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# The digital productivity paradox

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**Asia-Pacific  
Economic Cooperation**

**Advancing** Free Trade  
for Asia-Pacific **Prosperity**

# **APEC REGIONAL TRENDS ANALYSIS**

## **The Digital Productivity Paradox**

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November 2018

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The views expressed in this paper are those of the authors and do not necessarily represent those of the APEC Member Economies.

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## **KEY ABBREVIATIONS**

APEC	Asia-Pacific Economic Cooperation
FDI	foreign direct investment
GDP	gross domestic product
ICT	information and communications technology
IMF	International Monetary Fund
MSME	micro, small and medium enterprise
NEER	nominal effective exchange rate
OECD	Organisation for Economic Co-operation and Development
PSU	Policy Support Unit (APEC)
TFP	total factor productivity
UNCTAD	United Nations Conference on Trade and Development
WEO	World Economic Outlook
WTO	World Trade Organization

## KEY MESSAGES

### I. The Digital Productivity Paradox

- Digital technology has improved by leaps and bounds, and computers are more powerful, more compact and more affordable than ever before. Growth in computational capability has led to innovations that have transformed how firms and people do work. Tasks that used to take hours or days now take seconds or minutes. This continuous upgrading in digital technology should have led to higher growth in labour productivity, and ultimately growth in real wages.
- Instead, economists around the world have observed a downward trend in labour productivity growth in the last two decades. In the APEC region, both industrialised and developing economies experienced declining labour productivity growth in 2000–2017.
- Various theories have been put forward to explain the downward trend in labour productivity growth. It could be a measurement issue: current methods of measuring economic output may no longer be suitable for a digital economy. Or perhaps there is a lag between the time new technology is developed and its widespread application in production.
- Firm-level studies have shown a lack of technological diffusion: productivity is increasing in frontier firms while stagnating in non-frontier firms. Network effects and barriers to entry could be behind this trend. Policy uncertainty and skills gaps are also contributing to the lack of technological diffusion, making it more risky and costly for firms to adjust to new technologies.
- Addressing the downward trend in labour productivity growth requires new ways of doing things. Economies may need to reconsider revising how economic activity is defined, monitored and measured. Structural reforms may also be needed to make sure that rules and institutions remain relevant and responsive to new economic realities.
- Moreover, economies will need to invest in and upgrade their infrastructure, which forms the backbone of connectivity and underpins production. Finally, economies also need to invest in their people through education and skills development, active labour market policies and appropriate social protection.
- Previous technological breakthroughs have contributed to improving standards of living, and digital technology has the potential to do the same. But this does not happen automatically. Technology upgrading needs to lead to growth in productivity, and people need to feel the economic benefits through real wage growth. If digital technology is to live up to its potential, governments and firms need to ensure that this linkage remains unbroken.

## II. Mixed Growth amid Heightened Uncertainty

- The first half of 2018 was marked by continuing economic growth amid a backdrop of heightened uncertainty due to escalating trade tensions and a new normal of higher global interest rates, while some economies had to deal with exchange rate pressures along with rising oil prices and inflation.
- Although growth was uneven as the macroeconomic impact varied across economies, APEC as a whole expanded by 4.2 percent in the first half of 2018, which was faster than the 3.9 percent growth in the same period in 2017.
- Inflation has picked up in the APEC region, averaging 2.5 percent in September 2018 from 2.2 percent in September 2017, largely reflecting higher energy prices.
- Higher inflation and employment rates provided the basis for US monetary policy rate hikes. This, together with economy-specific factors, has generated mixed response from APEC economies. Out of the 17 APEC economies that use interest rates as their main monetary policy lever, six have hiked rates as of early October 2018 compared to end-2017 levels; two have lowered their rates; and the rest decided to keep rates unchanged, opting to boost economic growth while domestic inflation conditions were deemed to be benign so far.
- Even with the momentum in global demand, merchandise trade growth in APEC was lacklustre, reflecting the combined impact of trade tensions and policy uncertainty. Growth in merchandise trade value inched up in the first half of 2018 while it doubled for the rest of the world. Meanwhile, trade volume growth slowed down.
- As GDP and trade growth showed signs of moderation, a declining trend was also observed in foreign direct investment (FDI) flows. Global FDI dropped anew in the first half of 2018, falling by 41 percent to an estimated USD 470 billion from USD 794 billion in the first half of 2017.
- This decline followed a similar drop in annual global FDI inflows in 2017 which was mirrored by the fall in inflows of FDI into APEC economies by 20.7 percent, while FDI outflows from the region went up by 6.5 percent. Greenfield investments in APEC also contracted in 2017 by 5.5 percent compared to the level reached in 2016.
- The sluggish performance of trade and investment coincided with the increase in the number of trade- and investment-restricting measures compared to facilitating measures in the period October 2017 to May 2018.
- APEC is expected to maintain robust growth in 2018 with a 4.1 percent GDP expansion, propped up by the global economic momentum. However, growth is projected to moderate in 2019–2020, but still outpacing the rest of the world.



- The balance of risks has tilted to the downside for both the short term and the medium term due to prolonged and heightened uncertainty. A substantial part of this uncertainty is attributable to intensified trade tensions that could affect both trade activity and trade relations. Growth is expected to be further weighed down by policy uncertainty, higher inflation, exchange rate pressures, and episodes of financial market volatility. Against these downside risks is the upside potential for growth that could come from continued pick-up in global economic activity which should translate into sustained strength in domestic consumption.
- For many years, trade has been the major source of economic growth in the APEC region. However, from 2012 to 2016, trade growth consistently lagged behind GDP growth. It was only in 2017 that APEC trade once again expanded faster than economic output, with a projected convergence in 2019–2020. This implies that trade is no longer the reliable driver of APEC economic growth it once was.
- In a persistently uncertain external environment marked by many changes – encompassing economic growth, financial stability and rapid technological transformations – the APEC region needs to remain steadfast to its goal of balanced, inclusive and sustainable growth by boosting reliable sources of growth while, at the same time, harnessing drivers of future growth beyond trade. For example, there are opportunities in the digital economy that APEC can pursue, while also developing green technology, increasing greenfield investments and implementing productivity-enhancing reforms.

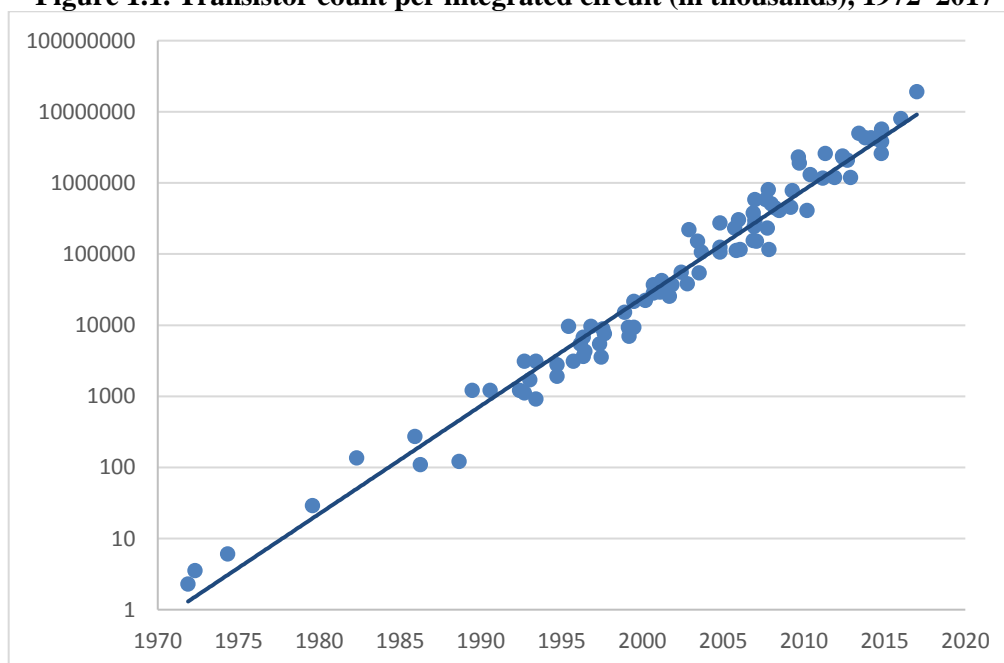
# 1 THE DIGITAL PRODUCTIVITY PARADOX<sup>1</sup>

## 1.1 INTRODUCTION

What is the interaction between interest rates, prices and employment? What is the distance between the Earth and the Moon at perigee? How do you properly tie a roast? Answering these once required a trip to a library, taking a course or waiting for a tutorial show to air. Today, with a click or a tap, vast stocks of information and know-how are available anywhere at any time.

Digital technology has improved by leaps and bounds. In 1965, Gordon Moore, the co-founder of Intel, predicted that the number of transistors per integrated circuit will double every two years. His prediction – now called Moore’s Law – has mostly held up: transistor count per integrated circuit has increased exponentially from about 2,000 in 1972 to more than 19 billion in 2017 (Figure 1.1). This has allowed computers to be more powerful, more compact and more affordable than ever before. A smartphone today has more computational power than all the computers used to send humans to the Moon.

**Figure 1.1. Transistor count per integrated circuit (in thousands), 1972–2017**



Note: Chart is in logarithmic scale, so the trendline shows an exponential growth path.

Source: K. Rupp, “40 Years of Microprocessor Trend Data”, Karl Rupp, posted June 2015, updated February 2018, <https://www.karlrupp.net/2015/06/40-years-of-microprocessor-trend-data/>.

This growth in computational capability has led to innovations that have transformed how firms and people do work. Many tasks have become easier and faster to complete, such as accounting, navigation, inventory management, translation and transcription. Studies have

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<sup>1</sup> Prepared by Emmanuel A. San Andres, Andre Wirjo, Satvinderjit Kaur Singh and Jason Carlo O. Carranceja, APEC Policy Support Unit (PSU). The authors would like to thank Kensuke Tanaka, Head of Asia Desk, OECD Development Centre, for contributing Box 1.1.

shown that technology has successfully improved efficiency by augmenting human labour and reducing time needed to do work.<sup>2</sup>

One would thus expect better technology to lead to higher labour productivity – and, further, for geometrically improving technology to lead to faster growth in labour productivity. This linkage is important because, in a competitive market economy, growth in labour productivity is needed to have growth in real wages, translating to improved welfare among workers and their households. Indeed, the average American worker’s real annual income in 1915 can be earned in 17 weeks in 2015 due in large part to technological change and productivity growth (leading to real wage growth) in the last century.<sup>3</sup> Today, however, it seems that technological change and innovation are happening everywhere without being reflected in the productivity data.

## 1.2 TRENDS IN LABOUR PRODUCTIVITY GROWTH

Despite continuous improvements in technology, economists have observed that labour productivity growth has been on a downward trend over the past two decades. OECD economies saw a 1 percentage point reduction in labour productivity growth during the period between 2000 and 2015, with a growth rate of only 0.75 percent in 2015.<sup>4</sup> The International Monetary Fund (IMF) noted similar reductions in labour productivity growth across the G5 and emerging market economies.<sup>5</sup> Christine Lagarde, head of the IMF, acknowledged the risks of the productivity slowdown on numerous occasions and highlighted the need for quicker policy action to reinvigorate growth.<sup>6</sup> This slowdown in labour productivity growth has also been observed in APEC economies. Between 2000 and 2017, both industrialised and developing APEC economies experienced declining labour productivity growth, with the downward trend being more noticeable in industrialised APEC economies (Figure 1.2).

