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RESILIENT GLOBAL VALUE CHAINS FOR ASEAN
and its Relationship with Partner Countries:

A WAY TO MITIGATE AND ADAPT TO THE ECONOMIC IMPACTS OF COVID-19

By ASEAN-Japan Centre

ASEAN-JAPAN CENTRE

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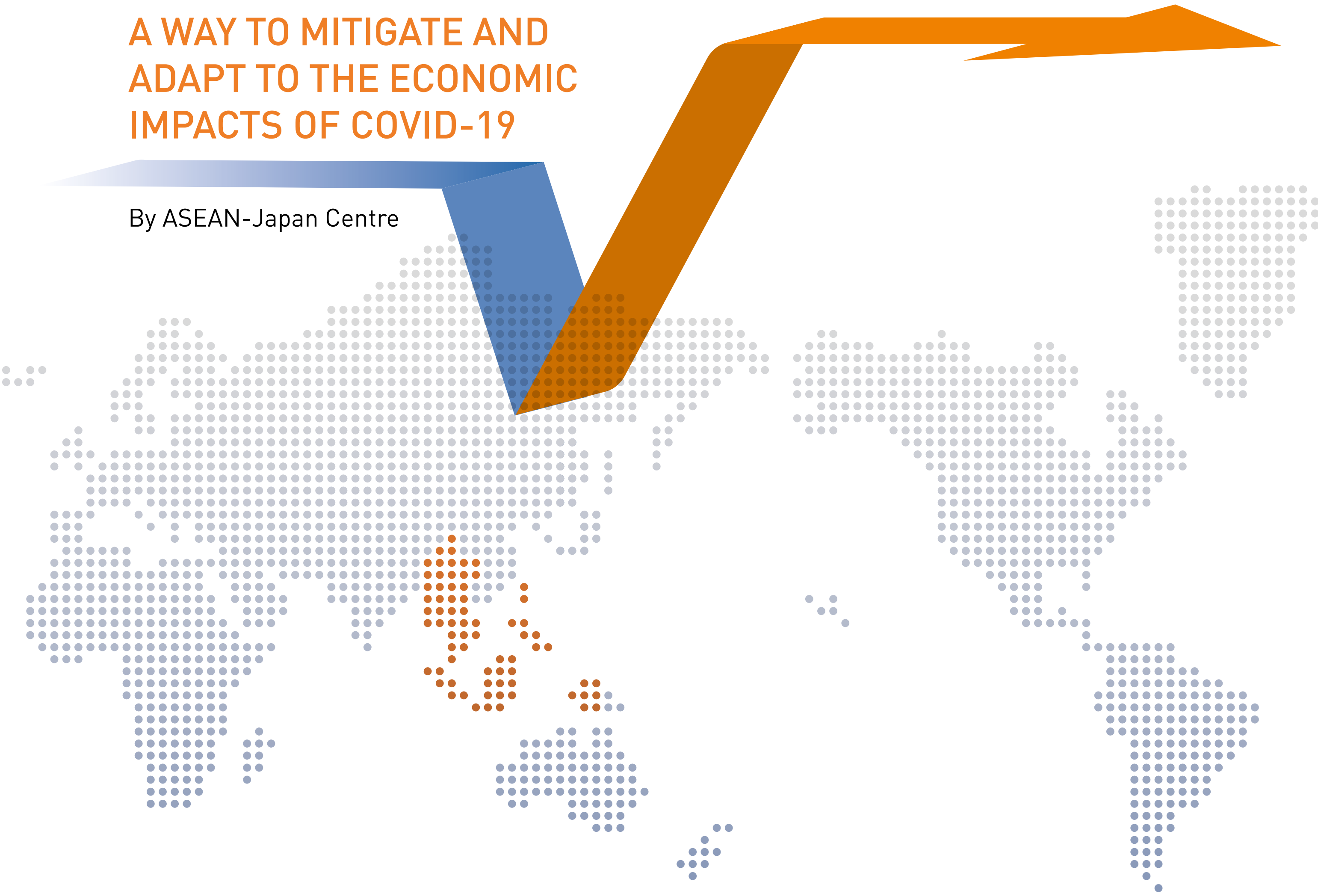

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NOTES

The terms "country" and "economy" as used in this study also refer, as appropriate, to territories or areas. The designations employed and the presentation of the material do not imply the expression of any opinion whatsoever on the part of the ASEAN-Japan Centre concerning the legal status of any country, territory, city, or area or of the authorities, or delimitations of frontiers or boundaries.

The following symbols have been used in the tables:

- Two dots (..) indicate that data are not available or are not separately reported.
- A dash (–) indicates that the item is equal to zero or its value is negligible.
- Use of a dash (–) between dates representing years, e.g., 2015–2016, signifies the full period involved, including the beginning and end years.
- Reference to "dollars" ($) means United States dollars, unless otherwise indicated.

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INTRODUCTION

Resilience has become a catchword for ASEAN's sustainable development in the post- or with COVID-19 era. It is the focus of the ASEAN Economic Ministers (AEM) Statement on Strengthening ASEAN's Economic Resilience in Response to the Outbreak of the COVID-19 (10 March 2020) and the AEM's and Japan's METI (Minister of Economy, Trade and Industry)'s Joint Statement on Initiatives on Economic Resilience in Response to the COVID-19 Outbreak (22 April 2020). In response to request from the AEM and Japanese METI ministers to achieve the following three objectives: (i) sustaining the close economic ties developed by ASEAN and Japan; (ii) mitigating the adverse impact of COVID-19 on the economy; and (iii) strengthening economic resilience through an "ASEAN-Japan Economic Resilience Action Plan", and as part of the AEM-METI framework (para. 7 of the 22 April 2020 document above), the ASEAN-Japan Centre (AJC) prepared this paper.

The term resilience has been used in conjunction with natural disasters. It appeared nearly 50 years ago in the context of ecological systems to refer to "the ability of systems to absorb changes ... and still persist" (Holling 1973; p. 17, as quoted in Rose 2009). Since then it has been widely used even in economics. Economic recovery from natural disasters can be also linked to resilience: the example of the Kobe earthquake in 1995 demonstrates this relationship (Horwich, 1997).

When resilience is used with economy, production, or supply chains, it also means the robustness of the system. In global value chains (GVCs) that are resilient, it means that even if one or more chains are disrupted, other chains replace these cut-off chains or play a substituting role so that GVCs continue to function. Do GVCs in ASEAN resist such disruptions? What do they look like? This question has become more pertinent today in ASEAN because of the pandemic, which puts the structure of production and supply chains into question. If GVCs should be strengthened and rebuilt, it should be "building back better" (Lallemant 2013). What is rebuilt should be more resilient. Lallemant calls the process to build a more resilient future "reformative recovery", as distinguished from a "response" or "reconstruction" to return to the initial resilience (Lallemant 2013).

The unprecedented magnitude of the ongoing crisis is raising major concerns about the future of the world economic outlook, especially as it relates to international trade and investment, as well as tourism traffic. This applies to the relationships between ASEAN and Japan, both of which have been affected from the beginning of this crisis. In this context, the AJC has reviewed the relationships between ASEAN and Japan as well as other ASEAN partners and presents a paper on the course of possible actions to mitigate the economic impact of this crisis and adapt to risk management in trade, investment and tourism. The approach that the AJC adopts here is to see the production systems through GVCs, taking into account the current pandemic that is likely to affect the future patterns of GVCs (which includes regional value chains).

The pandemic raised a set of questions regarding the efficient and effective network of production systems for many companies in ASEAN and Japan. Will globalization stop or slow down in ASEAN? Will international production become smaller? Will norms governing value chains change? Will companies be flexible enough to avoid the risks of running and managing value chains? There are countless questions; this paper attempts to provide responses to some of them.

The apparent answers to these questions are not easy, but what is absolutely sure is that the way that companies operate will not remain the same as before and they have to face restructuring. Seemingly strong industries such as automobiles, electronics, tourism, retail businesses (through established shops) are all losing competitiveness to other new businesses, or strengthening information technology (IT) and IT-related parts of their products. The pandemic is a driver and catalyst for changing and even overhauling the economic order with which ASEAN and Japan have long been satisfied.

Many foreign companies operating in ASEAN have realized that GVCs can provide the most efficient and effective manner of production. However, the pandemic requires a reconsideration of how the structure of production operates in ASEAN. At the same time, this pandemic poses a danger in that it makes the poor poorer and the rich richer. There has been a debate whether globalization works for the poor even before the pandemic.

This paper is organized as follows. Section I redefines the resilience of GVCs after or with COVID-19. The pandemic has caused the most serious impact on all economies, as proven by the decline of many macroeconomic indicators. The structure and nature of GVCs is supposed to guarantee efficient and effective production networks, but, ironically, because of this very nature and structure, the system is exposed to the risks from the pandemic and does not work as expected. Then, how should GVCs in the future look like? They should resist, mitigating the impact of and adapting to various possible risks and disruptions of supply and production chains.

Calling for resilient GVCs is a world agenda item. Section II provides an overview of GVCs in ASEAN, and in particular their relationships with Japan and other partner countries, to expose strengths and weaknesses. The important thing is to maximize the advantages and strengths and minimize the disadvantages and weaknesses of the current GVCs to lead to an ideal GVC. In some cases GVCs in ASEAN are so skewed and so concentrated that companies are exposed to external shocks such as the pandemic and natural disasters, and are easily threatened by the risks of producing and supplying their products. By using the database in value added trade data that the AJC has maintained in its project on GVCs in ASEAN,[1] this paper clarifies which industries in ASEAN are likely to be threatened by such risks, and with which partner country ASEAN has vulnerable or strong value chain relationships. This unique database exposes the complex web of value chains between ASEAN and Japan to light and helps countries and companies reset their mind on ideal production and supply chains, contributing to adaptation to the crisis. At the same time, the data on value added trade used here are all estimates and do not necessarily reflect the reality accurately. The utmost caution is required in interpreting the data.

Section III considers what ASEAN and Japan have to do to reinvigorate GVCs. There must be a set of strategies for this which should be undertaken by both the public and the private sectors. They include (1) policy measures and actions related to production and supply chains (or GVCs), (2) improvement in risk management by the private sector, (3) strong push towards digital transformation by both the public and the private sectors, (4) the promotion of new industries that are resistant to the crisis, and (5) reconsideration of company strategies for international production. ASEAN governments as well as the Japanese Government immediately provided many policy measures to fight against the pandemic. Many companies were rescued, even if temporarily, by these measures. However, what other policy measures are considered to lead both ASEAN and Japanese companies to rebuild resilient GVCs?

The paper ends with some concluding remarks on the way forward.

[1] The AJC is providing a series of 16 papers on GVCs in ASEAN, consisting of one regional paper, 10 country papers (one for each member state) and five industry papers (automobiles, electronics, textiles and clothing, agribusiness and tourism) (https://www.asean.or.jp/ja/centre-wide/centrewide/).

I. RATIONALE AND SUPPORT FOR RESILIENT GVCs

Trade and investment are the principal means to deliver goods and services. However, the current crisis reminds us of production networks that have already proved vulnerable to external risks such as natural disaster (e.g. Great East Japan Earthquake in 2011, Thai floods in 2011), disrupting and even cutting off key supply and delivery chains between Japanese companies and Asian companies, in particular Chinese companies. It is too late to awake to the vulnerability of supply chains every time there is an external shock. There is a need to review current production and supply chains and, if needed, re-establish crisis-resistant value chains.

Companies have always sought the maximum efficiency to produce, as if this were an axiom for all that engage in international production. They have established GVCs throughout the world to make it possible to achieve such efficiency. However, efficiency and risk are two sides of the same coin. The more efficient something is, the more risky it is. Companies pursue efficiency of production at the risk of security. It is legitimate for companies to rationalize and increase efficiency if there are many small providers. If there are only a few, companies easily succumb to fragility and vulnerability once they face an unexpected event (e.g. pandemic, natural disaster, terrorist attack).

Although this is a natural consequence of efficient procurement, when their supply or distribution chains are concentrated in a few firms and a few countries, companies have always a legitimate concern as to whether they will continue to receive required materials and inputs from suppliers, and continue to sell. It is paramount for them to procure and receive materials required for their production when needed. However, the secured and timely purchase and receipt of products may be interrupted. This is likely to take place when these value chains are weak, and become more severe when they are concentrated in a few companies and countries. The question is where and at what stage the value chain is concentrated. This is addressed in section II.

