Chapter 2

Risks to the economic outlook amidst the COVID-19 pandemic and policy responses in Emerging Asia

The economic growth outlook is clouded by several risks. This chapter explores major health and non-health risks. The evolution of the pandemic remains key, as the Omicron variant has led to a sharp rise in caseloads in early 2022. Several challenges need to be addressed as regards the supply and distribution of vaccines, as well as vaccine hesitancy. Despite the rollout of vaccines, some non-pharmaceutical interventions should be maintained for the time being. Digital tools should continue to be developed, together with telehealth and telemedicine. The chapter also discusses several non-health risks. First, the gradual rise in inflation is raising concern, as economies strengthen and food prices rebound. Second, supply-chain disruptions are another downside risk due to their potential impact on economic growth and consumer prices. Finally, disparities within and across countries in Emerging Asia constitute another risk to the outlook.

Introduction

This chapter examines key risks to the economic outlook set out in Chapter 1. The risks explored include the evolution of the pandemic; rising inflation; and the potential for further supply chain disruptions.

Overall, economic recovery is expected to continue in Emerging Asia, but uncertainty remains, as the COVID-19 pandemic continues to evolve (see Chapter 1). In the near term, the effectiveness of healthcare responses and vaccination programmes will have a strong role to play in determining economic developments. Indeed, an appropriate combination of health policy responses, vaccination, and a comprehensive exit strategy will be critical for coping with the pandemic as it continues to unfold.

Domestic inflation has been gradually increasing across the region, in tandem with rising commodity prices across the globe. This notwithstanding, the rise in inflation has been more moderate in Emerging Asia compared with the United States and other OECD member countries.

Another risk stems from the imbalances between supply and demand that have resulted from the irregular closing and re-opening of individual economies, and which have affected a number of key industries, have led to longer-than-anticipated disruptions to supply chains, and have contributed to growing price pressures. Although there are signs the recent supply-chain bottlenecks are starting to somewhat ease, the outlook will depend to a large extent on China's pandemic management policies. A continuation of the zero-COVID-19 policy in China could lead to further production slowdowns around the country's manufacturing and shipping hubs, which could have broader implications for other countries in Emerging Asia.

In addition to disparities within countries in Emerging Asia, the pandemic also threatens to exacerbate existing cross-country differences. A slowdown in China partly related to weak consumption and negative spillovers from the property sector could have broader impact on economies in the region, in particular for ASEAN countries.

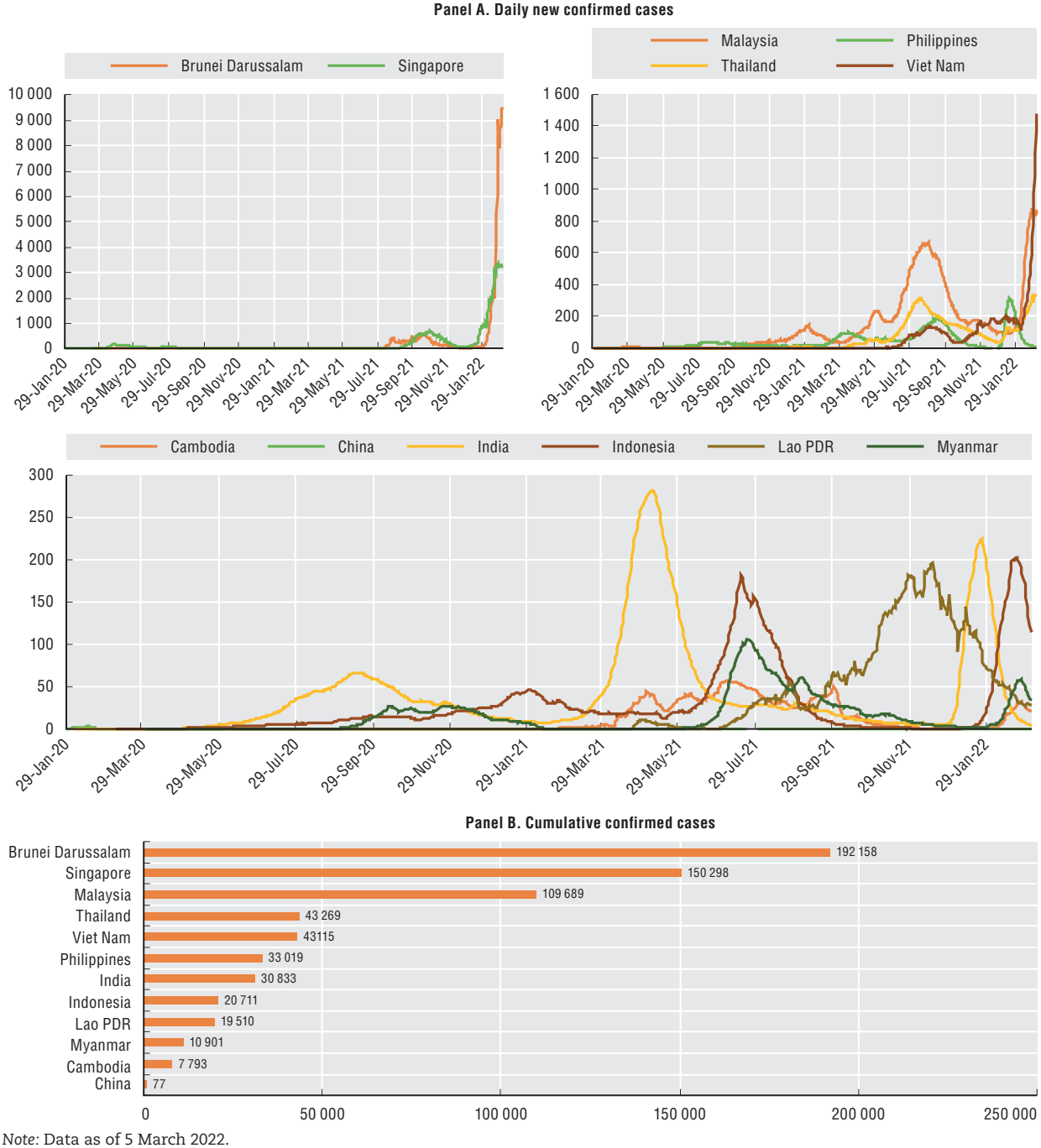
Healthcare and vaccine responses against COVID-19

Although the numbers of daily new confirmed COVID-19 cases in some countries in Emerging Asia have decreased from the peak that they reached in the second half of 2021, recent data show increases in cases in some countries at the beginning of 2022 (Figure 2.1, Panel A). As of 5 March 2022, Brunei Darussalam had more than 190 000 cumulative confirmed cases per million people, Singapore and Malaysia saw more than 150 000 and 100 000 cases per million people respectively, Thailand and Viet Nam had reached more than 40 000 cases per million people, and India and the Philippines both reached more than 30 000 cases (Figure 2.1, Panel B).

Indeed, the emergence of new variants has increasingly been putting extra pressure on the countries of Emerging Asia. As of 27 January 2022, the World Health Organisation (WHO) had identified four variants of concern. These are the variants that are known to spread more easily, and can in some cases cause more serious illness. They include the Beta, Gamma, and Delta variants, as well as the most recent addition, Omicron, which was added to the list in November 2021. The Omicron variant has been spreading rapidly in Emerging Asia, and all countries in the region had reported cases of it as of 10 January 2022. An

appropriate combination of policy responses, including speeding up vaccination programmes, implementing other effective health measures, and also further developments in digital health – as discussed in this section – are crucial factors for coping with the pandemic.

Figure 2.1. **COVID-19 cases per million people**



Note: Data as of 5 March 2022.

Source: Authors' compilation based on Our World in Data (2022), Coronavirus Pandemic (COVID-19) database, https://ourworldindata.org/coronavirus.

StatLink https://doi.org/10.1787/888934303792

Accelerating vaccination programmes

Vaccination has so far been considered to be effective in helping to protect people against severe disease. For instance, various studies found that COVID-19 vaccines have been highly effective in preventing deaths from the widely spread Delta variant (Christie, 2021; Sheikh, Robertson and Taylor, 2021). Therefore, effective vaccination programmes are seen as a critical tool in the transition towards a return to normality. However, the rollout of vaccine programmes across Emerging Asia has been uneven. Some countries such as China and Singapore started distributing vaccines as early as December 2020, while others did not start until March or April 2021 (Table 2.1).

Table 2.1. **Vaccine rollout in Emerging Asia**

Country	Vaccine rollout started
Brunei Darussalam	April 2021
Cambodia	February 2021
China	December 2020
India	January 2021
Indonesia	January 2021
Lao PDR	January 2021
Malaysia	February 2021
Myanmar	January 2021
Philippines	March 2021
Singapore	December 2020
Thailand	February 2021
Viet Nam	March 2021

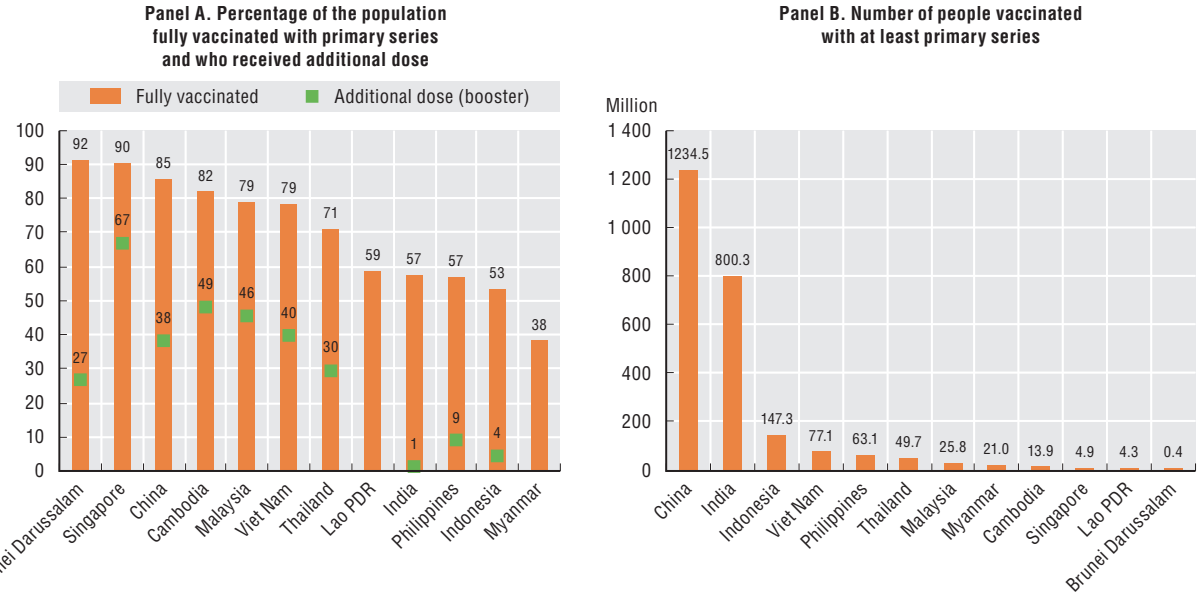
Source: Authors' compilation based on various national sources.

Although billions of doses of vaccine have been distributed in the region, and billions of people have been fully vaccinated with the primary series (Figure 2.2, Panel B), vaccine distribution programmes are uneven across Emerging Asian countries and still face challenges in some countries. As of 5 March 2022, Brunei Darussalam, Singapore and China led the region, and are also among the highest in the world, in vaccine distribution, with 92%, 90% and 85% of the population respectively having received a complete schedule of the primary series of vaccine doses (Figure 2.2, Panel A). Elsewhere, Cambodia had reached around 82%, Malaysia and Viet Nam had both reached around 79%, and Thailand had reached more than 71% of full vaccination. However, the number of fully vaccinated individuals in Myanmar, Indonesia, Philippines, India and Lao PDR still accounted for less than 60% of the population.

The WHO has set a global target for 70% of the world's population to be vaccinated against COVID-19 by mid-2022, in a bid to considerably increase the immunity of the global population, to protect people everywhere from disease, to protect health systems, to restart economies fully, to restore the overall health of society, and to reduce the risk of new variants (WHO, 2021b). In order to reach this goal, it is necessary to ensure access to vaccines, and notably to make sure that they are both affordable and equitably distributed. However, administering vaccines equitably around the world has thus far proven to be a significant challenge. Indeed, according to the Global Dashboard for Vaccine Equity, vaccination rollout has been slower in low- and middle-income countries (UNDP, 2021). In high-income countries, more than 68% of people had been vaccinated with at least one dose as of 2 March 2022, while in low-income countries

the rate stood at only around 13%. A slower or delayed process of administering vaccines could make countries more vulnerable to new surges of the virus, and lead to a slower recovery from the crisis. There is also evidence that vaccines represent a more significant financial burden for lower-income countries than for higher-income ones. High income countries would have to increase their healthcare spending by 0.8% on average to cover the cost of vaccinating 70% of the population, while low-income countries have to increase their healthcare spending by 56% (UNDP, 2021). In Emerging Asia, countries for which vaccination represents a higher financial burden have lower vaccination rates (Figure 2.3). As many countries begin to provide additional doses of vaccine, meanwhile, accelerating the distribution of the primary series of vaccines in those that are lagging behind will be even more important in order to address uneven global vaccination rates.

Figure 2.2. **Vaccination rate in Emerging Asia**



Note: Data as of 5 March 2022 (or latest data available). People fully vaccinated with primary series are defined as people who received all doses prescribed by the initial vaccination protocol.

Source: Authors' compilation based on Our World in Data (2022), Coronavirus Pandemic (COVID-19) database, https://ourworldindata.org/coronavirus.

StatLink https://doi.org/10.1787/888934303811

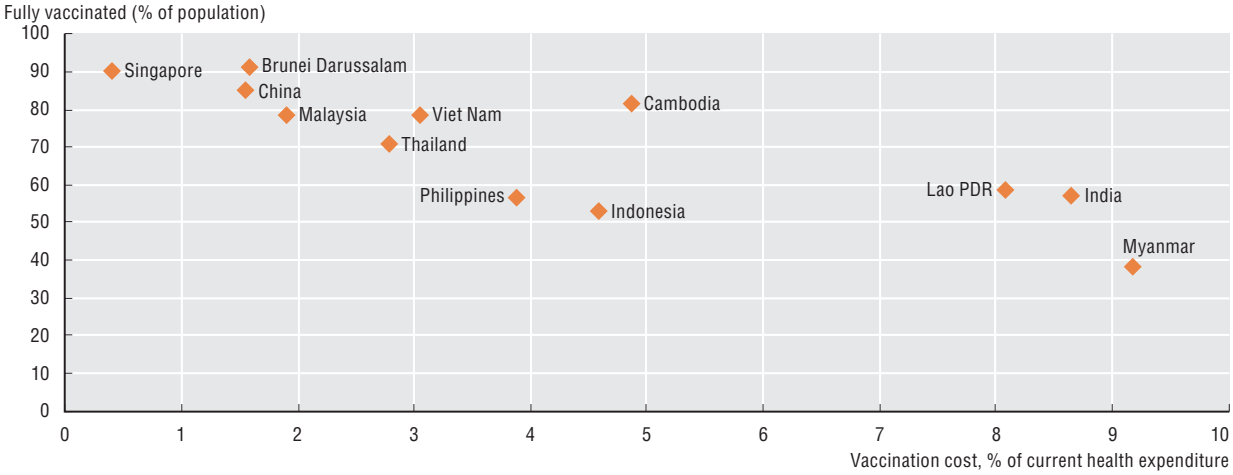
A range of challenges have hindered the distribution of vaccines in many countries in the world, including those in Emerging Asia. Indeed, in order to accelerate the distribution of vaccines and ensure their safe and timely delivery, it is necessary to address these challenges. In this connection, a report from the WHO set out some of the major logistical challenges in the delivery of vaccines. These include issues regarding the vaccine supply chain, vaccine storage infrastructure and power requirements, healthcare waste management, and human resources (WHO, 2021a).

The importance of scaling up capacity in manufacturing and logistics

Issues regarding the vaccine supply chain range from upstream manufacturing issues to vaccine distribution, and together they constitute one of the major challenges that countries face in improving their performance. As in other regions of the world, there is a

need in Emerging Asia to expand manufacturing capacity for vaccines. A survey of vaccine manufacturers in Africa, Latin America and the Caribbean, Southeast Asia, the Western Pacific and the Middle East by the Coalition for Epidemic Preparedness Innovations (CEPI) found that although manufacturing capacity varies across regions, experience with messenger ribonucleic acid (mRNA) vaccine technology and mRNA vaccine capacity, for example, remains limited across all of the regions (CEPI, 2021). Moreover, some vaccines that the WHO has authorised and that are widely used need ultra-low temperature for storage and transportation (Table 2.2). These vaccines have also been approved in many countries in the region (Table 2.3), for instance the Pfizer vaccine requires a temperature of between -90 to -60 degrees Celsius, while the Moderna and Janssen vaccines both need -25°C to -15°C, while other types of vaccines have a more favourable storage temperature of 2°C to 8°C.

Figure 2.3. **Vaccination cost and percentage of the population fully vaccinated in Emerging Asia**



Note: Data as of 5 March 2022 (or latest data available) for fully vaccinated people, and as of 2 March 2022 for vaccination cost. "Vaccination cost" is the cost of vaccinating 40% of the population as a percentage of current health expenditure. Both of these figures are in US dollars (USD).

Source: Authors' calculation based on Our World in Data (2022), Coronavirus Pandemic (COVID-19) database, https://ourworldindata.org/coronavirus and UNDP (2021), Global Dashboard for Vaccine Equity, https://data.undp.org/vaccine-equity/.

StatLink https://doi.org/10.1787/888934304495

Table 2.2. **Examples of vaccines authorised by WHO under Emergency Use Listings**

Vaccine	Manufacturer	Country	Storage temperature requirements
AstraZeneca/Oxford (Vaxzevria)	AstraZeneca	Sweden	2°C to 8°C
Covishield	Serum Institute of India	India	2°C to 8°C
Pfizer/BioNTech (Comirnaty)	BioNTech	Germany	-90°C to -60°C
Moderna	Moderna Biotech	Spain	-25°C to -15°C
Janssen (Johnson & Johnson)	Cilag International	Belgium	-25°C to -15°C
Sinopharm	Beijing Institute of Biological Products	China	2°C to 8°C
Sinovac - CoronaVac	Sinovac	China	2°C to 8°C
Covaxin	Bharat Biotech	India	2°C to 8°C

Source: Authors' compilation based on information from WHO (https://extranet.who.int/pqweb/vaccines/vaccinescovid-19-vaccine-eul-issued).

