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APEC Economic Policy Report 2021

Structural Reform and the Future of Work

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Structural Reform and the Future of Work

APEC Economic Committee

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Note: The terms "national", "nation" used in the text are for purposes of this report and do not imply the "political status" of any APEC member economy.

Cover photo: Shaping Motorcycle Tires by Huỳnh Văn Truyền / APEC Photo Contest 2021

PREFACE

The future of work is not about technology, but about people. Even as we get excited about the latest technology and advancements in artificial intelligence, discussions about the future of work should still be about the well-being of people and society in an increasingly digitalised economy.

This year's APEC Economic Policy Report (AEPR), which includes the Main Report, Individual Economy Reports (IERs), and Case Studies, discusses the complex topic of Structural Reform and the Future of Work. The four megadrivers of change discussed in the report—technological change, climate change, globalisation and demographic change—show how far our economies and societies have developed, but this development also comes with costs. The economic structures and policies that unleashed innovation, generated prosperity, and increased life expectancy have also led to growing inequality, environmental damage, and rising dependency ratios. And even as world grappled with these megadrivers, it experienced the COVID-19 pandemic in 2020, which added a layer of urgency to addressing these old challenges as new challenges emerged. The megadrivers of change will continue, but there is a need to address the real social and economic impacts that come with this change. In line with ensuring a people-centric future of work, the report makes five broad policy recommendations: (1) ensure economic security, (2) develop and redevelop skills, (3) update labour laws and institutions, (4), cooperate across borders, and (5) operationalise APEC initiatives on future of work.

This report was made possible through generous funding provided by Australia and New Zealand. I would like to express my gratitude to the AEPR 2021 Core Team—comprised Canada; China; Hong Kong, China; Indonesia; Malaysia; Mexico; New Zealand; Peru; Russia; Chinese Taipei; and the United States—for steering the AEPR to completion, and particularly to New Zealand's Annette Gittos for taking the role of Core Team Lead. I am happy to note that all 21 APEC Economic Committee (EC) members provided IERs for this AEPR, and special thanks are due to Canada; China; Indonesia; Malaysia; Mexico; New Zealand; the Philippines; Russia; Chinese Taipei; and the United States for contributing case studies. I would also like to thank the APEC Secretariat's Programme Director for the EC, Krirkbhumi Chitranukroh, for his valuable advice throughout the process and the APEC Policy Support Unit (PSU) for managing the production of the main report. The AEPR 2021 Main Report was drafted by a team at the PSU comprising Emmanuel A. San Andres, Tammy L. Hredzak, Satvinderjit Kaur Singh, Mas Ari Amry Bin A. Rahman, and Gabriel Chen Kwok Hui and a team at Detecon Asia-Pacific comprised of Fernando Paquete, Jose Santiago, Richard Horne, Sivinee Visoldilokpun, Lukas Michalzik and Thomas Wehr. This report has also benefited from the peer-review and inputs of members of the EC and the Human Resources Development Working Group (HRDWG).

As the EC's flagship report for 2021, it is my fervent hope that the AEPR on Structural Reform and the Future of Work feeds into the implementation of the Enhanced APEC Agenda on Structural Reform (EAASR) and Putrajaya Vision 2040, together with other ongoing EC initiatives such as the 3rd Ease of Doing Action Plan and the APEC Collaborative Framework on Online Dispute Resolution of Cross-Border Business to Business Disputes. I look forward to more EC and cross-fora collaboration on putting people at the centre of the future of work and the digital economy.

James Ding
Chair
APEC Economic Committee

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ABBREVIATIONS

APEC	Asia-Pacific Economic Cooperation
ASEAN	Association of Southeast Asian Nations
OECD	Organisation for Economic Co-operation and Development
MSMEs	Micro, small and medium enterprises
PSU	Policy Support Unit (APEC)
UN	United Nations
WTO	World Trade Organization

Abbreviations for APEC economies:

AUS	Australia
BD	Brunei Darussalam
CDA	Canada
CHL	Chile
PRC	People's Republic of China
HKC	Hong Kong, China
INA	Indonesia
JPN	Japan
ROK	Republic of Korea
MAS	Malaysia
MEX	Mexico
NZ	New Zealand
PNG	Papua New Guinea
PE	Peru
PH or PHL	The Republic of the Philippines
RUS	Russia
SGP	Singapore
CT	Chinese Taipei
THA	Thailand
US or USA	United States
VN	Viet Nam

KEY MESSAGES

- The future of work is not about technology but about people and the changing world around them. In the next decades, the future of work is expected to be affected by four megadrivers of change: technological change, climate change, globalisation and demographic change.

- Technological change has created new jobs and increased productivity. It has also enabled greater flexibility in production and workstyles, for example, through the gig economy and remote working, and more opportunities for career advancement through e-learning. Facilitated by technology, the gig economy is growing by about 33 percent annually. However, as the world enters the Fourth Industrial Revolution (4IR) era, which is fundamentally anchored by the use of advanced digital technology, unequal access to technologies and the digital divide between low-income and high-income economies continue to threaten growth.

- Within economies, rapid technological changes and automation have created job polarisation that widens wage inequality as manual and routine jobs face higher risks of displacement. Digital technology and the gig-economy have also created new challenges to ensuring legal labour protections of the workforce. Moreover, women are over-represented in occupations at high risk of automation and are less equipped with skills associated with automation. Existing gender gaps put women at a disadvantage in benefiting from the new job opportunities.

- Good governance, a conducive investment climate, and a sound macroeconomic policy framework will continue to be priorities in comprehensively addressing the growth divergence between high- and low-income economies.

- Climate change and the rise in incidence of extreme weather events impacts jobs; they damage business assets, disrupt transport and industrial infrastructure, and displace workers and settlements. The International Labour Organization (ILO) projects that a global temperature increase of 1.5 degrees Celsius will result in the loss of 2.2 percent of total hours worked, 80 million jobs and USD 2.4 trillion worldwide by 2030. The impact will be greatest in regions with high heat stress and for resource- or climate-dependent sectors like agriculture and construction.

- Transformation to a greener, circular economy to combat climate change is believed to have the potential to significantly contribute to the total number of jobs in the future. Net employment change is expected to be positive as consumption patterns adapt and green occupations grow. The ILO estimates that a shift to a greener economy with the right policies in place would create 24 million new jobs globally by 2030, with most of the job creation originating in the renewable energy sector. However, the impacts of the green economy and the circular economy come with a few caveats and limitations, especially with regard to skills mismatch and gaps.

- Globalisation has been a driving force for growth in the APEC region by providing access to new markets, leading to an increase in output, and more and better job opportunities. However, while specialisation improves efficiency in the economy and raises overall welfare levels, non-competitive industries may not survive and some workers can become structurally unemployed. But the gains from trade and economic growth provide fiscal space to improve access to basic services, including for vulnerable and disadvantaged groups. The efficiency gains and positive effect of globalisation on overall welfare may be enhanced by providing for labour adjustment and investments in reskilling and training of human capital.

- Average life expectancy has risen across the APEC region while birth rates have fallen. A key concern for policymakers is that an ageing population and rising dependency ratios will increasingly burden social protection and pension systems, threatening their financial viability. But it should also be recognised that the elderly members of the population are key contributors to the economy. The elderly have greater spending power, bring lifelong experiences to the workplace and are the source of significant demand in the care professions. However, their economic participation is hindered by lack of technological training, skills mismatches, lack of conducive working arrangements and workplace discrimination.

- The COVID-19 pandemic has had a significant impact on enterprises and workers. The type of work available and how it is conducted has drastically changed and, in doing so, accelerated 'future of work' trends. While some businesses have thrived in these new settings, others have had to cease operations. The subsequent labour market adjustments have resulted in reduced working hours or job losses. Many workers have dropped out of the labour market altogether.

- Workers in the informal economy are particularly vulnerable to the impact of COVID-19 through lack of job security, irregular and insufficient incomes, as well as poor access to healthcare and social protection. Thirty-four percent of the total employed APEC population in 2019 were estimated to be in either own-account work or contributing family work – a proxy for the informal economy. A larger reduction in employment of -3.1 percent was seen among them compared to wage and salaried employees. Meanwhile, high-skilled workers were the least affected as they were able to work from home and were more likely to have healthcare benefits and social protection. Employment in medium-skilled occupations dropped the most as it includes jobs that were be severely impacted by restrictions such as sales and service workers and plant operators.

- Women workers were more disadvantaged by COVID-19 than men. In APEC, women accounted for 44 percent of the total employed population in 2019 but they accounted for 54 percent of the total change in employment in 2020. They were also more likely to take on the burden of increased unpaid or underpaid care work. Meanwhile, youth were heavily impacted by increased joblessness, reduced entry-level positions, and disruptions to education provision. Other vulnerable segments of society – migrant workers, the elderly, the disabled, ethnic minorities and indigenous peoples – also

experienced higher unemployment rates, lower wages and reduced resilience during the pandemic.

- APEC economies implemented a range of extraordinary policy measures to help mitigate the impacts of COVID-19 – job retention and wage subsidy programmes, COVID-19 leave support schemes (including medical and family caregiving leave), social security programmes, investment in skills and training, and job redesign and growth initiatives. However, challenges remain as economies strive to balance immediate recovery needs with concerns surrounding fiscal budgets and long-term debt sustainability. Disparities in vaccination rates threaten an unequal recovery for the region. Moreover, there may be negative long-term impacts on labour markets that hinder a quick rebound.

- The disruptive nature of the pandemic and the impact of megadrivers on the labour market require effective social protection systems that reduce income uncertainty and mitigate the downside to workers. Economies can improve their protection systems by expanding the scope and coverage of unemployment benefit programmes, such as cash transfers and unemployment insurance, to cover the most vulnerable workers and by designing more targeted active labour market policies that can improve the employability of the unemployed.

- Policies that promote skills building in the face of rapidly changing labour market conditions are important to mitigate the skills gap and strengthen the resilience of the workforce. Governments can support the development of skills by developing better skills forecasting systems, expanding reskilling and upskilling programmes, promoting lifelong learning and increasing targeted investments in education to better align school curricula and labour market skills needs.

- The future of work also requires that policymakers be able to react quickly to changing market conditions by designing responsive and efficient labour market regulations. Governments need to improve the scope and coverage of employment protection legislation to include those in non-standard employment, ensure more inclusive collective bargaining systems, facilitate remote working arrangements and address discrimination.

- APEC is well-placed to address many of the behind-the-border and cross-border issues that have arisen due to the megadrivers affecting the future of work by promoting greater international labour mobility by reducing regulatory barriers; and by improving the international portability of social security benefits, updating tax rules to help prevent cross-border corporate tax avoidance, improving mechanisms to resolve cross-border commercial and labour disputes and having an inclusive approach to representation in policy discussions.

1. INTRODUCTION

Technological change and the future of work are both a threat and an opportunity for employers and workers. New technology could help APEC economies navigate a world in which knowledge is everything. With the cost of adaptation and skills training so high, everyone has a vested interest in ensuring that firms and workers are learning at pace. Economies need to be creating learning experiences that are supported by technology, while also realising tangible benefits for innovation. Digital transformation is one of the most important socioeconomic transformations of our times, and the arrival of the Fourth Industrial Revolution (4IR) has transformed economies in many different ways. The impacts of automation on the labour market are already well documented. Large and growing numbers of people – particularly lower-income workers, who are disproportionately likely to be poorly educated – are beginning to see their job prospects curtailed by automation. Robots are now finding work at warehouses. Even low-skilled retail staff have seen their prospects decline. Addressing the challenges of the future of work and economic development is central to building a modern, inclusive society.

The paragraph you just read was written by a robot. To be precise, it was written by a text generator powered by artificial intelligence developed by InferKit.[1] A human only had to type in prompts – 'Technological change and the future of work are' and 'the impacts of automation on the labour market' – and the text generator tapped into its artificial neural networks to provide the rest of the paragraph. A human was also needed to edit the text to include APEC references (the original text mentioned India and the United Kingdom) as well as deal with nomenclature issues. Note that the free trial version was used to generate the above paragraph; the paid version can presumably generate better and more coherent text.

The future of work is here, with 4IR technologies and new working arrangements changing economic opportunities and employment relationships. Yet, our economic structures, laws and institutions remain products of the past. Unaddressed challenges with roots in the era of steam engines – like climate change and growing inequality – are still hobbling economies and constraining economic potential.

This sets the backdrop for Chapter 2, which discusses the four megadrivers of change – technological change, climate change, globalisation, and demographic change – and how they relate to the future of work. Chapter 3 analyses how the COVID-19 pandemic, the biggest humanitarian and economic shock in recent history, has interacted with 'future of work' trends and accelerated digitalisation and automation, while Chapter 4 looks into how human resource management has changed in this context. Chapter 5 discusses policy options to tackle future of work challenges, and Chapter 6 concludes with a summary of findings and recommendations.

This report builds on the work of previous APEC Economic Policy Reports (AEPRs), as their analyses feature intersections with issues relevant to the future of work. AEPR 2017 on Human Capital Development discussed structural unemployment and skills mismatch due to globalisation, technological change, and ageing populations, and pointed to the importance of ensuring access to skills development, reskilling and lifelong learning. AEPR 2019 on the Digital Economy tackled productivity and business dynamism for firms and for micro, small

[1] See InferKit's website at https://inferkit.com/docs/generation

and medium enterprises (MSMEs) in the context of digitalisation, highlighting the need to rethink competition policy, promote innovation, and close the digital divide. AEPR 2018 on Infrastructure discussed the importance of investment and access to information and communication infrastructure, while AEPR 2020 on Structural Reform and Women's Empowerment tackled the gendered aspects of economic opportunities including in a digital economy. As such, whenever possible, this AEPR will seek to avoid repetition and duplication of the discussions and recommendations in previous AEPRs.

2. MEGADRIVERS OF THE FUTURE OF WORK

Change has always been a defining factor of the world of work. Every historical milestone or technological advancement, from the invention of agriculture to the invention of the Internet, is associated with a restructuring of economic relationships and institutions. The International Labour Organization (ILO) defines the future of work along five dimensions: (1) the future of jobs; (2) the quality of jobs; (3) wage and income inequality; (4) social protection systems; and (5) social dialogue and industrial relations.[2]

The future of jobs refers to job creation, job destruction or the changing composition of the future labour force. The quality of jobs evaluates issues like working conditions and the income security they provide. The wage and income inequality aspect touches on issues relating to average growth of wages and earnings, and their distribution across households in the future. Social protection systems are an important aspect of future of work in terms of addressing income uncertainty and supporting those in non-traditional forms of employment. Lastly, the social dialogue and industrial relations dimension is concerned with how organised worker institutions may evolve in the coming years to continue to support the labour force.

Although discussions on the future of work often revolve around cutting-edge technologies like artificial neural networks and nanorobotics, the future of work is ultimately not about technology but about people and the changing world around them. This chapter discusses the four megadrivers of change that are expected to affect the future of work in the next decades:

- technological change
- climate change
- globalisation
- demographic change.

These megadrivers are both global and local, affecting the world simultaneously due to their broad and massive extent, but also having differential impacts across regions and economies according to their development level and readiness to adapt (see Box 2.1).

[2] International Labour Organization (ILO), "The Future of Work: A Literature Review," Working Paper 29, ILO, Geneva, 2018.

Box 2.1 Regional perspectives on the future of work

Differences in economic institutions generate large variations in the way economies are affected by, and react to, technological progress.[3] Differences in economic policies, infrastructure (such as broadband coverage), factor endowments, competitive advantage, and skills base mean that each economy is exposed to a unique set of opportunities and challenges in embracing new technologies and the future of work.

In sub-Saharan Africa, where 60 percent of the population comprises smallholder farmers who contribute to 23 percent of the GDP,[4] the Fourth Industrial Revolution (4IR) is expected to drive the transformation of the agricultural sector, especially in the agro-processing space. The use of information and communications technology (ICT) in this sector will allow producers to upgrade all stages of the agricultural value chain. For instance, big data and the Internet of things (IoT) have made 'telephone' farming a reality by allowing middle-class farmers to farm their out-of-town holdings while working in cities.[4]

The use of digital technologies also enables farmers to be connected to service providers. For example, the Trotro Tractor[5] and Hello Tractor apps are used to buy mechanisation services whereas the Esoko[6] platform allows farmers to connect to markets. Despite relying heavily on agriculture, these process improvements allow African farmers to advance the sector by leveraging on the linkages with the industry and services sectors. In fact, capitalising on this advantage, manufacturers of high-quality products from agricultural proceeds may create a vast number of jobs across the value chains that include manufacturing, logistics, and retail.[7]

Developing Asian economies, on the other hand, have created over 30 million non-agricultural jobs annually in the last 25 years. The job creation, largely driven by the shift in employment from agriculture to industry and services, enabled improved productivity and higher incomes for workers.[3] Technological advancements, such as use of modern machine tools in manufacturing and of ICT in services, played a huge role in elevating productivity among economies in the region. For instance, according to data from the International Federation of Robotics, from 2010 to 2015, the stock of industrial robots rose by 70 percent (from 552,000 to 887,400 units) in nine economies within this region, illustrating the large-scale adoption of automation by businesses.[3] At the same time, a combination of many factors, including international trade, foreign direct investment, investment in education, and ease of doing business, contributed toward a sustainable environment for business growth. These developments gradually led to a rapid reduction in poverty across the Asian economies.

New technologies often result in reduction of workers for a given level of output. However, technological changes, supported by economic expansion, also led to new occupations and industries such as automotive workers and car salesmen in the 1990s, and app developers and

[3] African Development Bank, Asian Development Bank, European Bank for Reconstruction and Development, and Inter-American Development Bank (AfDB, ADB, EBRD, IDB), "The Future of Work: Regional Perspectives" (Washington DC: AfDB, 2018), https://www.afdb.org/fileadmin/uploads/afdb/Documents/Publications/The-Future-of-Work-regional_perspectives.pdf

[4] L. Goedde, A. Ooko-Ombaka, and G. Pais, "Winning in Africa's Agricultural Markets,' McKinsey and Company, 15 February 2009, https://www.mckinsey.com/industries/agriculture/our-insights/winning-in-africas-agricultural-market; T. Jackson, "Telephone Farmers' Reaping the Benefits of Agri-tech," *BBC*, 31 July 2015, https://www.bbc.com/news/business-33610593

[5] Trotro Tractor, Website, accessed 5 July 2021, http://www.trotrotractor.com/

[6] Esoko, Website, accessed 5 July 2021, https://www.esoko.com/

[7] AfDB et al., "The Future of Work"; African Center for Economic Transformation (ACET), "African Transformation Report 2017: Agriculture Powering Africa's Economic Transformation" (Accra: ACET, 2017), https://acetforafrica.org/acet/wp-content/uploads/publications/2017/10/ATR17-full-report.pdf

ICT technicians in the 2000s. In India; Malaysia; and the Philippines, approximately 43 to 57 percent of the jobs emerging between 2008 and 2018 were related to ICT.[8]

Europe and Central Asia provide a slightly different yet interesting case for researchers of the future of work. In Emerging Europe, where populations are ageing and birth rates are falling, the old-age dependency ratio is rising at a higher rate than economies like the US and the economies of the Organisation for Economic Co-operation and Development (OECD). Based on the current trend, the working-age population of Central and South-Eastern Europe is expected to shrink by 13.4 percent by 2040. For many economies in this region, this trend has been exacerbated by substantial emigration to higher-income economies in the European Union (EU), a trend that can be observed across all skill levels.[9] This puts a significant upward pressure on wages in the region and makes it increasingly challenging for some economies to ensure the critical mass of skills and expertise necessary to develop both the new and old economic sectors successfully.[3]

As the labour force in Emerging Europe shrinks and labour costs increase, the incentive to undertake automation will be greater relative to other regions. Based on World Bank's World Development Report in 2016, the share of automatable jobs in the foreseeable future among economies in this region is close to 56 percent.[10] Nevertheless, despite upward pressure on wages due to the demographic challenges, a high degree of technological adoption may theoretically help to reduce the pressure and maintain competitiveness, albeit potentially at the expense of certain jobs.[11]

In contrast to Emerging Europe, economies in the Southern and Eastern Mediterranean regions, parts of Central Asia, India and Turkey face relatively lower old-age dependency ratios and high fertility rates. Hence, these regions present an entirely different set of demographic challenges, centred on creating new quality jobs for the large number of youths who enter the labour market each year.[3]

2.1 TECHNOLOGICAL CHANGE

In the last decade, there has been an acknowledgement that the world has entered into what has been called the Fourth Industrial Revolution (4IR)[12] characterised by the intensive use of technologies such as artificial intelligence (AI), machine learning, the Internet of things (IoT), autonomous hardware and software robotics.[13] In terms of the labour market, Acemoglu and Restrepo posit that the 4IR, similar to previous industrial revolutions, increases the output and productivity of capital and labour and allows for substitution between both factor inputs for certain tasks.[14] Nevertheless, rapid technological changes and automation have created a

[8] Asian Development Bank, "Asian Development Outlook (ADO) 2018: How Technology Affects Jobs" (ADB, 2018), https://dx.doi.org/10.22617/FLS189310-3

[9] R. Atoyan, et al., "Emigration and Its Economic Impact on Eastern Europe," Staff Discussion Note SDN/16/07, IMF, 2016, 2, https://www.imf.org/external/pubs/ft/sdn/2016/sdn1607.pdf

[10] World Bank, "World Development Report 2016" (World Bank, 2016), https://www.worldbank.org/en/publication/wdr2016

[11] D. Acemoglu and P. Restrepo, "Robots and Jobs: Evidence from US Labor Markets," Working Paper 23285, National Bureau of Economic Research (NBER), Cambridge, MA, 2017, https://www.nber.org/system/files/working_papers/w23285/w23285.pdf

[12] The World Economic Forum coined the term 4IR after a German high-tech strategy project 'Industrie 4.0' to capture the creation and deployment of new technologies that merge the physical, digital and biological worlds across all disciplines, economies and industries. See ILO, "The Future of Work."

[13] APEC, "COVID-19, 4IR and the Future of Work," Policy Brief 34, APEC, Singapore, 2020.

[14] D. Acemoglu and P. Restrepo, "Automation and New Tasks: How Technology Displaces and Reinstates Labor," *Journal of Economic Perspectives* 33, no. 2 (2019): 3–30.

degree of job polarisation, with wage inequality widening as manual and routine jobs face higher risk of displacement.[15]

At the same time, the COVID-19 pandemic has highlighted the positive role played by technology in connecting people to new ways of working and gaining income opportunities. While certain industries like accommodation and food services have been heavily hit, employment in some sectors, such as the technology and pharmaceutical industries, held up well as people adopted new ways of working such as remote working[16] and telemedicine.[17] A study of nine economies by McKinsey Global Institute has found that, on average, more than 20 percent of the workforce in advanced and emerging economies could work remotely as effectively as working from an office.[18] Professional services, like finance, insurance and management, have the highest potential for engaging in remote work without any loss in productivity. Often, the potential for remote work is higher in advanced economies, such as Germany; Japan; the UK; and the US, as businesses and financial services form a large share of their economies. A survey by the US Bureau of Labor Statistics found that 37 percent of jobs could be done from home, although this varies according to location and industry.

Technology has also enabled greater flexibility in production, allowing companies to decentralise tasks, and employees to unbundle their jobs into sets of smaller tasks. Such flexibilities have enabled the emergence of the gig or sharing economy.[19] The gig economy, for instance, allows people to complement their daily work and earn additional income with little to no barriers to entry. The OECD has suggested that this new flexible way of working should not only benefit people who desire flexibility, but also benefit groups that have been conventionally marginalised, such as women, youth, and disabled workers.[20] In fact, new technologies are also expected to play an immense role in ageing economies as the elderly are likely to require digitally assisted healthcare or assistance in their daily lives.[21] For example, there is a growing market for in-home technology products and remote health monitoring to fill the gap in safety, health and connection among the ageing population.

Rapid digital transformation enables people to have multiple careers in their lifetime, across various industries and locations, owing to greater availability of reskilling opportunities.[22] The use of technology in education enables people to acquire new skills at minimal cost. Such skills and education opportunities allow workers to gain an upper hand in the job market and give them greater agility in treading new career paths.

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[15] M.A. Goos, A. Manning, and A. Salomons, "Explaining Job Polarization: Routine-Biased Technological Change and Offshoring," *American Economic Review* 104, no. 8 (2014): 2509–26; D. Autor, "Why Are There Still So Many Jobs? The History and Future of Workplace Automation," *Journal of Economic Perspectives* 29, no. 3 (2015): 3–30.

[16] C. Park, and A.M. Inocencio, "COVID-19, Technology, and Polarizing Jobs," ADB Briefs 147, ADB, Manila, 2020, http://dx.doi.org/10.22617/BRF200217-2

[17] N. Ayati, P. Saiyarsarai, and S. Nikfar, "Short and Long Term Impacts of COVID-19 on the Pharmaceutical Sector," *DARU Journal of Pharmaceutical Sciences* 28 (2020): 799–805, https://doi.org/10.1007/s40199-020-00358-5

[18] S. Lund, A. Madgavkar, J. Manyika, and S. Smit, "What's Next for Remote Work: An Analysis of 2,000 Tasks, 800 Jobs, and Nine Countries," McKinsey and Company, 23 November 2020, https://www.mckinsey.com/featured-insights/future-of-work/whats-next-for-remote-work-an-analysis-of-2000-tasks-800-jobs-and-nine-countries

[19] E. Brynjolfsson, and A. McAfee, *The Second Machine Age: Work, Progress and Prosperity in a Time of Brilliant Technologies* (New York: W. Norton Company, 2014).

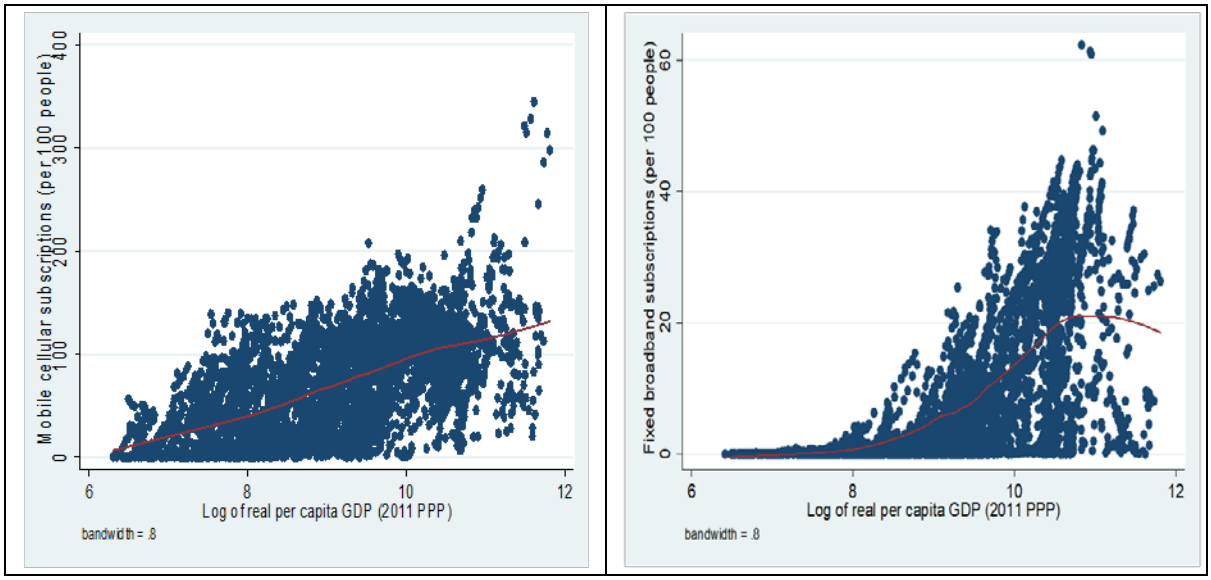
[20] Organisation for Economic Co-operation and Development (OECD), "Going Digital: The Future of Work for Women" (Paris: OECD, 2017).

[21] S. Pai, "The Rise of the Silver Economy," Global Coalition on Aging, 29 May 2018, https://globalcoalitiononaging.com/2018/05/29/the-rise-of-the-silver-economy/

[22] Park, and Inocencio, "COVID-19, Technology, and Polarizing Jobs."

Technological change has been a key economic driver over the past few decades; however, its deployment has been concentrated in a small number of economies.[23] This is because not all economies are equipped with the necessary infrastructure, skills and finance to adopt these technologies. In 2016, less than 2 percent of the population in low-income economies in Africa had access to fixed broadband, in contrast to the 22 to 41 percent adoption of fixed-broadband subscriptions in East and North Asia. As can be seen in Figure 2.1, there is a clear positive relationship between an economy's income status as measured by per capita GDP and access to mobile phones or broadband internet.

Figure 2.1 Scatterplot of access to Internet and per capita GDP, 2000–2018



Note: Red trendline is generated using nonparametric locally weighted scatterplot smoothing.
Source: World Bank, World Development Indicators; International Telecommunication Union; Directorate General for Budget, Accounting and Statistics (DGBAS), Chinese Taipei; APEC PSU staff estimates.

As a result, deployment of groundbreaking technologies has been limited to relatively tech-savvy economies. For instance, although industrial robots have experienced an annual growth rate of 17 percent since 2010, nearly 75 percent of the installations have been in five high-income economies: China; Germany; Japan; Korea; and the US.[24] The 2021 E-commerce Index by the United Nations Conference on Trade and Development (UNCTAD), which measures ICT deployment, skills, R&D activity, industry activity and access to finance, underline that relationship, with developed and high-income economies occupying the highest ranks of the index. In terms of APEC economies, most rank in the high and middle bracket of the index, with some, Papua New Guinea and Peru for example, in the lower strata. As the world enters the 4IR era, one fundamentally anchored by the use of the Internet, unequal access to technologies and the digital divide between the low-income and high-income economies continue to threaten growth.[25]

[23] ILO, "The Future of Work."
[24] A. Estevadeordal, et al., "Robotlution: The Future of Work in Latin American Integration 4.0," *Integration and Trade Journal* 21, no. 42 (2017).
[25] United Nations Economic and Social Commission for Asia and the Pacific (ESCAP), "Digital Divide in Asia and the Pacific," presentation, 2018, https://www.unescap.org/sites/default/files/Digital%20Divide%20in%20Asia%20and%20the%20Pacific.pdf

These digital divides also exist within economies and can be as wide as between economies.[26] Lower income and remote regions have poorer access to digital infrastructure. Globally, about 71 percent of households in the bottom 40 percent of the income distribution do not have access to the internet. Income gaps within economies cause differentiated access to digital technologies which result in different abilities to work remotely during the pandemic. For example, in the United States, a study found a strong and positive relationship between a neighbourhood's income status and home internet connections.[27]

2.1.1 Job losses and polarisation

Globally, automation is estimated to affect 1.1 billion workers, or 49 percent of jobs, and USD 12.7 billion in wages.[28] Other studies have also sought to estimate the impacts of technology on unemployment, as summarised in Table 2.1.

Table 2.1 Risk of technological substitution, estimates

Organisations/Authors	Estimates
Frey and Osborne–2013[a]	Nearly half (47%) of workers in the US are at high risk of being affected by automation
Bruegel–2014[b]	47% to 54% of jobs in the European Union are at risk of automation
OECD–2016[c]	Automation could replace 70% of activities, but only 9% are at high risk of high levels of automation.
World Bank–2016[d]	2/3 of all jobs in developing economies are susceptible to automation
ILO–2016[e]	56% of employment in Cambodia; Indonesia; the Philippines; Thailand; and Viet Nam are at high risk of displacement owing to technology
McKinsey–2017[f]	Automation could replace 45% of activities, but only 5% are at risk of being fully substituted by technology
PwC–2017[g]	Up to 38% of jobs in developed economies are at risk to automation

Source:
[a] C. Frey, and M. Osborne, "The Future of Employment: How Susceptible Are Jobs to Computerisation?" Working paper, University of Oxford, Oxford, 2013.
[b] J. Bowles, "Chart of the Week: 54% of EU jobs at Risk of Automation," Bruegel, 24 July 2014, https://www.bruegel.org/2014/07/chart-of-the-week-54-of-eu-jobs-at-risk-of-computerisation/
[c] M. Arntz, et al., "The Risk of Automation for Jobs in OECD Countries," OECD Social, Employment and Migration Working Papers, OECD Publishing, Paris, 2016.
[d] World Bank, "World Development Report 2016" (World Bank, 2016), https://www.worldbank.org/en/publication/wdr2016
[e] J. Chang and P. Huynh, "ASEAN in Transformation: The Future of Jobs at Risk of Automation" (Geneva: ILO, 2016), https://www.ilo.org/wcmsp5/groups/public/---ed_dialogue/---act_emp/documents/publication/wcms_579554.pdf
[f] McKinsey Global Institute, "Technology, Jobs and the Future of Work," Executive Briefing, McKinsey & Company, 24 May 2017, https://www.mckinsey.com/featured-insights/employment-and-growth/technology-jobs-and-the-future-of-work
[g] PwC, "The Long-View: How Will the Global Economic Order Change by 2050?" PwC, London, 2017.

[26] World Bank, "World Development 2016: Digital Dividends," 2016, World Bank Group, https://www.worldbank.org/en/publication/wdr2016
[27] J. Gao, A. Lopez, A. Gupta, and J. Su, "Unequal Disruptions: The Digital Divide During COVID-19," Asian Infrastructure Investment Bank, 7 May 2020, https://www.aiib.org/en/news-events/media-center/blog/2020/Unequal-Disruptions-The-Digital-Divide-During-COVID-19.html
[28] J. Manyika, et al., "A Future that Works: Executive Summary" (McKinsey Global Institute, 2017), https://www.mckinsey.com/~/media/mckinsey/featured%20insights/Digital%20Disruption/Harnessing%20automation%20for%20a%20future%20that%20works/MGI-A-future-that-works-Executive-summary.ashx

The summary in Table 2.1 highlights two important points. First, there is some degree of heterogeneity across economies owing to varying sector compositions, rate of technology adoption and relevant policy support. For example, OECD–2016 predict a high risk of technical substitutability among 9 percent of workers in the US, while ILO–2016 expects 56 percent of jobs in ASEAN-5 economies to be at high risk of displacement, both over a span of about two decades. This is because large sections of the population of developing economies are relatively unskilled and perform repetitive tasks which expose them to greater risks of automation.[29] Moreover, developing economies tend to have larger agricultural and manufacturing sectors which are more automatable compared to service sector-based economies. Secondly, although there is a risk of substitution by technology, OECD–2016 and McKinsey–2017 concur that such risk does not transcend into complete substitutability. In other words, workers may not completely lose their jobs to machines as automation takes a larger role in the economy. According to the World Economic Forum, although robots may replace a large number of workers, jobs heavily dependent on human-only traits, such as creativity and emotional intelligence, may increase in the future.[30] This notion is shared by Autor, who opines that the tasks that cannot be substituted by computerisation would be complemented by it.[31]

With regard to inequality within economies, an assessment of data from 21 advanced and developing economies – among them Indonesia; Mexico; and the United States – finds that adoption of new technologies affects job polarisation via two channels: (i) reduces employment in routine and manual tasks, and/or (ii) increases job creation for high-skilled, high-wage jobs.[32] However, the evidence of job polarisation is not as strong among developing economies compared to developed economies. Multiple studies suggest that technology-led job destruction would most likely be concentrated among low- and middle-skilled workers, where the nature of the jobs revolve around administrative and routine tasks such as bookkeeping, product testing, and machine operating, hence leading to a deepening of job polarisation.[33] As low- and middle-skilled jobs decline in number, wage premiums for high-skilled workers will rise. As both scenarios take place in the same labour market, affected workers face slow wage growth and deterioration in job quality.[34] For instance, in China, Fleisher finds evidence of polarisation among middle-income skilled jobs as the automation of non-cognitive tasks in the skilled sector led to the redistribution of employment to lower-skilled jobs.[35] However, the link between job polarisation and wage inequality is complex and may not adequately account for the wage trends over the past three decades.[36] While past trends have shown job polarisation to coincide with wage polarisation, Autor does not expect this to continue indefinitely.[37] He insists that polarisation will not be sustainable since many middle-skilled jobs will continue to demand a mixture of skills which cannot be easily substituted by technology at least in the

[29] Disrupted Development and the Future of Inequality in the Age of Automation (Schlogl and Sumner 2020).
[30] World Economic Forum (WEF), "Robot Revolution: The Economics of Automation" (Geneva: WEF, 2017).
[31] Autor, "Why Are There Still So Many Jobs?"
[32] W.F. Maloney and C. Molina, "Are Automation and Trade Polarizing Developing Country Labor Markets, Too?" Policy Research Working Paper 7922, World Bank, Washington, DC, 2016.
[33] C. Frey and M. Osborne, "The Future of Employment: How Susceptible Are Jobs to Computerisation?" Working paper, University of Oxford, Oxford, 2013; D. Acemoglu and D. Autor, "Skills, Tasks and Technologies: Implications for Employment and Earnings," National Bureau of Economic Research, June 2010, https://www.nber.org/papers/w16082
[34] T. Piketty, E. Saez, and S. Stantcheva, "Optimal Taxation of Top Labor Incomes: A Tale of Three Elasticities," *American Economic Journal: Economic Policy* 6, no. 1 (2014): 230–71.
[35] B.M. Fleisher, W. McGuire, Y. Su, and M.Q. Zhao, "Innovation, Wages, and Polarization in China," IZA Discussion Paper 11569, Institute of Labor Economics (IZA), Bonn, 2018.
[36] J. Schmitt, H. Shierholz and L. Mishel, "Don't Blame the Robots: Assessing the Job Polarization Explanation of Growing Wage Inequality." EPI-CEPR Working Paper, 2013. https://www.epi.org/publication/technology-inequality-dont-blame-the-robots/.
[37] Autor, "Why Are There Still So Many Jobs?"

short- to medium-term. Furthermore, complete automation of such middle income jobs will result in significant drops in quality which is undesirable.

For job losses to be compensated by job creation, new jobs need to be developed and regulated as old ones get phased out, but the question is whether the process could happen fast enough. For instance, research by Oxford Martin School demonstrates that only 0.5 percent of the American workforce shifted into jobs associated with the arrival of new technologies, especially those related to digital technologies such as online auctions and video audio streaming, in the 2000s, compared to 8 percent during the 1980s.[38] Likewise, a 2019 study by the Boston Consulting Group finds that the majority of surveyed companies in Canada; China; Japan; Mexico; and the United States expect a workforce reduction of 5 percent or more in response to the application of robotics in their respective industries.[39]

The issues surrounding adoption of technology extend beyond just the creation and destruction of jobs. According to a study covering 15 economies around the globe, men currently face more job losses compared to women due to automation, mainly due to men's higher participation in low- and middle-skilled jobs in manufacturing, such as in the automotive industry.[40] However, this differential gender impact could change over time as automation goes into services. A 2016 study by the ILO on the impacts of automation in the ASEAN-5 economies finds that women are overrepresented in occupations at high risk of automation,[41] such as the half a million machine operators in Cambodia's garment industry, Thailand's 1 million shop sales assistants, and Indonesia's 1.7 million office clerks.[42] Men will likely be better able to recover from such job losses: the gender gap in science, technology, engineering and mathematics (STEM) training and employment suggests that men are better equipped with the skills associated with digitalisation.[43] It is expected that roughly one job will be gained for every 2.9 jobs lost for men whereas only one job in 5.5 will be recovered for women.[44]

2.1.2 New job opportunities and related challenges

However, it is not all doom and gloom for the world of work in the presence of technology. The use of technologies associated with 4IR have presented large gains. For example, machine learning, a subset of AI, allows computer programs to be developed that can teach themselves to learn, reason and act in the presence of data. This enables hospitals to use a library of scanned images to accurately detect and diagnose cancer symptoms, and insurance companies to automatically recognise and verify car damage. A survey by PwC in 2017 estimates a potential global GDP gain of USD 15.7 trillion by 2030 through the adoption of AI alone.[45]

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[38] Oxford Martin School and Citi, "Technology at Work v2.0: The Future Is Not What It Used To Be," Citi GPS: Global Perspectives and Solutions, January 2016, https://www.oxfordmartin.ox.ac.uk/downloads/reports/Citi_GPS_Technology_Work_2.pdf

[39] D. Kupper et al. "Advanced Robotics in the Factory of the Future." 27 March 2019. https://www.bcg.com/de-de/publications/2019/advanced-robotics-factory-future. The survey covered 1,314 companies across 12 economies in the following industries: automotive, consumer goods, energy, engineered products, health care (pharmaceuticals and medical technology), process industries, transportation and logistics, and technology (media and IT equipment).

[40] Acemoglu and Restrepo, "Robots and Jobs."

[41] More than 70 percent chance of being automated within the next decade or two.

[42] J. Chang and P. Huynh, "ASEAN in Transformation: The Future of Jobs at Risk of Automation" (Geneva: ILO, 2016).

[43] World Economic Forum (WEF), "The Future of Jobs: Employment, Skills and Workforce Strategy for the Fourth Industrial Revolution" (Geneva: WEF, 2016).

[44] WEF, "The Future of Jobs."

[45] PwC, "Global Artificial Intelligence Study: Exploiting the AI Revolution – Sizing the Prize: What's the Real Value of AI for Your Business and How Can You Capitalise?" 2017, https://www.pwc.com/gx/en/issues/analytics/assets/pwc-ai-analysis-sizing-the-prize-report.pdf

In contrast to concerns highlighted by other studies, Moretti shows that every new technology job created around 4.9 additional local service jobs in the US.[46] Similarly, Goos et al., using a European dataset, find that technology jobs have a role in creating demand for occupations in the service sector.[47] Berger, Chen and Frey, and Mann and Püttmann, confirm that development of automation technologies would create a net gain in employment in the labour market.[48] The Moscow School of Management, in a study of the impact of new technologies on the future creation of jobs, finds that despite job losses in several blue- and white-collar jobs – such as postal workers and ticket officers – the potential for job creation outweighs the redundancies in the long term.[49]

The rapid adoption of new technologies does not only create new jobs and increase productivity but also opens opportunities for other forms of work. Digital technology has enabled greater opportunities in non-standard forms of employment, which deviate from the usual employer–employee relationship or entrepreneurial self-employment. Non-standard forms of employment can refer to work mediated through digital platforms and disguised employment/dependent self-employment, as well as home-based workers, temporary workers, and on-call workers.[50] In the context of 4IR and digitalisation, non-standard forms of employment are often mediated through digital platforms, giving rise to the so-called gig workers who provide services on contract, on call or on demand. Examples of these are drivers for ride-hailing apps or logistics workers hired through delivery apps.

Currently, flexible work (characterised by the gig or platform economy[51] and remote working) is rising in developed economies and is making its way among middle-class workers in emerging economies.[52] The World Bank estimates that the gig economy is growing by about 33 percent annually.[53] Indeed, the rise of the platform economy is estimated to contribute to the continuous growth in self-employment and contract work.[54]

The Global Gig-Economy Index 2019, powered by data from Payoneer network, estimates that, globally, the US gig economy grew the fastest with a 78 percent year-on-year revenue growth in 2019, followed by the UK at 59 percent.[55] This is because unlike most economies where the freelancer population tends to skew younger, professionals of all age groups in the US are drawn toward the gig economy. In two other APEC economies, the Philippines and Russia, the

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[46] E. Moretti, "Local Multipliers," *American Economic Review*: Papers & Proceedings 100 (2010): 1–7.

[47] [47] M. Goos, J. Konings, and M. Vanderweyer, "Employment Growth in Europe: The Roles of Innovation, Local Job Multipliers and Institutions," Working Paper, Research Centre for Regional Economics (VIVES), Leuven, 2015.

[48] C. Frey, T. Berger, and C. Chen, "Political Machinery: Automation Anxiety and the 2016 US Presidential Election," Oxford Martin School, Oxford, 2017; K. Mann and L. Püttmann, "Benign Effects of Automation: New Evidence from Patent Texts," SSRN, 15 August 2018, https://ssrn.com/abstract=2959584 or http://dx.doi.org/10.2139/ssrn.2959584

[49] Moscow School of Management SKOLKOVO, "Atlas of Emerging Jobs," Second Edition (SKOLKOVO, 2015).

[50] ILO, "Non-standard Forms of Employment," accessed 5 July 2021, https://www.ilo.org/global/topics/non-standard-employment/lang--en/index.htm

[51] According to M. Kenney and J. Zysman (2016), the platform economy refers to digitally enabled activities in business, politics and social interaction. Platform and gig economy are distinct in the sense that the platform economy runs on digital platforms while the gig economy can refer to any employment in temporary positions for short term commitments (e.g., gigs in the entertainment industry). There are significant overlaps between the two in the context of the digital economy, but they are not fully interchangeable.

[52] WEF, "The Future of Jobs."

[53] J. Messenger, "Working Time and the Future of Work" (Geneva: ILO, 2018).

[54] F. Schmidt, *Digital Labour Markets in the Platform Economy: Mapping the Political Challenges of Crowd Work and Gig Work* (Friedrich-Ebert-Stiftung, 2017).

[55] The index is based on data from a sample of over 300,000 freelancers, service providers and outsourcing professionals.

gig economy grew by 35 percent (ranked 6th globally) and 20 percent (ranked 9th globally), respectively. Despite the large growth, the gig economy remains a niche market. For example, in the US and UK, the gig economy constituted only around 0.4 to 0.7 percent and 4 percent of the working population, respectively. This is likely due to platform economy mostly representing a means for workers to complement their main income rather than replace a full-time job.[56]

The COVID-19 crisis has served as a catalyst for the adoption of more options for working, advancing the digitalisation of services, and enabling firms and individuals alike to benefit from flexible working arrangements.[57] Recently, Russia amended its labour law to allow specific remote working arrangements to be integrated into employment contracts. Gig economy jobs also rose during the pandemic. Latin American economies, on average, saw a 23 percent growth in demand for online freelance work[58] and a 77 percent rise in registration of new freelancers between March and June 2020.[59] In China, COVID-19 related movement restrictions increased the demand for gig economy jobs, leading to a higher number of average daily jobs and tasks filled under the platform economy.[60]

The gig economy and other forms of non-standard employment can provide additional sources of income and enable flexibility in choosing work hours or locations, but they can come at the expense of job quality. Gig workers are often not recognised as regular employees—i.e., being in standard employer-employee relationships—which means existing labour policies and regulations, such as minimum wages, social security benefits or labour standards, are unavailable to them.[61] Moreover, gig workers are often not covered by employer contributions for health insurance or social security, which means the workers need to contribute towards their own social protection or healthcare needs. As a result, gig economy workers tend to have higher financial burdens compared to regular employees.[62]

Workers in the gig economy are also less likely to receive on-the-job training which could have a negative effect on their career development. This is a particular concern for youths, who would have limited opportunities to gain experience and adapt to labour market demands.[63] Moreover, the ILO points out that workers in this sector have little control over their working hours, leading to poorer work–life balance, and they incur significant occupational safety and health risks as a result of poor induction, training and supervision.[64]

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[56] D. Farrer, F. Greig, and A. Hamoudi, "The Online Platform Economy in 2018: Drivers, Workers, Sellers, and Lessors," *TransportRN: Transportation & Society (Topic)* (2018).
[57] Park and Inocencio, "COVID-19, Technology, and Polarizing Jobs."
[58] Example of platforms include Malt, Workana, or Freelancer.com. See Digital Future Society and Inter-American Development Bank (IDB), "Platform Economy and COVID-19: A Look at Delivery, Home Care, and Online Freelance Work in Spain and Latin America," Barcelona, 2021.
[59] Digital Future Society and IDB, "Platform Economy and COVID-19."
[60] M. Umar, Y. Xu, and S.S. Mirza, "The Impact of Covid-19 on Gig Economy," Economic Research-Ekonomska Istraživanja, 2020, https://doi.org/10.1080/1331677X.2020.1862688. The platform economy refers to an online market where buyers and sellers meet. Some examples of businesses engaged in the platform economy include Amazon, Uber and Baidu.
[61] Chang and Huynh, "ASEAN in Transformation."
[62] Schmidt, *Digital Labour Markets.*
[63] WEF, "The Future of Jobs."
[64] ILO, "Inception Report for the Global Commission on the Future of Work" (Geneva: ILO, 2017).

Workers in non-standard forms of employment also tend to be in a weaker bargaining position in negotiating better workplace conditions and wages.[65] Without a physical workplace and relations with work colleagues, these workers may lose the capacity to organise themselves, which may lead to their being overlooked by trade unions.[66] Recent examples do, however, show trade unions starting to use multiple approaches to reach out to and protect these workers. The Independent Workers Union of Great Britain, who campaigned for basic rights and protection for Uber drivers in the UK, convinced the UK Supreme Court to rule in favour of recognising Uber drivers as formal employees rather than independent contractors. This reclassification entitles the Uber drivers to certain legal labour rights, such as minimum wages and paid leave.

Another concern with digital technology is its increasing use in surveillance and monitoring and the potential to exacerbate social inequities. Codagnone, Abadi and Biagi have found evidence of lack of protection of workers' privacy and of gender- and ethnicity-based discrimination in digital labour markets.[67] Advanced digital technologies and improved connectivity have led to concerns regarding intrusive surveillance and monitoring of workers. Always-on webcams, keylogging software and geolocation trackers have been used by firms to monitor remote workers, with negative implications on workers' privacy, autonomy and wellbeing.[68] Meanwhile, the use of AI and algorithms in the workplace and for human resource management could lead to discrimination, gender and racial bias, and greater inequity.[69] While computers tend to be seen as objective and disinterested arbiters, there is increasing recognition that the codes and algorithms underlying their functions are themselves subject to the programmer bias.

In the late 1940s, when telephones were stuck on walls and computers were measured in metres rather than centimetres, thinkers like Alan Turing were already contemplating artificial intelligence and their ability to mimic and surpass human thought processes and learning capabilities.[70] What must have sounded like science fiction technologies then are now commonplace applications found in our pocket-sized smartphones. As the foregoing discussions have shown, the application of 4IR technologies – i.e., technologies currently in existence – have already disrupted firms, workers, and employment relationships. Looking further into the future, technologies now in the realm of science fiction can likewise become feasible and economically viable. A long-term challenge for economies is to ensure that their human societies remain future-resilient even as technologies evolve beyond what is currently imaginable (see Box 2.2).

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[65] C. Codagnone, F. Abadie, and F. Biagi, "The Future of Work in the 'Sharing Economy': Market Efficiency and Equitable Opportunities or Unfair Precarisation," EUR 27913, Publications Office of the European Union, Luxembourg, 2016; International Organisation of Employers (IOE), "Understanding the Future of Work" (Geneva: IOE, 2017).

[66] H. Johnston, and C. Land-Kazlauskas, "Organizing On-demand: Representation, Voice, and Collective Bargaining in the Gig Economy," Conditions of Work and Employment Series 94 (Geneva: ILO, 2018).

[67] Codagnone, et al., "The Future of Work in the 'Sharing Economy.'"

[68] D.M. West, "How Employers Use Technology To Surveil Employees," Brookings, 5 January 2021, https://www.brookings.edu/blog/techtank/2021/01/05/how-employers-use-technology-to-surveil-employees/; O. Solon, "Big Brother Isn't Just Watching: Workplace Surveillance Can Track Your Every Move," *Guardian*, 6 November 2017, https://www.theguardian.com/world/2017/nov/06/workplace-surveillance-big-brother-technology

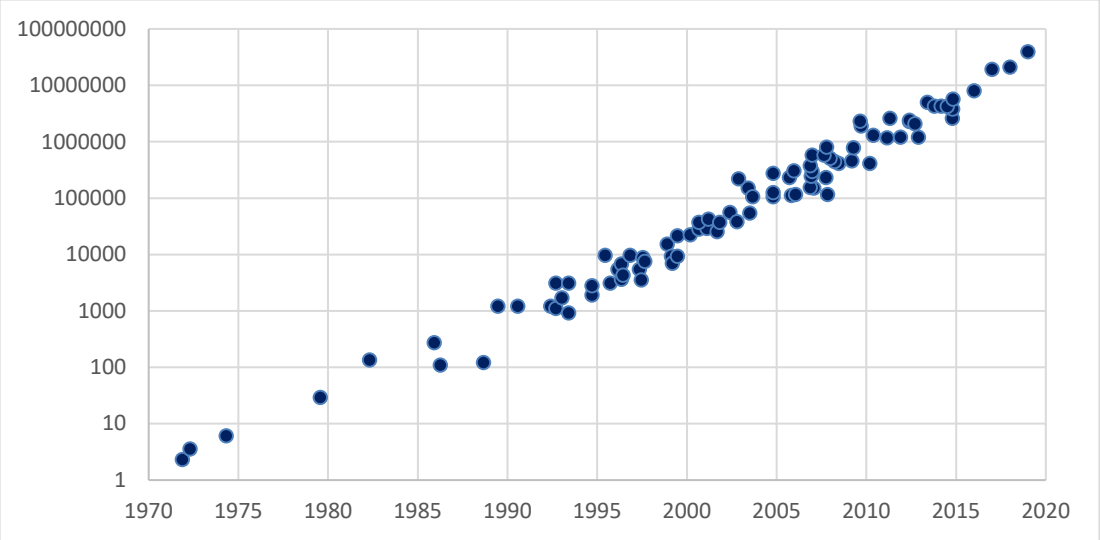
[69] R. Allen and D. Masters, "Technology Managing People – The Legal Implications" (AI Law Consultancy, 2021), https://www.tuc.org.uk/sites/default/files/Technology_Managing_People_2021_Report_AW_0.pdf; A. Köchling and M.C. Wehner, "Discriminated by An Algorithm: A Systematic Review of Discrimination and Fairness by Algorithmic Decision-making in the Context of HR Recruitment and HR Development," *Business Research* 13 (2020): 795–848, https://doi.org/10.1007/s40685-020-00134-w

[70] Gil Press, "Alan Turing Predicts Machine Learning And The Impact Of Artificial Intelligence On Jobs," *Forbes*, 19 February 2017, https://www.forbes.com/sites/gilpress/2017/02/19/alan-turing-predicts-machine-learning-and-the-impact-of-artificial-intelligence-on-jobs/?sh=29e945d41c2b

Box 2.2 The Future of Work in the long-term

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 almost 40 billion in 2019 (Figure 2.2). More transistors in an integrated circuit means more computational power in a smaller space, while improvements in mass production results in cheaper electronic devices. Indeed, computing power available per dollar has increased significantly since the 1940s.[71]

Figure 2.2 Transistor count per integrated circuit (in thousands), 1972–2019



Note: Chart is in logarithmic scale, so the linear trend shows an exponential growth path.
Source: K. Rupp, "48 Years of Microprocessor Trend Data," Karl Rupp, July 2020, https://zenodo.org/record/3947824

This growth in computational capability has led to the rapidly changing digital technologies that have transformed the future of work, and this trend is expected to continue if not accelerate in the future. But what does this mean if Moore's Law continues in the decades and even centuries ahead? What about the new developments in quantum computing and nanorobotics?

In terms of economic production, Moore's Law means that computers and robots will be more powerful, smaller and cheaper at an increasing rate. We have already seen this in our mobile phones. The Motorola DynaTAC that could only make calls and store 30 phone numbers cost USD 3,995 in 1984, while the 2021 Motorola Defy smartphone which is several multiples more powerful costs a tenth of that at USD 390. The set of human skills that a computer or a robot can do will become larger, and the set of skills that only a human can efficiently do will shrink. The cost of integrating computers and robotics into the production of goods and services will also go down in absolute terms, and in relative terms compared to a human worker. So where will this leave workers and their wages?

If, as implied by Moore's Law, there is no limit to the potential power, speed and cost-efficiency of a computer or robot, then it is possible to see a future where every job that is economically valuable enough to automate or computerise will be taken over by a robot, while humans are left with a few very high-value positions (e.g., leaders, entrepreneurs, innovators) and myriads of low-wage jobs that are not valuable enough to automate—i.e., the extrapolation of jobs polarisation. While reskilling, upskilling, and lifelong learning will help augment

transitions to the future of work, they may not be enough to future-proof all workers and their economic security. A cheaper computer or robot could foreseeably replace any human job, even new ones created in the future, when computing power catches up. We are starting to see this now where even jobs that were once thought to be future-proof because of being innately human interactions, like musical composition or booking a haircut over the phone, are under threat from new advancements in AI.[72] This will be true of any occupation that is valuable enough to be automated, and jobs that will be left for humans are a few positions that are extremely high value, and masses of jobs that are too low-value to bother automating. Even as new jobs are invented, new and cheaper technologies will develop the capability to do them more efficiently.

This does not mean that we need to fear a future where technology has progressed to the point where human labour is neither necessary nor efficient. If technology does reach this point, it means that humanity will have solved the problem of labour out of necessity, and we can imagine a world of labour for self-actualisation. Just as mechanisation and automation have reduced the need for human sweat in turning the soil and toiling in factories, robotics and AI could reduce the need for human mental exhaustion in analysing spreadsheets and documents. But if in this future world humans become increasingly obsolete for production, where will that leave workers and the wages they rely on for their wellbeing? What about jobs polarisation and growing inequality, which we are already seeing today?

This is where safety nets and social protection floors play a crucial role. Even as jobs are under constant threat of takeover by computers and robots, and even as new jobs are taken over by new computers, people's economic security need not be a casualty of technological progress. There should be a way to modify economic structures to accommodate accelerating technological change and computing power while guaranteeing human economic security and wellbeing. This is the real challenge of structural reform and policy development in the future of the future of work.

2.2 CLIMATE CHANGE

The international scientific consensus on climate change is clear: the Earth's climate has warmed significantly over the last two centuries, human activity through greenhouse gas emissions is the primary cause for this change, and this is causing widespread adverse impacts on ecosystems and societies.[73]

Climate change, and the rise in incidence of extreme weather events, impacts jobs. The extreme weather events damage business assets, disrupt transport and industrial infrastructure, and displace workers and settlements. Excessive heat is an occupational risk that reduces

[71] "Trends in the Cost of Computing," AI Impacts, accessed 5 July 2021, https://aiimpacts.org/trends-in-the-cost-of-computing/
[72] Some of the jobs that robots were thought to never be able to do include providing financial advice("How AI Can Improve Financial Analytics," *Forbes*, 23 July 2020, https://www.forbes.com/sites/louiscolumbus/2020/07/23/how-ai-can-improve-financial-analytics/); provide legal advice ("5 Lawyer Bots You Can Try Now," date, https://autom.io/blog/5-lawyer-bots-you-can-try-now); compose music ("AI's Growing Role in Musical Composition," Medium, date, https://medium.com/syncedreview/ais-growing-role-in-musical-composition-ec105417899); engage in customer service ("AI's Increasing Role in Customer Service," Forbes, 2 July 2019, https://www.forbes.com/sites/cognitiveworld/2019/07/02/ais-increasing-role-in-customer-service/); and make a phone appointment while fooling a human ("title," youtube, date, https://www.youtube.com/watch?v=D5VN56jQMWM).
[73] Intergovernmental Panel on Climate Change (IPCC), *5th Assessment Report* (Geneva: IPCC, 2014), https://www.ipcc.ch/report/ar5/syr/

productivity and in extreme cases may harm worker health. The ILO projects that a global temperature increase of 1.5 degrees will result in the loss of 2.2 percent of total hours worked, 80 million jobs and USD 2.4 trillion worldwide by 2030.[74] The impact will be unequal across economies and sectors. South Asia, Western Africa, Southeast Asia and Central Africa are expected to experience the strongest impact on businesses and workers due to rising heat stress. APEC economies lost 10 million full-time jobs in 1995 due to heat stress. In 2030, the loss is expected to increase by 80.3 percent to over 18 million jobs.