There has been a series of calls at the international and regional levels for strengthening and rebuilding value chains since the outbreak of COVID-19. On 16 March 2020, the G7 made the first joint statement on combatting COVID-19, followed by the G20 at its Leaders' Summit on 15 April 2020 endorsing the G20 Action Plan – Supporting the Global Economy through the COVID-19 Pandemic – by the G20 finance ministers and central bank governors. Furthermore, the trade and investment ministers of the G20 endorsed on 14 May 2020 the "G20 Actions to Support World Trade and Investment in Response to COVID-19" prepared by the Trade and Investment Working Group on building resilience in global supply chains and strengthening international investment (box 1); and in trade regulation, trade facilitation, transparency and operation of logistics networks. The World Trade Organization compiles the trade and trade-related measures (goods measures, services measures and intellectual property measures) related to COVID-19 of all member states. At the ASEAN level, even earlier than the G7 (on 10 March 2020), the AEM made an announcement as noted above and on 19 June issued the Hanoi Plan of Action on Strengthening ASEAN Economic Cooperation and Supply Chain Connectivity in Response to the Covid-19 Pandemic.

Box 1. **Building resilience in global supply chains, by the G20**

- Support the development and sharing of best practices, specifically in terms of measures that could be taken during a global crisis to support expanding production and trade in essential goods and services, including digital trade or e-commerce.
- Strengthen cooperation between authorities responsible for the regulation of trade, including customs authorities, with regard to issues relating to electronic document management.
- Ensure the transparency and availability of trade-related information and global market information useful to micro and small and medium enterprises (MSMEs), noting inputs from the (G20) Business 20.
- Encourage connection and policies to strengthen the cooperation between multinational corporations and MSMEs, noting inputs from the (G20) Business 20.
- Encourage governments to establish voluntary guidelines that would allow, in the event of a global health crisis, essential cross-border travel, including essential business travel, on an exceptional basis, in accordance with national laws and regulations, and without undermining efforts to safeguard public health.

Source: G20 Actions to Support World Trade and Investment in Response to COVID-19, 14 May 2020.

II. RISK INTENSITY OF GLOBAL VALUE CHAINS OF ASEAN

The disruption of supply chains brought about by the pandemic has gone beyond production halts in many product lines and even caused threats to life because of the lack of required medical and personal protective equipment (PPE) and products. In order for companies in Japan and ASEAN to have reliable, secure and stable production and supply chains under any circumstances, they should have well-coordinated and risk-minimized management and control over value chains. The current crisis not only reveals structural weaknesses and shortcomings in the regulations that govern international trade and investment, but also awakens many companies to industrial restructuring for future growth.

When companies stop receiving materials and inputs required for their production and exports from suppliers or related firms for any reason, they face serious consequences. The supply and production chain is disrupted and characterized as weak and non-resilient. If the companies have a milliard of suppliers, be they related or independent, although they reduce the risk of supply disruption, they face significant inefficiency in procurement and increased costs. Then what is the right balance? The most efficient number of suppliers cannot be determined easily and varies by industry and company. The vulnerability of value chains and the risk of losing competitiveness should be carefully balanced. In this section, the degree of vulnerability of chains is examined.

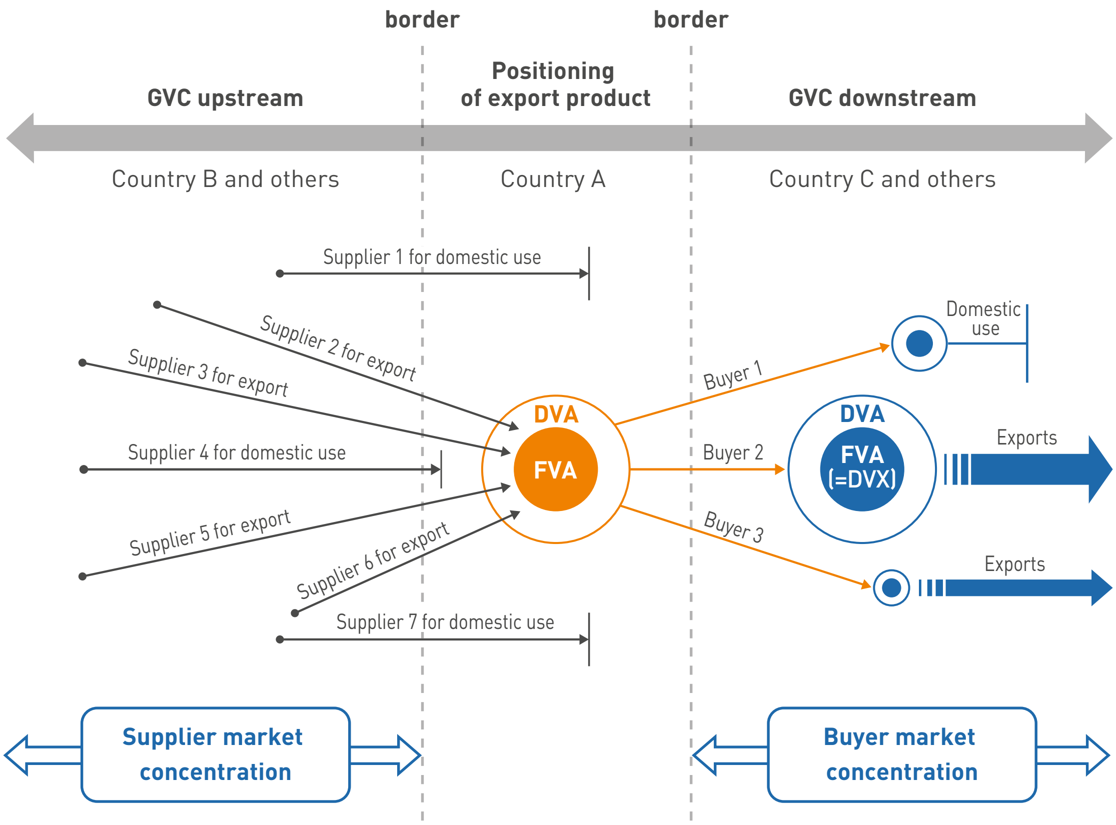
GVCs comprise upstream and downstream parts of chains. The upstream part refers to foreign providers and suppliers of the materials integrated into exports, while the downstream part refers to the chains in destination countries where exported products are used as inputs to the products exported therefrom. Thus, in considering how excessively concentrated GVCs are, there are two types: supplier market concentration (upstream) and buyer market concentration (downstream).

Ideal GVCs resist any risks, wherever they come from; for example, health issues such as the current pandemic, as well as natural disasters, economic downturns, and the like. Although it is not possible to avoid the risks completely at any time, it is possible to minimize such risks. Any interruption of supply and procurement in production processes is sometimes detrimental not only to the existence of such products but also to the standard of living, including threatening life (e.g. through a shortage of PPE) as the pandemic has done.

In order for companies to build resilient GVCs and for governments to facilitate the build-up of such networks, it is important to know what current GVCs look like and the extent to which they are vulnerable to risks. Risks that affect the upstream part of GVCs and those that affect the downstream part can be considered separately. The question is how much GVCs are concentrated in a few suppliers (for the upstream part) and a few buyers (downstream part). The more concentrated the chain is, the more risky and vulnerable to external shocks it is. The way that the risk is calculated is analogous to market concentration. Markets are concentrated when there is one seller (monopoly) or there are a few sellers (oligopoly) and when there is one buyer (monopsony) or there are a few buyers (oligopsony). In providing materials, parts and components, if there are only a few recipient firms or countries, this market is concentrated. Market concentration takes place in both ends of chains.

How large are supplier and buyer markets? How many are supplier firms and countries, and buyer firms and countries? How much do they each supply or buy? Along the GVC line, the production processes and stages before and after the company position are considered, and for each part the size and the concentration of the market is calculated (figure 1).

Figure 1. **Schematic diagram of GVC concentration structured by upstream (supplier) and downstream (buyer) part**



Source: AJC.
Note: FVA = foreign value added; DVA = domestic value added; DVX = value added incorporated in other country's exports. The size of the pies does not represent the size of the value.

a. Supplier market concentration of GVCs

Concentration of GVCs can be measured at two levels: foreign reliance (the degree of foreign reliance, or the extent to which exports rely on materials from foreign countries) and suppliers (the degree of market concentration, or the extent to which sources of foreign materials are concentrated) (figure 1). If a product exported from a country has a higher degree of foreign reliance – if it relies very much on foreign materials to be produced – then the risk of external shocks is high. The export product cannot be produced when foreign sources become unavailable. The higher the risk is, the higher the foreign reliance is. There is a need for domestic suppliers, which are not necessarily affected by external shocks. The risk associated with the degree of foreign reliance is amplified by the concentration of suppliers. If there are fewer suppliers, the risk of disruption to supply chains becomes higher,

Any product used and integrated into other product or consumed as a final product contains materials that come from within the home country or abroad, or both. When foreign materials are integrated into exported products, that constitutes the upstream part of GVCs. This is called foreign value added (FVA), or value added in trade that belongs to foreign countries (for GVC terminology, see box 2). The risk associated with the degree of foreign reliance is based on the FVA share, or the share of foreign materials integrated in exports. In other words, the size of FVA is considered. The higher the FVA share is, the more risky it is. A level of FVA share that is not overly high, nor too low is considered moderate. This moderate level is assumed to be between the average FVA share of all ASEAN and the average FVA share of the world. This level implies that in producing any product foreign materials are required at the regional or world average share. Any lower level is no or low concentration, and any higher level is highly concentrated. The medium level is moderately concentrated. The risk is thus characterized as high, low and medium, respectively.

Box 2. **GVC terminology used in the paper**

A country's exports can be divided into domestically produced value added and imported (foreign) value added that is incorporated into the country's exported goods and services. Furthermore, exports can go to a foreign market either for final consumption or as intermediate inputs to be exported again to third countries (or back to the original country). The analysis of GVCs takes into account both foreign value added in exports (the upstream perspective) and exported value added that is incorporated in third-country exports (the downstream perspective). The indicators used in this paper as well as other AJC papers on GVCs are as follows:

1. **Foreign value added (FVA):** FVA indicates what part of a country's gross exports consists of inputs that have been produced in other countries.
2. **Domestic value added (DVA):** DVA is the part of exports created in-country, i.e. the part of exports that contributes to gross domestic product (GDP). The sum of foreign and domestic value added equates to gross exports.
3. **Value added incorporated in other countries' exports (DVX):** This indicates the extent to which a country's exports are used as inputs to exports from other countries. At the global level, the sum of this value and the sum of FVA are the same.
4. **GVC participation:** This indicates the share of a country's exports that is part of a multistage trade process, by adding to the FVA used in a country's own exports the value added that is supplied to other countries' exports (FVA + DVX). The participation rate is a useful indicator for the extent to which a country's exports are integrated in international production networks.

Source: AJC (2019).

If only a few firms or a few countries provide the materials required for exported products, the upstream chain is vulnerable to disruption of supply caused by any event such as the current pandemic. If there are a number of supply chains, the risk is diversified. Therefore, the concentration of supply is calculated by looking at the structure of FVA. The degree of concentration used here is the Herfindahl-Hirschman Index (HHI).[2] The HHI tends to be large when there are only a few firms, or when a few firms have dominant shares in a market.

[2] The HHI is calculated by squaring the market share of each firm competing in a market and then summing the resulting numbers. It can range from close to zero to 10,000. Suppose there are three providers (firms or countries) of FVA, with market shares of 50 per cent, 30 per cent and 20 per cent. In this case the HHI is $50^2 + 30^2 + 20^2 = 3{,}800$. According to the U.S. Department of Justice this is highly concentrated.

As an example of the market share, the U.S. Department of Justice considers a market with an HHI of less than 1,500 to be a competitive marketplace, an HHI of 1,500 to 2,500 to be a moderately concentrated marketplace, and an HHI of 2,500 or greater to be a highly concentrated marketplace (table 1). As a general rule, mergers that increase the HHI by more than 200 points in highly concentrated markets raise antitrust concerns, as they are assumed to enhance market power. An HHI of more than 100 points may raise significant competitive concerns in moderately concentrated markets.

Table 1. **Herfindahl-Hirschman Index (HHI) range for market concentration**

HHI range	Market concentration
Less than 1,500	Unconcentrated
1,500–2,500	Moderately concentrated
More than 2,500	Highly concentrated

Source: U.S. Department of Justice (https://www.justice.gov/atr/herfindahl-hirschman-index).

For the degree of concentration of suppliers, the higher the HHI is, the higher the risk to external vulnerability. If companies have a number of supplier chains, it is less risky as they can shift the weight of supply to suppliers that are not affected by the shocks. However, it should be noted that this may happen at the risk of losing some efficiency, and thus competitiveness, though it must entail less loss than where no shift within the supplier network is possible and no supply is available.