Table 2.3. **Vaccines approved in Emerging Asia**

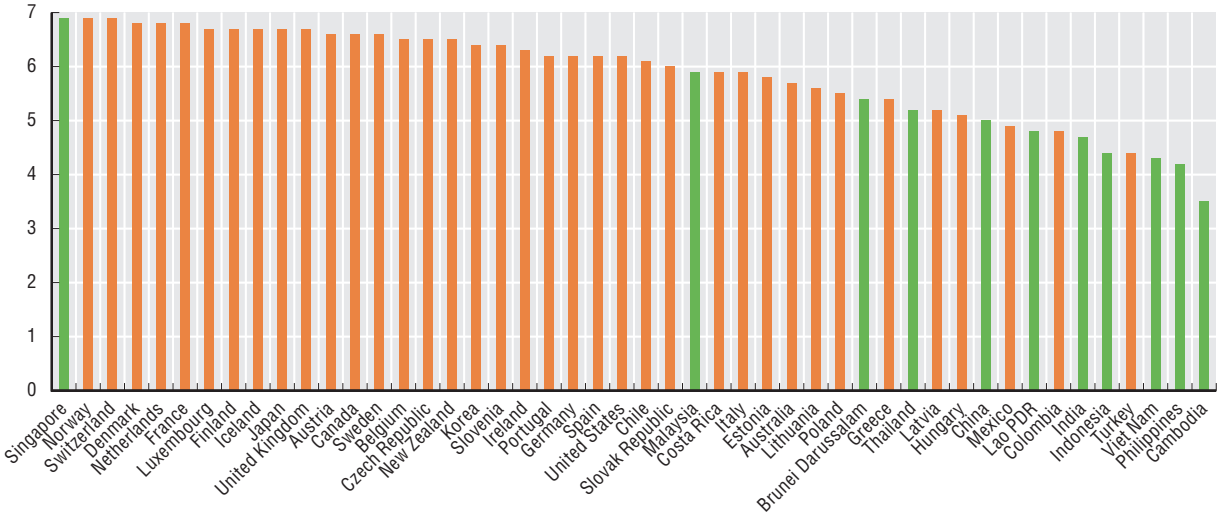
Country	Number of vaccines approved	Astra Zeneca/ Oxford (Vaxzevria)	Covishield	Pfizer/ BioNTech (Comirnaty)	Moderna	Janssen (Johnson & Johnson)	Sinopharm (Beijing)	Sinovac CoronaVac	Bharat Biotech Covaxin	Gamaleya Sputnik V	Others
Brunei Darussalam	4	√		√	√		√				
Cambodia	8	√				√	√	√		√	√
China	6						√	√			√
India	10	√	√		√	√			√	√	√
Indonesia	11	√		√	√	√	√	√		√	√
Lao PDR	6			√		√	√	√		√	√
Malaysia	7	√		√	√	√	√	√			√
Myanmar	3		√				√			√	√
Philippines	11	√		√	√	√	√	√	√	√	√
Singapore	3			√	√			√			
Thailand	6	√		√	√	√	√	√			
Viet Nam	8	√		√	√	√	√		√	√	√

Note: Data as of 11 February 2022. A vaccine that is approved in a given country may not be in use in said country.

Source: Authors' compilation based on information from the COVID-19 Vaccine Tracker website, https://covid19.trackvaccines.org/.

Limitations with regard to infrastructure remain a challenge in some countries in the region. One notable limitation in this regard is the lack of a stable and reliable electricity supply, which is necessary to power cold storage facilities for vaccines. Indeed, electricity supply is considered less reliable in Emerging Asian countries than in most OECD countries, with the exception of Singapore (Figure 2.4). Countries in Emerging Asia will need to improve vaccine facilities, including through the provision of a stable electricity supply and the availability of cold storage, in order to be able to receive and safely distribute a fuller range of vaccines, including those that require storage at an ultra-low temperature. They also need to ensure smooth distribution and last-mile delivery of the vaccines, especially in remote and rural areas.

Figure 2.4. **Quality of electricity supply, 2017**



Note: The numbers on the horizontal axis range from 1, which signifies "extremely unreliable" to 7, or "extremely reliable". This is based on the World Economic Forum's, Executive Opinion Survey, in which respondents answered the following question: "In your country, how reliable is the electricity supply (lack of interruptions and lack of voltage fluctuations)?".

Source: Authors' compilation based on World Economic Forum (2017), *The Global Competitiveness Index 2017-18*, https://www.weforum.org/reports/the-global-competitiveness-report-2017-2018.

StatLink https://doi.org/10.1787/888934304514

The need to address vaccine hesitancy

Even when vaccines are available, fear and hesitancy still may influence people's decisions over whether or not to get vaccinated. Vaccine hesitancy refers to a refusal or reluctance to accept a vaccination, despite one being available, and it is an increasingly important issue in global health. Indeed, even before the COVID-19 pandemic, the WHO had declared vaccine hesitancy to be among the top ten threats to global health (WHO, 2019). While the reasons why people choose not to get vaccinated are multifaceted, the WHO identified complacency, inconvenience in accessing vaccines, and a lack of confidence as some of the key reasons for vaccine hesitancy.

Similarly, a study by Dabla-Norris et al. (2021) also identified several reasons that influence vaccine acceptance. These include perceptions both of the severity of COVID-19 and of the side effects that vaccines may provoke. They also include how easy to access vaccination sites are, levels of compliance with protective behaviours, overall levels of trust in government, and the manner in which information is shared among peers. Further reasons include demographic factors such as age and gender. Elsewhere in the literature, Lau et al. (2021) studied various factors influencing acceptance of COVID-19 vaccines in Malaysia. They found that the degree to which vaccines are adequately tested, as well as considerations of their effectiveness and side effects are the main reasons for refusing vaccines. Furthermore, Kanozia and Arya (2021) highlighted that false information, lack of transparent information, lack of trust in government, and also religious factors, are among the factors responsible for COVID-19 vaccine hesitancy in India, Pakistan and Bangladesh.

In order to address the fears and doubts of people who are hesitant about taking a vaccine, it is necessary to ensure a high degree of transparency, to strengthen vaccine outreach efforts and campaigns, and to continuously provide clear and accurate information about the virus and vaccines through various channels and means of communication. Information should address questions of safety and the potential side effects of each type of vaccine, as well as the risks of contracting COVID-19, and the specific consequences of not getting a vaccine. As regards the former, any potential adverse reactions following vaccination should be reported in due time. The information should be communicated by health professionals in order to build trust and confidence.

Since a rich stream of new research and studies is continuously emerging regarding COVID-19 vaccines, providing training for healthcare workers is also important. Such training can strengthen the skills of healthcare professionals, updating their knowledge so that they can then help to increase awareness and reduce misinformation about vaccines, and to promote vaccination programmes more generally. Information and promotion materials should also be available in various local languages and dialects, so as to reach all communities.

International co-operation helps to speed up the distribution of vaccines

It is clear that international co-operation helps to accelerate the worldwide development, manufacturing and distribution of vaccines. Notably, the COVID-19 Vaccines Global Access facility (COVAX) and the Asia Pacific Vaccine Access facility (APVAX) are two examples of co-operation that include Emerging Asian countries. The COVAX initiative was launched in April 2020, and by mid-January 2022 the facility had reached its milestone of delivering a billion doses of COVID-19 vaccines to 144 participant countries, including some in Emerging Asia.

A number of bilateral vaccine donations to the region have also been distributed through COVAX, and private-sector actors and philanthropic foundations have also been mobilising significant resources through the facility. As for the APVAX initiative, it was launched in December 2020 with a fund of USD 9 billion in order to provide grants and loans for the supply of COVID-19 vaccines. In mid-March 2021, the first APVAX project was approved, to support the Philippines in procuring COVID-19 vaccines. Another APVAX project, this time for Indonesia, was approved later in March. Bilateral relations also play a major role in vaccine procurement for Emerging Asian countries. In addition, ASEAN has implemented regional initiatives, including the allocation of USD 10.5 million from the COVID-19 ASEAN Response Fund for vaccine procurement.

However, there is still room for further enhancement of international co-operation, particularly at the regional level. Indeed, regional initiatives have the potential to further address the large gaps that remain between countries in terms of vaccination. More recently, some ASEAN member countries have called for an increase in support, and for the specific allocation of more resources from the COVID-19 Response Fund for vaccine procurement due to the urgent need to accelerate vaccination programmes.

Box 2.1. **Cambodia's vaccination programme**

In Emerging Asia, Cambodia has been among the countries with the highest vaccination rates. Its capital city, Phnom Penh, was ranked as one of the most vaccinated capital cities in the world, with around 99% of its adult population fully vaccinated (Mekong Strategic Partner, 2021). In addition to being the first country in the region that is eligible to receive vaccines from the COVAX facility, the country has been benefitting from various kinds of bilateral co-operation in vaccine provision. Moreover, the Cambodian government has ring-fenced vaccine distribution based on geographical location. This has meant prioritising areas and cities with high risk of transmission and high economic and health impact. Such an approach is often considered clearer and simpler than an age-tiering or other categorisation of the population. Cambodia has also introduced vaccine mandates for certain segments of its workforce, including members of the armed forces and civil servants. The government's efforts in vaccine distribution have benefitted from the relatively low level of vaccine hesitancy in Cambodia, compared to many other countries (United Nations, 2021).

In order to increase vaccine production capacity and vaccination coverage, countries in Emerging Asia have started to create vaccines domestically. Indeed, Indonesia, Malaysia, Singapore, Thailand and Viet Nam have been producing their own vaccines. Most of them are still at an exploratory or pre-clinical stage, but some are already in the second or third phases of clinical trials.[1] As of December 2021, Viet Nam's home-grown vaccine candidate, Nanocovax, for instance, was in a phase three trial, while Thailand's vaccine candidate, ChulaCov19, and Singapore's candidate, ARCT-021, were both in phase two trials.

Omicron-specific vaccines could change immunisation programmes

Some pharmaceutical companies, such as Novavax, are responding to the emergence of the Omicron variant by developing Omicron-specific vaccines (Dolgin, 2021 and Novavax, 2021). As such developments unfold, the speed at which these vaccines can emerge, and the degree to which they will be effective, may have implications for the types of extra doses that healthcare systems may wish to offer people who have already completed their primary vaccination regimens. Novavax (Novavax, 2021), Moderna and Pfizer are all currently developing vaccines tailored to the Omicron variant. If these were to be developed quickly, they could conceivably replace a third dose of the vaccines that are currently in circulation, and which were designed for the wild-type virus. However, early indications from several vaccine producers, such as Pfizer and Oxford/AstraZeneca, suggest that a third dose of their current vaccine would provide sufficient protection against Omicron. Indeed, research has found that a booster dose of a COVID-19 vaccine could produce sufficient antibodies to neutralise the Omicron variant (Planas et al., 2021). Another study (Garcia-Beltran et al., 2022) found that a booster dose of an mRNA vaccine, such as Moderna or Pfizer, is necessary in order to provide immunity against the Omicron variant.

Implementing effective health measures, beyond vaccination programmes

Notwithstanding the merits of vaccination, vaccination alone is not sufficient, as fully vaccinated people can still test positive, especially with the emergence of new variants. Even as vaccination rates increase, preventive measures and non-pharmaceutical interventions (NPIs) are still an important part of governmental responses to COVID-19. These include wearing masks, physical distancing measures, restrictions on movement, hygiene measures, proper ventilation, and robust testing and contact tracing. In addition, medical systems and facilities also need to be improved.

Non-pharmaceutical interventions (NPIs)

While some countries in Emerging Asia started to relax foreign and domestic travel restrictions in the second half of 2021, prior to the emergence of the Omicron variant (Box 2.2), many behavioural restrictions remain in place, such as capacity limits on public or private gatherings, requirements for people to register their presence in public places, and the mandatory wearing of masks – either solely in indoor settings, or at all times once people have stepped outside of their homes (Table 2.4). Emerging Asian countries have enforced physical distancing and mask-wearing, and many have incentivised vaccination. An example of a vaccination incentive is the draw programme launched by the Hong Kong Airport Authority to give away 60 000 airline tickets to people who were fully vaccinated by September 2021 in response to slow vaccine uptake in Hong Kong, China (Hong Kong International Airport, 2021). With the exception of international travel and borders, meanwhile, enforcement and monitoring responsibilities have been increasingly delegated to subnational governments as the pandemic has continued to unfold.

Measures to restrict movement in response to COVID-19

Another type of measure that has often been implemented to limit the spread of COVID-19 within countries is placing restrictions on movement, such as quarantines and lockdowns. Mandatory quarantine is often applied for those who test positive for the virus, or who are considered to be a close contact of other people who have tested positive. Lockdown

measures tend to be implemented as a response to a surge in cases of COVID-19, which can jeopardise the capacity of healthcare facilities. Most countries in Emerging Asia have enforced some level of domestic movement restrictions at some point.

Table 2.4. **Examples of public health measures related to COVID-19**

Country	Capacity restrictions	Mask requirements	QR-code tracing
Brunei Darussalam	Mass gatherings, government offices and business premises: 200 people or 50% capacity, whichever is smaller.	Indoors.	The BruHealth app is mandatory.
Cambodia		In shops, restaurants, cafeterias, supermarkets, banks and other commercial areas (locally applied at provincial level).	
Indonesia	Applied locally.	Indoors and outdoors.	
Lao PDR		Offices and large social gatherings.	
Malaysia	Public or private gatherings: 50% in phase 2 or 3 of National Recovery Plan (NRP), 100% in phase 4 (vaccinated or negative test required in all phases).	Public transport.	
Myanmar		Indoors.	
Philippines	Dependent on the stringency level in each locality.	Masks indoors and outdoors. Face shields mandatory in high-risk activities under the 3C's framework (closed, crowded and close contact), and recommended for voluntary use in areas under Alert levels 3, 4 and 5.	The TRAZE app is the nationwide and unified contact tracing app for travel to the country.
Singapore	Workplaces: 50% (fully vaccinated); tourist attractions: 50% (fully vaccinated); social gatherings: maximum of five people (from 27 September 2021); 1 000 (fully vaccinated) for worship, wedding ceremonies, meetings, incentives, conferences and exhibitions activities, and entertainment.	Indoors and outdoors (age 6+).	The TraceTogether app is mandatory.
Thailand	Restaurants, entertainment, sports events, athletic facilities and fairs: dependent on the stringency level in each province or district.	Applied locally.	
Viet Nam	In Ho Chi Minh City, restaurants can run at 50% of capacity.	Public transport and public venues.	
China	Applied locally.	Applied locally.	Mandatory (must have green health code to access public venues).
India		Indoors and outdoors.	

Notes: Information as of 1 February 2022 or 5 November 2021. Full vaccination is as per national definitions.
Source: Authors' compilation based on media reports, national sources and AMRO (2021).

In Indonesia, domestic travellers to and from Bali or Java must show proof of vaccination (at least one dose), in addition to a negative PCR or rapid antigen test (Government of Indonesia, 2021). Elsewhere, Malaysia implemented a nationwide lockdown on 1 June 2021 following a surge in new cases. Moreover, Malaysians must be fully vaccinated for interstate travel, while Myanmar requires quarantine for certain kinds of interstate travel (Ministry of Hotels and Tourism Myanmar, 2021 and 2022). In Lao PDR, meanwhile, a number of provinces have gone in and out of lockdown frequently since the start of the COVID-19 pandemic. In addition to those provinces, travel between districts in the Bokeo province was prohibited from 27 October to 8 November 2021 (AMRO, 2021). Furthermore, China moved in August 2021 to impose inter-provincial travel restrictions in response to localised COVID-19 outbreaks.

Box 2.2. **Travel started to reopen in 2021, but some restrictions remain in place**

In the second half of 2021, international travel for both business and leisure was resuming slowly worldwide, including in Emerging Asian countries, although the emergence of the new Omicron variant subsequently introduced a fresh wave of uncertainty, heralding the risk of a re-tightening of travel rules. Travel restrictions have generally shifted from having a basis in geography to a basis in vaccination status, with fully vaccinated individuals often now subject to less stringent quarantine or testing requirements than their unvaccinated counterparts. As regards international arrivals for tourism purposes, countries where tourism receipts represent a larger amount of total export have started to ease entry restrictions, like Cambodia for instance (Table 2.5).

Table 2.5. **Overview of restrictions on international arrivals in Emerging Asian countries**

Country	International tourism receipts as % of total exports in 2019	Borders open for international tourism	Quarantine requirements for foreign visitors
Brunei Darussalam	2.70	No	Not applicable, as cross-border travel for tourism purposes is still suspended
Cambodia	25.21	Yes	No quarantine for fully vaccinated visitors; 14 days for visitors who are partially vaccinated or unvaccinated
Indonesia	9.20	Yes	5 days for fully vaccinated visitors and 7 days for partially vaccinated visitors; not applicable for visitors who are not fully vaccinated, as travel not allowed for this category
Lao PDR	13.94	Yes	24 hours for fully vaccinated visitors; not applicable for visitors who are not fully vaccinated, as travel not allowed for this category
Malaysia	9.33	Yes, to visitors from certain countries	5 days for visitors who have received a booster dose; 7 days for fully vaccinated visitors who have not received a booster dose; 10 days for partially vaccinated or unvaccinated visitors
Myanmar	14.27	No	Not applicable, as cross-border travel for tourism purposes is still suspended
Philippines	12.12	Yes	No quarantine for fully vaccinated visitors; not applicable for visitors who are not fully vaccinated, as travel not allowed for this category
Singapore	3.07	Yes, to visitors from certain countries	No quarantine for fully vaccinated visitors under the Vaccinated Travel Lane; not applicable for visitors who are not fully vaccinated, as travel not allowed for this category
Thailand	20.09	Yes	7 days for fully vaccinated visitors; 10 days for partially vaccinated or unvaccinated visitors
Viet Nam	4.21	Yes, to visitors from certain countries	3 days for fully vaccinated visitors; 14 days for partially vaccinated or vaccinated visitors, that could be prolonged by Vietnamese authorities to 21 days
China	1.52	No	Not applicable, as cross-border travel for tourism purposes is still suspended
India	5.80	Yes	No quarantine required

Note: Information as of 1 March 2022. Data for Brunei Darussalam, Singapore and China are as of 2018. "Fully vaccinated" means vaccinated with both doses for the two-dose vaccines and one dose for the mono-dose ones; "partially vaccinated" means vaccinated with one dose for the two-dose vaccines.

Source: OECD Development Centre based on various national sources and World Bank (n.d.), *International tourism receipts (% of total exports)*, https://data.worldbank.org/indicator/ST.INT.RCPT.XP.ZS (accessed on 11 February 2022).

Some Emerging Asian countries are allowing for a partial return of tourism, either by permitting nationals of certain countries to enter, or allowing tourism in designated regions. Indonesia and Viet Nam have tourism programmes where fully-vaccinated travellers from low risk countries can travel to certain regions, but they must stay there. In contrast, Thailand began a "Test & Go" programme on 1 November 2021, under which fully-vaccinated travellers arriving from countries deemed low-risk would be able to move about freely after a negative RT-PCR test on arrival with results delivered in no more than six hours.

