

ECONOMICS WORKING PAPER

Pandemic Fallout, Disruptive Technologies, and Divergent Demographics: Policy Challenges Facing Countries in the Indo-Pacific

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Abstract

New variants of the coronavirus are producing the worst outbreaks in many countries in the Indo-Pacific. Progress with vaccine rollouts has been uneven, further contributing to inequality of outcomes. The pandemic could have lasting effects by reinforcing nationalism, protectionism, and other trends that are already undermining globalisation. The most serious challenge posed by a pandemic induced acceleration towards a digital economy is the disruption to labour markets, made worse by divergent demographic trends in the region. Policies that increase factor mobility can narrow differences in capital-labour ratios and assist in productivity catch-up to promote more inclusive growth. Since commodity movements can substitute for factor movements, regional initiatives that liberalise trade can also reduce adjustment costs. Investing in a skilled and flexible workforce remains the long-term remedy.

Keywords: COVID-19, Technological Disruption, Indo-Pacific, Fourth Industrial Revolution

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Pandemic Fallout, Disruptive Technologies, and Divergent Demographics: Policy Challenges Facing Countries in the Indo-Pacific

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1. Introduction

As we approach the one-and-a-half-year mark since the coronavirus was first detected in human beings in Wuhan, China, the pandemic is not only still with us but is at or near its peak in many countries in the Indo-Pacific region². The emergence of more transmissible variants of the virus combined with lockdown fatigue is responsible for new waves of infection, the most concerning of which is the Delta variant associated with the devastating outbreak in India in May 2021. Many countries in the Mekong region that had managed the pandemic relatively well before the new variants emerged, such as Cambodia, Laos, Thailand, and Vietnam, succumbed to new waves. The so-called success stories like Singapore and Taiwan were forced to tighten restrictions in May, after having eased them gradually over the preceding months. Even Australia and New Zealand, which had almost completely sealed off their borders, have not been able to ward off the new variants. Malaysia was forced to reintroduce a general lockdown after concerns arose that its health system might be overwhelmed when its infection rate surpassed that of India at its peak, on a population-adjusted basis.

The pandemic is accelerating the move towards a digital economy, which will have both positive and negative consequences. There will be significant disruption to labour markets in the adjustment phase, which could be ameliorated through greater labour and capital mobility. Divergent demographic trends in the region will exacerbate the impact of technologically driven disruption, and increase the need for greater cross-border factor mobility. In short, policy reform will be required to play an increasingly important role in liberalising international factor flows at a time when the momentum is in the opposite direction as a result of the fallout from the pandemic. Unless this momentum can be arrested and policy can shift its direction, the region faces a very difficult and painful adjustment period during and after the pandemic. This is the key message of the paper.

These challenges present at a time when a subtle but unambiguous retreat from globalisation is taking place. Anti-globalisation forces can be deceived by parading as attempts to increase

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² Although the paper focusses on the Southeast Asian members of the Indo-Pacific region, references are made to other members of this vast and loosely defined region wherever possible.

resilience of supply chains by advocating reshoring or near-shoring³. More concerning are the reemergence of unabashedly nationalist industrial policy platforms such as Indian Prime Minister Modi's *Atmanirbhar Bharat* or 'self-reliant India' and US President Biden's 'Make in All of America' initiatives.⁴ These retreats come in the wake of the pandemic, which is also having impacts that will directly increase the costs of such actions. In this respect, the pandemic is likely to have a lasting impact when it reinforces other trends that are already undermining globalisation. The pandemic is providing political fodder for nationalists who favour greater protectionism and immigration controls and could end up slowing or reversing trade liberalization actions or curtailing labour and capital mobility at a time when it is needed the most (see, for instance, Legrain, 2020).

Amid all this gloom and ongoing uncertainty, or perhaps because of it,⁵ fifteen countries from the Indo-Pacific region finally signed the Regional Comprehensive Economic Partnership (RCEP) agreement in December 2020, creating the largest free trade area in history. In the US, a new administration was sworn in in February 2021, marking a possible return to a more rules-based international trading system after a period of relative chaos. The change in the White House has not seen any discernible impact on the US-China trade war so far, however, and the Phase II deal remains firmly on the backburner. While any resolution soon appears unlikely, the possibility of escalation remains in the context of a new Cold War emerging.

Regional and cross-regional cooperation initiatives will have to play a more important role in pushing for policy changes to address the many challenges in the Indo-Pacific and, if they fall short, then bilateral initiatives that have a better chance of inducing national reforms may have to fill in the void in a world where multilateralism has been seriously weakened.

The paper is in five parts. Section 2 describes the current situation with the pandemic and the vaccination rollout while examining likely economic recovery paths for the region. The distributional impact of the pandemic and the push it is providing towards a digital economy is discussed in Section 3, focussing on inequality. The policy changes required to deal with these impacts, in the short run and the long run, in the context of divergent demographic trends in the region are taken up in Section 4. The final section concludes.