The agriculture sector is expected to be the most severely affected, accounting for 60 percent of all working hour losses in 2030, given the damaging impacts of heat waves, floods and drought on crops.[75] The construction sector will contribute another 19 percent of working hours lost. Sectors that are heavily dependent on natural resources and climate, like energy, transport and tourism, will also be highly impacted. The intensity of temperature increases will be particularly high in cities owing to urban heating. This will in turn increase energy consumption, elevate air pollutants, deteriorate water quality and compromise human health. A 2017 study of 1,692 cities note that cities could lose 5.6 percent of their GDP by the end of the century due to climate change.[76]

The aftermath of the 2008 global financial crisis saw an increase in international calls for a transition to a green economy to address anthropogenic climate change as economies coped with a global economic recession, stark social inequalities and threatening environmental changes.[77] Economies such as China; Korea; and the United States labelled their stimulus packages as 'green' as they recognised that environmentally responsible fiscal stimuli would have the ability to boost the economy while driving sustainable growth.[78]

2.2.1 Green economy jobs

There have been multiple attempts to define jobs related to the green economy. The United Nations Environment Programme (UNEP) defines green jobs as 'work in agricultural, manufacturing, research and development (R&D), administrative, and service activities that contribute substantially to preserving or restoring environmental quality'.[79] The OECD defines green jobs as 'activities which produce goods and services to measure, prevent, limit, minimise or correct environmental damages … this definition includes technologies, products, and services that reduce environmental risk and minimise pollution and resources'.[80] On this basis, green jobs constitute a small yet significant share of total employment in the EU, that is,

[74] ILO, "Working on a Warmer Planet: The Impact of Heat Stress on Labour Productivity and Decent Work" (Geneva: ILO 2019), https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_711919.pdf
[75] ILO, "Working on a Warmer Planet."
[76] F. Estrada, W. Botzen, and R. Tol, "A Global Economic Assessment of City Policies To Reduce Climate Change Impacts," *Nature Climate Change* 7 (2017): 403–6, https://doi.org/10.1038/nclimate3301
[77] A.R. Davies, "Cleantech Clusters: Transformational Assemblages for a Just, Green Economy or Just Business as Usual?" *Global Environmental Change* 23, no. 5 (2013) 1285–95, https://doi.org/10.1016/j.gloenvcha.2013.07.010; L. Georgeson, M. Maslin, and M. Poessinouw, "The Global Green Economy: A Review of Concepts, Definitions, Measurement Methodologies and Their Interactions," *Geo: Geography and Environment* 4, no. 1 (2017), https://doi.org/10.1002/geo2.36
[78] D.J. Bowen, et al., "How We Design Feasibility Studies," *American Journal of Preventive Medicine* 36, no. 5 (2009): 452–7, https://doi.org/10.1016/j.amepre.2009.02.002
[79] United Nations Environment Programme (UNEP), International Labour Organization (ILO,) International Organisation of Employers (IOE), International Trade Union Confederation (ITUC), "Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World" (Geneva: UNEP/ILO/IOE/ITUC, 2008).
[80] Organisation for Economic Co-operation and Development (OECD), "The Environmental Goods and Services Industry: Manual for Data Collection and Analysis" (Paris: OECD, 1999).

approximately 1.7 percent of total paid employment in Europe[81] Other definitions of green jobs include jobs directly created via green policies (direct employment effects) or those created in the supply chain for products and services produced under green policies (indirect employment effects).[82] For the purpose of the discussion, this paper will adopt the definition provided by UNEP as it provides a broader perspective on what jobs are included in the green economy.

The transformation to a greener economy to combat climate change is expected to significantly contribute to the total number of jobs in the future.[83] Wallace-Wells provides evidence that insufficient pursuit of better environmental conditions will result in significant economic costs.[84] The author adds that for each 1 degree Celsius increase in average temperatures, there will be a loss of 1.2 percent of global GDP, which will likely increase unemployment. Nevertheless, the net employment change is expected to be positive as consumption patterns adapt and green occupations grow. The ILO estimates that a shift to a greener economy with the conducive policies in place would create 24 million new jobs globally by 2030, with most of the job creation originating in the renewable energy sector.[85] These conducive policies include those that strengthen social protection through unemployment protection, public employment programmes and payments for ecosystem services (jobs in agriculture, fisheries, forestry and tourism); support financially viable green investments; enable skills development for green jobs through training and educational programmes; and incorporate tax reforms that support the transition to a green economy while facilitating employment creation. The renewable energy sector also has the potential to absorb redundant workers from other sectors like construction and manufacturing.[86]

Several APEC economies are expected to create a large number of new jobs in renewable energies, such as Korea (950,000 jobs by 2030); and the United States (between 1.3 and 7.3 million jobs by 2030).[87] In Australia, there were 26,850 full-time equivalent jobs in renewable energy during fiscal year 2018-2019, mainly in the solar photovoltaic sector.[88] In the United States, the green economy is predicted to create numerous jobs in occupations such as energy auditors (202,000 jobs), climate change analysts (39,700 jobs) and fuel cell technicians (99,700 jobs) by 2022.[89] According to Burning Glass Technologies, there is strong demand for jobs in the following five environmental areas in the United States: (1) environmental scientists and teachers; (2) fuel cell and nuclear technicians; (3) natural resource conservation; (4) pollution

[81] European Commission, "Facts and Figures: Links between EU's Economy and Environment" (Luxembourg: Office for Official Publications of the European Communities, 2007).
[82] A. Bowen and K. Kuralbayeva, "Looking for Green Jobs: The Impact of Green Growth on Employment," Policy Brief, Grantham Research Institute on Climate Change and the Environment, London, 2015.
[83] M. Esposito, A. Haider, W. Semmler, and D. Samaan, and "Enhancing Job Creation through the Green Transformation," in *Green Industrial Policy. Concept, Policies, Country Experiences*, ed. T. Altenburg and Assmann (Geneva, Bonn: UN Environment; German Development Institute (DIE), 2017), Ch. 4.
[84] D. Wallace-Wells, "The Uninhabitable Earth," *New York Magazine*, 10 July 2017, https://nymag.com/intelligencer/2017/07/climate-change-earth-too-hot-for-humans.html
[85] ILO, "World Employment and Social Outlook 2018" (Geneva: ILO, 2019).
[86] ILO, "Skills for Green Jobs" (Geneva: ILO, 2011)
[87] ILO, "Skills for Green Jobs"
[88] Australian Bureau of Statistics, "Employment in Renewable Energy Activities, Australia," 6 April 2020, https://www.abs.gov.au/statistics/labour/employment-and-unemployment/employment-renewable-energy-activities-australia/latest-release
[89] R. Pollin, H. Garrett-Peltier, J. Heintz, and B. Hendricks, "Green Growth: A U.S. Program for Controlling Climate Change and Expanding Job Opportunities, Energy and Environment" (Washington, DC: Political Economy Research Institute (PERI) and Center for American Progress, 2014); International Organisation of Employers (IOE), "Understanding the Future of Work" (Geneva, IOE, 2017).

removal, waste management and recycling; and (5) renewable energy, with expected growth rates of up to 18 percent over the next five years.[90]

As mentioned earlier, a large portion of the job creation is expected to arise in the renewable energy sector. Wei et al., by modelling data on job creation in the US power sector from 2009 to 2030, find that the renewable energy and low carbon sectors generate more jobs per unit of energy delivered than the fossil fuel-based sector.[91] In fact, the renewable energy and low carbon sectors might yield over 4 million jobs by 2030 in the US alone. Similarly, Pollin et al. note that a USD 100 billion fiscal stimulus spent on energy efficiency and renewable energy strategies would generate 2 million direct and indirect jobs in the US.[92]

Other studies provide a more nuanced picture of the investments needed to generate green jobs. Barbier, assessing Korea's green stimulus, finds large variations in the number of jobs created per USD billion spent across the green industries: forest restoration generated close to eight times as many jobs per dollar as the least labour-intensive green sectors such as electric vehicles and clean energy. [93] Schwartz et al. additionally demonstrate that a rural electrification project in Peru, which is labour intensive, is more effective at creating jobs compared to hydroelectric schemes in Brazil.[94]

The increase in renewable energy jobs is not only pertinent to industrialised economies.[95] In developing economies, especially in remote and rural areas that are not connected to the central electricity grid, renewable energy technologies provide an economically viable alternative and can generate large employment opportunities.

In order to create new jobs in the green economy, economies have had to create a conducive environment.[96] For example, Korea has focussed on green technology development and the provision of necessary skills. After the Global Financial Crisis, about 79 percent of Korea's total stimulus was allocated to green activities. It has also created two human resource development sector councils, for New Renewable Energy and for Green Finance, which provide relevant short training courses. Furthermore, Korea encouraged green skills alliances across businesses, universities and trainers to provide green technology training.

2.2.2 Circular economy jobs

Circular economy approaches are also being discussed to address climate change, which could also have impacts on the labour market. The traditional model of economic production follows

[90] Burning Glass Technologies, "After the Storm: The Jobs and Skills that will Drive the Post-Pandemic Recovery (Burning Glass Technologies, 2021), https://www.burning-glass.com/wp-content/uploads/2021/02/after_the_storm_recovery_jobs_advance.pdf?utm_source=matt&utm_medium=email&utm_campaign=recovery

[91] M. Wei, S. Patadia, and D.M. Kammen, "Putting Renewables and Energy Efficiency To Work: How Many Jobs Can the Clean Energy Industry Generate in the US?" *Energy Policy* 38, no. 2 (2010): 919–31, https://doi.org/10.1016/j.enpol.2009.10.044

[92] R. Pollin, H. Garrett-Peltier, J. Heintz, and H. Scharber, "Green Recovery: A Program To Create Good Jobs and Start Building a Low-carbon Economy" (Washington, DC: Political Economy Research Institute (PERI) and Center for American Progress, 2008).

[93] E.B Barbier, "Rethinking the Economic Recovery: A Global Green New Deal," University of Wyoming, Laramie, WY, 2009.

[94] J.Z. Schwartz, L.A. Andres, and G. Draboiu, "Crisis in Latin America. Infrastructure Investment, Employment and the Expectations of Stimulus," Policy Research Working Paper WPS 5009, World Bank, Washington, DC, 2009.

[95] ILO, "Skills for Green Jobs" (Geneva: ILO, 2011)

[96] ILO, "Skills for Green Jobs" (Geneva: ILO, 2011)

a linear pattern: resources are gathered, processed and consumed while by-products are disposed as waste and do not re-enter the productive chain. A circular economy model seeks to keep any products, components and materials circulating in the economy for as long as possible via efficient waste management and use of resource inputs.[97] Two strategies commonly adopted in circular economy thinking are: (1) regeneration of biotic materials, and (2) maintaining the value of materials for as long as possible. Material reuse, repurposing and recycling are built into production and logistics within a circular economy model.

Structurally, a shift toward a more circular economy would lead to changes in economic activity, from raw material-intensive activities (such as extraction of fossil fuels) toward sectors that require fewer raw materials, such as services, renewables and recycling. This could trigger job losses in the primary sector as employment opportunities move toward secondary and tertiary sectors.[98] However, with activities in the secondary and tertiary sectors generally being more labour intensive, the result could be a net gain in jobs. For instance, globally, the four sectors with the highest raw materials footprint (construction, food production, primary-based metal production, and electricity) accounted for almost 90 percent of overall material use in 2011, but employed only 15 percent of the total workforce;[99] by contrast, activities related to product life extension (e.g. reuse, repair and remanufacturing) tend to be more labour intensive.[100] Looking further into the future, net employment may also increase as economies transition toward the services sector.

Multiple studies have investigated the employment potential of the circular economy at the economy level. The ILO expects that 6 million new employment opportunities will be created globally by embracing circular economy approaches.[101] The Economic Research Institute for ASEAN and East Asia (ERIA) projects that the adoption of more circular approaches could lead to the creation of 1.5 million jobs across Asia over the next two decades with an estimated economic potential of USD 324 billion.[102] In Australia, KPMG estimates that greater circularity in the food, transport, and built environment sectors will provide an additional 17,000 full-time jobs by 2047–2048.[103]

The impacts of the green economy and circular economy seem ideal on paper, but come with a few caveats and limitations, especially with regard to skills mismatch and gaps. For example, Circle Economy, a Dutch non-governmental organisation, identified 35 distinct skillsets required for the transition from a linear economy to a circular economy within the Amsterdam Metropolitan area, such as technical skills to design and operate machines, and systems skills to develop capacity to monitor and improve sociotechnical systems.[104] The study highlights the need for reforms in the education system and worker training to equip workers for the

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[97] Ellen MacArthur Foundation, "Towards the Circular Economy: Economic and Business Rationale for an Accelerated Transition" (Ellen MacArthur Foundation, 2013).
[98] OECD, "Labour Market Consequences of a Transition to a Circular Economy: A Review Paper," OECD, Paris, 2020.
[99] OECD, "Labour Market Consequences."
[100] OECD, "Labour Market Consequences."
[101] ILO, "World Employment and Social Outlook 2018: Greening with Jobs" (Geneva, ILO, 2018), https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_628654.pdf
[102] A. Tan, "The Business of Sustainability: Why Adopting Circular Economy Practices Can Lead to Growth," Business Times (Singapore), 4 February 2020, updated 27 October 2020, https://www.businesstimes.com.sg/asean-business/the-business-of-sustainability-why-adopting-circular-economy-practices-can-lead-to
[103] KPMG, "Potential Economic Pay-off of a Circular Economy" (KPMG, 2020), https://assets.kpmg/content/dam/kpmg/au/pdf/2020/potential-economic-pay-off-circular-economy-australia-2020.pdf
[104] Circle Economy, "Circular Jobs & Skills in the Amsterdam Metropolitan Area" (Circle Economy, 2018) https://assets.website-files.com/5d26d80e8836af2d12ed1269/5dea741c0f2ed678476019c8_Final-Circular-Jobs-and-Skills-in-the-Amsterdam-Metropolitan-Area-min.pdf

transition. For example, jobs in regenerative resources require high technical knowledge and skills in handling installation and maintenance of equipment. In this regard, attaining a university degree, which enables workers to gain sufficient knowledge to understand and apply the newly required technical skills, may be more vital than the past work experience valued in the linear economy. Vocational education and training (VET) is also expected to play a crucial role, especially among those already in the labour force by offering them lifelong learning opportunities.[105] Often circular economy related jobs require interdisciplinary skills which may be better conveyed through VET programmes that are specifically designed for a particular occupation.

Other analyses suggest that the skills transition may not be that steep. The European Commission note that, in comparison to the other megadrivers such as technological change, the circular economy requires relatively few new skills.[106] Chateau, Bibas and Lanzi modelled the future skills composition of green policies and found that the interchange between job creation and destruction often involves a similar set of skills as the broad skillsets required for different jobs are mostly homogenous.[107] Similarly, Cedefop suggests that most green jobs require a reinforcement of existing skills rather than completely new skills.[108] For example, as the economy goes greener, construction companies would require the same group of skilled workers, but with up-to-date training in energy efficiency. Rather than employing a completely different set of workers, the existing labour pool can be retrained to match the demand of the green economy. However, the type of retraining needed may differ across industries and depend on the type of task performed.[109]

Furthermore, the skillsets required for the circular economy should not be seen in isolation as they often overlap with the needs of other sectors. For instance, digital skills are a fundamental skillset in the circular economy as they are needed for handling complex machines and sophisticated software. As the skills needed in response to the various megadrivers may interact with each other, there may be a general increase in demand for cross-cutting competencies driven by technological change (e.g., communication and STEM-related skills).

2.3 GLOBALISATION

The main defining feature of the global economy over the past several decades has been globalisation. The Council of Europe defines globalisation as:[110]

> the ever closer economic integration … resulting from the liberalisation and consequent increase in both the volume and the variety of international trade in goods and services,

[105] Circle Economy, "Closing the Skills Gap: Vocational Education and Training for the Circular Economy' (Circle Economy, 2021), https://assets.website-files.com/5d26d80e8836af2d12ed1269/608c0aa6fec4df0fa7bd78e4_20210422%20-%20CJI%20VET%20Paper%202%20-%20297x210mm.pdf

[106] European Commission, "Impacts of Circular Economy Policies on the Labour Market" (Brussels: European Union, 2018).

[107] J. Chateau, R. Bibas, and E. Lanzi, "Impacts of Green Growth Policies on Labour Markets and Wage Income Distribution: A General Equilibrium Application to Climate and Energy Policies," OECD Environment Working Papers 137, OECD Publishing, Paris, 2018.

[108] Cedefop, "Skills for Green Jobs: European Synthesis Report" (Luxembourg: Publications Office of the European Union, 2010) http://dx.doi.org/10.2801/31554

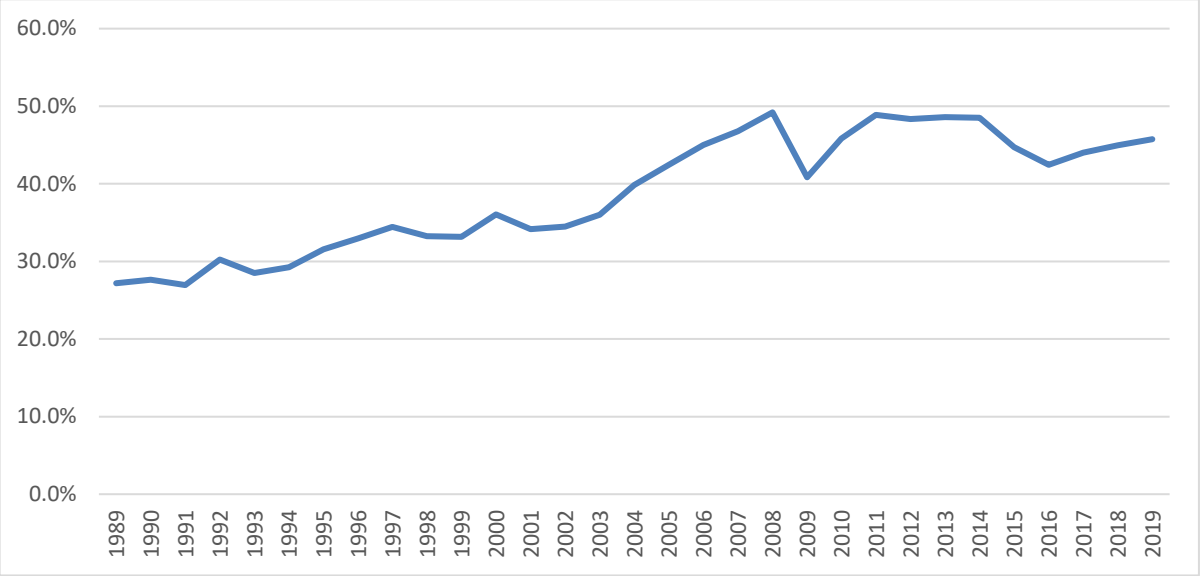
[109] OECD, "Labour Market Consequences."

[110] Council of Europe, "Globalisation," COMPASS: Manual for Human Rights Education for Young People, accessed 5 July 2021, https://www.coe.int/en/web/compass/globalisation

> the falling cost of transport, the growing intensity of the international penetration of capital, the immense growth in the global labour force, and the accelerated worldwide diffusion of technology, particularly communications.

Globalisation has been a driving force for growth in the APEC region, where the value of merchandise trade (the sum of imports and exports) has grown in value from USD 2.5 trillion in 1989 to USD 19 trillion in 2019, before receding to USD 18 trillion in 2020 due to the COVID-19 pandemic. Trade has also grown in importance in the region's economy, almost doubling in share of GDP from 27.2 percent in 1989 to 45.8 percent in 2019 (Figure 2.3).

Figure 2.3 Total trade as share of GDP in APEC, 1970–2019



Source: World Bank, World Development Indicators; Directorate General of Budget, Accounting and Statistics (DGBAS), Chinese Taipei; APEC PSU staff calculations.

The impacts of globalisation on the labour market are discussed extensively in the 2017 APEC Economic Policy Report (AEPR). While globalisation benefits economies that engage in it (trading partners benefit from the relationship, otherwise it would not occur), there may be sectors, firms or workers *within* an economy negatively affected by it. AEPR 2017 thus discusses the interaction between globalisation and structural unemployment, highlighting the need for active labour market policies and access to skills development to enable the reallocation of labour across sectors. The discussions in AEPR 2017 will not be repeated here, but it is worth highlighting two issues in the context of the future of work: the impact of globalisation on jobs and the impact on inequality.

2.3.1 Impact on jobs

Globalisation benefits economies by providing access to new markets, leading to an increase in output, and more and better job opportunities.[111] The economic growth from participating in global markets also allows economies to meet social goals such as better public services, including to the most vulnerable and disadvantaged.

[111] World Bank and World Trade Organization (WTO), "The Role of Trade in Ending Poverty" (Geneva: WTO, 2015), 19–25.

Critics, however, argue that globalisation has led to domestic job losses, and that restrictive trade policies are needed. A commonly cited example is the negative impact of globalisation on manufacturing jobs. In the United States, the displacement of domestic production led to the loss of more than 2 million well-paying manufacturing jobs,[112] while adding 2.4 million offshore during the 2000s.[113] Meanwhile, Chile experienced an 8 percent decline in net employment in manufacturing during trade liberalisation.[114] In response to calls for restrictive trade policies, proponents of globalisation point to studies such as a 2007 OECD analysis, which finds no correlation between trade openness and real wage growth between the 1990s and the early twenty-first century;[115] and they argue that protectionist policies lead to businesses incurring higher costs, which in fact could lead to jobs being eliminated.[116]

Nevertheless, it should also be recognised that the distribution of the macroeconomic gains from globalisation could vary within an economy. This is because the benefits of trade come from the efficiencies derived from an economy specialising in the production of goods and services in which it has a comparative advantage. In achieving such efficiencies, however, industries and sectors that are not competitive would not be able to survive, leaving their workers structurally unemployed.[117] This kind of change in the demand for labour is the first of two ways that workers are affected by globalisation.

The second way that globalisation affects workers is through changes in the demand for skills.[118] Skilled workers represent those with advanced skills, training and knowledge, often acquired through formal education or training, that would allow them to engage in tasks with high economic productivity and value. Unskilled workers, on the other hand, refer to those with a limited skill set and do not require advanced or formal education or training. Demand for skilled workers increases as technology shifts, or when a high-skilled sector becomes competitive after trade liberalisation and starts to draw in factors of production. Skilled workers are also needed when a low-skilled sector starts flourishing, and begins investing in technology to stay competitive. Such adoption of new technologies to stay competitive in a globalised economy leave behind unskilled workers. Even skilled workers could find their skills becoming obsolete or automated. The issue of skills mismatch is a problem for APEC economies: many workers remain unemployed even as a significant number of firms face challenges recruiting workers with appropriate skills.[119]

When firms are not able to overcome the skills mismatch issue, they may be forced to shut down, or they may move their operations offshore or outsource their activities abroad to remain competitive, leaving their former employees without jobs,[120] and often in a vicious cycle of

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[112] M.C. Klein, "How Many US Manufacturing Jobs Were Lost to Globalisation?" *Financial Times*, 6 December 2016, https://www.ft.com/content/66165693-ddf8-3988-b7e2-5ea887303c3e

[113] Council on Foreign Relations, "U.S. Trade and Investment Policy," Independent Task Report 67 (New York, NY: Council on Foreign Relations, 2011), https://cdn.cfr.org/sites/default/files/report_pdf/Trade_TFR67.pdf

[114] M. Rama, "Globalization and Workers in Developing Countries," January 2003, https://ssrn.com/abstract=636320

[115] OECD, "Globalisation, Jobs and Wages," Policy Brief (Paris: OECD, 2007).

[116] See also H. Molana, C. Montagna and G. Onwordi, "De-globalisation, Welfare State Reforms and Labour Market Outcomes," University of Nottingham, 2020.

[117] APEC, "APEC Economic Policy Report 2017" (Singapore: APEC, 2017)

[118] International Monetary Fund (IMF), World Bank and World Trade Organization (WTO), "Making Trade an Engine of Growth for All: The Case for Trade and for Policies to Facilitate Adjustment," Policy Paper, IMF, Washington, DC, 2017.

[119] APEC, 'Mismatch in Asia-Pacific Labour Markets' (submission by Australia at the *Roundtable Conference on Building Human Resource Development Partnerships for Innovative Growth and Sustainable Development*, Medan, Indonesia, 22–25 June 2013), accessed 15 May 2021, http://mddb.apec.org/Documents/2013/HRDWG/FOR/13_hrdwg_for_014.pdf

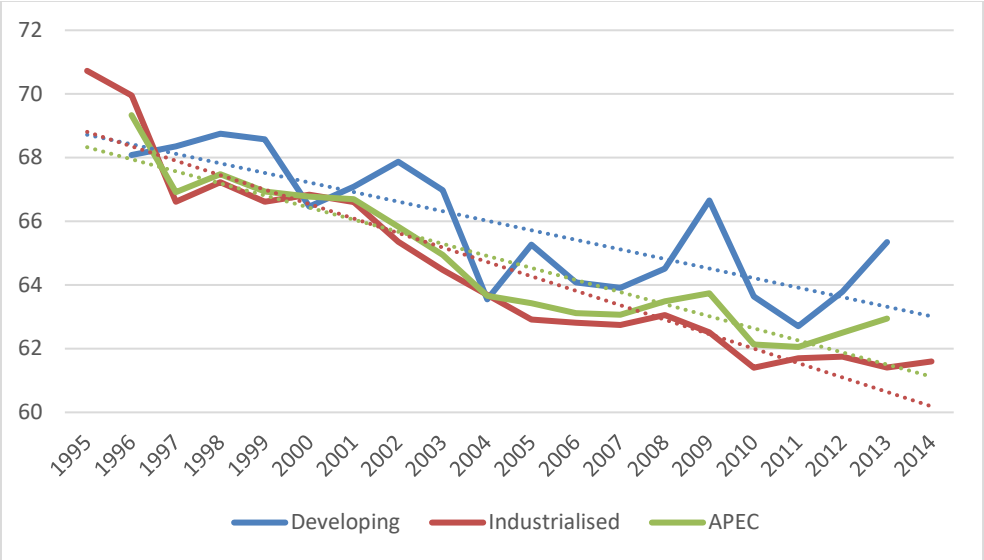
[120] L. Levine, "Unemployment through Layoffs and Offshore Outsourcing," Congressional Research Service, Washington, DC, 2010.

poor health and financial difficulties.[121] Unless steps had been taken to support these workers through the displacement they experienced, these workers are likely to see globalisation as a source of insecurity and loss, and lean toward policies that could provide some measure of relief.

2.3.2 Impact on inequality

Globalisation has been seen as a source of widening wage inequality in both developed and developing economies.[122] Among OECD economies, the labour share of income showed a gradual decline from 1980 to 2005. A similar observation is reported in the APEC region, where the adjusted share of labour income in GDP fell by about 7 percentage points between 1995 and 2014 (Figure 2.4). A falling labour share in GDP implies increasing income inequality as low- and middle-skilled workers get their income from labour, while owners of capital are mainly from the upper end of the income distribution.[123]

Figure 2.4 Adjusted labour share in APEC, 1995–2014 (% of GDP)



Note: Aggregates are weighted by GDP. Compensation data are not available for Indonesia and Viet Nam. Dotted lines are trendlines generated through a linear regression.
Source: APEC, "APEC Regional Trends Analysis: Declining Labour Share and the Challenge of Inclusion" (Singapore: APEC), https://www.apec.org/publications/2017/11/apec-regional-trends-analysis-2017

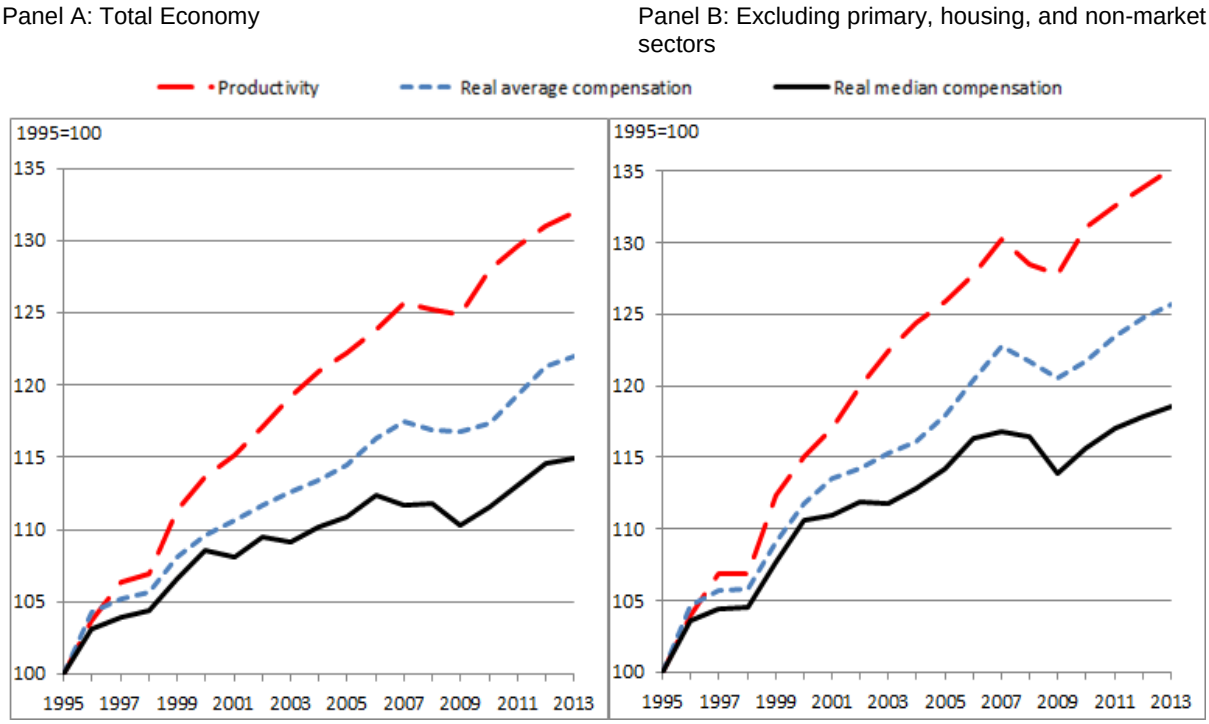
Globalisation, along with technological change, has been identified as a key cause of falling labour share in GDP.[124] For example, Nowak highlights that globalisation, in tandem with technological advancements, has opened up job opportunities, but has made it more difficult for labour unions to bargain for better wages and conditions.[125] Lower union density reduces workers' influence on corporate decisions, leading to rising disparity between labour and

[121] S.J. Davis and T. von Wachter, "Recessions and the Costs of Job Loss," Brookings, Washington, DC, 2011).
[122] B. Milanovic, *Global Inequality. A New Approach for the Age of Globalization* (Cambridge, MA: Harvard University Press, 2016); OECD, "Globalisation, Jobs and Wages."
[123] IMF, "Understanding the Downward Trend in Labour Income Shares", in *World Economic Outlook* (Washington, DC: IMF, 2017), Ch. 3.
[124] ILO and OECD, "The Labour Share in G20 Economies" (G20 Employment Working Group, Antalya, Turkey, 26–27 February 2015).
[125] P. Nowak, "The Past and Future of Trade Unionism," *Employee Relations* 37, no. 6 (2015): 683–91, https://doi.org/10.1108/ER-04-2015-0064

capital share. Likewise, a study of OECD economies from 1985 to 2003 observes that globalisation lowers employment protection for regular workers, but strengthens that of workers in atypical employment (those on fixed-term work contracts or employment through temporary work agencies).[126]

A related impact is the decoupling of real wage growth from productivity growth. In a competitive market economy, the linkage between productivity and wages is a key tenet of economic equity: workers need to be fairly compensated for their contribution to output, and higher productivity should be met with higher wages. A decoupling of productivity growth from wage growth, where the former grows faster than the latter, implies a breakdown in this linkage. This has been observed both at the economy level[127] and across groups of economies such as OECD.[128] The findings of decoupling for selected APEC economies are presented in Figure 2.5.

Figure 2.5 Macro-level decoupling in covered APEC economies, 1995–2013



Note: Unweighted average of Australia; Canada; Japan; Korea; New Zealand; and the United States. 1995–2013 for Japan and Korea; 1995–2012 for Australia; 1997–2012 for Canada and New Zealand; 1997–2013 for the United States. In Panel A, all series are deflated by the total economy value added price index. In Panel B, all series are deflated by the value-added price index excluding sectors in which labour shares are likely to be determined by fluctuations in commodity and asset prices, such as the primary and housing sectors, or are largely determined by nonmarket decisions. The sectors excluded in Panel B are the following (ISIC rev. 4 classification): (1) agriculture, forestry and fishing; (2) mining and quarrying; (3) real estate activities; (4) public administration

[126] J.A.V. Fischer and F. Somogyi, "Globalization and Protection of Employment," OECD, Paris, 2009, https://mpra.ub.uni-muenchen.de/17535/1/MPRA_paper_17535.pdf

[127] J. Bivens and L. Mishel, "Understanding the Historic Divergence Between Productivity and a Typical Worker's Pay: Why It Matters and Why It's Real," Economic Policy Institute, 2 September 2015, https://www.epi.org/publication/understanding-the-historic-divergence-between-productivity-and-a-typical-workers-pay-why-it-matters-and-why-its-real/

[128] OECD, "Decoupling of Wages from Productivity: What Implications for Public Policies?" in *OECD Economic Outlook 2018* (Paris: OECD, 2018), https://www.oecd.org/economy/outlook/Decoupling-of-wages-from-productivity-november-2018-OECD-economic-outlook-chapter.pdf

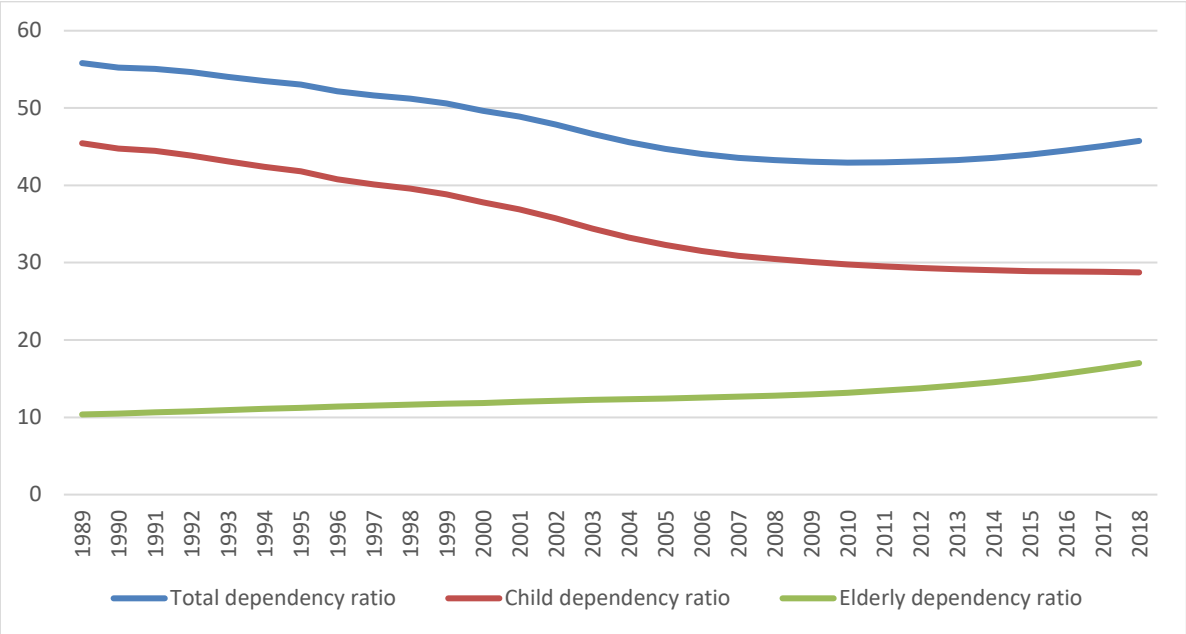
and defence, compulsory social security; (5) education; (6) human health and social work activities; (7) activities of households as employers; and (8) activities of extraterritorial organisations and bodies.
Source: OECD National Accounts Database; OECD Earnings Database; OECD staff calculations.

As with the falling labour share in GDP, globalisation and technological change have been identified as key causes of this decoupling. The OECD identifies the role of trade integration and global value chains in contributing to wage inequality and decoupling. Pessoa and Van Reenen on the other hand explain 'gross decoupling' through rising wage inequality and challenges related to rising healthcare and retirement costs.[129] Either interpretation implies the same conclusion: there is a need to strengthen the link between raising productivity – either due to globalisation or technological adaptation – and workers' wages.

2.4 DEMOGRAPHIC CHANGE

Over the past three decades, growing affluence and advancements in healthcare and nutrition have led to rising average life expectancy across the APEC region, from 71 years in 1989 to 77 years in 2018. At the same time, and for probably the same reasons, birth rates have fallen across the region from 22 births per 1,000 in 1989 to 14 in 2018. This has resulted in rising total dependency ratios in the APEC region starting in 2010, with the elderly dependency ratio driving the increase (Figure 2.6).

Figure 2.6 Average dependency ratios in APEC, 1989–2018

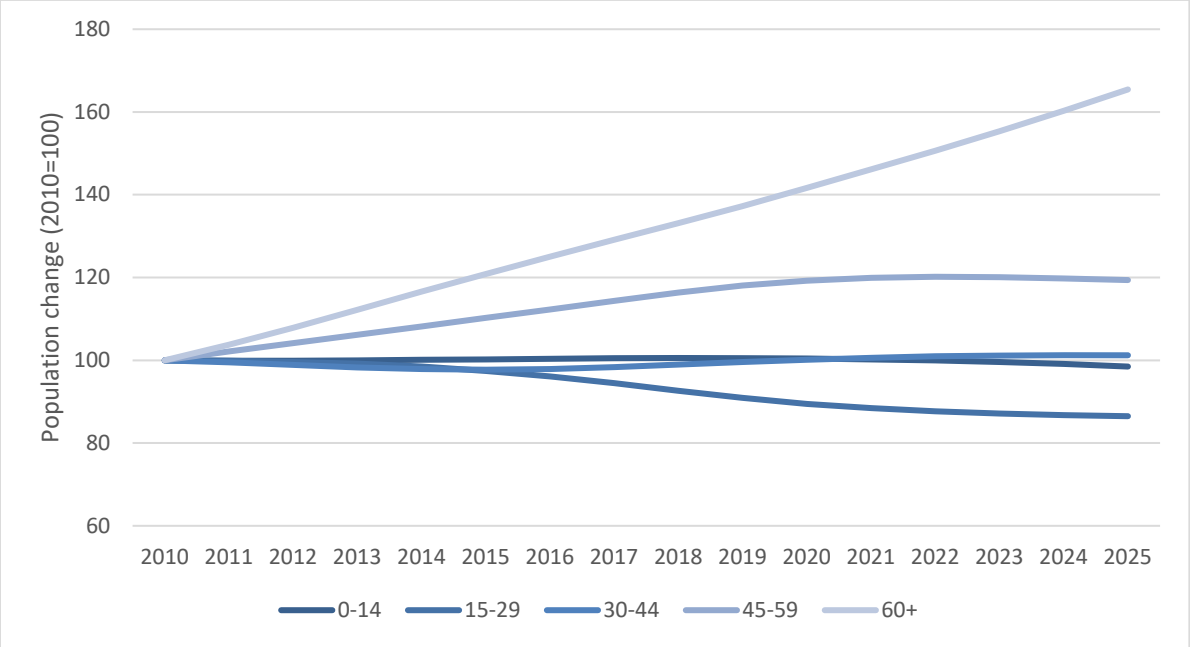


Note: Total dependency ratio is defined as the non-working age population who are children (0–14 years old) and elderly (65 years old and older) divided by the working-age population (15–64 years old). Child and elderly dependency ratios are the non-working age populations who are children and elderly divided by the working-age population, respectively. Aggregates are weighted by population.
Source: World Bank, World Development Indicators; Directorate General of Budget, Accounting and Statistics (DGBAS), Chinese Taipei; APEC PSU staff calculations.

[129] J. Pessoa and V. Reenen, "Decoupling of Wage Growth and Productivity Growth? Myth and Reality", CEP Discussion Paper, Centre for Economic Performance, October 2013, https://cep.lse.ac.uk/pubs/download/dp1246.pdf

As of 2021, there are 383 million people over the age of 65 in the APEC region. Relative to 2010, the population above 60 years old grew the fastest, followed by the 45- to 59-year-old age group (Figure 2.7). On the other hand, the population of people aged 29 years and below is expected to be lower in 2025 compared to 2010 levels. The increase in the share of older people suggests that there will be a consequent decline in the potential labour force.[130] In addition, rising educational attainment and longer school careers will lower participation rates among young people, potentially narrowing the size of the labour force.[131]

Figure 2.7 Population change by age group in APEC (2010 = 100), 2010–2025



Note: Figures show changes relative to 2010, which is indexed to 100. E.g., a figure of 110 means a 10 percent increase from 2010, while a figure of 95 means a 5 percent decrease from 2010 levels.
Source: ILOSTAT; APEC PSU staff calculations.

A key concern for policymakers is that an ageing population and rising dependency ratios will increasingly burden social protection and pension systems, threatening their financial viability. The tax base may also erode as labour participation rates fall while expenditures on pension and care services increase.[132] Moreover, healthcare costs tend to increase as the population grows older as they require more services and specialised machines.[133] For example, in the United States, increased life expectancy will lead to an increase of 15 to 29 percent in GDP expenditures on healthcare. As economies recognise the increasing burden of social protection, increased life expectancy would force some of them to reduce the pensions for future generations by half.[134]

[130] N. Bosanquet, C. Fraser, and P. Nolan, "Mind the (Fiscal) Gap: Direct Taxes, Public Debt and Population Ageing," Reform Ideas 10, 2013
[131] ILO, "World Employment and Social Outlook Trends" (Geneva: ILO, 2015).
[132] Schmidt, *Digital Labour Markets*; WEF, "The Global Risk Report 2017" (WEF, 2017), http://www3.weforum.org/docs/GRR17_Report_web.pdf
[133] T. Bengtsson, *Population Ageing – A Threat to the Welfare State? The Case of Sweden* (Berlin: Springer, 2010).
[134] International Federation of Pension Fund Administrators (FIAP), ed., "Advancing in the Strengthening and Consolidation of the Individually-Funded Pension Systems" (Santiago, FIAP, 2011), https://www.fiapinternacional.org/wp-content/uploads/2016/01/libro_fiap_2011_eng.pdf

2.4.1 The silver economy

While dependency ratios and the financial stability of pension funds need to be addressed, it should also be acknowledged that the elderly are key contributors to the economy. The silver economy, defined as economic activities and production that serves the needs and preferences of people aged 50 and above, is increasingly significant.[135] Recognising opportunities in the silver economy will not only improve the wellbeing of the elderly population, but it can also contribute to inclusive economic growth.

With growing numbers come growing spending power and greater potential for influencing consumer-driven economic growth.[136] Indeed, Huang, Lin and Lee find evidence that an ageing population has had a significant positive impact on the rate of economic growth.[137] The elderly may help drive the marketplace as consumers while their lifelong experiences would be useful in the workplace.[138] In 2019, the age 60+ cohort (roughly 187 million people) represented 28 percent of Europe's total spending power, equivalent to USD 3.64 trillion. By 2030, this number is expected to increase to over USD 5 trillion (a third of Europe's annual spending power), contributed by 221 million 60+ year olds, translating to a 1.2 percent increase in the rate of spending per person.[139]

Technological change is interacting with the ageing population. Technology to improve the wellbeing of the elderly is being developed not only in healthcare but also in architecture, appliances and infrastructure, leading to the emergence of gerontechnology (i.e., gerontology + technology). It has been demonstrated that technology has significant potential to improve healthcare access and delivery for the elderly,[140] and can also enable older people to live independently.[141]

The increase in ageing populations has also given rise to new job opportunities for other age groups, such as in the care professions, where humans still hold a comparative advantage against machines. Scheil-Adlung estimates that the global supply of workers in healthcare will need to increase by 27 million workers in the health occupations and 45.5 million in non-health occupations (such as low-skilled workers performing maintenance or cleaning at hospitals) in order to achieve universal health coverage by 2030.[142] On the other hand, the ILO estimates

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[135] D. Lloyd, "The Burgeoning Silver Economy," The Oxford Institute of Population Ageing: Blog, 15 January 2020, https://www.ageing.ox.ac.uk/blog/the-burgeoning-silver-economy

[136] W. Fengler, "The Silver Economy Is Coming of Age: A Look at the Growing Spending Power of Seniors," Brookings, 14 January 2021, https://www.brookings.edu/blog/future-development/2021/01/14/the-silver-economy-is-coming-of-age-a-look-at-the-growing-spending-power-of-seniors/

[137] X. Huang, and G. Chen, and E. Lee, "The Moderating Effect of Internal Control on Performance of Cross-Border M&A under the Uncertainty of Economic Policy: Evidence from China," *Journal of Korea Trade* 23, no. 7 (2019): 128–46, https://ssrn.com/abstract=3534858

[138] OECD and the Global Coalition on Aging (GCOA), "The Silver Economy as a Pathway for Growth: Insights from the OECD-GCOA Expert Consultation, 26 June 2014" (2014), https://www.oecd.org/sti/the-silver-economy-as-a-pathway-to-growth.pdf

[139] B. Tong, "Silver Economy Spending Power Trends in Europe," World Data Lab: Blog, 19 November 2019, https://worlddata.io/blog/silver-economy-europe

[140] L. Chen, "Gerontechnology and Artificial Intelligence: Better Care for Older People," Archives of Gerontology and Geriatrics 91, no. 104252 (2020), https://www.ncbi.nlm.nih.gov/pmc/articles/PMC7482590/

[141] M. Haufe, S.T.M. Peek, and K.G. Luijkx, "Matching Gerontechnologies to Independent-living Seniors' Individual Needs: Development of the GTM Tool," BMC Health Services Research 19, no. 26 (2019), https://doi.org/10.1186/s12913-018-3848-5

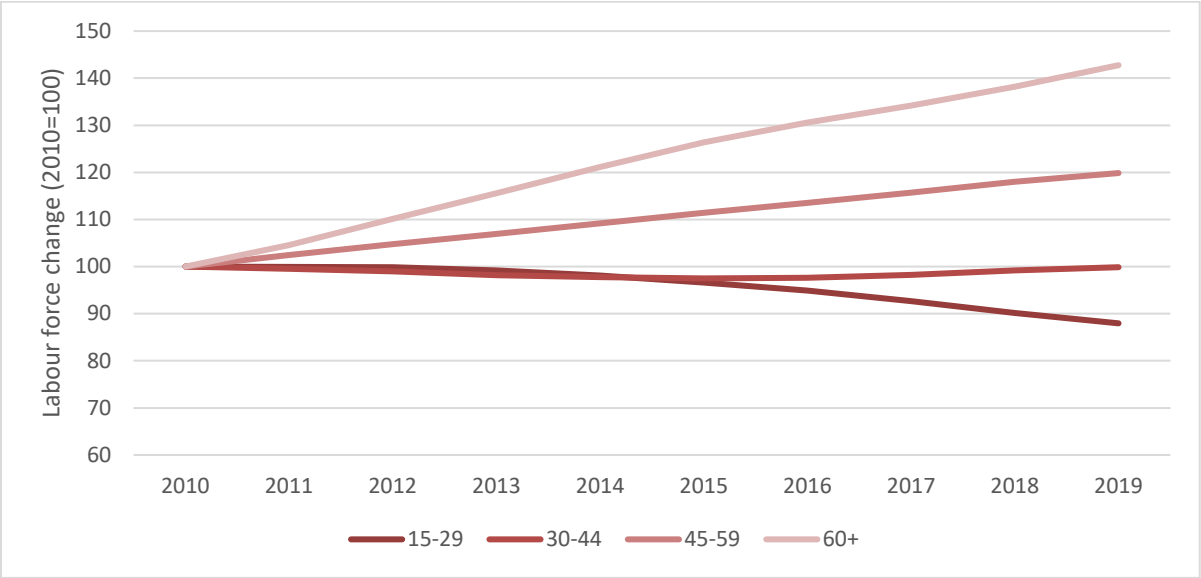
[142] X. Scheil-Adlung, "Health Workforce: A Global Supply Chain Approach, New Data on the Employment Effects of Health Economies in 185 Countries," Extension of Social Security - Working Paper 25, International Labour Office, Geneva, 2016, https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---soc_sec/documents/publication/wcms_537419.pdf

that even more healthcare jobs would be required just to maintain status quo: globally 153 million healthcare jobs would have to be created by 2030 to maintain the current levels of healthcare access.[143] While the estimates vary, these findings make it clear that the demand for workers in healthcare professions is growing and provides new opportunities for employment.

2.4.2 Lifelong working

Ageing populations can also remain economically productive. According to a Bank of America–Merrill Lynch survey, seven out of ten retirees in the United States would prefer to work in retirement to stay mentally and physically active, and gain extra earnings for a comfortable retirement. This survey indicates that labour supply from among the elderly can be improved. Fougère et al., when examining the potential economic and labour market effects of working longer in Canada, find that the marginal effects of working an additional year would lead to a 3.5 percent increase in real GDP per capita by 2050, while a gradual increase in the effective age of retirement could raise real GDP per capita by nearly 12 percent in 2050.[144]

Figure 2.8 Labour force change by age group in APEC (2010 = 100), 2010–2019



Note: Figures show changes relative to 2010, which is indexed to 100. E.g., a figure of 110 means a 10 percent increase from 2010, while a figure of 95 means a 5 percent decrease from 2010 levels.
Source: ILOSTAT; APEC PSU staff calculations.

In 2019, 161 million people above the age of 60 in the APEC region were in the labour force, of which 79 million were above the age of 65. Between 2010 and 2019, the labour force above the age of 60 grew by 43 percent, compared to a 12 percent reduction among workers aged 15 to 29 years old (Figure 2.8). In the same period, the share of workers above 60 years old increased from 7.5 to 10.2 percent. Whether out of choice or necessity, elderly workers are increasingly an important part of the APEC region's workforce.

[143] T. Balliester and A. Elsheikhi, "The Future of Work: A Literature Review," Research Department Working Paper 29, International Labour Office, Geneva, 2018, https://www.ilo.org/wcmsp5/groups/public/---dgreports/---inst/documents/publication/wcms_625866.pdf
[144] M. Fougère, S. Harvey, J. Mercenier, and M. Mérette, "Population Ageing and the Effective Age of Retirement in Canada," Skills Research Initiatives (SRI) Working Paper 2005-A-03, 2005.

However, as discussed in AEPR 2017, the increase in elderly workers poses several challenges for firms and policymakers. Firstly, elderly workers may need retraining to adapt to recent technological changes or new ways of working. Lovasz and Rio note that elderly workers may risk falling into low-skilled and low-paying jobs as their current skills may not match the current demand of employers.[145] Secondly, elderly workers are more susceptible to illnesses and injuries, thus limiting the type of work they can do. Companies may also have to incur additional expenses in providing appropriate work areas, equipment, or working arrangements for them. Thirdly, elderly workers may face a certain degree of prejudice from employers and co-workers which may lead to workplace discrimination.

[145] A. Lovász, and M. Rigó, "Vintage Effects, Aging and Productivity," *Labour Economics* 22(C) (2013): 47–60.

3. COVID-19, JOBS AND DIGITALISATION

In December 2019, when the very first cases of a novel coronavirus were reported,[146] no one could have imagined the impact the virus would have. One and a half years on, the world has been disrupted in various ways, including the contraction of economies, downward movement in the labour market, and changing ways of working and socialising. It has become clear that the pandemic has and continues to have deep socioeconomic impacts on APEC economies.

This chapter analyses the impacts of COVID-19 and how labour markets responded. It compares the impact of various policy measures on labour market performance and how people work. It also assesses the role played by COVID-19–related policies on APEC economies, focusing on sectors that have borne the brunt of the impacts.

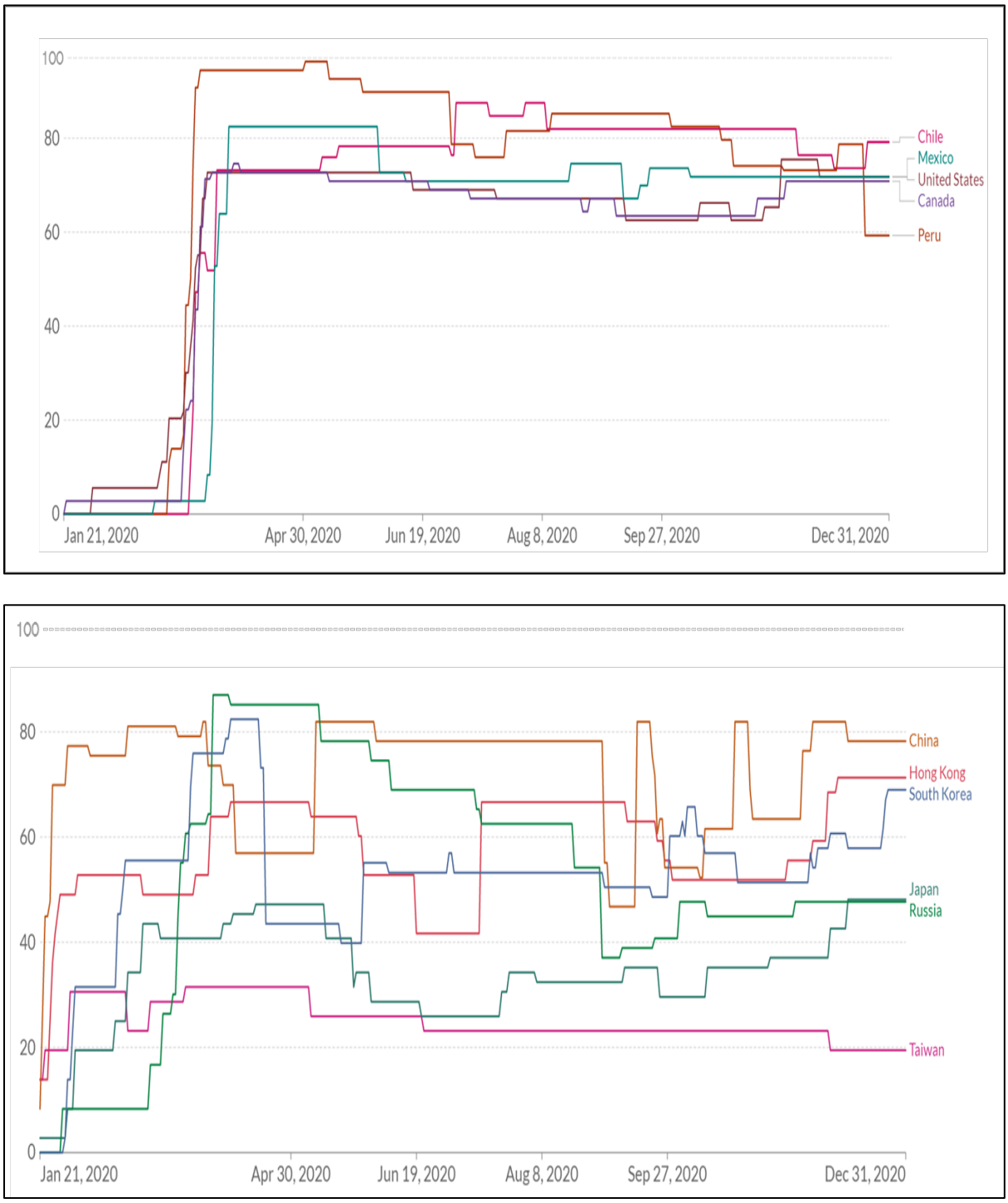
3.1 COVID-19 PANDEMIC RESPONSE IN APEC

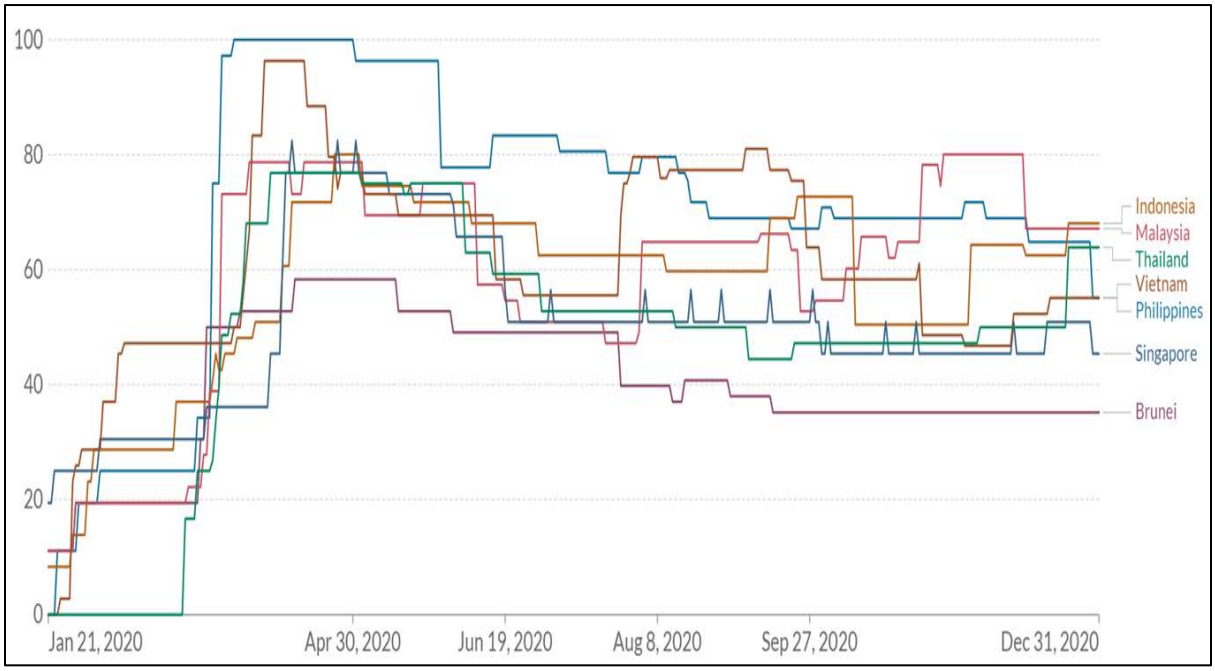
The APEC economies introduced a range of measures to stop the spread of the pandemic. The public was introduced to the concept of social distancing. Activities and events that attract crowds were prohibited. Economies also closed borders and restricted both international or cross-border travel and movement within communities. These lockdown measures, often implemented without much notice, gave economies more time to control the situation within their borders.

