>5.0-6.0</td>
<td>6.2</td>
<td>5.9</td>
</tr>
<tr>
<td>Additional growth</td>
<td>+0.4&lt;sup&gt;1&lt;/sup&gt;</td>
<td>+0.1</td>
<td>+0.1</td>
</tr>
</tbody>
</table>

Source: World Bank staff calculations

Note: Numbers indicate percentage point contribution to growth while numbers in brackets indicate contribution share to growth.

*The assumption is that the manufacturing sector’s share of approximately 25 percent of the economy is also reflected in its share contribution to the aggregate TFP.

<sup>1</sup> Calculated from a baseline growth of 5.8 percent.

<sup>2</sup> 1997 U.S. efficiency level.
111. All manufacturing industries stand to gain from the elimination of allocative inefficiencies (Figure 90).

The petroleum and chemical industries, the wood, paper products and furniture industries, and the food and beverage industries would benefit the most from the reallocation of resources to more productive firms. Prospective improvements in productivity would be greatest in manufacturing industries with higher levels of productivity dispersion, such as the food and beverage industries, while those with less productivity dispersion would be expected to experience smaller gains.

Figure 90: The potential productivity from eliminating efficiency spans across manufacturing subsectors

![Figure 90: The potential productivity from eliminating efficiency spans across manufacturing subsectors](image)

Source: World Bank staff calculations

Note: Machinery and equipment includes machinery and equipment; Metals include non-metallic mineral, basic metal and fabricated metal industries; Textile includes textile, apparel and leather-related industries; Petroleum and chemicals include refined petroleum, basic chemicals and others; Wood includes the wood, paper products and furniture industries; Food and beverage include food and beverage industries.

Conclusions and Recommendations

112. This report uses a variety of methodologies and aggregate and firm level data to identify productivity trends in Malaysia and analyse challenges to further productivity growth. It describes the recent evolution of productivity and compares Malaysia’s experience to that of regional and international comparators. Using World Bank macroeconomic data, the report explores how different economic forces have contributed to Malaysia’s growth over the last 25 years, and it outlines the country’s long term economic potential based on alternative scenarios. Analysing new data from the recently concluded Enterprise Surveys for ASEAN countries and other middle- and high-income economies sheds light on the ways in which infrastructure quality, workforce skills, innovation, and allocative efficiency influence the productivity of the Malaysian economy. Finally, a panel data sample of manufacturing firms using the economic censuses for 2005, 2010 and survey data in 2014 evaluates the role of resource misallocation on productivity growth and identifies the source of distortions in the manufacturing sector.

113. Malaysia’s overall productivity compares favourably to that of other middle-income countries, but remains below the levels attained by high-income countries. Over the last 25 years, factor accumulation has been the main driver of economic growth in Malaysia, as robust domestic and external demand and positive

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60 Productivity gains are measured against the overall efficiency of the U.S. manufacturing sector, which does not necessarily reflect the efficiency of each industry within that sector.
demographic dynamics boosted the country’s stocks of capital and labour. Cross-country comparisons highlight that while TFP growth in Malaysia has been broadly positive, it has not been sufficient to close the gap with higher-income economies in the region or peer countries worldwide. TFP’s contribution to growth has steadily increased over the years, but at a slower pace than in other regional countries.

114. Productivity growth in Malaysia has declined since the 2008 global financial crisis, due in part to weakening external demand. The 1998 and 2008 economic crises substantially slowed the growth of labour productivity in Malaysia. While productivity growth rebounded following the 1998 crisis, robust employment creation in the wake of the 2008 crisis has not been sufficient to return labour productivity growth to its pre-crisis levels. The Enterprise Surveys show that large firms have led the slowdown in labour productivity growth. Given the large proportion of exporting and manufacturing firms among large firms, this trend seems to reflect a substantial post-crisis decline in global demand for manufactures, a risk to which the Malaysian economy is particularly exposed.

115. Closing the gap with high-income countries will require accelerated productivity growth combined with strong performance of traditional growth drivers. The scenario analysis indicates that maintaining productivity, investment and labour force growth at their current rates would bring Malaysia’s GDP per capita to about 29 percent of the average GDP per capita of high-income economies in 2050. Accelerating annual TFP growth to 2.3 percent, a target of the 11th Malaysia plan, would boost Malaysia’s GDP per capita, but the country would still reach just 40 percent of the projected GDP per capita of high-income countries by 2050. Achieving convergence with high-income countries will therefore require accelerated TFP growth combined with the improved performance of factor accumulation and human capital formation.

116. Malaysian manufacturing firms show a high degree of variability in productivity levels, implying that resources are misallocated across firms. Improving resource allocation to match the most efficiency economy analysed (the U.S. economy in 1997) could yield aggregate productivity gains of as much as 23 percent, as more-productive firms would expand while their less-productive competitors would shrink or even exit the market. Improving this resource misallocation by removing distortions in the economy could potentially raise GDP growth by 0.1-0.4 percent points.