Two levels of concentration are calculated (table 2), for nine combinations (high-high, high-medium, high-low, medium-high, medium-medium, medium-low, low-high, low-medium and low-low). Multiplication of two levels of risk is also calculated on the basis of 1, 0.5 and 0.1 for high, medium and low, respectively. When the foreign reliance is high enough to be risky, what matters is how many foreign supplier chains exist. If suppliers are not concentrated, the total risk is not necessarily high. Even if there is moderate level of foreign reliance, if suppliers are concentrated, the risk is elevated. When foreign reliance is low (FVA < 20 per cent) but there are only a few suppliers, the risk intensity becomes 0.1 (= 0.1 x 1). This risk intensity is the same as the situation where foreign reliance is high (FVA > 38 per cent) but there are many supplier countries (0.1 = 1 x 0.1) (table 2).

Out of 222 industries whose classification of activities is standardized in 10 ASEAN countries (annex table 1), there is no industry where the risk intensity is high for both the degree of foreign reliance and the degree of concentration of supplier countries (in other words, high-high) (table 3). More than half of these industries in ASEAN (126 out of 222) seem to have not well established GVCs, as shown by low foreign reliance and low numbers of suppliers, thus facing no risk over GVCs, if any. The remaining 96 industries are in the moderate risk range in their GVCs (upstream part), either high risk for foreign reliance and low/medium risk for the number of suppliers (53 industries), or medium risk for foreign reliance and low risk for the number of suppliers (23), or low risk for foreign reliance and high/medium risk for the number of suppliers (20) (table 3).

Because of the spread of GVCs in ASEAN, one-quarter of industries in 10 ASEAN countries (53) show value chains that use high shares of foreign materials in their exports and in which these materials are widely sourced (risk combination of high-medium and high-low)(table 3). As there are many suppliers abroad, these industries can obtain required materials widely. In these categories, many industries in Singapore, Malaysia, and country representative industries of Viet Nam such as textiles and clothing, and electronics are included. The concern is that high reliance on foreign countries may cause vulnerability in the functioning of GVCs as, while it is unthinkable to assume

Table 2. **Methodology of risk calculation: Vulnerability of upstream part of GVCs to external shocks**

Degree of foreign reliance (extent to which exports must use materials from foreign countries)	**Degree of concentration** (extent to which source of foreign materials is concentrated)	**Risk to vulnerability** (6 stages from 0.01 to 1, with higher numbers being more risky)		**Upstream value chain description**
		Risk colour	**Risk intensity**	
High (FVA = >38%)	High (HHI = >2,500)		1	Value chains which use a high share of foreign materials in their exports and in which these materials are mainly from only a few countries.
	Medium (HHI = 1,500-2,500)		0.5	Value chains which use a high share of foreign materials in their exports and in which these materials are relatively sourced from many countries.
	Low (HHI < 1,500)		0.1	Value chains which use a high share of foreign materials in their exports and in which these materials are widely sourced.
Medium (FVA = 30–38%)	High (HHI = >2,500)		0.5	Value chains which use a medium share of foreign materials in their exports and in which these materials are sourced mainly from a few countries.
	Medium (HHI = 1,500-2,500)		0.25	Value chains which use a medium share of foreign materials in their exports and in which these materials are relatively sourced from many countries.
	Low (HHI < 1,500)		0.05	Value chains which use a medium share of foreign materials in their exports and in which these materials are widely sourced.
Low (FVA < 30%)	High (HHI = >2,500)		0.1	Value chains which use a low share of foreign materials in their exports and in which these materials are sourced.
	Medium (HHI = 1,500-2,500)		0.05	Value chains which use a low share of foreign materials in their exports and in which these materials are relatively sourced from many countries.
	Low (HHI < 1,500)		0.01	Value chains which use a low share of foreign materials in their exports and in which these materials are widely sourced from many countries.

Source: AJC.

Note: Degradation of colour implies the degree of the risk intensity. The more strong the colour is, the greater the risk. There are six levels of risk, which combine the risk due to reliance of essential products on foreign countries in exporting and the risk due to a limited number of supply lines (number of supplying countries). The risk is graded into high, medium and low, and the weight is given 1, 0.5 and 0.1 respectively for both types of risks. The risk intensity for each situation of GVC vulnerability is the multiplication of these two types of risks.

FVA = foreign value added. In 2017, the world average was 30% and the ASEAN average was 38%.

that all supply links with foreign countries could be cut off, it is not healthy to rely so much on foreign sources to produce export products. Domestic production is more required and even more important, as it constitutes a country's GDP. In particular, agriculture, hunting, forestry and fishing; textiles, clothing and leather; and wood and wood products in Singapore, and motor vehicles and other transport equipment in Thailand are reliant on foreign sources and their supplier market concentration is moderately high. Increasing domestic value added (DVA) while lowering FVA and/or increasing number of foreign suppliers is a policy option.

GVC participation in ASEAN seems to be high and spreads through many industries. Indeed the FVA share in exports is higher than any regional groups except the European Union (EU) (AJC 2019, p. 12). However, it seems to be in select industries as well as select countries where the degree of GVC is high. In fact, most ASEAN industries have lower involvement in GVCs in terms of FVA share (lower than the ASEAN average). Countries at the beginning of the value chain (e.g. exporters of raw materials) by definition have a low FVA content of exports.

As per the suggestion of the U.S. Department of Justice, when the HHI increases by 200,[3] they raise antitrust concerns (U.S. Department of Justice and the Federal Trade Commission 2010). If any country or any firm occupies a share of 14–15 per cent of the market, the HHI becomes 200. Looking at the HHI for countries, there are several cases where HHI is more than 200 (table 4). In those cases, fair competition may not be guaranteed and concerns about concentration are emerging. In this paper, this is the situation in which a country (or a firm) occupies a supplier market share to an extent that causes a risk of vulnerability to external shocks. The main countries in which this occurs are the following:

- China is by far the most important supplier to many industries in ASEAN. China occupies a market share of FVA that enhances its market power enough to cause a competitive concern in more than half of 222 industries (129). It is followed by Japan and Thailand (38 each). High concentration by Chinese suppliers is seen in at least one industry in all ASEAN countries except the Lao People's Democratic Republic and Myanmar. Among these 129 industries, the HHI is more than 1,000 (but less than 1,500) in the following 6: agriculture, hunting, forestry and fishing, and textiles, clothing and leather in Singapore; motor vehicles and other transport equipment in Thailand; electrical and general machinery, and metal and metal products in Cambodia; and agriculture, hunting, forestry and fishing in Viet Nam (annex table 2), in other words, more than 32 per cent market share is owned by China alone in these industries' foreign supplier markets. The dominance of Chinese supply in many products has increased during the pandemic as the country shows resilience and is returning to its powerhouse of exports while other major exporting countries are still struggling with the pandemic as of today.[4]
- Regarding the concentration of Japanese suppliers in ASEAN exports, 22 out of 38 industries where the Japanese HHI is more than 200 are in Viet Nam, across all industries except "unspecified". Japanese suppliers are also concentrated in the Philippines (four industries), Malaysia (four industries), Singapore (three industries), Thailand (three industries), and Indonesia (one industry) (annex table 2). Electrical and general machinery, precision instruments and motor vehicles show high concentrations of Japanese suppliers.

[3] Mergers resulting in highly concentrated markets that involve an increase in the HHI of between 100 and 200 points potentially raise significant competitive concerns and often warrant scrutiny. Mergers resulting in highly concentrated markets that involve an increase in the HHI of more than 200 points will be presumed to be likely to enhance market power (https://www.justice.gov/atr/horizontal-merger-guidelines-08192010#5c). In moderately concentrated markets, an increase in the HHI of more than 100 points potentially raises significant competitive concerns. In this paper, regardless of market (supplier or buyer) concentration, an HHI of 200 is adopted as the threshold.

[4] "Pandemic helps lift China exports", *The New York Times*, 2 September 2020. The Chinese share of world's exports during April-June 2020 reached 20 per cent, compared to 13 per cent in 2019.

Table 3. 222 industries **in ASEAN by the risk intensity of the upstream part of GVCs to external shocks**

Degree of foreign reliance (extent to which exports must use materials from foreign countries)	**Degree of concentration** (extent to which source of foreign materials is concentrated)	**Country: Industry, by value of FVA**[a]	
		Number of industries corresponding to each risk range (n = 222)	**Name**
High (FVA = >38%)	High (HHI = >2,500)	0	None
	Medium (HHI = 1,500-2,500)	4	Thailand: Motor vehicles and other transport equipment; Singapore: Textiles, clothing and leather; Singapore: Agriculture, hunting, forestry and fishing; Singapore: Wood and wood products
	Low (HHI < 1,500)	49	Singapore: Electrical and general machinery; Singapore: Petroleum, chemical and non-metallic mineral products; Malaysia: Electrical and general machinery; Philippines: Electrical and general machinery; Singapore: Financial intermediation and business activities; Singapore: Transport, storage and communications; Singapore: Metal and metal products; Singapore: Precision instruments; Malaysia: Transport, storage and communications; Singapore: Motor vehicles and other transport equipment; Malaysia: Food, beverages and tobacco; Malaysia: Metal and metal products; Singapore: Food, beverages and tobacco; Singapore: Trade; Singapore: Publishing, printing and reproduction of recorded media; Viet Nam: Textiles, clothing and leather; Thailand: Other manufacturing; Singapore: Community, social and personal service activities; Malaysia: Textiles, clothing and leather; Malaysia: Other manufacturing; Singapore: Hotels and restaurants; Malaysia: Motor vehicles and other transport equipment; Viet Nam: Petroleum, chemical and non-metallic mineral products; Singapore: Other manufacturing; Viet Nam: Electrical and general machinery; Malaysia: Hotels and restaurants; Singapore: Construction; Malaysia: Construction; Viet Nam: Other manufacturing; Viet Nam: Metal and metal products; Viet Nam: Wood and wood products; Viet Nam: Motor vehicles and other transport equipment; Malaysia: Precision instruments; Malaysia: Publishing, printing and reproduction of recorded media; Malaysia: Public administration and defence; Malaysia: Recycling; Viet Nam: Construction; Viet Nam: Publishing, printing and reproduction of recorded media; Philippines: Public administration and defence; Cambodia: Unspecified; Malaysia: Unspecified; Brunei Darussalam: Unspecified; Viet Nam: Unspecified; Malaysia: Other services; Indonesia: Unspecified; Thailand: Unspecified; Philippines: Unspecified; Brunei Darussalam: Recycling; Myanmar: Unspecified
Medium (FVA = 30–38%)	High (HHI = >2,500)	0	None
	Medium (HHI = 1,500-2,500)	0	None
	Low (HHI < 1,500)	23	Malaysia: Petroleum, chemical and non-metallic mineral products; Thailand: Electrical and general machinery; Thailand: Textiles, clothing and leather; Malaysia: Wood and wood products; Thailand: Community, social and personal service activities; Viet Nam: Food, beverages and tobacco; Philippines: Precision instruments; Malaysia: Community, social and personal service activities; Thailand: Precision instruments; Philippines: Petroleum, chemical and non-metallic mineral products; Singapore: Education, health and other services; Philippines: Motor vehicles and other transport equipment; Viet Nam: Transport, storage and communications; Thailand: Wood and wood products; Philippines: Metal and metal products; Singapore: Other services; Viet Nam: Precision instruments; Singapore: Electricity, gas and water; Malaysia: Electricity, gas and water; Cambodia: Recycling; Lao PDR: Unspecified; Cambodia: Motor vehicles and other transport equipment; Brunei Darussalam: Motor vehicles and other transport equipment
Low (FVA < 30%)	High (HHI = >2,500)	5	Lao PDR: Trade; Lao PDR: Transport, storage and communications; Lao PDR: Petroleum, chemical and non-metallic mineral products; Lao PDR: Public administration and defence; Lao PDR: Electricity, gas and water
	Medium (HHI = 1,500-2,500)	15	Lao PDR: Wood and wood products; Lao PDR: Textiles, clothing and leather; Cambodia: Electrical and general machinery; Lao PDR: Hotels and restaurants; Lao PDR: Education, health and other services; Cambodia: Metal and metal products; Lao PDR: Electrical and general machinery; Cambodia: Petroleum, chemical and non-metallic mineral products; Lao PDR: Motor vehicles and other transport equipment; Lao PDR: Food, beverages and tobacco; Lao PDR: Other manufacturing; Lao PDR: Construction; Lao PDR: Metal and metal products; Lao PDR: Mining, quarrying and petroleum; Lao PDR: Financial intermediation and business activities

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Table 3. 222 industries in ASEAN by the risk intensity of the upstream part of GVCs to external shocks (Concluded)