In the Philippines, as the COVID-19 pandemic has come under a greater degree of control, however, blanket lockdowns and "community quarantines" (the term used in the country) have been scaled back. Despite this, there is still a need to quarantine people who test positive. As of 8 September 2021, the government of Brunei Darussalam transferred all people who tested positive for the virus in the country to designated isolation facilities. In contrast, officials in Viet Nam permit home quarantine in the Nam Tu Liem district of Hanoi on a trial basis as of 16 November 2021 for so-called "F1 contacts", which refers to people who have been in contact with somebody who tested positive. However, this option is only available for the elderly, people suffering from chronic diseases, children, or pregnant women (Phuong, 2021). In some countries, restrictive measures also include the introduction of vaccine passports, whereby only vaccinated people (or those who are ineligible to be vaccinated) may access certain kinds of places. This is currently the case in Indonesia and Singapore (Government of Indonesia, 2021; Government of Singapore, 2022).

Adjustments to healthcare policy due to the Omicron variant

Most countries have made policy adjustments in response to the emergence of the Omicron variant, and Emerging Asian countries are no exception. Brunei Darussalam, Cambodia, Lao PDR, Malaysia and Viet Nam, at certain times, issued travel bans from countries where the variant was first identified. Countries have also extended, strengthened or reintroduced non-pharmaceutical interventions. Most of the measures in response to Omicron have taken the form either of capacity limits, or of vaccination requirements for certain settings. Mask mandates of some form were already widely in place.

With the exceptions of Indonesia's introduction of capacity limits, and Singapore's expansion of vaccination requirements, non-travel reactions to the emergence of the Omicron variant have been rather muted (Table 2.6). This is likely to be because stringent measures, such as requirements to wear face masks, were already in place beforehand, and also due to the apparent rarity of severe disease and death from Omicron as compared to other variants of the virus.

The rarer incidence of severe outcomes with Omicron should generally be seen as positive, but the variant's higher rate of transmissibility does provide a caveat. For the fragile healthcare systems that are common among Emerging Asian countries, an increasing proportion of the population requiring hospitalisation could place these systems under significant stress. In addition, a scaling up of genomic screening facilities for the identification of variants from viral samples from positive tests is also important, across Emerging Asia.

Medical facilities and supplies

In addition to preventive and restrictive measures, improving medical facilities and supplies is crucial as countries seek to cope with large increases in COVID-19 cases. For instance, the Cambodian government announced in 2021 that it would implement a project to improve medical infrastructure and medical waste management, in order to curb the spread of COVID-19. In Indonesia, meanwhile, an athletes' village in Jakarta was turned into an emergency facility to house COVID-19 patients. Furthermore, an indoor stadium in Lao PDR was converted into a temporary hospital in order to accommodate an increase in the number of COVID-19 patients. Moreover, regional co-operation initiatives, such as ASEAN's COVID-19 Response Fund, and also bilateral co-operation initiatives, can play a

role – not only in the provision and distribution of vaccines, but also in helping to close gaps in medical supplies and Personal Protective Equipment (PPE).

Table 2.6. **Examples of measures in response to the emergence of the Omicron variant**

Country	Travel restrictions	NPIs and vaccine requirements
Brunei Darussalam	Suspension and revocation of entry and exit travel approvals for people coming from South Africa, Botswana, Eswatini, Lesotho, Malawi, Mozambique, Namibia and Zimbabwe. **Prohibition rescinded 1 January 2022.**	None.
Cambodia	Travel from Angola, Botswana, Eswatini, Lesotho, Malawi, Mozambique, Namibia, South Africa, Zambia and Zimbabwe prohibited. **Prohibition rescinded 7 December 2021.**	None.
Indonesia	Travel from countries with Omicron cases prohibited, except for Indonesian citizens. **Prohibition rescinded 1 February 2022**. Quarantine periods from 1 February 2022: 5 days for fully vaccinated, 7 days for partially vaccinated.	From 7 February 2022: supermarkets, markets, malls and restaurants: 60% capacity; places of worship: 50% capacity; public facilities, art and cultural performances: 25% capacity. Group of Twenty (G20) events to use a bubble system, with daily rapid antigen testing, and compulsory use of Indonesia's *PeduliLindungi* application.
Lao PDR	From 2 December 2021: prohibition of travel from Botswana, Eswatini, Lesotho, Malawi, Mozambique, Namibia, the Seychelles, South Africa and Zimbabwe. All incoming travellers must take a PCR test upon arrival, and quarantine pending results and (from 3 February 2022) must wear a medical monitoring device for seven days.	None.
Malaysia	As of 6 December 2021, travel from Botswana, Eswatini, Lesotho, Malawi, Mozambique, Namibia, South Africa and Zimbabwe was prohibited (except Malaysian citizens and long-term pass holders). **Prohibition rescinded 28 December 2021**. Quarantine periods: 5 days for fully vaccinated with additional dose beyond base series, 7 days for fully vaccinated with only base series, 10 ays for all others. Special regional programmes for business and leisure travel. Malaysia-Singapore vaccinated travel lane (VTL): vaccinated travellers only, testing requirements based on means of transport.	None.
Singapore	None.	As of 1 January 2022: vaccine exemption period for recovered persons reduced from 270 to 180 days from the day of an initial positive test in Singapore. People whose exemption periods were shortened by the change had until 31 January 2022 to receive one dose of an mRNA vaccine, or two doses of Sinovac. As of 1 February 2022: vaccination required to be a guest at hotels, hostels or serviced apartments and to access indoor sports facilities or institutions of higher learning (degree-seeking students exempt).
Thailand	None.	Patrols increased at Thai-Myanmar border.
Viet Nam	As of 1 December 2021: Suspension of flights from Botswana, Eswatini, Lesotho, Mozambique, Namibia, South Africa and Zimbabwe. People with recent travel records from the listed countries also were prohibited from entering.	None.
China	None.	Lockdowns applied locally.
Hong Kong, China	As of 8 January 2022: implementation of a place-specific flight-suspension mechanism for Australia, Canada, France, India, Pakistan, the Philippines, the United Kingdom and the United States. Also from 8 January: Cabo Verde, Niger, and South Sudan designated as Group A specified places (tighter boarding and quarantine requirements). From 12 February 2022: Nepal added to place-specific flight-suspension mechanism.	None.
India	None.	Local vaccination drives.

Note: Information as of 13 February 2022 or latest available. Measures outlined in this table are in response to the emergence of the Omicron variant only; pre-existing measures that were not changed in response to Omicron are not included.

Source: Authors' compilation, based on national sources.

In addition to short-term responses to COVID-19 outbreaks, some countries have unveiled strategies aimed at enhancing healthcare capacity that will yield benefits in the longer term. In the Philippines, for instance, around PHP 17 billion (approximately USD 330 million) of the 2022 budget will be used to hire 26 035 health professionals for deployment to "underserved" hospitals or areas (DoH, 2021). In a similar vein, Malaysia announced as part of its budget for 2022 that it would extend the contracts of more than 10 000 medical practitioners and pharmacists to four years from the initial two years. Additionally, the Malaysian government has allocated MYR 100 million (Malaysian ringgit, the equivalent of around USD 23.9 million) as sponsorship of specialisation programmes for 3 000 medical practitioners. It has also been decided to allocate MYR 200 million (around USD 47.8 million) for increasing Teaching Hospital and Field Hospital Intensive Care Unit (ICU) capacity (Ministry of Finance Malaysia, 2021).

Developments in therapeutic medicine are a promising sign for living with COVID-19

Some pharmaceutical companies have developed COVID-19 therapeutics in pill form, which may shorten or reduce the severity of illness if taken early enough in the course of the disease. In turn, this could help to keep patients out of hospitals, preserving the capacity of hospitals and other medical facilities. These medications are beginning to gain emergency approval in some countries, and could become a valuable tool globally for minimising the negative health effects of COVID-19. Global or regional programmes may be needed to help developing countries to access them, in a similar way to how COVAX and APVAX have helped with vaccines.

One example is Pfizer's candidate, Paxlovid. In a press release on 14 December 2021, Pfizer announced that Paxlovid reduced the likelihood of hospitalisation and death by 88% compared to a placebo, when administered within five days of the onset of symptoms (Pfizer, 2021). Merck Sharp & Dohme has also developed an oral therapeutic called Molnupiravir, in collaboration with Ridgeback Biotherapeutics. In October 2021, MSD partnered with the United Nations Medicines Patent Pool to allow the drug to be sold royalty-free in 105 low- and middle-income countries, including Cambodia, Indonesia, Lao PDR, Myanmar, Viet Nam and India (Medicines Patent Pool, 2021). On 20 January 2022, the UN's Medicines Patent Pool announced that 27 drug-manufacturing firms had been licensed to produce either the raw ingredients for Molnupiravir, the finished drug, or both. Ten of these companies are located in India, five in China, and one each in Indonesia and Viet Nam (Medicines Patent Pool, 2022).

Testing and tracing

Testing and tracing is also an important part of countries' measures to cope with COVID-19. In particular, when at some point, with the increase in global vaccination rates and the development of therapeutic medicines, COVID-19 transitions from pandemic to endemic phase and becomes part of everyday life, testing could be more accessible and affordable. This includes not only the testing administered by laboratories, but also testing tools that could be easily and quickly performed at home. In Singapore, for instance, all workers, regardless of their vaccination status, who work in settings with unmasked clients, or who have close contact with clients when performing services – such as food and beverage enterprises, retail malls, supermarkets, last-mile delivery personnel and personal care services – are required to perform regular Fast and Easy Testing (FET). In addition, self-testing kits are available in pharmacies.

On the other hand, China is employing a "Zero-COVID" strategy that involves mass testing of city populations in response to as little as a single case. While this approach may keep COVID-19 cases to a minimum, the large amount of human and physical resources it requires, as well as its invasive and disruptive nature, may make it difficult to implement elsewhere.

In developing a manner of living with COVID-19, a multi-stakeholder approach is necessary in order to provide guidance and information on how to react to positive tests that is both widely available and easily accessible. This should include guidance on positive tests among fully vaccinated people, information on coping with general social frustration with restrictions (i.e. "pandemic fatigue").

Developing digital health initiatives further

Emerging Asian countries have been developing digital health tools during the pandemic

The COVID-19 pandemic has led to an acceleration in digitalisation. Indeed, digital health tools have played a key role in helping to manage the COVID-19 pandemic (Table 2.7), especially as restrictions on human contact have been employed in order to stop the spread of the virus. These tools have been developed by both public and private actors, and fall into two main categories: surveillance and telemedicine. However, some tools possess functions that overlap these two categories. Broadly speaking, surveillance tools are used to track the spread of the virus in the community. Some of these tools inform people if they have been exposed to a person who has tested positive for the virus.

Moreover, some digital health tools are used to enforce restriction orders on the movement of individuals. The digital tools make use of the geolocation and Bluetooth features of mobile phones in order to function. Some digital health applications may also provide health information related to the pandemic, including updates about public health requirements. Yet despite the upsurge in digital health tools during the course of the COVID-19 pandemic, telemedicine tools preceded it in many cases, and can offer healthcare support that goes beyond COVID-19.

Table 2.7. **Examples of digital applications related to COVID-19 in Emerging Asia**

Country	Check-in	Exposure monitoring	Quarantine enforcement	Health advice	Health records	Medical appointments	Book vaccine
Brunei Darussalam	Yes	Yes	No	Yes	Yes	Book/attend	Yes
Cambodia	Yes	No	No	No	COVID-19 (web-based)	No	Yes
Indonesia	No	Yes	No	No	COVID-19	Book/attend	Yes
Lao PDR	Yes	Yes	No	Yes	No	Book virological tests	Yes
Malaysia	Yes	Yes	Yes	Yes	COVID-19	Book/attend	Yes
Myanmar	Yes	No	Maybe	No	COVID-19	No	No
Philippines	Web-based	Yes	No	Yes	COVID-19	No	No
Singapore	Yes	Yes	Yes	Yes*	Yes*	Book*	Yes
Thailand	Yes	Yes	No	No	COVID-19	No	No
Viet Nam	No	Yes	No	Yes	COVID-19	No	Yes
China	Yes	Yes	Yes	No	Yes	No	No
India	No	Yes	No	Yes	COVID-19	No	Yes

Notes: Information as of 20 November 2021. A function marked with * refers to a function on a digital health tool that existed prior to the COVID-19 pandemic. **Yes** means at least one government-issued digital health tool possesses the given feature. A value of **Yes** for health records includes proof of COVID-19 vaccination, unless otherwise indicated.

Source: Authors' compilation, based on various sources.

Governments in Emerging Asia have taken two main approaches to developing digital health applications. Some have released several applications with few specific functions, while others have released a single, multi-function application. Malaysia is an example of the first group, having released three tools: the eCOVID19 application, *MySejahtera*, and MyTrace Malaysia. The latter of these tools, MyTrace Malaysia, uses Bluetooth communication from mobile devices to inform users if they have been in contact with a person who has tested positive for COVID-19 within a particular timeframe (MyGovernment, 2021). In addition, *MySejahtera* now provides QR code-based contact tracing and quarantine enforcement for all people entering Malaysia. It also provides health information, such as where COVID-19 testing and treatment can be accessed. Furthermore, it also offers access to telemedicine services through Virtual Health Advisory, which links to the platform DoctorOnCall (Government of Malaysia, 2021). The application also notifies users of their eligibility to receive a vaccine, and provides an option to book an appointment, although the appointment time is assigned, rather than selected by the user (Wong, 2021). Moreover, *MySejahtera* also holds a COVID-19 vaccine certificate.

Cambodia, Lao PDR, Myanmar, Singapore, Thailand, Viet Nam and India are taking similar approaches. Yet in the case of India in particular, several applications have been developed at the state level that may or may not be integrated with national ones. In contrast, Brunei Darussalam (*BruHealth*), Indonesia (*PeduliLindungi*), the Philippines (*StaySafe*), and China (*HealthCode*), are centralising digital health tools on a single application with a wide array of functions. While these applications may ultimately be more complex to develop and maintain, they remove some of the burden from users, who then only need to download a single application, rather than several. It can also help user-facing support staff to be trained more efficiently, as they only need to familiarise themselves with a single application.

Owing to the urgency of the pandemic, many of these applications were developed very quickly, and there may not have been time for them to undergo robust testing. Indeed user comments on download pages such as the Google Play Store (Android store) or Apple App Store indicate that some of the applications have experienced frequent and wide-ranging technical issues, and that they may be difficult for foreigners to use if they only provide service in local languages. Many of the applications have been updated several times already in order to add new features or correct these issues. However, many enhancements are required if these applications are to be used on a longer-term basis than foreseen initially. At the same time, developers must be aware of the digital tools that the population of each country or region tends to possess, and must design their applications accordingly. Many people in Emerging Asia have digital devices that are obsolete by several generations, precisely because these are more affordable for them to own. They also may not have strong enough Internet connections or large enough mobile data packages to support applications that are large in size, or heavy on graphics.

Surveillance tools pose challenges

The major challenges that surveillance tools throw up are quality and privacy. Since most of the tools were developed extremely quickly in response to the COVID-19 pandemic, they often have limitations, such as major bugs, as well as a lack of support for non-local languages, such as English. Application reviews on the Google Play Store, or Apple's App Store are rife with these two complaints, especially regarding the recovery of login information.

Contact-tracing apps must also be open in the background in order to work, and often require Bluetooth or Global Positioning System (GPS) technology to be running too. This has led many users to report increased battery drain on their devices. In addition to the technical issues, privacy concerns about how the data are being stored and used may also make people hesitant to download the tools. Despite most governments indicating that the data are secure, not distributed elsewhere, and deleted after a period of time, many people remain sceptical of these claims. Governments will need to work with citizens to wind down the tracing and quarantine enforcement aspects of these applications as the COVID-19 pandemic subsides, especially following a successful vaccination campaign.

China's health app was developed in a public-private partnership involving Alibaba & Tencent, and the end user has no information about what generates the code that they are assigned, even though it controls their ability to access public spaces and services (Li, Ma and Wu, 2022; Cong, 2021).

Telehealth and telemedicine could be further enhanced

Telehealth and telemedicine[2] have played a key role in providing medical care throughout the COVID-19 pandemic. Indeed, these services have allowed non-urgent medical care to continue without patients needing to be physically present at medical facilities. In turn, this has allowed healthcare providers to reserve hospital services for people who are the most in need. Still, expanding telehealth faces several barriers. While cost is often the primary barrier, poor digital infrastructure, poor digital literacy, and a lack of legal frameworks are other common issues.

Telemedicine services operate primarily on a fee-paying structure. Users pay either a set amount for each telemedicine encounter, or a subscription fee to cover a particular period. Subscription fees may include caps on the amount of services (i.e. the number of consultations) that subscribers can access in that period of time. Whatever the scheme, these services normally require out-of-pocket expenditure by users, though some governments and insurance providers have subsidised fees in whole or in part during the COVID-19 pandemic. For instance, West China Hospital in China's Sichuan Province has integrated telemedicine into its service, waiving all consultation fees. Elsewhere, some private insurance providers in the United States have added telemedicine to their coverage at no additional cost, and some states have added telemedicine to the scope of services that are covered under Medicare (AHIP, 2021). However, as the threat of the pandemic recedes in the United States, many of these temporary benefits are being cancelled (AHIP, 2021). Australia, meanwhile, is integrating telemedicine into its social healthcare systems. After bringing in telemedicine for remote communities under its public health programme, which is also called Medicare, Australia's health ministry expanded this move nationwide as part of its response to COVID-19. This initiative was welcomed, with millions of consultations in the service's first month, a trend that has continued (OECD, 2021). Considering the benefits, countries in Emerging Asia should strive to make some degree of telemedicine service available through their universal healthcare systems. The settings for eligibility and the degree of service that is available via telemedicine (e.g. national eligibility versus remote regions only, or a focus on specific services) can be defined to suit the needs of each country.

The expansion of telemedicine will require improvements to infrastructure, such as fast and affordable wireless Internet connections. In order to reap the gains from this

infrastructure, meanwhile, digital skills in the medical sector and general population must improve. Education on how to use telemedicine applications will need to be widespread, and developers must make them as user-friendly as possible, without compromising their functionality. Care providers will need to learn how to operate the applications to collaborate with medical professionals and patients and demonstrate to patients how to use the applications effectively, providing troubleshooting support as needed. They will need training on how to make assessments via teleconference, a setting in which current patient data are often absent. In this regard, even monitoring basic vital signs such as a patient's heart rate or blood pressure, or relying on still or video images of a patient rather than being able to examine him or her physically, present further challenges for the smooth operation of telemedicine. Crucially, care providers must learn to identify when a patient's condition as assessed in a telemedicine consultation requires an in-person consultation, or tests that can only be performed at a medical facility. Becker et al. (2019) propose that training in telemedicine becomes a standard component of medical and nursing school curricula, and possibly an area of specialisation. In addition, legal frameworks will need to be created or updated. Some countries in Emerging Asia have existing legal frameworks for telemedicine, while others do not (OECD, 2021). Where telemedicine is included in legal frameworks, moreover, it is rarely seen as a standalone entity.