117. The results show that more productive firms face larger distortions, mainly in output markets, where they sell their goods and services. While misallocation in factor markets (capital and labour) does not seem to be the main reasons holding productivity growth, misallocation in output markets, where firms sell their final products and services, does. The distortion in output markets may be explained by many reasons and some of the main challenges often mentioned refer to competition, the role of GLCs, asymmetric tax or subsidy structures and regulations. As a result, most productive firms are operating below their optimal level and they could have grown even larger. Overall, this finding underscores the importance of accelerating domestic market reforms to boost productivity.

118. The analysis highlights the need to further operationalise the productivity agenda at the core of economic policy in Malaysia. The country’s existing institutional framework has maintained a consistent, albeit lower than high income economies’ productivity growth rate for more than two decades. Going forward, policymakers will face a complex challenge as they strive to enhance productivity while accelerating physical- and human-capital formation. Malaysia’s existing institutional and policy arrangements pose several challenges that need to be addressed in order to refocus attention on productivity growth:

i. In the absence of more granular data and newer analytical tools on productivity it will be difficult to operationalise policy making to raise productivity growth. As in many countries, productivity in Malaysia is often estimated by analysing statistics and surveys that were not specifically designed
to measure productivity. To strengthen the analytical underpinnings of the policy process, a number of countries have begun preparing productivity-specific surveys, which are often administered at the subsector level. Subjects of particular relevance to productivity include subsector-level panel data, records of firm entry and exit and the evolving dynamics of the services sector. Furthermore, analysing detailed productivity information will require sophisticated statistical and econometric techniques, including specific methodologies for micro data and big data analytics. Developing the government’s research and evaluative capacity would help improve the quality of its economic policies, particularly at the subsector level.

ii. Deepening the measurement of productivity in the services sector would be key to raise efficiency of the domestic economy. Services represent a large share of GDP and employment in Malaysia. Yet, measuring productivity in the services sector can be challenging, especially compared to sectors with more easily quantifiable inputs and outputs, such as manufacturing. Qualitative improvements play a much larger role in value addition in the services sector, and services tend to be highly heterogeneous, further complicating productivity measurement. In some services subsectors, such as insurance, the value of outputs cannot be precisely defined or measured. Overcoming these data constraints requires regular surveys of services sector firms designed to measure both their individual productivity and aggregate contribution to economic growth in Malaysia.

iii. Fostering an institutional culture of collaboration with the private sector would serve to validate and operationalise data-driven policymaking. Sustainably accelerating productivity growth will require close collaboration between the public and private sectors. Establishing forums and coordinating bodies that represent a diverse range of sectoral stakeholders, including firms, regulators, consumers and policymakers, would help to promote productive dialogue and participatory decision-making and enable more comprehensive monitoring of progress on key dimensions of productivity.

iv. Creating a comprehensive institutional arrangements around cross-cutting themes would facilitate a broader view on productivity and the implementation of holistic economic policies. No single policy or set of policies in any one specific sector will be sufficient to boost Malaysia’s economic productivity. Productivity challenges reflect a complex mix of issues at the subsector level combined with cross-cutting constraints. The international experience identifies four crucial components of productivity: (i) workforce education, the value of which hinges on the alignment of workforce skills with labour-market demand; (ii) technical and non-technical innovation, including both the development of new technologies and the adaptation of existing technologies to the local context; (iii) infrastructure quality, not only in terms of physical capital but also the intangible capital of sound institutions; and (iv) regulatory efficiency, including market competition, which contributes to an improved business environment. Organising institutional focus groups around these topics would help policymakers develop a coordinated productivity strategy that addresses both sector-specific issues and economy-wide challenges.

119. A large body of work conducted by the World Bank shows policies that could serve to accelerate productivity growth. This report should be framed as an initial step in what is likely to be a longer-term process of understanding productivity trends in Malaysia and in proposing policy and institutional reforms to accelerate productivity growth. Yet, the main findings are in line with many of the challenges identified in previous reports, which reinforce existing policy recommendations in the different areas that influence productivity:
• Overcoming skills gaps could be reinforced through strengthened training programs. A stronger coordination with the private sector could improve the effectiveness of the existing training interventions and alleviate skill mismatches in the labour market. Such collaboration could take different forms: from inputs in the design of curricula, to provision of apprenticeship opportunities. A more intense use of labour market information to inform skill development policies and programs is likely to improve efficiency and effectiveness of the existing interventions. The government has introduced several initiatives and invested a large amount of resources to improve the education and skills development systems, and a stronger focus on effectiveness and efficiency of spending could lead to improvements in the skills of the Malaysian workforce. In particular, linking funding allocation to program performance measured in terms of impact would serve to raise efficiency and equity in the use of funds. For instance, the development of a monitoring and evaluation system that includes information on the labour market outcomes of participants even after the end of a program could be crucial to monitor the performance of different programs and assess their effectiveness.

• Maintaining high quality of infrastructure may be reinforced by strengthened planning and implementation capacities and continue improvements on trade facilitation. Malaysia’s increasing integration into global supply chains means that infrastructure and logistics in general are essential to enabling higher economic growth. Infrastructure strategies that focus on supporting trade are key supports of productivity gains. For instance, increasing attention has been paid in making sure that ports are well connected to their hinterlands through investments in highway and rail capacity expansion to raise better international connectivity, lower logistics costs, and higher economic competitiveness. Also, infrastructure development can be reinforced by defragmenting the appraisal and planning process for public investment, bolstering inter-agency collaboration and coordination. Similarly important is to continue improving trade facilitation, particularly customs clearance to respond to emerging challenges and maintain the competitive edge over other middle income countries.