³ Much of this discussion has taken place in relation to the US-China trade war. In April 2020, the Japanese government announced that it would spend some \$2bn to help Japanese multinationals leave China and set up shop at home or elsewhere in Southeast Asia. In a similar vein, former White House National Economic Council Director Larry Kudlow said the US could "pay the moving costs of American companies from China back to the US" in order to encourage reshoring.

⁴ In addition to dealing with perceived inequities associated with globalization at home, Biden's embrace of industrial policy is undoubtedly also a response to the rise in China's economic clout, and an attempt to stay ahead in the technology race.

⁵ That is, the motivation to conclude negotiations for RCEP that had dragged on for eight years may have come from concerns of rising protectionist pressures or fears over new restrictions on factor mobility, with the pandemic. For a discussion on using trade to overcome the impacts of restrictions on factor mobility, see Mundell (1968, Chapter 6).

2. The Evolving Pandemic and Prospects for Economic Recovery

The COVID-19 pandemic continues to evolve in uncertain ways. The latest cause for concern relates to the emergence of new and more transmissible variants leading to fresh waves of infection throughout the world (Figure 1), including the Indo-Pacific region (Table 1). Hardly any country in the region has been immune from the new variants. Even countries like Australia and New Zealand, which had almost completely sealed off their borders, have not been able to keep the new variants out. In Southeast Asia, countries that had appeared to have contained community transmission, like Cambodia, Laos, Thailand, Viet Nam and Singapore, have also succumbed, and are facing their worst outbreaks (Figures 1a and 1 b). The countries that had been struggling with managing the spread of the original strain have been the worst hit, especially India and Malaysia, but also the other South Asian countries as well as Indonesia and the Philippines.

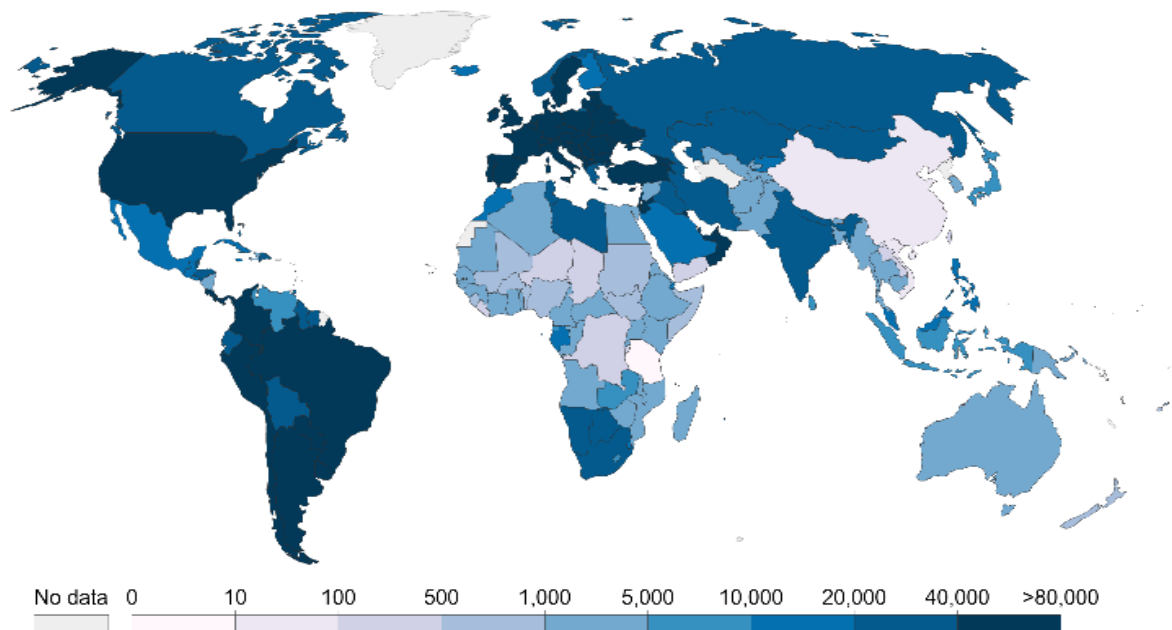
Nevertheless, the response from governments has been less draconian compared to the initial outbreak in early 2020. Even when the number of daily infections in India was the highest ever recorded anywhere, the government still resisted a general lockdown. It was only when the infection rate threatened to overwhelm the health system in Malaysia did the authorities eventually succumb and introduce a general lockdown. Even then, however, there was not a complete shutdown of businesses this time around, as a result of more flexible enforcement, lockdown fatigue, and businesses learning how to cope and manage better under these conditions. All other countries in the region have resisted general lockdowns but have employed targeted social distancing measures to try and contain the spread.

