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PANDEMIC (COVID-19) POLICY, REGIONAL COOPERATION, AND THE EMERGING GLOBAL PRODUCTION NETWORK

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ABSTRACT

In this paper, we explore the possible policy responses to the pandemic shock as well as the related economic (financial crisis) shocks on trade and global value chains (GVCs) in East Asia. We find that regional policy coordination is critical to mitigate and isolate the pandemic shock. It is important to identify the pandemic events early to flatten the pandemic curve at the national and regional level. This supports a recent study by the World Bank (2020) which highlights the importance of early mitigation policies during the pandemic shock. The cost of the pandemic and economic shocks increases significantly when several countries in the region experience the systemic pandemic shock concurrently. In this case, flattening the regional pandemic curve becomes important. The results also indicate the need for greater coordination in East Asia to mitigate the pending economic shock in terms of unemployment, corporate bankruptcy, and financial market fragility. The paper also highlights that the stability of the GVC network is critical during the pandemic in terms of hedging the risk of disruptions to the procurement of critical medical and health products as well as the stability of the services linkages to manufacturing, such as the logistics sector. Regional policy coordination and the stability of GVCs are valuable in the post-pandemic recovery of the region.

PANDEMIC (COVID-19) POLICY, REGIONAL COOPERATION, AND THE EMERGING GLOBAL PRODUCTION NETWORK

1. Introduction

The World Health Organization (WHO) declared the coronavirus disease (COVID-19) a pandemic in March 2020. Few countries in the world have escaped it: by 10 April, 1.6 million cases had been confirmed worldwide and 96,000 people had died. In comparison, during the spread of the severe acute respiratory syndrome (SARS), a previous version of the coronavirus, only 8,098 people were infected worldwide and 774 died over 2002–2004. SARS was less infectious but had a higher mortality rate and SARS victims were more contagious once they started showing symptoms. COVID-19 is relatively contagious, can be asymptomatic, and has a higher death rate than the normal seasonal flu.

The public health response to COVID-19, including lockdowns, has sent shocks running up and down both the supply side of production processes as well as the demand side. Shocks with worldwide significance are not uncommon. However, there are some key differences in the COVID-19 shock compared with others recently experienced. These differences both add to the significance of COVID-19 and shape the potential for the recovery.

For example, as opposed to policy shocks that affect the supply side of the economy, such as the United States (US)–China trade war, COVID-19 has led to tremendous disruptions on both sides of the global value chain (GVC). Global shocks are also associated with natural disasters, which lead to physical damage to industrial production. In contrast, in the current situation, global capacity remains in place, just out of use, creating the scope for a more rapid recovery than that of a natural disaster.

Research has found that even the response to natural disasters can be relatively fast if production networks are flexible and adapt. For example, Ando and Kimura (2012) studied the impact of the 2011 Great East Japan Earthquake, primarily a supply-side shock, on Japanese domestic and international production networks in the machinery industries. They compared it to the impact of the Global Financial Crisis, which was primarily a demand-side shock. The comparison was challenging because of the scale and prolonged impact of the Global Financial Crisis. Their study indicated that the speed of the response of Japanese industries to both shocks was related to the stability and robustness of production networks and their links with East Asia. Abe and Thangavelu (2012) also observed the significant physical damage to production and industrial activities from natural disasters such as the Great East Japan Earthquake. Based on the coordinated efforts of private businesses in the supply

chain, the supply chain recovery was faster than expected in that case. A recent study by Noy and Shields (2019) on the economic impact of SARS found that the impact on China, Hong Kong, Singapore, and Taiwan was very short and that the economies recovered within two to three quarters. This was attributed to the stronger containment policies of the countries but also to the flexibility of the GVC.

The expected effects of the COVID-19 pandemic are very large. A recent World Bank study projected that global gross domestic product (GDP) would fall by more than 2% in 2020 (World Bank, 2020). In comparison, in the year after the Global Financial Crisis, world GDP growth declined from 5.6% in 2007 to zero in 2009. Similarly, in the Asian Financial Crisis, annual GDP growth rates in East Asia fell from an average of nearly 8% in the previous decade to a region-wide average of zero over 1997–1999. Growth rates did not become negative, except in Thailand and Indonesia. The International Labour Organization (ILO, 2020) projected that the COVID-19 pandemic would lead to a 6.7% decline in working hours, which is equivalent to 195 million full-time workers in the world, including about 125 million full-time workers in Asia and the Pacific. Overall, the social distancing measures are affecting about 2.7 billion workers, which represents about 81% of the world's workforce.

The expectation of the devastating economic effects of COVID-19 has led to the adoption of massive relief packages by governments around the world. On 4 March 2020, China's Ministry of Finance announced a special fund totalling CNY110.48 billion ($16 billion) to manage epidemic control. China also allocated CNY1.85 trillion ($261 billion) of the quota of new issues of local government bonds to support provincial level governments (Huang et al., 2020). On 26 March 2020, the US Senate passed a $2.2 trillion relief package for the US economy (Beckett, Aratani, and Graham, 2020). Several other pandemic relief packages have been announced by European Union (EU) countries, Australia, and East Asian countries. Several studies have highlighted the risk of a financial crisis following the pandemic shock (International Monetary Fund (IMF), 2020).

In this paper, we explore the possible policy responses to the pandemic shock as well as to the shocks to production and trade, especially via GVCs. We focus on the East Asian region and the role of regional economic cooperation, through the Association of Southeast Asian Nations (ASEAN) Economic Community and the Regional Comprehensive Economic Partnership (RCEP), which comprises ASEAN plus six countries: Australia, China, India, Japan, the Republic of Korea (henceforth, Korea), and New Zealand. Drawing on the experience of the response to earlier global shocks and natural disasters, the paper also focuses on the operation of the GVCs and the value of maintaining linkages in manufacturing and services. The region's recovery in the post-pandemic period is dependent on regional trade and investment policies as well as the flexibility of GVCs, according to these earlier experiences.

This paper identifies two different shocks emanating from the COVID-19 virus. The pandemic shock is related to human health and well-being, while the subsequent economic shock (including the risk of a financial crisis) is due to the disruptive effects of the pandemic on economic activities and to the effects of public health policy responses – both leading to heavy disruption of GVCs on both the supply and demand sides of production and consumption.

A recent study by Eichenbaum, Rebelo, and Trabandt (2020) examined the interaction of a pandemic shock and an economic shock (but not the possibility of a financial shock nor the GVC effects). People respond to the epidemic by cutting back on spending, which affects the spread of the virus. However, they do not fully internalise the latter effect, which creates a role for government and policies to internalise these effects through containment, even though they lead to a deeper economic impact.

In this paper, we try to identify and isolate the effects of the pandemic shock from the economic shock. Without a policy response, the social costs of the pandemic in terms of human isolation, death, household disruption, and depression are significant. It may have an immediate economic effect and, if persistent, the pandemic shock may also increase the scale of the economic shock that follows it if there is no relief.

With respect to policy responses, it is important to load the cost of the response to the pandemic (mitigation, isolation, lockdown, and economic disruption) at the beginning of the pandemic cycle, to quickly flatten the pandemic curve at the national and then at the regional level. This helps match the demand for health services with the capacity available. The World Bank (2020) study highlighted the need for quick policy reactions (early investments in disease surveillance, testing, tracking, and quarantines), as occurred in Korea and Singapore, to successfully flatten the pandemic curve. These reactions, however, have an economic cost, for which relief is also recommended.

Regional cooperation can help respond to both the pandemic shock and the economic shock. We provide examples below but, briefly, a coordinated approach to the movement of people can reduce the extent of transmission. The adoption of a coordinated approach, internalising the costs of not responding to the pandemic, reinforces this effect. The benefits of relief packages also spill over to other economies in the region. Internalising these effects between countries benefits from coordination.

The paper also finds that the stability of the GVC network is critical during and after the pandemic. First, it is important to avoid disruptions to the procurement of critical medical and health products, by maintaining the stability of the services linkages, such as those provided by the logistics sector. Second, the paper highlights the value of the coordination of policy relevant to the operations of the GVC network more generally in the post-pandemic recovery period.

The paper is organised as follows. The next section briefly discusses the economic impact of the pandemic shock on East Asia. Section 3 discusses the possible pandemic policy response scenarios of the region, taking the Government of China's policy response to the pandemic as a case study. Section 4 concludes the paper and includes a policy discussion.

2. Economic Effects of COVID-19 in East Asia

The pandemic and the response to it have significant effects on both the demand and supply sides of the economy.[1]

In goods, demand has dropped significantly because of social distancing and high levels of uncertainty, despite the fiscal stimulus. The economic standstill may return to normal activities in a month or two, once the number of new COVID-19 virus cases falls below a certain threshold level. Eventually, the drop in demand for goods will reverse – the item not bought today can be purchased later. However, we might not be at the same starting point as the initial stopping point. We could only expect these points to be similar if the pandemic shock is temporary.