• Building innovation capacity calls for strengthening the R&D ecosystem and facilitating technology absorption. Despite growing expenditure on R&D from 0.6 percent of GDP in the 1990s to over 1 percent in 2014 and growing technology absorption, some of the challenges presented in the report highlight the need to raise the level of R&D in Malaysia, which seems to reflect insufficient investment, lacked of focus areas and weaknesses in skilled workforce to capitalise on investments by Malaysian firms. Also, some of the large exporters may also be linked to multinationals that are suffering from global weak demand and changes in global trade, including maturing supply chain in China. For these large manufacturing exporters, the issue is finding ways to prevent continuing deterioration in productivity by facilitating them to upgrade technological capability, mainly through technical innovation. This would likely require to improve access to skills/talents (likely including temporary movement of professionals) and more liberal investment policies (such as relaxing domestic content requirement) that would allow firms to deploy cutting edge production technology with minimal restrictions. Meanwhile, it is important to ensure that smaller firms get access to new technology, which could be fostered through supplier development programs to link them to multinationals and broader participation of government R&D programs.

• Addressing distortions in output markets where firms sell their goods and services may be achieved by reviewing policies that hamper competition. The findings of the report suggest that distortion in output markets are hurting productivity through inefficient allocation of resources. Several issues have been broadly highlighted in the recent past that could explain these inefficiencies, key among them the role of competition. To overcome these challenges, Malaysia can explore to strengthen its competition policy and adopt competitive neutrality in regulatory stance, particularly with respect to GLCs

61 Malaysia Knowledge Economy (MyKE-III) study.
operations. From the regulatory perspective, easing existing policies to further open markets for further foreign private sector participation, mainly in the services sectors, would also help to boost productivity.

120. Accelerating productivity in Malaysia will in large part depend on raising productivity of SMEs. This will require better equipping SMEs to compete more effectively and gain greater market access, as well as ensuring a strong enabling environment to realise their potential. In recognition of this, the government of Malaysia developed a SME Masterplan for 2012–2020 that aims to further facilitate business formation, encourage greater formalisation, stimulate the development of high-growth companies, and boost the productivity of SMEs in all sectors of the economy. It also proposes measures to encourage greater innovation within SMEs, upgrading SME management capabilities and worker competencies, while ensuring that creditworthy SMEs have access to needed financing.

121. Reinforcing the role of factors accumulation, such as female labour force participation, will also be needed to complement productivity gains. For instance, raising female labour force participation to the level expected given Malaysia’s economic development could raise income per capita by 23 percent. This could be further reinforced by avoiding a misallocation of talent due to segregation of women into certain fields of study, industries, and types of jobs (i.e. entrepreneurs and managers). Indeed, married women who leave the workforce do not return due to difficulties reconciling work and family responsibilities. This calls for measures that help men and women balance responsibilities, ranging from flexi-work arrangements and expanded childcare options, to incentives for more female participation in ‘non-female’ educational fields and job types.

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ANNEXES

Annex I: Enterprise Survey and Methodology and Implementation in Malaysia

An Enterprise Survey is a firm-level survey of a representative sample of an economy’s private sector. The surveys cover a broad range of business environment topics including access to finance, corruption, regulations, infrastructure, crime, competition, and performance measures.

The manufacturing and services sectors are the primary business sectors of interest. This corresponds to firms classified with ISIC codes 15-37, 45, 50-52, 55, 60-64, and 72 (ISIC Rev.3.1). Formal (registered) companies with 5 or more employees are targeted for interview. Services firms include construction, retail, wholesale, hotels, restaurants, transport, storage, communications, and IT. Firms with 100 percent government/state ownership are not eligible to participate in an Enterprise Survey. In each country, businesses in the cities/regions of major economic activity are interviewed.

The Enterprise Surveys Unit uses two instruments: the Manufacturing Questionnaire and the Services Questionnaire. Although many questions overlap, some are only applicable to one type of business. For example, retail firms are not asked about production and nonproduction workers. Over 90 percent of the questions objectively ascertain characteristics of a country’s business environment. The remaining questions assess the survey respondents’ opinions on what are the obstacles to firm growth and performance.

The mode of data collection is face-to-face interviews. The Enterprise Survey is answered by business owners and top managers. Sometimes the survey respondent calls company accountants and human resource managers into the interview to answer questions in the sales and labour sections of the survey. Typically 1200-1800 interviews are conducted in larger economies, 360 interviews are conducted in medium-sized economies, and 150 interviews take place for smaller economies.