Table 1: COVID-19 Infection and Mortality Rates in the Indo-Pacific and Major Economies, June 2021

Countries	infections	Infections/Million	Deaths	Deaths/Million
Brunei	248	562	3	7
Cambodia	37,321	2,204	311	18
Indonesia	1,885,942	6,895	52,566	191
Laos	1,979	268	3	0.4
Malaysia	646,411	19,735	3,768	115
Myanmar	144,876	2,646	3,237	59
Philippines	1,300,346	11,720	22,507	203
Singapore	62,245	10,561	34	6
Thailand	189,828	2,713	1,402	20
Vietnam	9,980	225	57	44
ASEAN	4,262,565	6,388	83,888	125
China	91,359	63	4,636	3
Japan	769,920	6,105	13,907	110
Korea	146,859	2,862	1,981	39
India	29,297,375	21,036	363,401	261
EU	32,381,720	72,764.00	732,504	1,640
US	34,275,941	102,984	614,018	1,845
World	175,716,463	22542.8	3,790,834	486

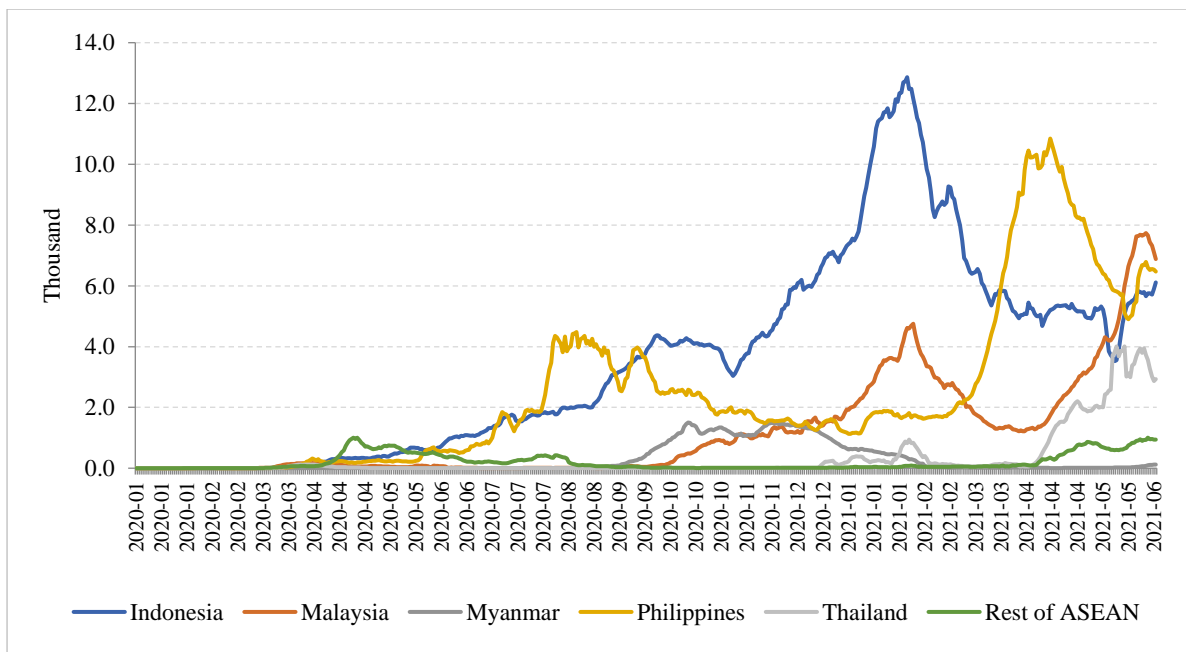
Source: <https://www.worldometers.info/coronavirus/> ; Accessed 11 June 2021.

Figure 1: COVID-19 Cases Around the World, June 2021



Source: Author's computation using data from European Centre for Disease Prevention and Control (ECDC) and Our World in Data, <https://ourworldindata.org/covid-cases>. Accessed 8 June 2021.

Figure 2a: COVID-19 Infections in ASEAN Countries with Major Community Outbreaks, 2020-June 2021 (7-day Moving Average)