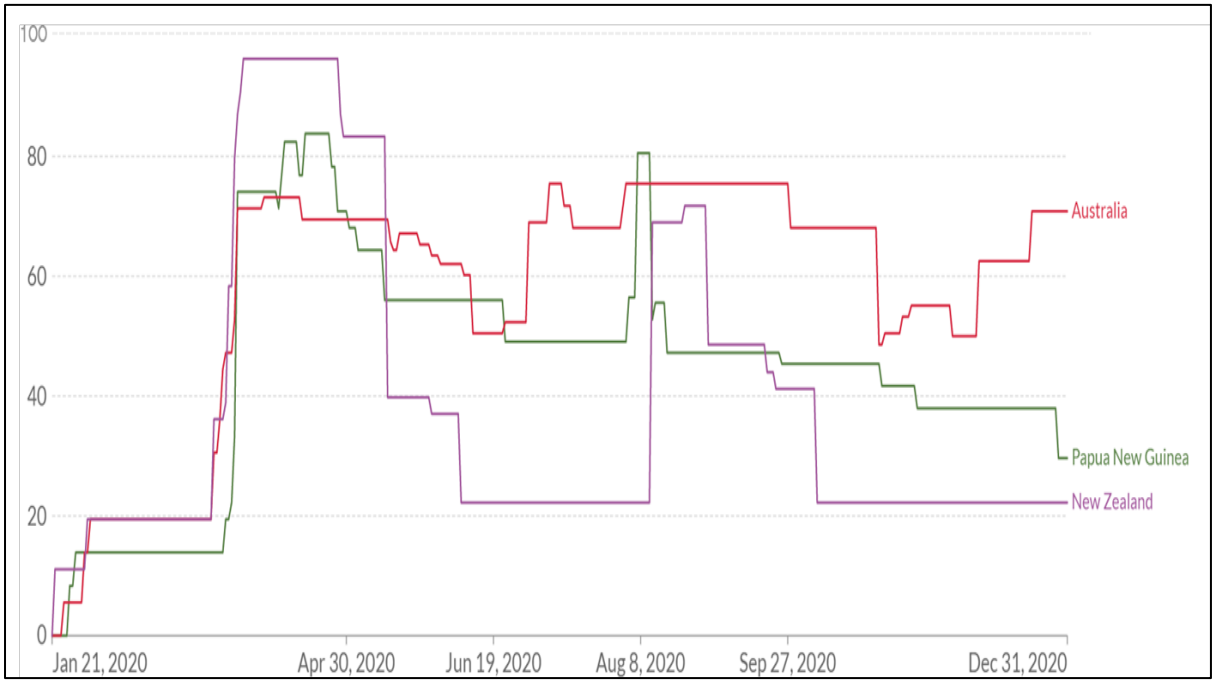
The COVID-19 Stringency Index, which tracks the strictness of the measures to address COVID-19, offers a snapshot of the trajectory of the COVID-19 response by the 21 APEC economies in the first quarter of 2020 (Figure 3.1). Most APEC economies introduced strict measures such as lockdowns soon after identifying their first confirmed COVID-19 cases, causing their stringency index score to rise. As may be expected, Figure 3.1 also shows the scores rising at different times for different economies, coinciding with when each economy found its first COVID-19 cases. Once the situation improves, economies may ease up on the measures, ramping up again when cases rise, which accounts for the fluctuations seen in the figure below. Also suggested by Figure 3.1 is how quickly some economies responded to COVID-19, in large part due to their past experience with outbreaks such as severe acute respiratory syndrome (SARS) in 2003–2004 and the H5N1 avian influenza outbreak in 2013–2014.

[146] World Health Organization (WHO), "Timeline: WHO's COVID-19 Response," accessed 5 July 2021, https://www.who.int/emergencies/diseases/novel-coronavirus-2019/interactive-timeline#event-7

Figure 3.1 COVID-19 Stringency Index (January 2020 – December 2020)





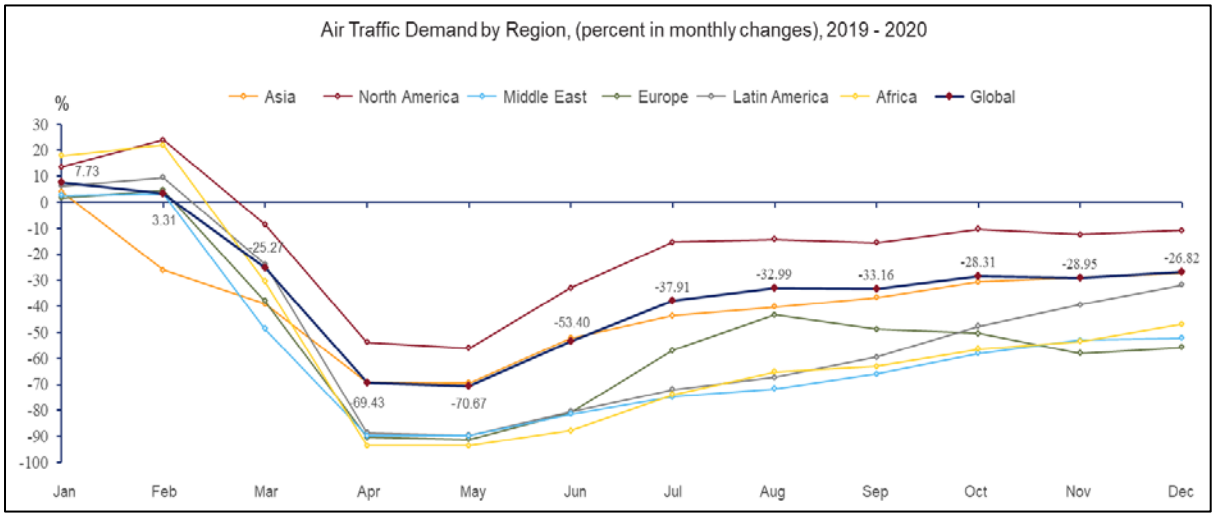


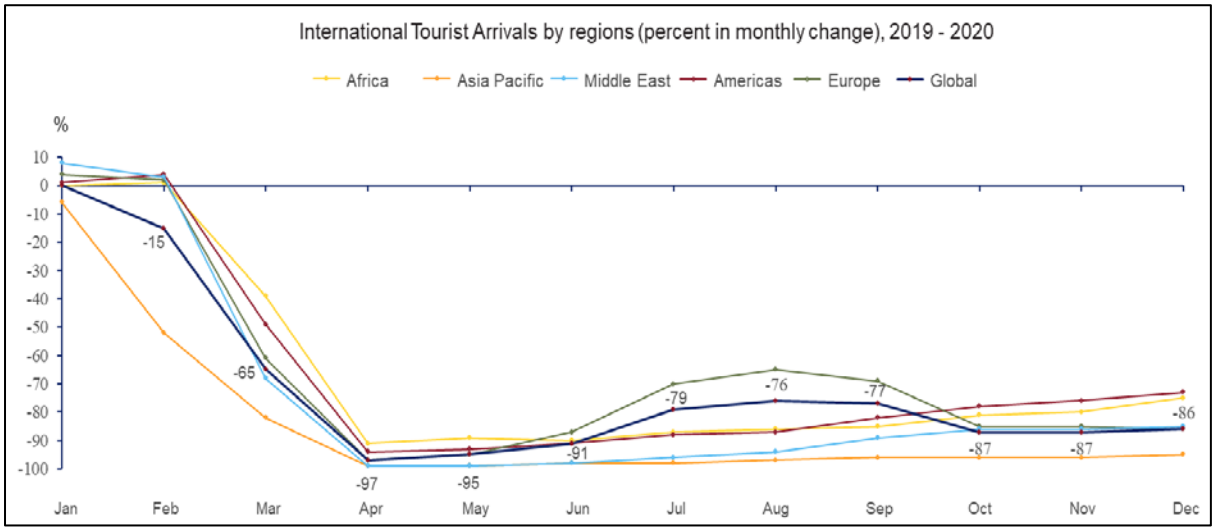
Note: The index is a composite measure based on nine response indicators, rescaled to a range from 0 to 100 (100 – strictest). The nine response indicators scored are: school closures; workplace closures; cancellation of public events; restrictions on gatherings; closures of public transport; public information campaigns; stay-at-home requirements; restrictions on internal movements; and international travel controls.
Source: Oxford COVID-19 Government Response Tracker (OxCGRT).

As discussed, APEC economies have broadly supported the implementation of strict COVID-19 measures. However, some of the measures come with serious economic costs. Lockdowns cause the economy to slow down, and for some sectors, come to near halt. For instance, when international and cross-border travel was prohibited, the airline industry and travel-related businesses were among the first to be seriously affected. Global air passenger traffic dropped

dramatically in 2020.[147] In May, the monthly change globally was 70.6 percent, the sharpest drop yet seen (Figure 3.2). There was a moderate recovery during the period June to December 2020, but not to pre–COVID-19 levels. Another indicator, international tourist arrivals, was also significantly down, falling sharply in all regions in April 2020. With COVID-19 yet to be resolved in many economies, international tourist arrivals saw little change from May to December 2020. Air traffic did see some recovery with the resumption of cargo operations. These impacts will reverberate beyond the airline sector, particularly in economies where the travel, tourism and hospitality sectors make up the major part the economy's GDP.

Figure 3.2 Air traffic demand and international tourist arrivals by region (January 2020 – December 2020)





Source: Committee of the Coordination of Statistical Activities, "How COVID-19 Is Changing the World: A Statistical Perspective, Vol. 3" (Committee of the Coordination of Statistical Activities, 2020); International Civil Aviation Organization (ICAO), COVID-19 Air Traffic Dashboard.

[147] International Civil Aviation Organization (ICAO), "Economic Impact Analysis of COVID-19 on Civil Aviation," July 2020.

3.2 IMPACTS ON THE ECONOMY

3.2.1 APEC GDP growth

COVID-19 continues to be a challenge for the APEC region, with some economies still facing down the third and fourth waves of the disease. The measures deployed – border closures, stay-at-home orders and movement restrictions – have dampened demand, threatening in particular MSMEs that may lack the resources to continue operations. The fallout has led to millions of people becoming jobless, and vulnerable to falling into extreme poverty.

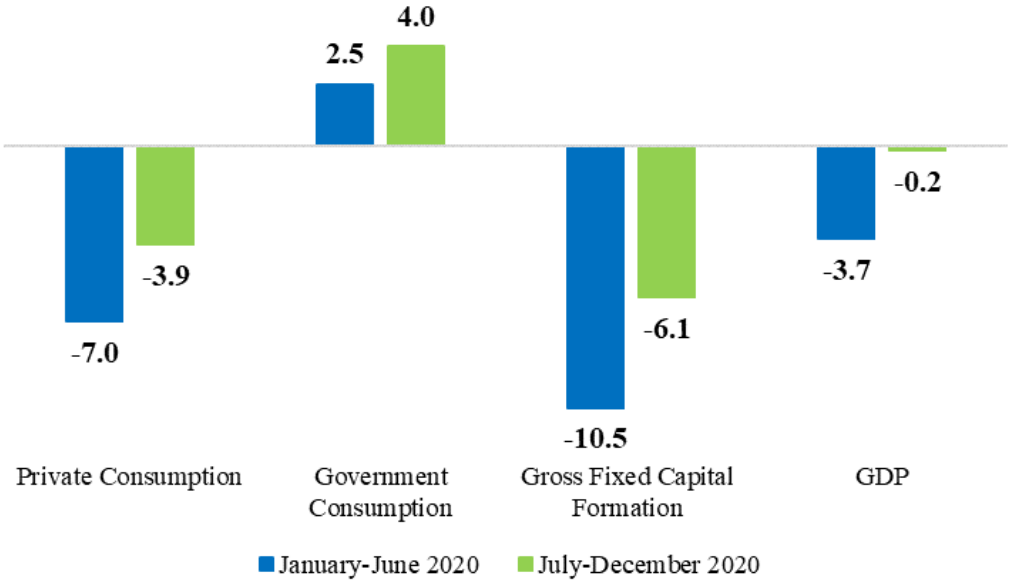
In the APEC region, GDP contracted by 3.7 percent in the first half of 2020 (Figure 3.3). The situation improved in the latter half of 2020, with GDP declining just 0.2 percent as pandemic-related financial relief was distributed to households and businesses even as economies continued to support and fund health measures. Such distributions and support led to an increase in government consumption, of 2.5 percent in the first half and a further 4.0 percent in the second half of 2020. The change in household consumption, the main driver of APEC growth, improved to -3.9 percent during the period July–December 2020 from -7.0 percent in the first half, while investments followed the same trend.

For the whole year 2020, APEC GDP declined by 1.9 percent (Figure 3.4), an improvement on the earlier projection of a 2.7 percent contraction in APEC Regional Trends Analysis (ARTA) May 2020.[148] There is, however, wide variation within APEC: a few economies grew, some economies declined but not as much as expected, while other economies went into recession. Emerging evidence estimates the impact of COVID-19 on the labour market and wellbeing in developing economies. Aggregated data in economies including Peru and Chile shows that 58 percent of respondents report that a household member closed their business compared to 43 percent of small businesses closed in the United States. This finding implies that the economic impacts of COVID-19 may be stronger in developing economies.[149]

[148] APEC, "APEC Regional Trends Analysis: What Goes Around Comes Around: Pivoting to a Circular Economy; Uncertainty Tests APEC Resilience amid COVID-19" (Singapore: APEC, May 2020), https://www.apec.org/Publications/2020/05/APEC-Regional-Trends-Analysis---What-Goes-Around-Comes-Around

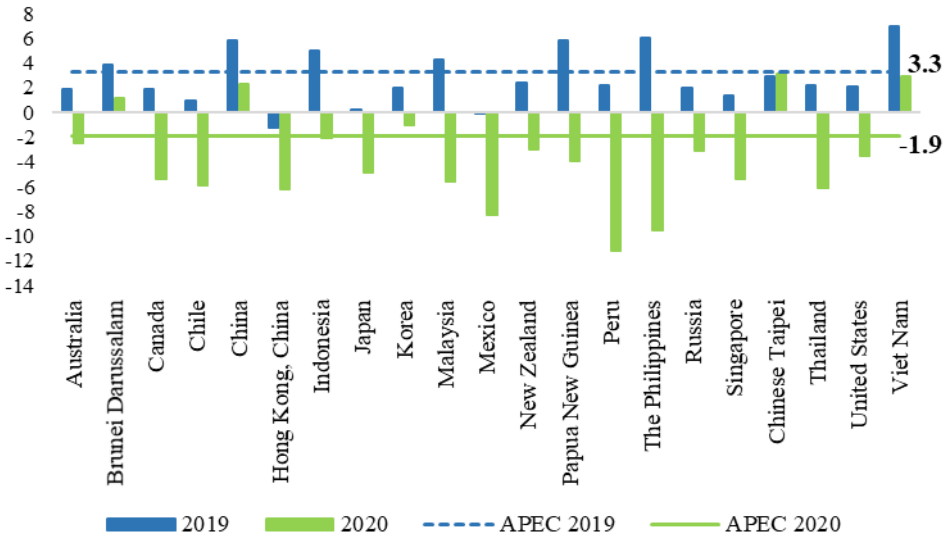
[149] N. Bottan, B. Hoffmann, D. Vera-Cossio, "The Unequal Impact of the Coronavirus Pandemic: Evidence from Seventeen Developing Economies," PLoS ONE 15, no. 10(2020): e0239797, https://doi.org/10.1371/journal.pone.0239797

Figure 3.3 Growth in consumption and investments (%), first and second half of 2020



Note: Data on consumption and investments are not available for China; Papua New Guinea; and Viet Nam. The calculation for weighted APEC GDP growth includes China and Viet Nam; but excludes Papua New Guinea due to unavailability of quarterly data on GDP growth.
Source: Economy sources; APEC PSU staff calculations.

Figure 3.4 Real GDP growth (%), 2019 and 2020



Source: Economy sources; International Monetary Fund (IMF), "World Economic Outlook: Managing Divergent Recoveries" (Washington, DC: IMF, 2021); APEC PSU staff calculations.

3.2.2 Trade performance

Trade performance in the region has been sluggish since 2018, when trade and technology tensions escalated. Border closures, major disruptions to global supply chains, and decreased overall demand due to COVID-19 have exacerbated the weakness in trade. Volume of merchandise exports in APEC in 2020 contracted by 2.6 percent after growing slightly in 2019, while volume of merchandise imports continued the decline seen in 2019 (Figure 3.5). The

value of merchandise trade stayed in negative territory in 2020, with exports decreasing by 4.7 percent and imports by 6.3 percent (Figure 3.6).

While trade performance in the APEC region in 2020 was weak, it compares favourably against the rest of the world. The value of world merchandise exports declined by 10.3 percent and the value of imports by 9.0 percent. The value of world merchandise trade was also lower by almost 8.0 percent in 2020 compared to 2019.

Commercial services sustained substantial losses in 2020 (Figure 3.8), largely due to travel and tourism being severely impacted by COVID-19. In particular, transport and travel services dropped by almost 50 percent in 2020 compared to the level in 2019 (Figure 3.7).

Figure 3.5 Growth in volume of merchandise trade (year-on-year, %)

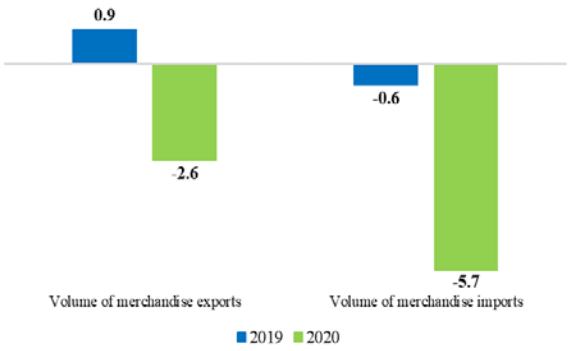
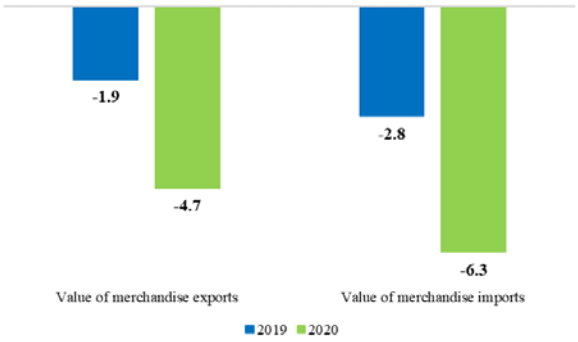


Figure 3.6 Growth in value of merchandise trade (year-on-year, %)



Note: Due to unavailability of data, the average growth in trade volume for APEC does not include Brunei Darussalam and Papua New Guinea.
Source: UNCTADstat (for trade volume); World Trade Organization (for trade values); APEC PSU staff calculations.

Figure 3.7 Growth in transport and travel services (year-on-year, %)

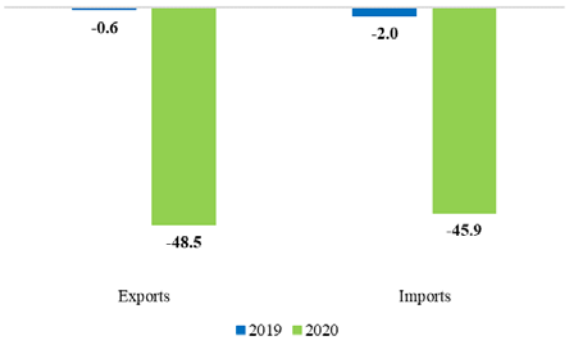
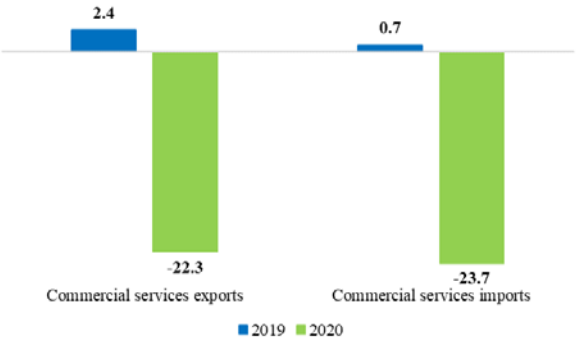


Figure 3.8 Growth in commercial services (year-on-year, %)



Source: World Trade Organization; APEC PSU staff calculations.

3.3 IMPACTS ON THE LABOUR MARKET

The COVID-19 pandemic has had a significant impact on enterprises and workers, affecting what work is available and how work is conducted. Moreover, there are structural changes to the composition of the labour market that are unique to the COVID-19 crisis, namely, the

prominence of temporary cessation of work, supported (e.g., via furlough schemes) or unsupported; transitions out of the labour market altogether, particularly for unpaid care work; and shifts in hours worked, particularly the reduction of hours. These concepts have all challenged the interpretation of traditional labour market metrics such as employment and unemployment, and prompt the need to examine other indicators to understand and impact of COVID-19 on labour markets globally and in the APEC economies.

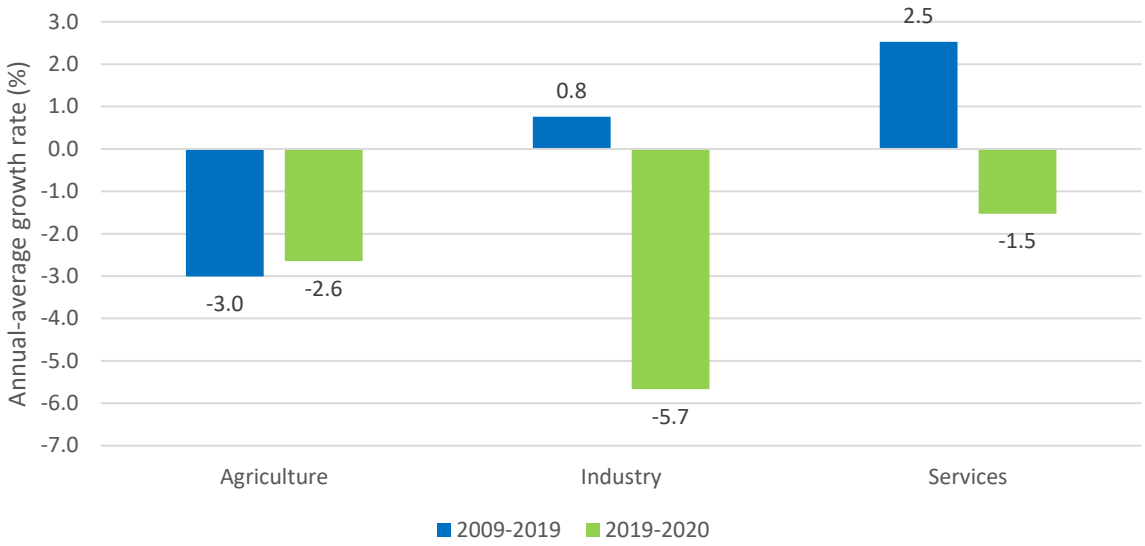
3.3.1 Total employment

The degree to which workers and enterprises have been impacted by the crisis is largely reflected in the sectoral composition of the different economies. Different COVID-19 containment measures, including lockdowns and social distancing measures, affect the ability to conduct business; value-chain disruption has created supply constraints, inhibiting production; while occupational exposure to COVID-19 through one's work has implications for the availability and health of workers. The sectoral dimension to these components can help explain the different impacts on employment and jobs through the labour demand and labour supply perspectives.

In 2020, it is estimated that across the APEC economies, employment in the services sector decreased by 1.5 percent, equivalent to 12 million employed.[150] This marks a substantial decline between 2019 and 2020 from a growth rate of 2.5 percent per annum over the last decade (see Figure 3.9). It also compares to a decline of 5.7 percent for industry (including manufacturing and construction), which had averaged 0.8 percent growth per annum over the last decade. The impact on industry is driven in large part by the impact on manufacturing, which accounted for 16 million employed, and the majority of the 21 million reduction in employment in 2020. Finally, the agriculture sector exhibited a slower decline in 2019–2020 than its decade-long average growth rate. This may be driven by transitions from services and industry back to agriculture, as a result of layoffs in these other sectors. The tourism sector – a cross-cutting industry that encapsulates a range of industries including different services such as transport, hotels and restaurants and other services – has been heavily impacted through a range of channels, including travel restrictions. In Canada, for instance, between February and April 2020, tourism jobs accounted for 27 percent of all job losses in the economy.[151]

[150] All aggregate regional labour market data for APEC economies used in Sections 3.3 and 3.4 are from ILOSTAT modelled estimates. The aggregate for the region includes all APEC member economies.
[151] Canada Labour Market Information Council, "LMI Insight Report no. 30, Sectors at Risk: The Impact of COVID-19 on the Canadian Tourism Industry" (2020), https://lmic-cimt.ca/publications-all/lmi-insight-report-no-30-sectors-at-risk-the-impact-of-covid-19-on-the-canadian-tourism-industry/

Figure 3.9 Employment growth rates (%), by broad sector group, APEC economies



Note: 'Industry' includes mining and quarrying; manufacturing; utilities (electricity, gas, etc.) and construction. 'Services' includes wholesale and retail trade; repair of motor vehicles, motorcycles; accommodation and food; transport, storage and communication; financial activities; education; health and social work activities; public administration and defence, compulsory social security; real estate, business and administrative activities; and other services.
Source: ILOSTAT: ILO modelled estimates.

Besides the sudden shock effects that the COVID-19 situation had on the services and industry sectors across the globe, APEC members such as Korea and Chinese Taipei are paying close attention to the gradual and long-term effects that the services and industry sectors, and especially 'working models of face-to-face contact', are facing due to the 'inevitable trend of digital transformation'.[152]

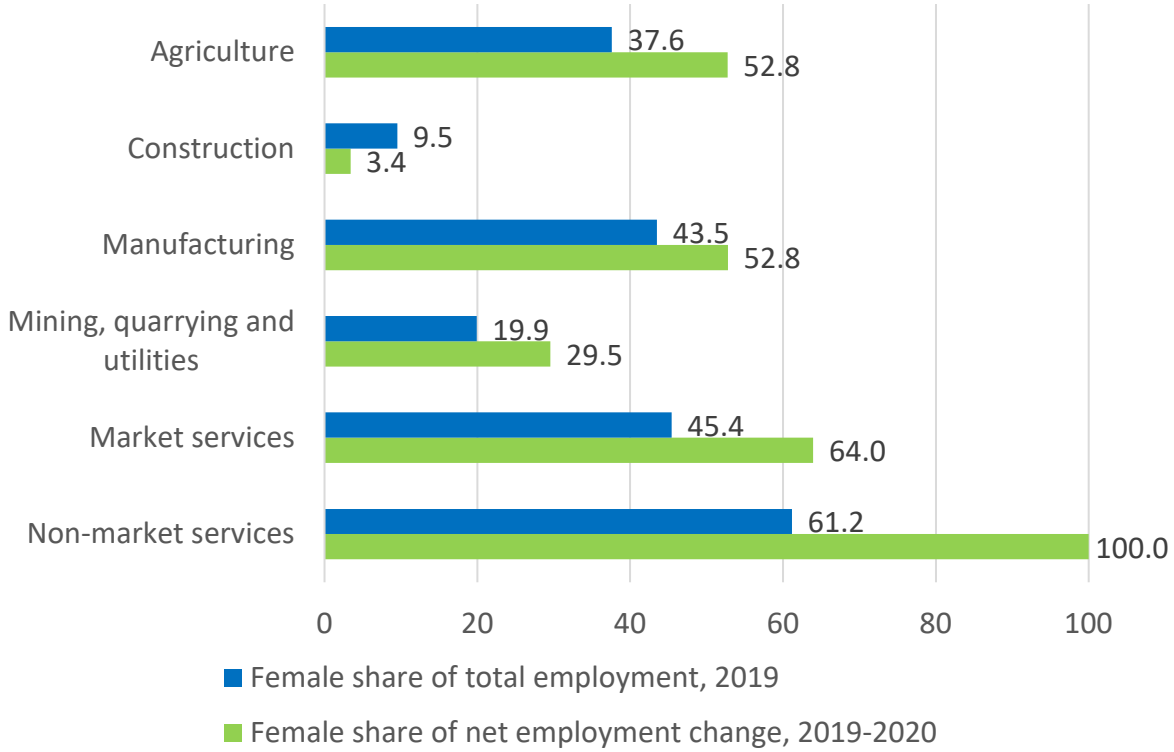
The transformative changes in the way people live and work, including flexible employment arrangements, teleworking or online learning, are projected to lead to a sustained 'decrease in the number of jobs for service sectors that provide face-to-face services, such as wholesale, retail, lodging, food service sectors; sectors that heavily employ vulnerable groups'.[153]

While women accounted for 44 percent of the total employed population in 2019, they accounted for 54 percent of the total change in employment in 2020. This again varies between sectors as can be observed in Figure 3.10. The figure shows that for most of the sectors, women's share of the total change in employment between 2019 and 2020 was greater than the share of employment they held in that sector. This is most marked in the services sector. The services sector can be broken down into market services and non-market services, whereby the former refers to activities such as retail and wholesale trade, and the latter to activities such as education and social services. Figure 3.10 shows that in non-market services, where women had a 61 percent share of total employment in 2019, women accounted for 100 percent of the total loss for men and women combined. In market services, the difference was less marked, but women still accounted for more than 60 percent of the total change despite having a 45 percent share of total employment in 2019. Only in construction did women account for a lower share of the change in employment than their share of total employment. This is likely to be

[152] Chinese Taipei Individual Economy Report 2021.
[153] Korea Individual Economy Report 2021.

due to the traditional gender dimensions of roles within the construction sector and the greater impact suffered by male-dominated roles in the sector.

Figure 3.10 Female share of total employment (%), 2019, and female share of net employment change (%), 2019–2020, APEC economies

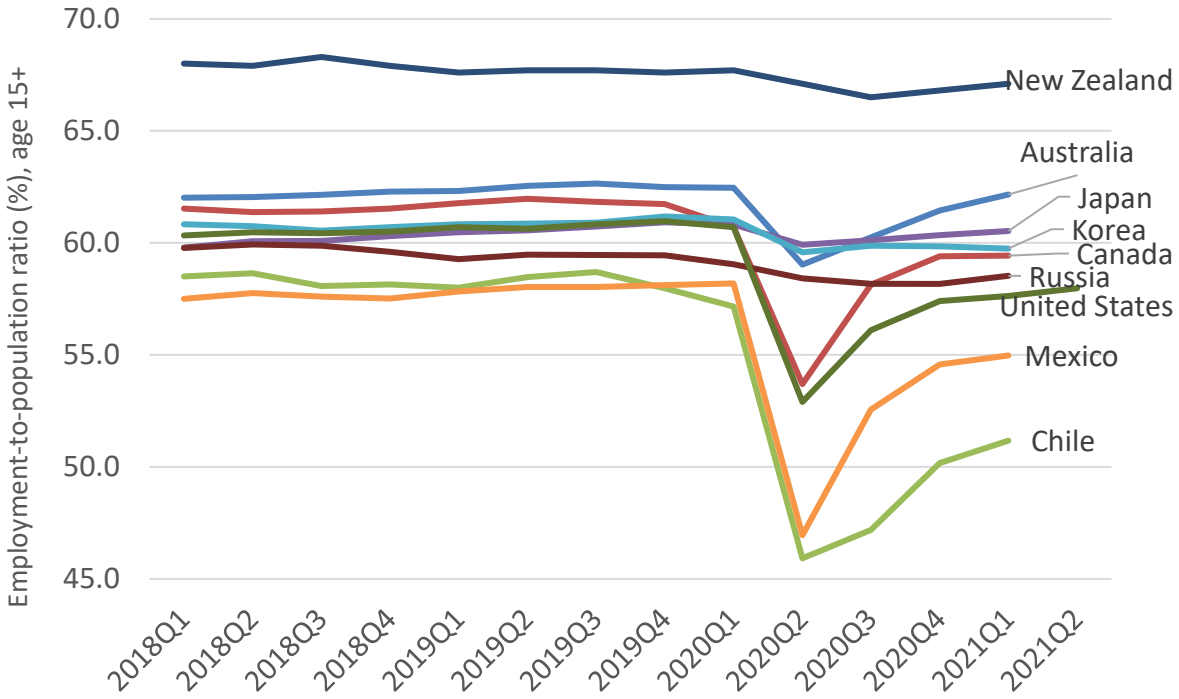


Note: See note from Figure 3.9.
Source: ILOSTAT: ILO modelled estimates.

Quarterly and monthly estimates provide some indication as to the timeframe through which the COVID-19 impact has manifested in employment losses and the subsequent signs of recovery in the latter stages of 2020 and early 2021. From existing data, using the employment-to-population ratio as a proxy, the sharpest drop in employment took place in Q2 (April 1 to June 30) 2020 for most economies (Figure 3.11). This was not uniform, and other economies – for instance, New Zealand and Russia – reached the lowest point in Q3 (July 1 to September 30) 2020. In the second half of 2020, employment-to-population ratios showed signs of upward recovery for most economies for which there is data available, but still remained lower than the rates pre–COVID-19 (Q1 2018 – Q4 2019).[154]

[154] ILOSTAT: Employment-to-population ratio, by sex and age, seasonally adjusted quarterly data. Based on national data from labour force surveys.

Figure 3.11 Employment-to-population ratio, selected APEC economies, Q1 2018–Q1 2021

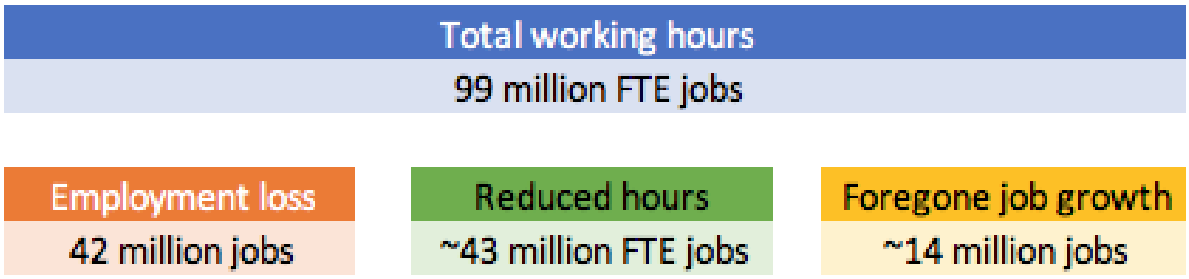


Note: The economies were selected based on the availability of data. Employment-to-population ratio here is calculated as the ratio of employed workers to working-age population aged 15+.
Source: ILOSTAT: Employment-to-population ratio, by sex and age, seasonally adjusted quarterly data. Based on economy data from labour force surveys.

The impact on the labour market as a result of COVID-19 does, however, go far beyond the impact measured by the change in employment. What is relatively unique to this crisis, is the manner in which the labour market has adjusted. While some have lost their jobs, others have had reduced hours, or had work suspended. Additionally, many have dropped out of the labour market altogether – for instance, for care work – rather than becoming unemployed. These factors create additional dimensions to the labour market impact that are not captured in employment and unemployment.

One way to view the impact of the crisis on labour markets is to convert total labour input across the economy into full-time equivalent (FTE) jobs, i.e., tallying total hours conducted by full-time and part-time workers, and converting them into equivalent full-time jobs, using a benchmark of 40 hours a week. This allows for the capture of reduced working hours as well as layoffs. For the APEC region, total FTE jobs are estimated to have decreased by the equivalent of 99 million FTE jobs – a value far higher than the change in total employment of 42 million. This total FTE value also takes into account foregone employment growth that was projected to occur in the absence of the pandemic. This is an important consideration for economies with relatively high rates of growth of the working-age population. A proxy measure for foregone job growth, based on sectoral growth rates of the last decade, would suggest that employment would have increased by around 14 million in the absence of the crisis.

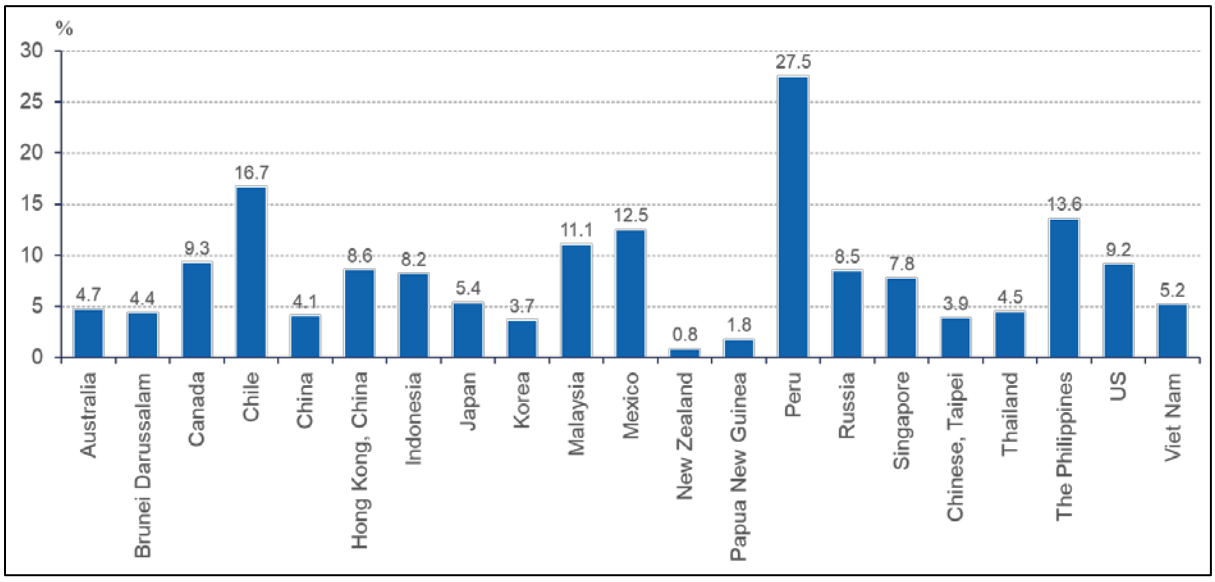
Figure 3.12 Reduction in labour input (full-time equivalent jobs) in APEC, 2020



Note: This is based on ILO estimates used for total working hours in full-time equivalent (FTE) and total employment loss. 'Foregone job growth' is based on 2020 estimates for employment based on a 10-year average growth rate for APEC economies. 'Reduced hours' is calculated by the difference.
Source: ILO modelled estimates for total FTE and employment losses.

Estimates of working-hour losses at the economy-level change frequently as new monthly, quarterly and annual data are released and incorporated into revised estimates. Hence, while the economy-level estimates provided in Figure 3.13 should be treated with caution, particularly for economies with no recent data on which to base the estimates, the findings suggest significant variation in the impacts on total working hours across the APEC economies. As outlined in the previous section, these working-hour impacts are likely to consist of total employment losses, reduced hours of work as well foregone job growth. It suggests that Peru and Chile have experienced among the highest working-hour losses of the APEC economies, while economies such as New Zealand, among the least.

Figure 3.13 Working hours lost due to COVID-19 (estimated), APEC economies, 2020



Source: ILOSTAT.

A number of policies have been implemented across the APEC economies to help support businesses and job retention in affected industries. These include: job retention and wage subsidy programmes; COVID-19 leave support schemes; scaled-up social protection systems; investment in skills and training, and job growth initiatives and job redesign – all of which are explored further in Section 3.5.1. In most cases, it is too early to assess the effectiveness of such policies, but it is anticipated that without such policies there would likely have been

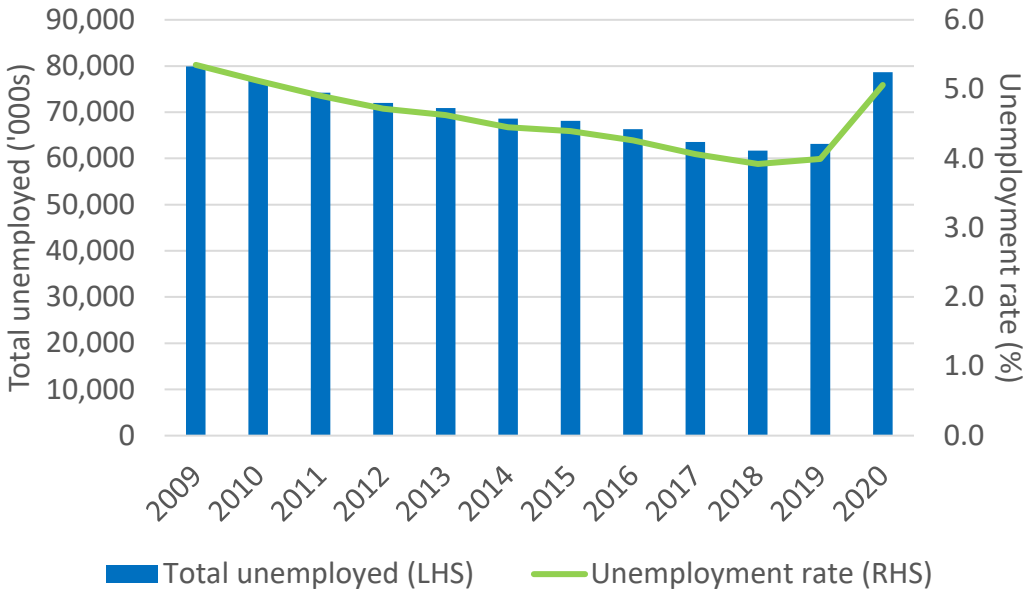
greater decreases in employment and larger increases in unemployment and inactivity. These policies enabled firms to retain workers, with benefits to both workers and the enterprise itself.

As one example, the Reserve Bank of Australia has estimated that the JobKeeper Payment 'reduced total employment losses by at least 700,000 at the peak of the crisis (April–July 2020)'.[155] As health restrictions eased and economic conditions improved, the temporary and targeted JobKeeper Payment ended in March 2021.

3.3.2 Unemployment and inactivity

Total unemployment is estimated to have increased between 2019 and 2020 for the APEC region as a whole, from 4.0 percent to 5.1 percent (corresponding to 15 million more unemployed). This compares to an increase from 5.4 percent to 6.5 percent for the world as a whole (corresponding to 33 million more unemployed).

Figure 3.14 Total unemployment and unemployment rate, APEC economies, 2009–2020



Source: ILOSTAT: ILO modelled estimates.

While Figure 3.14 paints a stark picture of the unemployment situation, unemployment rates fail to paint the complete picture of the labour market impact of COVID-19 on those out of work. This is owing to the formulation of the unemployment rate, in which unemployment is denominated as a share of the labour force, whereby the unemployed need to satisfy the criteria of both seeking and being available for work. This means that those who are not seeking but are available are not recognised as unemployed, and instead categorised as inactive, or outside of the labour force.

Many dropped out of the labour force altogether during the COVID-19 pandemic, i.e., becoming out of work and either not seeking and/or being available for work (i.e., inactive). These include many vulnerable groups, such as those considered high-risk to the COVID-19 virus itself, women who are more likely to take the burden of unpaid or underpaid care work, as well as youth who are more likely to be discouraged from attempting to re-enter the labour

[155] Australia Individual Economy Report 2021.

force. Those who are not seeking work but are available, are often considered discouraged workers or a category known as the 'potential labour force'. There is currently no data available to assess the change in the potential labour force as a result of COVID-19; however, some APEC economies such as Canada have adopted alternative measures[156] to accompany the unemployment rate to allow for a wider measure.

The digital divide, including access to quality Internet for remote working, has contributed to widened inequality both between and within economies.

Several APEC economies have therefore created action plans, such as the Digital Economy of the Russian Federation programme, which sets a wide scope of precise targets to be achieved by 2024. Besides providing the necessary information infrastructure (access to mobile and internet connections, including 5G, in remote areas), directives also cover aspects such as legal regulation of the digital environment (creating a conducive environment for the digital transformation) and digital economy human capital (upskilling and reskilling, and the development of new specialisations at all levels of education).[157] Infrastructure development initiatives are also part of the United States' American Jobs Plan, as well as policy measures discussed in, for example, Chile; China; Peru; Singapore; and Thailand.[158]

Policy responses with regard to unemployment and inactivity in the APEC economies, particularly for youth and other vulnerable groups (see Section 3.4.3), have included a range of active labour market policies. Some of these are explored further in Sections 3.5 and Section 4, particularly around skills development. They have also included support measures focused on the needs of vulnerable groups, such as targeted benefits packages for the newly unemployed with children. For instance, Russia increased the amount of unemployment benefits and also widened the scope of benefits to include payments for children whose parents have lost their jobs, doubling amount of unemployment benefits and simplifying the process for claiming the benefits.[159]

It is too early to assess the effectiveness of such schemes, particularly given the long-term implications of many of the COVID-19 effects on the unemployed and inactive. However, the focus on skills development has allowed for future skills demand to be factored into policies for those without work as a result of COVID-19. In Canada, since the launch of Skills Boost in 2018 and Future Skills in 2019, a set of these programmes have been designed and introduced to working or unemployed Canadians looking to return to school in order to upgrade their skills to prepare them for the jobs of the future through new skill development approaches and lifelong learning (see also Box 5.3).[160]

To be effective, skills training programmes should be developed in partnership with the private sector to ensure that the skills acquired are in demand. A recent Asian Development Bank (ADB) report on technical and vocational education and training (TVET) and Industry 4.0 in the Philippines, for instance, highlights the benefits of industry working groups and of close

[156] These alternative measures of unemployment account for the discouraged searchers, waiting workers, and involuntary part-time workers.
[157] Russia Individual Economy Report 2021.
[158] The Individual Economy Reports 2021 provided to APEC by the referenced economies.
[159] Russia Case Study.
[160] Canada Case Study.

collaboration between the private sector, government and providers of skills training (e.g., TVET institutions) for demand-led skills provision.[161]

3.3.3 Impacts on enterprises and MSMEs

The ability to create jobs in the private sector depends in large part on the ability of enterprises to do business. COVID-19 containment measures have had significant impacts on the ability of firms to conduct their business and therefore maintain or hire workers. Micro, small and medium enterprises (MSMEs) are particularly at risk, owing to lower financial reserves to sustain themselves through uncertainty.

Across the APEC economies, a contraction in demand was experienced, particularly in industries that require in-person interactions or are based on travel and freedom of movement. In economies like Indonesia and Thailand, this disrupted the labour market and severely affected monthly income.[162]

Consequently, as the pandemic has continued, many MSMEs have closed down. The top reasons mentioned by small business owners in a survey in Thailand – to which many responses from other APEC economies are likely to be similar – include:[163]

- Very few or no customers due to COVID-19 (88 percent of survey respondents)
- Government-ordered closure/restrictions (79 percent)
- Concerned about COVID-19 for themselves and their employees (72 percent)
- Insufficient cashflow to maintain employees (55 percent)
- Insufficient cashflow to maintain capital (28 percent).

According to a survey by the Canadian Imperial Bank of Commerce, 81 percent of Canadian small business owners were negatively affected by COVID-19 in 2020. Their sales dropped by 54 percent, and 32 percent were worried about the viability of their business.[164] Most of these small business owners considered various options to maintain the viability of their businesses: reducing operating expenses (34 percent), dipping into savings (29 percent), laying off their staff (25 percent) and applying for more credit (15 percent). Meanwhile, in the Philippines, a survey of MSMEs – which account for more than 99.5 percent of all enterprises and employed 63 percent of the labour force, as of the end of 2018 – has found that very few had sufficient access to credit to withstand the crisis.[165] Around 73 percent of firms had to close within a few weeks of the COVID-19 pandemic, though certain firms saw an improvement in the business environment, particularly those involved in the provision of essential goods and services.

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[161] Asian Development Bank, "Technical and Vocational Education and Training in the Philippines in the Age of Industry 4.0" (Manila: ADB, 2021), https://www.adb.org/publications/tvet-philippines-age-industry

[162] Indonesia and Thailand Individual Economy Report 2021.

[163] T. Parks, M. Chatsuwan, S. Pillai, "Enduring the Pandemic: Surveys of the Impact of COVID-19 on the Livelihoods of Thai People, Thailand Report First Round of Surveys (May–June 2020)" (Asia Foundation, September 2020), https://asiafoundation.org/wp-content/uploads/2020/09/Enduring-the-Pandemic-Covid-19-Impact-on-Thailand-Livlihoods-Sept-2020.pdf

[164] Canadian Imperial Bank of Commerce (CIBC), "COVID-19 Impact Felt by 81 Percent of Canadian Small Business Owners: CIBC Poll," News Release, 4 May 2020, https://cibc.mediaroom.com/2020-05-04-COVID-19-impact-felt-by-81-per-cent-of-Canadian-small-business-owners-CIBC-Poll

[165] S. Shinozaki and L.N. Rao, "COVID-19 Impact on Micro, Small, and Medium-Sized Enterprises under the Lockdown: Evidence from a Rapid Survey in the Philippines," ADBI Working Paper 1216, Asian Development Bank Institute, Tokyo, 2021, https://www.adb.org/sites/default/files/publication/677321/adbi-wp1216.pdf

Those in the manufacturing sector have been impacted by both local containment measures (such as local lockdowns) but also value-chain disruption across borders. Much of the value-chain disruption occurred early in the pandemic, before solutions were implemented later in 2020, reducing the disruption to the manufacturing sector. The garment sector in Southeast Asia is one such example. According to an ILO study, 60 percent of garment manufacturers surveyed reported disruptions to input supply.[166] This reduced the ability to conduct business and contributed to the layoff of workers.

Furthermore, in Australia and New Zealand, there has been a significant reduction in incoming migrants since COVID-19-related border restrictions were implemented. New Zealand notes: 'Along with an increase in returning New Zealanders, the border measures have resulted in changing skills mixes in the labour market, including skills and labour shortages in migrant-heavy industries.'[167] These factors are likely to exacerbate existing skills mismatches in the short and medium term, depending on the skills and numbers of returning New Zealanders. As such, 'employers may be incentivised to change their business models or make these jobs more attractive to New Zealanders in order to fill vacancies'.

In consideration of similar pre-existing challenges, Malaysia, for example, had introduced several policy measures before the COVID-19 outbreak, aiming to move domestic industries toward innovative business models that no longer depend on cheap labour and migrant workers, but employ more domestic graduates and skilled local workers.[168]

More generally, the challenge for local enterprises to adjust their operational working modes away from routine processes threatened by automation and/or toward new online-based sales and service models has been addressed by most of the APEC economies. Australia mentioned that 'changes to technology, automation and digitalisation have been impacting the Australian economy and labour market over decades, which has led to evolutionary rather than revolutionary changes in employment which have largely been managed through adjusting and modernising existing mechanisms'.[169]

An inquiry on technological change and the future of work completed by New Zealand's Productivity Commission in 2020 even emphasised that technological progress and adoption could drive productivity and income growth. This is partly due to the structure of New Zealand's economy, with a relatively small manufacturing base. At the same time there has been varied uptake of more capital-intensive business models. Adoption of, and investment in, technology overall has been relatively slow, and New Zealand acknowledges that this has 'contributed to little change in New Zealand's productivity performance over the past few decades'.[170]

The contribution of MSMEs to employment growth has not been overlooked in the APEC economies as targeted policies have been implemented to support MSMEs, both to facilitate job retention, and improve access to finance and other schemes. A more comprehensive look at policy responses covering businesses is provided in Section 3.5, particularly Section 3.5.2.

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[166] J.L. Jackson, J. Judd, and C. Viegelahn, "The Supply Chain Ripple Effect: How COVID-19 Is Affecting Garment Workers and Factories in Asia and the Pacific," Research Brief, ILO, 2020, https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/documents/briefingnote/wcms_758626.pdf
[167] New Zealand Individual Economy Report 2021.
[168] Malaysia Individual Economy Report 2021.
[169] Australia Individual Economy Report 2021.
[170] New Zealand Individual Economy Report 2021.

3.4 DIFFERENTIAL LABOUR IMPACTS OF COVID-19

There are a range of channels through which COVID-19 has impacted labour markets. The impacts are far from homogeneous and alongside the sectoral distribution, these vary by occupation, skill level, informality and status in employment. This section explores the ways employment has been impacted along these variables, highlighting cross-cutting issues for women, youth and other vulnerable groups.

3.4.1 Occupation and skill levels

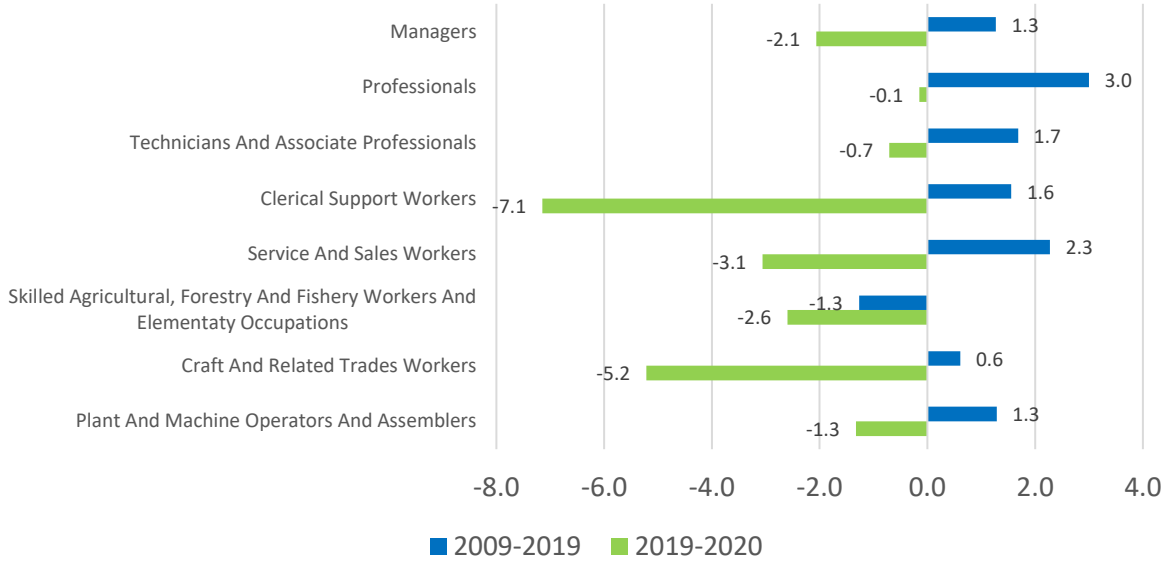
Certain occupations, particularly those recognised as providing essential services, including healthcare workers, but also other transport and public emergency services, have been at the forefront of the crisis and in many cases have greater exposure to COVID-19. A typology of occupations in the US, which was created to map occupational exposure to COVID-19, has been replicated elsewhere.[171] It used information on physical proximity and exposure to viruses in the workplace as considerations within the framework and highlighted how many occupations – such as care workers or lower-skilled medical workers, particularly assistants – were typically lower-paid despite the high risk of exposure to COVID-19.

According to ILO estimates for the APEC region, the occupation most impacted by COVID-19 in terms of the decrease in employment growth in 2019–2020 was 'clerical support workers', which declined by 7.1 percent. This category, which includes customer service clerks, receptionists and bank tellers, comprises many occupations that require interactions with others.[172] Despite the drop in the employment growth rate, this occupation only accounted for 5 percent of total employment in 2019, and corresponded to a decrease of 6 million employed in the APEC region. Instead, the sectors that accounted for the highest shares of total employment in the APEC economies, namely, 'skilled agricultural, forestry and fishery workers, and elementary occupations' and 'craft and 'service and sales workers', accounted for around 30 percent and 19 percent of total employment in 2019, respectively. The decrease of 5.2 percent and 3.1 percent, respectively, therefore accounts for a significant share of total employment, collectively corresponding to a decrease of 21 million employed.

[171] M. Lu, "These Are the Occupations with the Highest COVID-19 Risk," World Economic Forum (WEF), 20 April 2020, https://www.weforum.org/agenda/2020/04/occupations-highest-covid19-risk/

[172] ILO, "ISCO-08 Structure, Index Correspondence with ISCO-88," Updated 21 June 2016, https://www.ilo.org/public/english/bureau/stat/isco/isco08/

Figure 3.15 Change in employment, growth rate (%), by occupational groups, APEC economies



Source: ILOSTAT: ILO modelled estimates.

The skill dimension is a significant one. As will be outlined in Section 4.1, on the ability to work from home, there is a skill dimension to how workers were affected by the crisis. Higher-skilled workers were found to be more able to work from home, as well as more likely to be in companies and in positions with more favourable benefits and social protection eligibility than their medium– and low-skilled counterparts. The ILO estimates that employment in high-skilled occupations has decreased the least, by -0.7 percent in 2019–2020 (Figure 3.16). The employment decline in higher-skilled occupations accounted for around 6 percent of the total decrease in employment, despite high-skilled workers accounting for around 22 percent of the total employed population.

The ILO estimates that employment in medium-skilled occupations has dropped to the highest degree (by -3.9 percent in 2019-2020), particularly compared to the annual-average growth rate of the last decade (1.5 percent per annum). Medium-skilled jobs, which includes 'sales and service workers', 'plant and machine operators and assemblers' and 'clerical support workers', represent a growing share of APEC economies, driven largely by newly industrialised economies, including largely populated middle-income economies such as China; Indonesia; and the Philippines. The decrease in employment in low-skilled occupations at -2.6 percent in 2019–2020, represents a continued decline in employment in this sector (at 1.3 percent per annum), which is consistent with the long-term structural transformation and the shift from low– to higher-skilled jobs.

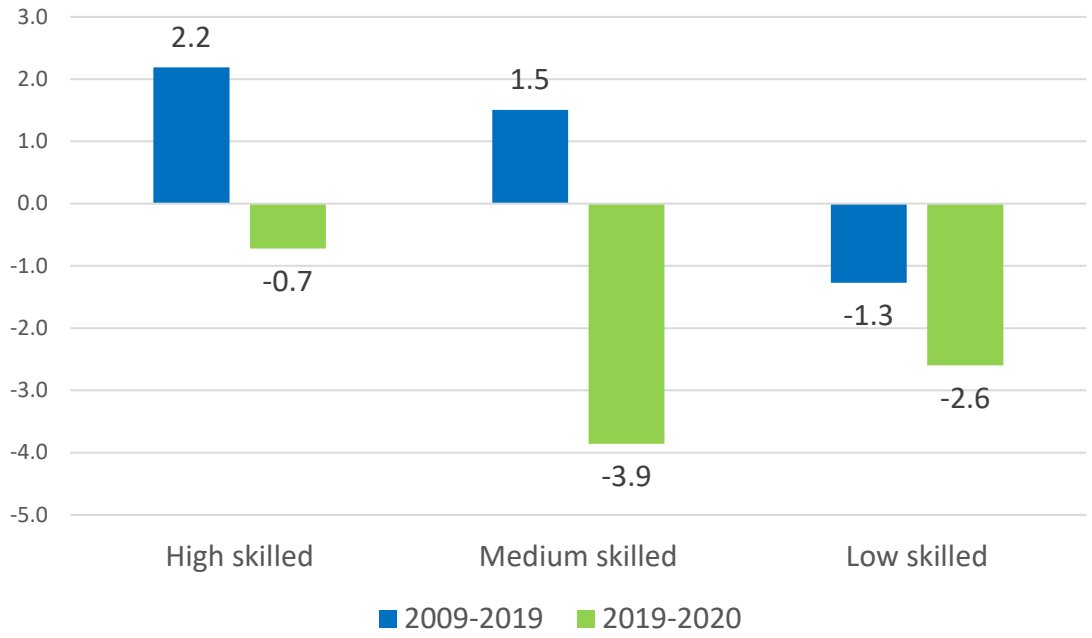
Insights from the Philippine's 2021 Individual Economy Report for APEC note that around 7.2 million local workers in 'collapsing occupations'[173] and 'machine terrain occupations'[174] are

[173] ILO, "COVID-19 Labour Market Impact in the Philippines: Assessment and National Policy Responses" (Geneva: ILO, 2020), https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---ilo-manila/documents/publication/wcms_762209.pdf. 'Collapsing occupations' refers to occupations that have low potential for transformative digitalisation and high risk of destructive digitalisation.
[174] ILO, "COVID-19 Labour Market Impact in the Philippines: Assessment and National Policy Responses." 'Machine terrain occupations' refers to occupations facing high risk of destructive digitalisation and high potential for transformative digitalisation.

exposed to a double-tiered risk of job disruption due to the combined challenges of digitalisation and COVID-19.[175] Other challenges identified in the Updated Philippine Development Plan (PDP) 2017–2022 include: (a) the temporary surge in displaced workers as domestic and global economic activities are slowed down; (b) the persistence of alternative work arrangements that may expose workers to new occupational and health risks; and (c) challenges in retooling and upskilling the current and future workforce[176].