The sampling methodology for Enterprise Surveys is stratified random sampling. In a simple random sample, all members of the population have the same probability of being selected and no weighting of the observations is necessary. In a stratified random sample, all population units are grouped within homogeneous groups and simple random samples are selected within each group. This method allows computing estimates for each of the strata with a specified level of precision while population estimates can also be estimated by properly weighting individual observations. The sampling weights take care of the varying probabilities of selection across different strata. Under certain conditions, estimates’ precision under stratified random sampling will be higher than under simple random sampling (lower standard errors may result from the estimation procedure).

The strata for Enterprise Surveys are firm size, business sector, and geographic region within a country. Firm size levels are 5-19 (small), 20-99 (medium), and 100+ employees (large firms). Since in most economies, the majority of firms are small and medium-sized, Enterprise Surveys oversample large firms since larger firms tend to be engines of job creation. Sector breakdown is usually manufacturing, retail, and other services. For larger economies, specific manufacturing sub-sectors are selected as additional strata on the basis of employment, value-added, and total number of establishments. Geographic regions within a country are selected based on which cities/regions collectively contain the majority of economic activity.

Ideally the survey sample frame is derived from the universe of eligible firms obtained from the country’s statistical office. Sometimes the master list of firms is obtained from other government agencies such as tax or business licensing authorities. In some cases, the list of firms is obtained from business associations or marketing databases. In a few cases, the sample frame is created via block enumeration.

63 The Sampling Note available on the Enterprise Surveys website provides the rationale for the sample sizes: http://www.enterprisesurveys.org/~/media/GIADB/EnterpriseSurveys/Documents/Methodology/Sampling_Note.pdf.
The 2015 Malaysia Enterprise Survey implementation

The sample frame consisted of listings of firms from Malaysia Department of Statistics (DOS). The universe was stratified into five manufacturing industries and two services industries: Food and Beverages (ISIC Rev. 3.1 code 15), Garments (ISIC code 18), Chemicals (ISIC code 24), Electronic Products (ISIC codes 31 and 32), Other Manufacturing (ISIC codes 16,17,19-23,25-29,30,33-37), Retail (ISIC code 52) and Other Services (ISIC codes 45, 50, 51, 55, 60-64, and 72). Regional stratification for the Malaysia ES was done across five regions: Central, South, North, East Coast and East Malaysia. Since the sampling design was stratified and employed differential sampling, individual observations should be properly weighted when making inferences about the population.

Business owners and top managers in 1,000 firms were interviewed from March 2015 through May 2016. The distribution of the achieved sample is presented in Table 10.

Table 10: Distribution of the Achieved Sample by Region, Size and Sector

<table>
<thead>
<tr>
<th>Region</th>
<th>Food Products</th>
<th>Chemical Products</th>
<th>Wearing Apparel</th>
<th>Electronic Products</th>
<th>Other Manufacturing</th>
<th>Retail Trade</th>
<th>Other Services</th>
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<td>144</td>
<td>143</td>
<td>162</td>
<td>122</td>
<td>129</td>
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</tbody>
</table>

Source: World Bank Enterprise Surveys
Annex II: Top obstacles reported by firms in different industrial sectors in Malaysia

Firms in different sectors in Malaysia have different opinions about what is the most important obstacle to their operations. Choosing from the same list of 15 items (presented in randomised order in order to prevent any bias determined by the position of the item in the list), the top obstacle cited by the highest percentage of firms was tax administration for the food and beverage manufacturing sector; tax rates for chemicals manufacturing; tax administration for electronics; customs and trade regulations for garments and all other manufacturing sectors grouped together. In the services sector (retail and all other services sectors covered by the survey), the top obstacle was practices of informal competitors.

Because retail and other services firms compose the vast majority (87 percent) of the universe of firms, the percentage of firms reporting an item as the top obstacle is very close to the average for Malaysia. On the other hand, in some cases manufacturing firms have very different opinions compared to the average firm in Malaysia.

In the food sector, only 7 percent report that informal competitors are the top obstacle, compared to 30 percent on average in Malaysia, while 19 percent of firms report tax administration as the top obstacle (more than twice the average for Malaysia).

In the garments sector, customs and trade regulations, transportation and electricity are much more frequently perceived as the top obstacle than for the average firm in Malaysia.

A peculiarity of the chemicals sector is that an overwhelming majority of firms choose the same item as the top obstacle: 65 percent indicate tax rates as the top obstacle, while the percentage of firms who pick any other item is 7 percent or less for each item.

There is much more heterogeneity in the electronics sector, where the top four obstacles rank very close with 17 to 11 percent of firms.

Figure 91: Percentage of firms that identify the specific business environment element as the top obstacles for the firm’s operations, by sector (Food).

Source: World Bank Enterprise Surveys
Figure 92: Percentage of firms that identify the specific business environment element as the top obstacles for the firm’s operations, by sector (Garments).

Ranking of business environment obstacles, % of firms

Source: World Bank Enterprise Surveys

Figure 93: Percentage of firms that identify the specific business environment element as the top obstacles for the firm’s operations, by sector (Chemicals and Chemical Products).

Ranking of business environment obstacles, % of firms

Source: World Bank Enterprise Surveys
Figure 94: Percentage of firms that identify the specific business environment element as the top obstacles for the firm’s operations, by sector (Electronics and Communications Equipment).