Many telemedicine programmes in Emerging Asia are ad hoc responses to the COVID-19 pandemic. Indonesia has offered telemedicine services for isolating COVID-19 patients since July 2021 (Cabinet Secretariat of the Republic of Indonesia, 2021). Under the service, patients who are self-isolating as the result of a positive test and experiencing mild or no symptoms of COVID-19 can receive teleconsultations with medical professionals during the isolation period. They can also receive electronic prescriptions for treatment packs. The Lao PDR Ministry of Health is also using telemedicine to provide reproductive and maternal care to women in isolation centres in border regions. This initiative began in August 2021 and grew out of a successful pilot programme in Luang Prabang during the nationwide lockdown in 2020 (UNFPA Lao People's Democratic Republic, 2021). While these endeavours have been successful, they appear to be ad hoc and time-bound; an emergency measure to cope with the pandemic and associated policies. This stands in contrast to Singapore, where telemedicine is being made a permanent option for care. Singapore's *Healthcare Services Act* was initially scheduled to begin regulating telemedicine in 2022, but this has been deferred to 2023 and existing laws will remain in force (Ministry of Health of Singapore, 2021 and Ministry of Health of Singapore, 2022).

Laws relating to data privacy as well as standards of care, ethics, and liability in telemedicine are necessary to allow for its conversion to a permanent measure in places where this has not yet occurred. This is particularly important where telehealth services are provided across jurisdictional lines such as national or subnational borders. Defining the jurisdiction of a cross-border telemedicine transaction and authorising practitioners to work with a patient from outside the jurisdiction in which the practitioner is physically located will remove a barrier for those who may benefit most from the service (i.e. those in rural areas, remote areas, or islands). Furthermore, as professionals providing telemedicine services often do so through a centralised service on contract, the terms of a doctor-patient relationship must be well defined as well as the division of liability of individual professionals and the service in case of malpractice. John et al. (2022) identify privacy, security and confidentiality as concerns for users in India and Malaysia, while noting the quality of care over telemedicine in India

is inconsistent. India's Personal Data Protection (PDP) bill is currently tabled in parliament and should ameliorate digital security concerns there. The *Malaysian Medical Council Advisory on Virtual Consultation* defined clinical, ethical, legal, technical and operational aspects of telemedicine in 2020, though it is unclear from John et al. (2022) if the advisory has addressed all key concerns despite telemedicine laws existing in Malaysia since 1997.

The importance of developing a cautious but firm exit plan from the COVID-19 pandemic

As governments look beyond the Omicron variant to craft plans to emerge from the long COVID-19 pandemic, they should give careful consideration to the relative benefits and risks of the various measures that they could apply. Moreover, measures should also acknowledge that epidemiological conditions and health threats are constantly changing. Still, as vaccine uptake increases, cases requiring hospitalisation or leading to death should decrease, and the justification for restrictive public health measures on the grounds of not overwhelming hospitals will decrease at the same time. Indeed, well-structured reopening is crucial once restrictive measures come to an end.

Most Emerging Asian countries have seen restrictions ease somewhat, and few lines of business remain completely closed. However, some countries have paused or reversed some of their re-opening policies in response to the Omicron variant. For instance, several countries enacted enhanced travel restrictions or travel bans from certain destinations, some of which are still in place.

Further policy challenges and risks: Dealing with the risk of inflation amid an uneasy economic recovery

Turning now to the other policy challenges and risks to the economic outlook against the backdrop of the long-running COVID-19 pandemic, it is important to note that a gradual rise in inflation in Emerging Asia is raising some concerns. As of now, inflation seems to be more contained in Emerging Asia compared to advanced economies, in part owing to the effectiveness of monetary policy in managing inflationary pressures. This notwithstanding, the region could see a rise in inflation as 2022 progresses, as the economy strengthens and food prices rebound.

Although inflation paths at present may not seem to be similar to those of previous major crises, it is worth noting that the pandemic is not over, and that the way in which it has impacted real economies is not quite the same as the effects of previous crises. Notably, rising prices in global commodities markets are raising some concerns. In addition, supply-chain issues at international and local levels also constitute a potential driver of higher domestic inflation in Emerging Asia over the coming months. Overall, with supply-side factors playing a non-negligible role in the uptick in inflation, there is potential for the trend to become more protracted in some countries in the region.

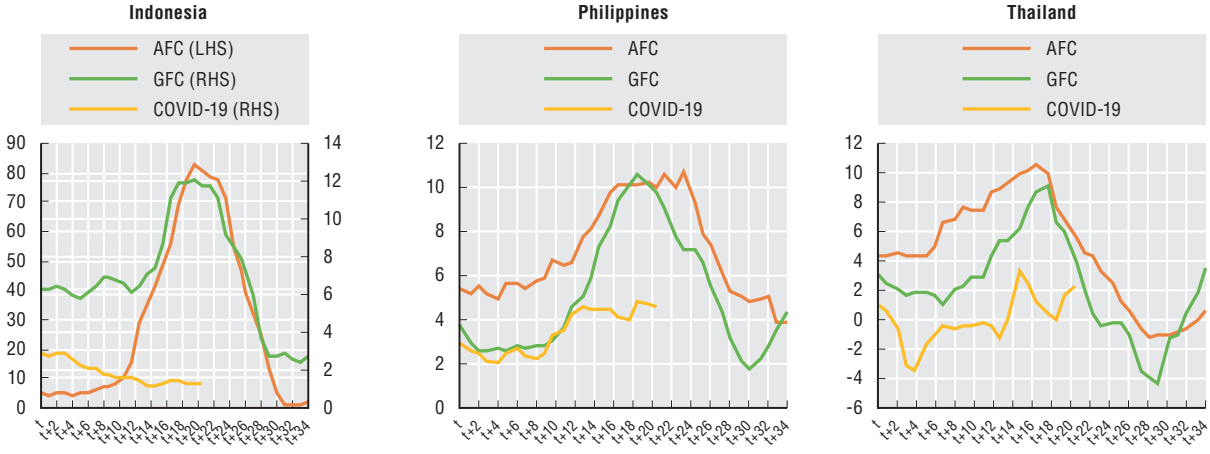
The steep uptick in inflation in advanced economies also poses a threat to countries in Emerging Asia. Indeed, while monetary authorities in advanced economies are very much aware of the importance of clear communication, a stronger response on their part to inflationary pressures has the potential to instigate capital flight away from Emerging Asia. In turn, this could mean that policy makers in the region will face a choice between, on the one hand, running the risk of volatile capital flows as interest-rate differentials narrow, and, on the other hand, increasing the interest rate cost burden at a time of high debt load in the public and private sectors alike.

Meanwhile, and although they acknowledge that external conditions are changing, monetary authorities in the region need to strike a fine balancing act between maintaining an accommodative stance long enough for sectors across the real economy to recover fully and achieving sufficient stability.

Inflation rates seem not to be tracking the paths seen in prior crises

The headline inflation trend is pointing upwards in some Emerging Asian economies, and this does not augur well for economic prospects and social stability in the region. Although still fairly modest, the prevailing rates of price increases in Malaysia, the Philippines, and Thailand as of October 2021 are already higher than their respective 10-year monthly averages. This has been causing concerns, against the backdrop of an already uneasy economic recovery. However, if benchmarked against the price movements during the global financial crisis (GFC) and the Asian financial crisis (AFC), the prevailing rates of increase in consumer price indices in the region have, thus far, arguably been more benign. Additionally, and as noted above, the inflation path during the COVID-19 pandemic does not seem entirely analogous to those of the two financial crises episodes – or at least not yet (Figure 2.5).

Figure 2.5. **Headline inflation in selected Emerging Asian economies during the AFC, GFC, and COVID-19 (%)**



Notes: RHS means right hand scale. Time "t" pertains to January 1997, January 2007, and January 2020. The data frequency is monthly, and the data are as of October 2021. The national source data for India, Indonesia, and Malaysia were extended backwards using the data from the IMF with the same base year. For Viet Nam, the IMF data with base year 2010 are used for consistency. The national CPI series has several series breaks.

Source: Authors' calculations based on CEIC, IMF, and national sources.

StatLink https://doi.org/10.1787/888934304533

As can be observed in Figure 2.5, the curves of the inflation path during the AFC and the GFC appear to match closely in the cases of a number of Southeast Asian economies, notwithstanding differences of magnitudes. In both periods, inflation remained subdued at the start of the cycle, before gaining significant momentum that lasted somewhere between two and six quarters during the AFC, and one and four quarters during the GFC.

By way of comparison, the emergence of COVID-19 two years ago saw inflation in Thailand dip into negative territory for close to a year, suggesting a sharper impact of the

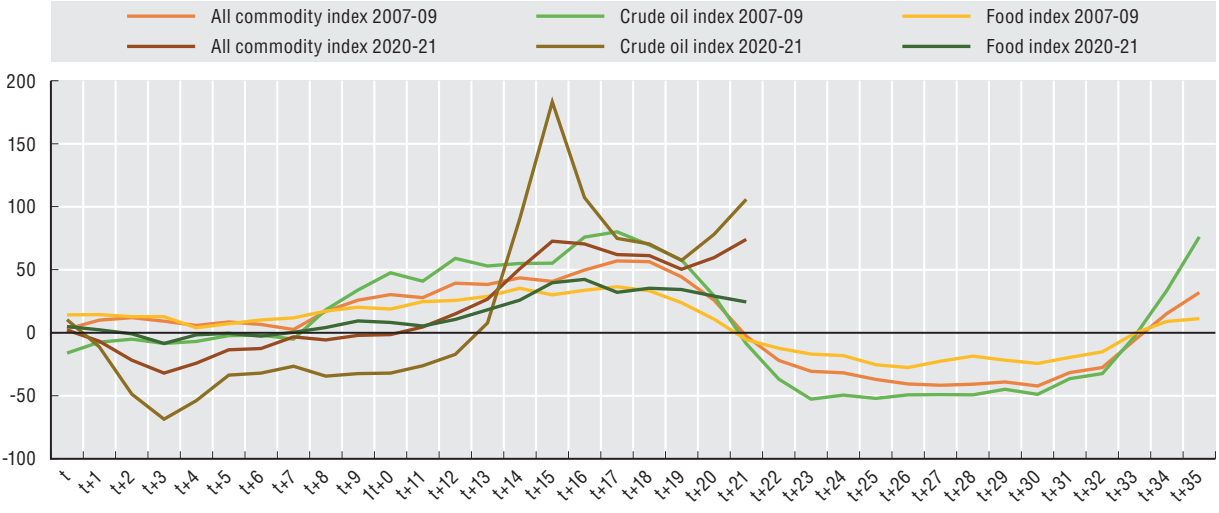
pullback in aggregate demand – stimulus measures notwithstanding. In recent months, the rates in the country have appeared to be on the rise, but the pace has been relatively moderate compared to the previous two financial crises, even with very low bases (following the deflation that occurred in 2020). While inflation has remained subdued in Indonesia, the current inflation rate in the Philippines is flatter.

One possible explanation for the difference in trends is that the COVID-19 cycle is still unfinished, making it difficult to assess how the current situation stacks up against the timelines of the AFC and GFC. Unlike the AFC and GFC, the pandemic also has multiple peaks in terms of economic impact, and has affected economies more broadly (not just on the financial front) than previous financial calamities. In late-2021 and the beginning of 2022, the spread of the Omicron variant has led countries to impose new rounds of lockdowns and border restrictions. These can have profound implications on consumption and the investment decisions of firms and households, which in turn underpin inflation patterns.

A sustained rise in global prices for food and fuel could alter the course of inflation

Concern about inflation risks is partly anchored in developments in global markets. For instance, Forbes (2019) underlines the impact of global factors through integrated global supply chains. In particular, the focus is on food and fuel prices. Notably, food accounts for the largest weight in the consumer price index (CPI) for many economies, including those in Emerging Asia. Fuel, which appears in the CPI under the rubrics of utilities or electricity, gas, and other fuels, also accounts for a modest share of the baskets that are used to calculate the CPI. Moreover, apart from their direct impact on headline inflation, food and fuel also have indirect effects, as their prices tend to affect the cost of other goods and services. These are also referred to as second round effects. Furthermore, food and fuel inflation are felt more strongly by households in lower income brackets.

Figure 2.6. **Changes in global commodity prices, year-on-year (%)**



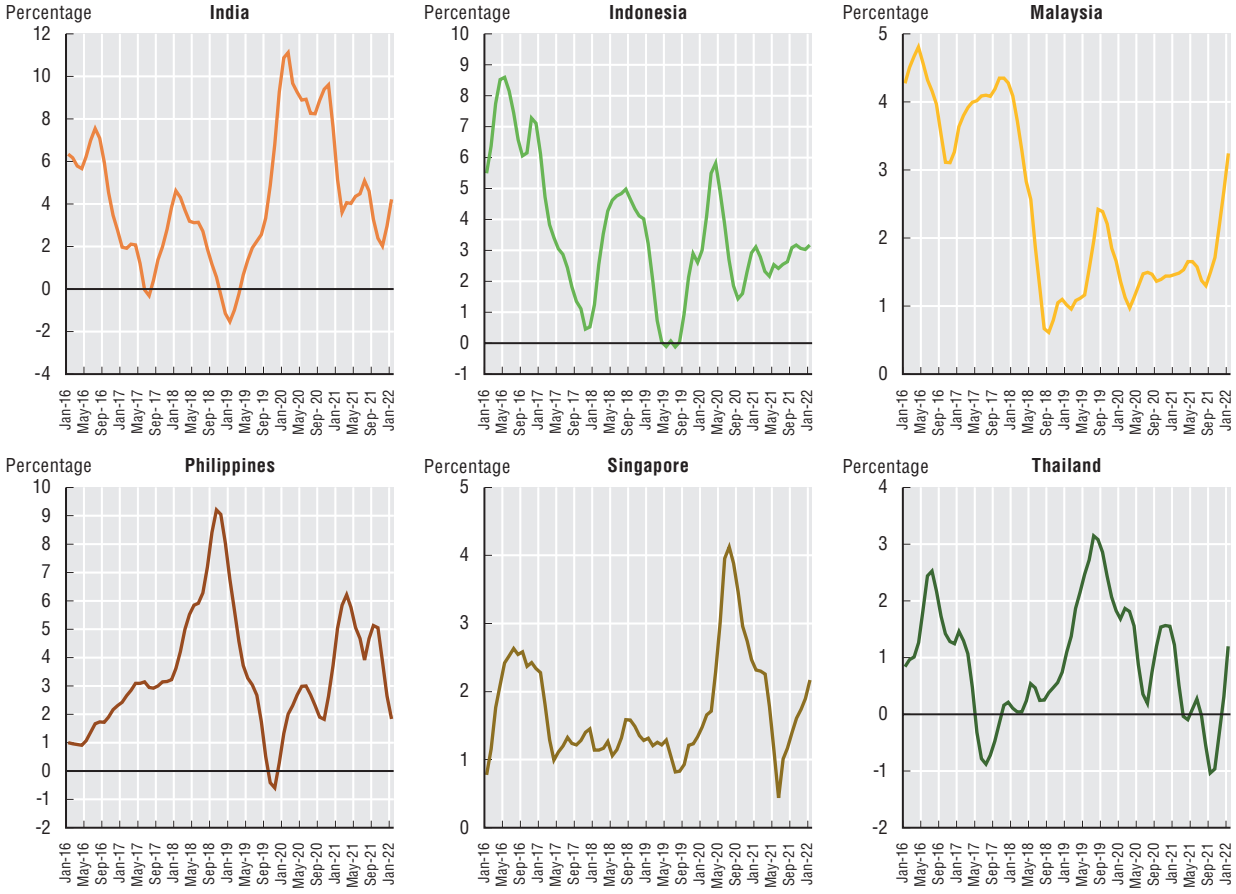
Notes: Time "t" pertains to January 2007 and January 2020. The data frequency is monthly, and the data are as of October 2021, accessed in December 2021. The price index for all commodities combined includes both fuel and non-fuel price indices. Crude oil index refers to the average petroleum spot price crude oil index (USD/barrel), or the simple average of three spot prices, namely, Dated Brent, West Texas Intermediate, and the Dubai Fateh. The Food Price Index includes cereal, vegetable oils, meat, seafood, sugar, and other food price indices.

Source: Authors' calculations, based on IMF Primary Commodity Price System database.

StatLink https://doi.org/10.1787/888934304552

Having lost substantial ground in 2020, global fuel prices soared to multi-year highs in 2021, on the back of sharp supply cuts by the oil-producing countries, and the anticipation of a recovery in demand, notably as restrictions began to ease before the Omicron variant instigated a fresh round of restrictions (Figure 2.6). Likewise, food prices have been picking up some steam. The global food price index increased by an average of 29% per month year-on-year between January and October 2021, compared to an average of 1.7% posted for the whole of 2020. Driven by the rise in the global cost of inputs such as energy, feeds and fertilisers (FAO, 2021a), the 12-month moving average of the IMF food price index in October 2021 stood at its highest level since November 2011. The same story is conveyed by the 12-month moving average food price index of the Food and Agriculture Organization of the United Nations (FAO), whose reading in November 2021 is already close to the peak that it reached ten years ago.

Figure 2.7. **Food-price inflation for selected Emerging Asian countries, January 2016 to January 2022, 3-month moving average (%)**



Note: The data are as of March 2022.

Source: Authors' calculations based on FAO Stat and CEIC.

StatLink https://doi.org/10.1787/888934304571

In Emerging Asia, food prices were in general fairly contained as of the first half of 2021 (Figure 2.7).[3] Indeed, the bumper harvest of key staples in parts of the region (FAO, 2021b), particularly rice, has helped to shield domestic consumers from rising global food prices.

Moreover, Asian countries' relatively low dependence on imports of fertilisers (FAO, 2021a) may also have helped to temper food-price inflation. Governments have also maintained support measures in aid of their local economies, helping to protect local consumers and producers. Assistance mechanisms that were employed in the region in 2021 included stock releases from government reserves, the roll-out of food subsidies and other kinds of consumption and marketing support, adjustments in the minimum purchasing price via government procurement, and a calibration of trade rules.[4] Nevertheless, the upward price pressure in global markets is likely to catch up with domestic prices if it is sustained. Indeed, the latest print for January 2022 points to rising food prices in India, Malaysia, Singapore and Thailand (Figure 2.7).