Degree of foreign reliance (extent to which exports must use materials from foreign countries)	Degree of concentration (extent to which source of foreign materials is concentrated)	Country: Industry, by value of FVA[a] Number of industries corresponding to each risk range (n = 222)	Name
Low (FVA < 30%)	Low (HHI < 1,500)	126	Indonesia: Electrical and general machinery; Thailand: Petroleum, chemical and non-metallic mineral products; Malaysia: Financial intermediation and business activities; Indonesia: Petroleum, chemical and non-metallic mineral products; Indonesia: Textiles, clothing and leather; Indonesia: Wood and wood products; Thailand: Food, beverages and tobacco; Thailand: Transport, storage and communications; Indonesia: Transport, storage and communications; Philippines: Textiles, clothing and leather; Viet Nam: Agriculture, hunting, forestry and fishing; Indonesia: Metal and metal products; Philippines: Transport, storage and communications; Malaysia: Mining, quarrying and petroleum; Malaysia: Agriculture, hunting, forestry and fishing; Thailand: Metal and metal products; Indonesia: Mining, quarrying and petroleum; Indonesia: Other manufacturing; Indonesia: Food, beverages and tobacco; Viet Nam: Mining, quarrying and petroleum; Philippines: Other services; Thailand: Financial intermediation and business activities; Thailand: Hotels and restaurants; Indonesia: Other services; Viet Nam: Trade; Thailand: Agriculture, hunting, forestry and fishing; Malaysia: Trade; Indonesia: Trade; Philippines: Trade; Malaysia: Education, health and other services; Viet Nam: Hotels and restaurants; Viet Nam: Financial intermediation and business activities; Brunei Darussalam: Mining, quarrying and petroleum; Indonesia: Agriculture, hunting, forestry and fishing; Philippines: Other manufacturing; Philippines: Wood and wood products; Philippines: Food, beverages and tobacco; Indonesia: Motor vehicles and other transport equipment; Philippines: Financial intermediation and business activities; Thailand: Publishing, printing and reproduction of recorded media; Thailand: Trade; Philippines: Agriculture, hunting, forestry and fishing; Philippines: Hotels and restaurants; Thailand: Education, health and other services; Indonesia: Hotels and restaurants; Thailand: Mining, quarrying and petroleum; Cambodia: Textiles, clothing and leather; Indonesia: Financial intermediation and business activities; Indonesia: Precision instruments; Viet Nam: Community, social and personal service activities; Philippines: Mining, quarrying and petroleum; Thailand: Construction; Indonesia: Publishing, printing and reproduction of recorded media; Viet Nam: Education, health and other services; Indonesia: Education, health and other services; Indonesia: Construction; Brunei Darussalam: Transport, storage and communications; Brunei Darussalam: Textiles, clothing and leather; Philippines: Education, health and other services; Brunei Darussalam: Hotels and restaurants; Philippines: Construction; Cambodia: Transport, storage and communications; Cambodia: Wood and wood products; Brunei Darussalam: Education, health and other services; Brunei Darussalam: Trade; Brunei Darussalam: Community, social and personal service activities; Philippines: Publishing, printing and reproduction of recorded media; Cambodia: Community, social and personal service activities; Cambodia: Trade; Viet Nam: Electricity, gas and water; Myanmar: Mining, quarrying and petroleum; Cambodia: Education, health and other services; Cambodia: Agriculture, hunting, forestry and fishing; Cambodia: Hotels and restaurants; Lao PDR: Agriculture, hunting, forestry and fishing; Brunei Darussalam: Electrical and general machinery; Brunei Darussalam: Other manufacturing; Brunei Darussalam: Construction; Singapore: Unspecified; Philippines: Electricity, gas and water; Myanmar: Textiles, clothing and leather; Viet Nam: Public administration and defence; Indonesia: Public administration and defence; Myanmar: Agriculture, hunting, forestry and fishing; Indonesia: Electricity, gas and water; Cambodia: Food, beverages and tobacco; Cambodia: Other manufacturing; Lao PDR: Community, social and personal service activities; Cambodia: Construction; Myanmar: Wood and wood products; Cambodia: Public administration and defence; Brunei Darussalam: Petroleum, chemical and non-metallic mineral products; Brunei Darussalam: Metal and metal products; Thailand: Electricity, gas and water; Brunei Darussalam: Agriculture, hunting, forestry and fishing; Viet Nam: Other services; Myanmar: Transport, storage and communications; Myanmar: Food, beverages and tobacco; Brunei Darussalam: Food, beverages and tobacco; Myanmar: Community, social and personal service activities; Lao PDR: Recycling; Brunei Darussalam: Public administration and defence; Brunei Darussalam: Wood and wood products; Myanmar: Other manufacturing; Myanmar: Recycling; Myanmar: Hotels and restaurants; Cambodia: Other services; Myanmar: Electrical and general machinery; Myanmar: Metal and metal products; Cambodia: Mining, quarrying and petroleum; Myanmar: Trade; Cambodia: Electricity, gas and water; Myanmar: Petroleum, chemical and non-metallic mineral products; Lao PDR: Other services; Myanmar: Education, health and other services; Brunei Darussalam: Electricity, gas and water; Myanmar: Electricity, gas and water; Brunei Darussalam: Other services; Myanmar: Motor vehicles and other transport equipment; Myanmar: Construction; Cambodia: Financial intermediation and business activities; Myanmar: Public administration and defence; Myanmar: Other services; Brunei Darussalam: Financial intermediation and business activities; Thailand: Public administration and defence; Myanmar: Financial intermediation and business activities

Source: AJC.

Note: There are six levels of risk, which combine the risk due to reliance of essential products on foreign countries in exporting and the risk due to a limited number of supply lines (number of supplying countries). The risk is graded into high, medium and low and the weight is given 1, 0.5 and 0.1 respectively for both types of risks. The risk intensity for each situation of GVC vulnerability is the multiplication of these two types of risks.

FVA = foreign value added. In 2017, the world average was 30% and the ASEAN average was 38%.

[a] Ranked in the order of the value of FVA (from large to small).

- Among ASEAN countries, at least five (Indonesia, Malaysia, Singapore, Thailand and Viet Nam) own an important share of supplying products to other ASEAN countries' exports in 3 (Viet Nam) to 38 (Singapore) industries. Thai suppliers are concentrated only in Cambodia and the Lao People's Democratic Republic. All 38 industries where Thai HHI is more than 200 are in these two countries. As a result of the "Thailand plus one" strategy, the Lao People's Democratic Republic has become the principal host country for Thailand in producing required products for Thailand and receiving necessary products from Thailand that are integrated into Lao exports.
- For Singapore, all of the 10 industries are in Brunei Darussalam, indicating a strong economic relationship between these two countries, with Singapore being the main supplier for products that are integrated as inputs to exports from Brunei Darussalam. Indonesia is a main supplier to Singapore's 12 industries, largely in the primary and resource-based sector. Malaysia is a supplier of petroleum, chemical and non-metallic mineral products in Indonesia and Brunei Darussalam. Seven out of eight industries where Malaysia is a main supplier are in other industries of these two countries.
- The United States is a large supplier, mainly for exports from Malaysia and the Philippines, but are only for 10 industries out of 24 in Malaysia and 6 industries out of 22 in the Philippines, with one each in Indonesia (finance intermediation) and Singapore (unspecified) (annex table 2).
- Unlike China and Japan, the Republic of Korea is not a large supplier for ASEAN exports to the extent that its presence affects the supplier market, except for one industry in the Philippines (metal and metal products industry) (annex table 2).

Table 4. **Partner countries that may influence vulnerability of upstream part of GVCs, by ASEAN industry, 2017**

Partner country	Number of ASEAN industries (n = 222) with HHI of more than 200
China	129
Japan	38
Republic of Korea	1
United States	18
ASEAN	71
Indonesia	12
Malaysia	8
Singapore	10
Thailand	38
Viet Nam	3

Source: Annex table 2.
Note: According to U.S. Department of Justice, an increase of HHI by 200 points is the level by which market power is enhanced in highly concentrated markets.

b. Buyer market concentration of GVCs

The downstream part of GVCs looks at the destination market. Along value chains, this market comprises value added incorporated in other country's exports (DVX). It is also an indication of international competitiveness of products as they are integrated into products exported from other countries. If there is no competitiveness, the product will not be used and integrated into export products. However, as products are more used as inputs to other country's exports or have a higher DVX share in own exports, companies face the challenge of being reliable suppliers. It implies that an inability to deliver goods and services required by other countries for their exports for any reason (pandemic, natural disasters etc.) harms the exportability of other countries. The higher the DVX share is, the higher the procurement risk, as the importers tend to be vulnerable to disruptions of procurement chains. As the DVX share in gross exports is 30 per cent for both ASEAN and the world, as in the case of FVA share range, eight percentage points are taken as intervals for the medium risk range (26 per cent to 34 per cent) (table 5). Thus, the DVX share higher than this range is considered high risk and that lower than this range is low risk. The degree to which exports are used by other countries for further export generation may appear less relevant for policymakers, as it does not change the DVA contribution of trade. Nevertheless a company, as a responsible supplier, remains relevant.

The number of industries of ASEAN (222 in this paper) is distributed as follows: 38 industries have a high DVX share, 87 a medium DVX share and 97 a low DVX share (table 6). The majority of ASEAN industries face medium or low risk as far as the size of the DVX market is concerned, as these products are used moderately or at low levels as inputs to exports from destination markets.

Similar to the risks associated with supplier market concentration, there are risks at two levels for buyer market concentration. The risk at the second level is regarding the extent to which the DVX market is concentrated. When DVX is concentrated in fewer countries or firms, a disruption of procurement chains causes a significant impact no matter where the cause of such disruption happens. The higher the HHI is, the more risky it is. The criteria are the same as for supplier market concentration; in other words, a low risk for less than 1,500, a medium risk for 1,500–2,500, and a high risk for more than 2,500 (table 1).

Out of 222 industries, only five (two with a high DVX share; one medium; and two low) (table 6) demonstrate high DVX market concentration: mining, quarrying and petroleum in Myanmar; recycling in Cambodia; agriculture, hunting, forestry and fishing, and wood and wood products in the Lao People's Democratic Republic; and textiles, and clothing and leather in Brunei Darussalam. Other industries show an HHI of less than 2,500 – or medium or high buyer market concentration.

The buyer market concentration is high in basic resources and resource-related industries such as mining, quarrying and petroleum; petroleum, chemical and non-metallic mineral products; and metal and metal products in natural resources-oriented economies. For agriculture, hunting, forestry and fishing, the concentration is high for the Lao People's Democratic Republic, but generally low in other countries. The primary sector other than agriculture products is destined for a few countries when it comes to exporting. Because of long-term and stable contracts between sellers and buyers of the primary sector products, the number of companies involved is relatively limited.

The HHI for buyer market concentration is lower than that for supplier market concentration. Regardless of the degree of forward integration (DVX share), the buyer market is not much concentrated. ASEAN products are widely purchased. This implies that ASEAN countries provide required inputs in other countries' exports widely. Therefore ASEAN faces less risk in supplying products if a limited number of buyers were to stop buying all of a sudden, as they can shift their selling chains to other buyers that did not cut their procurement lines.

Table 5. **Methodology of risk calculation: Vulnerability of downstream part of GVCs to external shocks**

Degree of forward integration (extent to which products are integrated into exports from other countries)	**Degree of concentration** (extent to which destination of products exported and integrated into other countries' exports is concentrated)	**Risk to vulnerability** (6 stages from 0.01 to 1, with higher number being more risky)		**Downstream value chain description**
		Risk colour	**Risk intensity**	
High (DVX = >34%)	High (HHI = >2,500)		1	Value chains in which exports tend to be used as inputs to other country's exports and in which these inputs are destined to only a few countries.
	Medium (HHI = 1,500-2,500)		0.5	Value chains in which exports tend to be used as inputs to other country's exports and in which these inputs are destined to relatively many countries.
	Low (HHI < 1,500)		0.1	Value chains in which exports tend to be used as inputs to other country's exports and in which these inputs are widely destined.
Medium (DVX = 26–34%)	High (HHI = >2,500)		0.5	Value chains in which exports are used moderately as inputs to other country's exports and in which these inputs are destined to only a few countries.
	Medium (HHI = 1,500-2,500)		0.25	Value chains in which exports are used moderately as inputs to other country's exports and in which these inputs are destined to relatively many countries.
	Low (HHI < 1,500)		0.05	Value chains in which exports are used moderately as inputs to other country's exports and in which these inputs are widely destined.
Low (DVX < 26%)	High (HHI = >2,500)		0.1	Value chains in which exports are used at low levels as inputs to other country's exports and in which these inputs are destined to only a few countries.
	Medium (HHI = 1,500-2,500)		0.05	Value chains in which exports are used at low levels as inputs to other country's exports and in which these inputs are destined to relatively many countries.
	Low (HHI < 1,500)		0.01	Value chains in which exports are at low levels as inputs to other country's exports and in which these inputs are widely destined.