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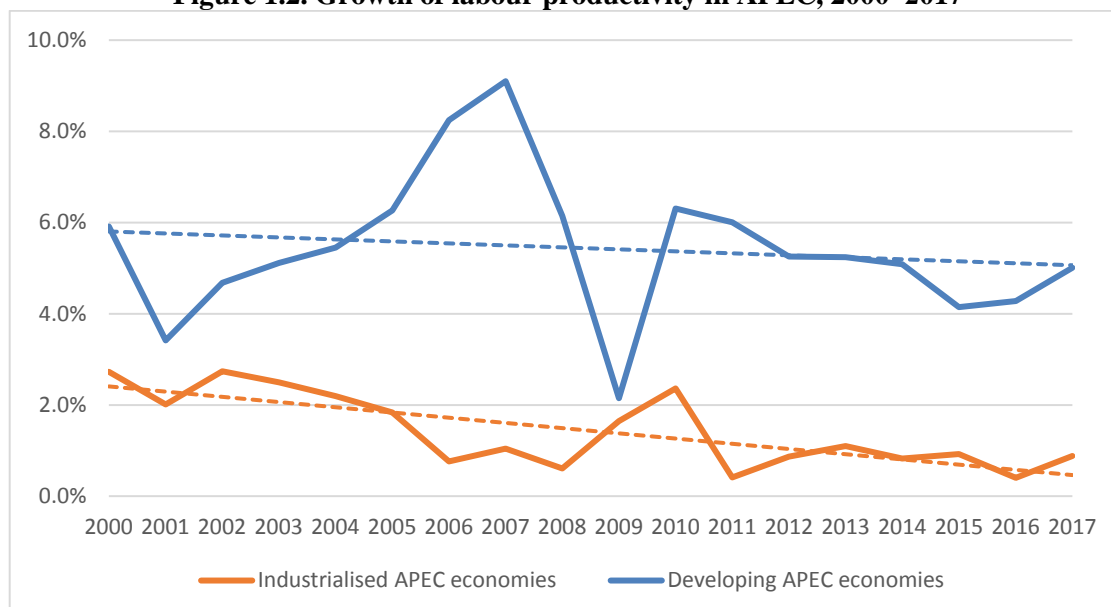
<sup>2</sup> APEC, “New Economy and APEC, 2001” (Singapore: APEC, 2001), <https://www.apec.org/Publications/2001/12/New-Economy-and-APEC-2001>; Agency for Science, Technology and Research (A\*STAR), *Annual Report April 2016 – March 2016* (Singapore: A\*STAR, 2016), [https://www.a-star.edu.sg/Portals/81/Data/News%20And%20Events/Publications/Astar%20Yearbook/Files/Astar%20Yearbook/ASTAR%20Yearbook/ASTAR\\_Annual\\_Report\\_1516.pdf](https://www.a-star.edu.sg/Portals/81/Data/News%20And%20Events/Publications/Astar%20Yearbook/Files/Astar%20Yearbook/ASTAR%20Yearbook/ASTAR_Annual_Report_1516.pdf).

<sup>3</sup> D.H. Autor, “Why Are There Still So Many Jobs? The History and Future of Workplace Automation”, *Journal of Economic Perspectives* 29, no. 3 (2015).

<sup>4</sup> P. Ollivaud, Y. Guillemette and D. Turner, “Links between Weak Investment and the Slowdown in Productivity and Potential Output Growth across the OECD” (OECD Economics Department Working Papers no. 1304, Paris: OECD Publishing, 2016), <http://dx.doi.org/10.1787/5jlwvz0smq45-en>.

<sup>5</sup> International Monetary Fund (IMF), “Is Productivity Growth Shared in a Globalized Economy?” in *IMF World Economic Outlook* (Washington, DC: IMF, April 2018), Ch. 4.

<sup>6</sup> C. Lagarde, “Reinvigorating Productivity Growth”, International Monetary Fund, 3 April 2017, <https://www.imf.org/en/News/Articles/2017/04/03/sp040317-reinvigorating-productivity-growth>.

**Figure 1.2. Growth of labour productivity in APEC, 2000–2017**

Notes: Industrialised APEC economies are Australia; Canada; Japan; New Zealand; and the United States. Developing APEC economies are the APEC members not classified as industrialised. Labour productivity is defined as real GDP per hour worked. Dotted lines are linear trendlines. Data are unavailable for Brunei Darussalam and Papua New Guinea.

Source: The Conference Board data (<https://www.conference-board.org/data/>); APEC PSU calculations.

A possible explanation for the slowdown in labour productivity growth is measurement errors in GDP. The System of National Accounts, which guides how economies measure GDP and other indicators of macroeconomic activity, was first developed in 1947. Although it has gone through several revisions – the latest one in 2008 – it is still oriented toward measuring brick-and-mortar economic activities such as agriculture or manufacturing. Some economists argue that the myriad of services brought about by the emerging digital economy pose challenges in calculating output as they may not be reflected in the traditional calculations of GDP, causing an underestimation of actual productivity.<sup>7</sup> For example, search engines, web-based email and social media platforms provide their services for free, so the full value of these services is not captured in traditional GDP accounting methods.

<sup>7</sup> See for example: C. Bean, “Independent Review of UK Economic Statistics” (London: Cabinet Office, 2016), [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/507081/2904936\\_Bean\\_Review\\_Web\\_Accessible.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/507081/2904936_Bean_Review_Web_Accessible.pdf); N. Ahmad and P. Schreyer, “Are GDP and Productivity Measures Up to the Challenges of the Digital Economy?” *International Productivity Monitor* no. 30 (2016), <http://www.csls.ca/ipm/30/ahmadandschreyer.pdf>.

While there are ways to overcome GDP's blind spots – for example, by tracking the transactions that may disappear into the informal economy or by approximating the value of the service based on advertisement expenditures used to finance the production – some economists argue that this underestimation is not sufficient to explain the low productivity. According to Crafts, adding the welfare gains from unmeasurable services during the period between 2005 and 2015 in the US would only have increased productivity growth by 0.4 percentage points while the reported productivity slowdown was 1.3 percentage points.<sup>8</sup>

Another explanation suggests that labour productivity growth has not yet increased but will do so in due course because of a lag in the impact of new technologies. History has shown that almost all ground-breaking technologies had delayed impacts on production. For example, it took almost a century for the steam engine to proceed from being patented in 1769 to being applied commercially. Up until 1830, its use, and hence its benefits to productivity, was negligible. This is true of other inventions like the telephone and electricity as well.<sup>9</sup> The reason for the lag was that it took time and a lot of resources to produce these technologies on a large scale, transport them for use, and build complementary infrastructure to support them.

However, today's technology is easier to adopt and utilise. According to Desjardins, the faster implementation of technology today could be a result of requiring less infrastructure to complement modern technology; for example, smartphones could largely use the mobile phone networks built decades ago.<sup>10</sup> In other words, most of the innovations of the digital age do not require complicated new physical infrastructure for its implementation. For instance, while the telephone took 39 years to reach 40 percent of the American market, the smartphone only took 10 years to achieve the same.<sup>11</sup> Furthermore, even if the impacts of technology had been delayed, the benefits of more than four decades of technology upgrading should have materialised in recent years instead of which there has been a productivity growth slowdown.

### 1.3 BARRIERS TO TECHNOLOGY USE

New technology can only contribute to labour productivity growth if (1) it is utilised in the production of goods and services and (2) workers can be reallocated to more productive roles or sectors as needed. If there are structural barriers to the utilisation of new technologies as well as the efficient allocation of labour, then new technologies may not have an impact on overall labour productivity growth.

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<sup>8</sup> N. Crafts, "The Productivity Slowdown: Is It the 'New Normal'?" *Oxford Review of Economic Policy* 34, no. 3 (2018).

<sup>9</sup> Crafts, "The Productivity Slowdown"; R.G. McGrath, "The Pace of Technology Adoption Is Speeding Up", *Harvard Business Review*, 25 November 2013, <https://hbr.org/2013/11/the-pace-of-technology-adoption-is-speeding-up>.

<sup>10</sup> J. Desjardins, "The Rising Speed of Technological Adoption", *Visual Capitalist*, 14 February 2018, <http://www.visualcapitalist.com/rising-speed-technological-adoption/>.

<sup>11</sup> McGrath, "The Pace of Technology Adoption".

The growing complexity of technological innovations and the importance of tacit knowledge to utilise them may hinder the transfer and utilisation of technology, making complementary and potentially expensive investments even more imperative. Furthermore, the diffusion of such technologies could be hindered by the lack of appropriate regulations for data and technology sharing. As a result, frontier firms are able to enjoy significant gains from their new technologies while non-frontier firms face structural and legal barriers that prevent them from harnessing these technologies, leaving them with stagnating productivity levels.<sup>12</sup>

Likewise, Bahar and Rapoport have found that the fastest productivity growth in Europe is concentrated among the most productive and least productive firms, whereas the rest of the firms are trapped in a ‘middle productivity trap’.<sup>13</sup> This indicates that frontier firms are able to invest in the development and utilisation of new technologies, but these innovations are not being diffused to other firms. As for the bottom firms, it seems that there are enough low-hanging fruit technologies for them to adopt and improve their productivity. Hence, while new technologies are being developed by and for frontier firms, there seem to be barriers to their diffusion to non-frontier firms.

A lack of business dynamism may also be hindering the uptake of new technologies. Business dynamism is the process by which firms rise, decline and evolve with innovation, competition and business cycles, that is, it is what powers creative destruction in a market economy. Business dynamism requires risk-taking and investment in new ways of doing things. Low business dynamism – seen in low rates of business start-ups and share of employment of newer firms<sup>14</sup> – allows incumbent firms to maintain their profitability and market share without having to be the most efficient firm. Lingering pessimism over past economic crises, poor investment climates and uncertain policy environments can have a negative impact on business dynamism and lead to low labour productivity growth. This relationship is confirmed by Decker et al. in their study on productivity growth using firm-level data in the US from the late 1990s to mid-2000s.<sup>15</sup> Their results indicate that the pace of innovation and technology diffusion depended very strongly on business and labour dynamism.

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<sup>12</sup> D. Andrews, C. Criscuolo and P.N. Gal, “The Global Productivity Slowdown, Technology Divergence and Public Policy: A Firm Level Perspective” (OECD, 2016), <https://www.brookings.edu/wp-content/uploads/2016/08/andrews-et-al.pdf>.

<sup>13</sup> D. Bahar and H. Rapoport, “Migration, Knowledge Diffusion and the Comparative Advantage of Nations”, *The Economic Journal* 128, no. 612 (2018).

<sup>14</sup> Crafts, “The Productivity Slowdown”.

<sup>15</sup> R.A. Decker et al., “Declining Dynamism, Allocative Efficiency, and the Productivity Slowdown” (CARRA Working Paper Series, Washington, DC: US Census Bureau, 2017), <https://www.census.gov/content/dam/Census/library/working-papers/2017/adrm/carra-wp-2017-02.pdf>.

As new technologies demand greater technical knowledge, many businesses have found themselves with a labour force lacking the required skills. New technologies are often skill-biased, favouring higher-skilled workers who are more adept at using them efficiently to raise productivity. Hence, lower-skilled workers risk losing their jobs and are further disadvantaged by the inflexibilities of the labour market which prevent their smooth reallocation to other suitable occupations.<sup>16</sup> An OECD survey found that about 30 percent of workers in OECD economies are employed in jobs for which they are either under- or over-qualified. Moreover, 17 percent of workers reported skill mismatches at their current jobs.<sup>17</sup> These skill mismatches prevent labour from being used optimally, hence negatively impacting productivity. McGowan and Andrews evaluated cross-economy industry data on skills mismatch and labour productivity in 19 OECD economies to find that skills mismatch is indeed negatively correlated to productivity.<sup>18</sup> As a result, equipping the future workforce with the right type of skills has become ever more necessary.<sup>19</sup>

## 1.4 REVITALISING PRODUCTIVITY GROWTH

The utilisation of new digital technology in production can be complicated by high adjustment costs, steep learning curve requirements, and slow development of complementary inputs like knowledge-based capital and adaptive institutions.<sup>20</sup> In order to address the challenge of declining productivity growth, there may be a need to (1) develop new ways of looking at economic activity; (2) align regulations and institutions with the needs of a digital economy; (3) invest in infrastructure; and (4) ensure access to skills development and social protection for workers.

### 1.4.1 Improve measurement of the digital economy

Proper understanding of the digital economy requires the ability to accurately measure and monitor it. While current methods of measuring GDP were suitable for the agricultural and manufacturing economies of the previous century, new methods may need to be developed for the digital-heavy, service-oriented economy of the future. Services have been identified as one of the core sources of productivity and many economies are already predominantly service-oriented, but measuring services output remains more challenging relative to physical goods. For instance, it is tricky to accurately measure the economic contributions

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<sup>16</sup> Hays and Oxford Economics, *The Hays Global Skills Index 2017 – Regional Dynamics of the Global Labour Market: Skills in Demand and Tomorrow's Workforce* (London: Hays, 2017), [https://www.hays.nl/cs/groups/hays\\_common/@nl/@content/documents/webassets/hays\\_2011936.pdf](https://www.hays.nl/cs/groups/hays_common/@nl/@content/documents/webassets/hays_2011936.pdf);

A.O. Krueger, E.A. San Andres and T.L. Hredzak, “APEC Economic Policy Report: Structural Reform and Human Capital Development” (Singapore: APEC Economic Committee, 2017), <https://www.apec.org/Publications/2017/11/2017-APEC-Economic-Policy-Report>.

<sup>17</sup> Organisation for Economic Co-operation and Development (OECD), *Skills Outlook 2013* (Paris: OECD, 2013).

<sup>18</sup> M.A. McGowan and D. Andrews, “Labour Market Mismatch and Labour Productivity: Evidence from PIAAC Data” (Economics Department Working Papers no. 1209, Paris: OECD, 2015).