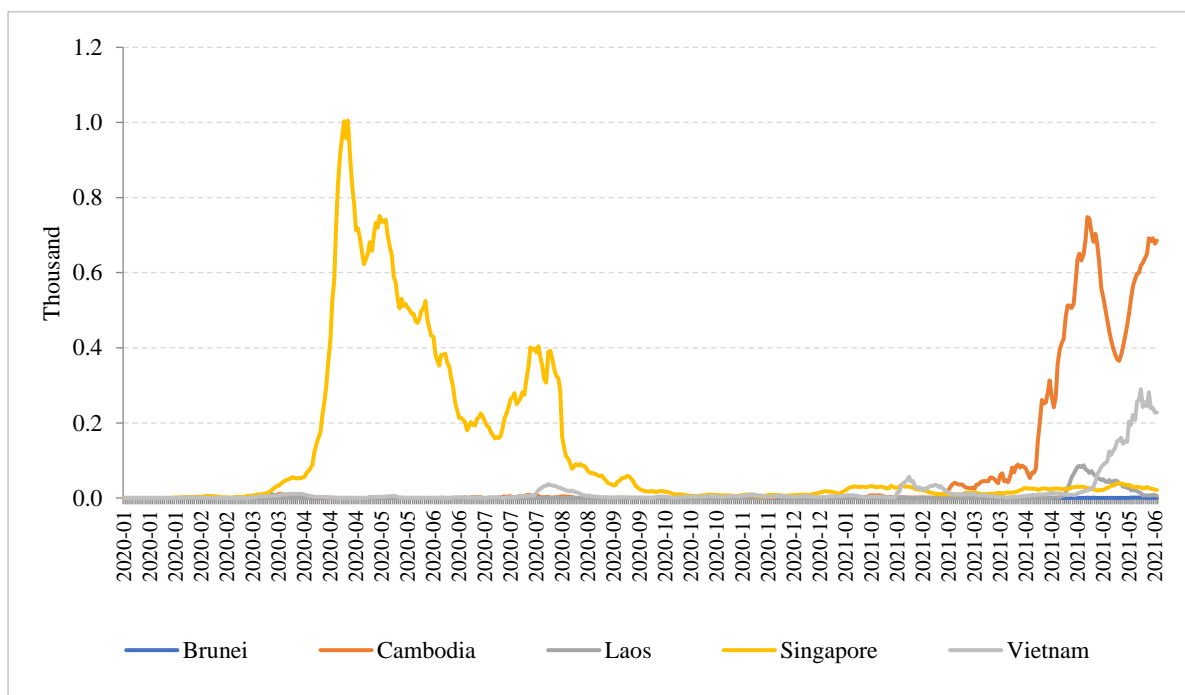


Source: Author's computation using data from European Centre for Disease Prevention and Control (ECDC) and Our World in Data, <https://ourworldindata.org/covid-cases>. Accessed 10 June 2021.

Note: Last data point is June 8, 2021. The rest of ASEAN includes Brunei, Cambodia, Laos, Singapore, and Vietnam.

Therefore, the direct economic impact of the new wave of infections, despite its severity, is unlikely to be as severe as the initial wave. On the whole, economic recovery in the region appears to be underway, with the bottom having been hit in the second quarter of 2020. As Figure 3 demonstrates, something akin to a V-shaped recovery appears to be underway in most of the ASEAN countries. The new waves may temper the rebound, it appears that it is unlikely to derail it. This is also the expectation from the ADB and the IMF (Table 2). Their latest forecasts, released in April 2021, see ASEAN growing by about 4.5 per cent in 2021. This is being driven by a sharp rebound in China, expected to exceed 8 per cent in 2021, and strong global growth of 6 per cent. Nevertheless, uncertainties remain over a rapidly mutating virus and it is difficult to predict how it will evolve even in the near term, and how governments will respond.

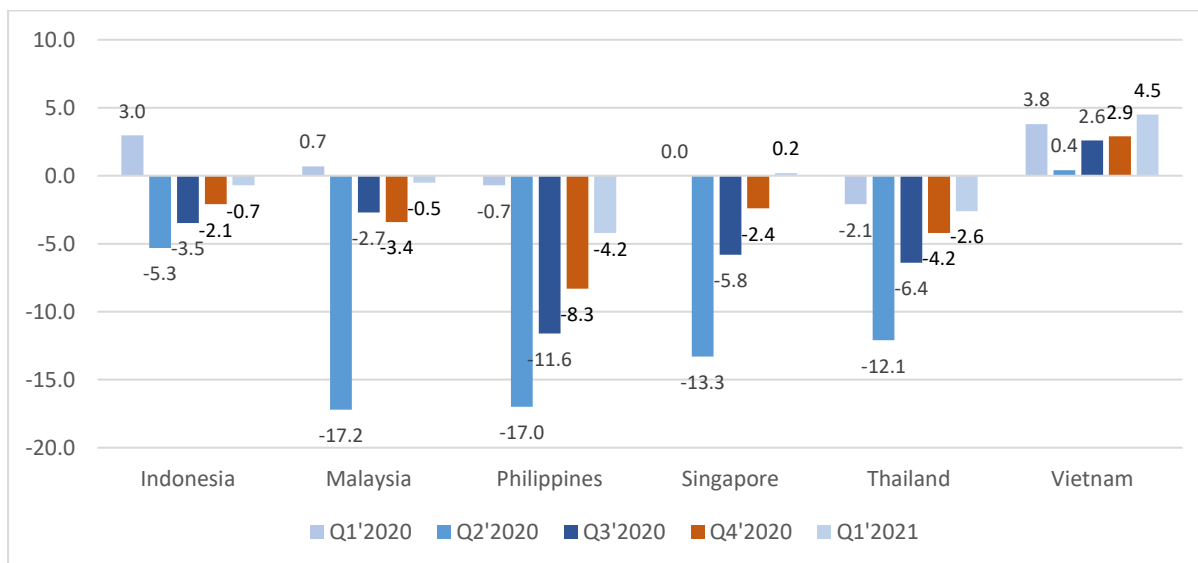
Figure 2b: COVID-19 Infections in ASEAN Countries with Recent Community Outbreaks, 2020-June 2021 (7-day Moving Average)