If unaddressed, supply chain disruptions will also contribute to upward pressure on prices

Disruptions to global supply chains, exacerbated by rising shipping costs, could also underpin faster inflation. As such, it is critical for economies and key stakeholders to persevere in co-ordinating the adjustments that they make in order to respond to supply-chain bottlenecks. They should also work continuously to improve basic infrastructure and connectivity, as well as improving procedural systems. Moreover, keeping domestic supply chains fluid is just as crucial in containing inflationary pressure, and in averting large-scale wastage of perishable goods.

Shortages in equipment and containers, together with port congestion and shipping delays, remain a problem globally (Cook, 2021; Kamali and Wang, 2021; UNCTAD, 2021), and have continued to hamper the global supply chain, even as the profits of the leading container carriers increased considerably in 2021 (Global Maritime Hub, 2021). Consequently, it is noted that "unreliable schedules, and port congestion have led to a surge in surcharges and fees, including demurrage and detention fees", which consequently have shone a spotlight on uncompetitive business practices, leading to calls for regulators to intervene, and to apply closer oversight (UNCTAD, 2021).

As per data from Drewry Supply Chain Advisors (2022), the cost of shipping declined somewhat from September to December 2021, yet it remains elevated. Indeed, the current world container price index is about five times higher than it was in December 2019. Notably, UNCTAD (2021) estimates that global import prices and consumer prices will respectively be about 10.6% and 1.5% higher by December 2023 (assuming the rates in August 2021 are sustained), than they would have been in a scenario without the freight-rate surge. These developments are discussed in greater detail below in the sub-section dedicated to supply chain disruptions.

In light of these difficulties faced by the international traders, UNCTAD (2021) underscores the importance of appropriate infrastructure and efficient processing systems. Some Asian economies are well regarded in this respect, and this may have helped to mute inflation spillovers to the region. Furthermore, UNCTAD (2021) argues that, because they have "the latest port technologies and infrastructure and can accommodate the largest container vessels", economies like Japan, Chinese Taipei, and Hong Kong, China managed to ensure faster turnarounds at a time when many major ports faced some difficulties, even while attracting a high number of port calls.

It is also important not to overlook the persistent threat COVID-19 may yet pose to domestic supply chains. Indeed, this domestic aspect is an area of policy that is relatively under-studied compared to the global supply chain. As evidenced by experience at the peak of restrictions on movement in response to COVID-19, transporting and distributing goods to various parts of a country became very challenging, especially in an archipelago like the Philippines, or in a large country like India. This led to higher prices, at least temporarily, as well as to substantial waste, especially when the goods involved were perishable, as was the case with agricultural products.[5]

One notable difficulty with inflation driven by the supply side – which can be due, among other factors, to supply-chain disruptions, supply cuts in the global oil market, and weather-induced reduction in food supply – is that it renders the monetary-policy tools that are designed to influence the demand side significantly less effective. As supply-side constraints have become more acute, and as hinted by the US Federal Reserve in a conference in October 2021, the risks are "clearly now to longer and more-persistent bottlenecks, and thus to higher inflation" (Ioanes, 2021). In addition, Reading (2021) also notes the potential for cost-push inflation to feed back into unemployment. Among non-monetary measures employed to temper supply-side pressures, fiscal solutions such as subsidies and tax reduction are typically used. However, given the impact of the pandemic on governments' coffers, such policies will now be more challenging to roll out and sustain than they were in previous years.

A reversal in monetary-policy stance in advanced economies poses another risk to recovery in Emerging Asia

As already noted, the inflation path in advanced economies and its possible implications for international capital flows is also a source of apprehension. As shown in Figure 2.8, the headline inflation rates in the euro area, the United Kingdom and the United States have risen sharply to multi-year highs since the start of 2021 in an almost synchronous fashion.[6] The possibility of inflation overshooting expectations, which was observed during previous financial crises, also cannot be discounted over the coming quarters.

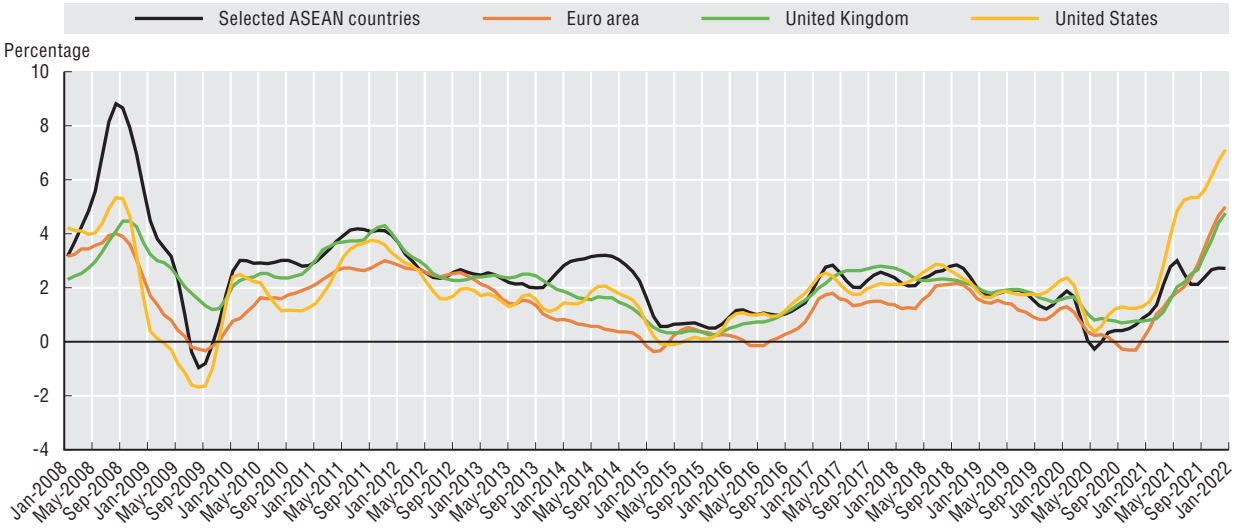
In turn, these developments have jump-started discussions on a tightening of monetary conditions, including rises in policy rates (Adrian and Gopinath, 2021). Looking ahead, the degree to which the major central banks provide clear signals about policy, and the receptiveness of the market to their communications, will therefore be critical for managing the impact of interest-rate changes on capital flows. Sharp swings in capital flows as seen in 2013 during the so-called taper tantrum, could disrupt the recovery in emerging markets, by inducing exchange rate volatility and contributing to inflation-push factors.

To avert a scenario similar to the taper tantrum, the US Federal Reserve conveyed its intent as early as July 2021 to cut back its asset purchases before the end of 2021 (Federal Reserve Bank of St. Louis, 2021). In line with this pronouncement, the US Federal Reserve did indeed lower its target amount for the purchase of US Treasuries to USD 70 billion for the monthly period from 15 November to 13 December, from USD 80 billion previously.[7] In comparison, the European Central Bank (ECB), following its monetary policy decision in October 2021, kept its net asset purchase target of EUR 20 billion under the Asset Purchase Programme, and maintained its key policy rates (ECB, 2021). The ECB's view on inflation, however, has changed,

with the bank noting at its February 2022 meeting that the "current phase of higher inflation will last longer than originally expected, but to decline in the course of this year" (ECB, 2022).

Figure 2.8. **Headline inflation in selected ASEAN countries, the euro area, the United Kingdom and the United States, January 2008 to January 2022**

3-month moving average (%)



Note: The data are as of March 2022. The average headline inflation for selected ASEAN countries represents the average of monthly headline inflation in Indonesia, Malaysia, the Philippines and Thailand.

Source: Authors' calculations based on OECD (2022).

StatLink https://doi.org/10.1787/888934303830

The marked depreciation of regional currencies such as the Lao kip, Myanmar kyat, and Thai baht against the US dollar since the start of year, due to COVID-19 and other domestic factors, do not bode well for these economies' resilience against potential capital-flow volatility when monetary support in advanced economies ends up being scaled back considerably. By the end of November 2021, the Lao kip, Myanmar kyat, and Thai baht respectively had depreciated by 34%, 17%, and 12% against the US dollar in the year to that date.[8]

Moving forward, responding to the stronger tapering actions from advanced economies at a time when the economic recovery is fragile will require a delicate balancing act for many developing economies, even if these actions are communicated well to the market. In Emerging Asia, for instance, it will herald a choice between, on the one hand, running the risk of capital flight as interest-rate differentials narrow, and, on the other hand, of increasing the interest rate burden when the debt load is still being managed carefully in both the public and private sectors.

In essence, such circumstances will require deft calibration of monetary-policy levers in order to contain the risks of inflation and capital flight, without unintentionally increasing risks to financial stability, such as making debt repayment more difficult as interest rates rise, and also without harming the recovery of the real economy. In addition, fiscal policy could complement monetary policy in addressing these challenges, by subsidising households and viable firms.

This also calls for an appropriate mix of macroprudential policies in order to manage credit flow in the system (see Chapter 4 for further discussion). Along this train of thought, it is worth noting that Shin (2019) observes that, in a sample of Asian economies, "contractionary macroprudential policy has significant negative effects on credit and output; and that these effects are qualitatively similar to those of monetary policy, which suggests that policy authorities may experience potential policy conflicts when credit conditions are excessive and the economy is in recession". The sample used in the study includes Indonesia, Malaysia, the Philippines, Singapore, Thailand, China and India.

Incidentally, and despite signals from advanced economies that tighter monetary policy is on the cards, the prevailing policy rates in a number of Emerging Asian economies currently remain at historic lows.[9] Against this backdrop, the differentials in benchmark bond yields between the US and Emerging Asia have, as expected, narrowed on the short-tenor bonds, albeit they have remained relatively stable on the longer tenors. For one-year benchmark bond yields, the mean spread stood at about 2.1% by the end of November 2021, or roughly 110 basis points lower than the mean spread by the end of 2019. For 10-year benchmark bond yields, the mean spread is 2.3% by end-November 2021, or about 10 basis points higher than the mean spread by the end of 2019.[10]

Emerging Asia's central banks are inclined to stay accommodative in the near term to support growth, even as global conditions seem to have inflected

Monetary authorities in the countries of Emerging Asia recognise the risks that current economic conditions pose. Nonetheless, and as of early 2022, recent public statements on monetary policy indicate that a number of the central banks in the region intend to remain accommodative. Their aim in so doing is to aid the real economy, particularly the labour market, in finding its footing. Policy views are generally anchored on the expectation that domestic inflation trends will stay stable or stabilise within the target bands in the near term.

In its monetary decision in January 2022, Bank Indonesia said that it expects inflation in 2022 to fall within its target range (Bank Indonesia, 2022). The central bank of the Philippines also conveyed a message following its meeting in December 2021 that inflation in the country is set to remain within the inflation target band of 2%-4% during the 2022-23 horizon (BSP, 2021).

Similarly, Malaysia's central bank said in its monetary policy statement in January 2022 that average headline inflation is likely to remain moderate in 2022 as the base effect from fuel inflation dissipates (Bank Negara Malaysia, 2022). Along the same lines, the central bank of Thailand, as per the decision of its monetary policy committee in February 2022, noted that headline inflation in 2022 would be higher than previously assessed and could exceed the target range in the early part of the year, but the average inflation rate for the full year 2022 would remain within the target range (Bank of Thailand, 2022).

The central bank of India took a similar stance on domestic inflation in the country, following its monetary policy committee meeting in February 2022. It posited that headline inflation is anticipated to peak in the final quarter of the fiscal year 2021-22 within the tolerance band and then moderate closer to target in the second half of the fiscal year 2022-23 (Reserve Bank of India, 2022).

Vulnerable households are likely to feel the inflation pinch, as labour markets continue to adjust and housing becomes less affordable

Anchoring inflation well is critical at a time when labour markets are still reeling from the impact of the pandemic. This impact has included income losses, a fall in work hours for those in employment, and a fall in labour income in 2020, before income-support measures (ILO, 2021). The ILO (2021) report notes that workers in the Americas are estimated to have lost 10.3% of labour income while in Asia and the Pacific, the labour income losses amount to about 6.6%. The job destruction has also been found to have disproportionately affected low-paid and low-skilled jobs. Furthermore, data published in 2021 indicate that the picture for wages and earnings in the region remains grim (Elder and Huynh, 2021; General Statistics Office, 2021).[11] Although wage pressures appear to be currently low in Emerging Asia, policy makers need to remain mindful of the interactions between wage developments and inflation (Box 2.3).

Box 2.3. Wage developments could also contribute to the pick-up in inflation

Although wage pressure appears to be currently low in Emerging Asian countries, policy makers need to remain mindful of the interactions between wage developments and inflation. The source of the shock will have important implications for the transmission of wage developments to prices. In some Emerging Asian countries, large numbers of workers left the labour force at the height of the COVID-19 pandemic, partly reflecting a shift into the informal sector (ADB, 2021a). The decline in labour force participation rates may not reverse as completely or as rapidly as anticipated. A negative supply shock in the labour market may lead to more persistent upward pressure on wages, which could eventually feed through to consumer prices. The economic literature agrees that labour shortages that arise from a decline in workers' willingness to work would lower the job filling rate and would trigger wage growth (Crump et al., 2022). On the other hand, the impact of higher wages on prices could therefore be partially offset by decreasing profit margins or by weak bargaining power on workers' side (Lombardi, Riggi and Viviano, 2020).

Several Emerging Asian countries have been confronted with labour-supply challenges, which started in the second half of 2021 and have continued into the first quarter of 2022. Viet Nam, for example, has struggled with labour shortages in recent months, as the pandemic-related restrictions have led many workers to relocate to the countryside. A shortage of more than 100 000 workers has been reported in Ho Chi Minh City alone (Hoang, 2021). Acute labour shortages have also been reported in Malaysia's palm oil sector (Chu, 2021), as well as in Thailand's labour-intensive food processing industry (Phoonphongphiphat, 2021). In another example, stronger wage cost pressures due to labour shortages in Singapore were one of the key drivers causing food services inflation to increase to 1.5% in annual terms in the third quarter of 2021 (MAS, 2021).

On the demand side, demand for resident and non-resident workers is anticipated to rise in 2022, as Emerging Asian economies gradually recover, putting upward pressure on wages. In particular, demand for labour is likely to continue to rise at a steady pace in sectors that posted strong performance during the pandemic, such as information and communication technology, health and social services, as well as financial and insurance services. In Singapore, for instance, employment and job vacancies in these sectors have both exceeded pre-pandemic levels, signalling a tightening of job market conditions (MAS, 2021).

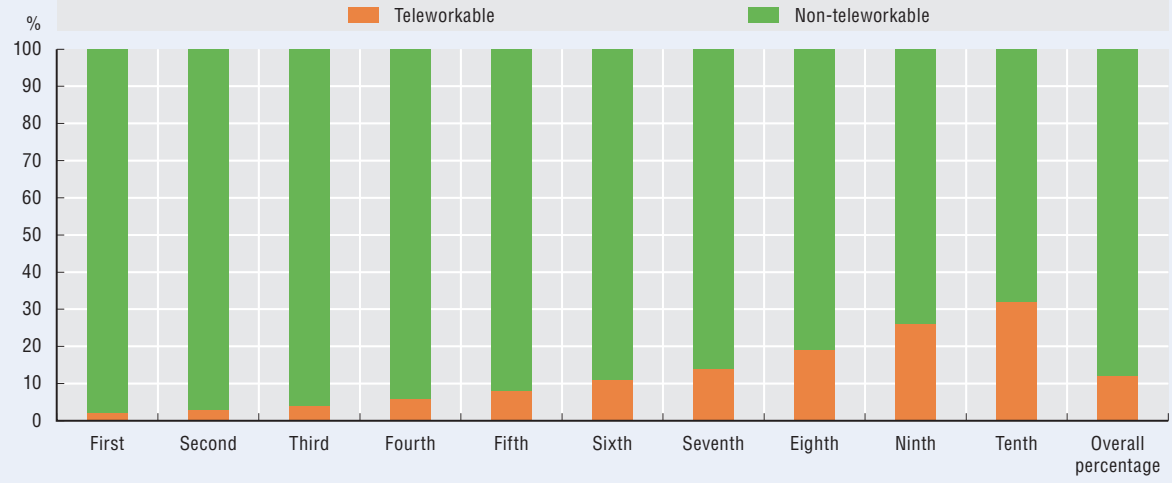
Moreover, there is evidence of growing wage inequality in some countries in the region (Huynh, 2021). These observations indicate that the behaviour of nominal prices and real prices (e.g. real wages) tend to differ and could mean greater financial difficulties in future for workers who are at the bottom of the income ladder. There are, indeed, strong indications that pre-existing inequalities within countries are also being reinforced by the COVID-19 crisis (Box 2.4).

Box 2.4. **The pandemic threatens to reinforce pre-existing inequalities**

The COVID-19 pandemic is a global shock that hit Emerging Asian countries almost simultaneously in early 2020. Since then, however, it has become increasingly clear that the health crisis is having very different impacts on different countries. Those countries that already exhibited low growth and limited fiscal space prior to the crisis have been more severely affected. Consequently, the pandemic threatens to exacerbate existing cross-country differences. Differences are not only appearing among Emerging Asian countries. Indeed, there are also strong indications that pre-existing inequalities within countries are also being reinforced by the crisis.

Lower-income individuals, those with lower levels of education, and also the young, are the people who have been most affected by the economic fallout and inequality from COVID-19. Based on empirical data, some recent studies consider the social consequences of the pandemic at the individual level. The findings of these studies suggest that the lockdown measures had a particularly marked impact on sectors in which work under physical distancing rules became difficult or nearly impossible, like for instance sector related to hospitality and recreation services (Gaduena, Caboverde and Flaminiano, 2020). Data for the Philippines show that the percentage of employees working in the sectors most affected by restrictive measures, and where teleworking is not possible, is notably higher in lower income brackets as compared to higher ones. For example, only 2% of Filipino employees in the first income decile were able to telework, compared to 32% in the highest income decile (Figure 2.9).

Figure 2.9. **Distribution of workers in jobs that are suitable for teleworking, by income decile in the Philippines, 2020 (%)**



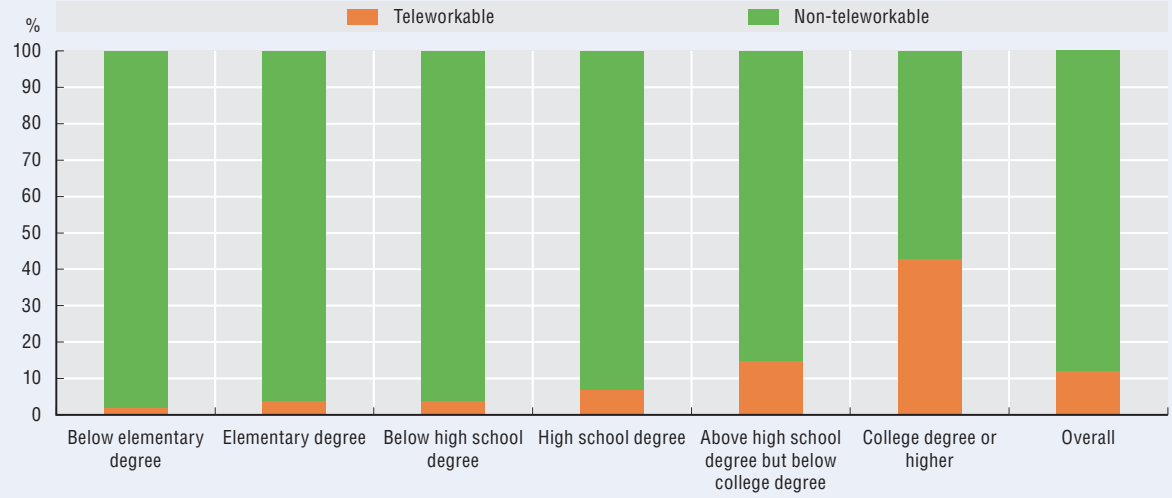
Source: Gaduena, Caboverde and Flaminiano (2020).