On the supply side, in the immediate term, there are significant disruptions to GVCs because people cannot go to work, transport systems are disrupted, suppliers shut down, and borders are more difficult to cross. In addition to production disruptions, we observe significant disruptions to services linkages and service sector activities. In particular, the breakdown of the ability of the logistics sector to move intermediate goods in GVCs leads to disruptions to production in other connected countries.

[1] Kennedy, Thomson, and Vujanovic (2006) discussed the macroeconomic implications of a pandemic.

This disruption leads to multiplier effects up and down the GVCs and greater negative impacts on participating countries.

In addition, the service sector is disrupted by the lockdown on the movement of people, which directly affects key services such as tourism, finance, hotels and restaurants, business, and aviation. The key element of the COVID-19 shock is the lockdown on the movement of people, as the current state of the economy is unable to identify and isolate the unobservable (those with the COVID-19 virus), which directly affects services activities linked to the movement of people. This impact will be more significant in countries that rely heavily on services activities to generate income and employment.

The impacts on the financial system are also significant, and will increase if the pandemic shock is prolonged. There will be large negative wealth effects from unemployment and large corporate bankruptcies globally, leading to financial fragility. Mortgage default rates may rise across Europe and the US, reflecting the signs of financial fragility. The global fiscal and monetary responses are designed to mitigate both the large negative wealth effects as well as the pending financial market crisis, and there could be several stages of fiscal and monetary policy stimulus across various countries over the coming months.

There could be medium- to long-run effects of pandemic shocks preceded by economic shocks on the domestic and regional economies. The medium- and long-run effects of economic shocks will be a function of the persistence of the pandemic. The key to pandemic policy is to mitigate and isolate the effects with strong regulations to make such shocks have only temporary disruptions to economic activities and to avoid significant loss of life. It is also important not to disrupt long-run processes of technological progress and to avoid the loss of production capacity through bankruptcies. Long and persistent pandemic shocks (more than 6 months) could lead to deep structural adjustments in the economy.

Countries	GDP (%)	Relief and Stimulus Packages*	Stimulus Package announcement date
Italy	-7.00	US$28.3 billion	10 March 2020
Australia		A$213.6 billion	31 March 2020
Japan	-1.50	1.6 trillion yen *(total second package)*	10 March 2020
South Korea	-1.80	US$13.7 billion	4 March 2020
France	-5.00	Euro 45 billion	17 March 2020
US	-2.80	US$2.2 trillion	26 March 2020
Germany	-6.80	US$814 billion	26 March 2020

Table 1: GDP Forecast of Impact of Global Pandemic (COVID19) on Developed Countries in 2020 (EIU, March 2020) GDP (%)

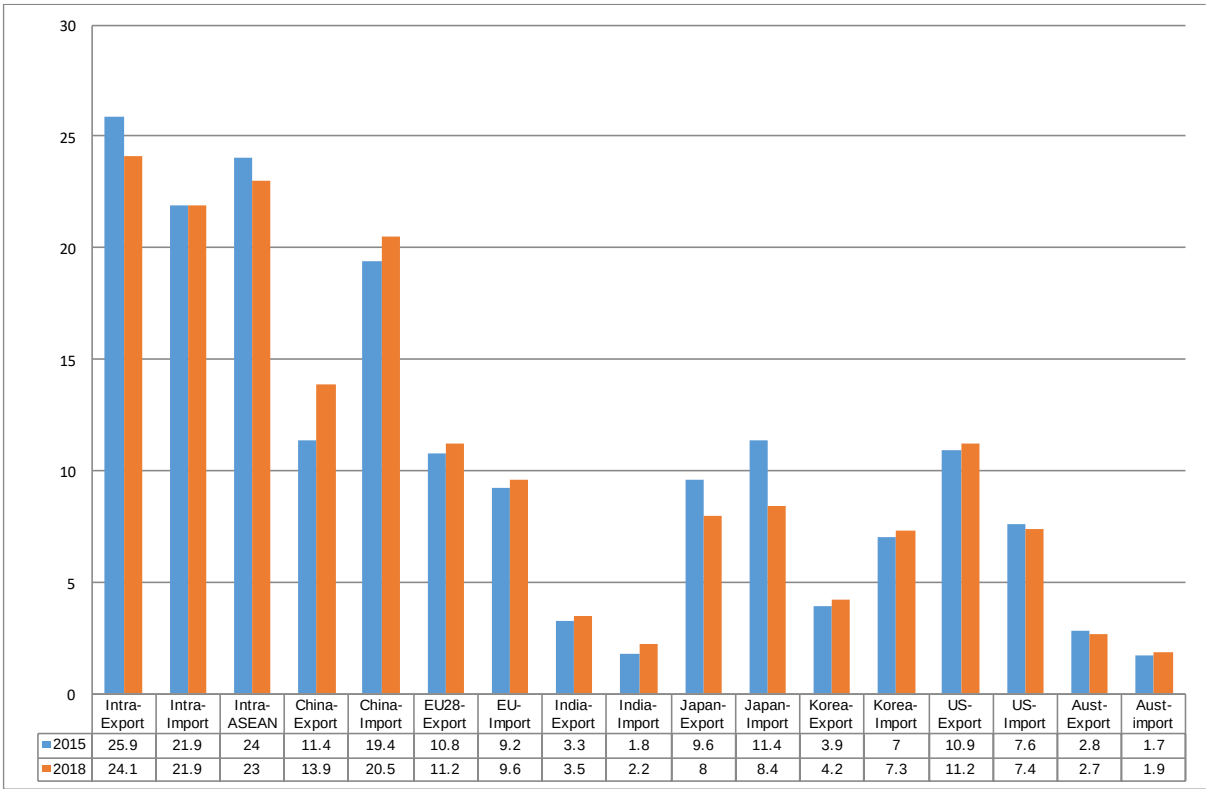
Source: EIU, 31 March 2020, and the relief packages as reported at the government websites. COVID-19 = coronavirus disease, GDP = gross domestic product. Notes: '$' refers to United States dollars, unless stated otherwise.

The devastating effects of COVID-19 are clearly reflected in various forecasts of the impact on global and regional GDP. Recent World Bank estimates showed that global GDP would fall by 2.1% in 2020 (World Bank, 2020: Table I.2.1). The Economist Intelligence Unit (EIU, 2020) predicted that most G20 countries would be in a recession, and that the greatest fall in GDP will be in Italy, Germany, and France (Table 1). The EIU expects GDP in the US to fall by 2.8% in 2020.

Table 1 also shows the relief and stimulus packages provided by the respective developed countries to mitigate the negative impact on the economy, businesses, and workers (in the right-hand column).

All of the Asian countries will contract. Table 2 shows the results of two scenarios developed by the Asian Development Bank (ADB). The scale of these effects is related to the strong trade and services linkages between China and ASEAN countries, driven by GVCs (ADB, 2020; Figure 1). China's share of ASEAN exports is about 13.9%. On the supply side, ASEAN imports about 20.5% of its total imports from China. Within ASEAN, Cambodia and Thailand, which have very strong service trade linkages in tourism and production with China, are expected to experience larger declines in GDP. Relatively large contractions from a persistent pandemic shock are also expected in Indonesia, the Philippines, and Viet Nam.

The ADB (2020) forecasts only considered the impact of the pandemic in China on Asian countries and did not account for the current pandemic in the EU and the US, which is more likely to be a disruption on the demand side. Trade with the US and the EU accounted for 9.3% and 10.2% of total ASEAN trade, respectively, in 2018. The US and EU export markets accounted for nearly 22.4% (11.2% each) of total exports in 2018 (Figure 1). Thus, the persistence of the pandemic in the US and the EU will have a further strong negative impact on ASEAN countries.



	Intra-Export	Intra-Import	Intra-ASEAN	China-Export	China-Import	EU28-Export	EU-Import	India-Export	India-Import	Japan-Export	Japan-Import	Korea-Export	Korea-Import	US-Export	US-Import	Aust-Export	Aust-import
2015	25.9	21.9	24	11.4	19.4	10.8	9.2	3.3	1.8	9.6	11.4	3.9	7	10.9	7.6	2.8	1.7
2018	24.1	21.9	23	13.9	20.5	11.2	9.6	3.5	2.2	8	8.4	4.2	7.3	11.2	7.4	2.7	1.9

Figure 1: Share of Intra-ASEAN and Extra-ASEAN Trade in 2015-2018 (%)

ASEAN = Association of Southeast Asian Nations, Aust = Australia, EU = European Union, US = United States. Note: Korea refers to the Republic of Korea. Source: ASEAN Secretariat. (https://www.aseanstats.org)

Adjustment at the sectoral level will be significant, according to ADB. In particular, agriculture and mining, light manufacturing, parts and components, hotels and restaurants, business services, and transport services are likely to be affected by the pandemic. Services trade such as tourism and logistics will be heavily affected, especially in countries such as Cambodia and Thailand which rely on Chinese tourists (ADB, 2020).