Source: Author’s computation using data from European Centre for Disease Prevention and Control (ECDC) and Our World in Data, <https://ourworldindata.org/covid-cases>. Accessed 10 June 2021.

Note: Last data point is June 8, 2021.

Figure 3: Quarterly Estimates of GDP for Select ASEAN Countries, 2020-Q12021,
(%, year-on-year)



Sources: Statistics departments or bureaus of respective countries.

Note: Cambodia, Laos and Myanmar are excluded because they do not report quarterly estimates of GDP.

Table 2: IMF and ADB Forecasts of GDP Growth, 2021-2022

Country	Actual 2019	Actual 2020	IMF April 2021 Forecast 2021	IMF April 2021 Forecast 2022	ADB April 2021 Forecast 2021	ADB April 2021 Forecast 2022
Brunei	3.9	1.2	1.6	2.5	2.5	3.0
Cambodia	7.0	-3.5	4.2	6.0	4.0	5.5
Indonesia	5.0	-2.1	4.3	5.8	4.5	5.0
Lao PDR	4.7	-0.4	4.6	5.6	4.0	4.5
Malaysia	4.3	-5.6	6.5	6.0	6.1	5.7
Myanmar	6.8	3.2	-8.9	1.4	-9.8	NA
Philippines	6.0	-9.5	6.9	6.5	4.5	5.5
Singapore	1.3	-5.4	5.2	3.2	6.0	4.1
Thailand	2.3	-6.1	2.6	5.6	3.0	4.5
Vietnam	7.0	2.9	6.5	7.2	6.7	7.0
ASEAN (a)	4.8	-3.4	4.9	6.1	4.4	5.1
China	5.8	2.3	8.4	5.6	8.1	5.5
Japan	0.3	-4.8	3.3	2.5	NA	NA
Korea	2.0	-1.0	3.6	2.8	3.5	3.1
India	4.0	-8.0	12.5	6.9	11.0	7.0
EU	1.3	6.6	4.4	3.8	NA	NA
US	2.2	-3.5	6.4	3.6	NA	NA
World	2.8	-3.3	6.0	4.4	NA	NA

Sources: IMF (2021); ADB (2021).

The solution, however, still lies with a speedy rollout of mass vaccination campaigns. The race is no longer between vaccine rollout and community spread but against the emergence of ever more transmissible and potentially more virulent strains, against which the efficacy of current vaccines remains somewhat uncertain. The progress with vaccinations in the region has been mixed (Table 3). As of early June, Singapore heads the tally with 71 doses per hundred population, with about a third of its population fully vaccinated. Bhutan comes in second with 63 doses per 100, and then much further down is Cambodia at 29 doses per 100. Of the more populous countries, India has ramped up its vaccination drive following its devastating second wave and has got to 16 doses per hundred. This has been achieved by reducing its exports of vaccines, which will affect the vaccination drive in other countries in the region. Malaysia and Indonesia record 11 doses per 100, while the Philippines and Thailand record only about 5. Laos and Vietnam lie at the bottom of the table with around 1 dose per 100. Economic recovery in countries struggling to contain community spread will remain fragile and uncertain as long as vaccination rates remain low.

Table 3: Progress with Vaccination in the Indo-Pacific and Major Economies

Countries	Per 100 people	Vaccinated	Fully vaccinated
Brunei	13	10.75%	2.61%
Cambodia	31	16.72%	13.96%
Indonesia	11	7.02%	4.20%
Laos	14	0.00%	0.00%
Malaysia	12	8.42%	3.77%
Myanmar	6	3.26%	2.25%
Philippines	6	4.10%	1.46%
Singapore	75	42.80%	32.28%
Thailand	8	5.94%	2.18%
Vietnam	1	1.40%	0.05%
ASEAN	9	5.85%	3.20%
China	59	NA	NA
Japan	17	12.60%	4.32%
Korea	26	20.61%	5.14%
India	17	14.08%	3.33%
EU	65	42.89%	22.87%
US	92	52.09%	42.77%
World	29	12.30%	6.26%

Source: <https://ourworldindata.org/covid-cases>. Accessed 13 June 2021; data relate to 11 June 2021.