StatLink https://doi.org/10.1787/888934304590

Box 2.4. **The pandemic threatens to reinforce pre-existing inequalities** *(cont.)*

Furthermore, there is also a correlation between the impact of lockdown measures and an individual's level of education. In the Philippines, for example, sectors where teleworking was feasible during the crisis tend to have a higher proportion of employees with a university degree or higher (Figure 2.10). Employees with tertiary education or higher are also presumably less affected by short-time work schemes and income shortfalls than people with lower levels of formal education, given the relative likelihood that they would be able to continue working from home during the pandemic period.

Figure 2.10. **Distribution of workers in jobs that are suitable for teleworking, by level of educational attainment in the Philippines, 2020**



Source: Gaduena, Caboverde and Flaminiano (2020).

StatLink https://doi.org/10.1787/888934304609

The effects of lockdown measures can also be differentiated with respect to an individual's age. For example, restrictions on mobility may exacerbate inequality for individuals who are still in school. For instance, the World Bank anticipates that the COVID-19 pandemic will leave more than 80% of 15-year-old students in Indonesia below the minimum level of reading proficiency, as defined by the OECD. The World Bank also estimates that learning losses during the pandemic will cost Indonesian students at least USD 253 billion in lifetime earnings (Afkar and Yarrow, 2021). The dispersion of learning outcomes that has been observed between people of greater and lesser economic prosperity is particularly problematic, because it could lead to lasting differences in the development of human capital, thus causing inequality to increase in the long term.

Finally, the COVID-19 crisis has also revealed the existence of substantive health inequalities in Emerging Asia. Moreover, and as already discussed, there is a consensus that the pandemic has had a disproportionate impact on the most vulnerable populations. According to a joint OECD-WHO (2020) report, most countries in the Asia-Pacific region have high out-of-pocket expenditures for healthcare, which has led to unmet needs. As stated in the same report, moreover, Asia-Pacific also accounts for around 65% of the global slum population, which typically has limited access to healthcare services.

The robustness of property prices in Emerging Asia, buoyed by rising input costs such as for base metals (PwC and the Urban Land Institute, 2021), is another point of concern, particularly from the perspective of those who are at the fringes of the economy. A study by Li et al (2021) shows that of the 24 cities in the Asia-Pacific region that it tracks,

"18 have experienced positive price growth, with nine even growing at double digits since the beginning of COVID-19". While this indicates rosy prospects for the sector, it will also fuel inflation, further tightening the budgets of households that are already experiencing economic difficulty and contending with lower real earnings. These developments are also likely to exacerbate the overall unaffordability of housing in the region, which has been a problem since long before the pandemic (Helble, 2019).

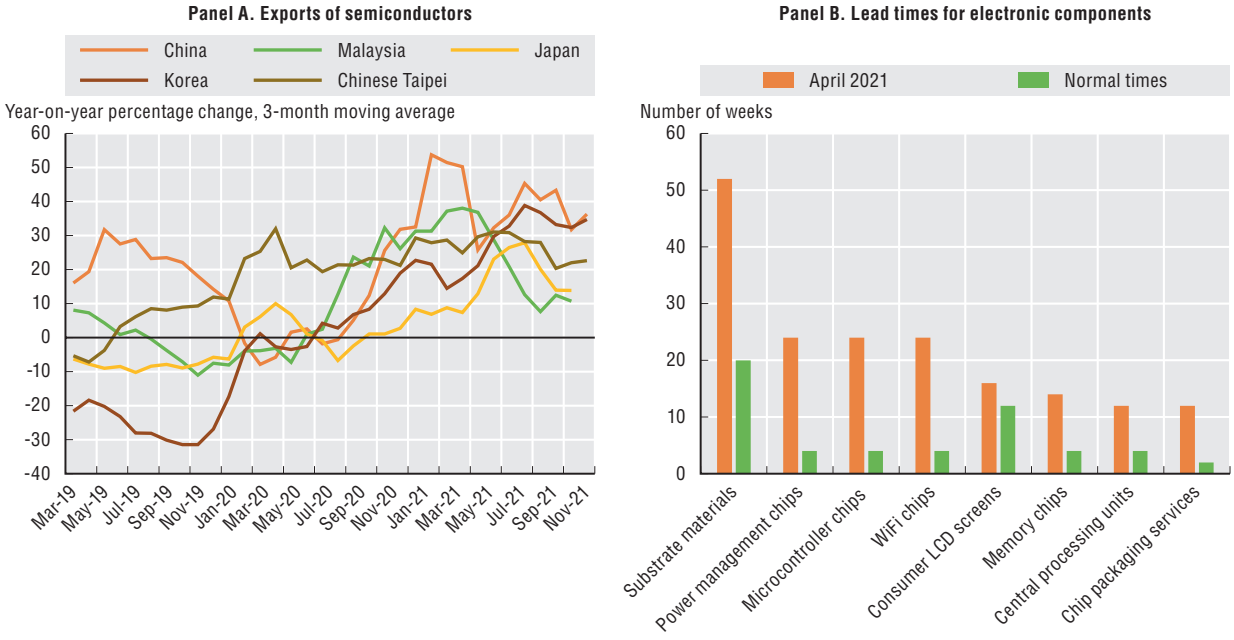
Supply chain disruptions continue to pose challenges

Supply chain disruptions have been a major feature of the COVID-19 pandemic, and they continue to pose challenges to economic recovery in Emerging Asia. A key reason for bottlenecks is the imbalance between supply and demand, amid intermittent shuttering and re-opening of individual economies. For instance, China's economy shuttered in the first half of 2020, while economies in the rest of the world continued to function unabated. The situation was reversed in the second quarter of 2020, when other major economies were brought to a halt, while China began to re-open. Consequently, demand surged in the second half of 2020, as consumption in China and other major economies was propelled by the fiscal and monetary support provided by governments to households and businesses. At the same time, supply has not been able to keep up with the revival in demand.

This imbalance between supply and demand has affected several key industries, including the global logistics sector and the production of raw materials and semiconductors. Throughout 2021, meanwhile, persistent localised pandemic-related restrictions, as well as labour-market shortages in several Emerging Asian countries, continued to add new bottlenecks. As a result, various disruptions emerged, affecting the smooth operation of global supply chains and weighing on economic growth in 2021. One of the major factors behind these bottlenecks is the rise in demand for semiconductors driven by structural changes triggered by the shift to remote work. The increase in commodity prices, in particular energy and metals, to above their pre-pandemic levels represents another triggering factor. Finally, logistical disruptions have emerged in the transport sector, and in container shipping in particular, with the sector struggling to cater for rising trade in merchandise as economies reopened.

Major manufacturers such as China, Malaysia, Japan, Korea and Chinese Taipei saw their semiconductor exports surge in the first half of 2021 (Figure 2.11, Panel A). In parallel, automotive producers lowered their semiconductor orders in 2020 on the back of faltering demand for cars during the pandemic. As producers re-directed production away from automotive to other sectors, the former was left with reduced access to semiconductors when demand for cars rebounded at the end of 2020 (Burkacky, Lingemann and Pototzky, 2021). Furthermore, restrictions implemented by the US administration in 2018 and 2019 on exports of chip software and chip-manufacturing equipment have weakened chip production in China, thus weakening the supply of such products (ADB, 2021b). Meanwhile, measures to contain COVID-19 disrupted production in other major chip-manufacturing hubs, as well as in packaging sites such as Korea, Malaysia and Viet Nam. Due to imbalances between supply and demand, lead times lengthened considerably in 2021 for various electronic components. For instance, lead times for power management and microcontroller chips lengthened to a minimum of 24 weeks in April 2021, compared to four weeks in normal times (Figure 2.11, Panel B).

Figure 2.11. **Exports of semiconductors from selected Asian economies, and minimum lead times for electronic components**



Note: Latest data on exports of semiconductors as of December 2021, except for Malaysia (November 2021) and Japan (November 2021). "Lead time" is defined as the period between the ordering and delivery of an electronic component. LCD stands for liquid-crystal display.

Source: Authors' calculations, based on data from CEIC and Ting-Fang and Li (2021).

StatLink https://doi.org/10.1787/888934303849

The rise in commodity prices also contributed to disruptions to supply chains. For example, iron ore prices surged through the summer of 2021 amid booming construction and industrial output in China. However, they subsequently fell sharply until November 2021, as the prospects for these sectors weakened, and started to rise again afterwards. Prices of other base metals, in particular aluminium and nickel, have continued to inch higher in recent months. This reflects their scarcity, but also their crucial role as inputs in the manufacturing of electronic products. Meanwhile, lower production in China has helped to push up aluminium prices in particular. China is a major producer of aluminium, but the country's recently announced emission-cut targets have contributed to lower aluminium production since July 2021. Chinese authorities have committed themselves to reducing the country's reliance on fossil fuels to below 20% by 2060, while pledging to strictly oversee investments in coal power, steel, electrolytic aluminium, cement, and petrochemicals (State Council of the People's Republic of China, 2021). In addition, the rationing of electricity in key manufacturing areas in China has also aggravated global shortages of industrial inputs and final goods. These electricity shortages have been caused by a variety of factors, including high coal prices, unpredictable weather patterns, and goals for tackling climate change (Maersk, 2021).

Finally, the brisk rebound in merchandise trade in the second half of 2020 and the first half of 2021 coincided with a shortage of shipping containers, as the spread of the Delta variant to many Southeast Asian countries exacerbated bottlenecks in the supply chain. On top of that, waiting times at ports increased due to high import volumes, containment measures at port facilities, and labour shortages, as containment measures affected the mobility of migrant

workers. Events such as a container ship running aground in the Suez Canal in March 2021 exacerbated the backlogs, while several ports in Emerging Asian countries experienced temporary disruptions due to abnormally high congestion rates (Box 2.5).

Box 2.5. **Several ports in Emerging Asia have experienced increases in congestion rates**

Major shipping hubs in Emerging Asia, including Singapore and Port Klang, have experienced elevated levels of congestion as containers have piled up at ports in the region. Similar disruptions have occurred at the dual ports of Los Angeles and Long Beach in the United States, as well as at Jebel Ali, a major container hub in the Middle East (Table 2.8). Conversely, backlogs appeared as of early November 2021 to have eased at the ports of Laem Chabang, Busan and Rotterdam, among others.

Table 2.8. **Congestion rates at selected ports in Emerging Asia and around the world, November 2021**

Port	Location	Total number of ships	Number of waiting ships	Number of ships in port	Congestion rate	Net change
Singapore	Singapore	101	53	37	58.9%	+22.2%
Port Klang	Malaysia	38	15	19	44.1%	+14.5%
Hong Kong/Shenzhen	Hong Kong, China; Shenzhen, China	229	82	69	54.3%	+10.4%
Jebel Ali	United Arab Emirates	53	10	31	24.4%	+7.7%
Savannah	United States	34	26	5	83.9%	+7.7%
Tanjung Priok	Jakarta, Indonesia	39	12	11	52.2%	+6.7%
Los Angeles/Long Beach	United States	106	33	27	55.0%	+1.6%
Qingdao	China	39	4	15	21.1%	-2.9%
Ningbo-Zhoushan	Shanghai, China	271	73	89	45.1%	-6.0%
Rotterdam	Netherlands	47	3	22	12.0%	-7.4%
Busan	Korea	50	4	35	10.3%	-7.7%
Laem Chabang	Thailand	44	2	13	13.3%	-9.4%

Note: Data as of 1 November 2021. The congestion rate is calculated as the number of anchored container ships that are waiting, divided by the sum of anchored container ships and container ships in port. Net change illustrates the congestion rate as of 1 November 2021, minus the April-October 2021 median.

Source: Varley (2021).

Meanwhile, severe backlogs were recorded at the Yantian International Container Terminal, one of China's busiest container ports. The disruptions came as the port imposed stringent disinfection and quarantine measures as of May 2021, when COVID-19 clusters were identified among its staff. In late May, Yantian port suspended the acceptance of export-laden container ships, leading to a severe backlog in the container yard, and to congestion outside the port, with more than 23 000 containers waiting to be exported (Reuters, 2021).

Increased congestion rates were also seen in several other ports in Emerging Asia. In Malaysia, Port Klang reported congestion rates 14.5% above normal in November 2021, while congestion rates at Tanjung Pelepas were 29.9% higher compared to normal times. Similarly, containers continued to pile up near Singapore. On 1 November 2021, the backlog was 22% above normal, with 53 container ships anchored off the coast of Singapore. In Indonesia, Jakarta's container hub of Tanjung Pelepas reported congestion rates 6.7% above normal (Varley, 2021).

Meanwhile, the ports corporation of Viet Nam suspended some operations at Ho Chi Minh's largest international terminal, citing severe labour shortages triggered by pandemic containment measures. Indeed, the workforce of the Saigon Newport Corporation was reduced by half at Ho Chi Minh's Cat Lai Terminal. The outbreak of COVID-19 led to a shortage of port officers and forklift truck drivers, as well as truck drivers. As a result, vessels were forced to wait on berth due to a lack of workers. The terminal stopped handling refer boxes and trans-shipments at the beginning of August 2021, while oversized and overloaded cargoes were also suspended around the same time (The Maritime Executive, 2021).

Developments affecting China's trade with advanced economies further complicated the normal functioning of supply chains. For example, backlogs at the Ningbo and Shanghai ports, stemming first from COVID-19-related closures and then from Typhoon Chanthu, jeopardised the smooth movement of merchandise across major ports in China. As such, shipping containers had to be returned empty to China from various parts of the world in order to be available for additional exports (State Council Information Office, 2021). Furthermore, the reduction in passenger flights due to the COVID-19 pandemic reduced air cargo capacity, putting extra pressure on maritime transport. As a result, shipping transit times lengthened, and transport costs from China to ports in the United States and Europe skyrocketed. For example, freight rates on the route from Shanghai to Rotterdam were nearly five times higher in mid-November 2021 compared to the same period in 2020, while prices on the Shanghai to Genoa route almost quadrupled over the same period (Drewry Supply Chain Advisors, 2022). As of late-February 2022, the composite index was still 81% higher compared to the same period in 2021, while freight rates on the Shanghai to Los Angeles route were more than double their value at the same point a year earlier (Table 2.9).

Table 2.9. **Spot freight rates by major route for selected dates in October 2021-February 2022**

(USD per 40-foot container)

Route	28 October 2021	4 November 2021	11 November 2021	24 February 2022	Year-on-year change
Composite index	9 669	9 195	9 193	9 477	+81%
Shanghai to Rotterdam	14 062	13 798	13 801	13 625	+61%
Rotterdam to Shanghai	1 591	1 585	1 580	1 439	+1%
Shanghai to Genoa	13 123	12 693	12 438	12 759	+48%
Shanghai to Los Angeles	10 976	9 857	9 947	11 030	+151%
Los Angeles to Shanghai	1 302	1 288	1 303	1 247	+125%
Shanghai to New York	13 554	12 667	12 718	13 160	+99%
New York to Rotterdam	1 189	1 189	1 189	1 198	+59%
Rotterdam to New York	6 161	6 123	6 255	6 518	+179%

Note: Year-on-year percentage changes as of 24 February 2022.

Source: Drewry Supply Chain Advisors (2022).

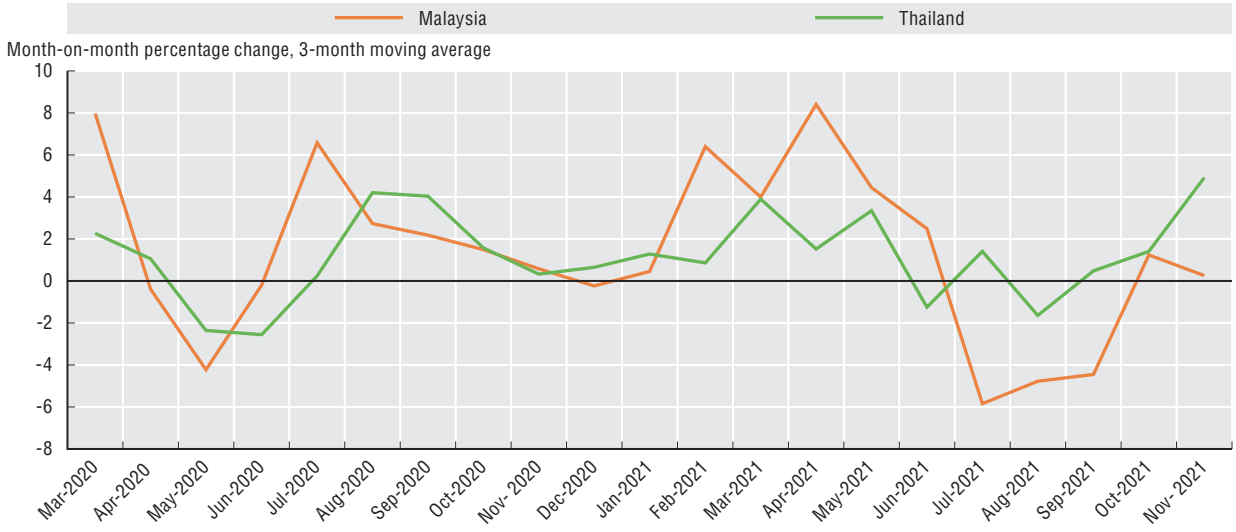
In the coming months, supply-chain disruptions could reverberate through Emerging Asian economies and weaken output growth. Indeed, manufacturing sectors affected by severe shortages appear to have been reporting weaker output dynamics since May 2021. For instance, the total production output for integrated circuits declined substantially in Thailand, in June, and in Malaysia, in July (Figure 2.12). Other sectors that rely on electronic equipment, such as the production of passenger cars, also reported lower output. In Malaysia, for example, the production of passenger cars declined by nearly 17.8% in April 2021 compared to the previous month, and posted another sharp fall in May (down by 15.9% month-on-month).