Source: AJC.

Note: Degradation of colour implies the degree of the risk intensity. The more strong the colour is, the greater the risk. There are six levels of risk, which combine the risk due to the use of products in foreign countries as inputs to their exports and the risk due to limited number of procurement lines (number of buying countries). The risk is graded into high, medium and low and the weight is given 1, 0.5 and 0.1 respectively for both types of risks. The risk intensity for each situation of GVC vulnerability is the multiplication of these two types of risks.

DVX = value added incorporated in other countries' exports. In 2017 the average for both the world and ASEAN was 30%. Like the 8% range for the medium risk for the upstream part of chains (FVA share), the same range is adopted for the downstream part of chains (DVX share).

Buyer markets of typical products used as inputs such as electrical parts and components, and automobile parts and components are not concentrated. Therefore, the products of electrical and general machinery and automobile industries in many ASEAN countries are shipped to many countries regardless of how much they are purchased. In other words, downstream value chains are not as strong as upstream value chains as their exports tend to be arms'-length transactions.

By looking at individual buyer countries, it is clear that although China is a strong influencer in providing inputs (upstream part), this country is not a dominant buyer of ASEAN products in its value chains. Indeed, other ASEAN member states such as Singapore and Thailand, as well as Germany and Japan, are more influential in determining the provision of ASEAN products through their purchase behaviour.

- Unlike in the upstream part of GVCs or suppliers, China does not figure as the main buyer in many industries. In only 11 industries is China's HHI more than 200 (table 7). They include agriculture, hunting, forestry and fishing industry in three countries (the Lao People's Democratic Republic, Malaysia and Myanmar), mining, quarrying and petroleum in two countries (Viet Nam and Thailand) and electrical and general machinery in two countries (Singapore and Malaysia) (annex table 3).
- Japanese buyers of ASEAN products are particularly concentrated in the primary sector and manufacturing industries of Brunei Darussalam. Other industries are in the Philippines (mining, quarrying and petroleum; motor vehicles and other transport equipment), Indonesia and Malaysia (mining, quarrying and petroleum), and Viet Nam (precision instruments).
- The Republic of Korea, unlike the case for the upstream part of GVCs, has a relatively large number of industries in which the country is involved enough to influence the level of market concentration. As with Japan, the majority of those industries are in Brunei Darussalam.
- ASEAN as a region has the largest number of industries in the destination market (97) where an ASEAN country can influence the level of market concentration. As a hub of procurement of many products from ASEAN, Singapore has the largest number of ASEAN industries whose buyer market competition may be threatened. Singapore's buyer behaviour may influence the vulnerability of the downstream part of GVCs in 52 out of 222 industries.
- Thailand has the largest number of industries after Singapore. As many as 32 out of 34 industries are in Cambodia, the Lao People's Democratic Republic or Myanmar (annex table 3), all of which are "Thailand plus one" countries. Exceptions are motor vehicles and other transport equipment in the Philippines and mining, quarrying and petroleum in Brunei Darussalam. Thailand is a buyer country for its value chains where products from "Thailand plus one" countries are integrated into Thai exports.
- As an important exporting country in the European Union, Germany buys products from ASEAN that are integrated into its export products from various industries and ASEAN countries, while the Netherlands is a main buyer for the Philippines and Thailand only.

Table 6. **222 industries in ASEAN by the risk intensity of the downstream part of GVCs to external shocks**

Degree of forward integration (extent to which products are integrated into exports from other countries)	**Degree of concentration** (extent to which destination of products exported and integrated into other country's exports is concentrated)	**Country: Industry, by value of DVX**[a] — **Number of industries corresponding to each risk range (out of 222)**	**Name**
High (DVX = >34%)	High (HHI = >2,500)	2	Myanmar: Mining, quarrying and petroleum; Cambodia: Recycling
	Medium (HHI = 1,500-2,500)	5	Indonesia: Petroleum, chemical and non-metallic mineral products; Indonesia: Electrical and general machinery; Indonesia: Metal and metal products; Philippines: Mining, quarrying and petroleum; Myanmar: Construction
	Low (HHI < 1,500)	31	Indonesia: Mining, quarrying and petroleum; Philippines: Electrical and general machinery; Malaysia: Mining, quarrying and petroleum; Malaysia: Petroleum, chemical and non-metallic mineral products; Philippines: Trade; Philippines: Other services; Philippines: Transport, storage and communications; Malaysia: Metal and metal products; Philippines: Petroleum, chemical and non-metallic mineral products; Philippines: Electricity, gas and water; Philippines: Education, health and other services; Indonesia: Education, health and other services; Indonesia: Unspecified; Myanmar: Trade; Viet Nam: Construction; Philippines: Publishing, printing and reproduction of recorded media; Myanmar: Community, social and personal service activities; Thailand: Public administration and defence; Philippines: Unspecified; Malaysia: Recycling; Myanmar: Electrical and general machinery; Myanmar: Electricity, gas and water; Myanmar: Metal and metal products; Brunei Darussalam: Public administration and defence; Viet Nam: Other services; Myanmar: Motor vehicles and other transport equipment; Myanmar: Public administration and defence; Cambodia: Unspecified; Myanmar: Recycling; Malaysia: Unspecified; Myanmar: Unspecified
Medium (DVX = 26–34%)	High (HHI = >2,500)	1	Lao PDR: Agriculture, hunting, forestry and fishing
	Medium (HHI = 1,500-2,500)	15	Malaysia: Transport, storage and communications; Brunei Darussalam: Financial intermediation and business activities; Indonesia: Publishing, printing and reproduction of recorded media; Brunei Darussalam: Mining, quarrying and petroleum; Philippines: Motor vehicles and other transport equipment; Indonesia: Precision instruments; Myanmar: Financial intermediation and business activities; Malaysia: Publishing, printing and reproduction of recorded media; Brunei Darussalam: Electricity, gas and water; Brunei Darussalam: Transport, storage and communications; Brunei Darussalam: Petroleum, chemical and non-metallic mineral products; Brunei Darussalam: Construction; Brunei Darussalam: Metal and metal products; Brunei Darussalam: Motor vehicles and other transport equipment; Brunei Darussalam: Other services
	Low (HHI < 1,500)	71	Malaysia: Electrical and general machinery; Singapore: Financial intermediation and business activities; Malaysia: Financial intermediation and business activities; Malaysia: Trade; Thailand: Trade; Indonesia: Trade; Thailand: Petroleum, chemical and non-metallic mineral products; Singapore: Electrical and general machinery; Indonesia: Agriculture, hunting, forestry and fishing; Indonesia: Transport, storage and communications; Indonesia: Financial intermediation and business activities; Singapore: Trade; Singapore: Transport, storage and communications; Thailand: Transport, storage and communications; Indonesia: Other services; Indonesia: Wood and wood products; Thailand: Electrical and general machinery; Singapore: Petroleum, chemical and non-metallic mineral products; Thailand: Financial intermediation and business activities; Philippines: Financial intermediation and business activities; Viet Nam: Mining, quarrying and petroleum; Thailand: Electricity, gas and water; Malaysia: Electricity, gas and water; Thailand: Community, social and personal service activities; Indonesia: Motor vehicles and other transport equipment; Thailand: Mining, quarrying and petroleum; Viet Nam: Trade; Singapore: Metal and metal products; Philippines: Food, beverages and tobacco; Malaysia: Construction; Indonesia: Electricity, gas and water; Singapore: Publishing, printing and reproduction of recorded media; Viet Nam: Petroleum, chemical and non-metallic mineral products; Philippines: Metal and metal products; Singapore: Electricity, gas and water; Philippines: Wood and wood products; Myanmar: Agriculture, hunting, forestry and fishing; Malaysia: Precision instruments; Viet Nam: Electricity, gas and water; Indonesia: Construction; Viet Nam: Electrical and general machinery; Viet Nam: Wood and wood products; Viet Nam: Metal and metal products; Philippines: Construction; Cambodia: Agriculture, hunting, forestry and fishing; Viet Nam: Motor vehicles and other transport equipment; Myanmar: Transport, storage and communications; Thailand: Unspecified; Brunei Darussalam: Electrical and general machinery; Myanmar: Petroleum, chemical and non-metallic mineral products; Myanmar: Wood and wood products; Indonesia: Public administration and defence; Viet Nam: Publishing, printing and reproduction of recorded media; Brunei Darussalam: Wood and wood products; Lao PDR: Transport, storage and communications; Lao PDR: Community, social and personal service activities; Myanmar: Education, health and other services; Singapore: Wood and wood products; Myanmar: Hotels and restaurants; Lao PDR: Mining, quarrying and petroleum; Myanmar: Other manufacturing; Lao PDR: Electrical and general machinery; Lao PDR: Food, beverages and tobacco; Lao PDR: Unspecified; Lao PDR: Public administration and defence; Lao PDR: Other manufacturing; Myanmar: Other services; Lao PDR: Motor vehicles and other transport equipment; Brunei Darussalam: Recycling; Lao PDR: Recycling; Singapore: Unspecified

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Table 6. **222 industries in ASEAN by the risk intensity of the downstream part of GVCs to external shocks** (Concluded)

Degree of forward integration (extent to which products are integrated into exports from other countries)	**Degree of concentration** (extent to which destination of products exported and integrated into other country's exports is concentrated)	**Country: Industry, by value of DVX**[a]	
		Number of industries corresponding to each risk range (out of 222)	**Name**
Low (DVX < 26%)	High (HHI = >2,500)	2	Lao PDR: Wood and wood products; Brunei Darussalam: Textiles, clothing and leather
	Medium (HHI = 1,500-2,500)	5	Singapore: Other services; Thailand: Education, health and other services; Lao PDR: Electricity, gas and water; Lao PDR: Petroleum, chemical and non-metallic mineral products; Philippines: Public administration and defence
	Low (HHI < 1,500)	90	Thailand: Agriculture, hunting, forestry and fishing; Indonesia: Textiles, clothing and leather; Indonesia: Food, beverages and tobacco; Malaysia: Agriculture, hunting, forestry and fishing; Malaysia: Wood and wood products; Thailand: Textiles, clothing and leather; Viet Nam: Agriculture, hunting, forestry and fishing; Thailand: Food, beverages and tobacco; Thailand: Motor vehicles and other transport equipment; Philippines: Agriculture, hunting, forestry and fishing; Malaysia: Food, beverages and tobacco; Thailand: Hotels and restaurants; Indonesia: Hotels and restaurants; Philippines: Precision instruments; Viet Nam: Financial intermediation and business activities; Philippines: Hotels and restaurants; Viet Nam: Food, beverages and tobacco; Singapore: Community, social and personal service activities; Malaysia: Hotels and restaurants; Thailand: Wood and wood products; Singapore: Precision instruments; Malaysia: Textiles, clothing and leather; Viet Nam: Transport, storage and communications; Malaysia: Community, social and personal service activities; Singapore: Hotels and restaurants; Thailand: Metal and metal products; Viet Nam: Textiles, clothing and leather; Thailand: Precision instruments; Philippines: Textiles, clothing and leather; Singapore: Motor vehicles and other transport equipment; Malaysia: Other manufacturing; Malaysia: Education, health and other services; Viet Nam: Hotels and restaurants; Indonesia: Other manufacturing; Malaysia: Motor vehicles and other transport equipment; Thailand: Other manufacturing; Singapore: Education, health and other services; Singapore: Construction; Thailand: Publishing, printing and reproduction of recorded media; Philippines: Other manufacturing; Viet Nam: Other manufacturing; Viet Nam: Community, social and personal service activities; Brunei Darussalam: Trade; Singapore: Agriculture, hunting, forestry and fishing; Singapore: Food, beverages and tobacco; Malaysia: Public administration and defence; Brunei Darussalam: Community, social and personal service activities; Cambodia: Financial intermediation and business activities; Singapore: Textiles, clothing and leather; Thailand: Construction; Lao PDR: Trade; Viet Nam: Education, health and other services; Lao PDR: Financial intermediation and business activities; Cambodia: Transport, storage and communications; Cambodia: Trade; Brunei Darussalam: Education, health and other services; Singapore: Other manufacturing; Cambodia: Community, social and personal service activities; Myanmar: Food, beverages and tobacco; Cambodia: Textiles, clothing and leather; Cambodia: Petroleum, chemical and non-metallic mineral products; Myanmar: Textiles, clothing and leather; Viet Nam: Precision instruments; Cambodia: Wood and wood products; Cambodia: Education, health and other services; Brunei Darussalam: Other manufacturing; Cambodia: Hotels and restaurants; Brunei Darussalam: Agriculture, hunting, forestry and fishing; Lao PDR: Hotels and restaurants; Cambodia: Construction; Lao PDR: Textiles, clothing and leather; Cambodia: Electrical and general machinery; Brunei Darussalam: Hotels and restaurants; Cambodia: Metal and metal products; Lao PDR: Construction; Lao PDR: Education, health and other services; Brunei Darussalam: Food, beverages and tobacco; Lao PDR: Metal and metal products; Cambodia: Food, beverages and tobacco; Viet Nam: Public administration and defence; Cambodia: Electricity, gas and water; Cambodia: Public administration and defence; Cambodia: Mining, quarrying and petroleum; Cambodia: Other manufacturing; Cambodia: Motor vehicles and other transport equipment; Cambodia: Other services; Lao PDR: Other services; Brunei Darussalam: Unspecified; Malaysia: Other services; Viet Nam: Unspecified

Source: AJC.