<sup>19</sup> McKinsey Global Institute, “A Future that Works: Automation, Employment, and Productivity” (McKinsey & Company, 2017).

<sup>20</sup> L. Boone, “Investing in the Digital Economy”, AXA Investment Managers – Tomorrow Augmented: The Digital Economy’s Next Stage of Evolution, 15 September 2017, [https://www.axa-im.com/en/content/-/asset\\_publisher/alpeXKk1gk2N/content/tomorrow-augmented-the-digital-economy-s-next-stage-of-evolution/23818](https://www.axa-im.com/en/content/-/asset_publisher/alpeXKk1gk2N/content/tomorrow-augmented-the-digital-economy-s-next-stage-of-evolution/23818); Andrews, Criscuolo and Gal, “The Global Productivity Slowdown”.

of new consumer services such as smartphone apps, cloud-based data services and search engines, which are often provided free of charge.

In addition to the challenge of measuring products and services that are free of charge to the consumer, Ylhäinen notes the inability of GDP to capture changes in quality.<sup>21</sup> This is of particular concern when prices of digital products are decreasing due to greater uptake, improved technology and lower overhead costs, while quality continues to rise. The blurring of production and consumption in the new sharing economy has further complicated the measurement of GDP. The new marketplace provided by digital platforms has allowed one to act both as consumer and producer, and this has led to an increase in borrowing and sale of second-hand goods, which is not captured by GDP.

Although literature on measuring the digital economy is still nascent, some authors have presented frameworks to better measure it. In their 2018 paper, Ahmad and Ribarsky introduce a new framework to incorporate digital goods and services into output accounting, suggesting the need to categorise firms not only based on what they produce and sell but also by method of transaction.<sup>22</sup> This is expected to make it easier to tackle the challenges of measuring various goods and services. Ahmad and Schreyer suggest that governments could look into other ways of capturing the value of free services and intermediary profits, such as calculating the cost that firms are willing to pay for data from search engines as well as the cost of advertising on such platforms.<sup>23</sup> While a comprehensive measure of the digital economy is yet to be achieved, improving measurement would allow governments to better capture the actual output of the economy, thereby creating a more accurate picture of productivity trends.

#### 1.4.2 Implement structural reforms for the digital economy

A 2015 study by the APEC Policy Support Unit (PSU) shows that there are positive correlations between services value-added, labour productivity and manufacturing exports.<sup>24</sup> There are indeed several mechanisms through which services can improve productivity. Information and communications technology (ICT) services, for instance, are critical for knowledge dissemination and diffusion. Research and development and engineering services can lead to better manufacturing processes via incorporation of new hardware modules that can lead to higher labour productivity, either by cutting production time or making it possible to complete the same number of tasks with fewer workers. Accounting services play an important role in ensuring that scarce resources are allocated efficiently through the budgeting process and by providing checks and balances within firms. Both legal and accounting services ensure that firms adhere to certain regulatory standards and could minimise the possibility of downtime brought about by forced closures and lawsuits.

<sup>21</sup> I. Ylhäinen, “Challenges of Measuring the Digital Economy”, Sitra, 12 June 2017, <https://www.sitra.fi/en/articles/challenges-measuring-digital-economy/>.

<sup>22</sup> N. Ahmad and J. Ribarsky, “Towards a Framework for Measuring the Digital Economy” (paper prepared for the 16th Conference of the International Association of Official Statisticians (IAOS), Paris, France, 19–21 September 2018), [http://www.oecd.org/iaos2018/programme/IAOS-OECD2018\\_Ahmad-Ribarsky.pdf](http://www.oecd.org/iaos2018/programme/IAOS-OECD2018_Ahmad-Ribarsky.pdf).

<sup>23</sup> N. Ahmad and P. Schreyer, “Measuring GDP in a Digitalised Economy” (paper presented at the IMF Fourth Statistical Forum, Washington, DC, USA, 17–18 November 2016), [https://www.imf.org/external/np/seminars/eng/2016/statsforum/pdf/Durand\\_paper.pdf](https://www.imf.org/external/np/seminars/eng/2016/statsforum/pdf/Durand_paper.pdf).

<sup>24</sup> G. Pasadilla and A. Wirjo, “Services, Manufacturing and Productivity” (Issues Paper No. 9, Singapore: APEC, 2015), <https://www.apec.org/Publications/2015/01/Services-Manufacturing-and-Productivity>.



However, as shown by the robust negative correlations between the OECD services trade restrictiveness index (STRI) and gross manufacturing exports (controlled for market size), structural barriers and policy uncertainty may dampen private sector investment in services, which would adversely affect productivity and hence the competitiveness of the sectors making use of them. Undertaking structural reform to remove such barriers as well as reducing policy uncertainty can go a long way in encouraging private sector investment and business dynamism.

Improving institutions – enhancing political stability, quality of government, and efficacy of regulations – is also needed in the digital economy. Economies with strong, predictable and transparent policies have been found to encourage investments as such institutions facilitate complex transactions, specialisation and flexibility while reducing transaction costs and risks.<sup>25</sup> Better institutions can also encourage firms to invest in new technologies. For example, placing business regulations on the internet will provide the type of transparency that can encourage the entry of innovative but risk-averse firms. Reducing the number of trade formalities through a single-window system can reduce transaction costs and encourage greater participation and competition.<sup>26</sup>

Ideally, the next step would be to mainstream technology and innovation so that it is available anywhere and to everyone, enabling equal opportunities for productivity improvement. Despite the enormous potential of new technologies, their adoption is uneven across economies, sectors and firms. For example, the McKinsey Global Institute has found that the United States captured only about 18 percent of its digital potential despite being one of the most highly digitised economies of the world.<sup>27</sup> Looking into individual sectors, agriculture and hunting, mining, construction, and entertainment and recreation had relatively low digitisation rates compared to sectors like ICT, media and professional services.<sup>28</sup> In some cases, the gap in adoption and utilisation between sectors and firms on the frontier vis-à-vis the rest of the economy appeared to have widened.

Although technical, economic and social factors determine the pace and extent of technology adoption, facilitating their diffusion can undoubtedly increase the competitiveness and productivity of the economy as a whole. A scenario modelling by the McKinsey Global Institute estimates that automation could increase global productivity growth by between 0.8 and 1.4 percent annually.<sup>29</sup> The same paper also indicates that in most digitised sectors, productivity has grown up to four times compared to the economy average. Box 1.1 by the OECD discusses the benefits of digitalisation in firms in emerging Asia.

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<sup>25</sup> R.E. Hall and C.I. Jones, “Why Do Some Countries Produce So Much More Output Per Worker than Others?” *The Quarterly Journal of Economics* 114, no. 1 (1999); L. Cherchye and W. Moese, “Institutional Infrastructure and Economic Performance: Levels versus Catching Up and Frontier Shifts” (Public Economics Working Paper Series ces0314, Leuven: Catholic University of Leuven, 2003), <https://ideas.repec.org/wpe/papers/ces0314.html>.

<sup>26</sup> J. Koh, “Ten Years of Single Window Implementation: Lessons Learned for the Future” (paper for the *Global Trade Facilitation Conference 2011*, Geneva, Switzerland, 12–13 December 2011).

<sup>27</sup> McKinsey Global Institute, “The Productivity Puzzle: A Closer Look at the United States” (McKinsey & Company, 2017).

<sup>28</sup> The overall digitisation of a sector is based on a set of 27 metrics to assess the digitisation of assets, usage and labour, according to McKinsey Global Institute, “The Productivity Puzzle”. For the full list of metrics and the methodology, see: McKinsey Global Institute, “Digital America: A Tale of the Haves and Have-mores” (McKinsey & Company, 2015).

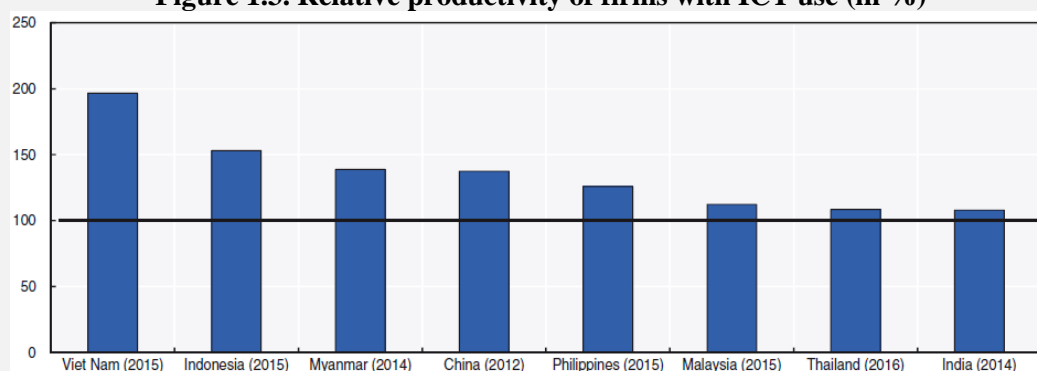
<sup>29</sup> McKinsey Global Institute, “A Future that Works”.

### Box 1.1. Digitalisation and productivity in emerging Asia

The use of ICT is transforming economies in emerging Asia and around the world, creating new challenges and opportunities. In addition to making possible new goods and services and modes of production and interaction, these technologies have important effects on firm and aggregate productivity. Firms making effective use of ICT can reach out to new markets, reduce costs and remain more flexible in the face of economic shocks. Industries may also become more productive through more efficient entry, exit and reallocation between firms, as well as through increased transparency and market competition.

The use of digital technologies is associated with higher levels of productivity among emerging Asian firms. In the eight economies in the region with sufficient data, average total factor productivity (TFP) was higher among firms with either a website or email use or both (Figure 1.3). On average, firms in Viet Nam making at least some use of these technologies had 196.6 percent of the average TFP level of firms that did not use these ICT tools. Similar large differences were seen in Indonesia (153.0%); Myanmar (138.8%); and China (138.8%). Even in Thailand and India, where the productivity difference by firm technology use was not as great, these figures were 108.6 percent and 107.9 percent, respectively.

**Figure 1.3. Relative productivity of firms with ICT use (in %)**



Note: Average TFP in firms with websites and/or using email is presented as a percentage of the average TFP of firms using neither technology; a figure of 100 percent means no difference in the average productivity levels of these two groups. Cambodia and Lao PDR were excluded from this analysis since they contained too few observations with sufficient data.

Source: World Bank Enterprise Surveys and OECD Development Centre calculations.

While firms can see benefits from adopting ICT – including implementation of labour-saving practices and improved efficiency in areas such as administration, inventory management, and promotion and customer service – the extent of these effects can be varied. There are also issues of reverse causation to consider, as more productive firms may be more likely to invest in ICT. Among wealthier economies, the adoption of ICT has been judged to have had varied effects on economies' productivity levels and growth rates. Among the explanations offered for these differences are differing degrees of implementation of the organisational and management reforms needed to realise productivity gains from ICT investment.

To facilitate a deeper spread of technology, focus can be drawn toward encouraging greater data sharing. While it is debatable whether data is the new oil, it is true that access to valuable data has improved productivity in many frontier firms particularly in the technology sector. Data on purchasing history of customers, for example, allow firms to undertake targeted advertising which potentially can lead to additional purchases. Data on browsing history of individuals enable firms to predict with high probability the interests

of those individuals and tailor their offers accordingly. Arguably, without access to such data (which are usually collected by frontier firms), non-frontier firms would not be able to contribute toward productivity. This has brought to the fore discussions around anticompetitive behaviour and competition policy in the digital economy.

On the other hand, it is also important that governments are aware of the implications of regulations on data transfers. Although there are legitimate reasons for regulating the use and transfer of data – such as for protecting individual privacy – they can have negative effects on productivity. In a 2018 paper, Ferracane et al. show that stricter data policies are negatively correlated to firms’ productivity in downstream sectors that rely on data intensively.<sup>30</sup> Moreover, the impact is stronger for manufacturing firms that also produce services, and in economies with a better digital-enabling environment. The paper covers two categories of data policies: those that impact cross-border data flows as well as those that apply to data usage domestically. Interestingly, the negative effect appears to be more robust for the latter category of restrictions.

### **1.4.3 Invest in infrastructure development**

A strong, reliable and resilient infrastructure is necessary in the production of goods and services. Roads, ports and airports serve as gateways to trade and mobility; energy infrastructure is crucial to production; and access to clean water and sanitation ensures a healthy and productive workforce. Likewise, universal, reliable and affordable access to ICT is essential to participate in the digital economy. Indeed, the 2018 APEC Economic Policy Report on Structural Reform and Infrastructure finds that a 10 percent increase in public and private capital stock could lead to a 1.1 and 1.5 percent increase in output per worker, respectively.<sup>31</sup> However, despite the importance of infrastructure, economies have often underinvested in this sector with consequent negative implications on productivity. APEC economies face significant infrastructure financing gaps ranging between USD 3.1 billion to USD 802.5 billion in 2017.