Countries	ADB Forecast of Impact of China Pandemic on Selected Asian Countries (ADB Economic Outlook, 2020)*		World Bank Pandemic Forecast (2020)**	Relief and Stimulus Packages***
	Pandemic shock in China (6 months)*	Pandemic Shock in China (6 months) plus 3 months at Developing Member Countries*	Global Pandemic	
China	-1.74	-1.74	-3.69	110.48 billion yuan (4 March 2020)
India	-0.04	-1.10	-2.41	1.3 trillion rupees (S$32.3 billion) (26 March 2020)
Brunei	-0.39	-0.62	-	$450 million (30 March 2020)
Cambodia	-2.9	-3.81	-3.21	US$800 million (10 March 2020)
Indonesia	-0.36	-1.28	-1.74	120 trillion rupiah (13 March 2020)
Laos	-0.43	-	-2.15	-
Malaysia	-0.42	-1.1	-2.09	RM250 billion (S$83.6 billion) (27 March 2020)
Philippines	-0.59	-1.67	-2.46	US$3.93 billion (expected) (22 March 2020)
Singapore	-0.98	-1.41	-2.08	US$33.2 billion (26 March 2020)
Thailand	-2.17	-2.83	-3.03	US$3.56 billion (22 March 2020)
Vietnam	-0.78	-1.52	-2.69	US$1.16billion (3 March 2020)
Japan	-	-	-2.23	1.6 trillion yen (*total 2nd package)* (10 March 2020)
South Korea	-0.31	-1.02	-2.44	US$13.7 billion (4 March 2020)

Table 2: Impact of Pandemic (COVID19) on East Asia and Selected Developed Countries on GDP Growth (%)

*ADB = Asian Development Bank, GDP = gross domestic product. Note: '$' refers to United States dollars, unless stated otherwise. *ADB (2020). ** World Bank (2020). ***Obtained from government websites (announcement date in parentheses). Sources: ADB (2020); World Bank (2020); and government websites. - Data not available*

Massive relief packages are provided by the East Asian countries to mitigate the negative impact of the pandemic (Table 2). In fact, each of these relief packages was provided independently without much coordination across the ASEAN countries. If there had been more coordination at the earlier stage of the pandemic, the relief packages could have been lower and more targeted to mitigate the negative effects of the pandemic, within and across countries.

3. Policy Responses to the Pandemic (COVID-19) Shock in East Asia

The impact of the pandemic shock creates a huge social cost to the economy in terms of the number of cases and fatalities. It imposes an economic cost as well, but its important impact is the pressure on the health system. The idea of 'flattening the pandemic curve' by imposing social isolation and adopting identification (testing) and implementation (enforcement) policies is to provide enough flexibility for domestic healthcare systems to respond to the most critically affected patients of the pandemic. This also reduces the social cost to the economy in terms of fatalities. However, the imposition of social isolation leads to the disruption of economic activities and thus increases the economic cost (Baldwin, 2020; Eichenbaum, Rebelo, and Trabandt, 2020; Gourinchas, 2020). The World Bank (2020) stimulation showed how a combination of healthcare policies with social isolation and appropriate economic policies could flatten both the pandemic and the 'recession curve'.

The response of the economy is critical to mitigate the pandemic shock. The outcome without any response is shown by the number of total cases along the orange line in Figure 2. If the economy recognises the pandemic effects but responds later and undertakes less enforcement of social isolation, there will be greater pressure on the local healthcare system, as the pandemic curve shifts beyond its capacity (see the purple pandemic curve in Figure 2). Early identification (testing), isolation (social distancing), and implementation (enforcement) can be applied to keep the number of cases of pandemic (COVID-19) cases below the domestic healthcare system capacity and reduce the number of fatalities (the green curve in Figure 2). This was the experience of China, Korea, Japan, Singapore, and Taiwan.

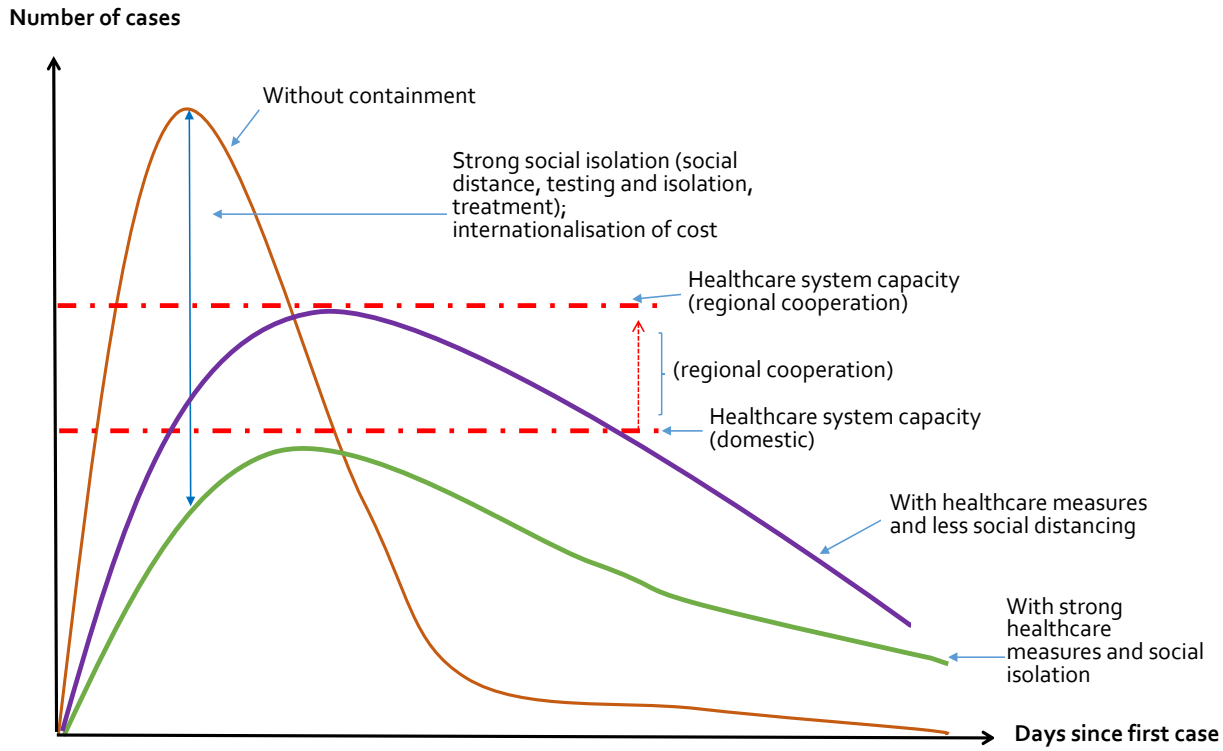


Figure 2: The Pandemic Curve and Policy Responses

Source: Derived by authors.

One potential impact of regional cooperation is also reflected in Figure 2. It could lead to an effective increase in the capacity of the healthcare system by sharing resources and sharing information and experience on management methods. This is illustrated by the upward movement in the red line.

Where is East Asia in terms of managing the pandemic (COVID-19)? Figure 3 shows the number of COVID-19 cases from 20 January 2020 to the first week of April. Figure A1 in the Annex shows these data at the level of regional aggregates.