Note: There are six levels of risk, which combine the risk due to the use of products in foreign countries as inputs to their exports and the risk due to limited number of procurement lines (number of buying countries). The risk is graded into high, medium and low and the weight is given 1, 0.5 and 0.1 respectively for both types of risks. The risk intensity for each situation of GVC vulnerability is the multiplication of these two types of risks.

DVX = value added incorporated in other countries' exports. The average for both the world and ASEAN is 30% (2017). Like the 8% range for the medium risk for the upstream part of chains (FVA share), the same range is adopted for the dwonstream part of chains (DVX share).

[a] Ranked in the order of the value of DVX (from large to small).

Table 7. **Partner countries that may influence vulnerability of downstream part of GVCs, by ASEAN industry, 2017**

Partner country	Number of ASEAN industries (n = 222) with HHI of more than 200
Australia	4
China	11
Japan	24
Republic of Korea	17
Germany	26
Netherlands	7
ASEAN	98
Indonesia	2
Malaysia	9
Singapore	52
Thailand	34
Viet Nam	1

Source: Annex table 3.
Note: According to the U.S. Department of Justice, an increase of the HHI by 200 points is the level at which market power is enhanced in highly concentrated markets.

III. STRATEGIES TO BUILD RESILIENT GVCs IN ASEAN

The previous section identifies which industries in each ASEAN member state are vulnerable to and with which trade partners they are vulnerable to external shocks. It is important for each country and each company engaged in international production networks to examine its vulnerability in the respective industry with possible reference to the AJC's risk calculation (annex table 4). This is, first and foremost, an important and quick guide to all member states to investigate vulnerable industries. With this general homework in mind, this section provides a set of strategies to build resilient GVCs for ASEAN.

GVC participation and economic growth are interrelated. Therefore, a policy recommendation made in the past by many organizations including ASEAN itself and the AJC (AJC 2019, p. 26-27) is to promote and create an environment conducive to GVC operations. This environment, however, also increases the risk of vulnerability to external shocks, including the current pandemic, because of greater foreign reliance on supply of and demand for ASEAN products and reduced numbers of foreign suppliers and buyers, even if that reliance is meant to enhance the competitiveness and efficiency of international production networks and thus ASEAN products.

GVCs result from globalization. Companies, in particular transnational corporations (TNCs), have every reason to expand their production facilities abroad and integrate them into international production networks. However, if the speed of globalization is measured by trade and foreign direct investment (FDI), it has already slowed down. Slow trade characterizes today's global trade trend and global FDI flows have not reached the peak achieved in 2015. When it comes to ASEAN, both trade and FDI flows have been expanding, but their growth rather reflects the growing economy of ASEAN. Indeed, if GVC participation is considered to measure globalization, it has remained at almost the same level or even declined since 2015 (AJC 2019, p. 16). In terms of FDI flows as a percentage of GDP, they have remained at 5 per cent or less since 2015, though this level is 1.5 times higher than in the early 2000s.

Therefore, even if the pace of globalization slows down, it is already part of the overall trend in the world. Whether the pandemic may accelerate this or not depends on how responsive and in what way governments and the private sector mitigate and adapt to its impact. Several strategies are being considered to make GVCs more resilient. Whether ASEAN is moving towards more globalization or not, the region has already reached the stage at which GVCs play an important role for sustainable development. Thus, more resilient GVCs are required, particularly so if the efficiency and competitiveness of certain industries in many countries have been threatened by high supplier market concentration, high buyer market concentration, or both.

This section analyzes and provides some consideration for better strategies in the areas of: (1) policy measures and actions related to production and supply chains (GVCs); (2) improvement in risk management by the private sector; (3) strong push to digital transformation by both public and private sectors; (4) promotion of new industries that are resistant to the crisis; and (5) reconsideration of company strategies for international production.

a. Pandemic-related policy measures and actions implemented by ASEAN member states

To ease the impact of the pandemic, all ASEAN member states have issued policy measures and fiscal and non-fiscal incentives to assist industries and companies operating in these countries. Understanding such policy measures and incentives is important and will be useful information or insight for all firms, including the Japanese business communities, so as to mitigate the risk and adverse impact of the pandemic, and decide on the best way forward to strategically overcome this issue.

Many of these policy measures were provided soon after the outbreak of the pandemic. ASEAN and international communities such as the G7 and the G20 made political commitments. Individual ASEAN countries provided measures and actions to reduce risk in operations, facilitate operations and provide access to funds. The main objective is to mitigate the impacts and save the companies. Their effects do not necessarily last long. Special measures and actions were also taken to expand medical facilities and medical research and development, and to increase health care and medical connectivity.

In the context of resilient GVCs, the question is whether ASEAN and its partner countries laid down concrete measures and actions to help companies operating in ASEAN to strengthen or rebuild GVCs that are resistant to external shocks. Indeed, many ASEAN countries have issued policy measures relating to, or affecting directly and indirectly, the maintenance of GVCs (box 3), mainly as part of overall economic measures. These measures include opening up another venue to maintain the flow of goods and services (Brunei Darussalam, Cambodia), easing border measures (introducing electronic issuance of certificate of origin and custom clearance in Cambodia and Indonesia), fiscal incentives for port operators and shipping companies (Malaysia, the Philippines), relaxation of investment in health-related facilities (Myanmar), and incentives for production of raw materials for medical and health-related products in Thailand. All of them help support value chains.

Box 3. **Select policy measures/actions that affect supply and production chains in ASEAN in response to the pandemic**

Brunei Darussalam: Allowance by the State of Sarawak (in Malaysia) for Bruneian and foreign companies in Brunei Darussalam to enter and exit the country through land checkpoints for the purpose of trade or sending of goods. Brunei Darussalam has approved similar arrangements for companies from Sarawak to send their goods over Brunei roads (from 1 April 2020 for a period of six months).

Cambodia: Acceptance of the certificate of origin and electronic customs clearance of an entire import declaration on condition that the original is submitted within 45 days.
Poipet, land border with neighbouring Thailand, and Kokkon, Viet Nam's main border, Bavet, are allowed to import and export cargo.

Indonesia: Deductibility of 30 per cent of production costs for companies that produce specific hygiene and medical equipment or that of all the amounts donated for individuals (Indonesian Government No. 29).

Relaxation of the procedure of certificate of origin: can be submitted electronically (Indonesia Customs).

Lao People's Democratic Republic: Extension of time for payment of road tax from 31 March to 30 June (Ministry of Finance No. 909).

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Box 3. **Select policy measures/actions that affect supply and production chains in ASEAN in response to the pandemic** (Concluded)

Malaysia: No import duty and sales tax exemption available for port operators who do not enjoy the tax incentive under Approved Service Projects. Port operators will be given import duty and sales tax exemptions on equipment and machinery whether imported or purchased locally, subject to two conditions:

(a) The equipment and machinery are used directly in the port operations; and
(b) Parts and consumables including those for maintenance purposes are not included.

This is proposed to be effective for applications submitted to the Ministry of Finance from 1 April 2020 to 31 March 2023.

International shipping companies that established and operate businesses in Malaysia will be given a double deduction on pre-commencement expenditures for setting up regional offices in Malaysia. The incentive is for applications received by the Malaysian Investment Development Authority (MIDA) no later than 31 December 2021.

A double deduction will be given on pre-commencement expenses incurred by international shipping companies for setting up regional offices in Malaysia. This proposal is for applications received by MIDA no later than 31 December 2021.

Myanmar: Exemption from lease fees for companies producing at state-run factories (for three to six months).

The Myanmar Investment Commission announced on 11 April 2020 that it would accelerate approvals for investments in labour-intensive and infrastructure projects. It will also accelerate approvals for health care and medical equipment businesses, including those involved in manufacturing supplies such as face masks, and prioritize pharmaceutical enterprises and health care service providers. Already on 9 April 2020, a 50 per cent reduction of investment application fees was announced.

Philippines: Free-of-charge storage period ("free time") for international shipping companies will be extended (announcement on 8 July).

Thailand: Adjustments to the benefits granted for the production of raw materials used in the manufacture of medical products, to encourage a more complete value chain in Thailand. For instance, pharmaceutical-grade alcohol production can now be entitled to an eight-year corporate income tax exemption. Additional benefits will also be granted for the production of non-woven fabric used as raw material for the production of medical masks or medical devices, by expanding the corporate income tax exemption to five years from three years.

A measure supports the adjustment of production lines to manufacture medical devices or parts by exempting import duties on machinery on the condition that the equipment is imported within 2020 and the application for production line adjustment is filed by September 2020.

Source: ASEAN-Japan Centre, based on various accounts.
Brunei Darussalam: Measures Undertaken by Government in Addressing the Impact of Covid-19 in Brunei Darussalam, 27 April 2020.
Cambodia: Information form JETRO (Phnom Penh Office), July 2020.
Indonesia: Cabinet Secretariat of the Republic of Indonesia, Gov't Continues Support For MSMEs, Households Amid COVID-19 Pandemic, 11 May 2020 (https://setkab.go.id/en/govt-continues-support-for-msmes-households-amid-covid-19-pandemic/).
Malaysia: Economic Stimulus Package 2020: Bolstering Confidence, Stimulating Growth, Protecting Jobs, Prime Minister of Malaysia, 27 February 2020
Myanmar: UNCTAD, Investment Policy Monitor, Investment Policy Responses to the Covid-19 Pandemic, Special Issue No. 4, May 2020,
Philippines: DTI-PEZA, "PEZA prepares post-COVID business continuity plans to assist affected registered enterprises in PH", 23 April 2020.
Thailand: The Board of Investment of Thailand (BOI), "Thailand BOI Approves Steps to Ease COVID-19 Impact, Accelerate Investment in Medical Sector", 19 April 2020; Joint Foreign Chambers of Commerce, "Measures to Look After and to Alleviate the Effects of the Corona Virus (Covid-19) on the Thai Economy, Both Directly and Indirectly", 25 March 2020.

These measures are for short-term relief for existing supply chains. While reducing excessive concentration in the upstream and downstream markets of GVCs, they do not necessarily lead to diversification of stable and reliable suppliers and buyers in GVCs.

Both the Japanese and ASEAN governments have introduced countermeasures to deal with and mitigate the impact of the pandemic. Given the large-scale operations of Japanese-affiliated companies in ASEAN, they are affected as much as ASEAN companies. In this respect, policy measures and incentives specially implemented by the governments should be well informed and utilized. Because of confusion and lack of information, such measures from ASEAN are not necessarily shared with Japanese-affiliated companies. Although many organizations, including JETRO and the AJC, are providing information,[5] it would be ideal if the ASEAN Secretariat would compile important policy measures introduced by all ASEAN member states and categorize them in accordance with specific policy objectives.

b. Improvement in risk management by the private sector

There is increasing recognition of the importance of and increasing demand for risk management. The current crisis has put many industries, in particular tourism-related industries (including the transport and entertainment industries) at risk and threatens the survival of these companies. Companies have to make the utmost efforts to minimize, monitor and control the risks and impact associated with internal and external shocks and at the same time maximize the realization of opportunities, if any. Companies have always experienced some sort of business risk. Therefore, there is a need to clarify what elements are required and embedded in daily business to minimize risks. Tourism in particular is vulnerable to natural disaster and health-related risks. It is important to look at various cases of risks such as pandemics, natural disasters, other types of crisis (terrorist, crimes) and solutions to minimize the risks.