Ranking of business environment obstacles, % of firms

Source: World Bank Enterprise Surveys

Figure 95: Percentage of firms that identify the specific business environment element as the top obstacles for the firm’s operations, by sector (Other Manufacturing).

Ranking of business environment obstacles, % of firms

Source: World Bank Enterprise Surveys
Figure 96: Percentage of firms that identify the specific business environment element as the top obstacles for the firm’s operations, by sector (Retail).

Ranking of business environment obstacles, % of firms

Source: World Bank Enterprise Surveys

Figure 97: Percentage of firms that identify the specific business environment element as the top obstacles for the firm’s operations, by sector (Other Services).

Ranking of business environment obstacles, % of firms

Source: World Bank Enterprise Surveys

Two types of firm level productivity estimates are available based on the ES data. The first is total factor productivity (TFP), or the portion of output that is not explained by the amount of inputs utilised. Because this estimation is troublesome for multiple reasons like selection, simultaneity, issues with using monetary (as opposed to physical) measures of output and inputs (Olley and Pakes 1996, Levinsohn and Petrin 2003, Foster et al. 2008, Hsieh and Klenow 2009, Restuccia and Rogerson 2013), the ES also provide much simpler but more robust estimates of firm productivity in the form of factor ratios. Unlike TFP estimates, these are also available for non-manufacturing firms.

**Total factor productivity**

A standard Cobb-Douglas production function is assumed of the following form:

\[ Y_i = A_i K_i^{a_k} L_i^{a_l} M_i^{a_m} \]  

(1)

where firm-level output \( Y_i \) is a function of inputs of capital \( (K_i) \), labour \( (L_i) \), and other inputs such as materials \( (M_i) \). The firm’s efficiency of production is measured by the term \( A_i \), which is the portion of output that cannot be directly attributed to the utilised inputs. The above model, or rather its version with natural logarithm applied on both sides, is often referred to as YKLM.

While analytically straightforward, estimation of \( A_i \) can be troublesome. Importantly, a selection and simultaneity problem exists as the firm’s choices regarding continuation of operations and quantities of inputs are guided by their productivity (e.g. Olley and Pakes 1996, Levinsohn and Petrin 2003). Since the past values of investment or intermediates may be used to remedy this problem, the ES have recently started collecting the corresponding information. This will be used in the future as the data becomes available. In addition to selection and simultaneity problems, there are issues associated with the fact that only monetary (as opposed to physical) output and inputs are observed. Such revenue-based TFP is often referred to as TFPR, where R stands for revenue. Estimates of TFPR are based on an implicit assumption that markets are perfectly competitive, thus the resulting productivity estimates do not allow to separate productivity from market power. Since the ES collect information on revenues and firm-level line item costs (rather than physical inputs and outputs), TFPR is the measure that can be estimated using the ES data.  

Equation (1) assumes a common production technology (i.e. \( a_k, a_l \) and \( a_m \) are the same within the sample). To avoid this rather restrictive assumption, equation (1) is enriched as follows. TFPR is estimated separately for each industry — grouped by two-digit ISIC codes, denoted with \( s \) (for sector) — over pooled economies. Furthermore, elasticities of output with respect to capital, labour, and materials \( (a_k, a_l \) and \( a_m \) are allowed to vary by the income level of the corresponding economy. The income levels are grouped according to the WB classification and are denoted with \( w \). Finally, to control for an average economy-level effect, a dummy variable for each economy \( c \) is included (e.g. Halvorsen and Palmquist 1980).

The regression function is thus as follows:

\[
\ln(Y_{sci}) = \beta_1 \ln(K_{sci}) + \beta_2 \ln(L_{sci}) + \beta_3 \ln(M_{sci}) + \\
+ \beta_4 \ln(K_{sci}) \cdot I_c + \beta_5 \ln(L_{sci}) \cdot I_c + \beta_6 \ln(M_{sci}) \cdot I_c + cYKL + FE_c + u_{YKLM} \\
\text{allows elasticities to vary by income group} \\
\text{represents TFP}
\]

---

64 This section is an adaptation from the methodological note available on the Enterprise Surveys website. Please consult the original note for additional details: Cusolito, Ana Paula, David C. Francis, Nona Karalashvili and Jorge Rodriguez Meza. 2016. “Firm Level Productivity Estimates”. Development Economics, Enterprise Analysis Unit, the World Bank Group. www.enterprisesurveys.org/  
65 For a recent discussion of these and other issues in estimation see for instance Foster et al. (2008), Hsieh and Klenow (2009), Restuccia and Rogerson (2013).
where

- \( s \) denotes sector
- \( c \) denotes economy (more precisely survey, which is a combination of economy and year)
- \( i \) denotes firm
- \( I_c \) denotes a vector of dummies for income group of the economy (high, medium or low income based on the WB classification)
- \( c_s^{YLM} \) are constants
- \( FE_c \) are economy fixed effects

To reiterate, the above regressions are run for each sector separately. Note that the underlying assumption of equation \((YLM)\) is that elasticities of output with respect to inputs are the same across countries within the same income groups.