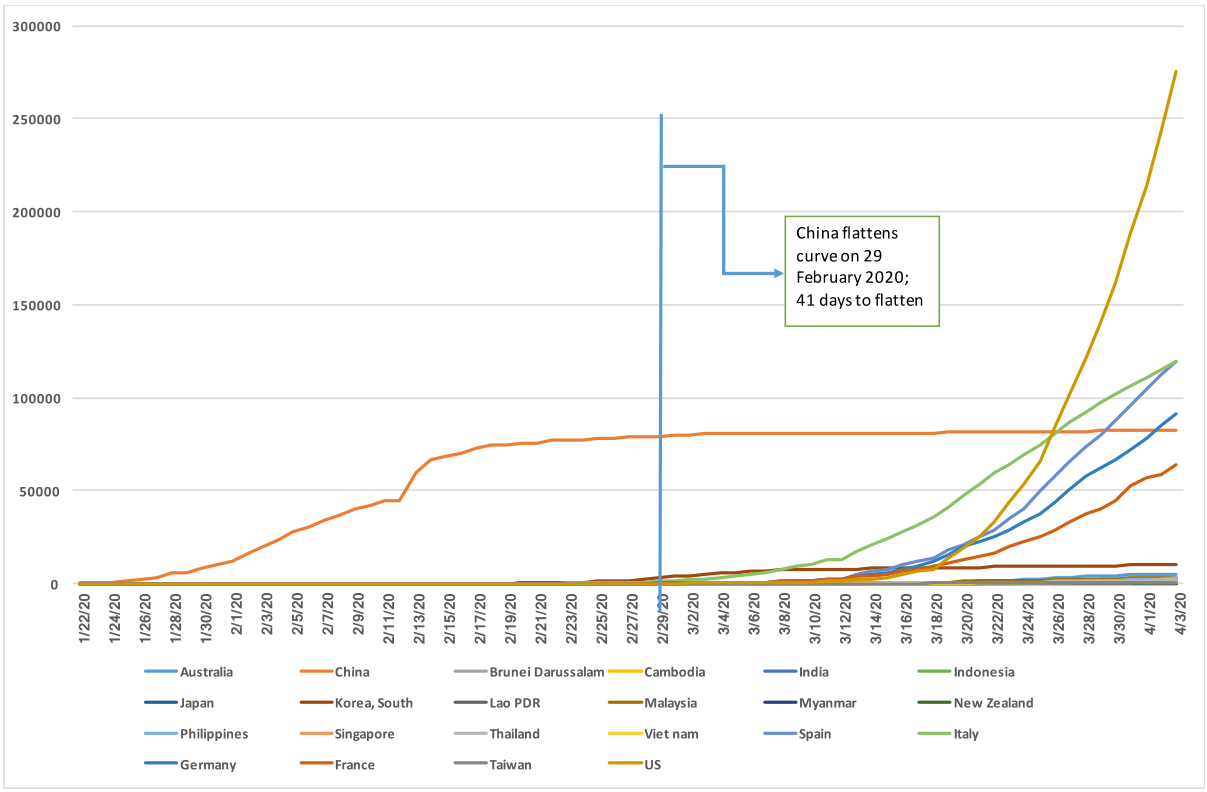


Figure 3: COVID-19 Cases Since 22 January 2020

COVID-19 = coronavirus disease, EU = European Union, US = United States.

Source: Johns Hopkins School of Public Health (2020), COVID-19 Pandemic. Novel Coronavirus (COVID-19) Cases Data. https://data.humdata.org/dataset/novel-coronavirus-2019-ncov-cases (accessed 8/4/2020)

Horizontal axis: month/day/year

The COVID-19 virus originated in Wuhan, Hubei Province in China. The first case was identified on 15 December 2019 and the first death occurred on 9 January 2020 (Huang et al., 2020). Wuhan's capital was locked down on 22 January 2020. We will take the lockdown of 22 January 2020 as the initial stop point of the economy and the stopping the growth of cumulative cases on about 29 February 2020 as the starting point of China's economic recovery from the pandemic shock. China managed to reach that point in 41 days. It can be argued that 41 days of Chinese policy regulation and mitigation caused the pandemic shock to be as temporary as possible in the Chinese economy, opening up the opportunity for the economy to recover. A shorter period of shock is likely to lead to a faster recovery period. In Korea, the pandemic began on 21 February 2020. It also managed to stop the growth in cumulate cases curve quickly, in about 40 days, in part based on lessons from China's response (see Figure A2 on number of new cases at the Annex).

Other economies have yet to reach this point by early April. Some took much longer to respond and appear to be suffering a larger and more persistent pandemic shock. For example, we saw strong pandemic effects in the US in early March 2020, suggesting a longer learning and adaption time. We also saw a more rapid rise in the EU and US pandemic curves in the initial stages, compared with China.

In Figure 4, we explore ways in which regional cooperation could be used to design policy responses in East Asian countries during the pandemic. In particular, the regional cooperation and policy coordination if one of the major trading partners experience a pandemic (e.g. the case of China), since it will have important implications for trade and GVC activities in the region in terms disruptions in service linkages and imports of intermediate inputs. We divide the dates in Figure 4 into three phases: we discuss a policy scenario (derived from China's experience) for each phase which is different from the policy that was actually adopted, and we note how the failure to act during that phase may have subsequently affected the infection curve. Actual policy responses are summarised in Table A1. Our focus is also the extent of and potential for regional cooperation.

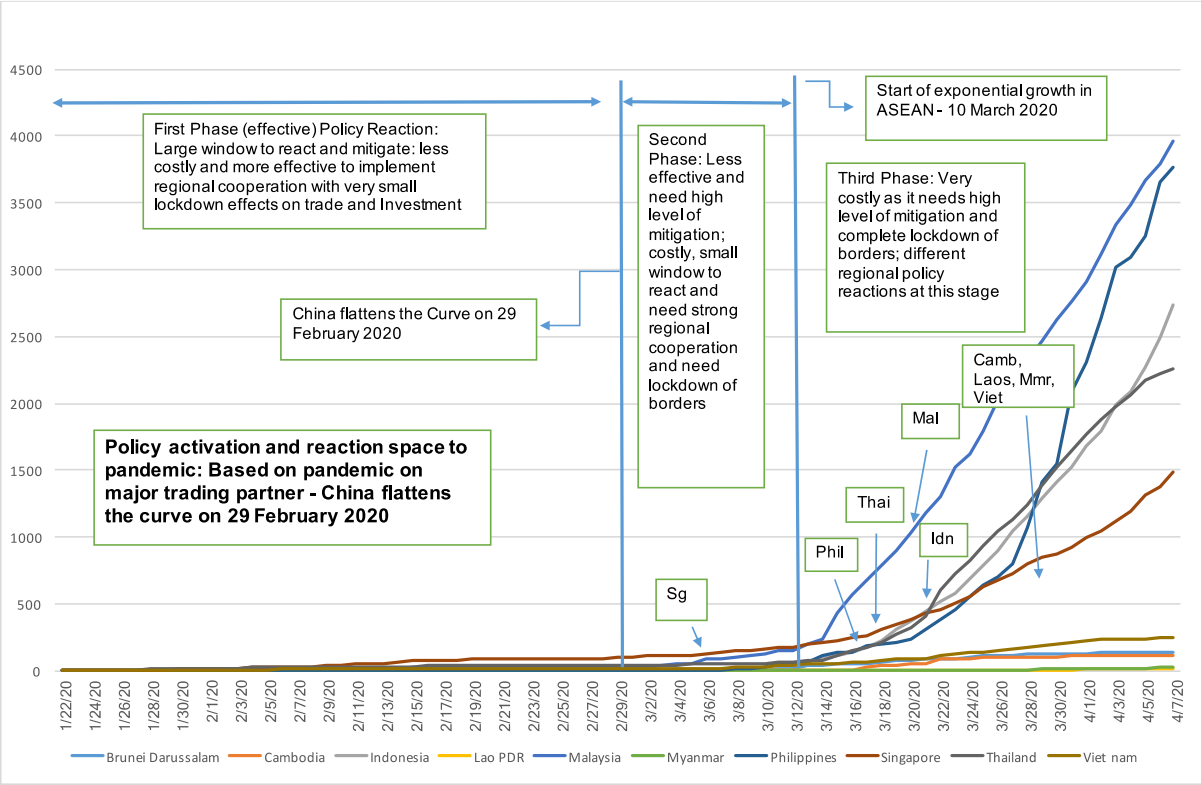


Figure 4: Policy Reaction to COVID-19 in East Asia

ASEAN = Association of Southeast Asian Nations, COVID-19 = coronavirus disease.

Source: Johns Hopkins School of Public Health (2020), COVID-19 Pandemic. Novel Coronavirus (COVID-19) Cases Data. https://data.humdata.org/dataset/novel-coronavirus-2019-ncov-cases (accessed 8/4/2020)

Horizontal axis: month/day/year

In the first phase, there was no common strategy in the region. Instead, there could have been greater coordination between ASEAN Member States and East Asian countries to mitigate and isolate the movement of workers and tourists from China, even though some economies did not experience the infection. At this stage, more information could have been shared with businesses and workers. Efforts could have been made to manage the movement of people, and stockpile the necessary healthcare and medical equipment. During this phase, there could have been more healthcare mitigation (hospital isolation and observation for identified cases and treatment to critical cases) and social isolation – identification (testing), isolation (managed social distancing and self-isolation) and implementation (enforcement) – which, although costly to business, would have had benefits for human well-being and fatalities in the longer term. Proper policy reactions could have reduced the

economic impact and, when supported by regional coordination, would have been likely to shorten the gap between the initial stopping point and new starting point at the regional level as well.