Many ASEAN countries need capacity-building in this area. For example, a series of workshops targeting ASEAN national tourism organizations and destination management organizations can be organized in the ASEAN countries where the tourism industry has been largely affected by the pandemic. This kind of workshop teaches not only risk management but also the ASEAN Tourism Crisis Communications Manual (2016) to support the crisis management strategy and staff at the organizational and national levels in the use of effective communications tools to be alert for, plan for, respond to, recover and rebound from crises and emergencies in states and their neighbouring countries (ASEAN 2016, p. vii). This manual contains 16 best practices from the Pacific Asia Tourism Association and the United Nations World Tourism Organization.

c. Strong push for digital transformation by both public and private sectors

What is emerging among ASEAN member states as well as their partner countries as a result of the impact of the pandemic is a move towards more digitalization. There is already a digital divide between countries, including those within ASEAN, and the pandemic has proven that the industries using, or based on, digital technology defy the crisis and even continue to grow. Although all member states

[5] The list of policy measures for which Japanese-affiliated companies operating in ASEAN are eligible will be compiled and published online. It will be available for public access and links to the respective agencies in each ASEAN Member States will also be provided. For those compiled by AJC, see https://www.asean.or.jp/ja/invest-info/20200330/.

recognize the importance of such technology and have already undertaken a number of initiatives at both the regional and national levels, there is a need for a strong push towards digitalization. ASEAN countries and Japan, many of which are moving slowly in digital transformation, can move together and establish digital networks, or value chains laden with digital technologies. Telemedicine is a typical example.

To take advantage of opportunities to restructure the industries provided by the current crisis, some ASEAN countries are ready to push their economies strongly in such a direction by providing online platforms, facilitating e-commerce and e-payment, accelerating the capital allowance for IT equipment, financing, and so on (box 4). This push includes new IT-based industries, as mentioned in the next subsection.

Box 4. **Select policy measures related to support for technology advances and development in ASEAN in response to the pandemic**

Brunei Darussalam: Providing co-matching grants for e-commerce and logistic services.

E-commerce platform 'e-Kadai': aims to provide an alternative to businesses for marketing their products online.

Community for Brunei provides a platform to bring Bruneian communities together to assist MSMEs in selling their products in the virtual market and for the general public to purchase goods virtually and make digital payments using debit or credit cards.

Malaysia: To incentivize businesses to undertake investments in 2020, qualifying capital expenditures on machinery and equipment including ICT equipment can claim an accelerated capital allowance within a two-year period for expenses incurred from 1 March 2020 to 31 December 2020.

Bank Negara Malaysia is to establish a RM300 million SME Automation and Digitalization Facility for SMEs to upgrade, modernize and rejuvenate their productive assets. Financing can be used for purchasing equipment, machinery, ICT (hardware, software, IT solutions and services) and other intangible assets to enhance productivity and efficiency.

Myanmar: e-Commerce and social commerce (e-commerce which utilizes SNS) are to be used to promote the retail and relevant logistics industries.

Philippines: The Central Bank is assisting banks to digitalize (e.g. online banking, e-money platform building) to mitigate the risk of COVID-19.

Source: ASEAN-Japan Centre, based on various accounts, including:
Brunei Darussalam: Measures Undertaken by Government in Addressing the Impact of Covid-19 in Brunei Darussalam, 27 April 2020.
Malaysia: Economic Stimulus Package 2020: Bolstering Confidence, Stimulating Growth, Protecting Jobs, Prime Minister of Malaysia, 27 February 2020.
Myanmar: UNCTAD, Investment Policy Monitor, Special Issue No. 4, May 2020, "Investment Policy Responses to the Covid-19 Pandemic".
Philippines: DTI-PEZA, "PEZA prepares post-COVID business continuity plans to assist affected registered enterprises in PH", 23 April 2020.

d. Promoting new and crisis-resistant industries

The gloomy evolution of markets, including a long economic recession worldwide and a continued appreciation of risk (other public health concerns, natural disasters, climate change), reduce firms' propensity to trade and invest. Many companies have already announced or may announce plans to curtail production, lay off workers and cut capital expenditure, all of which have implications for trade, investment and tourism. Thus, there is a need to shift attention to a different set of industries – so-called new industries. Many of these industries are required for successful establishment of the Fourth Industrial Revolution. These industries should also be risk-resistant.

New industries, particularly technology-intensive and IT-related ones, are emerging in the world, including in ASEAN. In many start-ups, both ASEAN and its partner country firms, in particular Japanese companies, may have common interests. Japanese companies may form joint ventures or take an equity investment. Among these new industries:

- In life sciences, which is related to health services, equipment and services for medical diagnosis (notably in vitro), clinical tests, biotechnologies, biocosmetics, and other bioproduction. This industry assumes more importance now because of the pandemic as it is directly related to life. This high-tech oriented industry is not advanced in ASEAN despite a call for telemedicine during the pandemic.
- In agro-food industries, high value added products (e.g. pastries, pre-cooked food, health food)
- In transport equipment, electric cars, hybrid motors, automotive logistics and innovative materials
- In business services: customer-service centres, providers of outsourced logistics and business services, regional headquarters, R&D centres, technical engineering and fintech services
- In personal services: care of senior citizens, health care (e.g. medical care at home and remote diagnosis)
- In ICT: micro- and nano-electronics, software for video games, interactive and virtual image technologies, Internet technologies and embedded technologies for wireless telecommunication systems
- In energy, chemistry, and environmental conservation: nano materials, improvements in existing materials, photovoltaic energy, wind power, water processing, recycling of wastes and non-food use of agricultural products (e.g. bio-fuels, bio-polymers, bio-solvents, bio-materials)
- In other industries: technical textiles (e.g. textiles with particular qualities in terms of robustness, suppleness or adaptability), as well as robotics

Among these industries, health services is not new but faces a formidable challenge in all ASEAN member states because of their limited capacity and ability. Despite recent favourable factors such as poverty reduction, health-related and social services in most of these countries are still underdeveloped and inadequate. Therefore, the industry is facing challenges to meet current and future demand, from both within and outside the region.

The current crisis aggravates this situation. The AJC prepared a report on trade in health services and organized an international forum on health services in 2019 with the objectives of providing some practical advice for government policymakers on how to strike a balance between promoting equitable and affordable access to a set of basic health and social services, and modernizing the health and social services sector with recent technologies through trade and investment liberalization (box 5). Therefore, it is important to mitigate and adapt to the crisis by strengthening health services in ASEAN.

Box 5. **Strengthening health services to mitigate and adapt to the risks from the pandemic**

Implementation of policy recommendations agreed and discussed with ASEAN member states through capacity-building and policy dialogue activities remains to be done. The AJC has recommended nine policy by mode (Services supply modes 1-4) for ASEAN member states:

- Carry out reforms with implications of liberalization and regional cooperation
- Promote public-private partnerships (PPPs) and better investment environments for domestic and foreign investors
- Increase domestic capacity in medical technology
- Remove the remaining entry and operational restrictions on international branch of health-related and social services business after putting in place quality assurance frameworks
- Establish a clear and transparent policy and regulatory framework
- Promote training programmes and general education to increase necessary skills of domestic labour in health-related and social services
- Implement the full mutual recognition agreements
- Conduct quality control and ensure consistent accreditation and certification
- Promote equal access to quality health-related and social services through universal health coverage

The AJC in consultation with ASEAN member states, in particular economic and health officials, the ASEAN Secretariat, the ASEAN Coordinating Committee on Services and its sub-working group on health-related and social services may embark upon prioritized areas of recommendations (such as promotion of public-private partnerships, mutual recognition agreements), and report to ASEAN economic and health ministers.

Source: AJC, Promoting Services Trade in ASEAN (Second Phase: Social Services): Trade in Health-Related and Social Services, February 2020.

These industries could be driving forces for new dynamic growth of ASEAN companies that will presumably trigger, sooner or later, new uptake and provide important "adaptive" services.

Even in the midst of the present crisis, there are many new and growing industries that some ASEAN countries have already embarked upon. Many of them play a role in adapting to the new configuration of the world economy. International organizations such as the AJC support these industries, which are resistant to external crises and have very promising prospects.

e. Reconsidering company strategies for international production: offshoring or reshoring

When companies reconfigure their own GVCs in order to strengthen their production and supply chains, there is an option to offshore their operations or to divest,[6] relocate, reshore and nearshore[7] their operations abroad. Although offshoring expands international production networks by

[6] Divestment is the process of reverse investment, involving capital withdrawals and reduction in the stock of assets that TNCs hold abroad. Divestment can involve either full or partial withdrawals of foreign assets. National statistics do not report the magnitude of divestment explicitly because they record only net flows or stocks in the balance of payments.

[7] Nearshoring is the process of positioning all or part of the value added activities in a country that is geographically, economically and culturally close to the country of origin of the TNC (UNCTAD 2013).

transferring value added activities abroad, by reshoring a TNC curtails and relocates all or part of its value added activities conducted abroad back to its home country (UNCTAD 2013). These two processes stand as the opposite of each other, but they go hand in hand as TNCs adopt dynamic strategies towards the global configuration of their activities. Policymakers should understand why they take place and what they mean for international production.

FDI activity is likely to decline in significant magnitudes in 2020 – by as much as 40 per cent in the world and 30–45 per cent in Asia (UNCTAD 2020). Japanese FDI outflows declined by 30 per cent in the first six months of 2020.[8] The question is in what specific way the downturn is taking place; that is, is it mainly through the lack of new investment or the divestment[9] of existing ones, or both? For the latter, whether it is complete or partial closure of foreign affiliates, and in the case of complete closure, whether divested foreign affiliates were relocated, including to home countries (reshoring), or not reopened, remains to be answered. All of them affect the configuration of international production networks.

If international supply or production chains do not meet the needs of companies or do not work in an efficient manner when needed, divestment may occur. This is a result of a strategic decision concerning the geographic scope of the TNC's value added activities (i.e. reconfiguration of international production networks of TNCs); a change of a foreign servicing mode (e.g. from local production to exports or licensing); or a complete withdrawal from a host country. In the first case, divestment takes the form of relocation of production to other locations or a return to the home country (reshoring). In particular, reshoring, as opposed to offshoring and nearshoring, seems to be on the agenda now, as firms increasingly find cases where offshoring is not necessarily cost saving and even threatens the security of human beings. These GVCs do not function as they are supposed to.

Therefore some countries, including Japan, encourage firms to strengthen and diversify their value chains abroad by providing financial assistance. Japan's complementary budget for FY2020 after the pandemic includes a programme to support the diversification of Japanese supply chains overseas in ASEAN through assistance in multiplication of supply chains and provision of equipment by ASEAN economic ministers and the METI Economic and Industrial Cooperation Committee (AMEICC).[10] Furthermore, the Japanese complementary budget for FY2020 for METI includes the promotion of domestic investment to strengthen production facilities in Japan, to combat risks associated with supply chains in the areas of products whose production is highly concentrated abroad and those that are essential for the healthy life of the Japanese.[11] Although this does not specifically target firms operating in ASEAN, it may encourage reshoring of Japanese affiliates. As of September 2020, first 57 firms were already selected and another 1,670 firms were applying for the remaining funds of this initiative to be selected in October 2020.[12]

In fact, closing of foreign affiliates is already rampant. For example, in the case of Japanese affiliates operating in ASEAN, the number of affiliates that closed down or withdrew is almost the same as those that are newly established, and even larger in certain years (table 8). Among those that were closed down or withdrawn, if past data are any indication, in 2011, about half of divested affiliates relocated either back to Japan or to other countries, and one half of these relocated firms are involved in reshoring (UNCTAD 2013, p. 28).

8 Nihon Keizai Shimbun, 14 August 2020.
9 Divestment is reverse investment involving capital withdrawals and reduction in the stock of assets held abroad. However, FDI statistics on a balance-of-payments basis, which is commonly used, do not report explicitly the magnitude of divestment as they are reported in net terms.
10 It has a budget of ¥23.5 billion, or $0.2 billion.
11 It is a budget of ¥220 billion, or $2.1 billion.
12 Nihon Keizai Shimbun, 9 September 2020.

Japan is ASEAN's fourth largest trading partner and ASEAN's second largest source of FDI. As the current situation is affecting the Japanese-affiliated companies operating in ASEAN or doing business with ASEAN, it is imperative for ASEAN to provide an environment conducive to the operations of Japanese companies in ASEAN through, for example, assisting them to maintain and rebuild more resilient GVCs.

Strategic considerations (i.e. reshoring and reconfiguration of production and management resources) were behind a large number of divestment moves undertaken recently. One third to one half of Japanese affiliates were closed or withdrawn for this reason (table 8). As a part of deliberate corporate strategy, reorganization, restructuring and downsizing in order to increase the efficiency of a corporate system often necessitate divestment. During and after the pandemic, companies may want to carve out non-essential businesses, and pursue the selection and concentration of businesses. Thus, a decision to focus on core business and divest from non-core activities often leads to the closure of operations. When affiliates lose their synergies with the rest of the TNCs, they are divested. Divestment also takes place when TNCs merge. There would be an uptick in mergers and acquisitions. Some operations are eliminated to avoid duplications, with the aim of cost saving that often drove a merger in the first place.

It should be noted that divestment may also be driven by this individual affiliate factor. For example, a survey of 127 Japanese foreign affiliates in ASEAN that had been divested in 2017 shows that one-fifth of such affiliates were closed for performance reasons (Japan, METI, 2019).