While public sector investment has contributed significantly to infrastructure development and will likely remain so moving forward, private sector investment will also need to be mobilised considering the size of the gaps. Encouraging private investment in infrastructure requires having sound infrastructure governance and project prioritisation processes. Economies will also need to develop institutional arrangements that are supportive of private sector involvement and competition where possible, and provide an institutional environment that supports private sector financing.

### **1.4.4 Develop and utilise human capital**

The adoption of new technology and innovation requires corresponding human capital that can ensure its efficient and productive use. This means that people already in the workforce who risk losing their jobs to technology need to acquire new skills and upgrade themselves

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<sup>30</sup> M.F. Ferracane, J. Kren and E. van der Marel, “Do Data Policy Restrictions Impact the Productivity Performance of Firms and Industries?” (working paper, Brussels: European Centre for International Political Economy (ECIPE), 2018), <http://ecipe.org/publications/do-data-policy-restrictions-impact-the-productivity-performance-of-firms-and-industries/>.

<sup>31</sup> APEC Economic Committee, “APEC Economic Policy Report 2018: Structural Reform and Infrastructure” (Singapore: APEC, 2018), <https://www.apec.org/Publications/2018/11/2018-APEC-Economic-Policy-Report>.

to be able to tackle the complexities of new technologies. Furthermore, the new workforce has to be prepared for the new jobs and skill requirements of a rapidly changing economy.

Governments and the private sector can play an important role in supporting reskilling activities by providing training and ensuring access to lifelong learning. Active labour market policies (ALMPs) can also ensure more efficient utilisation of human capital that has been displaced by technology by providing employment matching and training services while encouraging retraining.<sup>32</sup> To better equip the new workforce, education systems need to evolve in line with the new skills required by the digital economy. As technology, particularly automation, begins to undertake more predictable and repetitive activities, a premium would be placed on tasks based on social and emotional capabilities, creative thinking, logical thinking and problem solving.<sup>33</sup>

Regional cooperation also has a part to play in making sure that people have a role in the digital economy. Economies are grappling with the new challenges brought about by digital technology, many of which have cross-border implications. Facing these challenges will need research, discussion and policy coordination. Within the APEC region, the Framework on Human Resources Development in the Digital Age aims to address the various human impacts of rapid technological change.<sup>34</sup>

## 1.5 ONE MORE THING

Technological advancements have contributed immensely to improving living standards: the hand axe, the wheel, the printing press, the steam engine, the vaccine, to name a few. Digital technology has the potential to be a breakthrough of the same level. It is already changing (some say disrupting) how people work and interact, with important implications on economic and social life. Digital technology can uplift living conditions if it contributes to productivity growth and real wage growth. But this does not happen automatically. Labour productivity growth is on a downward trend and real wage growth is decoupling from it.<sup>35</sup> If digital technology is to live up to its potential, then governments and firms need to ensure that this linkage – from technology upgrading to productivity growth to wage growth – remains unbroken.

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<sup>32</sup> A.O. Krueger, E.A. San Andres and T.L. Hredzak, “APEC Economic Policy Report: Structural Reform and Human Capital Development” (Singapore: APEC Economic Committee, 2017), <https://www.apec.org/Publications/2017/11/2017-APEC-Economic-Policy-Report>.

<sup>33</sup> For a complete list of capabilities and where current technologies stand in their ability to replace humans, see: McKinsey Global Institute, “A Future that Works”.

<sup>34</sup> “APEC Framework on Human Resources Development in the Digital Age”, APEC, 15 May 2017, <https://www.apec.org/Groups/SOM-Steering-Committee-on-Economic-and-Technical-Cooperation/Working-Groups/Human-Resources-Development/Framework>.

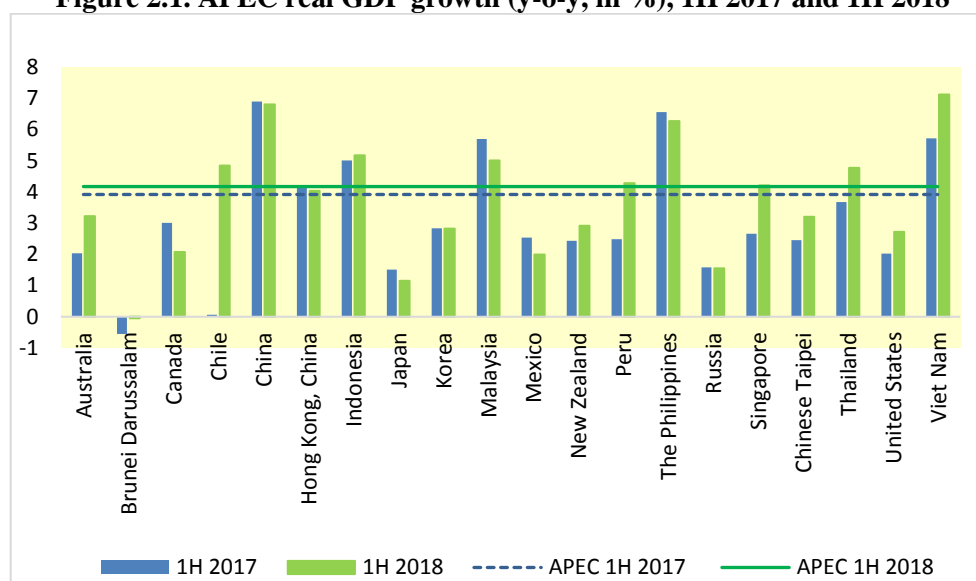
<sup>35</sup> L. Mishel and K.F. Gee, “Why Aren’t Workers Benefiting from Labour Productivity Growth in the United States?” *International Productivity Monitor* 23 (Centre for the Study of Living Standards, Spring 2012); C. Schwellnus, A. Kappeler and P.A. Pionnier, “Decoupling of Wages from Productivity: Macro-level Facts” (OECD Economics Department Working Papers no. 1373, Paris: OECD Publishing, 2017); M. Skare and D. Skare, “Is the Great Decoupling Real?” *Journal of Business Economics and Management* 18, no. 3 (2017).

## 2 MIXED GROWTH AMID HEIGHTENED UNCERTAINTY<sup>36</sup>

### 2.1 APEC GDP GROWTH

The first half of 2018 was marked by continuing economic growth amid a backdrop of heightened uncertainty due to escalating trade tensions and a new normal of higher global interest rates while some economies had to deal with exchange rate pressures along with rising oil prices and inflation. The macroeconomic impact varied in the APEC region, resulting in mixed growth across economies. As a whole, the APEC region expanded by 4.2 percent in the first half of 2018, which was faster than the 3.9 percent growth in the same period in 2017 (Figure 2.1).

**Figure 2.1. APEC real GDP growth (y-o-y, in %), 1H 2017 and 1H 2018**



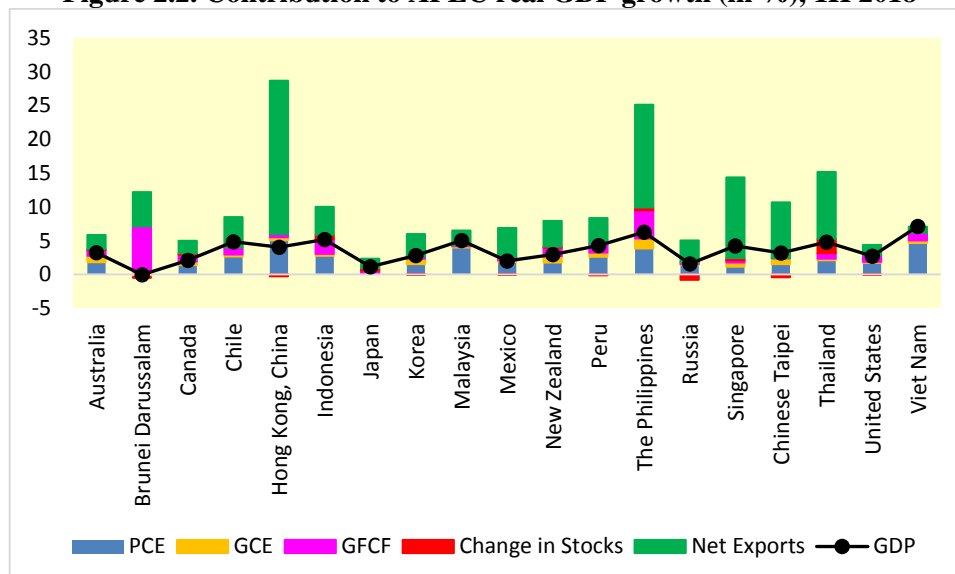
Note: Data not available for Papua New Guinea.

Source: Economy sources; *The Economist* Economic and Financial Indicators; IMF WEO database (October 2018); APEC PSU staff calculations.

The continued growth in APEC amid increased uncertainty in the external environment is owed largely to stable and strong household consumption. Trade has also provided a much-needed boost, with economies turning in net exports from 2017 up to the first half of 2018 (Figure 2.2).

The global demand momentum has continued to fuel consumption, trade and, to some extent, investment activity. In particular, APEC economies showed positive gross fixed capital formation during the period January–June 2018. Government consumption has also become more pronounced in the first half of 2018, with all APEC economies registering positive government spending.

<sup>36</sup> Prepared by Rhea C. Hernando, APEC Policy Support Unit (PSU). The author would like to thank Jason Carlo O. Carranceja for contributing Box 2.1 and Carlos Kuriyama for providing valuable comments.

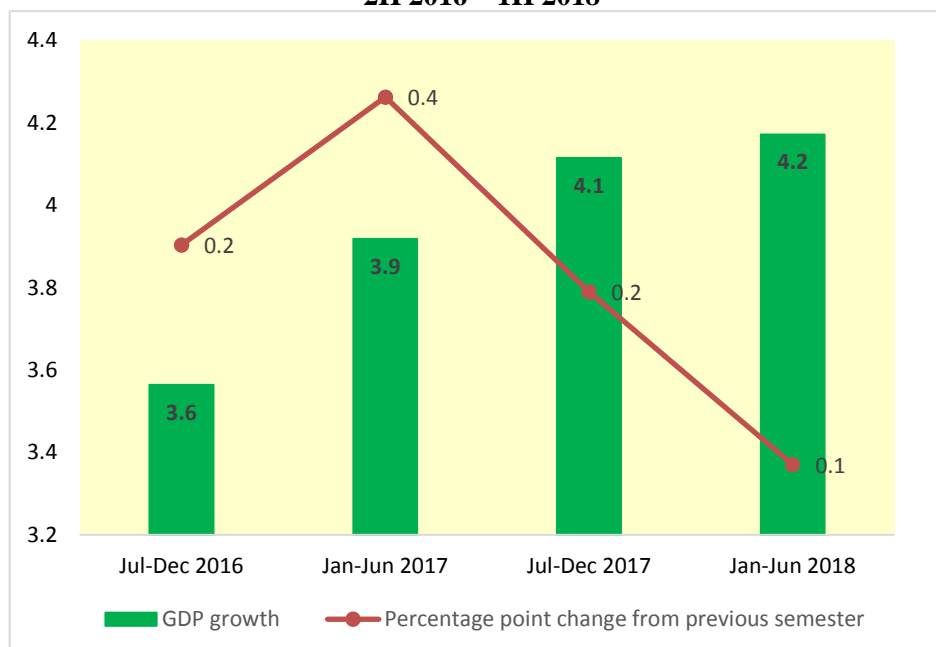
**Figure 2.2. Contribution to APEC real GDP growth (in %), 1H 2018**

PCE = private consumption expenditure; GCE = government consumption expenditure; GFCF = gross fixed capital formation.

Note: Data not available for China and Papua New Guinea.

Source: Economy sources; APEC PSU staff calculations.

However, it is observed that the rate of expansion of APEC as a whole has moderated. After surging in the first half of 2017, growth in APEC has inched up by only 0.1 percentage point in the first half of 2018 (Figure 2.3). This slower increase in growth could be attributed to elevated uncertainty in the global economy.