In the second phase, assuming no or limited policy action in the first stage, the effects of the pandemic become significant in several countries. The inter-regional effects, including through GVCs, also become important. At this stage, learning from the China case, policy responses could still have been available to reduce the growth of infections. The following are the key policy responses:

a. Doing so required greater isolation at the border, through regional coordination, since there is a greater chance of community transmission in the domestic economy.

b. The policy response would also involve developing flexibility in GVCs to ensure the movement of goods and services: shifting to digital and virtual activities would provide flexibility to some business. This applies especially to health and medical products and services during this phase.

c. Isolation of some foreign and domestic workers would be valuable. At the same time, there will be a need to move resources – including critical medical and healthcare workers – to countries where they are more in demand and valuable.

d. The economic impact is now larger and demands stronger fiscal packages.

e. At this stage, shocks in terms of unemployment and corporate bankruptcies become more likely. The experience of the region in managing financial crises will be important to mobilise.

In the third phase, most (or all) of the regional countries will experience the pandemic shock, assuming the action in the second stage is not significant. Each country is likely to experience a different pandemic curve due to population demographics, urban densities, healthcare facilities, and rural - urban migration dynamics. GVCs will now be shut down, directly affecting the procurement of medical and health equipment and services as well as basic food. During this phase, we should expect the reinforcement of the pandemic shock on the economic shock, with massive unemployment, large corporate bankruptcies, and greater financial fragility. In this phase, the likelihood of economic crisis is very high, even if it is possible to maintain the caseload within the capacity of the health system. The economic cost of the pandemic shock as well as the economic shock (unemployment and financial crisis) will be very high. The social and human cost, in terms of depression from unemployment and home isolation and the human cost of death, will be very large. The policy response includes the following:

a. We need to provide heavy relief packages to support the basic liveability of the domestic population.
b. We could expect a long fiscal and policy response to flatten the **regional (not individual country)** pandemic curve (see Figure A1) and a long economic recovery from the economic shock.
c. We expect a significant shift in a coordinated fiscal policy to support the economic recovery.
d. At this stage, the probability and expectation of financial crisis will be very high. A larger fiscal stimulus will also mitigate both the economic and pending financial crisis.

Our conclusion from this comparison of the evolution of policy options for each phase is that policy coordination and regional cooperation at the earliest stage could help to reduce the business and social costs, and prevent the human cost of death.

4. Policy Discussion

The policy experiment conducted here finds that policy coordination and regional cooperation in the early phase of the pandemic shock are critical to mitigate its effects and to minimise the reinforcement effect on economic shock in domestic economies and the region. It is important to mitigate and isolate the pandemic shock at the early phase by regional coordination and cooperation is critical so that real economic activity picks up sooner and more quickly. This result supports the World Bank (2020) study, which highlighted the early policy reaction (early investments in disease surveillance, testing, tracking, and quarantines) in countries such as Korea, Singapore, and Taiwan to mitigate and be successful in flattening the pandemic curve sooner.

It is important to manage the pandemic (mitigation, isolation, lockdown, and economic disruption) at the beginning of the pandemic cycle to quickly flatten the pandemic curve at both the national and regional level. The cost of the pandemic and economic shocks also increases significantly when several countries in the region experience the systemic pandemic shock concurrently.

We find that regional policy coordination is critical to mitigate and isolate the pandemic shock and that reacting early to the pandemic shock reduces the pending economic shock. We believe early policy reaction at the regional level will have a positive impact on flattening the pandemic curve but also on the responses of the GVC and domestic healthcare systems to the pandemic shock. Regional level policy coordination will also give the opportunity to recognise the infrastructure and institutional gaps in the healthcare and regional GVC network to mitigate such a pandemic shock. This also allows for greater risk management and risk sharing of the pandemic shock (social and economic cost) across countries in the region and with businesses. This will increase the capacity of the regional healthcare system to react to the pandemic shock (Figure 2 shows the shift upwards on the regional healthcare system capacity).

There is a strong need to understand the trade-off between the social cost and economic cost of the pandemic shock. The challenge is to recognise the trade-off between economic growth and the cost of border lockdown, leading to unemployment and lower growth. The key to mitigation and isolation of the pandemic shock is to internalise the cost of adjustment to business and workers. Thus, there is a need for coordination between various agencies within and between countries. In fact, there is a need to internalise the cost of the pandemic shock into the policy reaction functions of policymakers in the region due to the economic and social cost of unemployment, depression from isolation, human cost in terms of death, and isolation, leading to increase in household violence and drugs.

In the next section, we identify more specific areas for regional cooperation. This is followed by consideration of some points which are specific to the development of GVCs.

4.1. Regional Cooperation and Coordination

Regional coordination on the pandemic shock is critical in mitigating and isolating the effects of the shock. The following are the key considerations:

a. One possibility is to set up an ASEAN pandemic task force[2] to oversee and coordinate the policy responses across the ASEAN Member States. This task force could also act as an early warning system for ASEAN and East Asian countries of such a pandemic.

b. Information is the key to manage the pandemic shock, and more forward-looking indicators are critical to understand the dynamic cost of the pandemic. Thus, there is an urgent need to

[2] The task force could also be activated by the respective ASEAN countries chairing ASEAN in a particular year.

develop critical data on health, hospital capacity, healthcare workers, etc. for all ASEAN Member States. The forward-looking pandemic indicators will help to identify the infrastructure and policy gaps of the respective ASEAN Member States.

c. Regional cooperation provides a platform to recognise the institutional and infrastructure differences in the region. It also allows less developed countries to raise policy and resource concerns with respect to pandemic shocks. It is important to recognise the under-reporting of cases of the pandemic in less developed countries because of their lack of infrastructure and medical facilities to test for COVID-19. Thus, regional coordination will also permit ASEAN countries to recognise the infrastructure and policy gaps in less developed ASEAN Member States. More aid and infrastructure support could be provided early to less developed countries to prepare for pandemic shocks.

d. The task force could also establish an ASEAN pandemic network consisting of healthcare workers, hospitals, pharmaceutical companies, and research institutions to share information on medicines, virus research, and other best healthcare and medical practices. This network could be useful to activate healthcare resources in key countries and region that require resources to mitigate the pandemic shock.

e. The need for safety and standards is critical during a pandemic shock, and regional cooperation will be important to identify the key standards and safety required for medical and healthcare products and equipment. There is a need for more mutual recognition of standards across the ASEAN Member States that allows best practices to be adopted during a pandemic.

f. An ASEAN pandemic support fund could be established to undertake data collecting data and policy research, and become a depository for forward-looking indicators on medical and healthcare data.

g. It is also important to create leading and forward-looking indicators for pandemic shocks in the East Asian region that gives early warning to the region of potential pandemic. The Pandemic Preparedness Score (index) might be a possible index that could be used to identify the preparedness gap and the pandemic policy gap in the region.[3]

h. Regional cooperation is also required for the movement of basic food and supplies as countries undertake border lockdowns. The movement of essential food and supplies in the region will be important to maintain the affordability of basic supplies in the domestic economy, especially in the vulnerable part of the economy, such as unskilled temporary workers and poor households.

Regional coordination and cooperation are also expected to improve the resource allocation (allocative efficiency) in response to the pandemic shock to critical sectors and hospitals, and in supporting the well-being of healthcare workers. They will enable the region to regulate price distortions due to the pandemic shock and manage the excess supply effects in some regions. They will also provide a regional platform to coordinate the flexibility of the GVCs in terms of managing GVC activities after the pandemic shock and to concentrate on managing the pending economic shock. Recent studies have highlighted the impending financial fragility and financial crisis after the pandemic shocks (IMF, 2020; Becker et al., 2020; Segal and Gerstel, 2020).

Given the rural and urban dynamics in East Asia, the less developed countries are likely to experience persistence of the pandemic shock as more urban to rural migration will occur with the movement of

[3] See World Bank (2020) for the Pandemic Preparedness Score.

people back to rural areas due to the lockdown in urban regions. This increases the spread and contagion of the pandemic shock across the region and countries, leading to a longer domestic and regional policy response.

An additional reason for the consideration of regional cooperation is not evident in our earlier discussion of the three phases of the infection. Acting early on social isolation has the advantage of reducing the rate of growth of infections and flattening the curve. There is, however, a concern that the infection rate could rise again as lockdown conditions are lifted after the initial lockdown when the infection curve is flattened. This is referred to as the second wave and could be considered a 'fourth phase' which is yet to emerge in terms of Figure 4. A response to this risk, in the absence of immunisation, which may take a considerable time to develop, is to apply more widespread testing in order to isolate people who carry the virus or areas where it is localised

4.2. GVCs in East Asia

The paper also highlights that the governance and stability of the GVCs are critical during the pandemic in terms of hedging the risk of disruptions to the procurement of critical medical and health products as well as the stability of services linkages to manufacturing, such as the logistics sector and digital services.[4] GVC disruptions (border closures and restrictions on the movement of people) tend to increase the cost of the pandemic in terms of the procurement and sourcing of health and medical products in the global market due to limited supply. Businesses in the global production network could play an important role in facilitating the flexibility of the GVC. The level of knowledge sharing and innovation regarding new situations of the pandemic shock is the advantage of the open and flexible global production network. The business GVC network could also play an important role in identifying and maintaining standards and quality control of key medical and healthcare products and equipment.