The TFPR is estimated as:

\[
TFPR_{sc}^{YLM} = c_s^{YLM} + FE_c + u_{sc}^{YLM}.
\]

All estimates take into consideration the survey design for the ES by incorporating both stratification and probability (survey) weight information.

\( Y, K, L, \) and \( M, \) are proxied using the questions available in the ES. More precisely, \( Y \) is proxied by total annual sales of establishment; \( K \) is proxied by the replacement value of machinery, vehicles, and equipment; \( L \) is proxied by total annual cost of labour; and \( M \) is proxied by total annual cost of inputs.

Note that all the above variables are collected in local currency units (LCUs) which is specific to the survey and year. Consequently the data spans different fiscal years. For the estimation of cross-economy regressions all data must be transformed to a common currency-year. To do this, all variables are first exchanged into U.S. Dollars (US$) using the official exchange rate (period average) from the World Development Indicators. The data are then deflated to 2009 using the GDP deflator for the United States from the relevant reference fiscal year.

For the purposes of precision of estimation, the regressions were run only if the total number of observations in a sector and economy is at or above 15, and the total number of observations in a sector is at or above 120.

**Factor ratios**

The following much simpler but very informative measures of productivity are also provided: (i) labour cost per US$ of sales (in US$ 2009, as in the rest of the measures), (ii) total sales per worker, (iii) cost of inputs per US$ of sales, available for manufacturing firms only; and (iv) cost of finished goods per US$ of sales, available for services firms only. These are simple ratios of the corresponding variables.
Annex IV: Profile of Firms in Panel Dataset

The dataset used for the firm productivity analysis is a panel of survey data for years 2007, 2012 and 2014 and, census data for years 2005 and 2010 (Table 11). The panel data consists of the same selection of manufacturing firms across time. The dataset covers a large group of variables including gross output, percentages of export sales, material expenditures, energy expenditures, salaries, employees’ benefits, number of employees, investments, book values, and ownership structure. For the analysis, firms with zero capital stock and compensation for employees will be dropped from our empirical framework of both our approaches, although the Hsieh and Klenow (2009) approach requires further trimming of outlier firms.

The food and beverage (F&B) industries had the largest representation in terms of the number of firms (20.4%) in 2014, followed by the non-metallic mineral and other related products, basic metals and fabricated metal products (19.2 percent) (Figure 98). However, in terms of value-added, the share of F&B industries (12.7 percent) was smaller compared to the petroleum and chemical products industries (30.9 percent) in 2014. The second largest in terms of value-added was the machinery, electrical, electronics and computers (M&E&C) industries (23.1 percent). Of the total firms, approximately 87 percent of the firms were in operations for more 15 years, 13% between 6-15 years and only less than 1 percent for less than 6 years (Figure 99). The average age of the firms in the sample is 26 years. The profile of the firms represent the characteristics of the sample, which may not be an accurate representation of the population of firms.

**Figure 98: Firms by Industry (% share), 2014**

- F&B, 20.4
- Textile, 19.2
- Wood, 15.2
- Metal, 9.7
- M&E&C, 5.8
- Others, 16.6
- Transport, 3.6
- Petchem, 5.8
- Others, 16.6
- Transport, 3.6

**Figure 99: Firms by Age (% share), 2014**

- Young (< 6 years), 0.2
- Middle (6-15 years), 12.9
- Old (>15 years), 86.9

Source: DOSM

**Note:** Machinery and equipment (M&E&C) includes machinery and equipment; Metal include non-metallic mineral, basic metal and fabricated metal industries; Textile includes textile, apparel and leather-related industries; Petroleum and chemicals (Petchem) include refined petroleum, basic chemicals and others; Wood includes the wood, paper products and furniture industries; Food and beverage (F&B) include food and beverage industries.

---

66 The profile of firms for the other years in the panel data, namely 2005, 2007, 2010 and 2012 remains quite similar with perhaps, some slight differences to the percentages of the various composition of firms.
Slightly more than half (56.9 percent) of the sample in 2014 were big firms, defined as ones which hired more than 100 employees. Medium-sized firms which hired between 20-99 employees accounted for about one third, while small firms (less than 20 employees) has the smallest representation in terms of numbers (12.4 percent) (Figure 100).

By ownership type, a large proportion of the firms in the sample is made up of local firms (84 percent), with foreign ones accounting for 15 percent and the joint-ownership firms accounting for only 0.4 percent (Figure 101). In terms of sales orientation, firms which have exported at least 10 percent of their output are classified as export-oriented firms, and in total they accounted for about 55 percent of the sample in 2014.