At the consumer level, shortages of certain products have triggered rationing and cost-push increases to prices, as discussed in the previous section. These shortages may be partially responsible for the recent spike in inflation for consumer durables in some countries in the region. Prices of oil, natural gas and commodities had already firmed up since the second half of 2020, while higher transport costs have added further to price pressures. Prices of household durable goods rose in November 2021 in some countries in Emerging Asia, most notably in India, Lao PDR, Malaysia and Singapore. Meanwhile, prices

of consumer goods in India, Lao PDR, Malaysia and Singapore edged 6.4%, 4.9% and 2.6% and 2.1% higher, respectively (Figure 2.13). In India, the most recent inflation print for this class of goods represents the highest reading since January 2019.

Figure 2.12. **Total production output for integrated circuits in Malaysia and Thailand, March 2020 to November 2021**

Month-on-month percentage change, three-month moving average

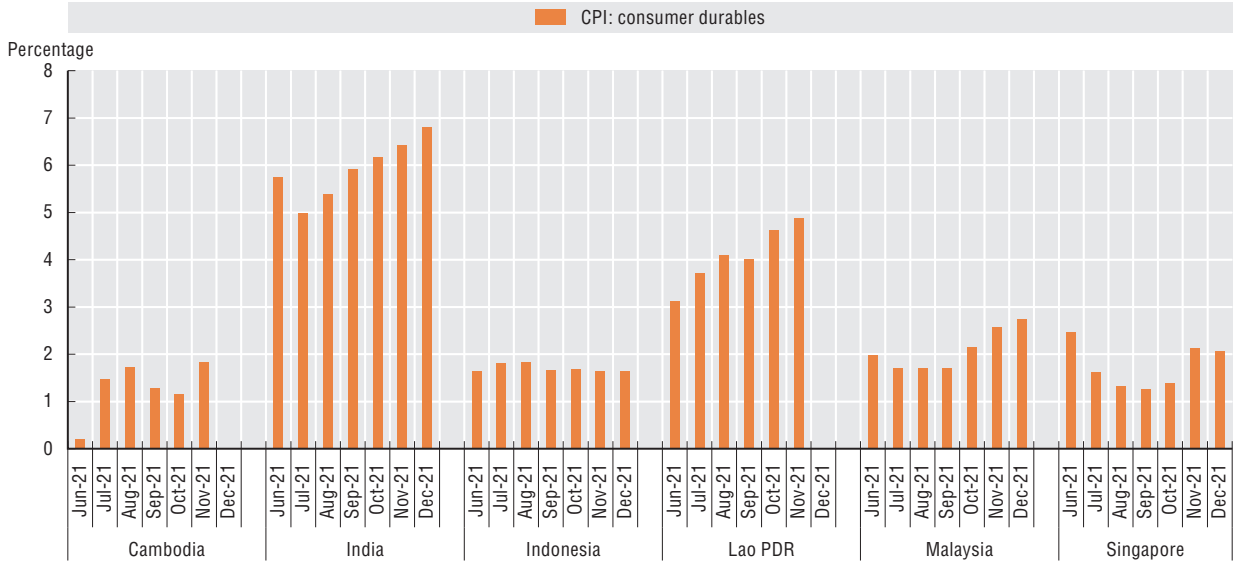


Source: Authors' calculations based on data from CEIC and national sources.

StatLink https://doi.org/10.1787/888934304628

Figure 2.13. **Prices of consumer durables in selected Emerging Asian economies, June to December 2021**

Year-on-year percentage change



Source: Authors' calculations based on data from CEIC and national sources.

StatLink https://doi.org/10.1787/888934304647

As of early 2022, there were some signs that stresses in supply chains were easing to a certain extent, but the balance of risks is mostly tilted to the downside. The concern is that the Omicron variant of COVID-19 could delay further improvements to the situation. Indeed, additional supply-chain disruptions and slowdowns may occur in the near term, as cases of the fast-spreading Omicron variant are reported across production and shipping hubs in Asia. In particular, potential lockdowns, amidst China's zero-COVID-19 strategy, in areas of the country that are home to concentrations of large production activities, could imply higher producer prices in the coming months. Furthermore, the war in Ukraine could add further upside pressure on oil and metal prices. On the other hand, the imbalance between supply and demand for semiconductors is likely to gradually ease in 2022, as pandemic-related risks recede and investment in semiconductor facilities increases.

Conclusion

A number of factors will determine the economic outlook in Emerging Asia as the COVID-19 pandemic continues to unfold. For a start, the emergence of new variants, like Omicron in recent months, increases the uncertainty surrounding the economic recovery. Against this backdrop, an acceleration of vaccination programmes, and effective health measures and exit strategies, are crucial areas for governments to focus on. Meanwhile, digital health tools also have the potential for further development, and can help authorities to mitigate damage from COVID-19. Furthermore, coping with inflation risks is also crucial. The headline inflation trend is pointing upwards in some Emerging Asian economies, clouding the outlook for economic growth and social stability in the region. Inflationary pressures are mostly the result of rising commodity prices on global markets, but supply chain bottlenecks have also contributed. Despite rising inflationary pressures, monetary policy remained accommodative in response to still fragile recoveries and uncertain prospects for the labour market. In addition, fiscal policy could also play an important role in overcoming the challenges related to higher inflation, by subsidising households and viable firms. This is all the more important, as the health crisis threatens to aggravate existing inequalities within countries in the region.

Disruptions to supply chains have, as discussed above, been a major feature of the COVID-19 pandemic. These disruptions have the effect of weakening the momentum of economic recovery in Emerging Asian countries. Moreover, additional supply-chain disruptions and slowdowns may occur in the near term, as cases of the fast-spreading Omicron variant are reported across production and shipping hubs in Asia.

Notes

1. The general stages of the development cycle of a vaccine are: exploratory stage, pre-clinical stage, clinical development (three-phase trial processes), regulatory review and approval, manufacturing, and quality control.
2. The terms "telemedicine" and "telehealth" are often used interchangeably, as the distinctions between them are not entirely clear. However, the United States Federal Communications Commission (FCC) does offer a definition of these terms (FCC, n.d.). According to the FCC's definition, telemedicine is "using telecommunications technologies to support the delivery of all kinds of medical, diagnostic and treatment-related services usually by doctors". The FCC definition goes on to say that "this includes conducting diagnostic tests, closely monitoring a patient's progress after treatment or therapy and facilitating access to specialists that are not located in the same place as the patient". Meanwhile, the FCC states that while telehealth is "similar to telemedicine", it "includes a wider

variety of remote healthcare services beyond the doctor-patient relationship". Moreover, "it often involves services provided by nurses, pharmacists or social workers, for example, who help with patient health education, social support and medication adherence, and troubleshooting health issues for patients and their caregivers". For the purposes of this report, both terms will refer to patient-facing activities, unless otherwise noted.

3. Myanmar is an exception. The country's situation in terms of national security and the state of the economy, compounded by COVID-19, is resulting in food shortages and substantially higher food prices locally, according to the FAO (2021b).

4. For more detailed information, please refer to FAO (2021a), and to the FAO Commodity Policy Developments database.

5. In India, Cariappa et al. (2021) demonstrated that the pandemic-induced lockdown restricted access to food markets, and that the majority of consumers experienced a price increase across COVID zones. The circumstances led to food loss along the supply chain and to waste on the side of the consumers, who stockpiled perishable goods, with the lack of storage facilities. The authors also posited that prices post-lockdown rose immediately, notably for chickpeas, mung beans, and tomatoes. In addition, Ochave (2020) provides ground-level evidence of farm-produce wastage in the Philippines. Meanwhile, Alam and Khatun (2021) also note that, in Bangladesh, "lockdown has impeded vegetable farmers' access to markets, thus limiting their productive and sales capacities".

6. Bernanke (2010) attributes the phenomenon of higher-than-anticipated inflation (i.e. inflation overshooting) after a recession to the increased anchoring of expectations by a credible monetary policy. Daly and Hobijn (2014) emphasise the increased downward wage rigidities in a recession, which bend the wage Phillips curve. Following the results of their simulation of the US economy, the authors argue that (i) "during recessions the rigidities become more binding and the labour market adjustment disproportionately happens through the unemployment margin rather than through wages;" (ii) "downward nominal wage rigidities cause recessions to result in substantial pent up wage deflation, [which] leads to a simultaneous deceleration of wage inflation and a decline in the unemployment rate during the ensuing recovery period"; and (iii) "this bending of the Phillips curve is especially pronounced in a low inflationary environment." Meanwhile, Christiano, Eichenbaum and Trabandt (2015) explain the "missing disinflation" by a fall in total factor productivity and increased costs of working capital.

7. For the data, refer to Treasury Securities Operational Details, https://www.newyorkfed.org/markets/domestic-market-operations/monetary-policy-implementation/treasury-securities/treasury-securities-operational-details#monthly-details.

8. The calculations are based on the daily data obtained from Fusion Media Ltd, https://www.investing.com/ (accessed 6 December 2021).

9. The current repo rate in India of 4% is the lowest in over two decades. The seven-day reverse repo rate of 3.5% set by Indonesia's central bank is at its lowest since data were first made public in June 2015. In Malaysia, meanwhile, the central bank's overnight policy rate of 1.75% is at its lowest point since it was first released in April 2004. The same can be said of the overnight reverse repurchase rate in the Philippines (2%), and the one-day bilateral repurchase rate in Thailand (0.5%), which were first published in June 2016, and May 2000 respectively, based on the current definitions. If extended backwards by adjusting roughly for series breaks, the current policy rate in the Philippines is going to be the lowest since the mid-1980s, when it was first released.

10. The calculations are based on the daily data obtained from Fusion Media Ltd, https://www.investing.com/ (accessed 6 December 2021). In this case, Emerging Asia is composed of China, India, Indonesia, Malaysia, the Philippines, Singapore, Thailand and Viet Nam. The data are as of 30 November 2021 except for the 1-year benchmark bond yield series for Thailand, which is updated only until 18 November 2021.

11. Comparable wage data for 2021 are not readily available yet, especially for many developing economies. Caution should also be exercised in interpreting average economy-wide wages in 2021, even for countries for which data are available. This is because the profile of the workers covered by surveys could have changed substantially, with millions of low-earning workers eased out of the labour market, resulting in a higher proportion of high-earning workers in the data (Rouse and Gimbel, 2021).

References

ADB (2021a), *COVID-19 and Labour Markets in Southeast Asia: Impacts on Indonesia, Malaysia, the Philippines, Thailand and Viet Nam*, December 2021, Asian Development Bank, Mandaluyong City, https://www.adb.org/sites/default/files/publication/758611/covid-19-labor-markets-southeast-asia.pdf.

ADB (2021b), *Asian Development Outlook (ADO) 2021 Update: Transforming Agriculture in Asia,* Asian Development Bank, Mandaluyong City, http://dx.doi.org/10.22617/FLS210352-3.

Adrian, T. and G. Gopinath (2021), *Addressing Inflation Pressures Amid an Enduring Pandemic*, International Monetary Fund, Washington D.C., https://blogs.imf.org/2021/12/03/addressing-inflation-pressures-amid-an-enduring-pandemic/.

Afkar, R. and N. Yarrow (2021), *Rewrite the future: How Indonesia's education system can overcome the losses from the COVID-19 pandemic and raise learning outcomes for all*, World Bank, Washington D.C., https://documents1.worldbank.org/curated/en/589551630680730676/pdf/Rewrite-the-Future-How-Indonesias-Education-System-can-Overcome-the-Losses-From-the-COVID-19-Pandemic-and-Raise-Learning-Outcomes-for-All.pdf.

AHIP (2021), "Health Insurance Providers Respond to Coronavirus (COVID-19)", 27 August 2021, https://www.ahip.org/news/articles/health-insurance-providers-respond-to-coronavirus-covid-19

Alam, G.M.M. and M.N. Khatun (2021), "Impact of COVID-19 on vegetable supply chain and food security: Empirical evidence from Bangladesh", *PLoS ONE*, Vol. 16, No. 3, PLOS, San Francisco, https://journals.plos.org/plosone/article?id=10.1371/journal.pone.0248120.

AMRO (2021), *ASEAN+3 and COVID-19: Panoply of Pandemic Policies*, ASEAN+3 Macroeconomic Research Office, Singapore, https://www.amro-asia.org/wp-content/uploads/2021/11/19.-ASEAN3_and-COVID-19_Panoply-of-Pandemic-Policies_November-5-2021.pdf.

Bank Indonesia (2022), *BI 7-day Reverse Repo Rate Held at 3.50%: Bank Indonesia Policy Mix in 2022 Oriented Towards Maintaining Stability and Strengthening National Economic Recovery*, 20 January 2022, Jakarta, https://www.bi.go.id/en/publikasi/ruang-media/news-release/Pages/sp_241522.aspx.

Bank Negara Malaysia (2022), *Monetary Policy Statement,* 20 January 2022, Kuala Lumpur, https://www.bnm.gov.my/-/monetary-policy-statement-20012022.

Bank of Thailand (2022), *Monetary Policy Committee's Decision 1/2022*, 9 February 2022, Bangkok.

Becker, C.D., K. Dandy, M. Gaujean, M. Fusaro and C. Scurlock (2019), "Legal Perspectives on Telemedicine Part 1: Legal and Regulatory Issues", *The Permanente Journal*, 23, 18-293, 7 June 2019, https://doi.org/10.7812/TPP/18-293

Bernanke, B. (2010), *The Economic Outlook and Monetary Policy*, Board of Governors of the Federal Reserve System, Washington D.C., https://www.federalreserve.gov/newsevents/speech/bernanke20100827a.htm.

BSP (2021), *Highlights of the meeting of the monetary board on the monetary policy stance held on 16 December 2021,* Bangko Sentral ng Pilipinas, https://www.bsp.gov.ph/Lists/HighlightsOfMBMeetings/Attachments/168/mb12162021.pdf.

Burkacky, O., S. Lingemann and K. Pototzky (2021), *Coping with the auto-semiconductor shortage: Strategies for success,* May 2021, McKinsey & Company, New York City, https://www.mckinsey.com/industries/automotive-and-assembly/our-insights/coping-with-the-auto-semiconductor-shortage-strategies-for-success.

Cabinet Secretariat of the Republic of Indonesia (2022a), "Gov't Declares PPKM Level 3 as Omicron Cases Rise", 7 February 2022, https://setkab.go.id/en/govt-declares-ppkm-level-3-as-omicron-cases-rise/.

Cabinet Secretariat of the Republic of Indonesia (2022b), "Gov't Expands Telemedicine Service for COVID-19 Patients Diagnosed Using Antigen Test", 16 February 2022, https://setkab.go.id/en/govt-expands-telemedicine-service-for-covid-19-patients-diagnosed-using-antigen-test/.

Cabinet Secretariat of the Republic of Indonesia (2021), "Gov't, Telemedicine Platforms Provide Free Services for COVID-19 Self-Isolation Patients", 5 July 2021, https://setkab.go.id/en/govt-telemedicine-platforms-provide-free-services-for-covid-19self-isolation-patients/.

Cariappa, A.G.A., K.K. Acharya, C.A. Adhav, R. Sendhil, and P. Ramasundaram (2021), "COVID-19 induced lockdown effects on agricultural commodity prices and consumer behaviour in India – Implications for food loss and waste management", No. 101160, Elsevier, Amsterdam, https://doi.org/10.1016/j.seps.2021.101160.

CEPI (2021), *Vaccine manufacturing landscape of Africa, Latin America-Caribbean, Southeast Asia-western pacific, and the middle east*, Oslo, https://cepi.net/wp-content/uploads/2021/10/CEPI-2021-Vaccine-Manufacturing-Capacity-Survey.pdf.

Christiano, L., M. Eichenbaum and M. Trabandt (2015), "Understanding the Great Recession", *American Economic Journal: Macroeconomics*, Vol. 7, No. 1, pp. 110–167, American Economic Association, Nashville, Tennessee, http://dx.doi.org/10.1257/mac.20140104.

Christie, B. (2021), "Covid-19: Vaccines are highly effective in preventing deaths from delta variant, study indicates", *British Medical Journal21* (BMJ) Clinical Research, 375:n2582, October 2021, https://doi.org/10.1136/bmj.n2582.

Chu, M.M. (2021), *Analysis: Malaysia's palm oil producers adjust to labour shortages, higher recruitment costs*, 9 December 2021, Reuters, Kuala Lumpur, https://www.reuters.com/markets/commodities/malaysias-palm-oil-producers-adjust-labour-shortages-higher-recruitment-costs-2021-12-09/.

Cong, W. (2021), "From Pandemic Control to Data-Driven Governance: The Case of China's Health Code", *Frontiers in Political Science*, Vol. 3, 14 April 2021, https://www.frontiersin.org/article/10.3389/fpos.2021.627959.

Cook, C. (2021), "2021 Port Congestion Report", *VesselsValue Blog*, VesselsValue, London.

Crump, R. K., S. Eusepi, M. Giannoni and A. Sahin (2022), "The Unemployment-Inflation Trade-off Revisited: The Phillips Curve in COVID Times", *NBER Working Paper*, No. 29785, February 2022, National Bureau of Economic Research, Cambridge, Massachusetts, https://www.nber.org/system/files/working_papers/w29785/w29785.pdf.

Dabla-Norris et al. (2021), "Who doesn't want to be vaccinated? Determinants of vaccine hesitancy during COVID-19", *IMF Working Papers*, No. WP/21/130, International Monetary Fund.

Daly, M. and B. Hobijn (2014), "Downward nominal wage rigidities bend the Phillips Curve", *Journal of Money, Credit and Banking*, Vol. 46, Issue S2, pp. 51-93, http://dx.doi.org/10.1111/jmcb.12152.

DoH (2021), *P20.8 B in '22 budget for hiring more health workers*, 29 August 2021, Department of Health of the Philippines, Manila, https://doh.gov.ph/sites/default/files/news_clips/083021-012.pdf.

Dolgin, E. (2021), "Omicron is supercharging the COVID vaccine booster debate", *Nature*, 2 December 2021, https://www.nature.com/articles/d41586-021-03592-2.

Drewry Supply Chain Advisors (2022), *World Container Index*, Drewry, London, https://www.drewry.co.uk/supply-chain-advisors/supply-chain-expertise/world-container-index-assessed-by-drewry (accessed 11 November 2021, 2 December, and 13 January 2022).

ECB (2022), *Combined monetary policy decisions and statement*, 3 February 2022, European Central Bank, Frankfurt am Main, https://www.ecb.europa.eu/press/pressconf/shared/pdf/ecb.ds220203.en.pdf.

ECB (2021), *Press Release: Monetary Policy Decisions*, European Central Bank, Frankfurt am Main, https://www.ecb.europa.eu/press/pr/date/2021/html/ecb.mp211028~85474438a4.en.html.

Elder, S. and P. Huynh (2021), *COVID-19 and Employment in the Tourism sector in the Asia–Pacific Region*, International Labour Organization, Geneva, https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/documents/briefingnote/wcms_827495.pdf.