We also expect the GVC network in Asia to adjust to hedge the risk of the COVID-19 shock in the region and globally. It is important to recognise that the GVC network has made important contributions to employment, productivity, and incomes for both developed and developing countries. It provides greater knowledge sharing of information and innovation that we have experienced over the past two decades from telecommunication technologies artificial intelligence, social media platforms, etc. It also allows for greater participation of developing countries in global development and growth, such as Grab, FoodPanda, Go-Jek, etc. The logic remains for their continuation.

In the longer term, the heightened perception of vulnerability will lead to redesigns. For example, responses from business will include duplication and higher levels of stockpiling to mitigate the future GVC disruptions. Perhaps, at a lower cost, there could also be architectural changes such as the following:[5]

a. New designs of products to reduce the specificity of inputs and raise substitutability in sourcing.
b. Fewer complex loops, where input suppliers use inputs as final products from downstream.
c. Movement of products 'point to point' and a lesser role for hub firms.

[4] This section is based on Findlay, Kimura, and Thangavelu (2020).
[5] See Inoue and Todo (2020).

Nation	Policy instrument	Products affected by policy intervention	Implementation date
China	Export ban	Masks and raw materials to make it	Jan 2020
Taiwan	Export ban	Masks	24 Jan 2020
India	Export ban	Personal protection equipment, including masks	31 Jan 2020
Thailand	Export license	Masks	6 Feb 2020
Thailand	Export limit	Masks	21 Feb 2020
Korea	Export limit**	Masks	26 Feb 2020
India	Export ban	24 active pharmaceutical ingredients	3 Mar 2020
Indonesia	Licence to operate*	Masks	5 Mar 2020
Taiwan	Export ban	Digital thermometers	6 Mar 2020
Viet Nam	Export limit**	Masks	11 Mar 2020
Indonesia	Export ban	Masks	12 Mar 2020
Indonesia	Export ban	Masks, sanitisers, and some types of medical equipment	18 Mar 2020
Malaysia	Export ban	Masks (of types: one-ply (ear loop), two-ply (ear loop), three-ply (ear loop))	18 Mar 2020
India	Export ban	Ventilators, surgical/disposable masks, and textile raw materials	19 Mar 2020
India	Export ban	Export ban of hydroxychloroquine	25 Mar 2020
India	Export ban	Export ban on artificial respiratory apparatus, oxygen therapy apparatus and breathing devices, and sanitisers	24 Mar 2020
Philippines	Export limit**	Firms told to allocate 80% of production to domestic market	25 Mar 2020
Thailand	Export ban	Extension on export ban on masks	31 Mar 2020

Table 3: Imposition of Export Controls on Medical Products Since 20 January 2020

** De facto export ban. ** Export authorisation scheme.*
Source: Global Trade Alert (https://www.globaltradealert.org/).

Firms will also undertake even more vulnerability analysis. The services links in the goods value chain were already understood to be important, but new elements related to chain management are likely to be added. All of this takes time and funding, which is difficult in the current environment. The nature of COVID-19 and its rolling process may help. As demand recovers in the rest of the world, capacity on the supply side in Asia will likely have become available. The response to rising demand could be rapid in that case, even within the existing regional patterns of the GVCs. This situation also offers the time and space to make longer-term adjustments to the shape of the chains.

In services, there is also a drop in demand, as people stay home and businesses shut down. This will not be made up for by later purchases. However, substitution to new forms of services is possible through the application of digital technology (e.g. health service providers now offer more telemedicine). On the supply side, more people are working from home on their particular tasks,

Product group	Disinfectants and sensitisation products	COVID-19 test kits and related apparatus	Medical consumables	Soap	Protective garments	Other medical devices	Thermometers
Australia	4.2	1.7	1.7	5.9*	3.7*	0	0
Brunei Darussalam	0	0	0	4.1*	0	0	0
Cambodia	12.3**	7.3*	1.2	7*	12.3**	2.3	15**
China	12**	3.7	5.5*	11.9**	14.5**	3.7*	5.2*
Taiwan	6*	1.7	0	1	9.2**	0	0.6
Indonesia	33.2**	3.8	6.7*	10.2**	15.8**	3.3*	5*
Japan	2.4	0	0	0	5.5*	0	0
Malaysia	0	0	3.3	3.8*	2.4	0	0
Myanmar	14.8**	3.3	1.8	6.1*	11.2**	2	3
New Zealand	0.8	1.3	0	5*	5.9*	0	5*
Philippines	6*	0.8	4	9.4**	10.9**	0.3	0.5
Republic of Korea	24.9**	2.7	5	6.5*	9.7**	0.9	2
Singapore	0	0	0	0	0	0	0
Thailand	14.9**	1.2	5.8*	10**	15.8**	0	0
Viet Nam	14.8**	0	4.7*	22.3**	16.1**	0	0

Table 4: Imposition of Export Controls on Medical Products Since 20 January 2020

** Restrictive. ** Highly restrictive.*
Source: Global Trade Alert (https://www.globaltradealert.org/).

schools and universities are delivering online, and so on. Firms are learning how to do things differently. In a digital environment, it is also a short step to organise procurement across borders. As that happens, trade in services will increase. This will result in more opportunities for suppliers in developing countries, by splitting out tasks and providing them online.

Virtual platforms will be useful for matching providers and users – providing assurance to both parties. The offer of matching and assurance services, also relevant to the new goods value chains, is a growth area of international business. In this respect, accelerating the digital trade protocol is important to provide a stable platform for trade and investment in services

There might be an offsetting force. Agglomeration appears to be important for some services (e.g. the way high-paid professionals congregate), but will the 'Zoom community' get together in new ways?

Capturing the opportunities in services and facilitating the adjustments in goods value chains will be helped by tackling unnecessary policy impediments. Important in that respect are commitments to

avoid new types of protectionism – both export controls and tariffs. The extent to which selected RCEP members (plus Taiwan) have imposed quantitative controls is shown in Table 3 (end dates are not always available). A significant number are listed here (some more than once as conditions were revised).

Table 4 shows the average tariffs currently applied to a range of medical products. Some countries show zero values or values less than 5% (Australia, Brunei, Malaysia, and Singapore). Others have values exceeding 5% (shown as *) and some have relatively high levels (shown as **, e.g. on disinfectants, soap, and protective garments).

A group of Asia-Pacific Economic Cooperation (APEC) trade ministers have called for a commitment on trade, but this should be strengthened and made more widespread (Ministry of Trade and Industry, Singapore, 2020). The information at Tables 3 and 4 indicates the scope to relax bans on exports, reduce tariffs, and bind them at zero.

In addition, we expect standards and other regulatory barriers to increase during and after the pandemic, which will add to the cost of international transactions. Questions are now being asked within economies about the rationale for various rules and regulations, in the context of responding to the crisis. We should ask the similar questions about cross-border regulatory differences. These are not matters for negotiation, but alignment, which is a process suited to and experienced in the systems of regional cooperation in ASEAN and APEC Now is the time to accelerate that effort.

To do so, the default can be shifted. Instead of asking 'why align?', ask instead 'why not?'. There is no better example of the relevance of this approach than the current challenges in GVCs for health and medical products. Renewed energy on trade facilitation in goods and services could be a positive outcome from the war on COVID-19.

The COVID-19 shock also provides an opportunity to accelerate connectivity in the hard and soft infrastructure development of less developed countries, increasing their ability to manage the risk associated with such shocks and to participate in procurement and access to key regional and global services.

It is equally important to examine the post- and pre-pandemic policies. Post-pandemic policy is critical to manage the recovery in the region. This might refer to a fifth phase in terms of the framework of Figure 4, in place once the pandemic is under control. There will be a debate about the value of reliance on international markets, the value of economic integration, and how to increase the resilience of economies. There could be more restrictions and inward-looking policies after the pandemic, which would impede the function of GVCs and trade and investment in the region.

The following are the key areas that require urgent regional policy coordination in this context:

a. A reaffirmation of the commitment to open trade and investment in the region would be valuable, noting the capability that is created for responding to shocks.
b. Greater flexibility in GVCs would increase the response of business to the disruptions; and the removal of tariffs and Non-Tariff Measures would assist.
c. A protocol needs to be developed on the movement of people during such pandemics and on the movement of people after the pandemic. The movement of people will be important to re-establish the services linkages in the GVC.
d. The protocol for the movement of people could include pre-tested health certificates, improved medical and travel insurance to cover diseases, and a framework for the virtual movement of people.

e. The policy framework for the recovery of the aviation and logistics sector is critical, and the sequence of policy coordination needs to manage the opening up of the connectivity and border activities between countries.
f. Reforms to services also need to be accelerated, especially in aviation, logistics, and digital services. These critical services require innovation and more platforms for the sharing of information and activities in both virtual activities as well as the actual movement of goods.
g. The connectivity of the hard and soft infrastructure of less developed ASEAN Member States needs to be improved, as these countries are likely to experience more GVC disruptions and take longer to recover in the post-pandemic period.