<table>
<thead>
<tr>
<th>Industry</th>
<th>Firms Belonging to the Industries in the Panel Data in 2014 (% share)</th>
<th>Value-added of Industries Represented in the Panel Data in 2014 (% share)</th>
<th>Value-added of Industries Surveyed by the Department of Statistics in 2014 (% share)</th>
</tr>
</thead>
<tbody>
<tr>
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<td>20.4</td>
<td>12.7</td>
<td>7.2</td>
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<td>Textile</td>
<td>9.5</td>
<td>1.3</td>
<td>1.7</td>
</tr>
<tr>
<td>Wood</td>
<td>15.2</td>
<td>5.3</td>
<td>5.8</td>
</tr>
<tr>
<td>Petchem</td>
<td>5.8</td>
<td>30.9</td>
<td>24.5</td>
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<td>19.2</td>
<td>9.8</td>
<td>10.6</td>
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<tr>
<td>Transport</td>
<td>3.6</td>
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</tr>
<tr>
<td>Others</td>
<td>16.6</td>
<td>9.3</td>
<td>18.1</td>
</tr>
</tbody>
</table>

Source: DOSM

Figure 100: Firms by Size (% share), 2014

Figure 101: Firm by Type of Ownership (% share), 2014

Source: DOSM
Annex V: Data Treatment and Methodology for the Resource Misallocation Impact on Total Factor Productivity

Data treatment
The main aim of the study is to provide quantitative evidence of the impact of resource misallocation on aggregate TFP. We attempt to answer the question of how much larger the Malaysian manufacturing sector could be, had they achieved the same allocative efficiency as the manufacturing firms in the US. The analysis uses a panel data set available for 2005, 2010 and 2014 to assess the changes in productivity gains from better reallocation of resources across time. The data covers approximately 3088 firms each year and 69 industries as defined by the 3-digit The Malaysia Standard Industrial Classification (MSIC) 2008 codes. As our empirical study requires the industry level capital and labour shares in the US, the 4-digit US industry codes based Standard Industrial Classification (SIC) were matched with the less narrowly defined 3-digit MSIC 2008 codes to obtain those matching shares. The data cleaning process involves removing firms which have zero capital stock and labour compensation data. In addition, industries which are represented by less than 9 firms and outliers (through the trimming of 1 percent tails) were also removed from the sample.

Methodology
Consider an economy with many sectors, denoted s. A final output $Y$ is produced in each country using a Cobb-Douglas production technology:

$$Y = \Pi_{s=1}^{S} Y_{s}^{\theta_{s}} \quad (1)$$

where $\theta_{s}$ is the value added share of sector s and $\sum_{s=1}^{S} \theta_{s} = 1$

Each sector’s output $Y_{s}$ is the aggregate of the individual firm’s output $Y_{si}$, using the CES technology:

$$Y_{s} = \left[ \sum_{i=1}^{M_{s}} Y_{si} \right]^{\frac{\sigma}{\sigma - 1}} \quad (2)$$

where $Y_{si}$ is the differentiated product by firm i in sector s and $\sigma$ is the elasticity of substitution within sectors.

Each firm produces a differentiated product with the standard Cobb-Douglas production function:

$$Y_{si} = A_{si} L_{si}^{1-\alpha_{si}} K_{si}^{\alpha_{si}} \quad (3)$$

where $A_{si}$ stands for firm-specific productivity, $K_{si}$ and $L_{si}$ are the firm’s capital and labour respectively, and $\alpha_{si}$ is the industry-specific capital share. Note that the assumption in this framework is that firms in the same narrowly-defined sector (i.e. 3-digit Malaysia’s Standard Industrial Classification, MISC) have the same production function.

Each establishment maximises current profits:

$$\pi_{si} = (1 - \tau_{Y_{si}}) P_{si} Y_{si} - w L_{si} - (1 + \tau_{K_{si}}) R K_{si} \quad (4)$$

where $P_{si} Y_{si}$ is the firm’s value added (which is the firm’s revenue minus the cost of intermediate inputs), $w$ and $R$ are the cost of one unit of labour and capital respectively. The term $\tau_{Y_{si}}$ denotes firm-specific output distortions that reduce firms’ revenues. Many factors could contribute to output distortions, ranging from transportation costs to subsidies. These factors could reduce output for a given set of inputs. The firm-specific “capital” distortions, which raise the cost of capital (relative to labour), is denoted as $\tau_{K_{si}}$. Credit market imperfections (such as preferential access to finance) and labour market frictions could contribute to different “capital” distortions $\tau_{K_{si}}$ across firms.

67 Adapted mainly from Nguyen et. al. (2016)
Hsieh and Klenow (2009) distinguish between the two productivity measures, TFPQ which captures “physical productivity” and TFPR which captures “revenue productivity”:

\[ TFPQ_{si} = \frac{Y_{si}}{L_{si}^{1-\alpha_s}K_{si}} \]  
\[ TFPR_{si} = \frac{P_{si}Y_{si}}{K_{si}} \]

In Hsieh and Klenow’s model, TFPR does not vary across plants within an industry unless plants face capital and/or output distortions. In other words, in the absence of distortions, more capital and labour should be allocated to firms with higher TFPQ to the point where their higher output results in a lower price, \( P_{si} \), which also result in the TFPR equalising across firms. As a consequence, any dispersion of TFPR across firms within an industry is an indication of distortions. A firm with TFPR higher than the sector average is more “taxed”, meaning, it suffers more obstacles, than other firms. However, it is normal for TFPQ vary across firms as different firms may have different productivity levels.