The uneven economic recovery in the region will be exacerbated and prolonged by the unevenness of the vaccine rollout. Economic recovery will be uneven not only across countries but also within them. It is this unevenness that will have long-lasting effects, such as increasing inequality between and within countries. The challenge facing the region going forward is how to deal with its lingering effects in a post-pandemic new normal.

3. Distributional Impacts from the Pandemic and its Push Towards a Digital Economy

The COVID-19 pandemic is likely to leave a larger pool of the poor and a rise in all kinds of inequality in its wake. There are two main reasons for this. The first is that the poor and other vulnerable groups are more susceptible and have higher COVID-19 infection and mortality rates. Second, the poor are also likely to suffer more from the unintended consequences of lockdowns and other social distancing measures (see Menon, 2020). The poor often live hand-to-mouth, and lockdowns prevent the poorest from begging or scavenging for food, or the millions in the informal sector from earning a daily subsistence income.

The poor in the formal sector may also be disadvantaged by the fact that the industries within which they tend to be employed are usually less amenable to the adoption of technologies that can help circumvent the impact of social distancing measures. Physical contact may represent a critical aspect of work for low-skilled employees in the manufacturing or construction sectors, for instance. The introduction of social distancing measures may leave them temporarily unemployed, as a result.⁶

One of the supposed silver linings of the pandemic has been the acceleration towards a digital economy. Lockdowns and social distancing measures have hastened the development and adoption of technologies of the Fourth Industrial Revolution (4IR) that enable work from home and remote learning. Looking forward, firms are restructuring their operations to adapt to a new normal that will involve less human interaction and be restricted by other risk mitigation regulations (see, for instance, APEC, 2020).

While this acceleration is generally welcome, there is concern that it may increase inequality within and between countries, further increasing the digital divide. The adoption rate of these technologies has favoured the more developed economies, as country preparedness is negatively correlated to their level of development. This will widen development gaps if left unaddressed.

Apart from digital infrastructure being limited in poor countries, access to what is available can vary by income class within society. The poor in developing countries are less likely to have the means to access this infrastructure and be further marginalised as a result. The inability of the poor to participate equally in remote learning threatens to perpetuate an inter-generational cycle of poverty and rising inequality.

The most serious challenge posed by a pandemic-driven acceleration towards a digital economy will be the impact on the labour market, as automation and increasingly advanced robotics and artificial intelligence take hold. Many low-skilled, repetitive jobs are being automated, starting in high-wage countries but spreading quickly to the developing world. With two-thirds of the world's robots already in the Indo-Pacific, some expect this region to be

⁶ The impact of the pandemic on labour markets can take several forms. Lockdowns reduce demand and supply of labour, although the impacts are not uniform across sectors. Foreign workers are more likely to be affected for a number of reasons. Government support schemes such as wage subsidies can reduce the overall impact on the demand for labour, but will favour local over foreign labour. Also, border restrictions will reduce the supply of foreign labour, and their share will be further diminished by domestic or foreign restrictions on the out-migration of local labour.

particularly susceptible to these changes. Although the net impact on jobs and the labour market, in the long run, remains unclear⁷, there is little doubt that disruptive technologies will result in significant labour churning and job displacement in the short run.

For instance, McKinsey (2017) predicts that 800 million workers could be displaced and about half may need new skills for new occupational categories. Low-skilled, repetitive jobs, such as assembly line workers are most at risk, and service jobs, such as business process outsourcing will be increasingly under threat. Apart from the greater risk of unemployment in the lower-skilled categories, low wage growth in this sector relative to higher skills, some of which could demand a huge premium, will add to wage and income inequality (Nuesch, 2007).

4. Policy Responses

As noted earlier, 4IR technologies may pose a threat to low-skilled jobs in the short run, affecting developing countries more than others initially. As an immediate response, enabling greater mobility of unskilled workers would curtail unemployment in labour-abundant countries and help sustain growth in labour-importing ones while also helping counter growing economic inequality within and between these countries.

Apart from the challenges posed by the pandemic and 4IR, countries in the Indo-Pacific region will also have to deal with another long-term trend in the form of divergent demographics. Not all of the Indo-Pacific is ageing at the same time or at the same speed, however. While South Asia (especially India, Nepal and Pakistan) and the newest members of ASEAN (especially Cambodia, Laos, and Myanmar) have relatively young populations, the rest of ASEAN and East Asia are already ageing or rapidly heading that way.

Population ageing affects growth through several channels. A rapidly ageing population can have adverse effects on economic performance and prospects through a decrease in the labour force, lower saving and investment rates, and spiralling pension and health care costs. The countries with the younger populations in the Indo-Pacific are also the less developed ones. For these countries, the biggest challenge lies in adopting policies that will allow them to utilise the demographic window to achieve rapid economic growth, increase per capita incomes, and build up human capital. This is going to be particularly challenging during and after the pandemic. Providing employment and enhancing skills of growing labour forces in these countries will be made more difficult by the negative impact that 4IR technologies will have on low-skilled workers in the short run.