The Philippines currently has a pool of medium– and high-skilled workers who provide opportunity and flexibility to face full-scale automation. A net positive effect of automation on employment in the Philippines is only significant among the manufacturing firms, while net job losses are highly probable in firms in the service industry. It is therefore understood that skills for the future workforce still need to be ensured through education and skills development in formal and non-formal settings, and in the workplace. [177]

Figure 3.16 Change in employment, growth rate (%), occupational skill levels, APEC economies



Source: ILOSTAT: ILO modelled estimates.

There is evidence of growth in the share of women working in higher-skilled occupations in APEC economies over the last decade. Estimates suggest that between 2009 and 2019, women working in occupations categorised as higher skilled, namely ‘managers’, ‘professionals’ and ‘technicians and associate professionals’, increased 2.6 percent per annum, compared to 1.5 percent per annum for medium-skilled occupations and a decrease of 1.7 percent per annum for low-skilled occupations.

[175] ILO, “COVID-19 Labour Market Impact in the Philippines: Assessment and National Policy Responses” (Geneva: ILO, 2020), https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/---ilo-manila/documents/publication/wcms_762209.pdf
[176] NEDA, “Updated Philippine Development Plan 2017-2022”, http://pdp.neda.gov.ph/wp-content/uploads/2021/07/7212021_Updated-PDP-2017-2022.pdf
[177] The Philippines Individual Economy Report 2021.

The ability to work from home is closely linked to the digital divide, which can exacerbate inequalities between and within APEC economies. At the same time, however, it has resulted in new norms around flexible working that look set to last. For instance, in the United States public sector, supervisors and managers expressed concern over remote work as it was perceived to be a way where they would have less leverage in the supervision of employees. Since the pandemic, however, more flexible telework options appear to have become a more standard feature for federal employees. Before COVID-19, less than 25 percent of federal employees engaged in telework at all and 42 percent of employees were eligible to telework. Following the outbreak of COVID-19, the office mandated to report the progress – the Office of Personnel Management (OPM) – directed a policy of maximum telework and, as a result, some departments cited an increase in telework of 90 percent compared to pre-pandemic figures[178].

In general, more flexible work arrangements in the long term (i.e. telework, flexible hours) may also enable workers to regain their employment and hours losses, as well as alleviate work–life balance issues, particularly for families that have to balance work and childcare. As another example of evidence for this, Mexico's telework law sets out to provide certainty to millions of workers in these new forms of employment: 'Equitably distributing domestic work, achieving a greater work–family conciliation, and protecting the rights of workers, especially women, allowing them to reconcile their work and personal responsibilities'.[179]

3.4.2 Informality and status in employment

Those working in the informal economy, who include those working in informal employment as well as those working for informal enterprises, are particularly vulnerable to the impact of economic shocks through lack of job security, regular and sufficient incomes, as well as access and eligibility to social protection. COVID-19 was no exception and many workers in the informal economy have little option but to continue working throughout the pandemic in order to make a living. Statistics on the informal economy are limited and statistics that provide an estimate for APEC economies as a whole are inexistent; however, for certain economies, there are signs that informality is relatively widespread. For instance, in China, more than half of total employment is estimated to be informal, according to a 2018 ILO report.[180] In Viet Nam, informal employment is estimated at 76 percent; in Indonesia at 86 percent; in Russia at 36 percent; in Mexico at 53 percent; and in Chile at 40 percent.

A proxy measure for the informal economy is to consider own-account workers (i.e., self-employed workers who do not hire any employees[181]) and contributing family workers (also known as unpaid family workers, that is, family members who contribute to the household economic activity but often informally and without pay). These are two categories of 'status in employment' that are considered to be more vulnerable and precarious than those who are categorised as either employees or employers. The share of own-account workers and contributing family workers is closely correlated with the informal economy, as these categories of workers also share similar aspects of precariousness. For the APEC region as a whole, an estimated 34 percent of the total employed population in 2019 are estimated to be

[178] The United States Case Study.
[179] Mexico Individual Economy Report 2021.
[180] ILO, "Women and Men in the Informal Economy: A Statistical Picture (Third Edition)" (Geneva: ILO, 2018), https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/documents/publication/wcms_626831.pdf
[181] According to ILO, self-employed workers can be either employers or own account workers. Employers are self-employed workers who hire their own employees, while own-account workers are those who do not hire any employees.

either own-account workers or contributing family workers. This is equivalent to around 510 million people. These workers are likely to have been disproportionately impacted by the COVID-19 crisis, particularly through the lack of social protection eligibility.

For these reasons, APEC economies like Chile are putting significant efforts into 'increasing inclusiveness in the labour market and reduce[ing] informality'.[182] Neighbouring Peru also recognises a high lack of protection of the labour force, such as insufficient access to the health and pension system, and lack of unemployment insurance. In 2019, 35 percent of the employed had access to a pension fund, and 31.1 percent of workers had health insurance paid by the employer. Peru reports that 61 percent of its workforce has a high probability of being affected by automation, and that 'the population with a high probability of automation is concentrated in the population with low levels of education, in the informal sector, and in micro and small enterprises'.[183]

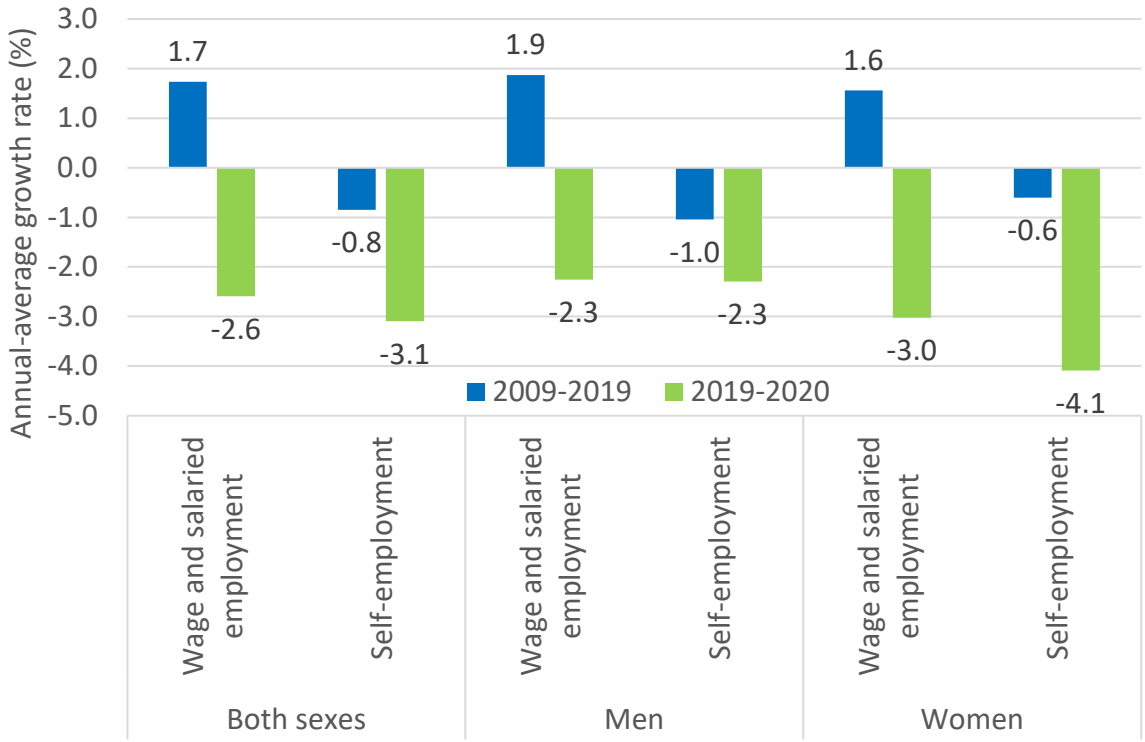
As a response, Peru's Ministry of Labour and Employment Promotion has designed the National Decent Employment Policy (PED) as a multisectoral strategy to address the problem of decent employment deficit in Peru. 'Increasing the generation of formal employment in productive units' is among the Priority Objectives of the PED.[184]

The COVID-19 pandemic has adjusted the composition of the employed population by status in employment. Wage and salaried employees are more likely to be eligible for benefits offered by the firm in which they work. Further, many schemes have focused on job retention through employees, sometimes overlooking or with less support for the self-employed. ILO estimates for self-employment and wage and salaried employment suggest that prior to the crisis the share of employment in the APEC economies in wage employment was increasing (1.7 percent per annum, 2009–2019) while employment in self-employment was decreasing by -0.8 percent per annum over the same period. This is consistent with structural transformation as industrialising economies generate new job opportunities so that there are more opportunities as employees rather than self-employment.

The COVID-19 crisis saw a reduction in employment across both wage and salaried employment and also self-employment in the APEC economies. As shown in Figure 3.17, the larger reduction of -3.1 percent for the self-employed, compared to -2.6 percent for employees, is consistent with the notion that employees had more support options in place. It is also consistent with the fact that many self-employed in the APEC region are in self-employment out of necessity. The ranks of the self-employed are more likely to be informal workers and are likely to have suffered income and livelihood losses as a result of the crisis and the lack of support options, particularly social protection, available.

[182] Chile Individual Economy Report 2021.
[183] Chile Individual Economy Report 2021.
[184] Peru Individual Economy Report 2021.

Figure 3.17 Status in employment, annual-average growth rate (%), by sex, APEC economies



Note: 'Wage and salaried employment' refers to paid employees; 'self-employment' refers to both own-account workers and employers.
Source: ILOSTAT: ILO modelled estimates.

There was also a gender dimension to the change in employment by status in employment. As shown in Figure 3.17, self-employed women showed the largest drop in employment between 2019 and 2020, of -4.1 percent, compared to -2.3 percent for their male self-employed counterparts. Similarly, wage and salaried women also exhibited a larger decrease in employment of -3.0 percent than their male counterparts at -2.3 percent. This suggests that women, even when in wage and salaried employment, were more likely to leave or lose their jobs as a result of the crisis.

Non-standard forms of work, which refers to employment arrangements that deviate from the traditionally defined regular full-time employment, are closely tied to both informality and status in employment. Gig economy workers, for instance, which refers to those working 'on-demand' with job placements often mediated through digital platforms, have been particularly exposed as a result of the crisis (see Section 2.1.2 for more discussion on gig economy workers). While there has been a boom in work for delivery drivers in many APEC economies as a result of COVID-19, many lack the employment benefits and social protection eligibility afforded to their formally employed counterparts. Many of these workers are considered own-account workers, one step removed from a formal temporary employment relationship. There has however been some progress, with policies in APEC economies devised to allow for eligibility and benefits for the gig economy. One such example is Malaysia, which has a Recovery Plan to develop social protection for gig-economy workers, including their skilling and a wider safety net system. The combined PRIHATIN Economic Stimulus Package and temporary Wage Subsidy Programme and Employment Retention Programme introduced wage subsidies, re-skilling and up-skilling, and hiring and training assistance schemes that were seen as crucial short-term fixes to cushion income loss and to upgrade the skills of the unemployed and youth. Overall, these programmes that benefited some 2.7 million workers and over

331,000 employers, and was further extended by three months benefiting a further 821,000 employees and nearly 82,000 employers.[185]

The Philippines also recognises that 'there is a need to enhance the accessibility (i.e., digitalisation of delivery of social protection assistance and services) and coverage of social security for workers, such as compensation for work-related hazards and unemployment insurance.' As the latter remains largely restricted to the formal sector, 'appropriate social protection benefits to non-traditional work economy (e.g., gig economy platform workers) [need] to be explored.'[186]

While many APEC economies have put the social protection of those who lack access to employment insurance, such as gig and platform workers, near the top of their social or labour protection agendas – for example, Canada; Korea; Mexico; Chinese Taipei; and Thailand have highlighted the topic in their Individual Economy Reports to APEC – Brunei Darussalam further recognises that it is a public challenge 'to ensure that the demand for the services provided by these workers (especially in the transport and delivery services sectors) will remain, or even increase, post-pandemic'.[187]

Further, new industry guidance has been issued in China to account for the boom in many platform economy jobs and the lack of employment regulation surrounding this work. Indeed, multi-sector state agencies issued access policies and industry guidance with general requirements to determine the methods and standards of supervision for new industries. For instance, a call for the appropriate reduction of deducted service fees in the transparent charging model led a major consumer services platform company to reduce deducted service fees by CNY 0.14 per order on average. The measure directly benefited 4 million workers. In addition, under government policies on social security and poverty alleviation, pilot projects in shared mobility services provided nearly 1.7 million flexible employment opportunities in five regions and contributed to inclusive employment by facilitating female labour participation. Of the 2.4 million female ride-hailing drivers, 32.4 percent have become the main source of family income[188].

Besides recognising the obvious economic potential of new online businesses and work formats, China observes that the market power of large platforms has increased. 'As the future of work is rooted in a highly digital environment, an increasing number of companies tend to use various platforms and massive data to monitor the workplace for real-time evaluation of employee performance'.[189] China raises concerns that 'employees are likely "manipulated" by platforms and algorithms while realising employment flexibility', which is why it has listed the market power of large platforms as one of the top three challenges of its economy in the future of work.[190]

3.4.3 Specific issues for various vulnerable groups

The impact of COVID-19 on different vulnerable groups is largely a cross-cutting issue that is intertwined with different labour market issues and concepts. Some of these impacts are touched upon in the preceding sections, including the disproportionate impacts on women. A

[185] Malaysia Case Study
[186] The Philippines Individual Economy Report 2021.
[187] Brunei Darussalam Individual Economy Report 2021.
[188] China Case Study
[189] China Individual Economy Report 2021.
[190] China Individual Economy Report 2021.

range of other groups are also particularly vulnerable to the COVID-19 crisis as well as containment measures. Factors contributing to vulnerability include the higher likelihood of being in precarious work or low-income households, as well as factors that are relatively unique to the type of work, such as the situation for migrant workers. Some of these issues are touched upon below.

Women

The impact on women has a sectoral dimension, as outlined in Section 3.3.1, with women more likely to be in sectors undergoing the greatest employment losses. At the same time, women are often more likely to be exposed to COVID-19, particularly due to their higher concentration in sectors such as healthcare and the care sector, which have the greatest occupational exposure to COVID-19 (see Section 3.4.1).

On top of this, there are signs that the COVID-19 pandemic may have seen a reversal of much progress in gender equality achieved over recent decades, including for female participation in the labour market.[191] Increased availability and affordability (including from government subsidies) of childcare had facilitated the increased participation of women in the labour force,[192] and likely reduced some gender pay gaps resulting from wage losses applied to absences due to childcare. With COVID-19, however, school closures and reduced childcare provision saw women revert back into the traditional roles of childcare and home-schooling at the expense of their full participation in the labour market.[193]

A study in Canada on the impact of COVID-19 on women in the labour market has found that school closures were more likely to result in women working less hours than men.[194] For instance, for parents of at least one child under the age of seven, average hours for women decreased by 26 percent for women, compared to 15 percent for men. At the same time, the number of women reporting full-week absences between February and April 2020 – a time when schools were closing and alternative arrangements needed to be sought for childcare – increased by 24 percent, compared to just 3 percent for men. These findings are consistent with the notion that childcare arrangements, including schools, facilitate greater female participation in the labour market, and the burden of removal of these, even temporarily, tends to fall back on women.

In Indonesia, the Ministry of Finance reported in 2020 that 40 percent of working women in the business sector were affected by the pandemic, and 60 percent (out of 740 million working women in the informal sector) had lost their jobs. Meanwhile, the Ministry of Women and Child Protection recorded a decline of 82 percent in women's income in 2021 compared to the previous period.[195]

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[191] ILO, "Building Forward Fairer: Women's Rights To Work and at Work at the Core of the COVID-19 Recovery," Policy Brief, ILO, Geneva, July 2021, https://www.ilo.org/wcmsp5/groups/public/---dgreports/---gender/documents/publication/wcms_814499.pdf

[192] D. Vuri, "Do Childcare Policies Increase Maternal Employment?" IZA World of Labor, 2016, https://wol.iza.org/uploads/articles/241/pdfs/do-childcare-policies-increase-maternal-employment.pdf

[193] G. Azcona, et al., "Fallout of COVID-19: Working Moms are Being Squeezed Out of the Labour Force," ILOSTAT, 27 November 2020, https://ilostat.ilo.org/fallout-of-covid-19-working-moms-are-being-squeezed-out-of-the-labour-force/; see also J. Allmendinger, "Life Course Trajectories in Times of COVID-19: A First Assessment," youtube, 28 September 2020. https://www.youtube.com/watch?v=MrzFyiBMwUU.

[194] Labour Market Information Council, "Women in Recessions: What Makes COVID-19 Different?" LMI Insight Report 39, LMiC, March 2021, https://lmic-cimt.ca/publications-all/lmi-insight-report-no-39/

[195] Indonesia Individual Economy Report 2021.

Working from home, while offering a new way of working for many and potentially increasing labour force participation for women, by offering more flexible arrangements, also carried a gendered dimension during the crisis. Working from home blurs the lines between work and home life,[196] and the crisis showed that the burden from taking on more care work alongside the paid work may contribute to increases in the 'invisible work' burden for women.

Youth

The youth have also been heavily impacted by the crisis.[197] With the increased joblessness in the APEC economies, and the ability of enterprises to create jobs having been compromised, youths transiting out of education and training face reduced entry-level positions. Many are likely to be in the category of 'not in employment, education or training' (NEET). These are most at risk of being discouraged from participating in the labour market, and experiencing disenchantment and even social alienation. From what available quarterly data exists for APEC economies, there are signs of growth in youth NEET. From Q1 2020 to Q1 2021, the number of NEET in the United States is estimated to have increased by 22 percent; in Viet Nam by 12 percent over the same period; 4 percent in Thailand; and 6 percent in Mexico.[198]

The issue of a lack of labour market opportunities for the youth is compounded by the impact of the crisis on education provision. The disruptions caused by school closures during the pandemic have exacerbated the situation for young people. Many economies lack the digital infrastructure for young people to attend virtual classes during periods of closure. This has affected their education, potentially delaying their entry into the labour market with potential scarring effects as well.

Ethnic minorities

Long-term discrimination has led to a higher proportion of ethnic minorities being employed in informal jobs with low pay and lack of social protection. Studies have found that even in formal employment, ethnic and racial minorities were more likely to be laid off compared to other groups.[199] For example, in the United States, a larger number of Asian American frontline workers experienced employment losses owing to discrimination and interpersonal racism during COVID-19.[200] The same study also found African American non-frontline workers experiencing the largest loss in employment in 2020. Similarly, Asian-Australians experienced twice the drop in hours worked compared to the rest of the Australian population in the early months of the pandemic.[201]

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[196] J. Charmes, "The Unpaid Care Work and the Labour Market: An Analysis of Time Use Data Based on the Latest World Compilation of Time-use Surveys" (Geneva: ILO, 2019), https://www.ilo.org/wcmsp5/groups/public/---dgreports/---gender/documents/publication/wcms_732791.pdf

[197] ILO, "World Employment and Social Outlook: Trends 2021"(Geneva: ILO, 2021), https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_795453.pdf

[198] ILOSTAT: Youth not in employment, education or training (NEET) by sex (thousands), quarterly data.

[199] https://jech.bmj.com/content/early/2021/04/21/jech-2020-216061

[200] https://link.springer.com/article/10.1007/s40615-021-00963-3

[201] https://csrm.cass.anu.edu.au/sites/default/files/docs/2020/11/The_experience_of_Asian-Australians_during_the_COVID-19_pandemic.pdf

Indigenous Peoples

Indigenous peoples have also been highly vulnerable to the pandemic and the measures implemented to contain it, in particular indigenous women.[202] This is in large part to the higher likelihood that indigenous peoples are in lower-paid jobs or in households living below the poverty line. In Canada, for instance, a recent study found that indigenous peoples, including members of the First Nations, Inuit and Métis communities, were more likely than their non-indigenous counterparts to be food insecure or below the poverty line.[203] Between July 2019 and July 2021, the employment rate of indigenous women in Canada fell 2 percentage points to 53.6 percent, while the employment rate for indigenous men edged up 0.4 percentage points, bringing their employment rate to 60.4 percent. Indigenous women face a double impact, namely, through the vulnerability of indigenous peoples but also through gendered norms – including expectations around childcare responsibilities and lack of decision-making power.[204]

In New Zealand, a study on the impact of COVID-19 on the jobs for vulnerable people highlights how the Maori population are more likely to have job instability, lower wages and precarious work.[205] While this makes this population more vulnerable to economic shocks, it is also made worse by the higher propensity of Maori to be working in sectors such as tourism, construction and manufacturing, which are sectors particularly affected by COVID-19 and the COVID-19 containment measures.[206] Moreover, some COVID-19 support policies and social protection contain gaps for certain types of workers, e.g., those employed by MSMEs, that disproportionately impact indigenous workers while the digital divide is also likely to have exacerbated inequalities between indigenous and non-indigenous populations.[207]

Migrant workers

A number of economies in the APEC region are major recipients or senders of migrant workers. In Southeast Asia, for instance, Malaysia; Singapore; and Thailand are major labour-receiving economies. Lockdowns resulted in many migrant workers fleeing back to their economies of origin through fear of being trapped under lockdown without means of making any income, while others underwent forced repatriation with or without their wages.[208] In the Philippines, remittances from overseas Filipino workers constitute a major source of income for the economy. As of August 2021, more than 640,000 overseas Filipino workers have returned to

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[202] UN Department of Social and Economic Affairs (DESA), "Indigenous Peoples and the COVID-19 Pandemic: Considerations," 2020, https://www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2020/04/COVID19_IP_considerations.pdf

[203] P. Arriagada, T. Hahmann, and V. O'Donnell, "Indigenous People in Urban Areas: Vulnerabilities to the Socioeconomic Impacts of COVID-19," Statistics Canada, 26 May 2020, https://www150.statcan.gc.ca/n1/pub/45-28-0001/2020001/article/00023-eng.htm

[204] UN Women, "Making Indigenous Women and Girls Visible in the Implementation of the UN Framework for the Immediate Socio-Economic Response to COVID-19Accessing Funds through the Multi-Partner Trust Fund," April 2020, https://www.un.org/development/desa/indigenouspeoples/wp-content/uploads/sites/19/2020/04/Prioritizing-indigenous-women-in-the-MPTF-April-2020.-UN-Women.pdf

[205] E. Chen, B. Craven, and M. Mikkelsen, "Impact on Vulnerable Workers — The Labour Market & Covid-19," From the Exosphere, 16 February 2021, https://medium.com/from-the-exosphere/impact-on-vulnerable-workers-the-labour-market-covid-19-3b8da675dcd0

[206] See New Zealand Case Study for a climate change recovery plan that implicitly may benefit indigenous groups while also focusing on sectors hit by COVID-19.

[207] Y. Dinku, B. Hunter, and F. Markham, 2020. "How Might COVID-19 Affect the Indigenous Labour Market?" *Australian Journal of Labour Economics (AJLE)* 23, no. 2 (2020): 189–209, https://ideas.repec.org/a/ozl/journl/v23y2020i2p189-209.html

[208] G. Subramaniam, "The Compounding Impacts of COVID-19 on Migrant Workers Across Asia (Pt 1)," Institute for Human Rights and Business," 22 July 2020, https://www.ihrb.org/focus-areas/covid-19/covid19-migrant-workers-overview

the Philippines.[209] Further, many of these Filipino workers are domestic workers – a group that has been particularly impacted by lockdown and travel restrictions, sometimes undergoing sudden cessation of contracts or being stranded and working longer hours, often unpaid.[210]

While in most APEC economies, access to treatment for COVID-19 has been largely available for non-citizens, migrant workers have sometimes fallen outside the scope of policies to support workers. This reflects not just the situation as a result of COVID-19, but also highlights a more systemic vulnerable situation for migrant workers. It has meant that changes to work situations, and permanent or temporary cessation of work is particularly impactful. Migrant workers are less likely to have the savings or social protection eligibility to sustain themselves for extended periods without work and potentially without the means to return home. [211]

Elderly

Older workers are also subjected to specific impacts of the crisis. As in other crises where there are significant layoffs of workers, it can be harder for older workers to re-enter the labour market.[212] In the United States, some estimates suggest that as many as 15 percent of workers aged 55 or above lost their jobs as a result of COVID-19, equivalent to 5.7 million workers.[213] There is also some evidence that older workers may be more likely to voluntarily give up their work during the COVID-19 crisis as a result of concerns about their own health.[214] A particular challenge for older workers is the digital divide and the lower likelihood that older workers would be equipped or have the computer literacy to work remotely.[215]

Disabled

Disabled workers are already disadvantaged in the labour market. For instance, a recent report found that the employment-to-population ratio for persons with disabilities was around 50 percent, globally in 2018, compared to around 75 percent for persons without disabilities, and disabled persons are also more likely to be early school leavers.[216] At the same time, the situation for persons with disabilities may not be clear in labour statistics as many who would be willing to work are not fulfilling the criteria to be classified as unemployed. The COVID-19 crisis is likely to have worsened the situation for many disabled workers, owing to the greater need for shielding and the obstacles from increased mobility barriers.[217] As with other vulnerable groups, there is a risk that access to digital technologies may be lower, thereby reducing the ability to work remotely.

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[209] Department of Labor and Employment (DOLE). "Over 640k OFWs return home" [Press release] (2020) https://www.dole.gov.ph/news/over-640k-ofws-return-home/

[210] ILO, "Impact of the COVID-19 Crisis on Loss of Jobs and Hours among Domestic workers," 15 Junw 2020, https://www.ilo.org/wcmsp5/groups/public/---ed_protect/---protrav/---travail/documents/publication/wcms_747961.pdf

[211] ILO, "World Employment and Social Outlook: Trends 2021."

[212] R. Crawford and H. Karjalainen, "The Coronavirus Pandemic and Older Workers," Briefing Note, Institute for Fiscal Studies, 30 September 2020, https://ifs.org.uk/publications/15040

[213] E. Gould, "Older Workers Were Devastated by the Pandemic Downturn and Continue to Face Adverse Employment Outcomes (Testimony prepared for the Senate Special Committee on Aging hearing on "A Changing Workforce: Supporting Older Workers Amid the COVID-19 Pandemic and Beyond)," Economic Policy Institute, 29 April 2021, https://www.epi.org/publication/older-workers-were-devastated-by-the-pandemic-downturn-and-continue-to-face-adverse-employment-outcomes-epi-testimony-for-the-senate-special-committee-on-aging/

[214] Crawford and Karjalainen, "The Coronavirus Pandemic."

[215] Gould, "Older Workers."

[216] ILO and Fundación ONCE, "An Inclusive Digital Economy for People with disabilities" (ILO and Fundación ONCE, 2021), https://www.ilo.org/wcmsp5/groups/public/---dgreports/---gender/documents/publication/wcms_769852.pdf

[217] ILO and Fundación ONCE, "An Inclusive Digital Economy."

Actions by economies

Economies have recognised the importance of participation of vulnerable groups. For example, with regard to overall labour participation, given the future demographic outlook in APEC economies, Japan is of the view that a 'long-term decline in the number of workers is inevitable', even though the number of employed people has increased due to the rise in labour participation rates of elderly people and women in the past years. In order to secure human resources in the health and welfare fields, and to maintain a vibrant economy, it therefore considered it essential 'to further increase labour participation, especially among women and the elderly'.[218] Even before the onset of the pandemic, Japan amended its Female Participation Act in 2019 to further promote the active economic participation of women. The Act requires private sector employers with 301 or more regular employees to recognise and analyse the situation of women employees in their companies, formulate action plans with numerical targets based on the analysis, and publish information on women's participation and advancement. In April 2022, the abovementioned obligation will be expanded to private employers with 101 or more regular employees.[219]

In Peru, targeted policy measures that focus on salary discrimination between men and women led to a clear trend of the wage gap decreasing in the last years. One example of such a measure is the law for equal payment of 2017, which recognises the principle of equal payment for work of equal value. Its regulations were approved by Supreme Decree N° 002-2018-TR and followed up by Guidelines for Equality to facilitate the implementation of the new obligations. However, as COVID-19 has challenged the implementation of the regulations on this matter, different stakeholders have recently come together to work on strengthening capacities as well as to provide technical assistance.[220]

In Mexico, as a result of the move to teleworking to keep employment going, the number of teleworkers rose from 2.6 million before to 12 million (22 percent of the workers in Mexico).[221] In fact, amendments to the Federal Labour Law were made in 2021, formalising teleworking modalities, labour conditions of teleworking and social security considerations, with the aim of taking advantage of the competitive benefits offered by labour digitisation, such as increased productivity, better work–life balance, and equality in opportunities and working conditions across genders.

Likewise, Korea has announced the intensifying of efforts to support the employment retention of vulnerable groups: 'To help the youth and women to accumulate work experiences and find a job in the private sector'.[222]

Ultimately, social protection that encompasses different groups and eliminates biases that might hinder or limit availability and eligibility to social protection is at the heart of the matter. It is worth noting that the 2017 APEC Framework of Human Resources Development in the Digital Age raises the need for social protection for women, the elderly, workers in the informal economy and in the sharing economy, among other commitments.[223] Efforts to bridge the digital divide are also a welcome means to stem widening inequalities, for instance, through

[218] Japan Individual Economy Report 2021.
[219] Japan Individual Economy Report 2021
[220] Peru Individual Economy Report 2021
[221] Mexico Case Study.
[222] Korea Individual Economy Report 2021.
[223] APEC, "2017 Leaders' Declaration: Annex B: APEC Framework on Human Resources Development in the Digital Age," APEC, 11 November 2017, https://www.apec.org/Meeting-Papers/Leaders-Declarations/2017/2017_aelm/Annex-B

digital skills training and ensuring digital access (for example, by providing subsidised computer equipment).

3.5 POLICIES TO MITIGATE THE IMPACTS OF COVID-19

The policies implemented in response to COVID-19 and its impacts addressed a variety of situations and needs in the APEC economies. All APEC economies adopted extraordinary measures to soften the consequences of the COVID-19 pandemic on the economy and specifically the labour market. Differences between economies in terms of the policies implemented may be traced to factors such as prevalence of contact-intensive jobs, the duration of lockdowns and the scale of the initial GDP contraction.

Those economies with existing employment support schemes (e.g., employment insurance) eased the conditions for access, lowered costs for firms, broadened their coverage and extended their duration. Those economies without such employment schemes swiftly introduced such forms of support. Reduced working hours were an effective tool against excessive labour dismissal during the pandemic. Some APEC member economies, such as Russia, adopted outright bans on legal loopholes that allowed employers to cut pay for workers when switching to remote setups.[224] Efforts were made to retain workers with specific skills and qualifications through reduced hours, or where they are unemployed, to re-skill or upskill. Policies incentivising remote working (i.e., teleworking) were deployed to enable people to continue working in a safe manner.

In addition, some APEC economies adopted measures providing income support to the self-employed and workers in the informal sector, strengthened sick leave and parental-leave benefits, promoted flexible work arrangements and reinforced unemployment benefit support. It has been necessary to adapt sickness benefits to protect the incomes of workers in quarantine after being diagnosed with COVID-19 or exposed to the virus. In several economies, schools were closed or teaching was undertaken on digital platforms, with social policy measures passed to support vulnerable groups like students from poor households. This required an adaptation of care and parental leave measures to allow parents to take care of their children. To mitigate the distributional effects of the crisis, several economies adopted targeted measures in favour of vulnerable groups.

This subsection describes a range of policies aimed at addressing the immediate situation yet also contributing to the long-term resilience and development of the economy and facing the changing nature of work, namely the future of work. Based on the Individual Economy Reports submitted to the APEC Secretariat by policymakers in the APEC economies, five common areas of response emerged:

- Job retention and wage subsidy programmes
- COVID-19 leave support schemes
- Social security systems
- Investment in skills and training
- Job growth initiatives and job redesign

[224] The Russian Federation Individual Economy Report 2021.

3.5.1 Job retention and wage subsidy programmes

Funds from job retention and wage subsidy programmes are typically paid to businesses on behalf of employees. One example is the Reliable Employment Programme implemented by Chinese Taipei from March 2020 to June 2021. Under this programme, 50 percent of the monthly wage gap was subsidised (for up to 12 months) for workers who have negotiated and agreed with their employers to temporarily reduce working hours or wages and have been registered by the local labour administrative authority. As part of Australia's JobKeeper Payment, eligible businesses received a direct payment from the government which had to be passed on to the employees through their paycheques.

Other APEC economies that have implemented job retention and wage subsidy programmes include Japan (Employment Adjustment Subsidy); Korea (Job Retention Support); Malaysia (Employment Retention and Wage Subsidy Programmes); Indonesia *(Bantuan Subsidi Upah);* the Philippines (Small Business Wage Subsidy Program); New Zealand (COVID-19 Wage Subsidy Scheme); and Singapore (Jobs Support Scheme). Chile introduced a three-pronged programme for reinstating suspended workers (*Subsidio Regresa*), for new hires (*Subsidio Contrata*), and to financially support the retention of employees with young children (*Subsidio Protege*). Canada implemented an Emergency Wage Subsidy (CEWS) and introduced temporary special measures under the existing Work-Sharing Program to allow employers to retain their workers and employees to share available work and receive income assistance for the hours not worked.

In the United States the Paycheck Protection Program provided loans to small businesses affected by the COVID-19 pandemic. The United States also provided tax credits and other forms of assistance for unemployment insurance and to healthcare providers, states, municipalities and other institutions to support workers affected by the pandemic.

In the Individual Economy Reports of China and Thailand, tax deductions are also highlighted as being among the measures most important to job retention, especially for MSMEs. These enterprises had been given considerable tax deductions for not laying off workers during the pandemic. In Thailand, these measures were often paired with debt restructuring measures including soft loans and credit guarantee schemes.

According to the Individual Economy Report of New Zealand, available evidence suggests that job retention and wage subsidy programmes have directly contributed to maintaining employment levels, incomes and economic activity during and after the first lockdowns and contributed to widespread support for public health restrictions.

In most APEC economies, the employment protection and wage subsidy plans were designed to provide immediate support to mitigate the effects of the pandemic on the labour market, to promote employment and protect workers' income. As such, there are currently few plans to expand these experiments or use these schemes beyond the pandemic. However similar or readjusted measures are being considered to meet employment challenges in future crisis situations.

3.5.2 COVID-19 leave support schemes

COVID-19 leave support schemes complement public health strategy by providing financial assistance to people who have to stay at home and cannot work because they may have been

exposed to COVID-19.

Medical leave: In New Zealand, a short-term absence payment is available to help businesses pay workers who cannot work from home while they wait for a COVID-19 test result. Meanwhile, Canada established a legal framework to allow for unpaid leave due to COVID-19. The *Canada Labour Code* was amended to add the ability to take 16 weeks of unpaid medical leave in order to quarantine. In the context of COVID-19, the provision of a medical certificate has been waived for workers in federally-regulated sectors who take unpaid medical leave and for those eligible for employment insurance (EI) sickness benefits. These emergency measures are winding down in 2021. The government of Canada launched EI consultations, including a public survey, in early August 2021 to seek stakeholder input on potential changes to the EI programme, including sickness benefits.

Leave for personal/family caregiving: Japan has created a scheme for workers taking care of children or other family members during the COVID-19 crisis. When workers need to take care of their children due to the temporary closure of elementary schools due to COVID-19, the government supports them by providing subsidies to employers. This programme also provides subsidies to small and medium enterprises (SMEs) who give special paid leave for family caregivers independently of the family care leave scheme under the Child Care and Family Care Leave Act. As of May 2021, it has not been decided whether or not these measures will continue to be applied after the end of the pandemic. As another example, Peru has implemented a number of measures to provide work facilities in 2020, including remote work for an immediate family member caring for a relative diagnosed with COVID-19 or caring for a relative in a high-risk group for COVID-19 infections, where the family member is the only one in charge of the person's care and support. These right-to-work facilities are in line with the provisions of ILO Convention C156 and Recommendation R165 on workers with family responsibilities, as well as with Peru's objectives to particularly improve the employment situation of women, who continue to be predominantly in charge of household tasks and whose employment situation has worsened with the health emergency.

Other leave support strategies: In Chile, the Employment Protection Law combines job retention initiatives and leave support schemes. It protects jobs and labour incomes by allowing for the temporary suspension of the employment relationship in companies that were totally or partially affected by social distancing requirements. It also allows employers to agree with their employees (individually or collectively) to reduce up to 50 percent of their working schedule when teleworking is not possible. In both cases, wages are financed from the unemployment insurance under more flexible criteria and social security and health contributions, and the corresponding employment rights should be maintained throughout.

Meanwhile, for China, instead of introducing new COVID-19- related leave schemes, attention was placed on taking measures to speed up the resumption of work and production. As epidemic prevention and control became increasingly precise, 'unreasonable examinations and regulations restricting workers from returning to work' were cancelled as soon as possible, especially for major engineering and export enterprises as well as for key industries in the domestic production.

In March 2020, a new unpaid leave related to COVID-19 was temporarily introduced under the Canada Labour Code to ensure that employees in the federally regulated workplaces are entitled to job-protected leave if they are unable or unavailable to work for reasons related to

COVID 19 (including family responsibilities and caregiving). These measures are slated be repealed no later than 20 November 2021.

3.5.3 Social security systems

APEC economies made adjustments to existing social security programmes such as unemployment insurance or introduced new COVID-19-specific social programmes to provide additional income support for individuals to cushion the economic impact of the pandemic. To finance these initiatives, several APEC economies introduced a special budget for the economic response plan to cover disease prevention, economic stimulus and special programmes to support individuals.

In Chinese Taipei, the special budget covers everyone, from families and disadvantaged groups to companies and industries. Measures include individual tax breaks and household expense subsidies, as well as relief and stimulus measures and tax cuts for businesses and industry. Self-employed workers and workers without an employer also received subsistence allowances for themselves, and for example, for children's school tuition fees, labour relief loans, and interest subsidies. These response measures have successfully saved jobs, stabilised the economy and built momentum for future growth and development while supporting individuals and families.

Various APEC economies acted to provide social protections to workers, such as Australia (Coronavirus Supplement); the Philippines (COVID-19 Adjustment Measures Program or CAMP); and Chinese Taipei (Reliable Employment Program). Indonesia modified the existing Pre-Employment Card Program to become a form of quasi social security, by providing cash transfers to protect workers and labourers and ensure business continuity. In China, pilot projects for occupational injury protection were advanced, and public employment services and rights protection for flexible employees strengthened.

Direct assistance to individuals who lost their employment has been provided to affected microenterprises and freelancers/entrepreneurs in Canada (Canada Emergency Response Benefit/Canada Recovery Benefits); Japan (Special loan of Emergency Petty Cash and Comprehensive Support Funds); and Korea (Livelihood Support). In Papua New Guinea, the government introduced short-term relief by amending the Superannuation Act to allow the unemployed to have access to 20 percent of their superannuation savings.

The Livelihood Assistance Grants in the Philippines also benefited low-income families in the informal sector whose livelihood or employment was affected by government-mandated quarantine. This programme was introduced alongside a temporary wage employment (cash-for-work) scheme called the Livelihood Assistance for Disadvantaged/ Displaced Workers (*Tulong Panghanapbuhay sa Ating Disadvantaged/Displaced Workers* or TUPAD) for informal sector workers, where beneficiaries work to disinfect/sanitise their communities or as contact tracers.

In the United States, via the Coronavirus Aid, Relief, and Economic Security (CARES) Act, the Consolidated Appropriations Act of 2021, and the American Rescue Plan, American workers have received direct payments of up to USD 1,400 for individuals (or USD 2,800 for married couples filing jointly) plus USD 1,400 for each qualifying dependent if they have an annual income of up to USD 75,000 for individuals, up to USD 112,500 for heads of household, and up to USD 150,000 for married couples filing joint returns.

Most of the temporary welfare system settings implemented by APEC economies during the height of the pandemic ceased as of May 2021. An exception is Korea, which took a longer-term outlook by establishing a multi-layered employment safety net and strengthened its protections for vulnerable groups. The Universal Employment Insurance Roadmap includes measures to gradually expand employment insurance coverage in order to protect all employed persons with the employment safety net. The government expanded strategic investment in the digital and green industries based on the mid- and long-term prospects of manpower supply and demand in new technologies, nurturing talent in new technologies and enhancing vocational training programmes for the vulnerable. Likewise, in New Zealand, a Social Unemployment Insurance scheme is being investigated and developed as 'a potential method to smooth incomes for people who lose their jobs and are seeking re-employment, to improve their labour market outcomes'.[225]

3.5.4 Investment in skills and training

As part of their policy responses to COVID-19, governments in the APEC economies have provided significant support to the vocational education and training sectors, to help to rebuild the economy by creating a more skilled and flexible workforce, which is prepared for the jobs that emerge in the future.

In Canada, training is a shared responsibility between the federal government and the provincial and territorial governments. Each year, the federal government provides over CAD 3 billion for individuals and employers to receive training and employment supports via the bilateral Labour Market Development Agreements and the Workforce Development Agreements with provinces and territories. Over a million Canadians a year benefit from programming and support under these agreements. In 2020–2021, the federal government provided an additional CAD 1.5 billion under the Workforce Development Agreements to help individuals and employers whose jobs and businesses were most affected by the pandemic.

In Australia, public investment in skills and training includes the establishment of a JobTrainer Fund, with the federal government matching funding from state and territory governments. JobTrainer funds free or low fee training places for job seekers and young people, including school leavers, in areas of identified skills need. The government is also delivering more apprenticeships to help build a pipeline of skilled workers. As part of its COVID-19 economic response, the government has put in place the Supporting Apprentices and Trainees Program to ensure apprentices and trainees already in work remain engaged and are in a position to support the economic recovery by paying eligible businesses a 50 percent wage subsidy through to March 2021. The government, through its Boosting Apprenticeship Commencements programme, will also pay businesses a 50 percent wage subsidy over 12 months for new apprentices or trainees engaged between October 2020 and March 2022. The Australian government also supported education by means of early childhood and at the primary to tertiary education level to cover scholars and students. The government also included displaced workers by supporting educational and training institutions involved in helping to match skills to jobs.

New Zealand supported apprenticeships with the Apprenticeship Boost Initiative and has set up a targeted Training and Apprenticeship Fund which provided funding to employers with first- and second-year apprentices. In addition, to support learning providers and students, especially tertiary education students, the Technology Access Fund was set up to continue

[225] New Zealand Individual Economy Report.

digital learning during COVID-19 using digital devices, Internet connections, and technical support. The student loan package was also doubled for course-related costs.

Likewise, in Brunei Darussalam, the i-Ready Apprenticeship Programme has been expanded in order to increase the employability and marketability of unemployed graduates at all levels. These programmes come alongside lifelong learning initiatives that are especially focused on upskilling and reskilling for locals, towards the development of the private sector. When companies in Brunei upskill or reskill their local employees, the training programmes can be financially supported through the Manpower Planning and Employment Council (MPEC) as part of the SkillsPlus programme. The locals are either trained in accordance to the skills that are presently required by the industry or as a step to help build their capacity, skills and competencies.

In the educational sector, Brunei rapidly worked to ensure that schools and other educational institutions would be able to continue delivering educational classes during the lockdown period. This was put in place in a matter of weeks (with some initial testing problems). The government made sure it supported technology investment, which it had already undertaken in 2018–2019, for faster broadband Internet at lower cost.

The Philippines had been implementing various alternative delivery modes (ADMs) in basic education even before the COVID-19 pandemic and is looking at upscaling and strengthening these ADMs and implementing flexible learning options.

Malaysia's approach was to encourage hiring, reskilling and upskilling including childcare subsidies and support for connectivity. The hiring and training assistance was aimed at businesses to reskill and upskill through programmes aimed at the return to work, for the gig economy, or to avoid redundancy. The Recruitment Incentive Programme / Training Assistance has helped over 100,000 employees secure employment in the manufacturing sector as well as in the wholesale and retail trades. In Korea, government-promoted training programmes focus on fostering digital skills and work in green industries.

In Thailand, a recruitment platform was established by the Ministry of Labour to promote job opportunities from government agencies, state enterprises, as well as in the private sector so that job seekers can apply for jobs that are consistent with their skills and experience, in some cases even channelled through social media.

In Singapore, the SGUnited Jobs and Skills package was introduced in May 2020 to curate jobs and skills opportunities. Schemes under the package provide support for locals to enter new jobs or take up meaningful skills opportunities that will boost their employability and help them be better positioned for the economic recovery. As of end March 2021, there were more than 100,000 placements in jobs and skills opportunities and Singapore has extended and enhanced the package in 2021 to, among other functions, support jobseekers moving into new occupations or sectors that have good prospects and opportunities for progression.

Canada has also announced the creation of 500,000 new training and work opportunities over the next five years. These new opportunities will be implemented through student placements, apprenticeships, skills training or re-tooling (including foundational and transferrable skills) and other workforce programs, such as the Sectoral Workforce Solutions Program aimed at helping fill in-demand jobs.

Chile's approach was to create new jobs in the public and private sector to accommodate the unemployed (and also students) with 25,000 internships and 30,000 paid training courses. This helped students avoid losing their drive to join the world of work and thus avoid increased youth unemployment.

Meanwhile, Chinese Taipei, upon the expiration of the Reliable Employment Program, set up the Recharge and Restart Training Program to provide subsidies for employers organising training courses and employees attending vocational training. Due to the impact of COVID-19, some industries have reduced working hours to ensure the continuity of their businesses and the livelihoods of employees. The Recharge and Restart Training Program encourages workers to utilise the reduced working hours to participate in training courses to continually develop personal working skills, thus maintaining their livelihoods and stabilising their employment. Meanwhile, companies are encouraged to help cultivate job skills during breaks so as to prepare for the future transformation of employment. The programme is set to be continued to anticipate future impacts on jobs and address them.

3.5.5 Job growth initiatives and job redesign

In Singapore, the Job Redesign under Productivity Solutions Grant encourages enterprises to work with pre-approved job redesign consultants to redesign work processes, tasks and responsibilities. It can help make jobs more productive and attractive for workers, and benefit enterprises by allowing them to hire and retain skilled workers to facilitate business transformation.

Similarly, New Zealand's economy has experienced a significant reduction in incoming migrants since the border restrictions were implemented. In response to this, employers may be incentivised to change their business models as well as to make these jobs more attractive to New Zealanders in order to fill vacancies.

According to Indonesia's Individual Economy Report, its new Omnibus Law aims to 'attract investment, create new jobs, and stimulate the economy by, among other things, simplifying the licensing process and harmonising various laws and regulations, and making policy decisions faster for the central government to respond to global or other changes or challenges'. The Omnibus Law amends more than 75 current laws and will require the central government to issue more than 30 government regulations and other implementing regulations within three months.

In neighbouring Malaysia, job growth and employment creation are organised under the Employment Council. The council proposes to provide 500,000 new employment opportunities by the end of 2021, and it is also expected to address the issue of skills mismatch in the labour market.

The potential of job redesign and new business models and work procedures has been accelerated by COVID-19. Mexico for example launched Together for Work to support the implementation of teleworking, and promote health and safety measures at work. It provides workers, employers and people in general with a set of digital tools, such as guides, training courses, and practical advice to take advantage of teleworking within the framework of social distancing due to COVID-19.

The rise of teleworking has also seen new legislation specific to the area. Chile's Telework

Law was enacted in March 2020. This law regulates remote work and the conditions under which it must be carried out, to ensure adequate working conditions and protection against work accidents and other contingencies.

In Japan, subsidies were provided to SMEs that introduce teleworking as part of the response to COVID-19. To promote high quality telework during and even after the COVID-19 pandemic, the government will continue to support SMEs owners who introduce telework in their operations. In addition, the government revised the teleworking guidelines to enable companies to introduce high-quality teleworking.

In Russia, an amendment to the Labour Code (as of 1 January 2021) expands the possibilities of organising remote work, with electronic personnel document management that allows the worker to protect his/her rights and the employer to form the whole range of details of interaction with the worker necessary for implementation of the work process.

In Thailand, a new project named Future New Skill Careers aims not only to provide offline and online trainings through universities with a focus on skill sets and knowledge that are currently in demand, but it also focuses on those industries most likely to recover quickly after the pandemic, 'such as smart farming, smart tourism, digital data management, food for the future, and industrial robotics'.

In China, an employment and entrepreneurship promotion plan for graduates was implemented, aiming to improve the services provided to unemployed graduates on a real-name basis. Support policies such as secured loans for entrepreneurship are being improved at the same time, in order to support and regulate the development of new forms of employment.

Both of these cases can also be seen as examples of efforts from APEC economies to accelerate access to jobs in the emerging and growing industry segments, facilitating the job-matching process. Several APEC economies have recently set up, or are in the process of setting up, systems to facilitate job matching – either online through ways of direct employer-to-employee communication, offline through a publicly-supported agency for emerging employment, or through a mix of both. Economies implementing this include Australia; Brunei Darussalam; Chile; New Zealand; and Thailand.

Overall, while most financial support measures are seen as rather short term, online recruitment platforms, skills development programmes and the promotion of teleworking opportunities are likely to continue being implemented also beyond the pandemic.

3.5.6 Challenges and risks to economic recovery

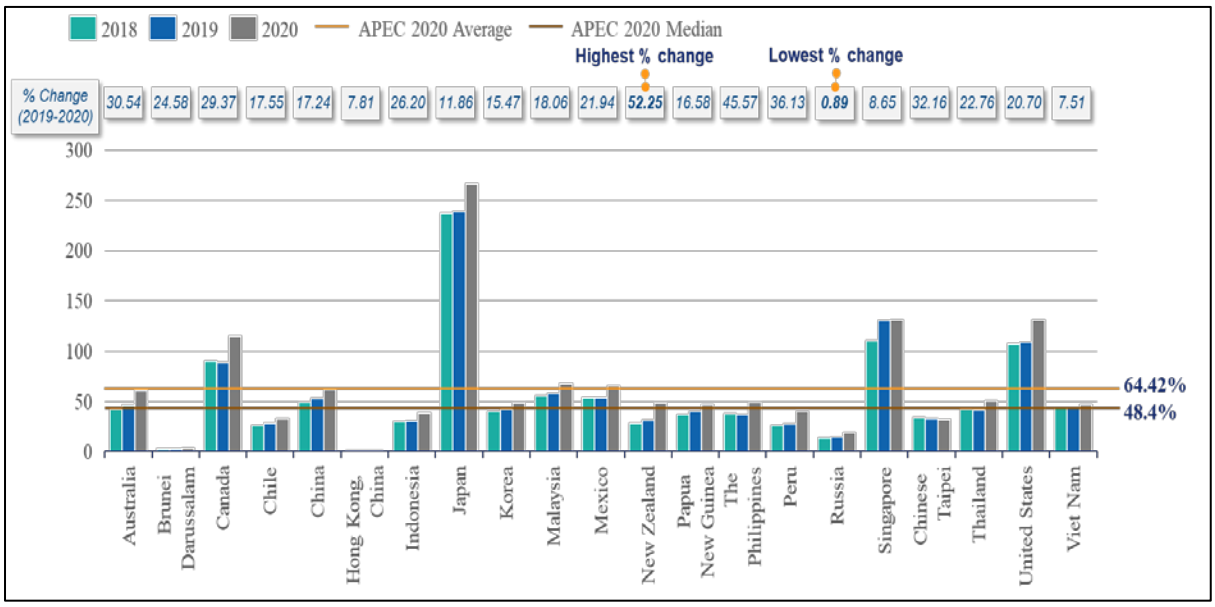
With many APEC economies still grappling with containing the spread of the virus, there is an immediate and urgent need to continue fiscal support. The absence of strong policy responses in the short term will exacerbate the economic impacts of COVID-19 and postpone recovery to pre-pandemic growth levels. Many APEC economies still have fiscal space to boost domestic demand. Economies are encouraged to sustain the recovery by avoiding any premature withdrawal of support measures.

Moreover, there is an opportunity to make investments that will address structural challenges to improve long-term productivity. For example, the United States, has been able to return to pre-pandemic levels of GDP this quarter, thanks to large stimulus plans under the American

Rescue Plan. The Infrastructure Investment and Jobs Act, pending passage, also includes investments for long-term productivity growth.

The challenges of balancing immediate recovery needs with concerns surrounding fiscal budgets and long-term debt sustainability will need to be weighed on a economy-to-economy basis. In some economies, funding was through additional (long-term) public debt. One such economy, Indonesia, has mandated a general budget deficit at 3 percent of GDP. However, in order to mitigate the impacts of COVID-19, this has been relaxed in 2020 and now allows budget deficits to exceed the 3-percent limit until 2023. Government debt to GDP ratio now stands at an average of about 64.6 percent across the 21 APEC economies. If calculated as median value, this figure stands at around 48.4 percent across the 21 APEC economies (Figure 3.18).

Figure 3.18 Government debt to GDP ratio, 2019–2020



Source: Statistics from APEC economies; Detecon analysis.

The varying pace and magnitude of policy support will result in differing speeds of recovery and therefore, widening external imbalances, which requires sound policies and strong macroeconomic fundamentals to maintain financial market stability.

3.6 RECOVERING FROM COVID-19

The post-COVID-19 recovery is predicated on several conditions being met or improved and others being avoided. One is that there will be no further waves of COVID-19 and its variants. Another is progress of vaccination programmes: more than 3 billion vaccine doses have been administered globally as of 1 July 2021.[226]

The responses of economies to COVID-19 have varied; from swift and proactive to haphazard and negligent. [227] Health systems were pushed to their limits and gaps in public health

[226] Johns Hopkins Coronavirus Resource Center, "Global Map," accessed 1 July 2021, https://coronavirus.jhu.edu/map.html
[227] A. Lal, et al., "Fragmented Health Systems in COVID-19: Rectifying the Misalignment between Global Health Security and Universal Health Coverage," *Health Policy* 397, no. 10268 (2021): 61.

infrastructure were exposed. COVID-19 will take time to disappear but will eventually cease to be an existential threat. However, what the pandemic has shown is the inadequacy of pre-pandemic levels of public health expenditure, capacity and access. Business-as-usual cannot continue, and there is a need for greater investment, innovation and access to healthcare as a defence against the next pandemic.

Disparities in vaccination rates across the APEC economies can be observed. With more than 56 percent of its population fully vaccinated, Chile was the APEC economy with the highest per capita rate for full vaccination, followed by the United States with more than 46 percent and Singapore with more than 36 percent fully vaccinated. With more than 600 million people at least partly vaccinated, China has vaccinated the highest number of persons in absolute numbers. Relative to the percentage of the population, Canada ranks first in APEC with more than 68 percent of its population having received at least one dose of COVID-19 vaccine as of 30 June 2021 (Table 3.1).

The level of vaccination affects both individual and business confidence. A rising trend usually presages an increase in investment and economic activity, helping to make jobs available as investments are made in systems, technology and operations, and job openings. The different rates of vaccination could create leads and lags in the economic recovery of APEC economies with serious consequences (Figure 3.19).

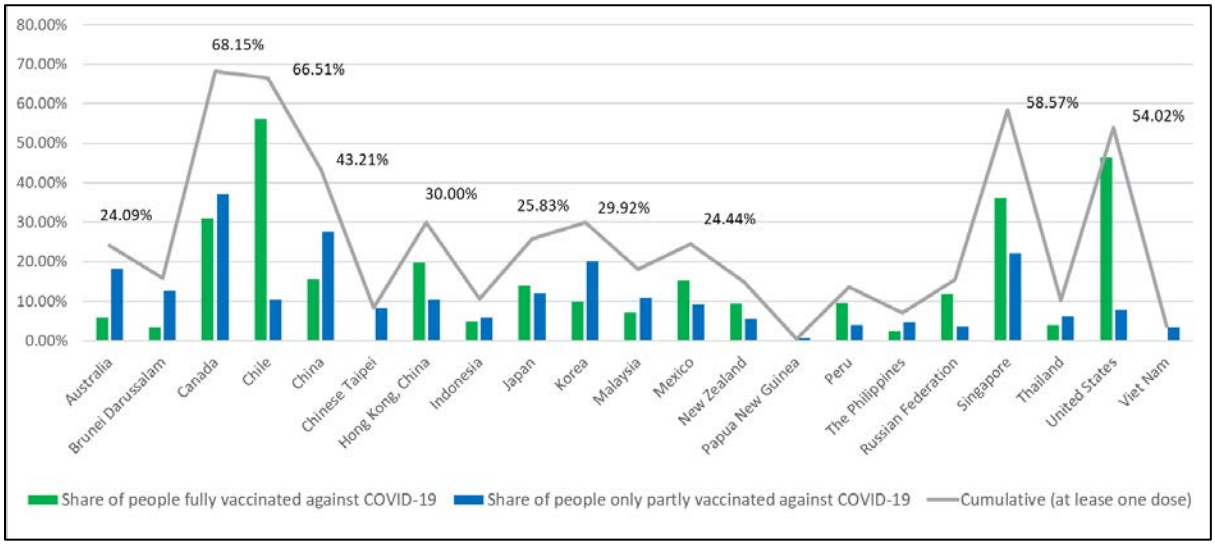
Table 3.1 Total vaccinations in APEC, as of 30 June 2021 (approx.)