**Figure 2.3. APEC real GDP growth (weighted average, y-o-y, in %), 2H 2016 – 1H 2018**

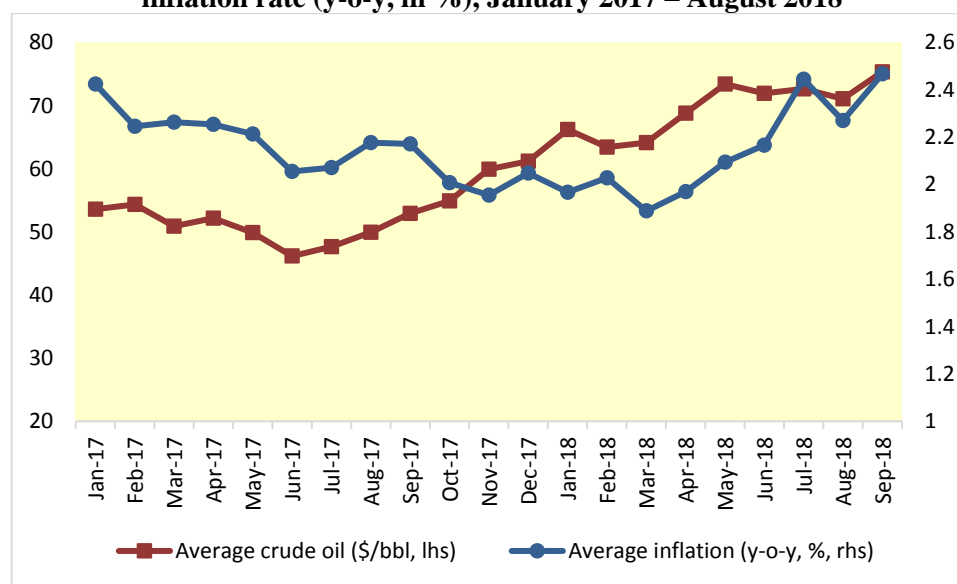
Note: Semi-annual GDP growth rate is not available for Brunei Darussalam and Papua New Guinea.

Source: Economy sources; APEC PSU staff calculations.

## 2.2 INFLATION AND MONETARY POLICY

Inflation has picked up in the APEC region, averaging 2.5 percent in September 2018 from 2.2 percent in September 2017 following a 42.3 percent increase in average crude oil prices during the same period (Figure 2.4). The rise in energy prices is due to production cuts by major oil exporters as well as diminished outputs from Iran and Venezuela coupled with stronger global demand as economic activity picked up starting in mid-2016.

**Figure 2.4. Average crude oil price (\$/bbl) and APEC average inflation rate (y-o-y, in %), January 2017 – August 2018**

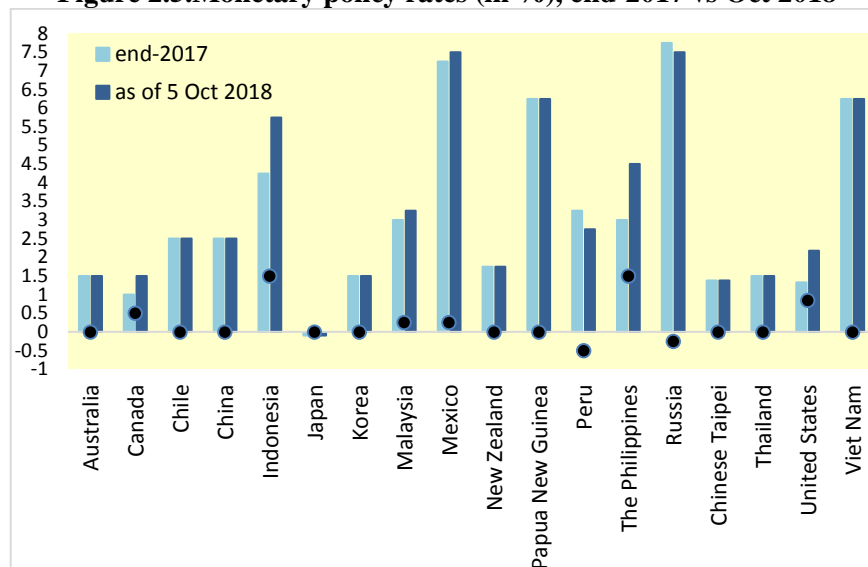


Source: World Bank Commodity Markets for commodity price indices; economy sources; IMF WEO database (October 2018); APEC PSU staff calculations for the APEC average inflation rate.

Higher oil prices and inflation rates have posed a challenge to monetary authorities, particularly in maintaining a balance between managing inflation expectations on the one hand and continuing to support growth on the other.

In the US, strong economic and employment growth coupled with increasing inflation have provided the basis for the US Federal Open Market Committee (FOMC) to gradually and continuously hike the target range for the US federal funds rate. The US FOMC has increased its benchmark interest rate eight times since the tightening cycle began in December 2015. This clear signal from the US Federal Reserve together with economy-specific factors have prompted the same tightening trend in some APEC economies. Out of the 17 APEC economies that use interest rates as their main monetary policy lever, six have hiked rates as of early October 2018 (Figure 2.5). Meanwhile, Singapore, taking into account macroeconomic uncertainties due to ongoing trade tensions, decided to slightly raise the slope of the Singapore dollar nominal effective exchange rate (S\$NEER) from the previous zero percent.

In contrast, two APEC economies lowered their monetary policy rates in 2018 from the end-2017 level, while the rest decided to keep rates unchanged, opting to boost economic growth while domestic inflation conditions were deemed to be benign so far.

**Figure 2.5. Monetary policy rates (in %), end-2017 vs Oct 2018**

Note: The monetary policy framework in Brunei Darussalam is based on a currency board system, with the Brunei dollar anchored to the Singapore dollar at par. Hong Kong, China maintains a currency board system pegged against the US dollar. For Singapore, monetary policy is conducted through the trade-weighted exchange rate, which is allowed to fluctuate within a policy band. The operating targets for the S\$NEER are expressed in the level, slope and width of the policy band which determine the direction of monetary policy. Japan conducts monetary policy mainly through money market operations. As of early October 2018, the Bank of Japan (BOJ) has conducted asset purchases at an annual pace of about JPY 6 trillion in exchange-rate traded funds and about JPY 90 billion in real estate investment trusts. At the same time, the BOJ also applied a -0.1 percent interest rate to the policy-rate balances in current accounts held by financial institutions at the BOJ.

Source: Economy sources.

## 2.3 TRADE PERFORMANCE

Even with the momentum in global demand, merchandise trade growth in APEC has slowed down in terms of both value and volume, reflecting the combined impact of trade tensions and policy uncertainty.

In terms of value, merchandise trade growth in APEC lagged behind the rest of the world, with exports expanding 11.1 percent and imports 12.7 percent in the first half of 2018 compared to 14.8 percent and 15.8 percent, respectively, for the rest of the world (Table 2.1). While the rest of the world doubled its trade growth in the first half of 2018 compared to the first half of 2017, trade growth in the APEC region increased by less than half a percentage point during the same period.

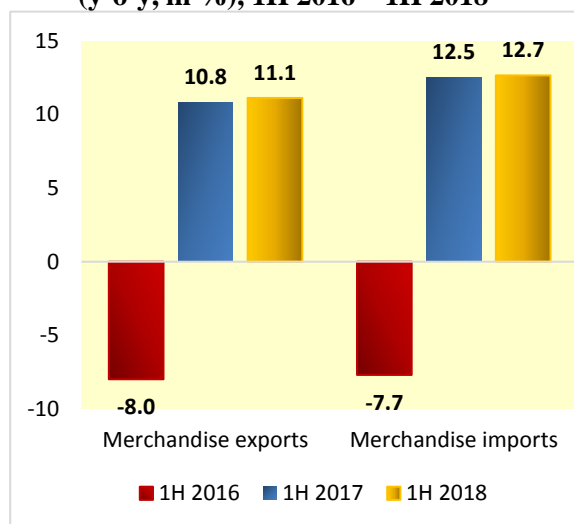
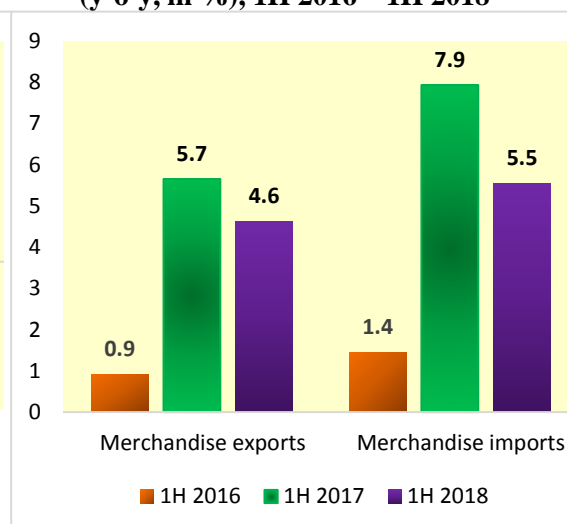


**Table 2.1. Value and growth in APEC merchandise trade, 1H 2016 – 1H 2018**

	Value (in billion USD)			Growth (y-o-y, in %)		
	1H 2016	1H 2017	1H 2018	1H 2016	1H 2017	1H 2018
<b>Merchandise Exports</b>						
World	7193.0	7815.0	8818.0	-5.1	8.6	12.8
APEC	3779.6	4188.2	4654.2	-8.0	10.8	11.1
Rest of the World (ROW)	3413.4	3626.8	4163.8	-1.7	6.3	14.8
<b>Merchandise Imports</b>						
World	7263.0	7980.0	9107.0	-5.3	9.9	14.1
APEC	3789.1	4263.3	4803.0	-7.7	12.5	12.7
ROW	3473.9	3716.7	4304.0	-2.6	7.0	15.8
<b>APEC's share of the World (in %)</b>						
Merchandise Exports	52.5	53.6	52.8			
Merchandise Imports	52.2	53.4	52.7			

Source: WTO.

Furthermore, the volume of merchandise exports and imports grew at 4.6 percent and 5.5 percent, respectively, in January–June 2018, slowing down from 5.7 percent and 7.9 percent during the same period in 2017 (Figure 2.7). Although trade in APEC continued to grow in the first half of 2018 in terms of both value and volume, the region's performance contrasted markedly from the significant turnaround seen in the first half of 2017 and was significantly below the performance of the rest of the world (Figures 2.6 and 2.7).

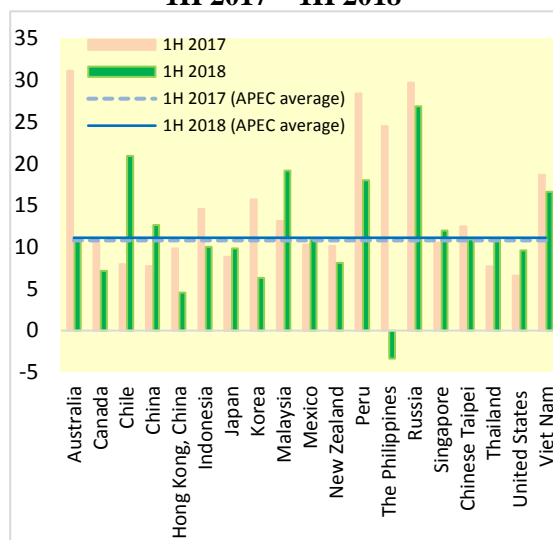
**Figure 2.6. Value of APEC trade (y-o-y, in %), 1H 2016 – 1H 2018****Figure 2.7. Volume of APEC trade (y-o-y, in %), 1H 2016 – 1H 2018**

Note: APEC average growth rate does not include Brunei Darussalam and Papua New Guinea due to data unavailability.

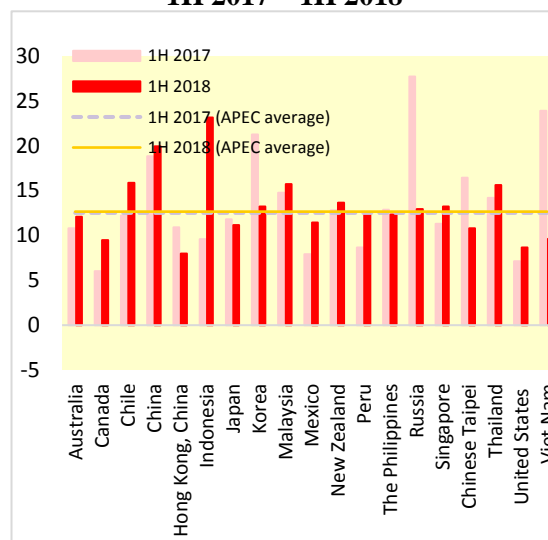
Source: WTO for trade values; UNCTAD Statistics for trade volume; APEC PSU staff calculations for APEC average growth rates.

Along with GDP growth, trade growth has become uneven across APEC in January–June 2018, with 11 member economies showing a moderation in exports growth (Figures 2.8 and 2.9).