FAO (2021a), *Food Outlook–Biannual Report on Global Food Markets*, Rome, https://doi.org/10.4060/cb7491en.

FAO (2021b), *Crop Prospects and Food Situation-Quarterly Global Report No. 4*, Rome, https://doi.org/10.4060/cb7877en.

FCC (n.d.), *Telehealth, Telemedicine, and Telecare: What's What?*, https://www.fcc.gov/general/telehealth-telemedicine-and-telecare-whats-what.

Federal Reserve Bank of St. Louis (2021), *No taper tantrum this time? Comparing bond market reactions in 2013 and 2021*, St. Louis, Missouri, https://fredblog.stlouisfed.org/2021/08/no-taper-tantrum-this-time/.

Forbes, K J. (2019), "Has Globalization Changed the Inflation Process?", *BIS Working Papers*, No. 791, Bank for International Settlements, Basel, Switzerland, https://www.bis.org/publ/work791.pdf.

Gaduena, A., C. E. C. Caboverde and J. P. Flaminiano (2020), "Telework Potential in the Philippines", *Rizalino S. Navarro Policy Center for Competitiveness Discussion Paper,* No. 2020-004, Makati City, Philippines, https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3738463.

Garcia-Beltran et al. (2022), "mRNA-based COVID-19 vaccine boosters induce neutralizing immunity against SARS-CoV-2 Omicron variant", *Cell*, Vol. 185, Issue 3, pp. 457-466, Cambridge, Massachusetts, https://doi.org/10.1016/j.cell.2021.12.033.

General Statistics Office (2021), *Press Conference to Announce The Labor and Employment Situation in The Third Quarter and 9 months of 2021*, Hanoi, https://www.gso.gov.vn/en/data-and-statistics/2021/10/press-conference-to-announce-the-labor-and-employment-situation-in-the-the-third-quarter-and-9-months-of-2021/.

Global Maritime Hub (2021), *Shipping profit margins accelerate: Profit margins Accelerate as 2021 EBIT set to beat all records*, Paris, https://globalmaritimehub.com/shipping-profit-margins-accelerate.html.

Government of Hong Kong Special Administrative Region (2022a), "Government implements place-specific flight suspension mechanism in response to Omicron variant and tightens boarding and quarantine requirements for places with Omicron cases detected", 5 January 2022, https://www.info.gov.hk/gia/general/202201/05/P2022010500713.htm

Government of Hong Kong Special Administrative Region (2022b), "Government extends place-specific flight suspension mechanism and implements place-specific flight suspension mechanism for Nepal", 11 February 2022, https://www.info.gov.hk/gia/general/202202/11/P2022021100536.htm.

Government of Indonesia (2021), *Update: Indonesia Travel Restrictions*, Consulate General of the Republic of Indonesia in the United States of America, Los Angeles, https://kemlu.go.id/losangeles/en/news/11727/update-indonesia-travel-restrictions#:~:text=All%20domestic%20travelers%20are%20required,test%2024%2Dhour%20prior%20departure.

Government of Malaysia (2021), *MySejahtera*, Kuala Lumpur, https://mysejahtera.malaysia.gov.my/intro_en/.

Government of Singapore (2022), "[Updated] Revised Safe Management Measures from 1 February 2022", 21 January 2022, https://www.gov.sg/article/updates-to-safe-management-measures-from-1-jan-2022.

Helble, M. (2019), *The Housing Unaffordability Crisis in Asia*, Asian Development Blog, Asian Development Bank, https://blogs.adb.org/blog/housing-unaffordability-crisis-asia.

Hoang, L. (2021), *Vietnam's supply chains struggle to shake off Covid impact*, 1 December 2021, Financial Times, London, https://www.ft.com/content/2eb1bdaa-fa8e-4d1e-9b47-85006df9e897.

Hong Kong International Airport (2021), *Airport Authority Launches Air Ticket Lucky Draw to Promote Vaccination*, 6 May 2021, https://www.hongkongairport.com/en/media-centre/press-release/2021/pr_1547.

HSA (2021), *COVID-19 self-test kits authorised for use in Singapore,* 10 June 2021, Updated on 6 January 2022, Health Sciences Authority, Singapore, https://www.hsa.gov.sg/consumer-safety/articles/covid19_selftests.

Huynh, P. (2021), *COVID-19 and Rising Wage Inequality: Trends and Challenges in Thailand and Viet Nam*, International Labour Organization, Geneva, https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/documents/briefingnote/wcms_767475.pdf.

ILO (2021), *ILO Monitor: COVID-19 and the World of Work, Seventh edition*, International Labour Organization, Geneva, https://www.ilo.org/wcmsp5/groups/public/@dgreports/@dcomm/documents/briefingnote/wcms_767028.pdf.

Ioanes, E. (2021), *Why Supply Chain Chaos and Inflation Could Last into 2022*, Vox, 24 October, https://www.vox.com/2021/10/24/22743104/supply-chain-inflation-shortages-2022.

John, O., S.N. Sarbadhikari, T. Prabhu, A. Goel, A. Thomas, S. Shroff, F. Allaudin, C. Weerabaddana, D. Alhuwail, U. Koirala, J. Johnrose, P. Codyre, A. Bleaden, S. Singh and S. Bajaj (2022), "Implementation and Experiences of Telehealth: Balancing Policies With Practice in Countries of South Asia, Kuwait, and the European Union", *Interact J Med Res* 2022 Vol. 11, No. 1, 8 February 2022, https://doi.org/10.2196/30755

Kamali, P. and A. Wang (2021), *Longer Delivery Times Reflect Supply Chain Disruptions*, International Monetary Fund, Washington D.C., https://blogs.imf.org/2021/10/25/longer-delivery-times-reflect-supply-chain-disruptions/.

Kanozia, R. and Arya, R. (2021), "'Fake news', religion, and COVID-19 vaccine hesitancy in India, Pakistan, and Bangladesh", *Media Asia*, Vol. 48, Issue 4, pp. 1-9, Taylor & Francis, London, https://www.tandfonline.com/doi/full/10.1080/01296612.2021.1921963.

Lao News Agency (2022), "Gov't eases anti-Covid restrictions", 4 February 2022, http://kpl.gov.la/En/Detail.aspx?id=64893.

Lau, J. F. W. et al. (2021), *Factors influencing acceptance of the COVID-19 vaccine in Malaysia: a web-based survey*, Osong Public Health and Research Perspectives, Vol. 12, No. 6, pp. 361-373, Seoul, https://doi.org/10.24171/j.phrp.2021.0085.

Li C., W.K. Lai, S. Wong, T. Armstrong, Neil Brookes and V. Garrett (2021), *Asia-Pacific Outlook Report 2022: Optimism and Opportunities Ahead*, Knight Franck – Asia Pacific, https://www.aprea.asia/images/Files/asia-pacific-outlook-report-2022-8655.pdf.

Li V.Q.T., L. Ma and X. Wu (2022), "COVID-19, policy change, and post-pandemic data governance: a case analysis of contact tracing applications in East Asia", *Policy and Society*, Vol. 41, Issue 1, pp. 129-142, Oxford University Press, https://doi.org/10.1093/polsoc/puab019

Lombardi, M. J., M. Riggi and E. Viviano (2020), "Bargaining power and the Phillips curve: a micro-macro analysis", *BIS Working Papers,* No. 903, November 2020, Bank for International Settlements, Basel, https://www.bis.org/publ/work903.pdf.

Maersk (2021), *Electricity rationing in China and its potential impact on the supply chain,* 28 October 2021, https://www.maersk.com/news/articles/2021/10/27/electricity-rationing-in-china-and-its-potential-impact-on-the-supply-chain.

MAS (2021), *Macroeconomic Review,* Volume XX, Issue 2, October 2021, Monetary Authority of Singapore, Singapore, https://www.mas.gov.sg/-/media/MAS/EPG/MR/2021/Oct/MROct21.pdf.

Medicines Patent Pool (2022), "27 generic manufacturers sign agreements with MPP to produce low-cost versions of COVID-19 antiviral medication molnupiravir for supply in 105 low- and-middle-income countries", 20 January 2022, https://medicinespatentpool.org/news-publications-post/27-generic-manufacturers-sign-agreements-with-mpp-to-produce-molnupiravir.

Medicines Patent Pool (2021), "MOLNUPIRAVIR (MOL)", October 2021, https://medicinespatentpool.org/licence-post/molnupiravir-mol.

Mekong Strategic Partner (2021), *Vaccination Nation: Unmasking Cambodia's Vaccination Success*, Phnom Penh, https://www.mekongstrategic.com/post/vaccination-nation

Ministry of Finance Malaysia (2021), *Touchpoints Budget 2022 Measures*, October 2021, Kuala Lumpur, https://budget.mof.gov.my/pdf/2022/ucapan/touchpoints-en.pdf.

Ministry of Foreign Affairs Republic of Indonesia (2022), "NEW & THE LATEST: Omicron Variant, and the Extension of Temporary Prohibition for Foreigners Entering the Territory of Indonesia", 2 February 2022, https://kemlu.go.id/paris/en/read/new-the-latest-omicron-variant-quarantine-and-the-extension-of-temporary-prohibition-for-foreigners-entering-the-territory-of-indonesia/1704/important-information

Ministry of Health and Family Welfare (2021), *Guidelines for International Arrivals (in supersession of all guidelines issued on the subject on and after 17th February 2021)*, New Delhi, https://www.mohfw.gov.in/pdf/GuidelinesforInternationalArrival20thOctober2021.pdf

Ministry of Health of Singapore (2022), "Listing of direct telemedicine providers: transition approach prior to licensing under the healthcare services act (HCSA)", 23 February 2022, https://www.moh.gov.sg/licensing-and-regulation/telemedicine.

Ministry of Health of Singapore (2021), "Healthcare services (HCSA)", 23 November 2021, https://www.moh.gov.sg/hcsa/home.

Ministry of Hotels and Tourism Myanmar (2022), "Testing and Quarantine Requirements for International Travellers to Myanmar (30-1-2022)", https://tourism.gov.mm/testing-and-quarantine-requirements-for-international-travellers-to-myanmar-30-1-2022/.

Ministry of Hotels and Tourism Myanmar (2021), *COVID Latest News*, Government of Myanmar, Naypyidaw, https://tourism.gov.mm/covid-19/.

MyGovernment (2021), "New Digital Normal (Post-Covid) | MyTrace Malaysia", *Government of Malaysia*, 2021, https://www.malaysia.gov.my/portal/content/30955.

Novavax (2021), *Novavax Statement on Omicron Variant Response*, 2 December 2021, https://ir.novavax.com/Novavax-Statement-on-Omicron-Variant-Response.

Ochave, R.M.D (2020), *Big harvests, big waste: Farm logistics remain the missing link*, BusinessWorld, 20 July, Manila, https://www.bworldonline.com/big-harvests-big-waste-farm-logistics-remain-the-missing-link/.

OECD (2022), *Inflation (CPI) (indicator)*, https://data.oecd.org/price/inflation-cpi.htm (accessed on 7 March 2022).

OECD (2021), *Economic Outlook for Southeast Asia, China and India 2021: Reallocating Resources for Digitalisation*, OECD Publishing, Paris, https://doi.org/10.1787/711629f8-en.

OECD-WHO (2020), *Health at a Glance: Asia/Pacific 2020: Measuring Progress Towards Universal Health Coverage*, OECD Publishing, Paris, https://doi.org/10.1787/26b007cd-en.

Our World in Data (2022), Coronavirus Pandemic (COVID-19) database, https://ourworldindata.org/coronavirus (accessed on 6 March 2022).

Pfizer (2021), *Pfizer Announces Additional Phase 2/3 Study Results Confirming Robust Efficacy of Novel COVID-19 Oral Antiviral Treatment Candidate in Reducing Risk of Hospitalization or Death*, New York, https://www.pfizer.com/news/press-release/press-release-detail/pfizer-announces-additional-phase-23-study-results.

Philippine News Agency (2021), *Omicron spreading faster than any other variant: WHO chief*, 15 December 2021, https://www.pna.gov.ph/articles/1162794.

Phoonphongphiphat, A. (2021), *Thai food exports fall short due to migrant labor shortage*, 14 December 2021, Nikkei Asia, Tokyo, https://asia.nikkei.com/Economy/Thai-food-exports-fall-short-due-to-migrant-labor-shortage.

Phuong, K. (2021), "HN to pilot home quarantine for Covid patient-contacted cases", *Government News*, 16 November 2021, http://news.chinhphu.vn/Home/HN-to-pilot-home-quarantine-for-Covid-patientcontacted-cases/202111/46135.vgp.

Planas, D. et al. (2021), "Considerable escape of SARS-CoV-2 Omicron to antibody neutralization", *Nature*, 23 December 2021, https://doi.org/10.1038/s41586-021-04389-z.

PwC and the Urban Land Institute (2021), *Emerging Trends in Real Estate Asia Pacific 2022*, PwC and the Urban Land Institute, Washington, D.C., https://www.pwc.com/sg/en/publications/assets/page/emerging-trends-real-estate-asia-pacific-2022.pdf.

Reading, B. (2021). *Return of cost-push inflation may lead to stagflation*, Official Monetary and Financial Institutions Forum, London, https://www.omfif.org/2021/10/return-of-cost-push-inflation-may-lead-to-stagflation/.

Reserve Bank of India (2022), *Governor's Statement: February 10, 2022*, New Delhi, https://www.rbi.org.in/scripts/BS_PressReleaseDisplay.aspx?prid=53249.

Reuters (2021), *Major shipping firms warn of worsening congestion at China's Yantian port*, 3 June 2021, https://www.reuters.com/world/asia-pacific/major-shipping-firms-warn-worsening-congestion-chinas-yantian-port-2021-06-03/.

Rocamora, J.A.L. (2022), "PH reopens borders to foreign tourists after nearly 2 years", *Philippine News Agency*, 10 February 2022, https://www.pna.gov.ph/articles/1167487.

Rouse, C. and M. Gimbel (2021), *The Pandemic's Effect on Measured Wage Growth*, Blog, 19 April, The White House, Washington D.C., https://www.whitehouse.gov/cea/written-materials/2021/04/19/the-pandemics-effect-on-measured-wage-growth/.

State Council Information Office (2021), *Ministry of Transport takes steps to boost supply of shipping containers,* Beijing, http://english.scio.gov.cn/m/pressroom/2021-09/27/content_77777441.htm.

Sheikh, A., C. Robertson and B. Taylor (2021), "BNT162b2 and ChAdOx1 nCoV-19 Vaccine Effectiveness against Death from the Delta Variant", *New England Journal of Medicine*, No. 385, pp. 2195-2197, Boston, Massachusetts, https://www.nejm.org/doi/full/10.1056/NEJMc2113864.

Shin, S. (2019), "Macroprudential Policy in Asian Economies", *ADB Economics Working Paper Series*, No. 577, Asian Development Bank, Manila, http://dx.doi.org/10.22617/WPS190114-2.

State Council of the People's Republic of China (2021), *Full Text: Working Guidance For Carbon Dioxide Peaking And Carbon Neutrality In Full And Faithful Implementation Of The New Development Philosophy*, 25 October 2021, Beijing, http://english.www.gov.cn/policies/latestreleases/202110/25/content_WS61760047c6d0df57f98e3c21.html.

The Maritime Executive (2021), *Vietnamese Terminal Suspends Some Operations Due to COVID-19 Surge*, 2 August 2021, Plantation (Florida), https://www.maritime-executive.com/article/vietnamese-terminal-suspends-some-operations-due-to-covid-19-surge.

Ting-Fang, C. and L. Li (2021), "How the chip shortage got so bad – and why it's so hard to fix", *Nikkei Asia*, 16 April 2021, https://asia.nikkei.com/Business/Business-Spotlight/How-the-chip-shortage-got-so-bad-and-why-it-s-so-hard-to-fix.

UNCTAD (2021), *Review of Maritime Transport 2021*, United Nations Conference on Trade and Development, Geneva, https://unctad.org/system/files/official-document/rmt2021_en_0.pdf.

UNDP (2021), Global Dashboard for Vaccine Equity, United Nations Development Programme, New York City, https://data.undp.org/vaccine-equity/ (data as of 2 March 2022; accessed on 6 March 2022).

UNFPA Lao People's Democratic Republic (2021), "Laos Innovates with Telehealth to Provide Maternal and Reproductive Health Services to Returning Female Migrants", 14 September 2021, https://lao.unfpa.org/en/news/laos-innovates-telehealth-provide-maternal-and-reproductive-health-services-returning-female.

United Nations (2021), *Information Note #11: United Nations support to Cambodia's national COVID-19 vaccination roll-out*, United Nations Cambodia, https://cambodia.un.org/en/138331-information-note-11-united-nations-support-cambodias-national-covid-19-vaccination-roll-out.

Varley, K. (2021), "Ships Queues Worsen Port Delays From Singapore to Piraeus", *Bloomberg News*, 2 November 2021, https://www.bloomberg.com/news/articles/2021-11-02/ships-queues-worsen-port-delays-from-singapore-to-piraeus.

Vietnam National Administration of Tourism (2021), "Vietnam debuts 'Live fully in Vietnam' campaign", *Ministry of Culture, Sports &Tourism*, 11 November 2021, https://www.vietnamtourism.gov.vn/english/index.php/items/16460.

WHO (2021a), *COVID-19 vaccination: supply and logistics guidance*, World Health Organization, Geneva, Switzerland, https://apps.who.int/iris/handle/10665/339561.

WHO (2021b), *Strategy to achieve global COVID-19 vaccination by mid-2022*, World Health Organization, Geneva, Switzerland, https://cdn.who.int/media/docs/default-source/immunization/covid-19/strategy-to-achieve-global-covid-19-vaccination-by-mid-2022.pdf.

WHO (2019), *Ten threats to global health in 2019*, World Health Organization, Geneva, Switzerland, https://www.who.int/news-room/spotlight/ten-threats-to-global-health-in-2019.

Wong, A. (2021), "Here's how MySejahtera will notify you about your Covid-19 vaccine appointment", *Malay Mail*, 8 April 2021, https://www.malaymail.com/news/malaysia/2021/04/08/heres-how-mysejahtera-will-notify-you-about-your-covid-19-vaccine-appointme/1964775.

World Bank (n.d.), *International tourism receipts (% of total exports)*, World Bank, Washington, D.C., https://data.worldbank.org/indicator/ST.INT.RCPT.XP.ZS (accessed on 11 February 2022).

World Economic Forum (2017), *The Global Competitiveness Index 2017-18*, The Global Competitiveness Report 2017-18, World Economic Forum, Geneva, Switzerland, https://www.weforum.org/reports/the-global-competitiveness-report-2017-2018.

Xinhua (2021), *China Focus: China maps path to carbon peak, neutrality under new development philosophy*, 25 October 2021, http://www.news.cn/english/2021-10/25/c_1310266060.htm.