5. Conclusion

The challenge of the early policy reaction to the pandemic is to officially recognise the initial stages of the pandemic curve. However, responses have been delayed, and we are most likely already closer to the latter phases of the pandemic. Several countries in the region are experiencing the pandemic shock simultaneously, which increases economic and social cost to the domestic economy and in the region. Nevertheless, scope remains for a coordinated policy response and regional cooperation, including in the application of fiscal policies; the sharing of information, experience, and resources in the health sector; and the application of technology for testing.

The key policy response includes a focus on GVCs, immediately because of their role in providing medical equipment and in the longer term in facilitating the recovery. The disruption to economic activities by COVID-19 is not due to the weakness of the global production network, but to the lack of institutional preparedness and regional cooperation to deal with and respond early when one of the key trading partners experiences a pandemic (the case of China). The experience of earlier shocks is that GVCs can respond to the disruption. However, we need stronger regional and global institutional cooperation and preparedness to deal with such shocks. This will be the key to mitigate the pandemic and create flexibility for GVCs to manage the risk and disruptions caused by such pandemic shocks. In fact, the strength of businesses in the GVC network is to manage such disruptions and to respond quickly and meet the needs of the market in the most efficient manner. The complete lockdown of regional borders incapacitated the ability of the GVC to respond to and support the market and pandemic policies in the region, which increases the economic cost of the pandemic.

The post-pandemic recovery will be critically based on the recovery of the GVC activities and regional cooperation on opening up the borders in terms of managing and easing the border lockdowns. The protocol for the movement of people (adoption of standard and recognised testing of people for pandemic) for trade and investment will be very important for the post-pandemic recovery, as this will have critical implications for GVCs in terms of services linkages and services GVCs. The recovery of the service sector in the post-pandemic period is important for the region's economic activities, particularly those of the developing countries.

The most immediate task for ASEAN and East Asia is to set up a regional task force to coordinate across the ASEAN Member States, including businesses, to recognise and identify policy and production gaps in the current pandemic (COVID-19) so as to increase the responsiveness to current policies and support the longer term development of GVCs in the region.

ANNEXE

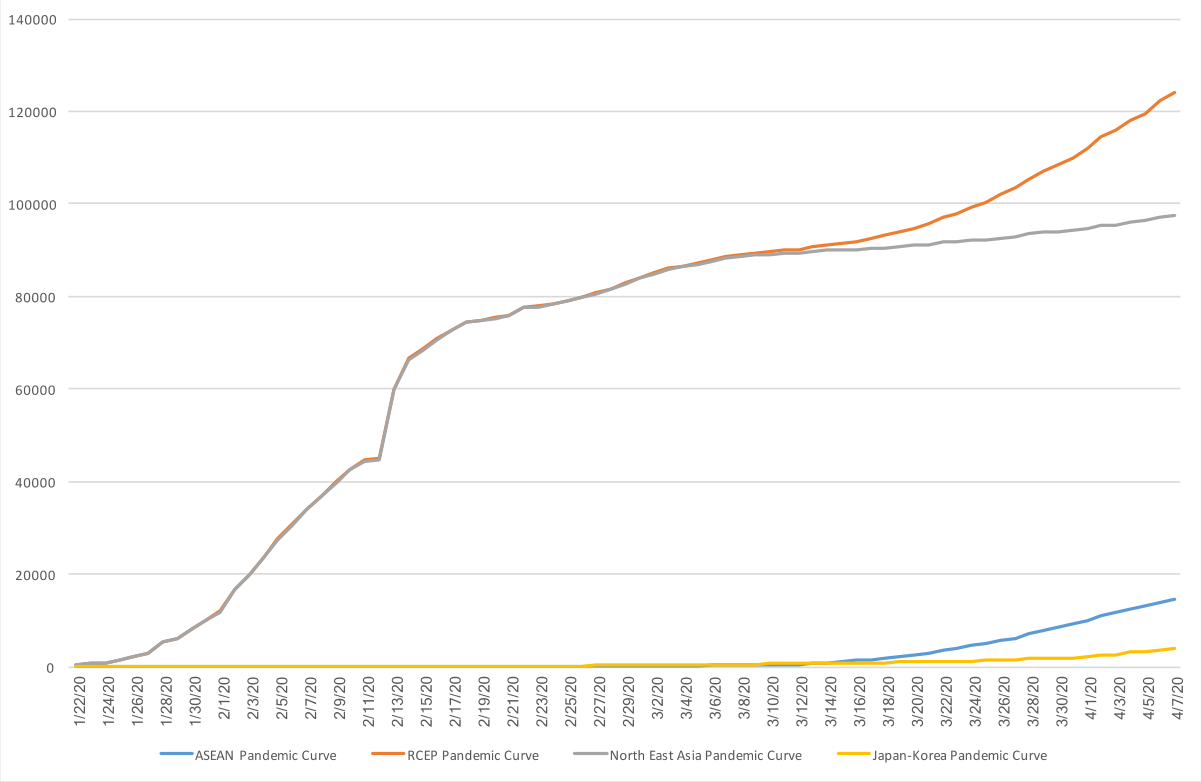


Figure A1: Regional Pandemic (COVID-19) Curves

ASEAN = Association of Southeast Asian Nations, COVID-19 = coronavirus disease, RCEP = Regional Comprehensive Economic Partnership.

Notes: 1. The ASEAN Member States are Brunei Darussalam, Cambodia, Indonesia, the Lao PDR, Malaysia, Myanmar, the Philippines, Singapore, Thailand, and Viet Nam; 2. North East Asia includes China, Japan, the Republic of Korea, Taiwan, and Hong Kong; 3. RCEP countries include ASEAN plus Australia, China, India, Japan, the Republic of Korea, and New Zealand.

Source: Johns Hopkins School of Public Health (2020), COVID-19 Pandemic. Novel Coronavirus (COVID-19) Cases Data. https://data.humdata.org/dataset/novel-coronavirus-2019-ncov-cases (accessed 8/4/2020)

Horizontal axis: month/day/year

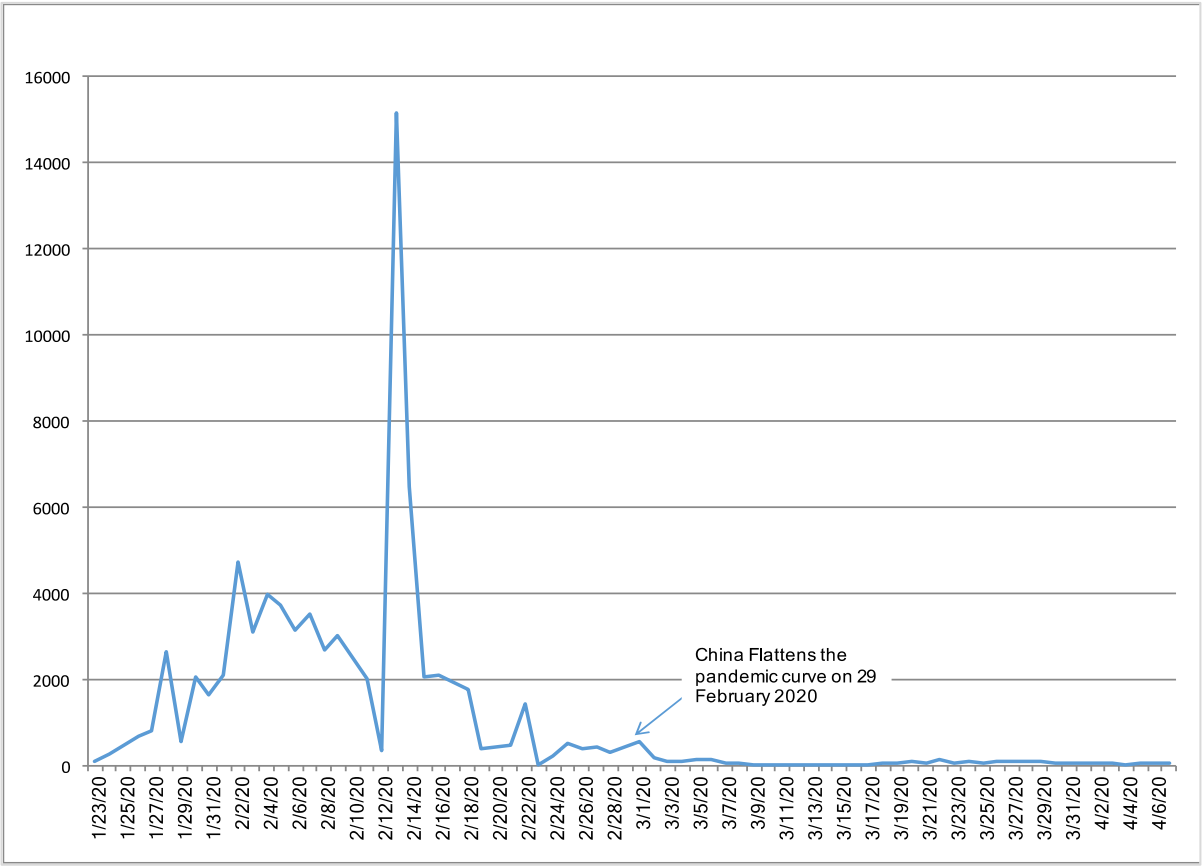


Figure A2: Number of New Cases at China

Source: Johns Hopkins School of Public Health (2020), COVID-19 Pandemic. Novel Coronavirus (COVID-19) Cases Data. https://data.humdata.org/dataset/novel-coronavirus-2019-ncov-cases (accessed 8/4/2020)