**Figure 2.8. Growth in the value of merchandise exports (y-o-y, in %), 1H 2017 – 1H 2018**



**Figure 2.9. Growth in the value of merchandise imports (y-o-y, in %), 1H 2017 – 1H 2018**



Note: Data not available for Brunei Darussalam and Papua New Guinea.

Source: WTO; economy sources; APEC PSU staff calculations.

The relatively sluggish performance of APEC merchandise trade suggests that trade tensions and policy uncertainties during the first half of 2018 have started to take a toll in the region. An escalation of trade tensions could result in further weakening of trade performance, with important implications for incomes and jobs (Box 2.1).

Meanwhile, APEC trade in commercial services showed firm and continued growth in the first half of 2018 following a strong rebound in 2017. The value of the region's commercial services exports grew by 10.3 percent in the first six months of 2018 compared to 4.9 percent and -0.7 percent in the same period in 2017 and 2016, respectively. Similarly, the value of commercial services imports expanded by 9.5 percent in January–June 2018 from 6.4 percent and -1.4 percent in the comparable months in 2017 and 2016, respectively (Figure 2.10).

### Box 2.1. Trade tensions in the APEC region

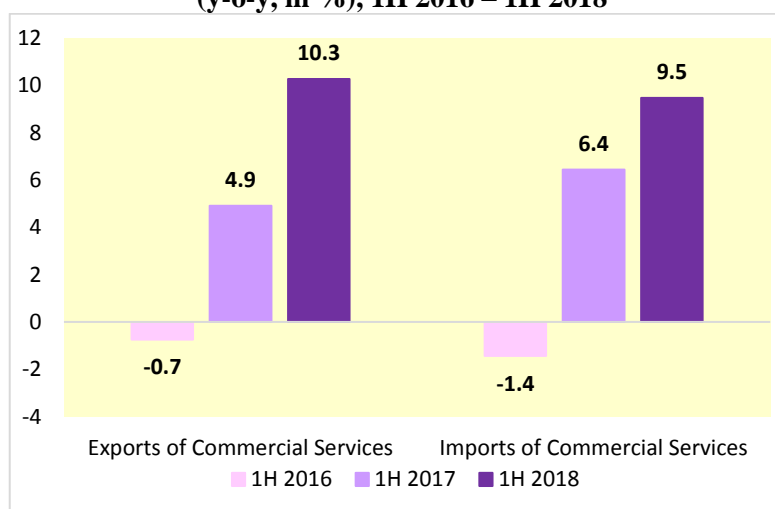
The year 2018 witnessed increasing trade tensions, challenging the global trade system. Hikes in tariff rates for specific products within the APEC region, as well as longer times for customs clearance and licence processing, could have a detrimental effect on trade in the short term. Recent WTO reports show evidence of such trends in the APEC region, as governments have been enacting more trade-restrictive than trade-facilitating measures (Figure 2.16).

One of the concerns is that a trade-restrictive measure could trigger reciprocal measures by other economies affected by the initial measure, creating a snowball effect. The tariff hikes and retaliatory measures implemented by seven economies between March and June 2018, which covered 1,782 tariff lines equivalent to USD 68.8 billion worth of trade,<sup>37</sup> are a case in point. Further rounds of tariff increases and retaliatory measures had also since been implemented by some APEC economies.

This is happening in the context of trade-related rhetoric and actions that contribute to policy uncertainty. Policy pronouncements threatening trade-restrictive measures, and those promising retaliation, contribute to trade tensions in the region. Furthermore, actions that do not help to strengthen international bodies involved in facilitating dispute settlements could weaken regional cooperation and economic integration.

The likely overall effect of trade tensions on many APEC economies is negative. While there might be limited gains from raising tariffs for specific domestic sectors, and for particular sectors in economies not affected by those new measures, all economies involved in these trade tensions lose out along with their major trade partners due to forgone consumption and trading opportunities, disruptions in global supply chains, an unpredictable trading environment, and heightened uncertainty that negatively affect overall economic growth.

**Figure 2.10. Growth in the value of commercial services  
(y-o-y, in %), 1H 2016 – 1H 2018**



Note: Data not available for Brunei Darussalam and Papua New Guinea.  
Source: WTO; APEC PSU staff calculations.

<sup>37</sup> Based on trade data from the International Trade Centre and Eurostat.

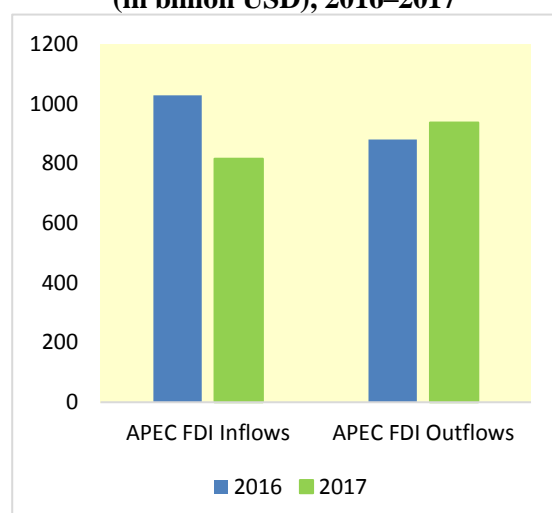
## 2.4 INVESTMENT TRENDS

As GDP and trade growth showed signs of moderating, a declining trend was also observed in foreign direct investment (FDI) flows, both globally and in the APEC region. Global FDI dropped anew in the first half of 2018, falling by 41 percent to an estimated USD 470 billion from USD 794 billion in the first half of 2017.<sup>38</sup>

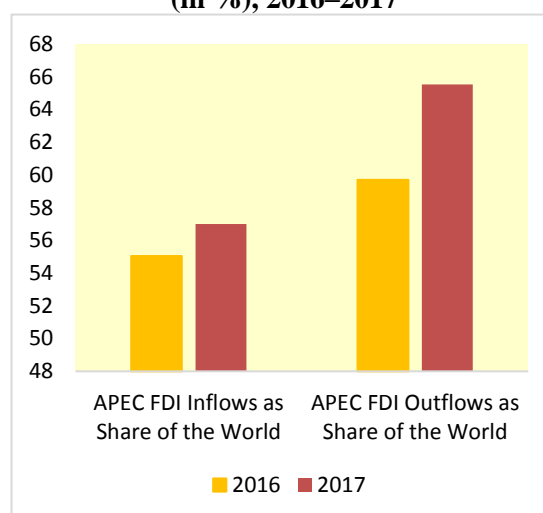
This decline followed a similar decrease in annual global FDI inflows in 2017 by 23 percent to USD 1.43 trillion compared to 2016, due in part to a 22 percent drop in the value of cross-border mergers and acquisitions.<sup>39</sup>

Available data covering all APEC economies show that, mirroring the global FDI trend, inflows of FDI into APEC economies also fell by 20.7 percent during the same period, while FDI outflows from the region went up by 6.5 percent (Figure 2.11). In terms of share of global FDI, APEC's share of FDI inflows increased to 57 percent in 2017 but its share of world FDI outflows was also higher at 65.5 percent (Figure 2.12).

**Figure 2.11. FDI inflows and outflows  
(in billion USD), 2016–2017**



**Figure 2.12. APEC share of world FDI  
(in %), 2016–2017**



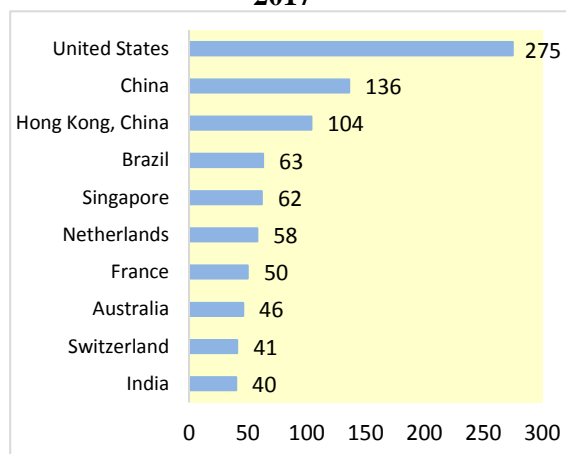
Source: UNCTAD World Investment Report 2018.

As in 2017, there were five APEC economies among the top 10 FDI hosts for the first half of 2018, with aggregate FDI inflows to these APEC members at USD 221.2 billion, equivalent to 47 percent of world FDI inflows (Figures 2.13 and 2.14).

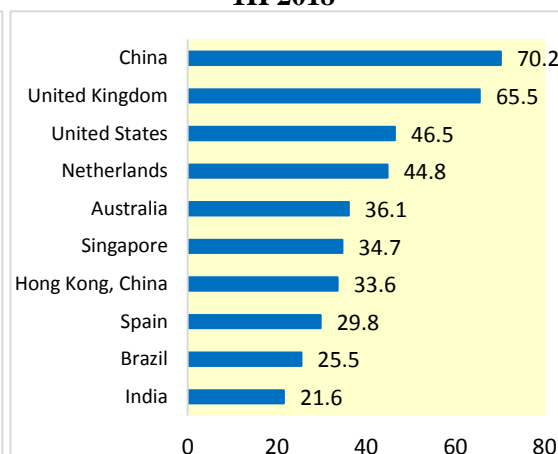
<sup>38</sup> United Nations Conference on Trade and Development (UNCTAD), *Investment Trends Monitor* no. 30 (October 2018).

<sup>39</sup> UNCTAD, *World Investment Report 2018: Investment and New Industrial Policies* (Geneva: United Nations Publications, 2018).

**Figure 2.13. Top 10 FDI host economies  
(value in billion USD),  
2017**



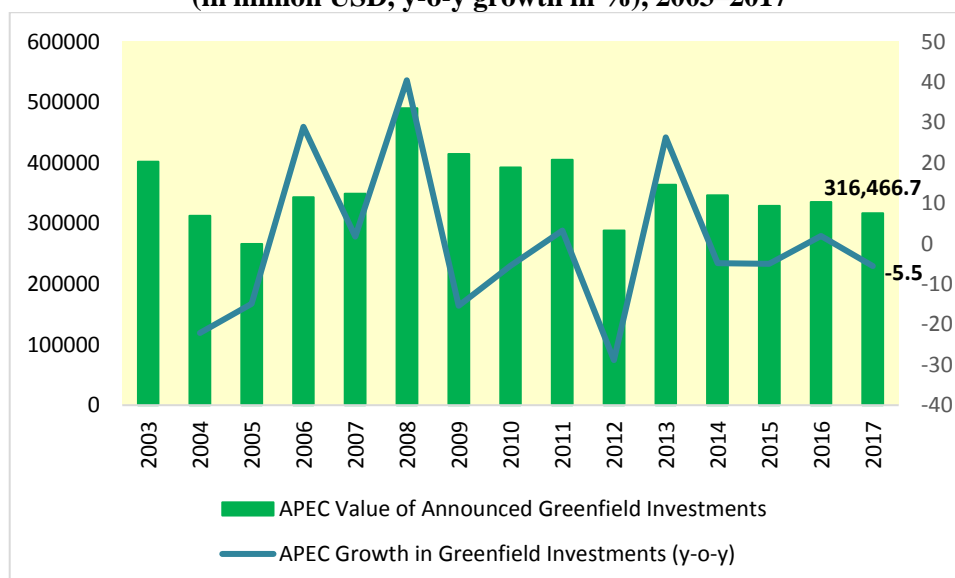
**Figure 2.14. Top 10 FDI host economies  
(value in billion USD),  
1H 2018**



Source: UNCTAD World Investment Report 2018.

Along with FDI, greenfield investments in APEC also contracted in 2017 by 5.5 percent compared to the level reached in 2016 (Figure 2.15). Greenfield investments are generally growth-enhancing since they necessitate building new plants, setting up new equipment and transferring technology and knowledge. The new resources and the transfer of technology and skills add to growth. The growth impact of greenfield investments could be even greater if they have positive spillovers such as the transfer of innovative technology or efficient systems. Greenfield investments also serve as a barometer for investors' optimism about an economy's economic fundamentals and growth prospects since these kinds of investments are at least medium term in nature.