Ageing countries with shrinking labour forces could get around shortages by allowing greater labour inflows, among other things (Menon and Nakamura, 2009).⁸ Countries with expanding

⁷ Far a discussion on how the long run impacts are likely to be net positive, see OECD (2016) and Menon (2019a).

⁸ There are other ways that ageing countries can make up for labor shortfalls that would complement greater labour inflows. Ageing economies could increase labor force participation rates by facilitating the entry of young adults into the labor force; removing barriers to the participation of women; increasing the mandatory retirement age, or scrapping it altogether; and adopting more flexible working arrangements. Improvements in labor productivity

labour forces due to youth bulges will need to either export labour or import capital, in the short run. Greater factor mobility can help reduce differences in capital-labour ratios and assist in productivity catch-up in the region to promote more inclusive growth.

Such policy changes must first overcome anti-globalisation forces, reinforced by the pandemic. Such forces can assume deceptive forms; for instance, they can appear in the guise of increasing resilience of supply chains through “reshoring”. These moves, if successful, would curtail rather than promote factor mobility.

Regional cooperation initiatives could serve as a buffer to withstand such anti-globalisation forces and prevent a retreat behind borders. When they promote greater integration through capital and labour mobility, they can also help mitigate many of the negative impacts that demographic and technological trends may have at the domestic level. The two mega-regionals that include countries from the Indo-Pacific are the RCEP and the CPTPP. In addition, there is ASEAN, the longest-running cooperation arrangement in the region, and a host of bilateral FTAs. To what extent can these agreements be relied upon to help in responding to these long-term trends affecting countries in the region?

In the immediate future, greater capital rather than labour mobility may prove to be the easier policy option given border restrictions on people's movement during the pandemic, which are likely to linger even in its aftermath. Countries in the region have made considerable progress in removing restrictions to long-term flows in the form of foreign direct investment (FDI), although these have occurred mainly through national rather than regional actions. More could be done in promoting other forms of capital flows through regional initiatives, however.

Thus far, efforts to promote capital market integration have focused mainly on regional surveillance and developing Asian bond markets, through various ASEAN+3 initiatives such as the Asian Bonds Market Initiative and its offshoots such as the Corporate Guarantee Investment Facility (see Menon, 2021). While these efforts have been important, they need to be complemented by broader domestic policy reforms aimed at lowering regulatory barriers and harmonizing standards and regulations. to increase cross-border capital flows and market integration. There is also a need to increase the coverage beyond ASEAN+3 to include the other countries in the Indo-Pacific region.

However difficult and politically sensitive it may be, greater labour mobility will have to play a complementary role if adjustment costs are to be contained and bottlenecks overcome, however. A joint ILO and ADB (2014) study predicted that based on trends existing at the time, more than half the skilled job vacancies in 2025 in most of the ASEAN countries could not be filled with adequately qualified workers. The pandemic would have significantly worsened this situation.

will also be necessary, compelling reforms in education and greater investments in technology. The potential to turn to greater automation and other technologies could play a mitigating role (see Menon, 2019b).

It is unlikely that mega-regionals such as RCEP or the CPTPP will be able to significantly impact labour flows in the region. The Labour Chapter in the CPTPP concentrates on protecting internationally recognised labour rights and the enforcement of labour laws. Although these issues gain importance during crises when abuses tend to increase, they do not directly address the need to expand labour movement between participating countries. RCEP does not have a chapter on Labour and does not directly address labour movement across borders.

In ASEAN, harmonisation and streamlining of employment visas has been an important initiative in reducing barriers to labour mobility. ASEAN economies have signed several mutual recognition agreements (MRAs) for skilled jobs, but implementation has been stymied by domestic rules and regulations on employment and licensing requirements. Furthermore, these MRAs will have to be more responsive to the rapidly changing skill and labour market conditions as a result of the pandemic and the 4IR. Most of the labour movement within ASEAN relates to low skilled workers, and a significant but unknown share is undocumented.

A large number of both documented and undocumented workers have been repatriated following the onset of the pandemic, forced to return to economic conditions markedly worse than what they had originally fled. As economic conditions worsen and legal channels for labour movement tighten, the number of undocumented workers is likely to rise again. Policy changes should circumvent the potential increase in undocumented workers since it does not serve the interests of the sending or receiving countries, let alone placing the workers themselves at great risk.

Even if these agreements cannot promote greater factor mobility, they can assist by promoting trade by limiting the resort to protectionism and by keeping an open trading system for goods and services. As demonstrated by Samuelson's (1948) factor price equalisation theorem, commodity movements and factor movements can serve as close substitutes in achieving similar outcomes. That is, even when the cross-border movement of labour or capital is restricted, trade in goods and services that are produced using these factors is sufficient to equalise wages and rentals in both countries over time. Kemp (2006) demonstrated how Samuelson's (1948) limiting two country case generalized to the many country configuration under less restrictive conditions, increasing the practical value of the theorem. Therefore, trade liberalisation through regional agreements or other means can serve an important role in achieving the desired outcomes in the adjustment process when increasing factor mobility is difficult or delayed.