Horizontal axis: month/day/year

Country	Date	Policy Response
Singapore	Early February 2020	Strong quarantine of travellers: testing, contact tracing, identifying clusters, containment
	4 March 2020	Partial arrival bans and quarantine from China, Iran, Northern Italy, Japan, and the Republic of Korea
	22 March 2020	Border closures and quarantines
Brunei	24 March 2020	Border closures and entry bans
	Until 1 April 2020	Lockdown, quarantine
Cambodia	30 March 2020–30 April 2020	Border closures and entry bans
	17 March 2020	Arrival bans on Italy, Germany, Spain, France, United States, and Iran
	1 April 2020	Lockdown and quarantine
Malaysia	16–31 March 2020	Border closures and entry bans
	Extended 14 April 2020	Lockdown and quarantine
Philippines	15 March–14 April 2020	Lockdown and quarantine
Thailand	16 March–30 April 2020	Lockdown and quarantine
Indonesia	20 March 2020	Border and visa restrictions; quarantine
	23 March 2020	Lockdown of offices, entertainment centres, cinemas, etc. Supermarkets are open.
Lao PDR	30 March–19 April 2020	Border closures and entry bans
	Until 30 April 2020	Lockdown and quarantine
Viet Nam	31 March 2020	Border closures and entry bans; quarantine
	1 April 2020	Lockdown and quarantine
Myanmar	30 March 2020	Border restrictions

Table A1: National Responses to COVID-19 in Southeast Asia

COVID-19 = coronavirus disease.

Source: Centre for Strategic and International Studies (2020), Southeast Asia Covid-19 Tracker. https://www.csis.org/programs/southeast-asia-program/southeast-asia-covid-19-tracker (accessed 26 March 2020)

REFERENCES

Abe, S. and S.M. Thangavelu (2012), 'Natural Disasters in Asia: Introduction', *Asian Economic Journal*, 26(3), pp.181–87.

ADB (2020), 'The Economic Impact of COVID-19 Outbreak on Developing Asia', *ADB Briefs*, 6 March. Manila: Asian Development Bank. https://adb.brief-128-economic-impact-COVID-19-developing-asia.pdf (accessed 10/3/2020).

Ando, M. and F. Kimura (2012), 'How Did the Japanese Exports Respond to the Two Crises in the International Production Networks? The Global Financial Crisis and the Great East Japan Earthquake', *Asian Economic Journal*, 26(3), pp.261–87.

Baldwin, R. (2020), 'The Supply Side Matters: Guns Versus Butter, COVID-style', VOX CEPR Policy Portal, 22 March. https://voxeu.org/article/supply-side-matters-guns-versus-butter-covid-style (accessed 25/3/2020).

Beckett, L., L. Aratani, and B.A. Graham (2020), 'Trump Signs $2.2tn Stimulus Bill After Invoking Defense Production Act – As It Happened', *The Guardian*, 27 March. (https://www.theguardian.com/us-news/live/2020/mar/27/coronavirus-us-live-news-trump-stimulus-vote-house-thomas-massie-latest-updates?page=with:block-5e7e39068f08af215f6fcae5#block-5e7e39068f08af215f6fcae5)

Becker, Bo, Ulrich Hege, Pierre Mella-Barral, 2020. 'Corporate debt burdens threaten economic recovery after COVID-19: Planning for debt restructuring should start now', VOX CEPR Policy Portal, 21 March 2020 (https://voxeu.org/article/corporate-debt-burdens-threaten-economic-recovery-after-covid-19) (accessed 25/3/2020)

Eichenbaum, M.S., S. Rebelo, and M. Trabandt (2020), 'The Macroeconomics of Epidemics', *NBER Working Paper*, No. 26882. Cambridge, MA: National Bureau of Economic Research.

EIU (2020), *EIU Update: COVID-19 to Send Almost All G20 Countries into a Recession*, 26 March. London: The Economist Intelligence Unit. https://www.eiu.com/n/covid-19-to-send-almost-all-g20-countries-into-a-recession/ (accessed 27/3/2020).

Findlay, C., F. Kimura, and S. Thangavelu (2020), 'COVID-19 and the 'Zoom' to New Global Value Chains', East Asia Forum, 5 April. https://www.eastasiaforum.org/2020/04/05/covid-19-and-the-zoom-to-new-global-value-chains/

Gourinchas, P.-O. (2020), 'Flattening the Pandemic and Recession Curves', in R. Baldwin and B. Weder di Mauro (eds.) *Mitigating the COVID Economic Crisis: Act Fast and Do Whatever It Takes*. A VoxEU.org Book. London: Centre for Economic Policy Research.

Huang, Y., C. Lin, P. Wang, and Z. Xu (2020), 'Saving China from the Coronavirus and Economic Meltdown: Experiences and Lessons', VOX CEPR Policy Portal, 23 March. https://voxeu.org/article/saving-china-coronavirus-and-economic-meltdown-experiences-and-lessons (accessed 36/3/2020).

ILO (2020), 'ILO Monitor 2nd Edition: COVID-19 and the World of Work, Updated Estimated and Analysis', *Briefing Note*, 7 April. Geneva: International Labour Organization. https://www.ilo.org/wcmsp5/groups/public/@dgreports/@dcomm/documents/briefingnote/wcms_740877.pdf (accessed 8/4/2020).

IMF (2020), 'Policy Steps to Address the Corona Virus', *Policy Paper*, No. 20/015, 6 March.https://www.imf.org/en/Publications/Policy-Papers/Issues/2020/03/16/Policy-Steps-to-Address-the-Corona-Crisis-49262 (accessed 15/3/2020).

Inoue, H. and Y. Todo (2020), 'Propagation of Economic Shocks Through Supply Chains', VOX CEPR Policy Portal, 10 September. https://voxeu.org/article/propagation-economic-shocks-through-supply-chains (accessed 18/3/2020).

Kennedy, S., J. Thomson, and P. Vujanovic (2006), 'A Primer on the Macroeconomic Effects of an Influenza Pandemic', *Treasury Working Paper*, No. 2006-01. Canberra: Government of Australia, The Treasury.

Ministry of Trade and Industry, Singapore (2020), 'Joint Ministerial Statement by Australia, Brunei Darussalam, Canada, Chile, Myanmar, New Zealand and Singapore Affirming Commitment to Ensuring Supply Chain Connectivity Amidst the COVID-19 Situation', Press Release, 25 March. https://www.mti.gov.sg/Newsroom/Press-Releases/2020/03/Joint-ministerial-statement-affirming-commitment (26/03/2020).

Noy, I. and S. Shields (2019), 'The 2003 Severe Acute Respiratory Syndrome Epidemic: A Retroactive Examination of Economic Costs', *ADB Economics Working Paper Series*, No. 591. Manila: Asian Development Bank.

OECD (2020), 'Coronavirus: The World Economy at Risk', *OECD Interim Economic Assessment*, 2 March. Paris: Organisation for Economic Co-operation and Development. https://www.oecd.org/berlin/publikationen/Interim-Economic-Assessment-2-March-2020.pdf (accessed 15/03/2020).

Segal, S. and D. Gerstel (2020), 'The Global Economic Impacts of COVID-19', 10 March. Washington, DC: Centre for Strategic and International Studies. https://www.csis.org/analysis/global-economic-impact-covid-19 (accessed 15/03/2020).

World Bank (2020), *World Bank East Asia and Pacific Economic Update, April 2020: East Asia and the Pacific in the Time of COVID-19*. Washington, DC: World Bank. https://www.worldbank.org/en/region/eap/publication/east-asia-pacific-economic-update (accessed 01/04/2020).

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