**Figure 2.15. Value of announced greenfield investments  
(in million USD, y-o-y growth in %), 2003–2017**

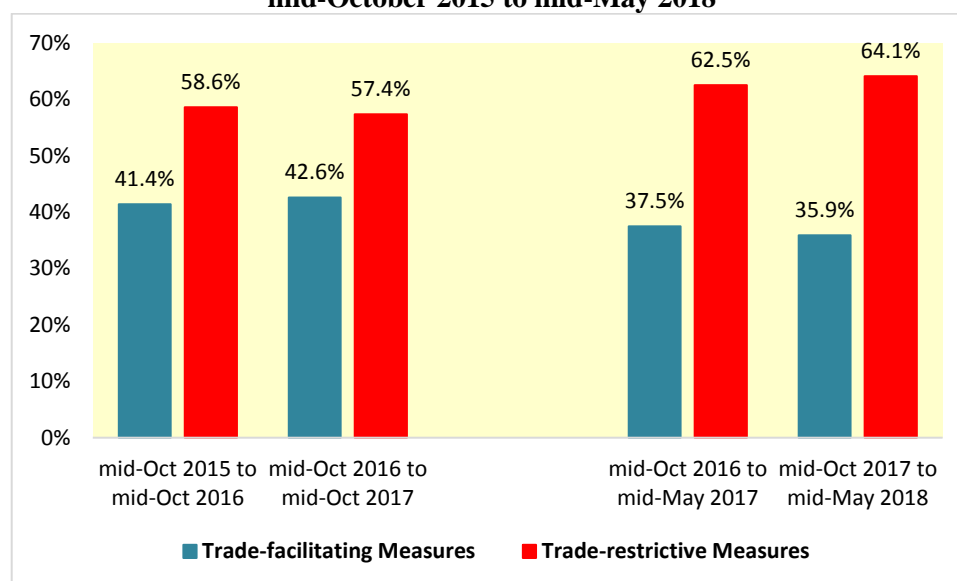


Source: UNCTAD World Investment Report 2018.

## 2.5 TRADE AND INVESTMENT MEASURES

According to World Trade Organization (WTO) reports on trade developments covering all 21 APEC member economies, trade-restrictive measures have consistently outnumbered trade-facilitating measures in the period mid-October 2015 to mid-May 2018.<sup>40</sup> Trade-restrictive measures comprised 57.4 percent of total trade measures for the period mid-October 2016 to mid-October 2017.<sup>41</sup> Latest available data on developments in the trading environment covering the period mid-October 2017 to mid-May 2018 show that trade-restrictive measures as a percent of total trade measures have increased anew to 64.1 percent compared to only 35.9 percent for trade-facilitating measures (Figure 2.16).

**Figure 2.16. Trade measures (as percent of total),  
mid-October 2015 to mid-May 2018**



Source: WTO, “Overview of Developments in the International Trading Environment: Annual Report by the Director General” (released every November); WTO, “Report to the Trade Policy Review Body (TPRB) from the Director General on Trade-Related Developments” (released every July).

The bulk of the trade-restrictive measures during mid-October 2017 to mid-May 2018 is attributed to the initiation of 37 anti-dumping investigations relating to international price discrimination (see Table 2.2 for the summary and Annex 1 for the specific measures<sup>42</sup>).<sup>43</sup>

<sup>40</sup> For comprehensive coverage of trade and trade-related measures implemented in the APEC region, this APEC Regional Trends Analysis uses two WTO reports : (1) “Overview of Developments in the International Trading Environment: Annual Report by the Director General” (released every November) for trade developments covering the annual periods mid-October 2015 to mid-October 2016 and mid-October 2016 to mid-October 2017; (2) “Report to the Trade Policy Review Body (TPRB) from the Director General on Trade-Related Developments” (released every July) covering the periods mid-October 2016 to mid-May 2017 and mid-October 2017 to mid-May 2018.

<sup>41</sup> WTO, “Overview of Developments in the International Trading Environment: Annual Report by the Director General (mid-October 2016 to mid-October 2017)” (16 November 2017).

<sup>42</sup> Annex 1 can be downloaded at [https://www.apec.org/-/media/Files/Publications/2018/Annex%201\\_Trade%20and%20Trade-Related%20Measures\\_mid-Oct%202017%20to%20mid-May%202018](https://www.apec.org/-/media/Files/Publications/2018/Annex%201_Trade%20and%20Trade-Related%20Measures_mid-Oct%202017%20to%20mid-May%202018).

<sup>43</sup> The WTO defines ‘dumping’ as a situation involving international price discrimination, wherein the price of a particular product is lower when sold in the importing economy compared to the price of the same product that is sold in the exporting economy. Article VI of the 1994 General Agreement on Tariffs and Trade (GATT) elaborates on the basic principles that cover the governance of anti-dumping actions including the investigation, determination and imposition of anti-dumping duties.

This is followed by the initiation of 17 countervailing investigations and 12 instances of imposition of or increase in tariffs, duties or taxes on exports and/or imports.<sup>44</sup>

**Table 2.2. Trade and other trade-related measures by APEC members, mid-October 2017 to mid-May 2018**

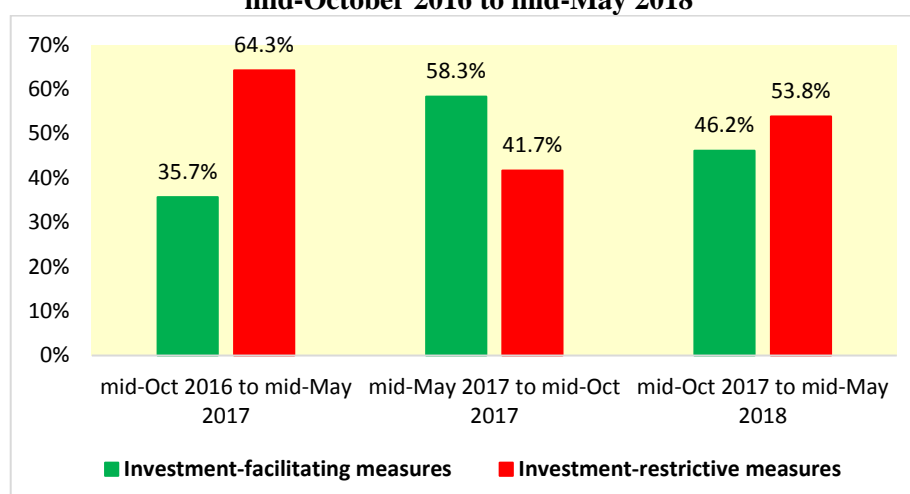
	Number of Measures
<b>Trade-restrictive measures</b>	
Initiation/Resumption of anti-dumping investigation	37
Initiation of countervailing investigation/duties	17
Initiation of safeguard investigation/duties	2
Increase/Imposition of import tariffs, export duties, and taxes	12
Imposition of export/import requirements/quotas/restrictions	2
Other trade-restrictive administrative measures	5
<b>Sub-total: Trade-restrictive measures</b>	<b>75</b>
<b>Trade-facilitating measures</b>	
Termination of anti-dumping investigation/duties	15
Termination of countervailing investigation/duties	6
Termination of safeguard investigation/duties	1
Reduction/elimination of export duties/import tariffs and taxes	10
Elimination of import/export ban and other restrictions	1
Other trade-facilitating administrative measures	9
<b>Sub-total: Trade-facilitating measures</b>	<b>42</b>
<b>Total: Trade and trade-related measures</b>	<b>117</b>

Source: WTO, “Report to the Trade Policy Review Body (TPRB) from the Director-General on Trade-Related Developments (mid-October 2017 to mid-May 2018)” (10 July 2018).

Latest data on investment measures covering nine APEC economies also show an uptick in investment-restricting measures compared to investment-facilitation measures during the period mid-October 2017 to mid-May 2018 (Figure 2.17). This represents a reversal from the previous period when investment-facilitating measures outnumbered investment-restricting measures.

<sup>44</sup> Parallel to anti-dumping duties are ‘countervailing measures’ meant to level the playing field between local and foreign producers of the same product in cases where the latter can afford to sell at a lower price because of government subsidies.

**Figure 2.17. Investment measures (as percent of total),  
mid-October 2016 to mid-May 2018**



Note: Only nine of the 21 APEC member economies belong to the G20, namely: Australia; Canada; China; Indonesia; Japan; Korea; Mexico; Russia; and the United States.

Source: WTO–UNCTAD–OECD 17th, 18th and 19th Reports on G20 Trade and Investment Measures.

The imposition of additional requirements combined with higher fees and lower thresholds for foreign exchange use or overseas financing largely made up the measures that effectively restricted investments during the period (Table 2.3 for the summary and Annex 2 for the specific measures<sup>45</sup>).

**Table 2.3. Investment measures among APEC G20 members,  
mid-October 2017 to mid-May 2018**

	Number of measures
<b>Facilitating foreign investments</b>	
Increasing transparency in the investment environment	0
Clarifying and simplifying rules and processes	3
Relaxing rules on foreign exchange quota and settlement	2
Increasing threshold for foreign investments	1
Lifting caps on foreign ownership	0
<b>Sub-total: Investment-facilitating measures</b>	<b>6</b>
<b>Restricting foreign investments</b>	
Imposing additional requirements/prohibitions	2
Increasing/Imposing taxes/fees/surcharges	2
Introducing foreign ownership ceiling	1
Lowering caps on foreign exchange use and overseas financing	2
<b>Sub-total: Investment-restricting measures</b>	<b>7</b>
<b>Total: Investment measures</b>	<b>13</b>

Source: WTO–OECD–UNCTAD 19th Report on G20 Trade and Investment Measures.

<sup>45</sup> Annex 2 can be downloaded at [https://www.apec.org/-/media/Files/Publications/2018/Annex%20Investment%20Measures\\_mid-October%20to%20mid-May%202018](https://www.apec.org/-/media/Files/Publications/2018/Annex%20Investment%20Measures_mid-October%20to%20mid-May%202018).

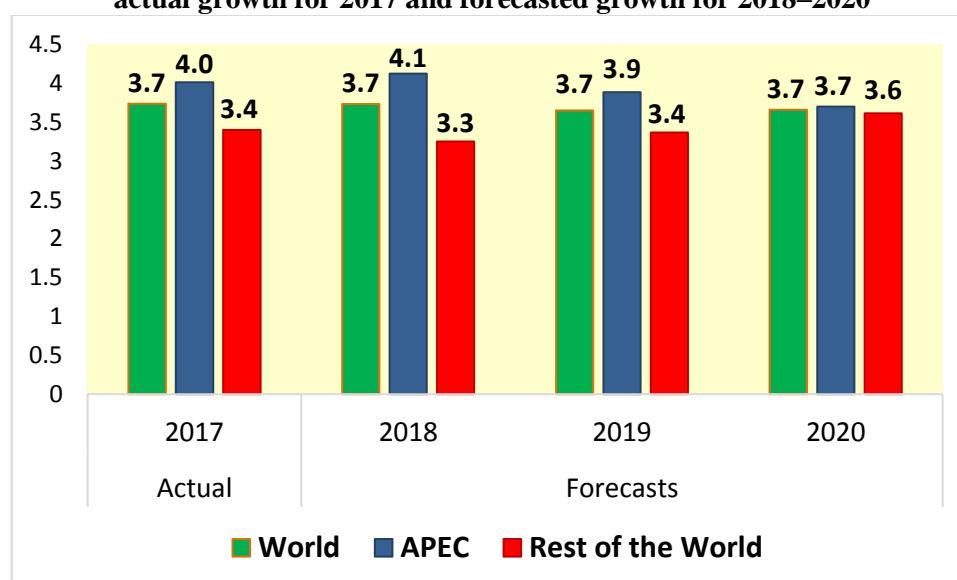


## 2.6 NEAR-TERM OUTLOOK, RISKS AND OPPORTUNITIES

The APEC region benefited from the global economic recovery that took off on a firmer footing starting mid-2016, characterised largely by stronger global demand and supported by relatively low interest rates and inflation. These accommodative conditions fed positively into domestic demand, boosting consumption, trade and investment, translating into higher economic growth. This buoyant global economic activity was reflected in APEC, with the region's GDP expanding by 4.0 percent in 2017 from a growth of 3.5 percent in 2016. Moreover, in 2017, APEC grew significantly faster than the rest of the world, which expanded at 3.4 percent.

APEC is expected to maintain this robust growth in 2018 with a 4.1 percent GDP expansion, propped up by the global economic momentum. However, growth is projected to moderate in 2019–2020, but still outpacing the rest of the world (Figure 2.18).

**Figure 2.18. Near-term real GDP growth (y-o-y, in %), actual growth for 2017 and forecasted growth for 2018–2020**



Source: IMF WEO database (October 2018); APEC PSU staff calculations.

The balance of risks has tilted to the downside for both the short term and the medium term due to prolonged and heightened uncertainty. A substantial part of this uncertainty is attributable to intensified trade tensions around the world. Tariffs and retaliatory measures that cover a large and varied number of trade products are already starting to affect trade activity, with declines in trade volume even as trade values grew only marginally in the recent period. This was the primary reason behind the WTO's move in September 2018 to downgrade its near-term merchandise trade volume forecast to 3.9 percent for the whole of 2018 (from the April 2018 forecast of 4.4 percent) and 3.7 percent for 2019 (from 4.0 percent). Another adverse consequence of current trade tensions is the potential worsening of trade relations, which could reduce business confidence and affect medium- and long-term trade and economic growth prospects.