Economy	Number of people fully vaccinated against COVID-19	Number of people partly vaccinated against COVID-19	Total number of people (at least partly) vaccinated
Australia	1,500,000	4,640,000	6,140,000
Brunei Darussalam	14,721	55,016	69,737
Canada	11,660,000	14,060,000	25,720,000
Chile	10,730,000	1,980,000	12,710,000
China*	223,300,000	398,700,000	622,000,000
Hong Kong, China	1,480,202	768,966	2,249,168
Indonesia	13,470,000	15,810,000	29,280,000
Japan	17,490,000	15,180,000	32,670,000
Korea	5,070,000	10,270,000	15,340,000
Malaysia	2,320,000	3,530,000	5,850,000
Mexico	19,570,000	11,940,000	31,510,000
New Zealand	455,074	263,994	719,068
Papua New Guinea	710	49,750	50,460
Peru	3,180,000	1,320,000	4,500,000
The Philippines	2,632,938	5,180,000	7,810,000
Russia	17,340,000	5,360,000	22,700,000
Singapore	2,130,000	1,300,000	3,430,000
Chinese Taipei	41,800	1,960,000	2,001,800
Thailand	2,820,000	4,290,000	7,110,000
United States	154,880,000	25,790,000	180,670,000
Viet Nam	193,041	3,390,000	3,583,041

*Latest available data from China: 10 June 2021.

Source: E. Mathieu,. et al., "A Global Database of COVID-19 Vaccinations," *Nature Human Behaviour* 5 (2021):947–953; Official data collected by Our World in Data (latest data available on or around 1 July 2021).

Figure 3.19 Vaccination rates in APEC per 100 people, as of 30 June 2021 (approx.)



Source: E. Mathieu,. et al., "A Global Database of COVID-19 Vaccinations," *Nature Human Behaviour* 5 (2021):947–953; Official data collected by Our World in Data (latest data available on or around 1 July 2021).

When discussing the recovery of the APEC economies from the pandemic, it is worth looking at actual 2020 GDP figures together with forecasts for 2021.When compounding the economic performance of these two years, the diverse nature of the APEC economies becomes apparent, including their main drivers of economic activity.

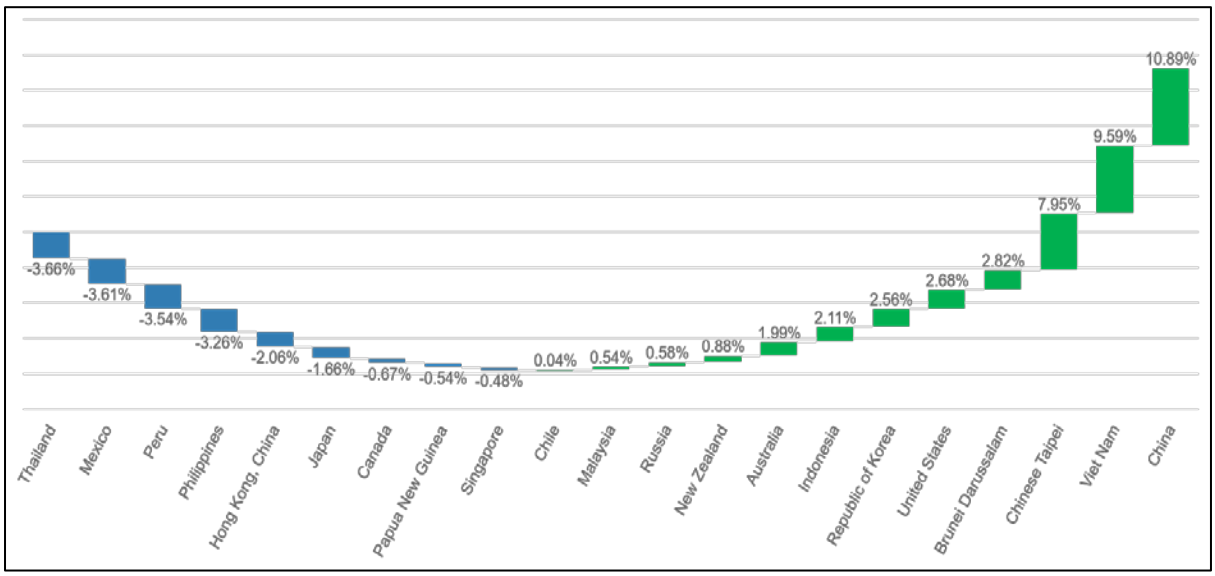
By end of 2021, it is projected that the overall GDP of seven APEC economies – Canada; Chile; Malaysia; New Zealand; Papua New Guinea; Russia; Singapore – would hover within 1 percent of their GDP levels before the pandemic (end of 2019).

Six APEC economies – Hong Kong, China; Japan; Mexico; Peru; the Philippines; Thailand – are expected to reach GDP levels that are still 1.66 to 3.66 percent lower in 2021 than they were in 2019, even with the world economy overall bouncing back strongly (Figure 3.20).

The delay in the recovery process for these economies can be attributed to the relatively slow rollout of vaccination programmes. In the case of Thailand and the Philippines, the road to recovery depends on international travel resuming and providing much required relief to the tourism sector, a significant part of their economies. Meanwhile, Hong Kong, China is expected to remain affected by the slow recovery of the transportation and tourism sector.

In the cases of Mexico and Peru, economies heavily reliant on the export of natural resources, the contraction of international trade throughout 2020 was so severe that even with positive developments in exports throughout 2021, the levels of economic activity will not reach 2019 levels by the end of 2021.

Figure 3.20 Net GDP growth after the COVID-19 pandemic, annual percentage rates compounded (Jan 2020 – Dec 2021)



Source: World Economic Outlook (April 2021) – Real GDP Growth Rates; IMF; Detecon research and analysis.

The opposite can be said about the remaining eight APEC economies. They are set to see compound GDP grow between 1.99 and 10.89 percent for the two-year period from the beginning of 2020 to the end of 2021. These economies include Australia; Brunei Darussalam; China; Indonesia; Korea; Chinese Taipei; United States; and Viet Nam.

These economies either had very early lockdowns, with stringent circuit breaker measures to get COVID-19 under control before opening up (e.g., Australia; China; Viet Nam); or very fast rollout of vaccines (e.g., China and the United States); or a combination of the two. They also had highly sought-after products during and after the pandemic. For China, general manufacturing demand remained very high, including for the production of vaccines and personal protective equipment. On the other hand, Chinese Taipei is a major source of the electrical components (computer chips) required globally by an increasingly digitalised world economy.

With regards to the referenced IMF forecasts from April 2021 (Figure 3.20), it has to be noted that the economic situation across APEC economies is still changing very frequently, making it necessary to also consider alternative scenarios based on current and future pandemic effects. For example, Japan's Mid-Year Economic Projection for FY2021 estimates the local GDP return to the pre-pandemic level by the end of 2021. And while a July 2021 update by the IMF for a few selected economies forecasts a more positive GDP outlook in APEC especially for Canada, the US and Mexico, previous estimates have been confirmed for Japan or even slightly reduced for China and Russia.

Korea, in its Individual Economy Report, notes that, along with the improvement in export conditions and the recovery of consumer confidence, the employment rate has switched to a rising trend since March 2021, driving a gradual recovery from employment shock. The number of employed workers in manufacturing also turned the corner, with numbers rising again after 14 months. The services sector, which was hit hardest by COVID-19, saw a considerable increase in the number of the employed as a result of increase in vaccinations and a general easing of lockdown restrictions. Furthermore, all age groups, including the youth and

those in their 30s to 40s, who have suffered the most to date in terms of employment, saw improvements in this area at the start of 2021.

At the same time, however, recent ILO projections highlight a number of negative long-term effects of COVID-19 on labour markets across the globe, forecasting a 'legacy of increased geographic and demographic inequality, rising poverty and fewer decent jobs'.[228]

As with most forecasts regarding the post-COVID-19 era, a large part of the economic recovery, and whether growth could be sustained, would eventually depend on the possible paths of the health situation, such as whether there will be another wave of the pandemic, whether economies would be able to overcome the current wave, and whether vaccines would emerge that could effectively contain the spread of COVID-19 variants.

The ILO expects the recovery of global labour markets to pre-pandemic levels to take until at least 2023 and be 'uncertain and unequal across the world's regions'.[229] This is partly due to unequal access to vaccines, but also because many developing and emerging economies may lack the resources to fund fiscal policies (such as income support measures) for an extended period of time.

COVID-19 vaccines have been proven to protect against the worst symptoms of the disease, preventing the overburdening of health systems and avoiding the need for repeated lockdown measures. High vaccination rates thus create confidence in people and in businesses to invest and rebuild; and fiscal stimulus and economic assistance present an opportunity to rebuild better. At the same time, the side effects of these economic stimuli should be considered, especially if continued over a prolonged period. Inflation could affect monetary policy by increasing the cost of borrowing, eventually leading to spillover effects for those businesses and individuals that took out additional loans.

The ILO emphasises that recovery from COVID-19 cannot be considered as a health issue alone. It states that 'without a deliberate effort to accelerate the creation of decent jobs, and support the most vulnerable members of society and the recovery of the hardest-hit economic sectors, the lingering effects of the pandemic could be with us for years in the form of lost human and economic potential and higher poverty and inequality'.[230] The employment prospects of young people is just one example of this. According to the ILO, youth employment fell 8.7 percent in 2020, compared to 3.7 percent for adults, with the biggest drops experienced in middle-income economies.

APEC economies like Australia; Canada; and New Zealand have rolled out education and training programmes critical to young people (as well as the inactive or underemployed). However, if demand for new employees remains low, the entry of young people into the labour market could be delayed or disrupted, with even short delays having long-term implications for their employability.

While large enterprises tend to provide outstanding employment opportunities, especially during changing market conditions, MSMEs also create interesting new job roles and experiences. However, without a positive outlook on sustainable future revenues, MSMEs may

[228] ILO, "Slow Jobs Recovery and Increased Inequality Risk Long-term COVID-19 Scarring," 2 June 2021, https://www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_794834/lang--en/index.htm
[229] ILO, "World Employment and Social Outlook: Trends 2021."
[230] ILO, "Slow Jobs Recovery."

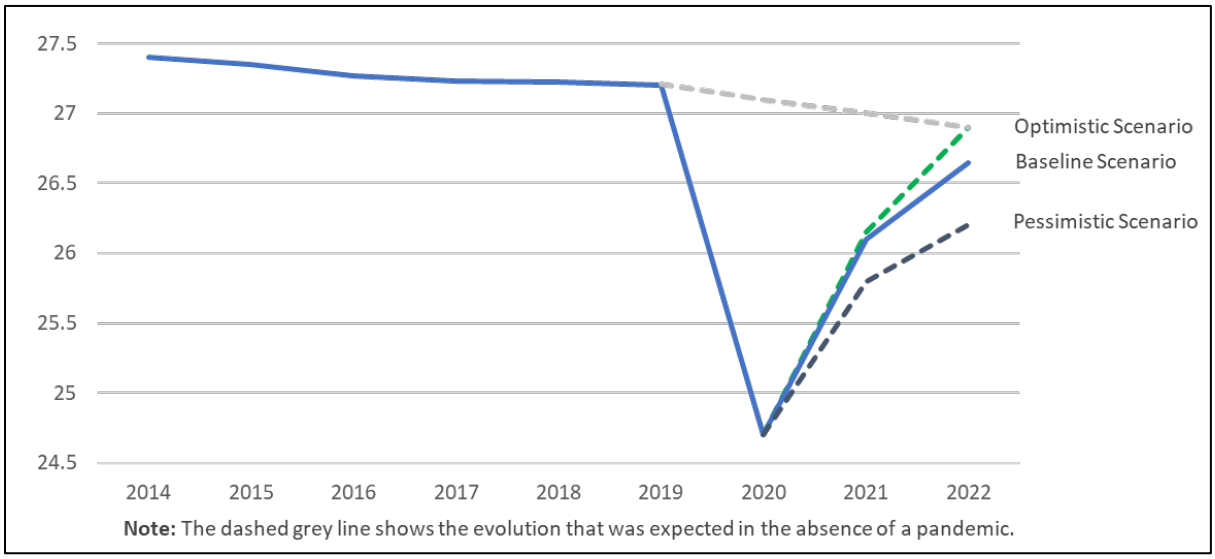
not be able to continue to do so, even after taking into account the cost-saving effects of digital technology or the gig economy, and this could have long-term implications for the recovery path.

The ILO report on working hours helps us understand the implications if an aggressive recovery is not maintained (Figure 3.24). The pessimistic scenario shows close to 65 percent utilisation of work hours relative to pre-pandemic levels (assuming a 40-hour work week). Lost hours or underutilised working hours means a loss in output, and thus, incomes, for those affected. What is not shown is the potential gap that may arise due to unequal demand for skills as the economies take on the technology transformation to protect themselves against future situations similar to the pandemic.

The task of building capacity and developing human capital in the respective APEC economies differs according to their stage of technology transformation. Some are further along in adopting new technologies and arrangements, and would only have to make some adjustments. Others would have a much larger gap to close not only in their skills and experience base but also in what their infrastructure allows. Building new or upgrading infrastructure takes time and a lot of investment.

While the delay poses social and economic questions of how to support people out of work who are trying to enter the labour market and who have been idle or inactive, the lag also gives policymakers, companies, and educational institutions time to act on providing workers with the relevant training and education. This is vital as the changes in work and the workplace are not a once-off occurrence compelled by the imperatives of, for example, working from home during COVID-19, but an inexorable shift that will see business, government and organisation in the economy move toward new modalities.

Figure 3.21 Ratio of total weekly hours worked to population aged 15–64 under three global ILO scenarios, 2014–2022 (hours per week)



Source: ILOSTAT: ILO modelled estimates, April 2021.

Cross-economy cooperation would be important in supporting the education and training of workers in the APEC economies, and thus, overall economic recovery in these economies. APEC economies could share their experience and knowledge in providing the technology and

solutions that could speed the process of achieving wider inclusion (for example, cheaper access to the internet, use of both broadband and mobile connectivity) across all segments of an economy. The practice in Malaysia of a tax deduction for the acquisition or provision of connectivity devices to employees and individuals is an example of a measure to increase connectedness across society.

Community dialogue is also essential. As government and community services move toward digital, efforts must be made to engage on the ground with communities and individuals to help them get to know and use the new modalities. This would require policymakers to use innovative approaches that could gain wide support from, and the participation of, a range of stakeholders.

Efforts should also be made to provide relevant education and training to prepare workers for the technology transformation and the cross-pollination of best practices among APEC economies together with engagement with communities at the local level. This can help them understand and take advantage of the changes would mean that low-skilled, low-wage workers, and young and old people, would be less likely to be faced with exclusion and remain in vulnerable situations. This is especially true as many of these persons are to be found in occupations most likely to be affected in a technology transformation of the economy.
In December 2019, when the very first cases of a novel coronavirus were reported,[231] no one could have imagined the impact the virus would have. One and a half years on, the world has been disrupted in various ways, including the contraction of economies, downward movement in the labour market, and changing ways of working and socialising. It has become clear that the pandemic has and continues to have deep socioeconomic impacts on APEC economies.

This chapter analyses the impacts of COVID-19 and how labour markets responded. It compares the impact of various policy measures on labour market performance and how people work. It also assesses the role played by COVID-19–related policies on APEC economies, focusing on sectors that have borne the brunt of the impacts.

[231] World Health Organization (WHO), "Timeline: WHO's COVID-19 Response," accessed 5 July 2021, https://www.who.int/emergencies/diseases/novel-coronavirus-2019/interactive-timeline#event-7

4. THE CHANGING MANAGEMENT OF WORK

The pandemic has brought about unprecedented changes to the way people work, accelerating the adoption of remote working. This adoption depends on the type of job, social distancing, skills and access to infrastructure.[232] For instance, jobs involving outdoor activities (e.g., taxi drivers, agricultural workers) are considered unlikely to be suitable for remote working, whereas those holding jobs such as accounting or consulting are more likely to be able to work remotely.

A smooth transition to remote working during the COVID-19 pandemic will require several features.[233] Employers and governments could invest in digital infrastructure, adopt new communication technologies, introduce legislation to enable remote working, and provide fiscal assistance to maintain economic activity and preserve jobs for its workforce.

These topics were in fact addressed by the majority of APEC economies in their 2021 Individual Economy Reports for APEC. Some of the economies that recognised these challenges are currently in the process of gathering data before determining the appropriate course of action, while other economies have already introduced measures to implement structural reforms. Some of the APEC economies have developed new action plans on these topics, or updated existing long-term strategic plans in light of the significant changes triggered by the COVID-19 situation.

Remote working has caused an acceleration toward digital transformation.[234] Workers face new challenges and will need to upskill or reskill, to be proficient in using digital tools and adapting to new work trends. In response, APEC economies have introduced active labour market policies to reduce frictions caused by a rapidly changing work environment.

These labour market policies in the APEC economies not only address the 'reskilling and upskilling of workers affected by automation', particularly in retail and manufacturing (United States), but also reforms in 'education and vocational training systems so that they meet the needs of employers' (Australia), enable 'lifelong learning' (Brunei Darussalam; Canada; Korea; Thailand) and/or 'stabilize the employment of elderly persons' (Japan; Chile), for example also in social contribution projects.[235]

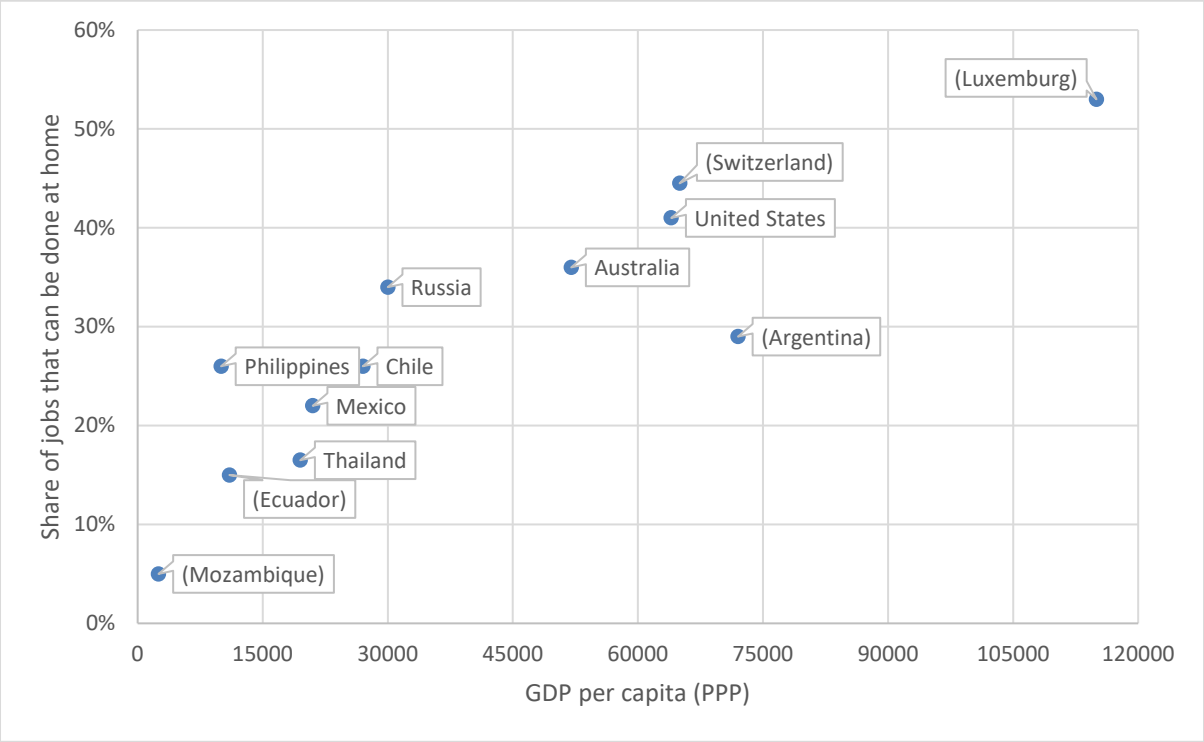
Developing effective ways to offer suitable job opportunities, through public employment agencies or digital online services, has been highlighted for example by Australia; Brunei Darussalam; New Zealand; Peru; and Thailand. In the case of Brunei, developing salary frameworks or guidelines for emerging in-demand jobs are also part of the economy's action plans. In China, Australia and New Zealand, action plans have been envisaged to leverage

[232] J. Dingel, and B. Neiman, "How Many Jobs Can Be Done at Home?" Working Paper 26948, National Bureau of Economic Research, Cambridge, MA, 2020, https://doi.org/10.3386/w26948
[233] M. Famiglietti, F. Leibovici, and A.M. Santacreu, "The Decline of Employment during COVID-19: The Role of Contact-Intensive Industries," *Economic Synopses*, no. 40 (2020), https://doi.org/10.20955/es.2020.40
[234] APEC, "Managing the Long-term Economic Effects of the Flexible Work Arrangements: APEC Practices and Recommendations" (Singapore: APEC, 2021), https://www.apec.org/-/media/APEC/Publications/2021/5/Managing-the-Long-term-Economic-Effects-of-the-Flexible-Work-Arrangements/221_EC_Managing-the-Long-term-Economic-Effects-of-the-Flexible-Work-Arrangements.pdf
[235] The Individual Economy Report submitted to APEC by the respective economies.

emerging technologies to ease labour shortages – addressing a general shortage of skilled labour, or in order to mitigate mismatch in urban vs. rural skill supply and demand situations.

Within APEC, differences in economic structure explain the variation in remote working. Other factors that affect remote work include differences within sectors, distribution of employment by company size, the share of self-employed workers and workers' skills. For instance, in the US, over 30 percent of workers could potentially perform their tasks remotely,[236] whereas in Thailand and Mexico roughly 20 percent of jobs can be executed remotely (Figure 4.1).

Figure 4.1 Variation in share of jobs that can be done at home



Source: J. Dingel, and B. Neiman, "How Many Jobs Can Be Done at Home?" Working Paper 26948, National Bureau of Economic Research, Cambridge, MA, 2020, https://doi.org/10.3386/w26948

4.1 WORKING FROM HOME

Distancing rules had a mixed impact on APEC economies due to differences in the labour market. For instance, those with jobs that require a high degree of face-to-face physical interactions such as hospitality and tourism are unable to work from home as their work involves close contact with other workers, customers, suppliers and transportation workers. APEC economies with a high share of workers in these jobs are more exposed to negative demand shock due to social distancing measures as well as having higher risk to exposure to COVID-19.

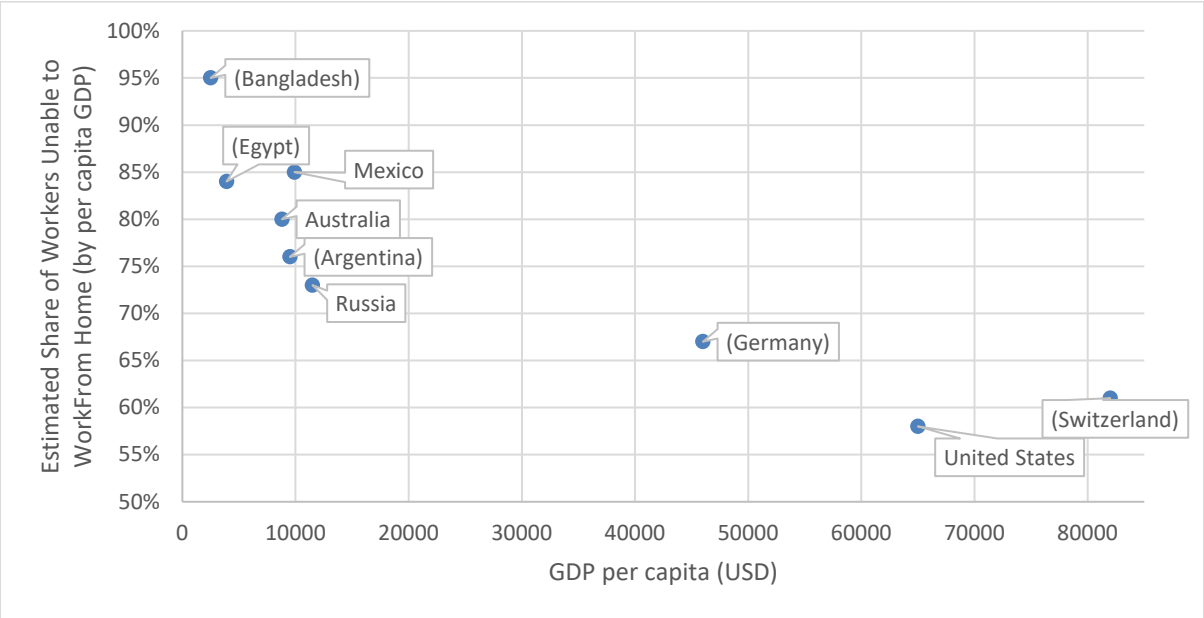
Jobs that are less vulnerable to social distancing measures are more adaptable to remote working, allowing workers to remain in employment remotely, and in some cases with reduced

[236] OECD, "Capacity for Remote Working Can Affect Lockdown Costs Differently across Places," 2 June 2020, https://www.oecd.org/coronavirus/policy-responses/capacity-for-remote-working-can-affect-lockdown-costs-differently-across-places-0e85740e/

working hours.[237] Additionally, some jobs already require the significant use of digital tools, such as graphic designers or call centre agents. Prior to the pandemic, digital tools enabled tasks to be performed remotely given the right infrastructure, internet connectivity and available equipment (routers, mobile and broadband connections, and suitable software and applications). This allowed a shift to remote working to occur seamlessly and made remote working a feasible alternative to reduce economic losses while managing the risks of COVID-19 infections.

For instance, in Viet Nam, about 20 percent of workers can work from home as they do not have to be present at the workplace.[238] Additionally, the possibility of working from home is positively correlated with wages in Viet Nam: 60 percent of high-paying jobs allow workers to work from home. Figure 4.2 shows that in Mexico; Russia; and the US, the number of jobs that require workers to be present at a place of work could be as high as 80 percent, 70 percent and close to 60 percent respectively.[239]

Figure 4.2 Estimated share of workers unable to work from home (by per capita GDP)



Source: World Economic Forum (WEF), "The Future of Jobs Report 2020" (Geneva: WEF, 2020), http://www3.weforum.org/docs/WEF_Future_of_Jobs_2020.pdf

Figure 4.3 shows that those in the accommodation and food services, retail, transportation, education, and construction have a relatively high risk of unemployment. Jobs in these areas typically require physical proximity to others, and also cannot be conducted remotely, which makes job losses or reduction of hours more likely when lockdowns or social distancing measures are imposed.

At the other end are those working in financial services, whose jobs typically do not require physical proximity with others, and their tasks can often be performed remotely, which reduces the risk of social distancing and lockdowns affecting their livelihoods. Thus, just around 7 percent of these workers are at risk of unemployment. Some 9 percent of those working in

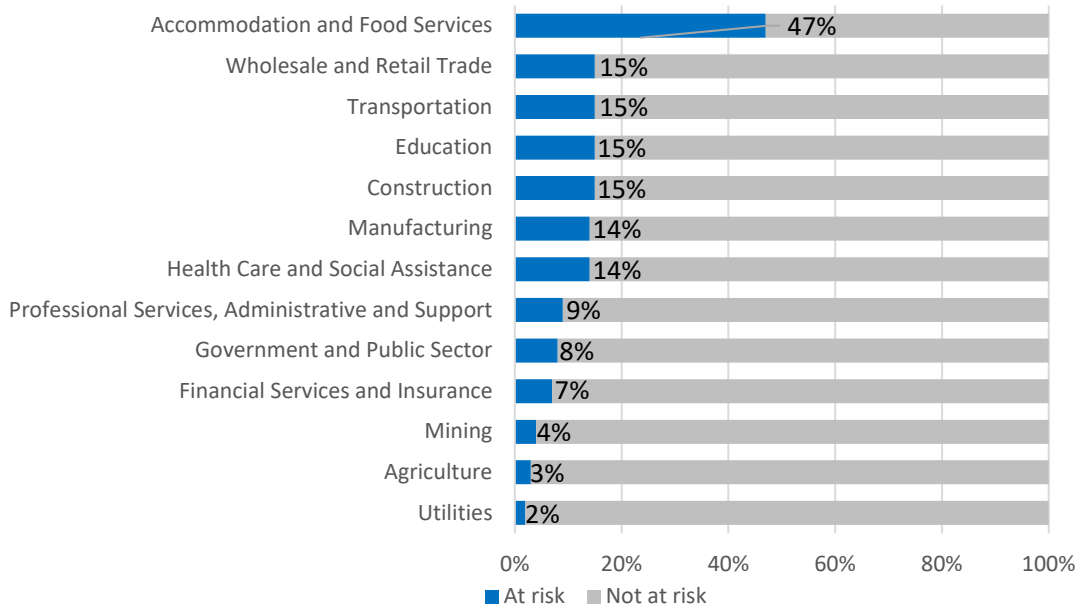
[237] WEF, "The Future of Jobs Report 2020" (Geneva: WEF, 2020), http://www3.weforum.org/docs/WEF_Future_of_Jobs_2020.pdf
[238] F. Saltiel, "Who Can Work from Home in Developing Countries?" *COVID Economics* 7 (2020): 104–18.
[239] WEF, "The Future of Jobs Report 2020."

professional services (e.g., business or administration) are estimated to be at risk of unemployment. Their jobs require close personal contact, but with some tasks that can be executed remotely.

Those working in utilities and agriculture likely cannot work remotely. However, they have been assessed to have a relatively low risk of unemployment, at 2 percent of utilities workers, and 3 percent of those in agriculture, because of the essential nature of their jobs.

Low-wage workers in APEC are more vulnerable to wage losses.[240] For instance, while personal service workers might experience lower demand due either to lockdowns or consumers' self-imposed social distancing, other workers such as teachers, business professionals and managers may be able to execute their tasks remotely, mitigating the impact of the COVID-19 pandemic on their income.

Figure 4.3 Estimated share of workers at risk of unemployment due to COVID-19



Source: World Economic Forum (WEF), "The Future of Jobs Report 2020" (Geneva: WEF, 2020), http://www3.weforum.org/docs/WEF_Future_of_Jobs_2020.pdf

4.2 NEW SKILLS NEEDED

The COVID-19 pandemic has accelerated the adoption of technology and is shaping the new normal of work. This new normal will require access to the Internet through mobile and broadband networks. Infrastructure would have to be installed or upgraded, and cost to consumers brought down. Workers facing unemployment or shorter hours will have limited earnings, and would find it difficult to afford Internet access if rates are high.

Human capital development has always been recognised as a key contributor to economic growth, being positively correlated with an economy's competitiveness. Skill development

[240] APEC, "Effective Labor Market Signaling: A Strategy Addressing Unemployment and Talent Mismatch" (Singapore: APEC, 2012), https://www.apec.org/-/media/APEC/Publications/2012/10/Effective-Labor-Market-Signaling-A-Strategy-Addressing-Unemployment-and-Talent-Mismatch/2012_hrd_effectiveLabrMkt.pdf

contributes to long-term economic competitiveness and could create more inclusive economic growth, especially if it is accessible to people facing structural barriers to economic participation, such as the poor, women, youth, the elderly and those with disabilities. The COVID-19 pandemic has disrupted access to and opportunities for schooling, tertiary education, and training, while the decline in job opportunities caused by the pandemic and changes in the skills required have added to the economic vulnerability of many workers.

There is a significant learning gap that needs to be addressed. It is expected that 85 million jobs will disappear in the next 4 to 5 years and 97 million new ones emerge.[241] These jobs will require new skills, as seen in Table 4.1.

Table 4.1 Jobs and shifts in demand

Decreasing Job Demand	Growing Job Demand
Data Entry Clerks	Data Analysts and Scientists
Administration & Executive Secretaries	AI & Machine Learning Specialists
Accounting, Bookkeeping and Payroll Clerks	Big Data Specialists
Accountants & Auditors	Digital Marketing and Strategy Specialists
Assembly & Factory Workers	Process Automation Specialists
Business Service & Admin Managers	Business Development Professionals
Client Information & Customer Service Workers	Digital Transformation Specialists
General and Operations Managers	Information Security Analyst
Mechanics & Machine Repairers	Software & Application Developers
Material Recording & Stock Keeping Clerks	Internet of Things Specialist

Source: World Economic Forum (WEF), "The Future of Jobs Report 2020" (Geneva: WEF, 2020), http://www3.weforum.org/docs/WEF_Future_of_Jobs_2020.pdf

The government of Canada estimates that 75 percent of employment growth in Canada between 2019 and 2028 would be in high-skill occupations. It is therefore important for the Canadian economy to build a culture of lifelong learning so workers obtain new skills they require to continue to succeed in the labour market. Upskilling and reskilling programmes are being developed to improve employee engagement and retention, attract new talent, and speed up the adoption of new trends.[242]

Similarly, in Brunei Darussalam, the government has provided upskilling and reskilling opportunities for individuals, particularly for those impacted by slow business activities during the pandemic, to pursue self-development in order to ensure relevance to industrial needs and to maintain, as much as possible, their employability and marketability.[243]

The impacts of decreasing demand for specific jobs should be understood better to allow policymakers to make decisions on where and how to allocate resources to develop human capital. Areas of growth include Artificial Intelligence (AI) and machine learning, business development, digital marketing and others which are not mainly administrative and routine transactional jobs. Some of these jobs will change over time, and it is likely there will be further integration of tasks between workers and machines. This will require adaptation and training for workers remaining in these jobs.

[241] ILO, "World Employment and Social Outlook: Trends 2021."
[242] Canada Individual Economy Report 2021.
[243] Brunei Darussalam Individual Economy Report 2021.

Moreover, the labour market disruption due to COVID-19 requires workers to rapidly adapt to an evolving and uncertain labour market environment. Learning in the age of digital transformation will require not only rethinking what to learn, but also how and where to learn. Workers now require higher levels of adaptability, creativity and innovation to adjust to a post-pandemic labour market. Rapid technological changes will affect how human capital development occurs and will require intervention by all stakeholders, from governments to organisations, businesses and individuals. Continuous learning, including reskilling and upskilling of foundational skills such as literacy, numeracy and digital skills, should be integrated into work and made available to those in between work or returning to work. This includes workers currently in the formal sector, vulnerable and informal workers, unemployed workers, workers returning to work, older workers, and other marginalized groups.

4.3 MODERNISING HUMAN RESOURCES

Even before the COVID-19 pandemic, human resource (HR) management was increasingly focused on employee engagement, efficiency, retention, and building an agile organisation that could respond rapidly to changing market situations, such as new technology, competition and regulatory issues.

For example, integrated HR information systems that interface with organisation-wide systems through cloud-based platforms and analytic tools have seen rising adoption. According to one estimate, 36 percent of organisations are using intelligent automation in HR and businesses.[244] HR transformations will focus on consolidating care and talent.[245] However, not all organisations have successfully transformed their operating models and are still in the process of strategic transformation.[246] This is often due to roles and structures not adapting and changing with overall transformation and management changes.

The ‘right to disconnect’ can be seen as another important HR-related topic here. Prior to the COVID-19 pandemic, the issue of work–life balance and the effect of workplace e-communications was already a growing concern for workers. While the increased availability of mobile technologies and constant connection may be beneficial, it carries risks when it is not balanced against the need for rest. According to Canada’s Individual Economy Report, these risks include anxiety, depression and burnout. For this reason, the Canadian government committed in September 2019 to co-develop with employers, labour organisations and other stakeholders a policy on the right to disconnect, which will benefit federally regulated workers.[247]

Across the APEC economies, such situations have become much more prevalent through the impact of the pandemic. For instance, before the COVID-19 outbreak, only 2.6 million Mexicans – equivalent to 5 percent of the economically active population – were teleworkers. Due to the pandemic, in just a few months this figure has increased to 12 million workers, representing an increase of 22 percent of the labour force.

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[244] KPMG International, “HR Transformation: Which Lens Are You Using?” 2017, https://assets.kpmg/content/dam/kpmg/xx/pdf/2017/08/hrt-executive-summary.pdf

[245] D. Pant, “The State of HR Technology Adoption,” People Matters, 20 April 2018. https://www.peoplematters.in/site/interstitial?return_to=%2Farticle%2Ftechnology%2Fthe-state-of-hr-technology-adoption-18056

[246] KPMG International, “HR Transformation.”

[247] Canada Individual Economy Report 2021.

According to Mexico's National Institute of Statistics and Geography (INEGI), the COVID-19 pandemic has caused 12.2 percent of the economy's companies to adopt teleworking. Of this figure, 44.8 percent are large enterprises, while 19 percent are SMEs and 11.2 percent are micro-enterprises.[248]

Similarly, when the pandemic reached its peak in Chile in June 2020, the percentage of teleworkers reached 28.9 percent. A COVID-19 Engagement and Telework Survey showed that the main benefits of this modality for workers in Chile have been the reuse of transportation time for other activities, more time to spend with cohabiting, and greater autonomy to manage the time spent at work. The survey also recognised an increase in worker exhaustion in teleworking and isolation conditions, caused primarily by emotional exhaustion.[249]

Technical trends in HR include growing adoption of artificial intelligence (AI), machine learning (ML), conversational user interfaces (CUI), blockchain, augmented reality (AR), virtual reality (VR)[250] and big data analysis. Solutions built on these technologies are under development and are poised to enhance HR functions across the employee lifecycle. Several shifts are notable: HR now makes core decisions with IT providing critical support; there is a shift toward a focus on user experience as software is designed to be easy to use; and there is adoption of new ideas in HR such as agile and design thinking approaches. An example is Spotify whose music streaming platform was able to change its way of working overnight in response to the pandemic measures through digitalisation of learning and development, face-to-face training and leadership development. Due to being ready to leverage on the use of the technology, they were able to increase their staff by a third in 2020.[251]

Using social media platforms to attract candidates has also increased. More fluid performance management systems have been introduced, with a more 'in the flow' reviewing process compared to 'on the go' check-ins. The constraints imposed by space and time zones have also been reduced with the ability to engage in online discussions and video conferencing.

Brunei Darussalam is actively working to facilitate the connection between employers and jobseekers. Various outreach programmes and recruitment drives are organised to not only provide a platform for jobseekers to connect with potential future employers, but also to support the Employee Value Proposition of local firms – that is, to enhance their attractiveness as employers.[252]

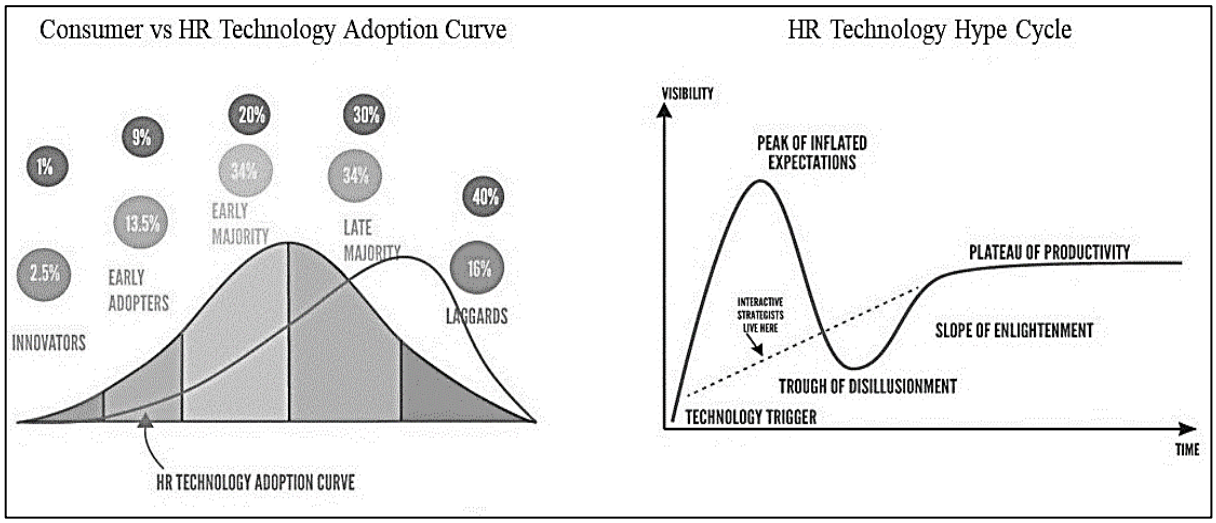
The introduction of mobile applications has also been a major change for HR and continues to develop as mobile and other wearable devices gain users. This has allowed HR to provide learning 'on the go' through bite-sized modules. AI and analytics, including predictive

[248] Mexico Individual Economy Report 2021.
[249] Chile Individual Economy Report 2021.
[250] PwC, "How Virtual Reality Is Redefining Soft Skills Training," 5 June 2021, https://www.pwc.com/us/en/tech-effect/emerging-tech/virtual-reality-study.html#:~:text=At%203%2C000%20learners%2C%20VR%20was,than%20classroom%20or%20e%2Dlearning
[251] "Spotify's Talent Play: Distributed, Flexible, and Diverse", Managing the Future of Work (Podcast), Harvard Business School, 24 March 2021, https://www.hbs.edu/managing-the-future-of-work/podcast/Pages/podcast-details.aspx?episode=18444434
[252] Brunei Darussalam Individual Economy Report 2021.

analytics, will bring more data to the decision-making process in recruitment, learning and other areas.[253]

Figure 4.4 illustrates a conceptual model which reflects a common pattern that occurs in the adoption of technology in HR functions and helps to explain the gap between expectations and adoption. The left side of Figure 4.4 shows the HR technology adoption curve which partially explains the lag in adoption. The right side illustrates how expectations are often over-inflated and after disillusionment the trajectory gains momentum. It is part of the change cycle, where adoption is fast but use is slow and takes longer for users to get the best use out of the technology.[254]

Figure 4.4 Consumer vs HR technology adoption curve and HR technology hype cycle



Source: J. Miller-Merrell, "The Why Behind HR Technology's Hype Cycle," Workology, 20 May 2014, https://workology.com/hr-technology-adoption-cycle/

When the COVID-19 pandemic occurred, the HR community had at its disposal the technology, policies, processes and workflow to act. Prior to the pandemic, HR departments already had or were familiar with the wide range of digital tools and technology available. Adoption and use of technology were dependent on awareness and budgets, which varied from organisation to organisation. Size was less critical as the usage of cloud technology allows a much more dynamic approach without large-scale investments.

During the pandemic, HR departments had to pivot and move into a different mode of operation. In addition to considering the safety and wellbeing of the workforce, they had to implement means to communicate and engage workers remotely. They also had to review their business continuity plans and their policies. COVID-19 forced HR departments to modernise their platforms, and in some cases abandon legacy systems. Systems and processes had to be more agile and adapt quickly to changing circumstances. HR departments had to consider how diversity and integration can be applied, and how it reflects the demographics and structure of the workforce. Box 4.1 provides a case study of a large firm navigating HR management and processes in the midst of COVID-19.

[253] "How HR Technology has Evolved," HR Technologist, 13 July 2017, https://www.hrtechnologist.com/articles/hr-analytics/how-hr-technology-has-evolved/
[254] J. Miller-Merrell, "The Why Behind HR Technology's Hype Cycle," Workology, 20 May 2014, https://workology.com/hr-technology-adoption-cycle/

As HR departments and organisations increase their digital footprint, HR policies will have to be revisited along with the associated workflow and processes. However, changes in processes and workflow often precede changes in policies, as the latter require multiple user reviews and approvals while the former are more administrative. Inevitably, new digital circumstances will expose the gaps in existing HR policies and strengthen the need to revisit and amend them.

Box 4.1 HR before and during COVID-19

To dig deeper into HR issues before and during COVID-19, we examine the case of an IT company in Southeast Asia. The company operates in the digital telecommunications sector offering wholesale telecommunication services to domestic and international clients. The company employs around 600 full-time equivalents (FTEs), with employees making up about 85 percent of FTEs and contractors making up the balance. It has a three-year investment plan of around USD 220 million in several major technical and infrastructure projects including an investment in human resource development across the company.

While this company may not be representative of most companies in the APEC region, its case study can offer insights in managing HR issues in three areas: (a) managing future of work HR issues with different workforce levels and skills; (b) showing the need to have a forward-looking plan for the future of work; and (c) showing the need to develop an enabling environment to address 'future of work' challenges.

Prior to COVID-19, HR policies encompassed recruitment policy, the selection process and remuneration (for example, ensuring no discrimination on pay). Recruitment was based on a mix of factors, such as experience, skills, fit (culture and values) and periodic reviews to ensure unbiased recruitment. A cloud-based human resource management system was established in 2019 and was in the process of being implemented in the HR life cycle. This included recruitment, payroll, performance, leading and development, health and safety and environment, job design and surveys.

Talent acquisition

COVID-19 had minimal impact on the organisation's recruitment, learning and development plans. A digital talent acquisition system was already in place, having been launched and refined in the latter part of 2019. This allowed the recruitment process to proceed without much constraint. Initial hindrances included setting up large screens, rearranging interview rooms, ensuring secure links to the system, and adequate time for the talent team and managers to familiarise themselves with the technology.

Once this was achieved, the process proceeded without undue problems arising. Occasional connectivity issues for candidates were a recurring problem, and it was decided that interviews would be rescheduled without any negative implications for the candidate. All interviews were extended to allow a short period for candidates to familiarise themselves with the new mode of interaction, as well as to make them feel at ease should the system malfunction. Initially, there were a few complaints from

candidates as they 'felt awkward' with the new system, but by May–June 2020 these complaints no longer arose.

Onboarding and induction of new employees

There were two challenges. The first challenge was the onboarding process which had previously been done face-to-face. Typically, new employees and workers were brought together and given an understanding of the organisation systems, policies and work set-ups. This process had to be digitalised in a matter of weeks. This digitalisation was made possible through collaboration between the HR team, corporate communications, knowledge management and key functional areas, such as IT, cyber security, and health and safety. Onboarding material was converted to digital presentations, while virtual discussions and question-and-answer sessions were held.

The next challenge was the induction of new employees and implementation of the 'buddy system', given challenges with COVID-19 work rotations and social distancing restrictions. The buddy system is aimed at helping new employees rapidly integrate into the organisation and create their own internal and external work network. The team collaborated with several other departments to develop a plan to manage this virtually. A particular issue was aligning the schedules of new employees with their buddies. The virtual buddy system was successful, as new employees were quick to adopt the technology and applications being used. In some cases, new employees suggested other new applications which in due course were trialled, and at least one has been introduced within the organisation.

Learning and development

The strategic plans of the organisation included an ambitious training and development programme. It had identified that there were development needs for managers and team leaders. A workforce planning and a needs analysis exercise conducted in late 2019 concluded that there were a variety of skills that would be required in the near future as a result of its plans to invest in new technology and systems. It had also identified that not all future roles required engineering degrees and thus had already agreed with vocational training institutions to employ apprentices. Agreements were also made with universities to accommodate undergraduate interns as part of their work experience requirements.

The advent of COVID-19 caused several problems. Firstly, face-to-face classes and workshops could not be held. The providers responded by developing a different approach to the delivery that would still meet the objectives that had been agreed upon. The learning management system, which was being developed, had to be brought forward to accommodate resources that would be provided in digital format, which required collaboration with the knowledge team. Most of this collaboration was done virtually due to social distancing restrictions being in place.

Secondly, training of technical skills was initially delayed by a couple of months due to the pandemic but was soon back on track. For apprentices, social distancing restrictions were not an issue as most of their tasks were in the field and thus their training and work experience could proceed accordingly. For interns and others, the interaction had to be virtual and thus, significant mentoring and coaching occurred

virtually via digital communication platforms such as WhatsApp, Microsoft Teams, Sharepoint and Zoom. In response, one of the first modules of the management development programme was how to manage at a distance. This included providing a variety of tools for remote management, such as work logs that were recorded digitally and could then be discussed in virtual meetings, and check-in sessions that replaced face-to-face ones where the schedule did not permit face-to-face meetings.

Learning Academy

The company established a virtual Learning Academy to work collaboratively with the learning and development team and the performance management team to help develop, monitor and assess progress in learning across the organisation. This includes technical training to both reskill and upskill employees and contractors, as the organisation was implementing an active interface for its workforce. This interface would involve multiple stakeholders such as senior leaders, managers, team leaders, the HR team, and the suppliers of the new technology, equipment and systems.

This engagement is essential to both provide a vision of the future with the technology and what employees' roles will be like. For example, robotic process automation (RPA) would be introduced to automate early warning of potential equipment failure (preventive analytics applied to maintenance), allowing the technician and engineer to rectify the issue before a critical failure occurs. This reduces crises from occurring and reduces customer complaints and dissatisfaction. There are also plans for laboratories for testing and other development, which will allow employees to learn and experiment with this system, closing the gap between concept and reality. Practical training includes an internal apprenticeship which would require monitoring of the applications for learning and later assessment of real live situations before the employee is certified in the particular tasks or technology/systems.

The future of talent management

With changes in the work and skills required for new technologies, systems and applications, jobs will change in various ways. Some might be relatively minor, such as customer service being able to manage and analyse data. This requires a mix of technical knowledge as well as soft skills to interact with multiple stakeholders. Engineers involved in face-to-face interactions with customers will require knowledge of the technology, system, and applications as well as the soft skills to manage demanding customers. These changes imply that all workers will need to consider lifelong learning. HR is responsive to the fact that employees are not one-dimensional and bring with them experience and skills that can be applied across the organisation and thus is always looking for opportunities to develop these persons and provide new opportunities.

For example, in the HR department of the organisation in the case study, two members of the department had roles in HR information systems and in HR analytics. When HR increase its adoption of digital applications, the two members had untapped skills. Within 12 months, they were moved to the Analytics Centre of Excellence. One of the employees now leads this unit, having demonstrated considerable knowledge and experience with analytics and data usage. COVID-19 also brought challenges to the

nature of work and how it is carried out. Job crafting and a new method of valuing roles needed to be developed. In early 2021, the company realised that jobs were changing faster than the organisation was able to rewrite them. Thus, a permanent review was set up for all organisation functions to ensure that the skills needed were understood and that the employees had them. The review also ensured that a cross-functional assessment was made to value and reward workers with fair compensation and to retain key workers for their experience and skills.

5. ADDRESSING FUTURE OF WORK CHALLENGES

As the previous sections have shown, technological advances, climate change, globalisation, and demographic change have brought about a number of transformations in the way in which businesses operate and people engage in work. Some of the main trends include a rise in e-commerce, greater use of automation and artificial intelligence, and an increase in non-standard forms of employment. These changes to the nature of work are consequently creating greater skills imbalances and job displacement as well as increased levels of vulnerable employment. The COVID-19 pandemic has exacerbated the pace of many of these trends and has required workers, firms, and governments to react quickly to rapidly changing circumstances. Going forward, economies will need to have responsive regulatory frameworks in place in order to take greater advantage of the opportunities presented by the changing nature of work, while also mitigating against any negative externalities.

This section will explore various policy responses so that economies are better able to respond to the changing nature of work in order to harness the opportunities and confront the challenges. It also assesses the current level of regulatory preparedness in the APEC region by examining some of the policies in place among the APEC members. Drawing heavily on policy recommendations put forth by organisations such as the International Labour Organization and the OECD, the following topics are covered: (1) developing effective social protection systems; (2) developing human capital and promoting greater inclusion; (3) designing efficient labour market regulations; and (4) addressing cross-border issues through greater international cooperation.

5.1 DEVELOPING EFFECTIVE SOCIAL PROTECTION SYSTEMS

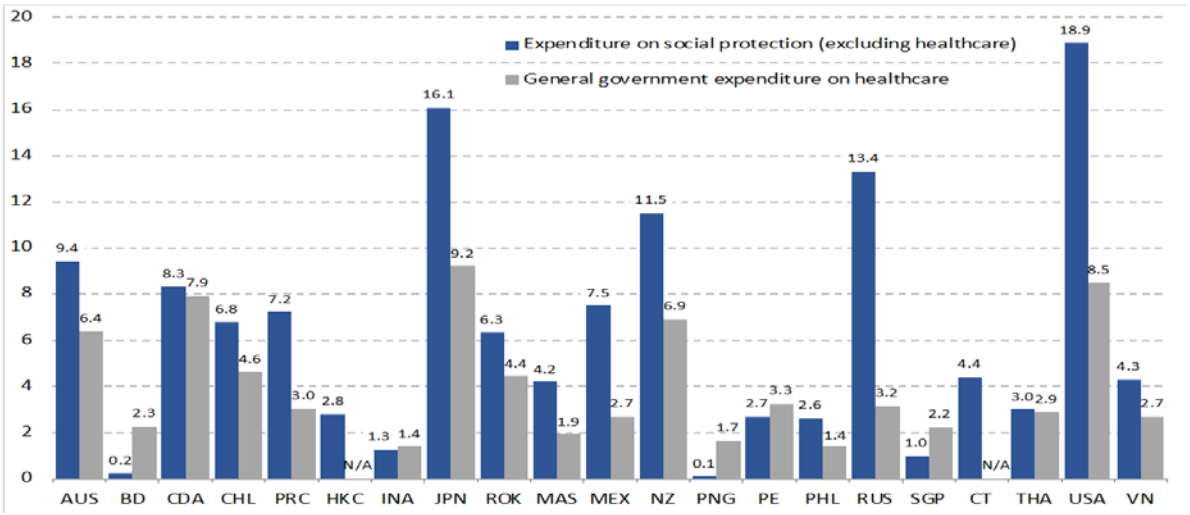
The megadrivers described in Chapter 2 have disruptive impacts on labour markets, and require effective social protection systems that reduce income uncertainty and mitigate the downside for workers, particularly those displaced by changing technologies, globalisation, and climate change. The COVID-19 pandemic adds another disruption to the mix, resulting in much higher levels of unemployment. There also remains much uncertainty associated with the future of work given that new forms of technology are often very difficult to predict. In order to not stifle technological growth and innovation – and the resulting displacement of workers that may arise – economies should aim to ensure a greater level of both income support and employment support.

This chapter discusses how ‘future of work’ challenges could be mitigated through developing more effective social protection systems: (1) expanding the scope and coverage of unemployment benefits to ensure that the most vulnerable workers are protected; and (2) designing more targeted active labour market policies that enable the unemployed to improve their employability through training services. In their 2017 Action Agenda, APEC Leaders identified as a priority area of work the need to strengthen social safety nets and improve access to social protection, including by promoting social protection floors in line with ILO

Recommendation 202.[255] The Recommendation states that social protection should cover the unprotected, the poor, and the most vulnerable, including workers in the informal economy. It aims to ensure that all members of society enjoy at least a basic level of social security throughout their lives.[256] In addition, Pillar 3 of the Enhanced APEC Agenda for Structural Reform 2021–2025 includes reforms that target access to social protection schemes for those workers most affected by economic shocks or the transition to new sectors.[257]

Social protection systems include a wide range of policies such as healthcare coverage, child and family benefits, unemployment benefits and old-age pensions. These benefits play a crucial role in reducing poverty and inequality as well as in achieving more inclusive growth. Such systems are vital during times of economic disruption and transition by providing a safety net for workers that may be adversely affected. The amount of public spending on social protection varies substantially across the APEC region. Public expenditure on social protection (including spending on healthcare) is above 10 percent of GDP in around half of the APEC economies (Figure 5.1). There are several economies where total spending is less than 5 percent of GDP, suggesting that there is indeed considerable scope for the expansion of social protection schemes. The share of vulnerable people covered by the social protection floor is also quite low across the region. Although a few economies have 100 percent coverage, the majority have under 40 percent coverage (Figure 5.2).

Figure 5.1 Public expenditure on social protection, latest available year (% of GDP)



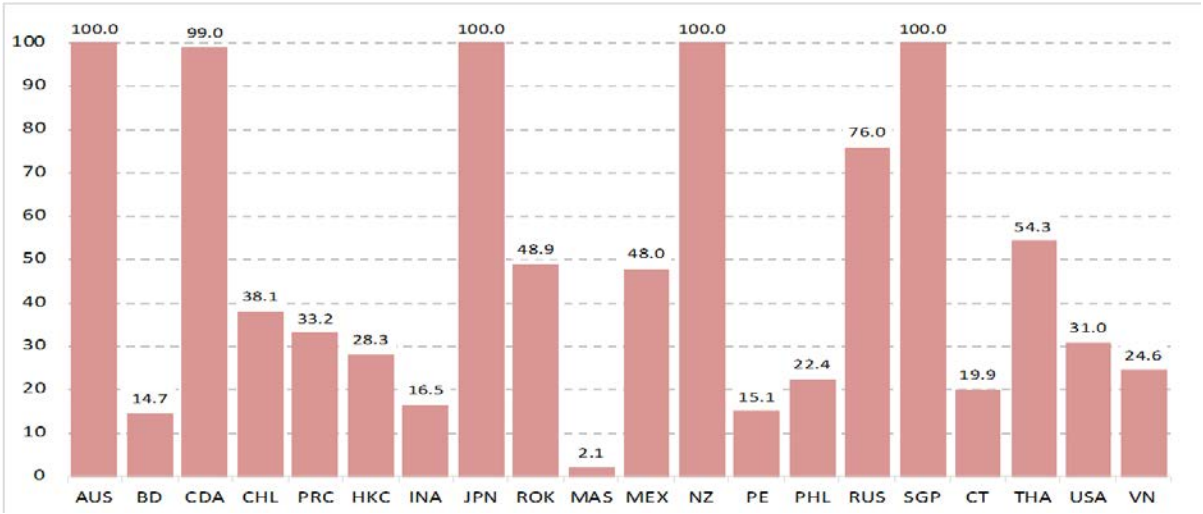
Note: Refer to page v of this report for abbreviations for APEC member economies. Data shown for social protection expenditure are the latest available year for each economy. Data shown for healthcare expenditure are for 2018. Healthcare expenditure data are not available for Hong Kong, China. Chinese Taipei's public expenditure on social protection was 11.0% in 2019, but this includes healthcare and non-healthcare expenditure (Data from the Directorate General of Budget, Accounting and Statistics (DGBAS), Chinese Taipei)
Source: ILO World Social Protection Database.

[255] APEC, "2017 Leaders' Declaration: Annex A: APEC Action Agenda on Advancing Economic, Financial and Social Inclusion in the APEC Region," https://www.apec.org/meeting-papers/leaders-declarations/2017/2017_aelm/annex-a

[256] ILO, "ILO Social Protection Floors Recommendation, 2012 (No. 202), accessed 5 July 2021, https://www.ilo.org/secsoc/areas-of-work/legal-advice/WCMS_205341/lang--en/index.htm. The social protection floor should comprise at least the following social security guarantees: (1) access to essential healthcare, including maternity care; (2) basic income security for children; providing access to nutrition, education, care and any other necessary goods and services; (3) basic income security for persons in active age who are unable to earn sufficient income, in particular in cases of sickness, unemployment, maternity and disability; and (4) basic income security for older persons.

[257] APEC, "2021 APEC Ministerial Meeting on Structural Reform: Annex 1 - Enhanced APEC Agenda for Structural Reform (EAASR)," 16 June 2021, https://www.apec.org/Meeting-Papers/Sectoral-Ministerial-Meetings/Structural-Reform/2021_structural/Annex-1

Figure 5.2 Coverage of social protection floor, latest available year (% of vulnerable)



Note: Refer to page v of this report for abbreviations for APEC member economies. Data shown are the latest available year for each economy. Data are not available for PNG.
Source: ILO World Social Protection Database.