Hsieh and Klenow chose the elasticity of substitution, \( \sigma = 3 \) and \( R = 10 \) which assumes the real interest rate of 5 percent and the depreciation rate of 5 percent. Capital share, \( \alpha_s \), and labour share, \( 1-\alpha_s \), are taken from the U.S. manufacturing sectors. The underlying assumption is that capital and labour shares from sectors in the U.S. represent the least distorted environment. Any deviation of capital-labour share from the U.S.’s level suggests distortions.

The output and capital wedges can be measured as follows:

\[ 1-\tau_{ysi} = \frac{\sigma}{\sigma - 1} \frac{wL_{si}}{(1-\alpha_s)P_{si}Y_{si}} \]  
(7)

\[ 1+\tau_{ksi} = \frac{\alpha_s}{1-\alpha_s} \frac{wL_{si}}{RK_{si}} \]  
(8)

\( wL_{si} \) represents firm i’s wage bill and \( P_{si}Y_{si} \) represents the firm’s value added. Both values are taken from the panel dataset. To understand the intuition of equation (8), we rewrite it as:

\[ (1+\tau_{ksi})^{1-\alpha_s} = \frac{wL_{si}}{RK_{si}} \]  
(9)

\( 1-\alpha_s \) is the labour-capital ratio in the undistorted (U.S.) environment. If firm i’s actual labour capital ratio \( \frac{wL_{si}}{RK_{si}} \) is higher than the undistorted labour capital ratio, this indicates that the firms face difficulties accessing capital (relative to hiring labour), and as a result, use less capital than the optimal level. This is equivalent to stating the firm has a positive capital wedge \( \tau_{ksi} \). Hsieh and Klenow shows that TFPR can be calculated as:

\[ TFPR_{si} = \frac{\sigma}{\sigma - 1} \frac{R^{\alpha_s} - (1-\alpha_s)}{(1-\alpha_s)} (1+\tau_{ksi})^{\alpha_s} \frac{1-\tau_{ysi}}{1-\tau_{ysi}} \]  
(10)

Equation (10) implies that in the absence of distortions (i.e. \( \tau_{ksi} = 0 \) and \( \tau_{ysi} = 0 \)), TFPR is the same for all firms “i” within a sector “s”. Using this equation, we can deduce that a firm with higher \( \tau_{ksi} \) and/or higher \( \tau_{ysi} \) also has a higher TFPR.

The industry level \( \overline{TFPR}_s \) is:

\[ \overline{TFPR}_s = \frac{\sigma}{\sigma - 1} \frac{R^{\alpha_s} - (1-\alpha_s)}{(1-\alpha_s)} \frac{w}{\sum_{i}^{\alpha_s} P_{si}Y_{si}}^{\alpha_s} \frac{1-\alpha_s}{1-\tau_{ysi}} \]  
(11)

When there are no distortions (i.e. \( \tau_{ksi} = 0 \) and \( \tau_{ysi} = 0 \)) for all i, the right hand side of (11) equals the right hand side of (10), which means that TFPR are equalised for all i.

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Firm $i$’s productivity is measured as:

$$A_{si} = \frac{(P_{si}V_{si})^{\frac{\sigma}{\sigma-1}}}{(wL_{si})^{\frac{1}{\sigma-1}}K_{si}^{\sigma-1}}$$  \hspace{1cm} (12)

and the efficient industry’s productivity level (when all marginal products are equalised) is:

$$\bar{A}_s = (\sum_{i=1}^{N_s} A_{si}^{\sigma-1})^{\frac{1}{\sigma-1}}$$  \hspace{1cm} (13)

From (10) to (13), we can calculate the ratio of the actual TFP in the economy to the efficient level of TFP:

$$\frac{Y}{Y_{eff}} = \prod_{s=1}^{S} (\sum_{i=1}^{N_s} \frac{A_{si}^{\frac{TPPR}{TPPR_{si}}}}{A_{si}^{TPPR_{si}}})^{\frac{1}{\sigma-1}}$$  \hspace{1cm} (14)

We calculate the ratio of actual TFP to the efficient level of TFP and then aggregate this ratio across sectors using the Cobb-Douglas aggregator.

**Table 12: Summary Statistics – TFP Dispersion and Gains in 2005, 2010 and 2014**

<table>
<thead>
<tr>
<th>Year</th>
<th>Firms</th>
<th>TFPQ</th>
<th>TFPPR</th>
<th>Wedge</th>
<th>Potential efficiency gains moving towards complete elimination of distortions</th>
<th>Potential efficiency gains moving to 1997 US level of efficiency</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>SD*</td>
<td>75-25</td>
<td>90-10</td>
<td>SD</td>
<td>75-25</td>
</tr>
<tr>
<td>2005</td>
<td>7.576</td>
<td>1.1169</td>
<td>1.5688</td>
<td>2.9986</td>
<td>0.7445</td>
<td>0.9832</td>
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<td>1.1890</td>
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<td>1.2173</td>
<td>1.7611</td>
<td>3.2107</td>
<td>0.7997</td>
<td>1.0368</td>
<td>1.9991</td>
</tr>
</tbody>
</table>

Source: World Bank staff calculations
Note: *SD = standard deviation
REFERENCES


UK Competition and Markets Authority (2015) Productivity and Competition – A Summary of the Evidence