Growth in the next two years is expected to be further weighed down by (1) uncertainty in the direction of monetary, fiscal and trade policies; (2) the upward trend in oil prices which could translate to higher inflation; (3) exchange rate pressures experienced by some economies and the implications for external debt repayments and other foreign exchange

exposure; and (4) episodes of financial turbulence as seen in equity markets in the early quarter of 2018 which, coupled with rising interest rates, could put a squeeze on credit conditions, dampening consumption and investment.

Against these downside risks is the upside potential of continued strength in global demand redounding to sustained domestic consumption. However, this scenario is looking less likely amid the prevailing environment of an increase in interest rates and inflation rates, especially with energy prices poised to remain elevated as supply constraints persist.

All of these factors are behind the downward revision by the IMF of its short-term GDP growth forecasts (Table 2.4). Nonetheless, the APEC region is still expected to outpace the rest of the world in the near future, albeit at a moderated pace. After solid economic performance in 2017–2018, APEC GDP growth is projected to moderate to 3.9 percent in 2019 and further slow to 3.7 percent in 2020, converging with world growth.

**Table 2.4. GDP growth projections (y-o-y growth, in %), 2018–2020**

	World	APEC	ROW
April 2018			
<b>2018</b>	3.9	4.1	3.6
<b>2019</b>	3.9	4.0	3.8
<b>2020</b>	3.8	3.7	3.9
October 2018			
<b>2018</b>	3.7	4.1	3.3
<b>2019</b>	3.7	3.9	3.4
<b>2020</b>	3.7	3.7	3.6
Difference			
<b>2018</b>	-0.2	0.0	-0.3
<b>2019</b>	-0.2	-0.1	-0.4
<b>2020</b>	-0.1	0.0	-0.3

ROW=Rest of the world.

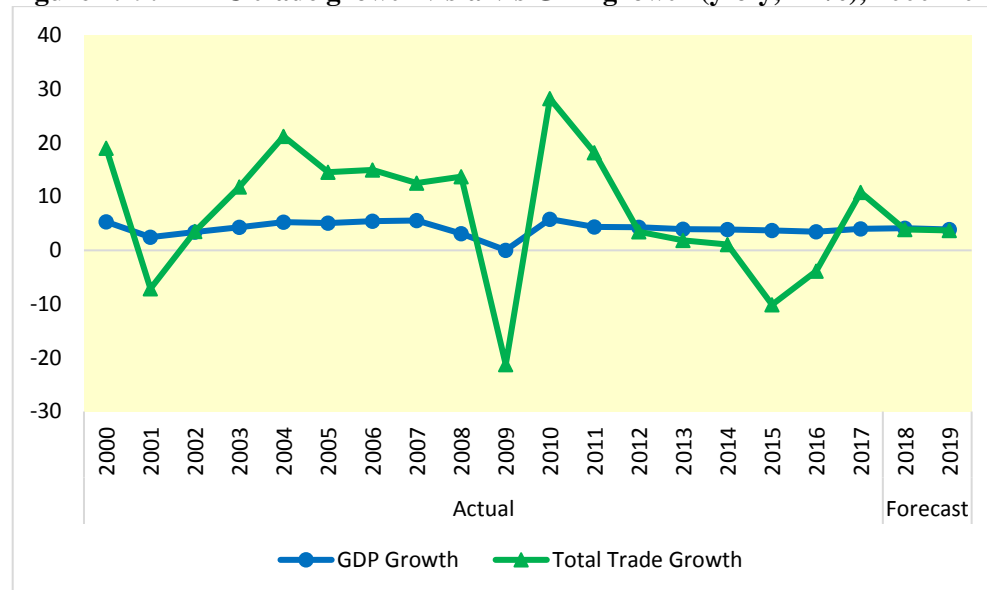
Note: GDP growth projections for APEC and ROW are calculated by APEC PSU staff based on the GDP forecasts from the IMF WEO database.

Source: IMF WEO database (April and October 2018); APEC PSU staff calculations.

## 2.7 CONCLUSION

For many years, trade has been the major source of economic growth in the APEC region. Indeed, the period 2000–2011 saw APEC trade growing above GDP, except for two years: (1) in 2001, when market confidence plunged as the dotcom bubble burst due to unrealistic valuations of start-up companies and market speculation; and (2) in 2009, during the global financial crisis. However, from 2012 to 2016, trade growth has consistently lagged behind GDP growth. It was only in 2017 that APEC trade once again expanded faster than economic output, with a projected convergence in 2019–2020 (Figure 2.19).

**Figure 2.19. APEC trade growth vis-à-vis GDP growth (y-o-y, in %), 2000–2019**



Source: WTO for total trade growth; IMF for GDP growth; APEC PSU staff calculations for APEC average growth.

This implies that trade is no longer the reliable driver of APEC economic growth it once was. In fact, when the responsiveness of economic growth to trade started to slow down, it was replaced by domestic consumption as the stable and strong source of growth among APEC economies.<sup>46</sup>

In a persistently uncertain external environment marked by dominating downside risks, which could dent an otherwise strong recovery in trade, economies need to boost current sources of growth while harnessing drivers of future growth. The recent escalation in trade tensions, not only in terms of tariff impositions but also difficulties in trade cooperation, has made finding alternative sources of growth more urgent.

On the demand side, consumption continues to be a reliable source of economic buoyancy. Sustaining domestic consumption entails maintaining a relatively accommodative environment. Policy actions to fuel consumption could differ across economies, depending on economy-specific conditions. For example, economies with benign inflation can opt to keep interest rates relatively low so as to support credit conditions and further spur consumption and investment. On the other hand, economies experiencing an upward trend

<sup>46</sup> See discussion in: R.C. Hernando and E.A. San Andres, “Structural Reform for Resilient and Inclusive Growth” (APEC PSU Policy Brief no. 13, Singapore: APEC, September 2015), <https://www.apec.org/Publications/2015/08/Structural-Reform-for-Resilient-and-Inclusive-Growth>.

in inflation rates could turn to fiscal policy measures where there is adequate room, such as reducing tax rates or implementing social protection initiatives to sustain consumer spending. In addition, economies with enough reserves and fiscal policy space could tap into government resources to implement projects or livelihood programmes that provide employment and augment household incomes.

There is also incentive for APEC to realise the economic potential of a growing middle class. A study by Brookings Institution shows that globally there are around 3.2 billion people who could be classified as middle class, with projections of another 160 million people added per year in the next five years.<sup>47</sup> The market for middle-class consumption is estimated to grow at an average rate of about 4 percent in the long term, with expected purchases in consumer durables as well as services such as tourism, entertainment, health, education and transport.

On the supply side, boosting the services sector could unlock opportunities for both developed and developing economies. In APEC, trade in commercial services remained robust even as trade in goods showed signs of moderating amid prolonged and elevated uncertainty in merchandise trade policy. The services sector is also the largest employer by sector, employing 59 percent of APEC's workforce in 2017, lending more urgency to boosting this sector.<sup>48</sup> Enhancing the services sector so that it can become an engine of growth requires removing regulatory bottlenecks, harmonising standards, adopting best practices, upgrading education and skills, and developing infrastructure.

Many changes are happening all at the same time, encompassing economic growth, financial stability and rapid technological changes, which have the potential to transform economies, businesses and individual lives. As the region stands on the precipice of change, APEC needs to remain responsive and relevant by updating its framework and strategies to be able to address emerging challenges effectively (see Box 2.2). As it considers its post-2020 agenda, APEC needs to remain steadfast in its objective of balanced, sustainable and inclusive growth through boosting reliable sources of growth and harnessing drivers of future growth.

### **Box 2.2. Fostering future drivers of growth in APEC**

After 25 years of implementing the 1994 Bogor Goals, APEC is in the process of conducting a final assessment of the initiative, which ends in 2020. An APEC Vision Group has also been formed to advise Senior Officials on APEC's priorities post-2020. The challenge is to come up with a strategy that aligns APEC policies, projects and programmes with the objective of sustainable and inclusive growth. While the strategy could remain focused on the free flow of trade and investments, it may also include promoting other drivers of future growth. Some examples of potential future drivers of growth are highlighted below.

#### *Digital economy*

First, there is immense opportunity in the digital economy. Estimates show that e-commerce currently makes up around 12 percent of total trade. Moreover, digital and online platforms are transforming businesses by expanding market reach to include the global market as well as introducing more efficient point-of-sale systems that guarantee transparency and real-time

<sup>47</sup> H. Kharas, "The Unprecedented Expansion of the Growing Middle Class: An Update" (Global Economy and Development Working Paper no. 100, Washington, DC: Brookings Institution, February 2017).

<sup>48</sup> Data from StatsAPEC: <http://www.statistics.apec.org>.

payments. Along with opportunities, there are also challenges inherent in the digital era, foremost of which is the reskilling of the workforce to cope with technological changes. The other challenge relates to putting in place the necessary digital infrastructure to widen access to broadband and smartphones.

#### *Green technology*

Second, APEC could promote green technology, starting with micro, small and medium enterprises (MSMEs). An APEC PSU policy brief published in February 2018 finds that MSMEs make up 97 percent of all enterprises and employ 50 percent of the workforce in the region, contributing between 20 to 50 percent to GDP growth. The aggregate environmental impact of MSMEs could be significant, so it might be useful to address associated challenges of defining green, sustainable and innovative MSMEs, which involves gathering baseline data; establishing a framework; assessing APEC work in this area thus far and determining gaps; and developing appropriate green growth indicators to have a benchmark with which to compare progress.<sup>49</sup> Moreover, adopting a greener approach could make resources more sustainable, benefiting resource-dependent APEC economies. In fact, APEC has made decisive strides toward this end. In 2012, APEC Leaders agreed to cut tariff rates on 54 environmental goods to 5 percent by 2015. An assessment conducted in 2015 shows that most economies had successfully reduced their tariff rates while the rest had plans to do so.<sup>50</sup>

#### *Greenfield investment*

Third, greenfield investments have the potential to positively affect growth both in the short term and the medium term since these kinds of investments require the transfer of resources, equipment, technology and skills from the investor to the economy. Economies might benefit from understanding the whys and hows of greenfield investments: Why are they declining? How do economies attract greenfield investments? The answers may differ per economy, although macroeconomic stability, the peace and order situation, and the overall regulatory and business environment are some of the factors that investors assess before they commit to new, especially medium-term, investments.

#### *Productivity-enhancing reform*

Finally, ensuring that economic growth is inclusive as well as sustainable requires implementing reforms that enhance productivity. Different economies in different development stages may adopt different strategies, mindful of what is both appropriate and feasible. Risks could be mitigated through careful examination of the economy's level of economic, financial and technological development; proper calibration and sequencing of reforms; preparation of mitigating measures to support those affected by the reforms; and continuous monitoring of economic impact, especially among the poor and vulnerable groups.

Improving education, health and social outcomes could also transform an economy; for example, it could facilitate an easier grasp or adoption of technological advancements, with potential significant implications for development pace and phase – from largely agricultural to more industrial, financial or knowledge-oriented. This could also result in greater economic, financial and social inclusion as more people have the skills and education necessary to be able to participate fully in economic development.

Regulatory reforms that widen the space for and the depth of innovation remain crucial in any economy because they help facilitate the production of more goods and services at less cost,

<sup>49</sup> For example, see: D. Cheok and S.K. Singh, “Identifying Green, Sustainable and Innovative MSMEs in APEC” (APEC PSU Policy Brief No. 19, Singapore: APEC, February 2018), <https://www.apec.org/Publications/2018/02/Identifying-Green-Sustainable-and-Innovative-MSMEs-in-APEC>.

<sup>50</sup> APEC PSU, “Assessment of the APEC Leaders’ Growth Strategy” (Singapore: APEC, November 2015), <https://www.apec.org/Publications/2015/11/Assessment-of-the-APEC-Leaders-Growth-Strategy>.

which could feed into productivity, business profitability and wages/incomes, leading to the sustainability of businesses and employment.

Reforms in infrastructure that result in increased investments continue to be a game-changer in economic development. Farm-to-market roads literally pave the way for small and large businesses to raise profits and improve household incomes. In this digital age, building and boosting technological infrastructure to increase the speed and reliability of internet connections or widen access to mobile technology are crucial not only to be able to adapt to dynamic changes but also to increase financial inclusion, which is one of the pathways toward inclusive growth.

Even as trade and investments continue to contribute to growth, it is crucial for APEC to diversify and foster other drivers of future growth to remain resilient and ensure that economic growth benefits all, including poor households, women, MSMEs and other vulnerable groups.

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