In some APEC economies, social benefits, such as medical coverage, unemployment benefits, and pension schemes, are tied to employment. Administering benefits in this way can be problematic as it excludes the self-employed and may cause part-time and temporary workers to become ineligible or lose benefits when they change employers. Given the increasing rise in non-standard forms of employment (such as gig workers), the coverage of benefit programmes should be expanded to ensure those workers are included. Proposals include portable benefits, which would allow workers to more easily transfer benefits they have accrued with one employer to a new employer.[258] Another policy option is to allow individuals, such as the self-employed or independent contractors, to opt-in and contribute to social benefits insurance programmes.[259]

5.1.1 Ensuring income support

Income support in the form of unemployment benefits provides income replacement during periods of unemployment or reduced working hours. In addition to lessening the financial impact on workers due to sudden drops in income, income support may also allow unemployed workers to retrain for new roles. There are two major types of unemployment benefit schemes:

- contributory – often referred to as unemployment or employment insurance, these schemes are typically financed through mandatory contributions shared between employers and employees (and sometimes with a government contribution)

[258] For more discussion, see D. Rolf, S. Clark, and C.W. Bryant, "Portable Benefits in the 21st Century: Shaping a New System of Benefits for Independent Workers", Future of Work Initiative (The Aspen Institute, 2016), https://www.aspeninstitute.org/publications/portable-benefits-21st-century/. For a discussion of how decoupling social insurance from employers would increase labour flexibility, see also M. Henrekson, "How Labor Market Institutions Affect Job Creation and Productivity Growth," IZA World of Labor (2020):38, http: https://wol.iza.org/articles/how-labor-market-institutions-affect-job-creation-and-productivity-growth/long

[259] For more discussion on ways to cover non-standard workers in contributory social protection systems, see OECD, "The Future of Social Protection: What Works for Non-standard Workers?" (Paris: OECD, 2018).

- non-contributory – often referred to as unemployment assistance, these schemes are normally funded through general taxation.[260]

Unemployment benefit programmes vary widely across the APEC region, with several member economies having no legislation that mandates the provision of any type of unemployment benefit (Table 5.1). Those economies without programmes anchored in legislation may have other statutory benefits that cover income support following the termination of employment, such as legislatively mandated severance payments.[261] Among the APEC member economies that do have unemployment benefit schemes, most are contributory schemes financed through mandatory contributions. Only Australia; Hong Kong, China; and New Zealand have non-contributory unemployment benefit schemes.

Table 5.1 Overview of unemployment benefit programmes

Economy	Anchored in legislation	Type	Legally mandated severance payment
Australia	✓	Non-contributory	
Brunei Darussalam			
Canada	✓	Contributory	✓
Chile	✓	Contributory	✓
China	✓	Contributory	✓
Hong Kong, China	✓	Non-contributory	✓
Indonesia	limited provision		✓
Japan	✓	Contributory	
Korea	✓	Contributory	✓
Malaysia	limited provision	Contributory	✓
Mexico	limited provision		✓
New Zealand	✓	Non-contributory	
Papua New Guinea	limited provision		
Peru	limited provision	Contributory	✓
The Philippines	limited provision		✓
Russia	✓	Contributory	✓
Singapore			
Chinese Taipei	✓	Contributory	✓
Thailand	✓	Contributory	✓
United States	✓	Contributory	
Viet Nam	✓	Contributory	✓

Source: ILO World Social Protection Database.

Both contributory and non-contributory unemployment benefit programmes have strict eligibility requirements, which usually require the applicant to be unemployed through no fault of their own (e.g., if they were made redundant due to workforce reductions). In addition,

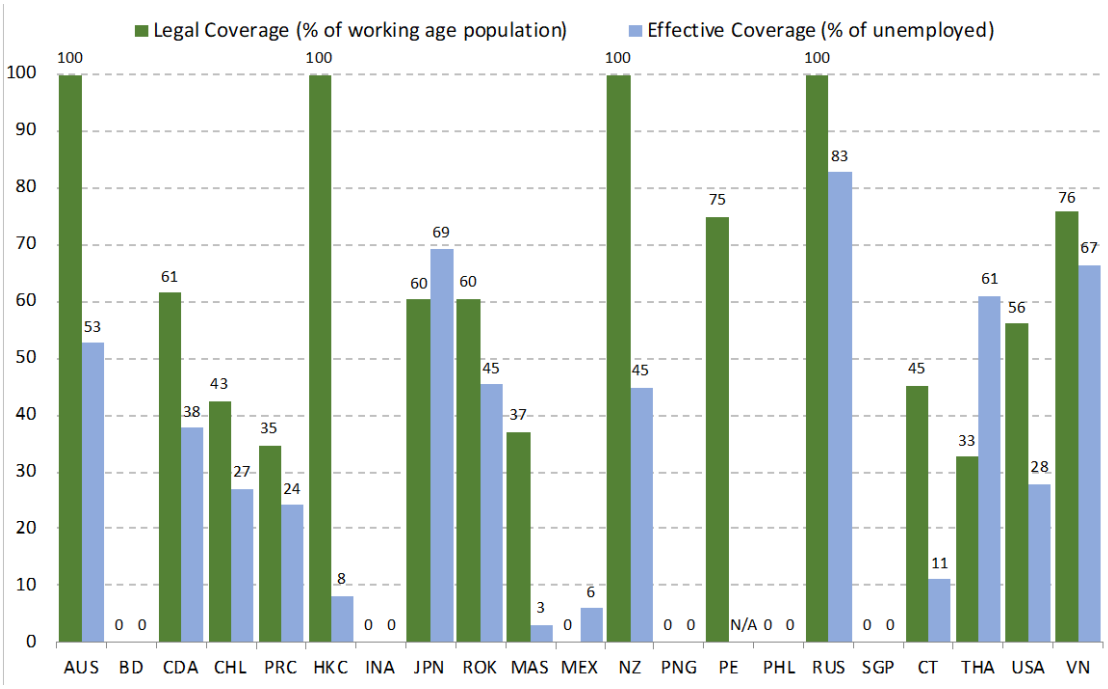
[260] For an in-depth review of unemployment benefit schemes globally, see A. Asenjo and C. Pignatti, "Unemployment Insurance Schemes Around the World: Evidence and Policy Options", ILO Research Department Working Paper 49, ILO, Geneva, 2019, https://www.ilo.org/global/research/publications/working-papers/WCMS_723778/lang--en/index.htm

[261] Severance payments, including redundancy payments and retrenchment payments, are one-off, lump-sum payments paid by the employer to the employee immediately following the termination of employment. They are typically a percentage of the monthly salary multiplied by the number of years of employment with the company (sometimes subject to a maximum amount).

contributory benefit programmes typically require that the applicant has made a certain number of contributions (e.g., six months) over a certain time period (e.g., the past 12 months) in order to be eligible to receive benefits. Therefore, some workers, particularly those on temporary or part-time contracts, may find that they do not have enough insured earnings in order to be eligible for benefits once they have become unemployed. In addition, those working in the informal sector as well as the self-employed (including independent contractors) may not be legally covered under many unemployment insurance programmes and are therefore ineligible to receive benefits.

Unemployment benefit schemes also have limits regarding the amount and duration of benefit payments, which are meant to cover only basic expenses while recipients are unemployed. For non-contributory schemes, recipients are usually entitled to a means-tested amount based on household income, which is subject to periodic reviews of their job search progress. Under contributory schemes, recipients receive a share of their previous salary, subject to a cap, with the duration often based on the amount of their previous contributions, limited to a maximum period. The typical duration of unemployment benefits is usually no longer than one year in most APEC economies.

Figure 5.3 Coverage of unemployment benefits, latest available year



Note: Refer to page v of this report for abbreviations for APEC member economies. Data shown are for the latest available year for each economy. For JPN and ROK, legal coverage includes both mandatory and voluntary contributions. Data on effective coverage are not available for PE. Although the Philippines has no institutionalised unemployment benefit scheme, its Social Security System (SSS) provides cash aid to members who are involuntarily separated from employment; in 2020, this aid was disbursed to almost 136,000 members, making effective coverage around 3% of the average number of unemployed that year.
Source: International Labour Organization, World Social Protection Database.

Figure 5.3 illustrates the share of working-age population legally covered by the unemployment benefit system in each APEC economy. While there is 100 percent legal coverage in some economies owing to their having non-contributory systems, legal coverage in those with contributory systems ranges from under 40 percent of the working-age population in China;

Malaysia; and Thailand, to above 70 percent in Peru and Viet Nam. Given that not all employed persons are legally covered under contributory unemployment benefit schemes, it follows that not everyone will receive income support once they have become unemployed. In addition, the long-term unemployed often find that they have reached the limit for the duration of time they can receive benefits. In around half of the APEC economies with an unemployment benefit scheme, less than 30 percent of those unemployed are recipients of benefits, with several members having less than 15 percent of unemployed persons receiving benefits.

A large number of unemployed workers are ineligible to receive benefits: the long-term unemployed, first-time jobseekers, or those previously engaged in part-time or informal employment. This further exacerbates the difficulties faced by these groups, who are already vulnerable and in need of social protection. The scope and coverage of an unemployment benefit programme should therefore aim to ensure that such vulnerable workers are not excluded from income support. For example, under Canada's employment insurance programme, the recipient's regional unemployment rate is one of the factors that determines duration of benefits, thereby targeting those workers that may be more affected by long-term structural unemployment.

Cash transfers are another type of income support to ensure that the most vulnerable are protected. These direct payments can be either (1) conditional, made on the condition that the recipient fulfils specified conditions (such as school attendance); (2) labelled, provided for a specific purpose, but the conditions are not enforced; or (3) unconditional, made without any conditions required for the recipient. The idea of providing unconditional cash transfers to the working-age population in an economy – i.e., a universal basic income – has increasingly gained traction as a policy option to address challenges associated with the future of work. The aim is to reduce poverty and replace other social benefit schemes that often require means-testing and more complex levels of administration. Box 5.1 presents the debate surrounding minimum income guarantees.

Box 5.1 Minimum income guarantees

A minimum income guarantee, also known as universal basic income, is an unconditional cash transfer paid to the working-age population to cover basic living costs and is independent of income or employment status. The rise of robotics and artificial intelligence has some observers concerned that more and more segments of the labour market will be disrupted, resulting in high levels of persistent structural unemployment. Proponents of minimum income guarantees argue that the changing nature of work, technological transformation in particular, will have such a severe impact on the labour force that providing a basic income will be necessary.

Advocates also argue that providing a minimum income guarantee would give individuals greater flexibility to engage in socially beneficial activities that may otherwise by too costly or risky for them, such as participating in education and training courses, volunteering, caring for family members, or starting a business.

Since the cash transfer is made to all working-age individuals, regardless of their financial means, critics argue that minimum income guarantees do not target those most in need of financial assistance and therefore may have a negligible impact on poverty reduction. In

addition, the provision of a minimum income guarantee may create adverse incentive effects, especially on incentives to work, thereby having a detrimental impact on existing labour market activation policies as well as potentially reducing tax revenue.

No economy currently has a policy in place to ensure a minimum income, although there have been several pilot projects conducted around the world to assess the feasibility and impact of providing a basic income. These trial studies are, however, usually small-scale and limited in scope. For instance, the project may target only certain groups, such as the unemployed, or the income provided may not be high enough to compensate for excluding all other forms of social assistance cash transfers. Also, some pilot projects lack sufficient funding to fully examine the impacts or are cancelled before results can be generated. It is therefore often difficult to determine from the studies the impact that the provision of a basic income has on employment incentives.

Importantly, many of the pilot projects found that basic income recipients report higher levels of physical, economic and mental wellbeing compared to those in control groups. For example, preliminary findings from an ongoing 12-year study in Kenya found that basic income recipients experienced greater food security and higher levels of physical and mental health.[262] Despite the Ontario Basic Income pilot project in Canada having been prematurely cancelled, a survey of recipients also found that receiving a basic income noticeably improved their physical and mental health, labour market participation, food security, and housing stability, while one-quarter of respondents reported that they had begun an educational or training programme during the pilot.[263]

Although it is expected that minimum income guarantees would replace existing cash benefit programmes, research has found that significant additional spending is likely to be required in order to finance a universal basic income.[264] Funding sources could include abolishing existing tax allowances and taxing the basic income itself, although the study found that those measures would also be inadequate to finance a minimum income guarantee in some economies. Many economies would therefore have to implement changes in tax revenue generation in order to finance an income guarantee at a meaningful level. In addition to increasing tax rates or introducing new sources of taxation, economies could also raise additional revenue through reforms that improve the efficiency and compliance of tax systems. Alternatively, economies could reduce the basic income amount or implement eligibility requirements in order to remain budget-neutral. For instance, rather than being universal, minimum income guarantees could instead be targeted at certain population groups, such as those below the poverty line or those working in industries displaced by technological transformation.

The impact of a minimum income guarantee would therefore depend on several factors, including whether existing targeted programmes would be replaced and, if so, which ones; how the programme is to be financed, including whether there would be any changes to the

[262] A. Banerjee, et al., "Effects of a Universal Basic Income during the Pandemic", Working Paper, Innovations for Poverty Action (IPA), 2020, https://www.poverty-action.org/publication/effects-universal-basic-income-during-pandemic. This large-scale study, which began in 2017 and is being conducted by the non-profit GiveDirectly, intends to measure a wide range of outcomes concerning the provision of a basic income, including economic status, time use, risk-taking, gender relations, and mental health.

[263] The Ontario Basic Income pilot project was a CDA 150 million programme launched in late 2017 to provide 4,000 beneficiaries with monthly cash transfers for three years. It was terminated early following a change in government with participants receiving their final payment in March 2019. M. Ferdosi, T. McDowell, W. Lewchuk, and S. Ross, "Southern Ontario's Basic Income Experience Report," (Hamilton: School of Labour Studies, McMaster University, 2020), https://labourstudies.mcmaster.ca/news/access-southern-ontario2019s-basic-income-experience-report

[264] OECD, "Basic Income as a Policy Option: Can It Add Up?", Policy Brief on The Future of Work, OECD, Paris, https://www.oecd.org/els/emp/Basic-Income-Policy-Option-2017.pdf; World Bank, "World Development Report 2019: The Changing Nature of Work: (Washington, DC: World Bank, 2019), https://www.worldbank.org/en/publication/wdr2019

existing tax system; and the amount of the basic income as well as whether there would be any eligibility conditions for recipients. There is unlikely to be a one-size-fits-all basic income scheme due to the competing policy priorities and objectives that exist within each economy. Given the complex considerations and implications of a basic income, APEC members are encouraged to conduct well-designed pilot projects in order to better assess the feasibility and impact of a minimum income guarantee in their economy. Since the nature of work will most likely continue to change in unexpected ways, the provision of a minimum income guarantee as a form of social protection should remain a future policy option for APEC economies.

5.1.2 Expanding employment support

An important feature of an unemployment benefit programme is how well it incentivises unemployed workers to regain employment. Conventional wisdom has been to simply limit the benefit duration. Many benefit schemes also require that recipients be actively seeking employment in order to remain eligible for income support. However, strategies to assist jobseekers should focus on the benefits from training and skills matching in order to achieve better long-term results. There is some evidence suggesting that a longer duration of unemployment benefits may allow for better match quality between workers and jobs.[265]

Programmes should therefore require participation in active interventions, such as training services, thereby enabling jobseekers to use the period of unemployment to upgrade their skills and improve their employability. Active labour market policies (ALMPs) aim to promote more efficient and higher quality matching of jobseekers and vacancies. Supply-side measures, such as training programmes and job search assistance, are used to enhance workforce adaptability.[266] Demand-side measures, such as wage subsidies, are used to support employment and provide incentives to create new jobs. An empirical study found that ALMPs, such as training, employment incentives, supported employment, and direct job creation, reduce unemployment at the aggregate level, with the positive effects particularly beneficial for low-skilled workers.[267]

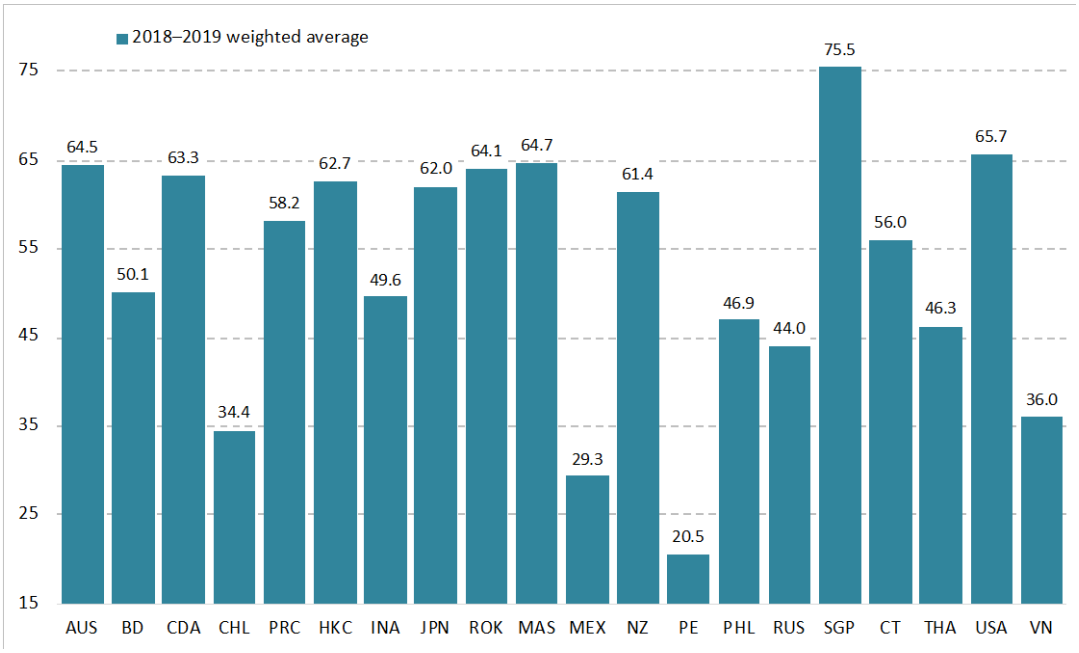
Public employment services, coordinated with private employment services and supported by comprehensive labour market information systems, should work to identify skills needs and training opportunities, thereby improving job-skill matching and ensuring greater efficiency in labour markets. Comprehensive unemployment benefit systems, combined with effective ALMPs, will provide greater support to those most in need of skills development or retraining, especially the long-term structurally unemployed. Based on data from the World Economic Forum's Executive Opinion Survey, the extent to which ALMPs help unemployed people to reskill and find new employment was considered to be somewhat low across the APEC region. While scores range from 20.5 in Peru to 75.5 in Singapore, most members have scores between 50 and 65 (out of 100) (Figure 5.4).

[265] For example, Caliendo et al. has found that those who enter jobs around the time unemployment benefits are exhausted receive lower wages and are significantly more likely to subsequently exit employment compared to those with an extended duration of benefits. See M. Caliendo, K. Tatsiramos, and A Uhlendorff, "Benefit Duration, Unemployment Duration and Job Match Quality: A Regression-Discontinuity Approach", *Journal of Applied Econometrics* 8, no. 4 (2013): 604–27

[266] ILO, "COVID-19: Public Employment Services and Labour Market Policy Responses", ILO Policy Brief, ILO, Geneva, August 2020, https://www.ilo.org/emppolicy/areas/covid/WCMS_753404/lang--en/index.htm

[267] V. Escudero, "Are Active Labour Market Policies Effective in Activating and Integrating Low-skilled Individuals? An International Comparison", ILO Research Department, Working Paper 3, ILO, Geneva, February 2015, https://www.ilo.org/public/libdoc/ilo/2015/487304.pdf

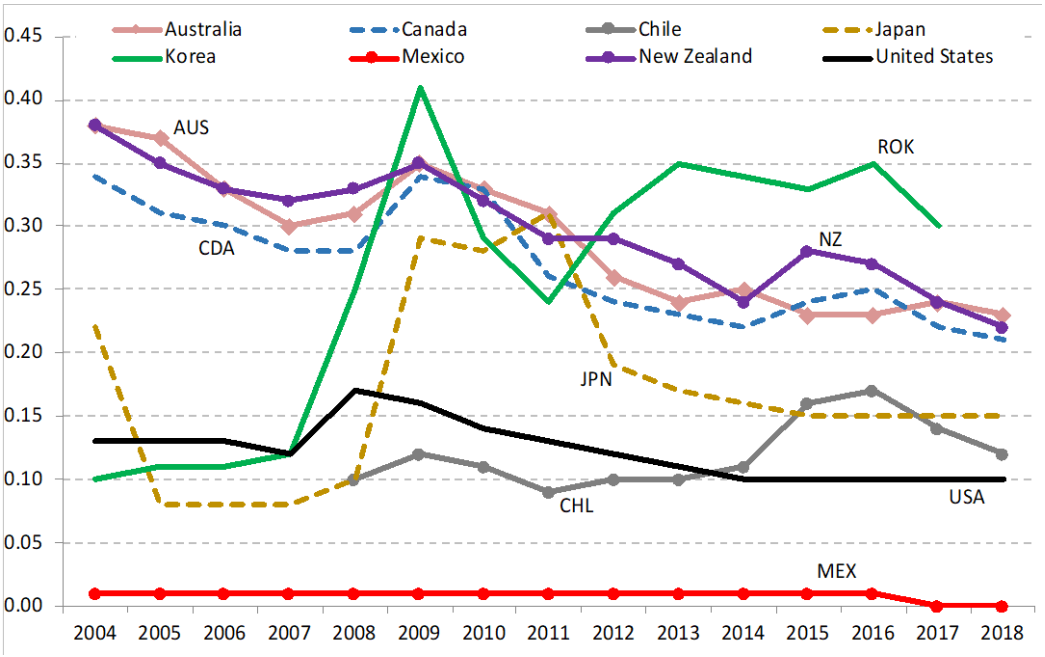
Figure 5.4 Global Competitiveness Index: Active labour market policies (score)



Note: Refer to page v of this report for abbreviations for APEC member economies. Based on responses to the Executive Opinion Survey question 'In your (economy), to what extent do labour market policies help unemployed people to reskill and find new employment (including skills matching, retraining, etc.)?'. Scores range from 0 to 100; a higher score indicates that labour market policies help to a greater extent. Data are not available for PNG.
Source: World Economic Forum (WEF), Global Competitiveness Index 2019.

Inadequate spending on ALMPs can result in higher levels of long-term unemployment. However, based on data from the Organisation for Economic Co-operation and Development (OECD), public expenditure on ALMPs (as a share of GDP) is relatively low in the eight APEC economies for which data are available (Figure 5.5). In fact, spending in all economies was below the OECD average of 0.48 percent of GDP in 2018 and far below the best performer, Denmark, which had spending of 1.89 percent of GDP. While there was a slight uptick in expenditure on ALMPs (as a share of GDP) in most economies immediately following the 2008 global financial crisis, the share has steadily fallen in many APEC economies since 2004. Given the importance of ALMPs to assist the unemployed in accessing training opportunities and regaining employment, APEC members should aim to allocate more resources to improving and strengthening ALMPs in their economy.

Figure 5.5 Public spending on active labour market policies, 2004–2018 (% of GDP)



Note: Refer to page v of this report for abbreviations for APEC member economies. Public expenditure on active labour market policies includes spending on public employment services and administration, training, employment incentives, sheltered and supported employment and rehabilitation, direct job creation, and start-up incentives. For CHL, data are not available for 2004-2007. For ROK, data are not available for 2018.
Source: OECD.Stat.

The economic impact of the COVID-19 pandemic underscores the need for economies to have well-developed and well-functioning social protection systems that provide effective income and employment support. Box 5.2 summarises case studies submitted by Malaysia and Russia, both of which have implemented measures to help businesses retain employees and also enhanced existing programmes to help financially support those that have become unemployed.

Box 5.2 Supporting employment and enhancing social protection during the COVID-19 pandemic in Malaysia and Russia

Malaysia

Malaysia's economy was already slowing prior to the COVID-19 pandemic, and its problems compounded as thousands of businesses had to close due to the implementation of the movement control order (MCO), causing demand for many goods and services to drop dramatically. GDP growth in 2020 is projected to range between -2 percent to 0.5 percent, a sharp drop from the 4.3 percent growth in 2019. Although growth is expected to slowly pick up in tandem with the recovery of the global economy, a full rebound would likely take years.

Notably, job losses in 2020 were more than 2.5 times higher in comparison to 2019 and continued to be high in the first quarter of 2021 due to the ongoing economic disruption caused by the pandemic. Malaysia had established an Employment Insurance System on 1 January 2018 to provide income replacement of up to six months for insured workers who lose their jobs due to retrenchment or other similar circumstances. As of April 2021, there were 400,000 registered active employers with 6.3 million workers who had contributed at least once in the past 12 months.

However, in response to the economic downturn and sudden spike in loss of employment, the Malaysian government implemented the temporary Wage Subsidy Programme and Employment Retention Programme under the PRIHATIN Economic Stimulus Package to help firms retain as many jobs as possible. The Wage Subsidy Programme was launched on 1 April 2020 to cover six months of financial assistance, benefiting 331,950 employers and more than 2.7 million workers. It was extended for an additional three months, benefiting 81,921 employers and over 800,000 workers.

Russia

The massive economic disruption arising from the COVID-19 pandemic also created an unprecedented shock in the Russian labour market. In 2020, the average annual unemployment rate reached 5.7 percent, after having not exceeded 4–5 percent over the previous five years (2014–2019). Around 680,000 workers have been laid off during the pandemic, with the arts, entertainment, hospitality, food service, and retail industries being most affected.

The Russian government has adopted a range of initiatives to support workers who become unemployed. First, both the minimum and maximum amounts of unemployment benefits have been increased, while the scope of those eligible for unemployment benefits has been expanded. Second, the minimum amount of childcare allowance, which is received by non-working parents, has been doubled, while the procedure for processing those payments has been simplified.

Russia has also introduced a number of measures to support employers to retain jobs. For SMEs, insurance premiums were decreased from 30 percent to 15 percent and direct subsidies (in the amount of the minimum wage) were provided for the salary payment of each employed person. Also, for businesses in the most affected industries as well as socially oriented enterprises, soft loans at a rate of 2 percent were offered, with the loans forgiven if firms retained at least 90 percent of their employees.

5.2 DEVELOPING SKILLS AND IMPROVING PRODUCTIVITY

Developing human capital and promoting greater inclusion in the workforce is fundamental to addressing the ongoing challenges as a result of the various megadrivers changing the nature of work. Policies that promote skills building in the face of rapidly changing labour market conditions are an important component to mitigating the skills gap and strengthening the resilience of the workforce. This section will discuss several policy responses so that governments are better able to prepare the labour force for the future of work, including (1) developing better skills forecasting systems that can inform comprehensive labour market information systems; (2) expanding reskilling and upskilling programmes and promoting lifelong learning through well-functioning adult learning systems; and (3) increasing targeted investments in education by better aligning school curricula to future labour market skills needs and ensuring more equitable access to high quality education.

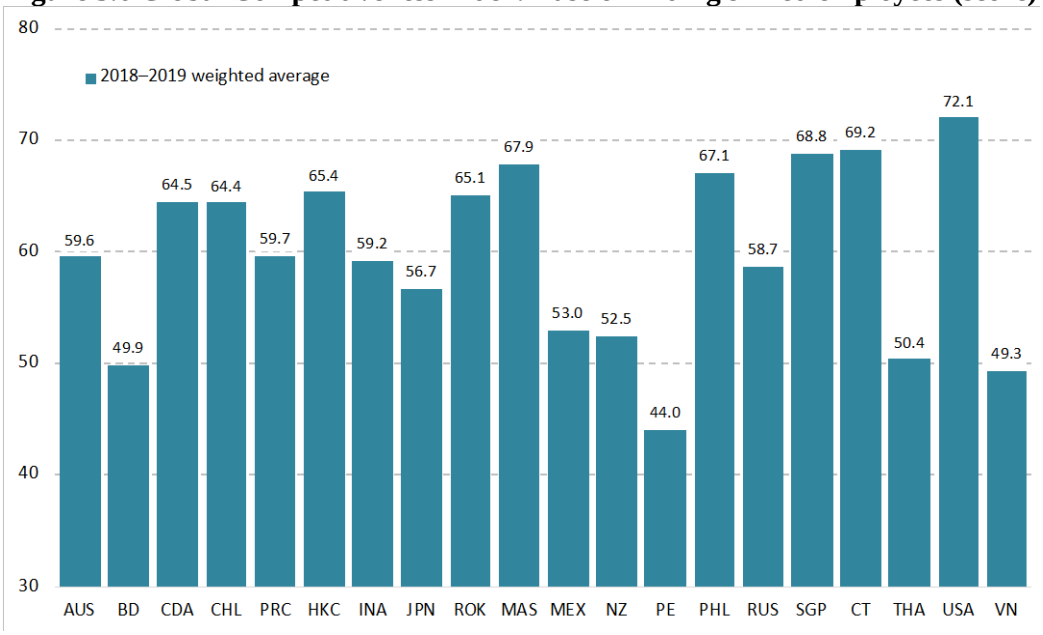
5.2.1 Developing better skills forecasting systems

As the drivers changing the nature of work continue to rapidly evolve, the skills needed to perform those jobs often change just as rapidly. As a result, many APEC economies have a skills imbalance, which may be more acute in certain industries. In other words, there is a mismatch between the skills that businesses require and the skills that are available in the labour market. Such gaps between the demand and supply of skills in the labour market can hinder economic growth and development. Skills shortages have been shown to increase the cost of

hiring and constrain the ability of firms to adopt new technologies, while skills mismatches have been associated with lower labour productivity and increased structural unemployment.[268] The World Economic Forum estimates that closing the global skills gap could add USD 11.5 trillion to global GDP by 2028.[269]

Based on data from the World Economic Forum's most recent Executive Opinion Survey, the ease in which employers are able to find skilled employees varies substantially among the APEC economies, from a low of 44.0 (out of 100) to a high of just 72.1, with only nine APEC members having a score above 60.0, indicating that there is indeed a severe skills gap across the region (Figure 5.6). Examining data from the Hays Global Skills Index that measures the gap between the skills businesses are looking for and the skills available in the labour market also reveals a skills imbalance in many APEC economies (Figure 5.7). Over the past five years, only four of the 11 APEC members for which there are data registered an improvement in the talent mismatch in their economy, suggesting that resolving the regional skills gap will require much greater policy efforts.

Figure 5.6 Global Competitiveness Index: Ease of finding skilled employees (score)

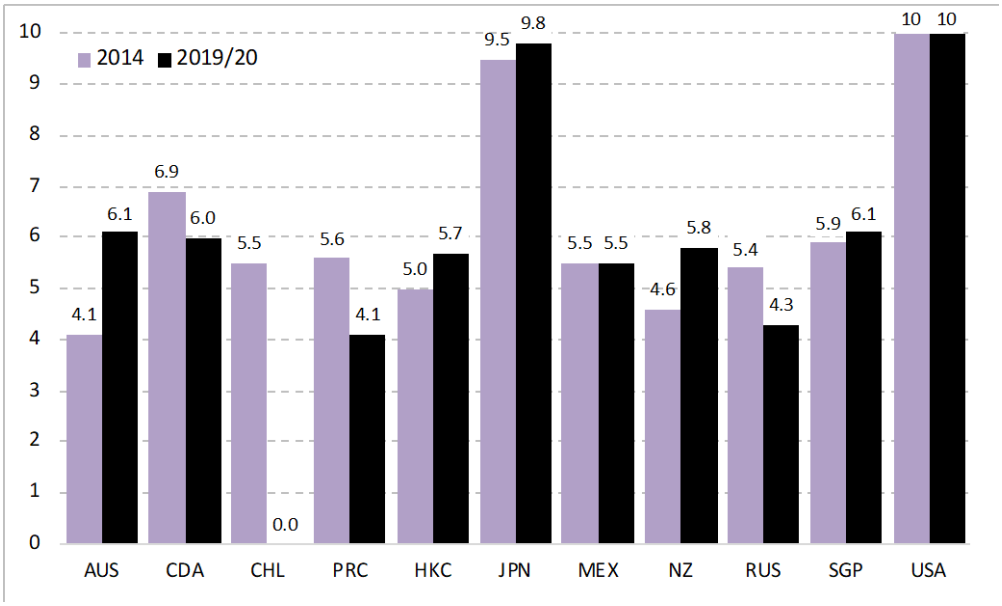


Note: Refer to page v of this report for abbreviations for APEC member economies. Based on responses to the question 'In your (economy), to what extent can companies find people with the skills required to fill their vacancies?'. Scores range from 0 to 100; a higher score indicates greater ease of finding skilled employees. Data are not available for PNG.
Source: World Economic Forum, Global Competitiveness Index 2019.

[268] ILO and OECD, "Approaches to Anticipating Skills for the Future of Work" (Prepared for the G20 Employment Working Group, Geneva, 2018), https://www.ilo.org/global/about-the-ilo/how-the-ilo-works/multilateral-system/g20/reports/WCMS_646143/lang--en/index.htm

[269] World Economic Forum (WEF), "Closing the Skills Gap Accelerators," accessed 5 July 2021, https://fr.weforum.org/projects/closing-the-skills-gap-accelerators

Figure 5.7 Hays Global Skills Index: Talent mismatch (score, 2014 & 2019/20)



Note: Refer to page v of this report for abbreviations for APEC member economies. Scores range from 0 to 10; a higher score indicates that businesses are facing a serious problem in finding workers with the skills they need. Data are available for only the 11 APEC members shown.
Source: Hays and Oxford Economics, The Hays Global Skills Index, 2014 and 2019/20 editions.

Another indicator that can be used to assess the skills gap in an economy is the wage pressure exhibited in high-skill occupations and industries. Since these jobs require a higher-than-average amount of training, education and/or experience – all of which take time to develop – these jobs and sectors are more vulnerable to skills shortages, which then creates pressure on wages, causing them to rise more quickly than wages for low-skill jobs. Data for 12 APEC members from the Hays Global Skills Index reveal that high-skill occupations in many APEC economies are indeed experiencing wage pressure (as indicated by a higher score), albeit not as severe as the wage premiums exhibited in high-skill industries (Figure 5.8). The data for wage pressure in these industries, such as engineering and technology, indicate that many APEC economies are experiencing severe and persistent skills shortages as just five members registered an improvement over the past five years.

Figure 5.8 Hays Global Skills Index: High-skill wage pressure (score, 2014 & 2019/20)

Note: Refer to page v of this report for abbreviations for APEC member economies. Scores range from 0 to 10. For high-skill occupations (those that require a higher-than-average amount of training, education and experience), a higher score indicates that there is rising wage pressure, signalling that these occupations are experiencing shortages of workers with the necessary skills. For high-skill industries (those that require higher-skilled staff), a higher score indicates that wages in those industries are growing faster than in low-skill industries relative to the past, signalling the emergence of sector-specific skills shortages. Data are available for only the 12 APEC members shown.

Source: Hays and Oxford Economics, The Hays Global Skills Index, 2014 and 2019/20 editions.

One of the greatest challenges for policymakers in addressing the skills gap in their economy is in determining which economic sectors will experience sustainable growth, and therefore, which skills will be in demand in the medium- and long-term. In particular, the fast pace of technological advancements, as well as their disruptive nature, makes it very difficult to anticipate the skills needs of the future. Nevertheless, systematic analyses that assess existing skills shortages and forecast future skills needs is an essential component of labour market policy in order to ensure better matching of skills demand with skills supply.

There are several instruments that APEC members can implement in order to collect and develop information on skills needs, such as employer and employee surveys, sector studies, and quantitative analysis of labour market indicators and data.[270] For example, the Canadian Occupational Projection System (COPS) publishes, every two years, 10-year forecasts on the number of job openings and jobseekers for 293 occupational groupings (covering the entire workforce), thereby allowing for the identification of those occupations that may face labour shortages or surpluses.[271] Regular and consistent data collection through such methods will allow policymakers to better understand which economic sectors are expected to grow, which can then be used to anticipate future skills demands.

The data and information collected from skills assessments and forecasts can be used to develop more advanced labour market information systems (LMIS). A comprehensive LMIS takes a holistic approach towards skills requirements in an economy and allows for collaboration and coordination between policymakers, education and training providers, and employers and employment service providers. Skills forecasts should also be used to better inform education and training curricula, thereby enabling more efficient job-skills matching and helping to reduce future skills imbalances in the labour market. Non-traditional labour market information such as big data from digital platforms and social media can complement traditional data sources such as labour force surveys and administrative data to provide a real-time and accurate, albeit limited, dynamic picture of the labour market.

5.2.2 Expanding access to lifelong learning, upskilling and reskilling

Upskilling and reskilling programmes are another important component to addressing the skills gap in an economy. Upskilling involves training so that workers can develop additional skills in order to continue performing in their current job, while reskilling provides training so that workers can build new skills in order to do a different job. Such training helps to ensure that the workforce remains equipped with the skills necessary to perform jobs in a rapidly changing labour market. The World Economic Forum forecasts that 85 million jobs are likely to be displaced by 2025 due to the disruptions caused by automation and the COVID-19 pandemic, while 97 million new jobs are expected to be added; it also estimates that 50 percent of all employees will need reskilling by 2025.[272]

Given the disruptions caused by the megadrivers described in Chapter 2 and the critical need across the world to reduce the resulting skills gap, it is clear that both companies and governments will need to invest more in training programmes in order to upskill and reskill the workforce. However, based on data assessing the extent to which companies invest in training and employee development, scores among the APEC members vary significantly, ranging from 37.6 (out of 100) to 73.3, with a regional average of just 59.8, indicating that there is much room to increase the provision of workforce training in many economies (Figure 5.9).

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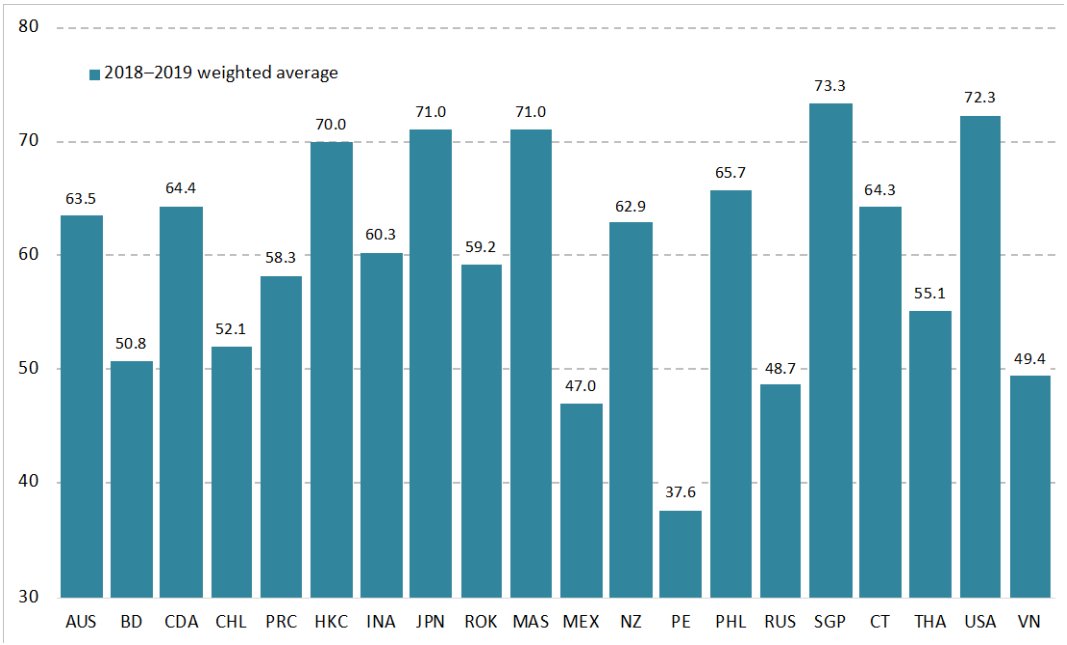
[270] For further discussion, see H. Řihová, "Using Labour Market Information: Guide to Anticipating and Matching Skills and Jobs, Vol. 1" (Luxembourg, Publications Office of the European Union, 2016), https://www.etf.europa.eu/en/publications-and-resources/publications/using-labour-market-information-guide-anticipating-and

[271] Employment and Social Development Canada (ESDC), "Canadian Occupational Projection System (COPS)," Government of Canada, modified 3 October 2017, http://occupations.esdc.gc.ca/sppc-cops/w.2lc.4m.2@-eng.jsp;jsessionid=mabuSIK6AObDZBtqHj-wZWdSSPP4XDppiTSpAk0mg9ALrdNYYjeS!-158110836

[272] World Economic Forum (WEF), "The Future of Jobs Report 2020" (Geneva: WEF, 2020), http://www3.weforum.org/docs/WEF_Future_of_Jobs_2020.pdf

Figure 5.9 Global Competitiveness Index: Extent of staff training (score)

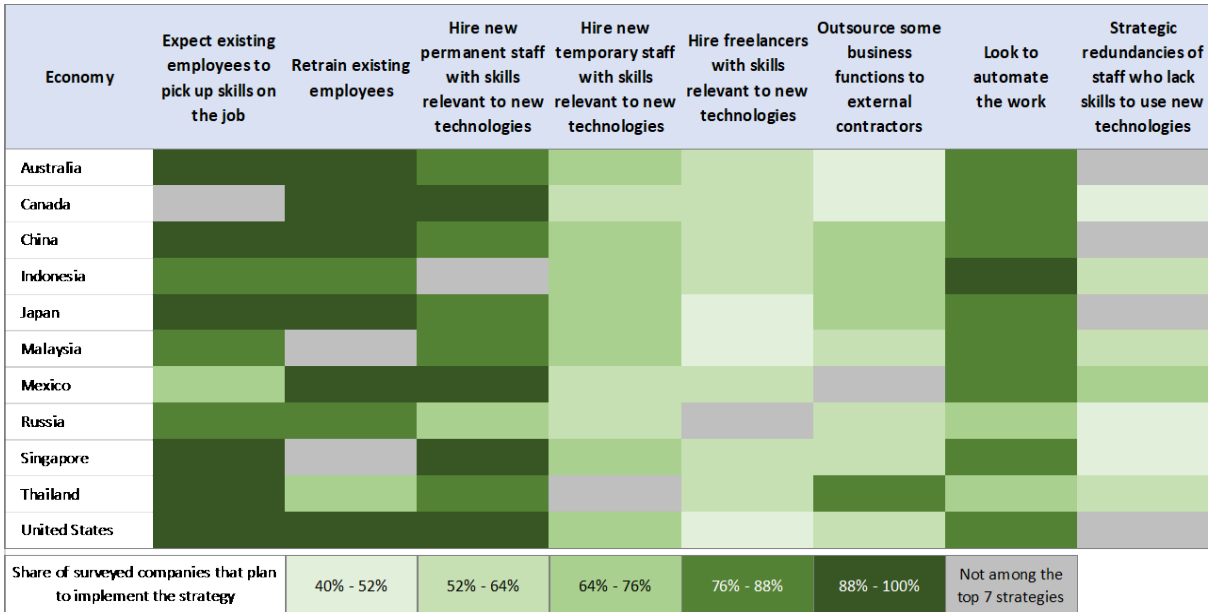


Note: Refer to page v of this report for abbreviations for APEC member economies. Based on responses to the question 'In your (economy), to what extent do companies invest in training and employee development?'. Scores range from 0 to 100; a higher score indicates a greater extent of investment. Data are not available for PNG.
Source: World Economic Forum, Global Competitiveness Index 2019.

Responses to the World Economic Forum's Future of Jobs Survey 2020 allow for a more detailed examination of how firms are responding to changing skills needs. The data reveal that many companies expect existing employees to pick up skills while on the job. Among the 11 APEC members for which data are available, that strategy was one of the top three responses to shifting skills needs by businesses operating in nine economies, with it being the top strategy in six of those economies (Figure 5.10).

Other common responses included retraining existing employees, hiring new permanent staff with the skills relevant to new technologies, and looking to automate the work. Although not typically among the top three strategies, businesses operating in the APEC region also planned to hire new temporary staff or freelancers with the relevant skills as well as to outsource some business functions to external contractors. In some APEC economies, companies also planned to make redundant staff lacking the necessary skills.

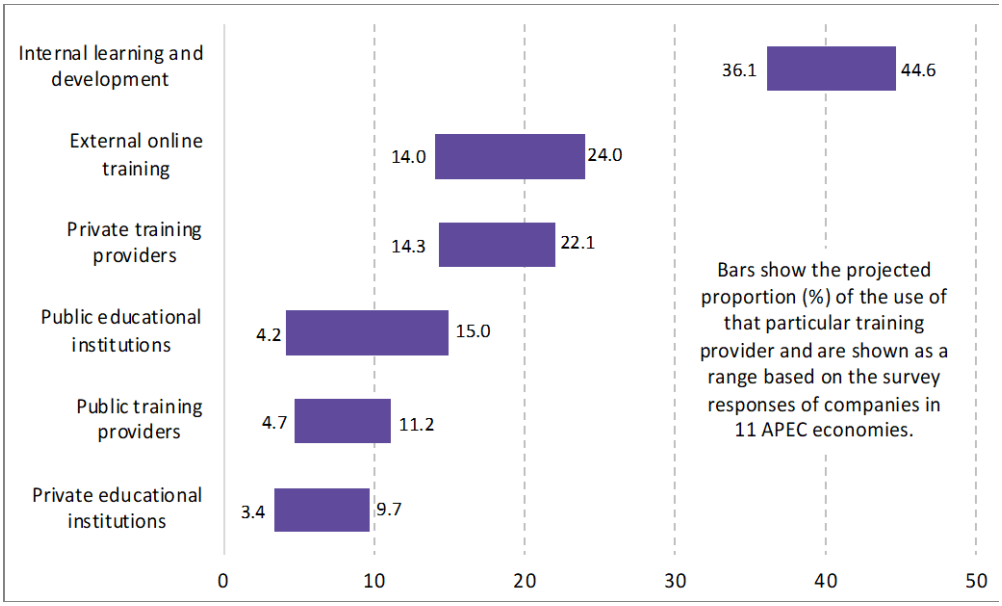
Figure 5.10 Response of businesses to shifting skills needs, as of 2020



Note: Based on responses to the question 'How likely is your organization to undertake the following strategies to address the shifting skills demand?". (Respondents may select more than one response.) Data are available for only the 11 APEC members shown.

Source: World Economic Forum (WEF), "The Future of Jobs Report 2020" (Geneva: WEF, 2020), http://www3.weforum.org/docs/WEF_Future_of_Jobs_2020.pdf

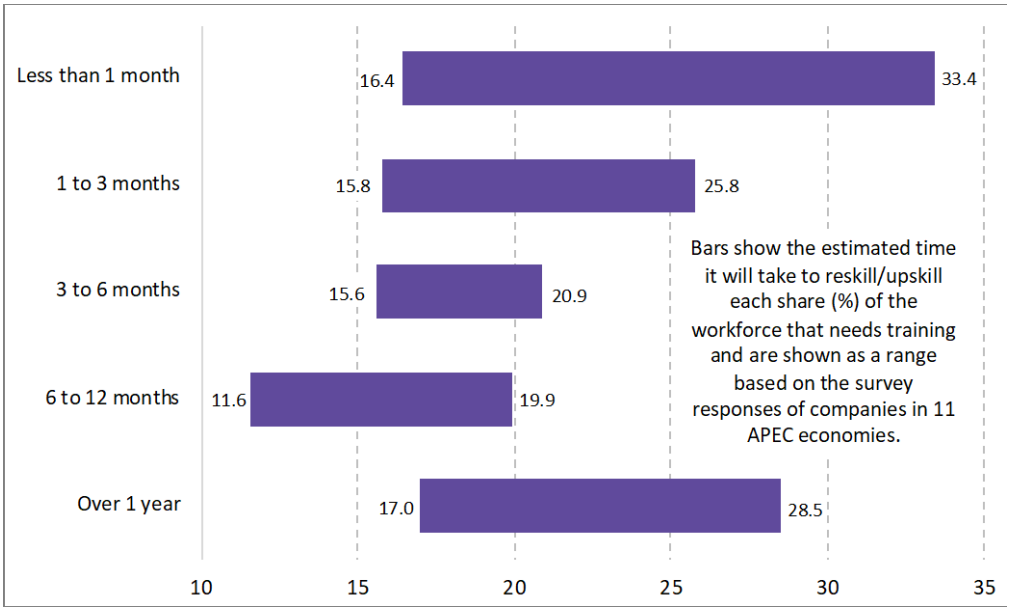
Figure 5.11 Projected use of training providers



Note: Based on responses to the question 'In your future retraining programme, what proportion of training provision will come from the options mentioned below?' Data are available for the following 11 APEC members: Australia; Canada; China; Indonesia; Japan; Malaysia; Mexico; Russia; Singapore; Thailand; USA.

Source: World Economic Forum (WEF), "The Future of Jobs Report 2020" (Geneva: WEF, 2020), http://www3.weforum.org/docs/WEF_Future_of_Jobs_2020.pdf

Figure 5.12 Expected duration of reskilling



Note: Based on the question 'Bearing in mind the evolving skill demand, how long do you expect the reskilling/upskilling of your employees to take?', for which respondents were asked to provide the share of their workforce for each duration of reskilling/upskilling. Data are available for the following 11 APEC members: Australia; Canada; China; Indonesia; Japan; Malaysia; Mexico; Russia; Singapore; Thailand; USA.
Source: World Economic Forum (WEF), "The Future of Jobs Report 2020" (Geneva: WEF, 2020), http://www3.weforum.org/docs/WEF_Future_of_Jobs_2020.pdf

Of those firms that expect to retrain or upgrade the skills of their employees, most plan to do so using in-house training. Based on survey responses from businesses operating in 11 APEC economies, internal learning and development programmes are projected to account for between 36.1 and 44.6 percent of employee training (Figure 5.11). This is followed by external online training courses (14 to 24 percent) and private training providers (14.3 to 22.1 percent). Educational institutions, both public and private, and public training providers are expected to account for a relatively low share of employee training among the surveyed firms. In most APEC economies for which there are data, it is expected to take up to three months to upskill or reskill just under half of those employees that require training, and over one year to provide training for around 25 percent of those employees (Figure 5.12).

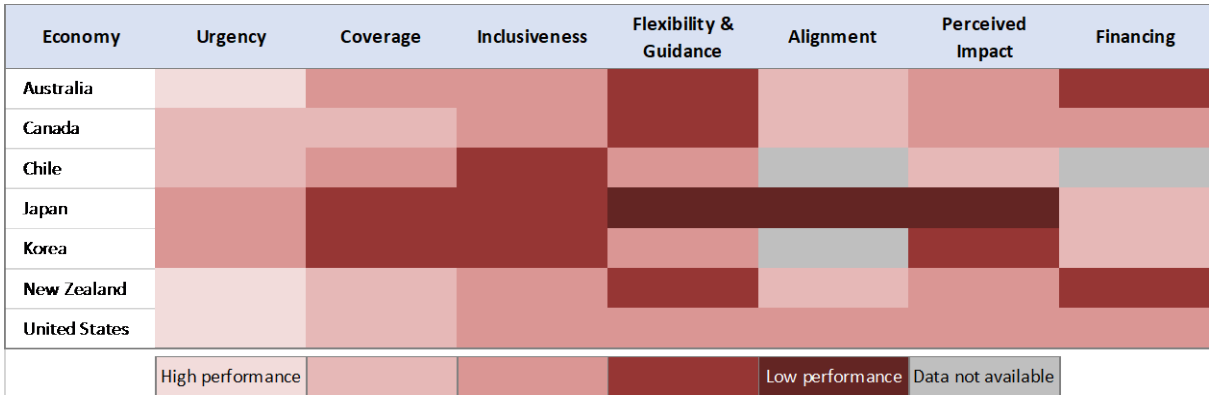
The response of business to shifting skills needs and retraining indicate that public educational institutions and public training providers are not commonly used to upskill and reskill current employees. However, government collaboration with the private sector is necessary in order to ensure a more comprehensive and systematic approach to skills building and human capital development within an economy. The promotion of lifelong learning through targeted investment in adult learning systems is an important policy response in order to confront the many challenges that will arise as the nature of work continually evolves, including new forms of technology, increased digitalisation, and ageing populations. According to the World Economic Forum, greater public–private collaboration on large-scale upskilling and reskilling

initiatives could lead to the creation of 5.3 million net new jobs and increase global GDP by USD 6.5 trillion by 2030.[273]

Adult learning systems comprise a variety of training programmes designed to achieve various objectives, such as basic skills courses, reskilling initiatives for the unemployed, and professional training for employees. Well-functioning adult learning systems will enable more women, elderly workers, and those from socioeconomically disadvantaged backgrounds to become more economically active, thereby helping to ensure greater inclusion of these groups in the workforce. According to the OECD, the following dimensions are important in order to ensure the future-readiness of adult learning systems: wider coverage and inclusiveness; better alignment with changing skills needs; improved training quality and effectiveness; ensuring adequate and sustainable financing; and improved governance and coordination.[274]

A review by the OECD of adult learning systems found that the systems in many economies are under-prepared to address the critical skills challenges facing economies. Although data are available for only seven APEC members, each economy performs relatively well in some dimensions, while having room for improvement in other areas (Figure 5.13). Most of these economies perform less well with respect to the flexibility and guidance aspect of their adult learning systems, suggesting that more effort should be made to provide sufficient information on existing training programmes as well as to improve the flexibility of training provision. The inclusiveness of the systems is another area in which most economies could improve. Table 5.2 presents a number of policy measures that economies can implement in order to improve the functioning of adult learning systems.

Figure 5.13 Adult learning systems in selected APEC economies, 2019



Note: Data are available only for the seven APEC economies shown.
'Urgency' assesses how pressing is the need to update the adult learning system.
'Coverage' measures the extent to which people and firms are engaged in learning.
'Inclusiveness' assesses the extent to which different groups of the population take part in adult learning to similar degrees.
'Flexibility & Guidance' assesses whether there is sufficient information on existing adult learning provision and the extent to which training is provided in a flexible manner.
'Alignment' measures the extent to which the provided adult learning is directly relevant to address current and future skill needs.
'Perceived Impact' assesses the perceived usefulness and effectiveness of training participation.
'Financing' measures how well the adult learning system is financed.
Source: OECD, Priorities for Adult Learning (PAL) Dashboard.

[273] WEF, "Upskilling for Shared Prosperity" (Geneva: WEF, 2021), https://www.weforum.org/reports/upskilling-for-shared-prosperity
[274] OECD, "Getting Skills Right: Future-Ready Adult Learning Systems" (Paris: OECD, 2019), https://doi.org/10.1787/9789264311756-en

Table 5.2 Key policy measures to improve the functioning of adult learning systems

Dimension	Policy Measure
Coverage and Inclusiveness	• *Enabling adults to make informed choices about education and training* by promoting the benefits of adult learning, providing high quality information and individualised advice and guidance services. • *Addressing barriers to participation* through flexible training provision, statutory education and training leave, financial incentives and the recognition of prior learning, among others. • *Providing targeted support* to increase the participation of under-represented groups, such as adults with low skills, the unemployed, migrants and older adults. • *Encouraging employers' engagement* in adult education and training through: providing better information about the benefits of training and the availability of training opportunities; building capacity to offer training; and providing financial incentives when the level of training is sub-optimal.
Alignment	• *Collecting and using high-quality skills assessment and anticipation information* to align adult learning policy more strategically with labour market needs. • *Steering individuals and providers' training choices towards skill in demand* by providing labour market information and guidance, setting targeted incentives and offering training options that are in line with skill needs. • *Designing targeted programmes* for adults whose skills are likely to become obsolete in the future, such as those working in sectors undergoing structural change.
Impact	• *Collecting information* about the effectiveness of training providers and programmes by defining quality criteria and monitoring and evaluating results. • *Building the capacity* of providers to implement quality assurance systems. • *Certifying and awarding quality labels* to providers meeting specified quality criteria. • *Sharing information on quality and effectiveness* of programmes and providers to help individuals, employers and institutions make informed choices about training investments. • *Encouraging the use of high-performance work practices* to put skills to fuller use at the workplace.
Financing	• *Ensuring adequate public financing* of adult learning systems in line with the social benefits that are generated. • *Incentivising employers to contribute* to the financing of adult learning through training levies, tax incentives and subsidies when there are suboptimal investments in training. • *Incentivising individuals to contribute* to the financing of adult learning through training subsidies, tax incentives and loans, as well as paid training leave and individual training accounts.
Governance and Coordination	• *Improving vertical coordination between different levels of government*, for example, by setting clear leadership and governance arrangements between central/federal, regional and local governments. • *Strengthening horizontal coordination between different ministries*, for example, by establishing inter-sectoral bodies, embedding cross-ministry coordination mechanisms in legal frameworks, and setting up regular meetings across different ministries involved in adult learning. • *Increasing cooperation between the government, social partners and other stakeholders*, for example, by involving stakeholders in the design/update of the adult learning legal framework, developing tripartite agreements, establishing formal procedures for consultation with stakeholders in the legal frameworks, and/or developing committees, councils, advisory bodies or fora to establish a structured dialogue with stakeholders. • *Enhancing policy coherence through adult learning strategies*. The strategies could identify policy priorities in adult learning, establish measurable (quantitative) targets to be achieved within predefined deadlines, allocate dedicated budgets for the implementation of adult learning strategies, and develop clear monitoring mechanisms to keep track of progress.

Source: Reproduced from OECD, "Getting Skills Right: Future-Ready Adult Learning Systems" (Paris: OECD, 2019), https://doi.org/10.1787/9789264311756-en

APEC members have launched a number of initiatives to upskill and reskill their workforces, focusing on the most pressing skills needs in their economies so as to help mitigate the impact of the megadrivers. Box 5.3 summarises a case study submitted by Canada that discusses recent initiatives to more effectively promote lifelong learning as their labour market continues to evolve. Box 5.4 presents a case study submitted by Indonesia that describes an innovative initiative to build labour force skills, thereby also improving worker productivity and providing individuals with greater opportunities for employment. A case study submitted by the Philippines discusses designing educational curricula and standards to better prepare the workforce for green jobs, especially those in the agriculture sector (Box 5.5).

Box 5.3 A renewed approach to lifelong learning in Canada

Over the last few decades, the Canadian labour market has experienced a decline in the share of manual and routine jobs, and an increase in skilled jobs that usually require some form of post-secondary education. Moreover, high-skilled jobs are forecast to represent 75 percent of new jobs created between 2019 and 2028.

Upskilling, reskilling and lifelong learning therefore play increasingly important roles in helping individuals succeed in Canada's evolving labour market. High-skilled workers are more likely to seek and have access to opportunities for continuous learning. Canadians with lower skills, however, do not benefit from the same level of access to skill adaptation opportunities and are becoming particularly vulnerable to job market exclusion.

Skills Boost

In 2017, the Canadian government introduced Skills Boost, a set of measures to provide enhanced financial assistance targeted at working or unemployed Canadians looking to return to school to upgrade their skills. A three-year pilot project was launched in the 2018–2019 school year that included (1) top-up funding of CDA 200 per month (up to CDA 1,600 per school year) to the Canada Student Grant (CSG) for full-time students who have been out of high school for at least 10 years; and (2) allows an applicant's eligibility for a CSG to be assessed based on the current (instead of previous) year's income for those whose financial circumstances have changed significantly. Skills Boost also allows eligible employment insurance claimants to continue receiving benefits while taking a full-time course or training programme.