While trade can help with the adjustment process, it is not a perfect substitute for factor mobility. Given the sensitivities involved with labour mobility in particular, bilateral agreements may end up being more feasible than regional ones.⁹ The India–Singapore Comprehensive Economic Cooperation Agreement (CECA) is one such bilateral deal that has enabled short and long-term employment visas, ranging from 2 months to 3 years, to nationals

⁹ Similarly, a different but related set of sensitivities underlies the preference to start with the small numbers approach – either bilateral or trilateral- towards the governance and rulemaking for digital trade in the region, such as the Australia–Singapore Digital Economy Agreement and the Digital Economy Partnership Agreement (DEPA) between Singapore, Chile and New Zealand (see Armstrong *et al.*, 2021).

of both countries. Despite some of the issues being politicised in Singapore in particular, leading to concerns over losing jobs to foreigners, the long-run benefits outweigh the costs to both countries (see Das, 2018; Koh, 2019). Similar agreements involving other ASEAN countries would be of mutual benefit. Bilateral rather than regional arrangements are also the more feasible route towards addressing the perennial problem of undocumented migrant workers.

While importing skills can help countries catch up and address the challenges posed by the 4IR in the short run, the long-term challenges of 4IR will require a fundamental transformation in systems of education and learning. Governments must pursue education reform and promote lifelong learning. Augmenting cognitive skills such as math's and sciences will be critical for the transition to a more innovative, knowledge-based economy. There has been a lot of discussion about using the pandemic as a catalyst to "build back better" but so far only a few of the more developed economies such as Australia and Singapore have laid out programs to increase investments in technical and higher education. There will also be a need to strengthen regional education networks and connect innovation incubators in the region. New and innovative approaches to public-private collaboration are also needed, particularly in areas such as research and development.

To help offset the impacts that the 4IR could have on the lower-income classes in the poorer countries, the existing, fundamental challenges facing the education system and skills development should not be ignored either. This comes at a time when the poor have fallen further behind in education and skills formation as a result of the pandemic. These countries will have to reverse the decline resulting from the pandemic before addressing the pre-pandemic challenges of increasing retention rates in secondary education and improving post-secondary vocational training. All of this will be necessary to build a stronger foundation upon which other innovations may succeed.

Once these improvements are set in train, we can expect a ratcheting effect to kick in, whereby the enhancements to the system affecting the first generation of students are compounded as some of them go on to become the providers of training, and the teachers, for the next generation. This is a virtuous circle that creates its own inertia and result in an inter-generational augmentation of skills and human capital at an increasingly rapid pace. The sooner this change is made to the system of basic education, the earlier can this positive cycle be set in motion, in preparation for the demands of the 4IR.

5. Conclusion

A year and a half after it started, the COVID-19 pandemic is far from over. The emergence of new, more transmissible variants has produced new waves of infections, with many countries in the Indo-Pacific facing their worst outbreaks. The solution lies with speeding up vaccine rollouts but progress has been uneven, further contributing to inequality in outcomes in a host of areas. Despite ongoing uncertainty, economic recovery is underway in the region, with the bottom having been hit in the second quarter of 2020. Despite the severity of the new waves of

infection, countries have generally avoided general lockdowns and focussed on targeted measures, which has muted the impact on the economy.

The effects of the pandemic are likely to linger long after it is over or downgraded. It will leave a larger pool of the poor and a rise in all kinds of inequality in its wake. The pandemic may reinforce nationalism, protectionism, and other similar trends that are already undermining globalisation. Even a supposed silver lining of the pandemic – the acceleration towards a digital economy – could worsen an already bad distributional outcome.

The most serious challenge from the 4IR will be the impact on the labour market, particularly the displacement of low-skilled workers in the short run. Divergent demographic trends in the region could add to the overall disruption to labour markets and economic growth. Policies that enable greater factor mobility can help reduce differences in capital-labour ratios and assist in productivity catch-up in the region to promote more inclusive growth. Given the sensitivities involved with liberalising factor movements, it may be easier to start with bilateral agreements that could later be multilateralised to include more countries.

Since commodity movements can serve as a substitute for factor movements, it is important that regional and other initiatives continue to liberalise and promote trade in goods and services to reduce adjustment costs.

While these measures can help ameliorate the adjustment costs in the short run, investing in a more skilled and flexible workforce is the long-term remedy. The poorer countries in the region will have to first address the pre-pandemic challenges of increasing retention rates in secondary education and improving post-secondary vocational training before they can start building an innovative society prepared for the 4IR.

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