As of 31 July 2020, approximately 100,000 Canadians have benefited from top-up grants as part of Skills Boost. While a robust evaluation of the top-up grant funding is pending, the flexibility to determine an applicant's eligibility for the CSG based on the current year's income has proven to be an important enhancement, as changes in family income for low- and middle-income learners can be significant from year-to-year. As a result, the Skills Boost reassessment measure has become a permanent feature of the Canada Student Financial Assistance Program, and the top-up grant will be extended for an additional two years.

As part of Budget 2021, Canada announced its intention to extend the CAD 1,600 Skills Boost top-up to the CSG for an additional two school years (until July 2023) to ensure that benefits to adult students are not interrupted as the Canadian economy shifts as a result of the COVID-19 pandemic. In addition, the government intends to make the flexibility to use the current year's income to determine eligibility for the CSG a permanent change to the programme. Meanwhile, Future Skills has begun to generate evidence and insights about the changing nature of work, the shifting demand for skills, and innovative approaches to skills assessment

and development to inform policy development, programme design and service provision. Knowledge mobilisation and coordination will be key to encourage broader adoption of effective practices through replication and scaling.

Future Skills

In 2019, the Canadian government also launched the Future Skills initiative, which encourages collaboration and innovation among all actors involved in the skills training and development process to help transform skills policies and programmes and meet the evolving needs of jobseekers, workers and employers. With 50 percent of funding dedicated to supporting underrepresented and disadvantaged groups, Future Skills also contributes to fostering a diverse and inclusive workforce. The initiative created the following bodies:

- Future Skills Council: an advisory body that brought together business, labour, education and training, indigenous peoples, and not-for-profit organisations and governments and provided advice to the Minister of Employment, Workforce Development, Disability and Inclusion on emerging skills and workforce trends. In November 2020, the Council released a report that identified five priority areas to ensure that Canada's skills development and training programmes are prepared for the future and it hosted a series of engagement events and a national forum. The Council's report is also being used to inform planning and priority setting by the Future Skills Centre and government policies and programmes.

- Future Skills Centre: an independent innovation and applied research centre that identifies emerging in-demand skills and funds community-based applied innovation projects, with a focus on groups that have been historically underrepresented in the labour force, to create an evidence base for effective training and skills development. As of April 2021, the Future Skills Centre had engaged over 5,000 stakeholders, initiated over 110 innovation projects in collaboration with skills development organisations to identify solutions for challenges arising from the changing world of work, and published 55 reports. The Centre has begun to generate evidence and insights about the changing nature of work, the shifting demand for skills, and innovative approaches to skills assessment and development to inform policy development, programme design and service provision. Knowledge mobilisation and coordination will be key to encourage broader adoption of effective practices through replication and scaling.

Box 5.4 An innovative approach to skills development in Indonesia

The Indonesian labour market faces challenges such as low worker productivity and severe educational and skills mismatches. Despite significant improvements in school enrolment and an increased education budget, the level of education remains low.

Vocational training centres (VTCs) are yet to have adequate funding and coverage areas. Although the government plans to improve VTCs through institutional reform, perception rebranding, content redesign, and infrastructure revitalisation, labour market demand and rapid digital transformation have outpaced these efforts. Meanwhile, only 7.7 percent of firms allocate any budget for employee education and training.

As a result, 78 percent of firms face difficulties in finding highly skilled employees and high-level managers, particularly for jobs relating to technology, data analysis, finance and agribusiness. To ensure that the Indonesian labour force is prepared for the future of work, a radical reskilling and upskilling approach is necessary.

In April 2020, Indonesia launched the Pre-Employment Programme, or *Program Kartu Prakerja*, which is expected to complement and fill in gaps in education and VTCs in order to meet future skills demands. The aims are to (1) develop workforce competence; (2) increase workforce productivity and competitiveness; and (3) develop entrepreneurship.

The programme is implemented by the Job Creation Committee, which comprises 14 ministers and other government executives and is chaired by the Coordinating Minister for Economic Affairs. The Committee is supported by the Implementation Team and the Project Management Office (PMO), which consists of the Committee Secretariat and the Executive Management. The Executive Management serves as a programme director in developing a collaborative ecosystem with a variety of stakeholders.

The programme's ecosystem includes seven digital platforms (Sisnaker, Pijar Mahir, Tokopedia, Bukalapak, Sekolahmu, Mau Belajar Apa, and Pintaria) with a total of 179 training providers and 1,561 types of training. Five payment partners are also incorporated that provide cash assistance and incentives, including one bank (BNI) and four e-wallet companies (OVO, Gopay, LinkAja, and Dana). This ecosystem is in cooperation with seven educational institutions (Airlangga University, Atmajaya University, Gadjah Mada University, Indonesia Mengajar Movement, IPB University, Muhammadiyah Malang University, and Universitas Indonesia) to maintain independent training curations. The ecosystem is also provided with job vacancies data by three job portals (Jobs.id, JobStreet.com, and Karir.com).

The programme is open to all Indonesian citizens aged 18 years and over. It is intended for jobseekers, new graduates, and those currently unemployed as well as those currently employed and entrepreneurs who are not currently attending formal education, not receiving other government assistance, and are not members of the military, civil servants, or other government-related workers. Recipients may choose training programmes according to their interests, talents, and skills needs – either for seeking a new and/or better job or to become entrepreneurs.

Despite being a new initiative, the programme has already made a significant impact. By the end of 2020, 5.5 million beneficiaries from 514 cities/districts had enrolled in the programme. Of the beneficiaries, 84 percent had not had any previous training, 82 percent were unemployed, 78 percent were young (18–35 years old), 45 percent were women, and 5 percent were disabled.

Monitoring and evaluation was done by the PMO requesting beneficiaries to fill in a paid Evaluation Survey one month, three months and six months after completing the training. The Kartu Prakerja PMO Report 2020 reported that recipients rated quality of training an average of 4.93 out of 5, and nearly all (98 percent) agreed that the programme had provided them with new skills and improved their knowledge and soft skills.

At the time of the survey, 35 percent of the unemployed participants in the programme indicated that they had become employed. The programme was also found to have spurred entrepreneurship: the number of entrepreneurs increased 47 percent compared to February 2020 (before programme implementation). Recipients reported that the programme provided knowledge and skills relevant for entrepreneurship, particularly on starting and growing businesses, marketing products, obtaining technical production skills, and financial management. In addition, 70 percent of the beneficiaries used their post-training incentives for working capital to kick-start their businesses.

The programme has also accelerated financial inclusion and promoted online learning. By requiring all trainees to have a bank account or e-wallet to receive the cash assistance and

incentives, the programme has helped to increase financial inclusion; prior to this, a quarter of the beneficiaries did not have a bank account or e-wallet. In terms of online learning and training, 92 percent of the beneficiaries had not used digital learning before. After finishing the programme, 76 percent noted that they are motivated to subscribe to online training in the future and are even willing to pay out-of-pocket.

Going forward, there will be a continuous effort to improve the quality of service of the programme and to find the most suitable implementation mechanism. In the medium term, the main challenges are transitioning from a quasi-social assistance programme as the economy recovers from the COVID-19 pandemic to its initial purpose to increase workforce competence through online training; raising public awareness about the core aims of the programme; and managing collaboration with the private sector ecosystem. In the long term, the main challenges are establishing a digital learning culture and ensuring the sustainability of the programme, particularly in matching policy design with the interoperability of the programme.

Box 5.5 Improving skills development in agriculture for green jobs in the Philippines

While the agriculture sector accounts for more than a quarter of total employment in the Philippines, net employment in the sector has been on a downtrend since 2012. Other jobs that do not necessarily pay high wages often offer a relatively stable income, non-wage benefits, and better working conditions in comparison to agricultural work. Moreover, data reveal that workers in the services sector are paid more than twice as much as those in agriculture, while the increased availability and declining job search costs of non-agricultural jobs have led to workers shifting from agriculture to other sectors. This out-migration of farmworkers has resulted in an aging agricultural workforce with lower educational attainment.

To support skills development in this sector, the National Technical Education and Skills Development Plan 2018–2022 identify agriculture, fisheries and forestry as priority sectors. In addition, the passage of the Green Jobs Act in 2016 is a major reform for labour and employment, including in the agriculture sector. The law provides a pioneering approach to institutionalising labour and employment dimensions in the policy framework for addressing climate change issues by mandating the development of human capital to enable and sustain the transition to a greener economy.

The National Green Jobs Human Resource Development Plan has been prepared and will support the Philippines' transition to a green economy by identifying the skills, competencies and gaps in the various sectors and developing appropriate strategies to improve the current skills and training system. Agencies are already implementing measures to support green skills development. In particular, the Technical Education and Skills Development Authority (TESDA) is focused on formulating the necessary training regulations for the implementation of skills training, programme registration, and assessment and certification in support of the requirements for skilled labour in a green economy.

Around 33 out of 246 training regulations (TRs) are being greened, including in hydroponics, vertical gardening, and seaweed farming. TESDA has made progress in the 'Greening the Curriculum and Training' aspect, where qualifications with green competency are now available for over 20 TRs, including some of those in the agriculture and fishery sectors. While the impact of the Green Jobs Act has yet to be studied, labour demand in the green subsector

is expected to grow by 2.7 percent, which is slightly higher than the 2.1 percent growth forecast for the conventional subsector.

There still remains a need to fast-track the adoption and implementation of the Green Jobs Human Resource Development Plan, green jobs assessment and certification criteria/guidelines, and the tools to monitor green jobs. Doing so will help to provide empirical evidence for policy analysis and further recommendations. In addition, multilevel partnerships with local and international organisations for funding, technology transfer and capacity building in the area of skills development for a green economy continue to be encouraged and actively sought.

5.2.3 Increasing targeted investments in education

Investments in education and digital infrastructure are critical to developing human capital and preparing the workforce for the future. The APEC Economic Policy Report 2017 on Structural Reform and Human Capital Development provided a comprehensive review on how economies can improve labour force skills through greater investments in education, particularly in early education and vocational training, and it underscored the importance of ensuring high-quality jobs.[275] This was followed by the APEC Economic Policy Report 2018 on Structural Reform and Infrastructure and the APEC Economic Policy Report 2019 on Structural Reform and the Digital Economy, both of which emphasised the increasing need for high-quality digital infrastructure, especially affordable access to fixed broadband services.[276] Many of the policy measures recommended in those reports are also relevant to address the challenges facing economies due to the changing nature of work.

Given the objectives of this report, we discuss how investments in basic education should be targeted so as to meet the future skills demands of the labour market as well as to ensure more equitable access to the opportunities presented by the changing nature of work. Examining data from the World Economic Forum, it is clear that current workforce skills across the region are not sufficient in order to meet the labour demands of businesses. Scores on the extent to which graduates (from secondary education and from university) possess the necessary skills are quite low, with just two APEC members achieving a score above 70 (out of 100) (Figure 5.14). Although scores on the extent of digital skills among the active population are higher compared to the skillset of graduates in most APEC economies, just five members have a score of 70 or above. The weak performance in these two indicators suggests that there is an urgent need to improve the basic skills being taught in educational institutions across the region.

Although there is expected to be growth in jobs that require IT skills, such as process automation specialists and information security analysts, other types of skills will also be necessary.[277] Based on data from the World Economic Forum, the top skills employers in the APEC region see as increasingly important over the next few years include analytical thinking

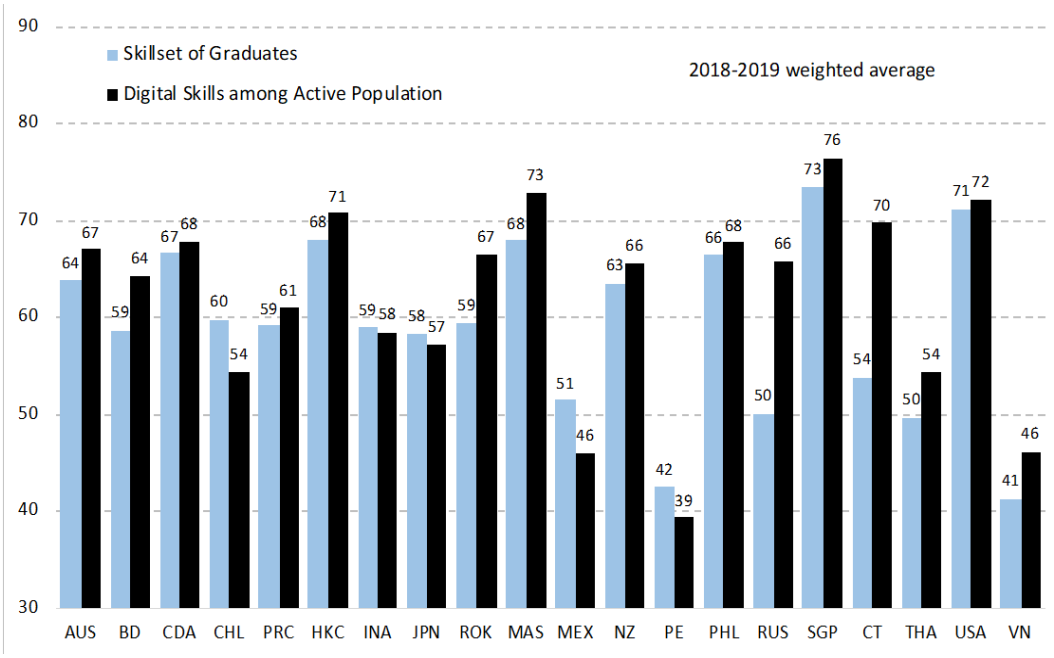
[275] APEC, "APEC Economic Policy Report 2017: Structural Reform and Human Capital Development" (Singapore: APEC, 2017), https://www.apec.org/Publications/2017/11/2017-APEC-Economic-Policy-Report

[276] APEC, "APEC Economic Policy Report 2018: Structural Reform and Infrastructure" (Singapore: APEC, 2018), https://www.apec.org/Publications/2018/11/2018-APEC-Economic-Policy-Report; APEC, "APEC Economic Policy Report 2019: Structural Reform and the Digital Economy" (Singapore: APEC, 2019). https://www.apec.org/Publications/2019/11/2019-APEC-Economic-Policy-Report

[277] WEF, "The Future of Jobs Report 2020."

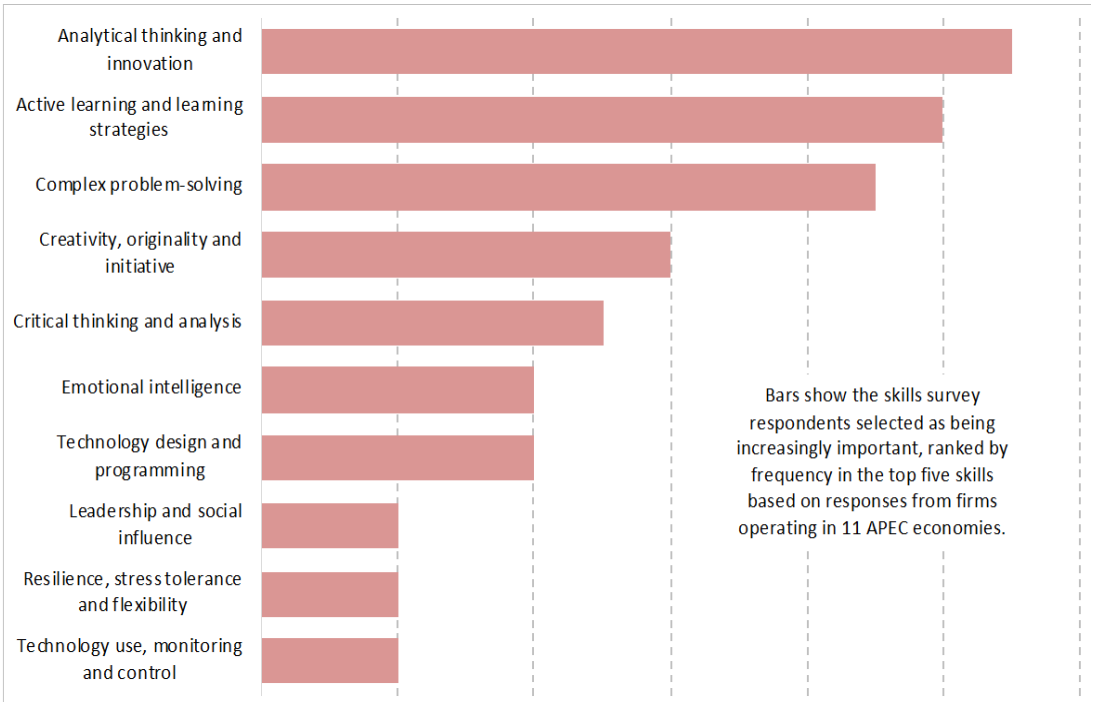
and innovation, active learning and learning strategies, and complex problem-solving (Figure 5.15). Firms in all 11 APEC economies for which there are data considered 'analytical thinking and innovation' to be among the top five future skills. Creativity, originality and initiative as well as critical thinking and analysis were also ranked highly among the APEC members. Other emerging skills in the region include those relating to self-management and interpersonal communication such as emotional intelligence; leadership and social influence; and resilience, stress tolerance and flexibility.

Figure 5.14 Global Competitiveness Index: Current workforce skills (score)



Note: Refer to page v of this report for abbreviations for APEC member economies. 'Skillset of Graduates' is the average score of responses to the following two questions: 'In your (economy), to what extent do graduating students from secondary education possess the skills needed by businesses?' and 'In your (economy), to what extent do graduating students from university possess the skills needed by businesses?'. 'Digital Skills among Active Population' is based on responses to the question 'In your (economy), to what extent does the active population possess sufficient digital skills (e.g. computer skills, basic coding, digital reading)?' Scores range from 0 to 100; a higher score indicates a higher extent of skills. Data are not available for PNG.
Source: World Economic Forum (WEF), Global Competitiveness Index 2019.

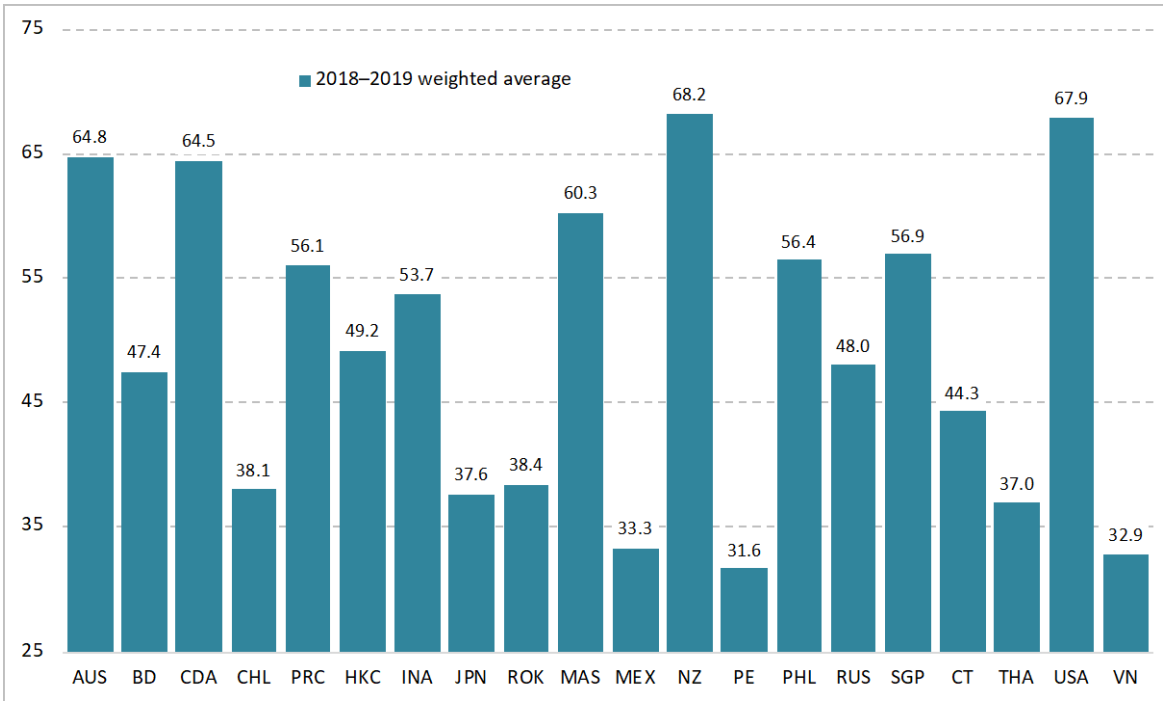
Figure 5.15 Emerging workforce skills of 2025



Note: Based on responses to the question 'Keeping in mind the tasks that will be performed by the key roles in your organization, in the next four years would you expect an increase or decrease in the use of the following skills by individuals?'. The figure shows the list of skills respondents selected as being increasingly important within their organisation, ranked by frequency, and is based on responses from firms operating in the following 11 APEC economies for which data are available: Australia; Canada; China; Indonesia; Japan; Malaysia; Mexico; Russia; Singapore; Thailand; USA.
Source: World Economic Forum (WEF), "The Future of Jobs Report 2020" (Geneva: WEF, 2020), http://www3.weforum.org/docs/WEF_Future_of_Jobs_2020.pdf

Given the increasingly important role that analytical and critical thinking skills will play in the future of work, it is vital that schools in the region fully integrate the teaching of these skills into existing curricula. However, the extent to which critical and creative thinking is currently taught appears to be limited. Although scores vary substantially among the APEC members, most have scores under 60 (out of 100), while no economy has a score above 70 (Figure 5.16). It is therefore crucial that policymakers review and update education curricula on a regular basis so that students are equipped with the critical thinking, self-management and interpersonal skills that are expected in the labour market of the future. As discussed earlier, linking skills forecasting with the development of school curricula is an essential policy measure to ensure that labour markets are efficient.

Figure 5.16 Global Competitiveness Index: Critical Thinking in Teaching (score)



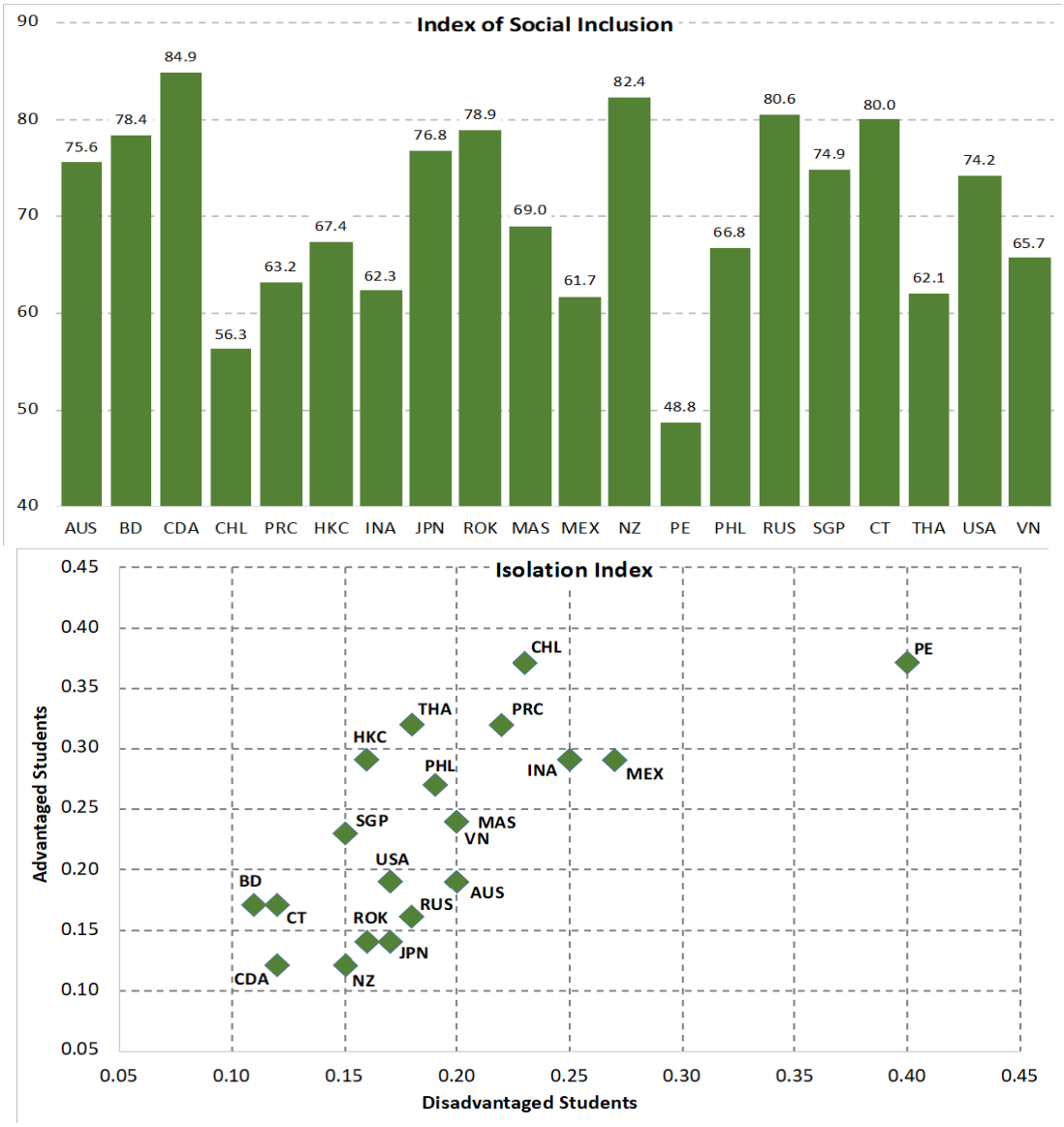
Note: Refer to page v of this report for abbreviations for APEC member economies. Based on responses to the question 'In your (economy), how do you assess the style of teaching?'. Scores range from 0 to 100; a higher score indicates that the style of teaching encourages creative and critical individual thinking, while a lower score indicates that the style is more frontal, teacher-based, and focused on memorising. Data are not available for PNG.
Source: World Economic Forum (WEF), Global Competitiveness Index 2019.

As digital skills continue to become increasingly more important – not only for workers, but also for the general population – governments should aim to ensure that all schools are equipped with sufficient information and communications technology (ICT) infrastructure (hardware and connectivity). Greater investment to ensure equitable access to digital technology in schools will also promote development in rural areas and other traditionally underserved communities, thereby helping to reduce the digital divide within an economy. Moreover, ensuring adequate digital infrastructure in these communities is a vital and urgent step to reduce barriers, especially as the COVID-19 pandemic has pushed many services online, thereby worsening the digital divide for some marginalised populations, particularly indigenous groups and those in rural and remote areas.

Integrating the teaching of digital skills into the education curricula will not only equip all students with necessary skills, thereby helping to address the digital divide, but will also enable populations to take greater advantage of the opportunities presented by the digital era.[278] The Malaysian Smart School Initiative, a public–private partnership involving various stakeholders, is a good example of a holistic, all-encompassing approach to incorporating the use of ICT in schools.

[278] For more discussion on upgrading education for the digital era, see OECD, "Economic Outlook for Southeast Asia, China and India 2020: Rethinking Education for the Digital Era" (Paris: OECD, 2019), https://doi.org/10.1787/1ba6cde0-en.

Figure 5.17 OECD PISA: Social diversity and equity in education (score, 2018)



Note: Refer to page v of this report for abbreviations for APEC member economies. The Index of Social Inclusion measures the amount of socioeconomic variation within schools. A higher index score implies that there is more socioeconomic diversity amongst students who attend the same schools than among students attending different schools. The Isolation Index analyses whether social segregation between schools is better explained by the concentration of either disadvantaged or advantaged students in some schools. A higher index score implies that students are more often isolated in certain schools, based on their socioeconomic status. A student's socioeconomic status is estimated by the PISA index of economic, social and cultural status (ESCS), a composite measure that combines into a single score the financial, social, cultural and human capital resources available to students. Students are considered socioeconomically advantaged (disadvantaged) if they are among the 25% of students with the highest (lowest) values in the ESCS index in their economy. Data for PRC include only four participating provinces of Beijing, Shanghai, Jiangsu and Guangdong. Data are not available for PNG.
Source: OECD Programme of International Student Assessment (PISA) Database.

Policymakers should also endeavour to ensure that all socioeconomic groups in the economy have equitable access to high-quality education. Research has found that high levels of socioeconomic segregation between schools can have an impact on the learning opportunities that are available and therefore on education outcomes since the socioeconomic composition of a school often determines its availability of resources, such as the quality and quantity of

teachers.[279] However, data from the OECD's Programme for International Student Assessment (PISA) reveal a high degree of social stratification across schools in many APEC economies (Figure 5.17). Based on the Index of Social Inclusion, 84.9 percent of the socioeconomic diversity of students in Canada was observed within schools (rather than between schools), while just 48.8 percent of socioeconomic diversity was observed within schools in Peru.

Furthermore, in over half of the APEC economies, the Isolation Index is higher for socioeconomically advantaged students than for disadvantaged students. This indicates that advantaged students are less likely, on average, to attend the same schools as disadvantaged students, implying that there is a higher concentration of advantaged students in some schools. This could result if, for example, some private schools charge such high tuition fees that only the most affluent families are able to enrol their children in these schools. Ensuring high-quality education across the entire school system can lead to better academic performance of all students, regardless of their socioeconomic background, thereby also helping to develop a more highly skilled labour force.

5.3 DESIGNING EFFICIENT LABOUR MARKET REGULATIONS

As discussed earlier, the changing nature of work – and the way in which people engage in employment – has opened up vast opportunities. However, many of the new jobs that have come into existence often lack the employment protections necessary to ensure job security and stability. Governments around the world have in fact been slow to react to the dynamic changes recently witnessed in the labour market. The rapidly evolving trends shaping the future of work require that policymakers are able to react quickly to changing market conditions by designing responsive and efficient labour market regulations.

Labour market regulations cover a wide range of institutions, including various aspects of labour legislation such as statutory minimum wage rates and employment protection legislation, labour unions and collective bargaining rights, and the unemployment insurance system. This section will discuss several policy responses so that members are able to improve regulatory adaptability against rapidly changing labour market conditions. These include (1) improving the scope and coverage of employment protection legislation to include those workers engaged in non-standard employment; (2) ensuring more inclusive collective bargaining systems that aim to improve training opportunities and reduce wage inequality; (3) adjusting to remote working arrangements; and (4) addressing discrimination encoded in algorithms. It is important to note that labour market institutions vary widely across the APEC region, so potential reforms must be examined within the context of each economy.

5.3.1 Improving employment protection legislation

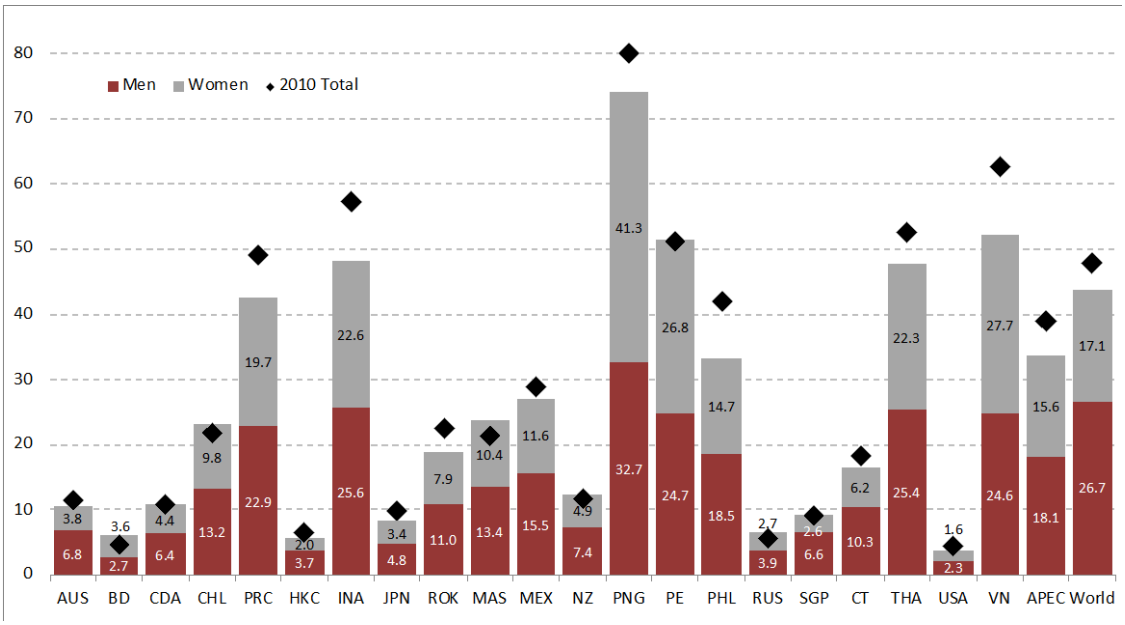
A large informal sector has been a persistent problem in many APEC economies. Workers in this sector typically lack the employment benefits and statutory protections of those in the formal sector (e.g., legally mandated minimum wage rates, maximum working hours, paid medical leave, paid maternity leave) as well as being outside the scope of coverage of most social protection schemes (e.g., employment injury benefits and unemployment benefits). Too high a number of workers in informal employment can hinder large-scale initiatives to upskill and reskill the labour force through formal training schemes. As such, APEC economies will not be able to properly address future of work challenges without ensuring that workers in

[279] OECD (2019c).

vulnerable employment are included in the scope of employment protection legislation and social protection schemes.

Since data on the informal sector are extremely limited, we use ILO estimates on own-account workers and contributing family members to analyse the share of vulnerable employment.[280] In 2019, there were an estimated 512 million people considered to be in vulnerable employment in the APEC region, representing one-third of total employment. This is, however, an improvement since 2010, when vulnerable employment accounted for just under 40 percent of total employment. Since 2010, the share of workers engaged in vulnerable employment fell in over half of the APEC economies (Figure 5.18). Some members achieved quite substantial reductions of five percentage points or more, including China; Indonesia; Papua New Guinea; the Philippines; Thailand; and Viet Nam. However, given the fundamental importance of formalising informal enterprises, continued policy efforts to reduce vulnerable employment are necessary.

Figure 5.18 Vulnerable employment, 2010 & 2019 (% of total employment)



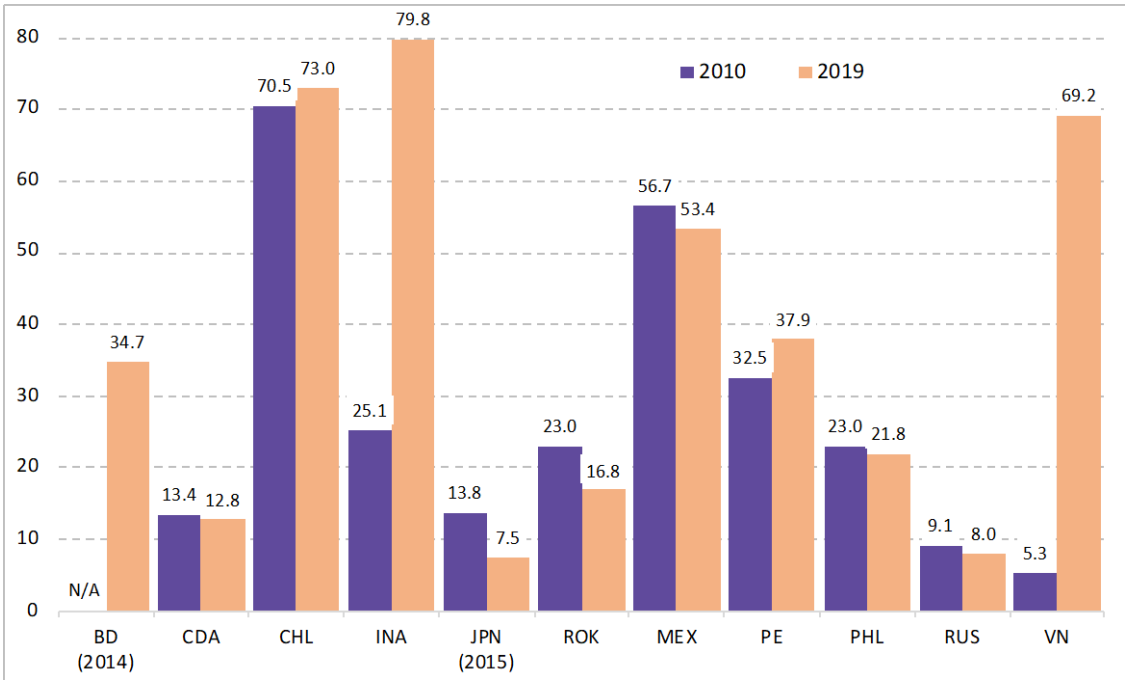
Note: Refer to page v of this report for abbreviations for APEC member economies. Vulnerable employment is defined as own-account workers and contributing family workers. Data shown are estimates modelled by the ILO.
Source: ILOSTAT; APEC PSU calculations.

Workers employed on temporary contracts also typically have fewer employment protections than those on standard contracts, such as being exempt from receiving severance payments, and are often ineligible for benefits under social protection schemes. Furthermore, the ILO reports that workers engaged in non-standard forms of employment are less likely to receive on-the-job training and that those firms with a higher share of employees on such contracts tend to underinvest in training for both temporary and permanent employees.[281] This disparity in training opportunities can lead to a skills gap between different categories of workers,

[280] Own-account workers are those workers who, working on their own account or with one or more partners, hold the type of job defined as a self-employed job (i.e., jobs where the remuneration is directly dependent upon the profits derived from the goods and services produced), and have not engaged on a continuous basis any employees to work for them during the reference period. Contributing family workers are those workers who hold self-employment jobs as own-account workers in a market-oriented establishment operated by a related person living in the same household.
[281] International Labour Organization (2016).

especially for those employed on fixed-term contracts for longer periods. Although data are available for only half of the APEC members, over 30 percent of employees were engaged as temporary employees in several APEC economies in 2019 (Figure 5.19). Since 2010, many members registered a decrease in the share of temporary employees; however, there were quite substantial increases in Indonesia and Viet Nam.

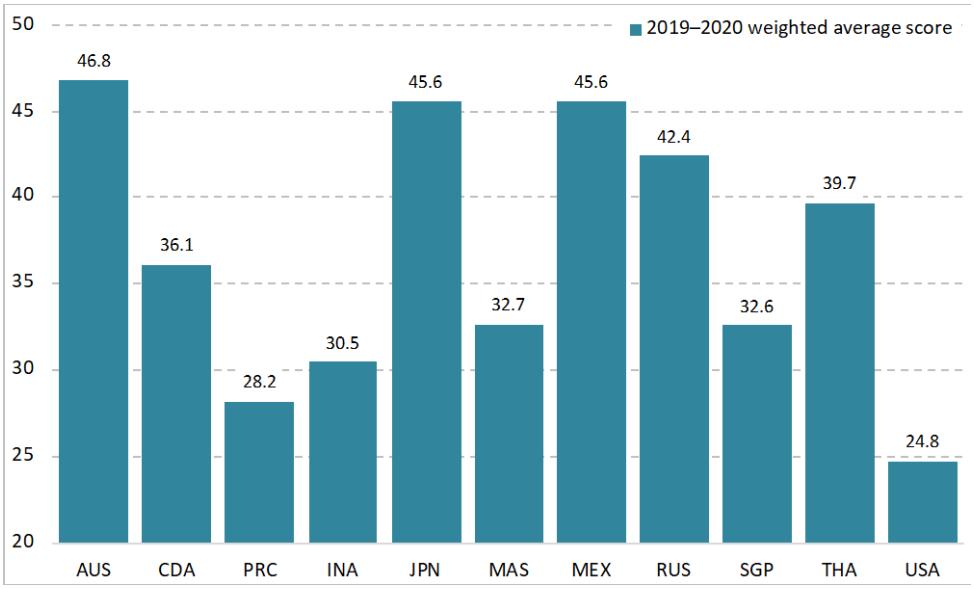
Figure 5.19 Temporary employment, 2010 & 2019 (% of total employees)



Note: Refer to page v of this report for abbreviations for APEC member economies. Temporary employment, where workers are engaged only for a specific period of time, includes fixed-term, project- or task-based contracts, as well as seasonal or casual work, including day labour. For VN, data for 2011 are shown for 2010. For JPN, data for 2015 are shown for 2020. Data for BD are only available for the year shown. Data are available for only the 11 APEC members shown.
Source: ILOSTAT.

More recently, the gig economy, while often providing greater opportunities for employment as well as flexible working arrangements, has also had a detrimental impact on working conditions, such as working hours, remuneration, and job stability. According to a survey of firms operating in 11 APEC economies, the gig economy is considered to have worsened working conditions, on average, in all of those economies as indicated by their score below 50 (Figure 5.20).

Figure 5.20 Erosion of working conditions impacted by the gig economy (score)



Note: Refer to page v of this report for abbreviations for APEC member economies. Based on responses to the question 'In your (economy), what is the impact of the online gig economy on working conditions (e.g., working time, remuneration, stability)?'. Scores range from 0 to 100; a higher score corresponds to a more positive impact (i.e., the online gig economy significantly improves working conditions). Data are available only for the 11 APEC members shown.

Source: World Economic Forum (WEF), "The Future of Jobs Report 2020" (Geneva: WEF, 2020), http://www3.weforum.org/docs/WEF_Future_of_Jobs_2020.pdf

The insecure nature of non-standard forms of employment, such as jobs in the gig economy, as well as the impact on working conditions underscores the need to improve the scope and coverage of employment protection legislation. Additionally, the rise of the gig economy has had a detrimental impact on labour rights as these workers are often excluded from forming labour associations and engaging in collective bargaining. Box 5.6 summarises a case study submitted by China that highlights the challenges an economy faces in developing a regulatory framework for the digital economy.

Box 5.6 Developing a regulatory framework for the digital economy in China

The rapid growth of the digital economy in China has brought about a range of new business forms, resulting in a number of new occupations and providing an important channel for flexible employment. In 2018, there were 191 million jobs in China's digital economy (including the platform economy, network economy, and non-contact economy), accounting for 24.6 percent of total employment, with annual employment growth in new business forms outpacing that in traditional business forms. However, as new business forms have developed, problems such as unclear regulatory rules have also arisen. For instance, the legality of certain types of businesses has not been clarified, although such business activities were not strictly prohibited either. There was also a lack of in-depth understanding of certain new ways of doing business and their consequences, leading to insufficient regulations.

China therefore developed several inter-agency guidelines on the general requirements to determine the methods and standards of supervision for new technologies, industries, business forms, and business models, in accordance with the principles of encouraging innovation,

inclusiveness and prudence. These include: Guiding Opinions on Promoting the Development of the Sharing Economy (July 2017), Guiding Opinions on Developing the Digital Economy to Stabilize and Expand Employment (September 2018), Regulations on Optimizing the Business Environment (October 2019) and Opinions on Supporting Multi-channel Flexible Employment (July 2020).

As a result, regulatory reform measures that adapt to the characteristics of the digital economy have been introduced, including (1) strengthening the alignment and coordination between sectors and local governments concerning market access policies (e.g., rules that restrict the development of the sharing economy, such as administrative licensing and commercial registration, were lifted or standardised to a large extent and new market access policies were introduced); (2) improving labour laws and regulations and refining labour policies concerning new forms of employment so as to effectively protect the legitimate rights and interests of workers; (3) accelerating the development of various industries, such as online learning and training, online health services, and online entertainment, while also creating conditions for remote working, telecommuting, and part-time employment; and (4) setting appropriate regulatory rules for the platform economy and other new business forms.

The inclusive and prudential supervision principles and institutional arrangements for new business forms adopted by China have laid a solid foundation for the development of the platform economy, thereby helping to drive economic growth and create more flexible jobs. For example, there are millions of stores covering more than 260 service categories operating on Meituan, a shopping platform for consumer products and retail services, with annual turnover reaching CNY 100 billion in 2019 for a year-on-year increase of 22.1 percent. The platform had a total of 9.5 million delivery drivers at the end of 2020, of which about 2.3 million were from impoverished areas. Inclusive and prudential supervision also improves the sustainability of new business forms. Many of the leading companies involved in the digital economy in China have begun to expand upstream and downstream in the industrial chain or horizontally to other areas, thereby further building and improving the platform ecosystem.

The regulatory framework in China continues to face some challenges, including ensuring the protection of labour rights and mitigating the market concentration of Internet platforms. A large number of digital employees do not have labour relations with the platforms, which, to a certain extent, runs against the rules for protecting the rights and interests of employees under current labour law. It is sometimes difficult to directly identify the responsibilities of employers, and consequently, labour disputes occur from time to time.

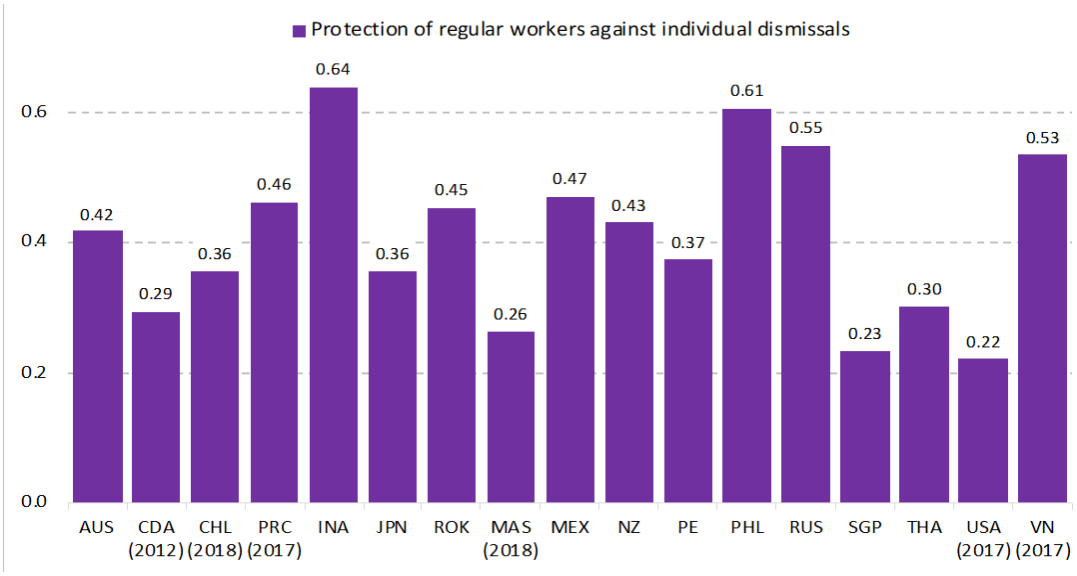
A second challenge is that market resources have accelerated in recent years to concentrate on leading Internet platforms, resulting in a de facto monopoly. Some Internet platforms take advantage of their relatively monopolistic position by, for example, raising service rates. In response to these challenges, China is stepping up reforms to promote the sustainable and sound development of the platform economy.

Employment protection legislation comprises a wide range of rules and regulations, including statutory notice periods prior to dismissal, rules regarding collective redundancies or mass layoffs, and the treatment of different categories of workers such as those on temporary contracts. Since employment protection legislation regulates the hiring and dismissal of workers, the level of such legislation in an economy helps to determine the flexibility of the labour market. A two-tier labour market system can arise when some employees are in highly protected jobs (e.g., those on permanent, continuous or open-ended contracts) while others are engaged in less secure, temporary forms of employment. Economies must therefore decide the

appropriate balance – weighed against other policy objectives – between enhancing business flexibility and protecting jobs when designing employment protection legislation.

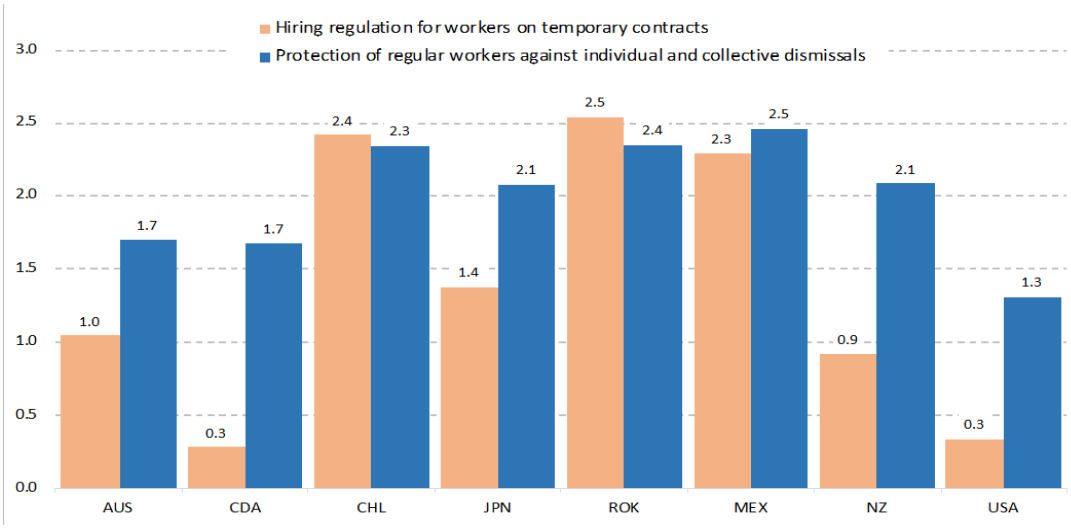
Figure 5.21 Strictness of employment protection legislation, 2019 (score)

(a) ILO employment protection legislation



Note: Refer to page v of this report for abbreviations for APEC member economies. Scores range from 0 to 1; the higher the score, the stricter the employment protection legislation. Data shown are for 2019 unless otherwise noted. Data for Canada refer to the federal level. Data are not available for BD; HKC; PNG; and CT.
Source: ILO EPLex Database.

(b) OECD employment protection legislation



Note: Refer to page v of this report for abbreviations for APEC member economies. Scores range from 0 to 6; the higher the score, the stricter the employment protection legislation. Data are available for only the eight APEC members shown.
Source: OECD Employment Protection Legislation Database, 2020 edition.

To examine the strictness of employment protection legislation across the region, we use composite indicators from two sources:

- ILO, which has coverage for nearly all APEC members, but only covers regulations governing individual dismissals of workers on regular contracts.
- OECD, which has coverage for only eight APEC members, but has two summary indicators covering regulations on (1) the hiring of workers on temporary contracts and (2) individual and collective dismissals of workers on regular contracts.

Regulations regarding dismissal of workers on standard contracts include the length of notice period and severance pay entitlements as well as additional notification requirements or priority rules considerations (if any) in the case of collective dismissals. As shown in Figure 5.21(a), employment protection for regular workers against dismissal is highest in Indonesia; the Philippines; Russia; and Viet Nam, and weakest in Canada; Malaysia; Singapore; and the United States.

Policies governing fixed-term contracts include whether there are any restrictions on the number of times a temporary contract can be renewed as well as its cumulative duration and whether temporary employees and regular employees are treated equally in terms of working conditions. Examining the OECD data, Australia; Canada; Japan; New Zealand; and the United States have relatively low levels of regulation covering employees on temporary contracts, while Chile; Korea; and Mexico have comparatively much higher levels of protection (Figure 5.21(b)).

The ILO's Employment Protection Legislation Database allows us to examine more specific policies in the APEC region. In two-thirds of APEC economies for which there are data, there is legislation distinguishing between different types of employment contracts (Table 5.3). Several APEC members require valid reasons, such as the nature of the work being seasonal, for the use of a fixed-term contract. There are only four economies in which there is a statutory limit on the maximum number of successive temporary contracts an employee can be engaged in, while just under half of the APEC member economies limit the maximum cumulative duration of successive fixed-term contracts. Given the increasing trend in non-standard forms of employment, members should evaluate their current employment protection legislation so as to provide greater protection for all workers. This could include, for example, updating regulations to ensure that temporary workers are not continually engaged on fixed-term contracts or by extending employment benefits for standard employees to include non-standard workers. Policies and regulations may also need to address the use of AI and algorithms in hiring and firing decisions, especially as they have the potential to magnify existing inequities and vulnerabilities (Box 5.3).

Regarding legislation governing collective dismissals, two-thirds of the APEC members for which there are data require prior consultations with trade unions (Table 5.4). Just six APEC members legislatively mandate priority rules based on social considerations, age, or job tenure prior to dismissal, while only five require that those who have been dismissed should be given priority for rehiring. In ten APEC economies, employers have statutory obligations to consider alternatives to dismissal, such as reassignment or retraining. Procedural requirements for collective dismissals are an important policy instrument to address the challenges associated with the changing nature of work. For instance, since technological change can result in a high level of structural unemployment, requiring that businesses consider retraining staff before deciding on collective dismissals is one approach to engage firms in greater training and skills development.

Table 5.3 Regulation of fixed-term contracts

Economy	Are fixed-term contracts (FTC) regulated	Valid reasons for FTC use required	Maximum number of successive FTCs	Maximum cumulative duration of successive FTCs (in months)	Applicable Year
Australia		no limitation	no limitation	no limitation	2019
Canada		no limitation	no limitation	no limitation	2012
Chile	✓	no limitation	2	12	2018
China	✓	no limitation	2	120	2017
Indonesia	✓	objective and material reasons	2	36	2019
Japan	✓	no limitation	no limitation	no limitation	2018
Korea	✓	no limitation	no limitation	24	2019
Malaysia	✓	no limitation	no limitation	no limitation	2018
Mexico		objective and material reasons	no limitation	no limitation	2010
New Zealand	✓	objective and material reasons	no limitation	no limitation	2019
Peru	✓	objective and material reasons	no limitation	60	2019
The Philippines		no limitation	no limitation	no limitation	2013
Russia	✓	objective and material reasons	no limitation	60	2019
Singapore		no limitation	no limitation	no limitation	2019
Chinese Taipei	✓	objective and material reasons	no limitation	no limitation	1984
Thailand	✓	objective and material reasons	no limitation	24	2019
United States		no limitation	no limitation	no limitation	2017
Viet Nam	✓	objective and material reasons	2	72	2011

Note: Data for Canada refer to the federal level. Data are not available for Brunei Darussalam; Hong Kong, China; and Papua New Guinea.
Source: ILO EPLex Database; Ministry of Labour, Chinese Taipei.

Table 5.4 Procedural requirements for collective dismissals

Economy	Prior consultations with trade unions (workers' representatives)	Employer's obligation to consider alternatives to dismissal (e.g., transfers, retraining)	Priority rules for collective dismissals (social considerations, age, job tenure)	Priority rules for re-employment	Applicable Year
Australia	✓	✓			2019
Canada	✓	✓			2012
Chile					2018
China	✓	✓	✓	✓	2017
Indonesia	✓	✓			2019
Japan	✓	✓			2018
Korea	✓	✓		✓	2019
Malaysia			✓		2018
Mexico	✓		✓	✓	2010
New Zealand	✓				2019
Peru	✓	✓		✓	2019
The Philippines					2013
Russia	✓	✓	✓		2019
Singapore					2019
Chinese Taipei	✓	✓	✓	✓	2003
Thailand					2019
United States					2017
Viet Nam	✓	✓	✓		2012

Note: Data for Canada refer to the federal level. Data are not available for Brunei Darussalam; Hong Kong, China; and Papua New Guinea.
Source: ILO EPLex Database; Ministry of Labour, Chinese Taipei.

Box 5.3 Addressing human prejudices in artificial intelligence

Artificial intelligence (AI) and the algorithms underpinning its operation are designed to aid human decision-making and potentially reduce human bias and error. An unbiased decision-making system can process higher volumes of information than humans, and may benefit traditionally disadvantaged groups.[282] As such, artificial intelligence has been deployed for a range of uses, from hiring decisions in human resource departments, to facial recognition technology and criminal justice algorithms.

Although artificial intelligence is designed to reduce the impact of human biases, it can make the problem worse by deploying biases in sensitive areas. Artificial intelligence has to be trained in a process that requires data. A biased dataset, which could include biased human decisions or reflect historical or social inequities, will lead to a biased artificial intelligence system. Flawed data sampling in which some groups are over- or under-represented in the training data may result in the same problem.

For example, research has found that training natural language processing models using news articles can lead algorithms to exhibit gender stereotypes.[283] In 2018, Amazon stopped using an internal artificial intelligence recruiting system after the company discovered that the new system was not rating candidates in a gender-neutral way.[284] Similarly, some automated risk assessments used by judges in the United States to determine bail and sentencing limits have been found to generate biased conclusions, adversely affecting racial minorities.[285]

Addressing the potential harms from the use of artificial intelligence and algorithms will require structural reform and policy decisions. Legislators could enact laws that would require companies to check their artificial intelligence systems for bias through a government agency.[286] This could require companies to disclose their artificial intelligence training data and share how their artificial intelligence systems fare when applied to different demographic groups. Governments could also work with the private sector to establish a harmonised set of standards that require robustness tests of the artificial intelligence system before it is implemented, to ensure artificial intelligence algorithms are fair.[287]

Regulations on the use and deployment of AI systems in fields where AI can cause harm through discriminatory practices could also be introduced. Companies could be obliged to report serious incidents and malfunctioning AI systems to regulators. Infringement of regulations could be penalised with fines.

In the long run, having the right mix of policies can result in better decisions for everyone with unbiased AI algorithms. A key consideration would be finding the right balance. On the one hand, policymakers seek to promote technological innovation, while on the other, policymakers must ensure that new technologies will not discriminate and cause harm.

In 2021, the European Commission published its Proposal for a Regulation on a European Approach for Artificial Intelligence, which seeks to regulate the development and usage of artificial intelligence systems in a cross-border and regional setting.[288] A similar undertaking could be initiated for the APEC region.

5.3.2 Ensuring collective bargaining rights

Labour rights comprise two fundamental components of industrial relations: the freedom to associate (i.e., unionisation) and the right to collective bargaining. Agreements reached through collective bargaining can include wage scales and employee benefits, access to training opportunities, and occupational health and safety standards. Trade unions and collective bargaining systems can be characterised based on their degree of centralisation. In general, a more exclusive system is that under which negotiations take place at the enterprise level between the labour union and a single employer and the collective agreement applies only to union members. The system becomes more inclusive as it allows for employees of an enterprise that are not union members to be covered by a collective agreement if, for example, centralised negotiations are allowed to take place between coordinated trade unions and multiple employers (such as at the industry level) with the agreement then extended to all employees in the sector.

The structure of trade unions and collective bargaining arrangements varies substantially across the APEC region. In addition, the specific regulations governing collective bargaining within an economy can vary based on industry sector. The share of public and private sector employees that are members of trade unions is highest in China (45 percent) followed by Russia (31 percent) (Figure 5.22). In contrast, less than 10 percent of employees in Indonesia; Malaysia; Peru; the Philippines; and Thailand are union members. The share of employees covered by a collective bargaining agreement is similar to trade union density in most APEC economies given the more exclusive nature of the collective bargaining systems in the region. In Australia, however, although 14.5 percent of employees are union members, 47.1 percent are covered by a collective agreement due to a more inclusive system. Since 2010, half of the APEC members for which there are data have exhibited a slight decline in the trade union density rate, while the other half had an increase, most notably China. The share of employees covered by a collective bargaining agreement has remained somewhat stable in many APEC economies since 2010, although some members, such as Chile and China have registered larger changes.

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[282] J. Kleinberg, J. Ludwig, S. Mullainathan, and C.R. Sunstein, "Discrimination in the Age of Algorithms. *Journal of Legal Analysis* 10 (2018):113–74, https://doi.org/10.1093/jla/laz001

[283] B. Packer, Y. Halpern, M. Guajardo-Céspedes, and M. Mitchell, "Text Embedding Models Contain Bias. Here's Why That Matters," Google Developers Blog, 13 April 2018, https://developers.googleblog.com/2018/04/text-embedding-models-contain-bias.html

[284] J. Dastin, J. (2018, October 10). "Amazon Scraps Secret AI Recruiting Tool that Showed Bias against Women," *Reuters*, 10 October 2018, https://www.reuters.com/article/us-amazon-com-jobs-automation-insight-idUSKCN1MK08G

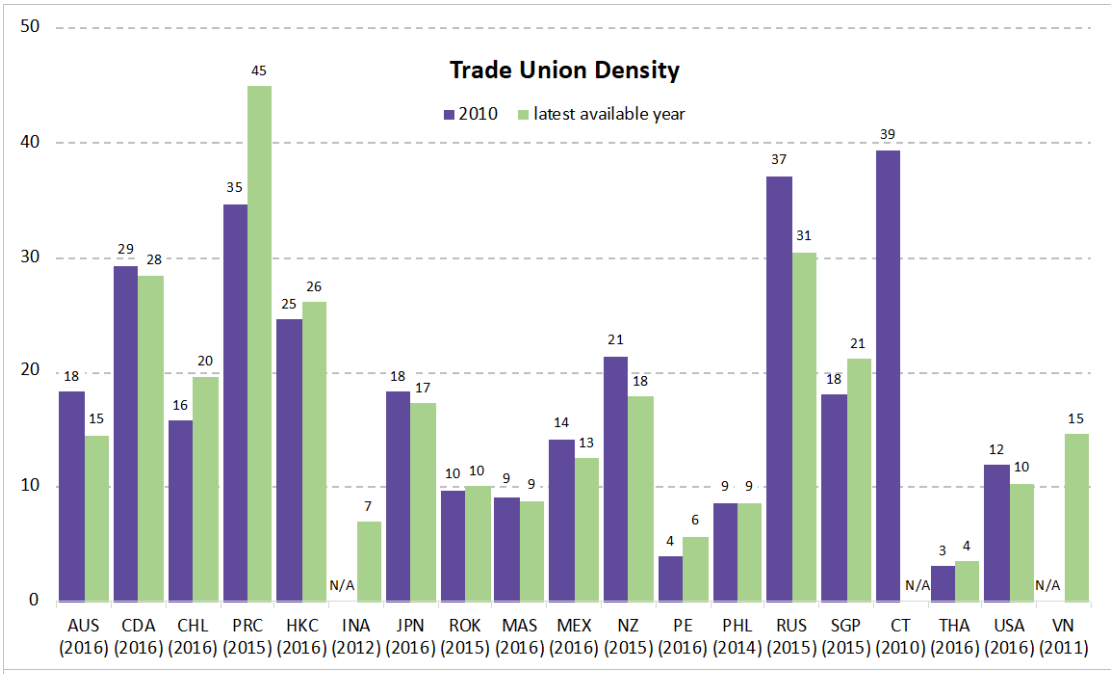
[285] N.T. Lee, P. Resnick, and G. Barton, "Algorithmic Bias Detection and Mitigation: Best Practices and Policies To Reduce Consumer Harms," Brookings, 22 May 2019. https://www.brookings.edu/research/algorithmic-bias-detection-and-mitigation-best-practices-and-policies-to-reduce-consumer-harms/

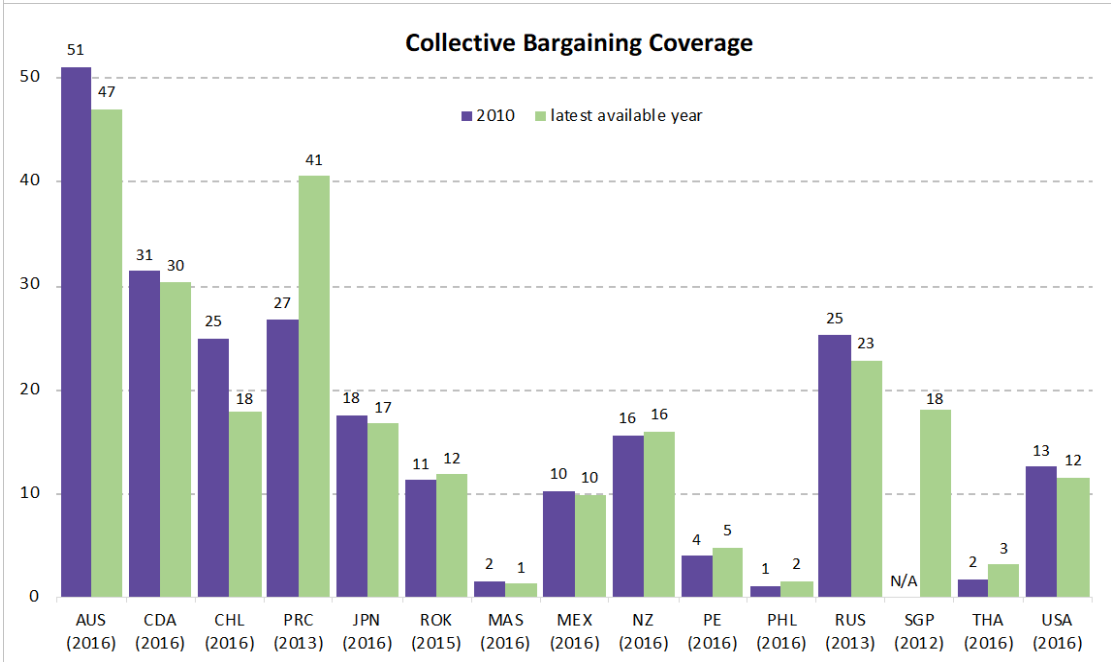
[286] R. Heilweil, "Why Algorithms can be Racist and Sexist," Vox, 18 February 2020, https://www.vox.com/recode/2020/2/18/21121286/algorithms-bias-discrimination-facial-recognition-transparency

[287] B. Uzzi, "A Simple Tactic that Could Help Reduce Bias in AI," *Harvard Business Review*, 4 November 2020, https://hbr.org/2020/11/a-simple-tactic-that-could-help-reduce-bias-in-ai

[288] Eversheds Sutherland, "US House AI Task Force Is the Latest Authority To Address Algorithms and Racism," JD Supra, 13 May 2021, https://www.jdsupra.com/legalnews/us-house-ai-task-force-is-the-latest-3198114/

Figure 5.22 Labour rights, 2010 and latest available year (% of total employees)





Note: Refer to page v of this report for abbreviations for APEC member economies. Trade union density rate conveys the number of union members as a percentage of the total number of employees; it excludes those union members who are not in paid employment (e.g., self-employed, unemployed, retired). Data for INA; CT; and VN are only available for the year shown. Data are not available for BD and PNG. The collective bargaining coverage rate conveys the number of employees whose pay and/or conditions of employment are determined by one or more collective agreements as a percentage of the total number of employees. For MAS, data for 2011 are shown for 2010. Data for SGP are only available for the year shown. Data are not available for BD; HKC; INA; PNG; CT; and VN.
Source: ILOSTAT.

The participation of labour unions is crucial in helping determine skills shortages and identify future skills needs as well as to develop relevant qualification standards and high-quality

training curricula.[289] Trade unions are also strong advocates for improving access to training opportunities, with an emphasis on continuous learning, and there is some evidence to indicate that union membership has a positive impact on training outcomes.[290] In addition, a vast body of research has found that collective agreements compress wage distribution (the ratio between the average wages of the top and bottom 10 percent of earners), with smaller wage differentials as the degree of collective bargaining centralisation increases in an economy.[291] Given the positive impact that unions and collective bargaining agreements have on training opportunities and wage inequality, APEC members could implement policies that support more inclusive systems of industrial relations. Policies could include, for example, regulatory frameworks that allow for more centralised negotiations to take place at the sector level as well as mechanisms to extend the coverage of collective bargaining agreements to all employers in certain sectors.

Although legislation on labour rights may exist, it is also necessary to ensure that those rights are enforced. The International Trade Union Confederation (ITUC) monitors infringements on workers' rights by both employers and governments, such as violations of collective bargaining rights and on the right to strike as well as measures that exclude workers from establishing or joining a trade union. Each year, the ITUC issues a Global Rights Index that assesses the number of breaches and assigns a rating to each economy.[292] Although no APEC members received the best rating of 1, five members – Canada; Japan; New Zealand; Singapore; and Chinese Taipei – received a rating of 2, indicating that although collective labour rights were guaranteed in these economies, there were some instances of labour rights infringements in 2019. On the other hand, 14 other APEC economies received a rating of 3 to 5, which indicates regular or systemic violations of guaranteed labour rights, or the lack of any guarantees of labour rights. In general, there have been a number of recent infractions across the APEC region, suggesting that stronger enforcement of labour rights is required.

5.3.3 Adjusting to remote working arrangements

Lockdowns and stay-at-home measures implemented by governments around the world to reduce the spread of COVID-19 have brought about an increase in remote working arrangements. Although the number of employees engaged in remote work on a part-time and full-time basis has been gradually increasing over the years, the pandemic has drastically accelerated the adoption of remote work by employers (Box 5.4). Remote work has also been enabled by the recent increase in Internet broadband speeds and access across the APEC region (Figure 5.23).

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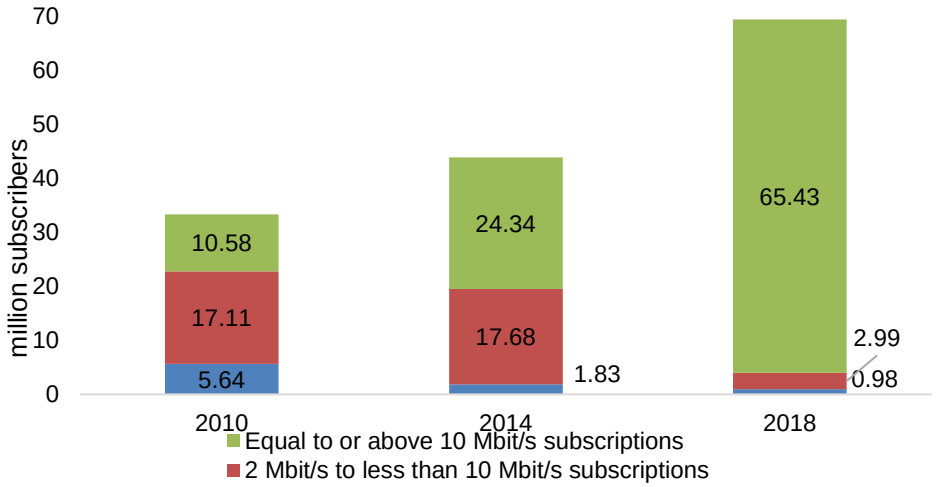
[289] For more discussion, see WEF, "Global Agenda Council on Employment: Matching Skills and Labour Market Needs: Building Social Partnerships for Better Skills and Better Jobs, Davos-Klosters, Switzerland 22–25 January," (WEF, 2014), https://www.weforum.org/reports/matching-skills-and-labour-market-needs-building-social-partnerships-better-skills-and-better-jobs

[290] A study examining the period 2001–2013 in the United Kingdom found that union members were a third more likely to have received training in the previous three months than non-union employees. The researchers also found that organisations with a union presence, and especially those with union involvement in training decisions, had higher overall levels of training. See M. Stuart, D. Valizade, and I. Bessa, "Skills and Training: The Union Advantage – Training, Union Recognition and Collective Bargaining," Research Paper 21, Centre for Employment Relations, Innovation and Change at Leeds University Business School, Leeds, May 2015, https://www.tuc.org.uk/sites/default/files/Skils_and_training.pdf

[291] For a detailed review of the literature on the relationship between trade unions, collective bargaining agreements, and wage inequality, see S. Hayter, "Unions and Collective Bargaining," in *Labour Markets, Institutions and Inequality: Building Just Societies in the 21st Century*, ed. Janine Berg (Edward Elgar Publishing, 2015), 95–122, https://www.ilo.org/global/publications/books/WCMS_314464/lang--en/index.htm

[292] Ratings range from a best score of 1 (collective labour rights are guaranteed) to a worst score of 5 (collective labour rights are not always guaranteed).

Figure 5.23 Speed of fixed broadband subscriptions in APEC, 2010–2018



Note: There are data gaps for Brunei Darussalam; Indonesia; Korea; Papua New Guinea; Peru; and the Philippines.

Source: APEC, "Managing the Long-term Economic Effects of the Flexible Work Arrangements: APEC Practices and Recommendations" (Singapore: APEC, 2021), https://www.apec.org/-/media/APEC/Publications/2021/5/Managing-the-Long-term-Economic-Effects-of-the-Flexible-Work-Arrangements/221_EC_Managing-the-Long-term-Economic-Effects-of-the-Flexible-Work-Arrangements.pdf

Remote work provides several advantages. In the context of a pandemic, it has proved to be an important aspect of business continuity, enabling employees to carry out tasks from home to reduce exposure risks to an airborne disease. Under normal circumstances, benefits to remote work include reduced commuting time, increased opportunity for workers to focus on their tasks without workplace distractions, and better work-life balance.

However, remote work may also have certain liabilities. Workers may feel isolated, particularly those that live alone. The lack of a clear structure may lead to overwork, as workers dip in and out of work, even outside of regular office hours. Over a protracted period, these factors may negatively affect an individual's mental wellbeing and cause burnout. For workers who do not have a conducive work environment at home – e.g., parents with young children, or those living in areas with a high volume of background noise – productivity may also decrease. Additionally, the loss of contact with fellow employees may reduce opportunities to build a workplace culture.

To mitigate negative impacts associated with remote working arrangements, firms and managers will have to adapt their practices to ensure employee wellbeing and continued productivity. The ILO identifies five areas that need to be addressed: time sovereignty, results-based management, skills and training, community, and communication.[293]

Time sovereignty refers to enabling remote workers to manage their working time, rather than trying to replicate the regimented system of office-based work. This allows workers to work at a time and location that is most convenient for them to be productive. This implies that a results-based management approach should be adopted. Objectives, tasks and timelines should be identified, followed by monitoring and discussing progress without overly burdensome

[293] ILO, "Practical Guide on Teleworking during the COVID-19 Pandemic and Beyond" (Geneva: ILO, 2020).

reporting requirements, while also factoring in work–life balance such as for those living with dependents. Remote working arrangements will require appropriate skills and tools; as such, firms could provide access to appropriate equipment such as laptops and applications for remote working and communication, while also providing tech support and training at all levels of the organisation.

Given the risks of social isolation associated with remote working, firms need to make efforts to help remote workers stay connected with colleagues. Firms could introduce informal opportunities for workers to connect, such as large-scale online social events or lunchtime calls with team members. Firms should also focus on internal communication: research has shown that teams that work remotely face more significant communication challenges than face-to-face teams.[294] Workers tend to share less information with their colleagues when communicating via electronic means and may face difficulties in interpreting and understanding the information they receive. Thus, managers and workers need to ensure that communication is effective and provide a continuous flow of information.

Policy has a key role in ensuring a smoother adjustment to remote working arrangements. Apart from ensuring access to digital skills, technology and infrastructure, economies need to eliminate cultural and regulatory barriers to the adoption of flexible work arrangements. This includes promoting the right to work remotely even after the COVID-19 pandemic. Cross-border remote working arrangements could also be supported through tax treaties and portability of social protection and retirement benefits. Likewise, policies that ensure work–life balance (e.g., right to disconnect), workers' privacy, and cybersecurity can help economies find the right balance between improving productivity and ensuring workers' welfare under remote working arrangements.[295]

Box 5.4 Remote work after COVID-19

Prior to the COVID-19 pandemic, remote work was limited in scope and scale, as companies were concerned over its impact on productivity and corporate culture. The potential for remote work was also limited and concentrated in several professional sectors such as information and technology, finance, management and consulting.

However, lockdowns and safe distancing measures to minimise the spread of COVID-19 have increased the scale and frequency of remote working. The crisis has likely accelerated an underlying pre-pandemic trend for remote workplaces. This trend includes the adoption of remote working labour contracts, gig workers, and digital talent platforms.

Data collected from the Online Labour Index indicates that, on the whole, there has been an increase in both labour demand and supply for work on online-based platforms between 2017 and 2020. From mid-April to June 2020, demand for such work increased due to the COVID-

[294] ILO, "Practical Guide."

[295] APEC, "Managing the Long-term Economic Effects of the Flexible Work Arrangements: APEC Practices and Recommendations" (Singapore: APEC, 2021), https://www.apec.org/-/media/APEC/Publications/2021/5/Managing-the-Long-term-Economic-Effects-of-the-Flexible-Work-Arrangements/221_EC_Managing-the-Long-term-Economic-Effects-of-the-Flexible-Work-Arrangements.pdf; OECD, "Productivity Gains from Teleworking in the Post COVID-19 Era : How Can Public Policies Make It Happen?" Updated 7 September 2020, https://www.oecd.org/coronavirus/policy-responses/productivity-gains-from-teleworking-in-the-post-covid-19-era-a5d52e99/

19 pandemic, while labour supply has been rising faster than demand.[296] Additionally, online talent solution company Upwork conducted a study of the US workforce in 2020 and found that more professionals are freelancing full-time: the share of independent professionals increased to 36 percent in 2020, up 8 percentage points since 2019.[297]

The forced shift to a remote workspace due to the pandemic is likely to have several lasting effects. Companies are more likely to allow existing employees to work remotely. A survey of executives from the information and technology sector conducted in 2020 found that 34 percent of respondents expect to have at least one-tenth of their employees working remotely for at least two days a week after COVID-19, compared with 22 percent of executives surveyed before the pandemic. Moreover, 85 percent of respondents said that their businesses have somewhat or greatly accelerated the implementation of technologies that digitally enable employee interaction and collaboration.[298] Notably, a separate survey on the long-run post-pandemic remote workforce indicated that 82 percent of respondents anticipate a moderate to significant increase in virtual work.[299]

The growing trend of remote workplaces comes with challenges. Companies will have to restructure how their workforce is managed, choosing which employees and roles are best suited to remote work. Physical workplaces will also have to be reconfigured. With workers working partly remotely and partly in person, shared desk spaces or co-working facilities may increase. There will also be greater demand on resource management and training for deployment of new technologies that facilitate this shift.

The demand for a remote workforce has also created a shift toward a blended workforce model. Over the last decade, a proliferation in digital technology platforms has allowed companies to experiment with hiring freelancers or gig workers. Since 2009, the number of digital talent platforms has grown from 80 to more than 330 worldwide.[300] Work arrangements for highly skilled freelancers range from long to short-term, tactical and strategic, and generalised and specialised. A remote workplace also enables companies to reduce costs by hiring freelancers from economies where labour costs are lower.

Digital talent platforms present an opportunity for firms to find top talent for hard-to-fill positions. For highly skilled workers, these arrangements provide greater flexibility in staying productive in the workforce while managing work–life priorities. However, companies will have to address challenges from a blended workforce model. Managers will have to develop new skills to lead teams remotely, redefining work and tasks into discrete components that could be handled by internal or external workers. Changes will have to be made to organisational policies and processes to allow for teams to integrate temporary workers.

[296] ILO, "World Employment and Social Outlook 2021: The Role of Digital Labour Platforms in Transforming the World of Work" (Geneva: ILO, 2021), https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_771749.pdf
[297] Upwork, "Freelance Forward 2020," 2020, https://www.slideshare.net/upwork/freelance-forward-2020
[298] S. Lund, et al., "What 800 Executives Envision for the Postpandemic Workforce," McKinsey & Company, 23 September 2020, https://www.mckinsey.com/featured-insights/future-of-work/what-800-executives-envision-for-the-postpandemic-workforce
[299] M. Dickmann and B. Bader, "Now, Next and Beyond: Global Mobility's Response to COVID-19" (The RES Forum, 2020), https://theresforum.com/wp-content/uploads/2020/07/RES20-EY-RES-Forum-Report-Issue-1-12.pdf
[300] J. B. Fuller, et al., "Building the On-demand Workforce" (Harvard Business School and BCG, 2020), https://www.hbs.edu/managing-the-future-of-work/Documents/Building_The_On-Demand_Workforce.pdf

5.4 ADDRESSING CROSS-BORDER ISSUES

As an international forum, APEC is well-placed to address many of the cross-border issues that have arisen due to the megadrivers driving the future of work. Globalisation, in particular, has transformed the way in which businesses operate. While this has opened many opportunities for both businesses and consumers, it has also given rise to a greater number of cross-border business disputes, greater opportunities for businesses to avoid corporate taxes, and greater attention on the barriers to international labour mobility. This section will explore several areas in which APEC could play a role, including (1) promoting greater international labour mobility by reducing regulatory barriers and improving the international portability of social security benefits; (2) updating tax rules to help prevent cross-border corporate tax avoidance; and (3) improving mechanisms to resolve cross-border commercial disputes, especially for MSMEs and workers.

5.4.1 Promoting international labour mobility

As discussed earlier, the labour markets of many APEC economies are experiencing skills imbalances, which may be more acute in certain industries. To help address this issue, members could identify which industries are most constrained due to a lack of domestic candidates with the appropriate skills to fill roles so as to allow for more foreign entrants. Reducing regulatory barriers on services trade in those industries – such as measures on visa restrictions, employment and residency requirements, and recognition of foreign qualifications – can help to mitigate the skills gap in an economy. Box 5.5 summarises a case study submitted by Chinese Taipei that discusses recent regulatory reforms in order to attract more foreign professional talent to the economy.

Box 5.5 Reducing barriers to promote foreign talent in Chinese Taipei

Like many economies, Chinese Taipei found its talent shortage growing increasingly serious in the face of a domestic brain drain and intense competition for external talent, while lacking sufficient incentives to attract foreign professional talent. Although several policies aimed at attracting foreign talent had already been implemented along with significant regulatory easing, foreign workers still faced restrictions on matters concerning visas, employment, residency, insurance, retirement and taxation.

To address this issue, Chinese Taipei drafted the Act for the Recruitment and Employment of Foreign Professionals, which came into force in 2018. The Foreign Professionals Act relaxes regulations on visas, employment and residency, as well as optimises insurance, tax and retirement benefits offered to foreign professionals in order to create a friendlier work and residence environment.

Key features of the Foreign Professionals Act are as follows:

- Provides a range of favourable treatment measures targeted at workers with specialised knowledge and skills in the fields of science and technology, economy, education, culture and the arts, sports, finance, law, and architectural design. Measures include issuing these ‘foreign special professionals’ with an Employment Gold Card, valid for one to three years, which allows holders to freely seek, take up and change employment. Other measures

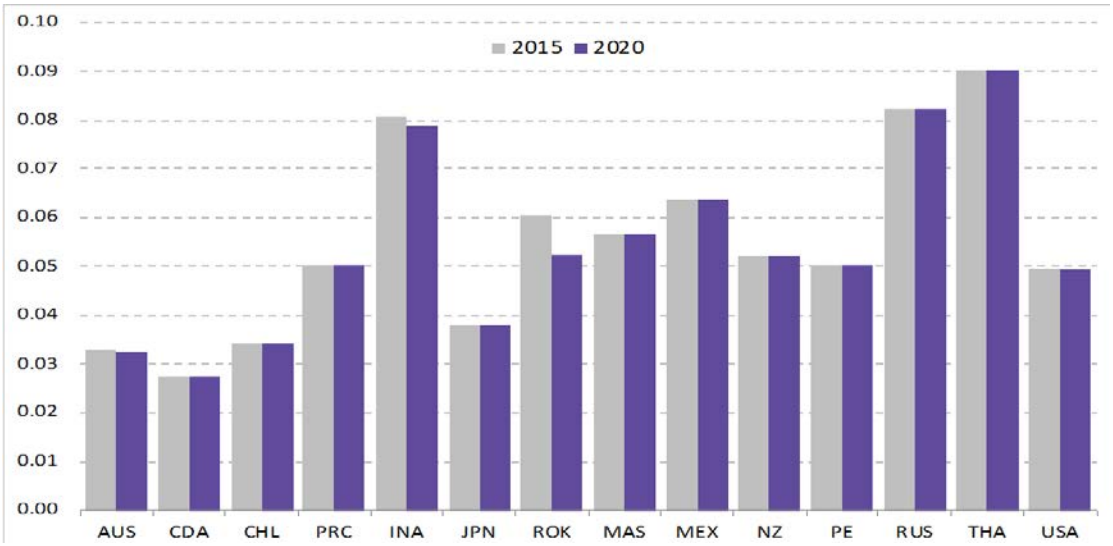
include offering tax benefits, bolstering retirement protections, and relaxing visa conditions and limits on inclusion in the health insurance system for their family members.
- Offers employment-seeking visas to ordinary foreign professionals to make it easier for them to find jobs.
- Allows foreign arts workers to undertake commissions and creative work and allows foreign teachers with specialised knowledge or skills to work at cram schools.
- Establishes the one-stop Foreign Professionals Online Application Platform to streamline administrative procedures and increase user convenience. Also establishes an integrated online–offline talent recruitment website portal to present relevant information and provide a dedicated consulting service.

As of the end of June 2021, the Employment Gold Card had been issued to 2,878 foreign special professionals. Professionals in the economic field accounted for 64.7 percent of the total, followed by those in science and technology (13.8 percent) and in finance (7.6 percent). A number of these recipients include internationally renowned experts, industry leaders and entrepreneurs. As of the end of May 2021, approval had been granted for the employment of 2,321 foreign special professionals; 221 people had obtained employment-seeking visas; work permits had been issued to 203 freelance artists; and a number of work permits and permit residency approvals had been granted to family members of foreign professionals.

In order to strengthen the recruitment and retention of foreign professionals and young international talent, Chinese Taipei has amended the Foreign Professionals Act to further relax regulations on employment and residency as well as to enhance other benefits such as the tax inducements and social security provisions. The Amendments are expected to be enforced before the end of 2021.

Services trade regulations on the movement of people include labour market tests and quotas, limits on the duration of stay, and recognition of foreign qualifications. Examining data from the OECD's Services Trade Restrictiveness Index, regulatory barriers on labour mobility across 22 services sectors are lowest in Canada and highest in Thailand (Figure 5.24). In half of the APEC economies that are included in the Services Trade Restrictiveness Index, restrictions on the movement of people contribute the second highest share to overall services trade restrictiveness after regulations on foreign ownership. Professional services, such as legal services, architecture, engineering, accounting, and computer services, tend to face the most restrictive policies across the APEC region compared with other services sectors. Except for Korea, no APEC economy that is included in the Services Trade Restrictiveness Index has made significant progress in removing regulatory barriers on the movement of people in services trade between 2015 and 2020.

Figure 5.24. Services trade restrictions on movement of people, 2015 & 2020 (score)



Note: Refer to page v of this report for abbreviations for APEC member economies. Restrictions on movement of people include information on quotas, labour market tests, and duration of stay for foreign natural persons providing services as intra-corporate transferees, contractual service suppliers, or independent service suppliers. These categories are covered by the GATS and have in common that the natural persons do not seek employment in the host economy. This policy area also contains information on recognition of foreign qualifications in regulated professions. Scores range from 0 to 1; the higher the score, the more restrictive. Data shown are the simple average of the scores across 22 services sectors in each economy. Data are available only for the 14 APEC members shown.
Source: OECD Services Trade Restrictiveness Index (STRI); APEC PSU calculations.

While there are obvious practical barriers to increasing international labour mobility, not least of which are language barriers, improving the regulatory environment so that workers with in-demand skills can fill roles more easily is an important step toward improving labour market imbalances in an economy. One major barrier to greater trade in professional services involves the recognition of qualifications obtained in another economy. Most APEC economies have laws or regulations that establish a process for recognising qualifications that have been gained abroad, although this can vary by sector. For example, all APEC economies for which there are data have processes in place to recognise foreign qualifications in architecture and engineering services, while less than half have one for insurance brokers. Across the 14 APEC members for which there are data, Mexico and Peru have laws or regulations establishing a process to recognise qualifications earned abroad in the greatest number of services sectors.

There are opportunities for regulatory cooperation among APEC members in relation to qualification standards. These would normally take the form of greater mutual recognition of the qualifications earned abroad that are most relevant in certain services sectors as well as information and knowledge exchange to develop high quality standards across the APEC region. For instance, together with business involvement, members could work toward creating some common minimum standards in relation to technical skills qualifications and assessments in order to enhance mutual recognition, thereby improving the mobility of professionals across the region. Efforts such as these could also be linked to capacity-building initiatives that aim to develop standards of excellence in teaching through better alignment of curricula with occupational standards so as to strengthen educational institutions across the APEC region.

Another important aspect to promote international labour mobility is to ensure social security protections for workers that are employed in multiple jurisdictions over the course of their

lifetime. Migrant workers sometimes find that they are ineligible for social security benefits due to requirements on the number of contributions or on the minimum period of residency, particularly for long-term benefits such as old-age pensions in contributory systems. Cross-border portability of social security benefits would allow workers to maintain and transfer acquired social security entitlements from one economy to another. International social security agreements are typically the instrument used to establish portability of benefits between economies. These bilateral or multilateral treaties have two main purposes: (1) to eliminate dual social security contributions on the same earnings and (2) to totalise social security coverage periods earned between economies in order to establish benefit entitlement.

A study in 2021 estimates that just 23.3 percent of migrant workers, mainly in developed economies, were covered by bilateral social security arrangements in 2013.[301] As Table 5.5 illustrates, there is certainly scope to expand social security agreements among APEC members. Canada has the most social security agreements with other APEC members (10), followed by Korea (9). Several members, including Indonesia; Malaysia; Papua New Guinea; Thailand; and Viet Nam, do not have any bilateral social security agreements, while Russia does not have one with another APEC economy. Although coordinating between the social security systems of two economies can be complex, APEC members are encouraged to explore bilateral social security agreements with other members in order to ensure that the increasing number of migrant workers within the APEC region are covered by social security protections.

Table 5.5 Social security agreements between APEC members

	AUS	BD	CDA	CHL	PRC	HKC	INA	JPN	ROK	MAS	MEX	NZ	PNG	PE	PHL	RUS	SGP	CT	THA	USA	VN
AUS			✓	✓				✓	✓			✓								✓	
BD																					
CDA	✓			✓	✓			✓	✓		✓	✓		✓	✓					✓	
CHL	✓		✓						✓					✓						✓	
PRC			✓					✓	✓												
HKC																					
INA																					
JPN	✓		✓		✓				✓						✓					✓	
ROK	✓		✓	✓	✓			✓				✓		✓	✓					✓	
MAS																					
MEX			✓																		
NZ	✓		✓						✓												
PNG																					
PE			✓	✓					✓												
PHL			✓					✓	✓												
RUS																					
SGP																					
CT																					
THA																					
USA	✓		✓	✓				✓	✓												
VN																					

Note: Refer to page v of this report for abbreviations for APEC member economies. This table shows the bilateral social security agreements in effect as of 11 May 2021 between APEC members. The Korea–New Zealand and Korea–Philippines social security agreements were recently signed and are not yet in effect. The Canada-China and Japan-Korea social security agreements eliminate dual contributions only.
Source: Compiled by APEC PSU using information publicly available on relevant government agency websites.

[301] R. Holzmann and J. Wels, "The Cross-Border Portability of Social Security Benefits: Status and Progress," *International Social Security Review* 73, no.1 (2020): 65–97.

5.4.2 Updating tax rules to prevent cross-border corporate tax avoidance

Along with the changing nature of work is the changing nature of firms. As economies become increasingly more globalised and digitalised, boundaries continue to expand, thereby enabling firms to grow even faster and larger. However, this has also given rise to a number of policy challenges, one of which is that it has become easier for firms to improperly avoid corporate income taxes. While the practice of multinational enterprises transferring earnings from affiliates in high-tax economies to those in low-tax economies in order to lower worldwide tax liability is not, in itself, tax avoidance, some such practices (sometimes referred to as 'tax base erosion' or 'profit shifting"') are abusive or otherwise improper and, thus, constitute tax avoidance. The OECD estimates that tax base erosion and profit shifting causes an annual loss of up to USD 240 billion in revenue, which is equivalent to around 10 percent of global corporate tax revenue.[302] This practice has a disproportionately large negative impact on developing economies given their greater reliance on corporate income taxes due to their large informal sectors and resource constraints that limit their ability to enforce a broad tax base.[303]

It is important that economies take steps to modernise tax rules and help prevent cross-border corporate tax avoidance. For instance, by strengthening anti-tax avoidance rules as well as regulations on transfer pricing, economies can close some of the gaps in tax policies that make profit shifting possible. It is, however, sometimes difficult for developing economies to implement and enforce a complex suite of anti-tax avoidance rules due to a lack of capacity. Bilateral tax treaties and tax information exchange agreements also include provisions, such as cooperation on the exchange of information, that seek to prevent corporate tax evasion and avoidance.

However, given the global nature of profit shifting, tackling corporate tax avoidance effectively requires a global response. There are a number of international tax cooperation instruments that aim to prevent firms from exploiting gaps and mismatches in tax rules. Most notably, the OECD/G20 Inclusive Framework on Base Erosion and Profit Shifting (BEPS) intends to update international tax rules for a global and digitalised economy while improving coordination across economies. The outputs of the BEPS Project in 2015 consisted of 15 actions, four of which are minimum standards that all members of the Inclusive Framework commit to implement and which are subject to peer review. The minimum standards are (1) eliminating harmful tax practices and improving transparency; (2) incorporating tax treaty provisions to prevent treaty abuse; (3) requiring large multinational enterprises to prepare an economy-by-economy report for use in transfer pricing risk assessments; and (4) making dispute resolution between jurisdictions more timely, effective and efficient.

Action 15 of the Inclusive Framework on BEPS concerns the Multilateral Convention to Implement Tax Treaty Related Measures to Prevent BEPS (Multilateral Instrument, or MLI), which allows governments to close loopholes in existing tax treaties by transposing the treaty anti-avoidance rules into bilateral tax treaties worldwide. Table 5.6 highlights the current status of APEC members with respect to their participation in the Inclusive Framework on BEPS and the Multilateral Instrument. In general, APEC members have made much progress in implementing the minimum standards of the Inclusive Framework, although there is still work to be done. Importantly, the MLI is currently in force in just 10 APEC economies, while a

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[302] OECD, "Inclusive Framework on Base Erosion and Profit Shifting (BEPS)," accessed 5 July 2021, https://www.oecd.org/tax/beps/

[303] E. Crivelli, R. de Mooij, and M. Keen (2016). "Base Erosion, Profit Shifting and Developing Countries", FinanzArchiv Public Finance Analysis 72, no. 3 (2016): 268–301.

further five members have signed the Convention. Following the 2020 Ministerial Meeting, APEC Finance Ministers strongly reaffirmed their commitment to promoting tax certainty and tackling tax avoidance and evasion in the APEC region and also stressed the importance of the OECD/G20 Inclusive Framework on BEPS to continue advancing the work on the tax challenges arising from digitalisation.[304]

Table 5.6. OECD/G20 Inclusive Framework on Base Erosion and Profit Shifting (BEPS), current status of APEC members

Economy	Inclusive Framework on BEPS Membership	Multilateral Instrument (MLI)
Australia	✓	in force
Brunei Darussalam	✓	
Canada	✓	in force
Chile	✓	in force
China	✓	signed
Hong Kong, China	✓	signed
Indonesia	✓	in force
Japan	✓	in force
Korea	✓	in force
Malaysia	✓	in force
Mexico	✓	signed
New Zealand	✓	in force
Papua New Guinea	✓	signed
Peru	✓	signed
The Philippines		
Russia	✓	in force
Singapore	✓	in force
Chinese Taipei		
Thailand	✓	
United States	✓	
Viet Nam	✓	

Note: Status as of 29 June 2021. Thailand has expressed intent to sign the MLI. Although Chinese Taipei is not a member of the BEPS Framework, it has committed to implementing the BEPS minimum standards and performs self-assessments of its position by referencing the practice of those jurisdictions that participate in the MLI.
Source: OECD, "Inclusive Framework on Base Erosion and Profit Shifting (BEPS)," accessed 5 July 2021, https://www.oecd.org/tax/beps/

[304]APEC, "2020 APEC Finance Ministers' Meeting: APEC Virtual Finance Ministerial Statement on Mitigation and Recovery of COVID-19 Pandemic," 25 September 2020, https://www.apec.org/Meeting-Papers/Sectoral-Ministerial-Meetings/Finance/2020_finance

5.4.3 Improving mechanisms to resolve cross-border disputes

The rise in globalisation and international trade has also given rise to an increasing number of cross-border commercial disputes. These disputes can range from disputes on the sale of goods, such as product quality issues, to disputes on major infrastructure projects, such as work not being completed within the time stipulated in the contract, to disputes on the registration and use of Internet domain names. Commercial arbitration, which avoids litigation through court proceedings, is the primary dispute resolution mechanism in international trade, especially for large transactions.[305] Legislation based on the United Nations Commission on International Trade Law (UNCITRAL) Model Law on International Commercial Arbitration has been adopted in 17 APEC economies, thereby helping to facilitate the resolution of commercial disputes across the region.[306]

However, small businesses often find commercial arbitration procedures to be complicated, time-consuming and costly. Alternative dispute resolution mechanisms, such as mediation, are typically more suitable for the low-value disputes that are common among MSMEs. In a recent study commissioned by the APEC Business Advisory Council (ABAC), 58 percent of survey respondents considered the lack of effective dispute resolution mechanisms to be a 'major' or 'severe' problem for MSMEs in the region.[307] Given the rise in international e-commerce, and the resulting difficulties that MSMEs can face in conducting complex contract negotiations and in accessing commercial justice across borders, APEC could pioneer the use of digital technologies to resolve cross-border business disputes.

Online dispute resolution (ODR) improves access to commercial justice for MSMEs as ODR offers an effective and convenient dispute resolution mechanism for transacting parties to resolve cross-border disputes online. ODR makes cross-border e-commerce transactions more efficient, reduces transaction costs in resolving disputes, and thereby lowers the barriers of MSMEs to engage in global business transactions and enhances their business opportunities. A study by LawtechUK Feasibility Study and Proof of Concept on Using Online Dispute Resolution to Tackle SME Late Payment Crisis[308] outlines the potential of ODR as an affordable and easy-to-use alternative to the court system for smaller businesses to recover unpaid debts in view of the disruptions brought by COVID-19 to the justice system.

The APEC Collaborative Framework on Online Dispute Resolution of Cross-Border Business to Business Disputes and Model Procedural Rules initiative is designed to provide MSMEs with a convenient, efficient and low-cost method to resolve low-value business-to-business (B2B) cross-border disputes electronically through three phases: negotiation, mediation and

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[305] International Trade Centre (ITC), "Settling Business Disputes: Arbitration and Alternative Dispute Resolution, 2nd ed," (Geneva: ITC, 2016), https://www.intracen.org/publication/Settling-Business-Disputes-Arbitration-and-Alternative-Dispute-Resolution---2nd-ed/

[306] APEC members yet to adopt the UNCITRAL Model Law on International Commercial Arbitration are Indonesia; Papua New Guinea; Chinese Taipei; and Viet Nam, while the adoption varies by state in the United States. See United Nations Commission on International Trade Law (UNCITRAL), "Status: UNCITRAL Model Law on International Commercial Arbitration (1985), with amendments as adopted in 2006," accessed 5 July 2021, https://uncitral.un.org/en/texts/arbitration/modellaw/commercial_arbitration/status

[307] APEC Business Advisory Council (ABAC and University of Southern California, Marshall School of Business, "Realizing the Untapped Potential of MSMEs in APEC: Practical Recommendations for Enhancing Cross-Border Trade" (Manila: ABAC, 2018), https://www2.abaconline.org/assets/2018/ABAC_Research/ABAC_IV_Marshall_School_Final_Report_MSMEs_trade_11132018_compressed.pdf

[308] LawtechUK (March 2021), "Using Online Dispute Resolution to Tackle SME Late Payment Crisis – LawtechUK Feasibility Study and Proof of Concept": https://resources.lawtechuk.io/files/SME_ODR-LawtechUK_feasibility_study.pdf

arbitration. Currently, five APEC member economies, China; Hong Kong, China; Japan; Singapore; and the United States, have opted–in to the APEC ODR Framework, while a number of other member economies are undergoing internal consultations with a view to opting-in to the APEC ODR Framework in the near future. Online platforms which partner with existing ODR providers that will comply with the APEC ODR Framework, including mediation and arbitration centres, are currently being developed in the following participating economies: Chile; China; Hong Kong, China; Japan; Thailand; and the United States. Other APEC members are encouraged to join the ODR pilot programme. By improving alternative dispute resolution mechanisms in the region so that cross-border disputes can be resolved quickly, affordably, and fairly, APEC will help to improve the regional trading environment, especially for MSMEs.

A key gap in the cross-border dispute resolution infrastructure relates to labour. With the proliferation of digital technology and opportunities for remote working arrangements, there have been an increasing number of labour contracts and relationships where the employee is in one economy and the employer is in another.[309] One example of this is the consultancy contracts often done between firms – including international organisations – and self-employed consultants based in another economy. Another example is labour done through digital platforms where the customer and service provider are in different jurisdictions. In these situations, there is little recourse for the worker in case of dispute with the employer apart from writing persuasive letters or leaving poor feedback ratings (in the case of digital platforms). Workers in these situations cannot seek recourse from domestic courts as the employer is in another jurisdiction, while seeking redress abroad could be too prohibitive. Currently, there is little coordination and harmonisation on cross-border labour contracts covering taxation and revenue realisation, benefits and social protection, and governing law and venue. The trend towards cross-border, digitally enabled work will only continue, and economies need to consider adapting current institutions or developing new ones to ensure workers' rights to decent work and fair compensation across borders.[310]

5.5 PROMOTING TRIPARTISM IN APEC

The International Labour Organization (ILO) defines tripartism as the principle of 'dialogue and cooperation between governments, employers, and workers'.[311] Each sector acts as a partner and an advocate, openly discussing the benefits and costs of economic policies through cooperation, consultation, negotiation and compromise.[312] In practice, government is represented by one or more ministries, workers are usually represented by trade unions, while employers are represented by employers' organisations. These stakeholders collaborate to form tripartite agreements on various policies including wages, benefits, vacation, safety and working conditions.

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[309] J. Berg, et al., "Working Conditions on Digital Labour Platforms: Opportunities, Challenges, and the Quest for Decent Work," VoxEU, 20 September 2019, https://voxeu.org/article/working-conditions-digital-labour-platforms

[310] ILO, "Policy Responses to New Forms of Work: International Governance of Digital Labour Platforms" (Background paper prepared for the 2nd meeting of the G20 Employment Working Group, Tokyo, Japan, 22–24 April 2019), https://www.ilo.org/global/about-the-ilo/how-the-ilo-works/multilateral-system/g20/reports/WCMS_713378/lang--en/index.htm

[311] ILO, "International Labour Standards on Tripartite Consultation," accessed 21 June 2021, https://www.ilo.org/global/standards/subjects-covered-by-international-labour-standards/tripartite-consultation/lang--en/index.htm

[312] H.J. Wiarda, *Corporatism and Comparative Politics: The Other Great "Ism."* (M.E. Sharpe, 1997).

Tripartism provides a distinct advantage: by having delegates to directly represent the views of government, workers and employers, it provides a connection with policy and economic reality that cannot be reproduced when only two of the parties are in the discussion. The involvement of workers and employers can lead to better governance and a greater culture of awareness in policymaking on wider social and economic issues. There is empirical evidence to indicate that tripartism has made economic reforms more equitable and politically sustainable. Tripartism has also helped economies reconcile economic and social goals.[313]

A key international convention to promote the implementation of tripartism is the Tripartite Consultation (International Labour Standards) Convention, 1976 (No. 144). This ILO convention has been ratified or adopted into practice by 18 APEC economies.[314] Given the heterogeneity within APEC economies, tripartism is implemented in various ways. For example, in the Philippines, tripartite councils are established based on industry and geographical region, and the Department of Labor and Employment actively promotes the creation of Industry Tripartite Councils.[315] In Singapore, tripartite partners include a confederation of trade unions in the industrial, service and public sectors and a trade union of employers.[316] In their Individual Economy Reports, New Zealand and Singapore have pointed to the importance of tripartite consultations in promoting dialogue, developing structural reforms and building capabilities related to the future of work. In fact, New Zealand has established a Future of Work Tripartite Forum that provides a space for discussion on 'future of work' issues between government, and workers' and employers' representatives. The Tripartite Forum discusses issues such as protection for contractors, lifelong learning, and in-work training, with social unemployment insurance and industry transformation plans among its priority areas to address future of work challenges.[317]

While tripartism is adopted in most APEC member economies, APEC itself does not adopt a tripartite approach in discussing economic policies that have an impact on employment issues. APEC meetings are attended by government officials from member economies, while the private sector is represented by the APEC Business Advisory Council (ABAC). In its current structure, there is no space or voice for workers in economic policy discussions in APEC, even on issues that directly impact their jobs and economic security.

APEC's close partnership with private-sector stakeholders has been very beneficial for both the forum and the development of economic policy. Important APEC initiatives like the Free Trade Area of the Asia-Pacific (FTAAP) had their beginnings from ABAC. ABAC has contributed valuable insights through its research and regular letters to Ministers and Leaders, including calls for greater inclusion and addressing growing inequality.

Applying tripartism in the APEC forum would be a way of putting these calls to practice. No matter how well-intentioned government officials and employers are when devising policy tracts to promote inclusive growth, there will always be blind spots without actual worker representation.

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[313] L. Fraile, ed., *Blunting Neoliberalism: Tripartism and Economic Reforms in the Developing World* (Palgrave Macmillan and ILO, 2010).

[314] ILO, "Ratifications of ILO Conventions: Ratifications by Convention," accessed 21 June 2021, https://www.ilo.org/dyn/normlex/en/f?p=NORMLEXPUB:11300:0::NO::P11300_INSTRUMENT_ID:312289

[315] Bureau of Labor Relations, "Tripartism (TIPC and ITC)," 2017, https://blr.dole.gov.ph/wp-content/uploads/2017/10/tripartismandsocialdialogues.pdf

[316] Ministry of Manpower, Singapore, "Tripartism in Singapore," accessed 23 June 2021, https://www.mom.gov.sg/employment-practices/tripartism-in-singapore

[317] Ministry of Business, Innovation and Employment, New Zealand, "Future of Work Tripartite Forum," updated 20 January 2021, https://www.mbie.govt.nz/business-and-employment/employment-and-skills/future-of-work-tripartite-forum/

APEC's work at the Policy Partnership on Women and the Economy (PPWE), for example, highlights the importance of elevating women's leadership in economic policy discussions. Women need to be represented in economic policy discussions as they bring different experiences and interests to the table, and the importance of representation is recognised in the La Serena Roadmap for Inclusive Growth.

In the context of the future of work, APEC can consider a tripartite approach in economic policy discussions that affect workers. As seen in Chapter 2, experience shows that workers are affected by economic policy decisions on trade, investment and digitalisation. Inequality has increased in part because globalisation and technological change have reduced the bargaining power of labour. And as with other vulnerable groups, workers have experiences and interests that are not understood and cannot be properly articulated by government or the business sector.

Ensuring that the labour sector has a seat at the table along with the private sector will not only improve equity in economic policy discussions, but it will also concretise APEC's stated goals for greater inclusion.

6. SUMMARY AND RECOMMENDATIONS

Technological advancement is an integral part of human advancement. The control of fire improved early humans' physical security and access to nutrition, while the invention of agriculture led to the rise of civilisations and institutions. More recently, the exponential development of digital technologies has enabled access to millennia of scientific knowledge and human wisdom at the touch of a screen. History has clearly shown that humanity benefits from more, rather than less, technology. However, just like fire, technology can have destructive impacts if utilised malevolently or recklessly. The same civilisations and institutions advanced by agriculture also took advantage of slavery and serfdom, while digital technology has enabled the proliferation and mainstreaming of misinformation, pseudoscience and conspiracy theories.

The four megadrivers of change discussed in Chapter 2 – technological change, climate change, globalisation and demographic change – show that development also comes at a cost. Rapid Fourth Industrial Revolution (4IR) technological change has the potential to unleash economic productivity and prosperity, but could come at the cost of income insecurity especially for vulnerable groups. Industrialisation, electrification and mass production have improved living standards and welfare, but they gave rise to environmental degradation and rising global temperatures. Globalisation has increased prosperity and improved international cooperation, but it also contributed to growing inequality and structural unemployment. Improvements in medicine and nutrition and rising affluence have increased life expectancies but have also led to the challenge of ageing populations.

Then, in 2020, the world experienced the COVID-19 pandemic, which added a layer of urgency to addressing old challenges related to the megadrivers of change even as new challenges were added. COVID-19 sent the world into isolation as strict guidelines were placed on human-to-human contact to curb the spread of the virus. Over 16 months in, thousands of businesses have shut down, unemployment has skyrocketed, progress on extreme poverty has reversed, and close human contact and travel have become a distant memory. Governments all over the world are scrambling to rescue businesses, industries and livelihoods by adopting and adapting social protection policies.

It was clear for businesses that maintaining the status quo was no longer sufficient in the new socially distanced world. Along with this realisation came a new wave of acceleration in the technology megadriver as work, school and fun shifted online. Businesses started using digital technologies, such as mobile phone applications, video conferencing, collaborative platforms and artificial intelligence, to continue work. These adjustments fuelled a seven-year leap in the adoption of digital technologies.

However, for some sectors, teleworking was not an option as face-to-face interactions were intrinsic to the work. Examples include the personal care services, nightclub, construction and caregiving sectors. Workers in these sectors were left unemployed or forced to expose themselves to high risk of being infected. Employment protection policies were key to support workers in such sectors but in most cases were either unavailable or out of scope, especially if the workers were informally employed.

Even among sectors that could leverage on digital technologies, there were gaps that needed to be addressed. Economies most unprepared to facilitate the shift to digitalisation were severely impacted as they lacked the physical and institutional infrastructure, and skillset needed to support the digital transformation. For example, businesses adopted digital technologies but regulations to ensure safe online transactions were inadequate to allow a secure experience; schools went online but students did not have access to computers or an Internet connection at home; and artificial intelligence was embedded into processes but staff lacked the skillset needed to complement the technology. Demand for gig economy services grew, but the protection workers providing these services did not. As a result, vulnerable segments of society were at greater risk of losing out.

Women in the workforce were particularly vulnerable as they were disproportionately employed in informal work that lacked access to social protection, were engaged in hard-hit sectors like hospitality and food services, and were overburdened by unpaid work when schools and childcare centres closed. Both young and older workers were worse off compared to middle-aged employees. Young people experienced severe setbacks in the recession facing the labour market as many businesses implemented hiring freezes and layoffs, while older workers were exposed to larger health risks and were less equipped to work with digital technologies. Groups that had been facing long-term vulnerabilities, such as ethnic minorities, indigenous peoples, and migrant workers, were more likely to be engaged in informal jobs or be targeted for layoffs. In general, discrimination and mistrust grew during the pandemic as healthcare services were stretched and decent jobs became limited. The COVID-19 pandemic will end but these groups will continue to be at risk when the next global crisis arises.

The future of work is not about technology, but about people. Technology will move forward, innovations will continue and opportunities will bloom. But there is a need to address the real social and economic impacts that come with change.

Ensure economic security. The disruptive nature of the pandemic and the impact of the megadrivers on the labour market requires effective social protection systems that reduce income uncertainty and mitigate the downside to workers at risk of displacement. Economies can improve their protection systems by expanding the scope and coverage of unemployment benefit programmes to cover the most vulnerable, including workers in the informal economy. Social protection policies could include better healthcare coverage, unemployment benefits in the form of cash transfers and unemployment insurance, and old-age pensions. Targeted active labour market policies that provide training services are also needed to improve the employability of the unemployed. Such policies will improve matching of jobseekers and vacancies, and better equip the workforce with the skillsets needed in the future, for example, in the digital and green economies.

Develop and redevelop skills. The changing nature of work has magnified the skills imbalance in many economies, hence reducing labour productivity and increasing structural unemployment. Policies that promote skills building in the face of rapidly changing labour market conditions are important to mitigate the skills gap and strengthen the resilience of the workforce. Governments can support the development of skills by building better skills forecasting systems through employment surveys and sector studies that capture the current labour imbalances and enable anticipation of future skill demands. Skills gaps can also be narrowed by upskilling and reskilling workers, and promoting lifelong learning to equip them with the skillsets needed to perform in the changing labour market. Government collaboration with the private sector would be necessary to provide a more comprehensive approach to skills

building. Lastly, targeted investments in education would be necessary to better align school curricula and future of work labour market skills needs, such as IT skills and critical thinking skills. It would be pertinent to ensure that all socioeconomic groups in the economy have access to high quality education so that no one would be left behind in embracing and contributing to the future of work.

Update labour laws and institutions. Many new jobs have come into existence with the changing nature of work but these often lack the employment protections necessary to ensure job security and stability. The future of work requires that policymakers are able to react quickly to changing market conditions by designing responsive and efficient labour market regulations. Workers in informal employment or on temporary contracts and the gig economy are often exempt from receiving on-the-job training and severance payments, and have poor representation in labour associations, hence exposing them to larger risk of unfair dismissals and redundancies. Governments need to improve the scope and coverage of employment protection legislation to include those in non-standard employment. Ensuring inclusive collective bargaining systems will improve the labour market by increasing training opportunities, reducing wage inequalities and ensuring stronger enforcement of labour rights. Governments need to put policies in place to allow adjustments to remote working arrangements that have become indispensable in adapting to future of work needs and COVID-19 restrictions. These could include better access to digital infrastructure and skills, and elimination of regulatory barriers to flexible working arrangements.

Cooperate across borders. APEC is well-placed to address many of the behind-the border and cross-border issues that have arisen due to the megadrivers driving the future of work, especially globalisation. Skills surpluses and shortages faced in some industries can be addressed by facilitating foreign entrants by reducing visa restrictions, enabling recognition of foreign qualifications and improving the international portability of social security benefits. Globalisation has increased the occurrence of tax avoidance which needs to be addressed through regional cooperation. Implementing bilateral tax treaties and increasing tax transparency are some ways in which governments can address tax avoidance and evasion concerns. Cross-border disputes have become more common with the rise in international trade and remote working arrangements. As such, it is important for governments to adapt current institutions, increase harmonisation on cross-border labour contracts and improve alternative dispute resolution mechanisms. Finally, APEC can engage with a broader range of stakeholders and practice tripartism to allow greater representation of employers and workers in relevant policy discussions.

Operationalise APEC initiatives on future of work. The future of work agenda is not new to APEC. Some policy areas that can address future of work challenges are already mentioned in existing APEC initiatives and declarations (Table 6.1). For example, Leaders have called for progress in facilitating cross-border labour mobility in the 2014 APEC Connectivity Blueprint, while in 2017 they mandated work on strengthening social protection floors in the APEC Action Agenda on Advancing Economic, Financial and Social Inclusion. Also in 2017, the APEC Framework on Human Resources Development in the Digital Age was endorsed, which focuses on addressing future of work challenges. APEC is in a unique position to operationalise its initiatives and programmes addressing future of work challenges with its various fora tackling trade, investment, structural reform, human resources development, science, and digital economy. APEC needs to be the forum where innovative approaches to addressing future of work challenges are developed, policies are discussed, and consensus for implementation is achieved.

Table 6.1 Mapping of future of work policy areas with APEC fora and initiatives

Future of work policy area	APEC fora	EAASR Pillars[1]	Relevant APEC initiatives
Developing effective social protection systems • Ensuring income support • Expanding employment support	EC, FMP, HRDWG	Pillar 2: improve resilience against shocks Pillar 3: ensure social protection floors Pillar 4: prevent erosion of human capital	• APEC Action Agenda on Advancing Economic, Financial and Social Inclusion • APEC Framework on Human Resources Development in the Digital Age
Developing Skills and Improving Productivity • Developing better skills forecasting systems • Expanding access to lifelong learning, upskilling and reskilling • Increasing targeted investments in education	DESG, EC, HRDWG, PPSTI	Pillar 1: improve competitiveness Pillar 2: improve resilience against shocks Pillar 3: ensure equal access to economic opportunities Pillar 4: boost productivity and digitalisation	• APEC Action Agenda on Advancing Economic, Financial and Social Inclusion • APEC Framework on Human Resources Development in the Digital Age • APEC Internet and Digital Economy Roadmap • APEC Services Competitiveness Roadmap
Designing efficient labour market regulations • Improving employment protection legislation • Ensuring collective bargaining rights • Adjusting to remote working arrangements	EC, HRDWG	Pillar 1: improve future-efficiency of labour markets Pillar 2: ensure delivery of quality jobs Pillar 3: improve inclusion and well-being Pillar 4: promote uptake of digitalisation	• APEC Action Agenda on Advancing Economic, Financial and Social Inclusion • APEC Framework on Human Resources Development in the Digital Age
Addressing cross-border issues • Promoting international labour mobility • Updating tax rules to prevent cross-border corporate tax avoidance • Improving mechanisms to resolve cross-border disputes	CTI, EC, FMP HRDWG	Pillar 1: improve efficiency of regional labour markets Pillar 2: reduce cross-border uncertainty Pillar 3: ensure equity in cross-border labour markets Pillar 4: adapt to cross-border digital economy	• APEC Connectivity Blueprint • APEC Framework on Human Resources Development in the Digital Age • Cebu Action Plan • APEC Services Competitiveness Roadmap
Promoting tripartism	CTI, EC, SCE	Pillar 3: ensure inclusion and representation Pillar 4: work with stakeholders to address future of work challenges	• Putrajaya Vision 2040 • APEC Framework on Human Resources Development in the Digital Age

[1] EAASR = Enhanced APEC Agenda for Structural Reform 2021-25. Mapping is based on the EAASR Concept Paper (http://mddb.apec.org/Documents/2021/EC/EC1/21_ec1_006a.pdf) endorsed by EC in March 2021. The four EAASR Pillars are:
Pillar 1: Creating an enabling environment for open, transparent, and competitive markets;

Pillar 2: Boosting business recovery and resilience against future shocks;
Pillar 3: Ensuring that all groups in society have equal access to opportunities for more inclusive, sustainable growth, and greater well-being; and
Pillar 4: Harnessing innovation, new technology and skills development to boost productivity and digitalisation.

Note: CTI = Committee on Trade and Investment; DESG = Digital Economy Steering Group; EC = Economic Committee; FMP = Finance Ministers' Process; HRDWG = Human Resources Development Working Group; PPSTI = Policy Partnership on Science Technology and Innovation; SCE = SOM Steering Committee on ECOTECH. This mapping is not an exhaustive listing of applicable APEC fora and initiatives.

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