Even if divestment takes place after the pandemic, if it was fueled in large part by internal restructuring of TNCs, it was in many cases a response of TNCs to the general economic downturn and the need to cut costs in the face of growing competition and/or slowing demand. Added to these reasons is the need of securing lifelines in the home economy through reshoring. In this environment, retaining existing FDI is no less important. What role, if any, can governments take to arrest divestment? For the purpose of this discussion, there is a need to reiterate the distinction made between complete closure and relocation (including reshoring), even though for individual countries, the consequences of divestment and relocation are identical. They do, however, call for different policy responses and they differ in the ability of policymakers to affect them.

When a closure in one country leads to a shift of investment to another, more locationally advantageous country for the investment in question, the major policy issue is maintaining the relative attraction of a country for FDI. This is particularly important for investment that does not have high barriers to exit (i.e., does not involve high sunk costs). The initial investment is undertaken on the basis of an evaluation of the location advantages of the country concerned, which at that point in time was considered as more attractive for FDI than other potential locations. To prevent the relocation of investment, governments must continuously improve location conditions, so that they remain attractive relative to other potential locations. The pandemic poses a serious challenge to ASEAN as a competitive location to host GVCs.

Table 8. **Number of Japanese foreign affiliates newly created in and closed/withdrawn from ASEAN, 2009–2018**

Establishments/Withdrawals	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Establishments	**62**	**72**	**172**	**233**	**207**	**189**	**140**	**102**	**104**	**110**
Of which:										
Philippines	1	3	14	11	8	14	13	9	5	15
Malaysia	3	6	15	15	15	16	13	10	10	10
Thailand	22	20	36	77	66	39	34	18	25	23
Indonesia	10	6	41	57	34	37	17	17	10	9
Closures/withdrawals	**126**	**107**	**108**	**90**	**106**	**78**	**121**	**119**	**141**	**117**
Of which:										
Philippines	19	8	12	8	7	6	13	3	13	9
Malaysia	25	11	7	17	14	16	19	20	17	19
Thailand	31	33	25	23	34	15	35	32	43	27
Indonesia	15	16	21	6	13	7	14	20	16	24
Closures/withdrawals due to restructuring and reconfiguration of management resources	**61**	**44**	**57**	**49**	**51**	**39**	**49**	**59**	**50**	..

Source: Japan Ministry of Economy, Trade and Industry, *Wagakuni Kigyo no Kaigai Jigyo Katsudo Kihon Chosa*, various issues.

CONCLUSION: PREPARING FOR ANOTHER CRISIS

The international production system evolves continuously, as do GVCs, with expansion in one sector or country sometimes accompanied by contraction in another. The composition and organization of value added activities by a TNC change continuously to respond to exogenous environmental, technological and social factors, as well as new endogenous strategic priorities. Therefore, temporary divestment including reshoring, if any, after the pandemic should not be a big concern for ASEAN.

However, in some industries in ASEAN, GVCs have reached a level of market concentration that may cause some concern about the healthy operation of GVCs (see annex table 4 for such industries). Expanding the DVA share while recognizing the important role that foreign inputs (FVA) play in increasing export competitiveness is a common policy agenda item for all countries. At the same time, diversification of export destination, rather than concentration, is required in the case of high concentration of the downstream market of GVCs.

Structural reforms aimed at ensuring more stability in a crisis-prone economic system, renewed commitment to an open environment for trade and investment, and the implementation of policies that favour investment and innovation are key issues. For effectively dealing with the COVID-19 crisis and its economic aftermath, it is important for policymakers to resist the temptation of quick-fix solutions or protectionism and to maintain an overall favourable business climate.

The risk intensity identified and calculated in this paper does not necessarily mean that those industries with a high risk intensity are always exposed to external shocks, These industries simply have a higher tendency to be exposed than industries with a lower risk intensity. This analysis provides ASEAN governments and companies with reasons why they should worry about vulnerability to external shocks. At the same time, reducing vulnerability means losing efficiency of production, which is necessary payment for further resilience and robustness of GVCs.

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ANNEXES

Annex table 1. **List of industries covered in this paper**

Industry	Brunei Darussalam	Cambodia	Indonesia	Lao PDR	Malaysia	Myanmar	Philippines	Singapore	Thailand	Viet Nam
Agriculture, hunting, forestry and fishing	■	■	■	■	■	■	■	■	■	■
Community, social and personal service activities	■	■	□	■	■	■	□	■	■	■
Construction	■	■	■	■	■	■	■	■	■	■
Education, health and other services	■	■	■	■	■	■	■	■	■	■
Electrical and general machinery	■	■	■	■	■	■	■	■	■	■
Electricity, gas and water	■	■	■	■	■	■	■	■	■	■
Finacial intermediation and business activities	■	■	■	■	■	■	■	■	■	■
Food, beverages and tobacco	■	■	■	■	■	■	■	■	■	■
Hotels and restaurants	■	■	■	■	■	■	■	■	■	■
Metal and metal products	■	■	■	■	■	■	■	■	■	■
Mining, quarrying and petroleum	■	■	■	■	■	■	■	□	■	■
Motor vehicles and other transport equipment	■	■	■	■	■	■	■	■	■	■
Other manufacturing	■	■	■	■	■	■	■	■	■	■
Other services	■	■	■	■	■	■	■	■	□	■
Petroleum, chemical and non-metallic mineral products	■	■	■	■	■	■	■	■	■	■
Precision instruments	□	□	■	□	■	□	■	■	■	■
Public administration and defence	■	■	■	■	■	■	■	□	■	■
Publishing, printing and reproduction of recorded media	□	□	■	□	■	□	■	■	■	■
Recycling	■	■	□	■	■	■	□	□	□	□
Textiles, clothing and leather	■	■	■	■	■	■	■	■	■	■
Trade	■	■	■	■	■	■	■	■	■	■
Transport, storage and communications	■	■	■	■	■	■	■	■	■	■
Unspecified	■	■	■	■	■	■	■	■	■	■
Wood and wood products	■	■	■	■	■	■	■	■	■	■
Total number of industries covered	22	22	22	22	24	22	22	21	22	23

Source: AJC-UNCTAD-Eora database on ASEAN GVCs.
Note: Non-shaded areas indicates the absence of data.

Annex table 2. **Partner countries that may influence vulnerability of upstream part of GVCs by ASEAN industry, 2017**

Partner country	HHI	Number of industries	ASEAN country/industry[a]
China	>1,500	None	None
	200-1,500	129	Singapore: Agriculture, hunting, forestry and fishing; Singapore: Textiles, clothing and leather; Thailand: Motor vehicles and other transport equipment; Cambodia: Electrical and general machinery; Cambodia: Metal and metal products; Viet Nam: Agriculture, hunting, forestry and fishing; Cambodia: Motor vehicles and other transport equipment; Singapore: Other manufacturing; Cambodia: Other manufacturing; Singapore: Food, beverages and tobacco; Cambodia: Construction; Philippines: Textiles, clothing and leather; Cambodia: Agriculture, hunting, forestry and fishing; Singapore: Metal and metal products; Singapore: Motor vehicles and other transport equipment; Cambodia: Food, beverages and tobacco; Cambodia: Textiles, clothing and leather; Singapore: Hotels and restaurants; Singapore: Other services; Cambodia: Financial intermediation and business activities; Malaysia: Textiles, clothing and leather; Cambodia: Education, health and other services; Singapore: Electricity, gas and water; Singapore: Community, social and personal service activities; Cambodia: Hotels and restaurants; Cambodia: Petroleum, chemical and non-metallic mineral products; Singapore: Wood and wood products; Cambodia: Wood and wood products; Indonesia: Textiles, clothing and leather; Singapore: Construction; Thailand: Community, social and personal service activities; Brunei Darussalam: Textiles, clothing and leather; Viet Nam: Transport, storage and communications; Viet Nam: Other services; Cambodia: Public administration and defence; Thailand: Publishing, printing and reproduction of recorded media; Cambodia: Mining, quarrying and petroleum; Viet Nam: Motor vehicles and other transport equipment; Singapore: Publishing, printing and reproduction of recorded media; Viet Nam: Metal and metal products; Viet Nam: Petroleum, chemical and non-metallic mineral products; Viet Nam: Trade; Cambodia: Transport, storage and communications; Cambodia: Electricity, gas and water; Thailand: Electrical and general machinery; Viet Nam: Electricity, gas and water; Malaysia: Precision instruments; Viet Nam: Mining, quarrying and petroleum; Viet Nam: Community, social and personal service activities; Singapore: Education, health and other services; Thailand: Textiles, clothing and leather; Viet Nam: Construction; Viet Nam: Education, health and other services; Singapore: Financial intermediation and business activities; Singapore: Electrical and general machinery; Singapore: Precision instruments; Viet Nam: Hotels and restaurants; Viet Nam: Food, beverages and tobacco; Viet Nam: Textiles, clothing and leather; Cambodia: Trade; Thailand: Education, health and other services; Malaysia: Electrical and general machinery; Cambodia: Recycling; Viet Nam: Other manufacturing; Viet Nam: Public administration and defence; Thailand: Hotels and restaurants; Thailand: Electricity, gas and water; Cambodia: Community, social and personal service activities; Viet Nam: Electrical and general machinery; Thailand: Financial intermediation and business activities; Indonesia: Electrical and general machinery; Indonesia: Electricity, gas and water; Indonesia: Motor vehicles and other transport equipment; Indonesia: Agriculture, hunting, forestry and fishing; Indonesia: Other manufacturing; Viet Nam: Financial intermediation and business activities; Brunei Darussalam: Metal and metal products; Thailand: Agriculture, hunting, forestry and fishing; Indonesia: Precision instruments; Thailand: Other manufacturing; Philippines: Other manufacturing; Thailand: Food, beverages and tobacco; Malaysia: Motor vehicles and other transport equipment; Malaysia: Construction; Singapore: Unspecified; Viet Nam: Precision instruments; Indonesia: Construction; Cambodia: Other services; Thailand: Precision instruments; Philippines: Agriculture, hunting, forestry and fishing; Lao PDR: Electrical and general machinery; Singapore: Trade; Brunei Darussalam: Other manufacturing; Viet Nam: Wood and wood products; Malaysia: Metal and metal products; Thailand: Trade; Malaysia: Other manufacturing; Thailand: Metal and metal products; Indonesia: Food, beverages and tobacco; Lao PDR: Motor vehicles and other transport equipment; Brunei Darussalam: Petroleum, chemical and non-metallic mineral products; Indonesia: Metal and metal products; Indonesia: Other services; Thailand: Construction; Indonesia: Education, health and other services; Brunei Darussalam: Electrical and general machinery; Brunei Darussalam: Food, beverages and tobacco; Viet Nam: Publishing, printing and reproduction of recorded media; Philippines: Motor vehicles and other transport equipment; Brunei Darussalam: Motor vehicles and other transport equipment; Malaysia: Recycling; Malaysia: Hotels and restaurants; Brunei Darussalam: Electricity, gas and water; Malaysia: Petroleum, chemical and non-metallic mineral products; Brunei Darussalam: Construction; Brunei Darussalam: Wood and wood products; Malaysia: Food, beverages and tobacco; Brunei Darussalam: Mining, quarrying and petroleum; Philippines: Precision instruments; Indonesia: Hotels and restaurants; Malaysia: Agriculture, hunting, forestry and fishing; Philippines: Construction; Brunei Darussalam: Hotels and restaurants; Singapore: Transport, storage and communications; Indonesia: Transport, storage and communications; Thailand: Wood and wood products; Philippines: Electricity, gas and water; Indonesia: Petroleum, chemical and non-metallic mineral products; Singapore: Petroleum, chemical and non-metallic mineral products
Japan	>1,500	None	None
	200-1,500	38	Viet Nam: Food, beverages and tobacco; Viet Nam: Publishing, printing and reproduction of recorded media; Viet Nam: Wood and wood products; Viet Nam: Motor vehicles and other transport equipment; Viet Nam: Textiles, clothing and leather; Viet Nam: Other manufacturing; Viet Nam: Construction; Viet Nam: Electrical and general machinery; Viet Nam: Metal and metal products; Malaysia: Motor vehicles and other transport equipment; Viet Nam: Trade; Viet Nam: Precision instruments; Viet Nam: Other services; Viet Nam: Petroleum, chemical and non-metallic mineral products; Viet Nam: Hotels and restaurants; Thailand: Textiles, clothing and leather; Viet Nam: Education, health and other services; Philippines: Electrical and general machinery; Viet Nam: Community, social and personal service activities; Viet Nam: Public administration and defence; Viet Nam: Mining, quarrying and petroleum; Viet Nam: Financial intermediation and business activities; Viet Nam: Electricity, gas and water; Indonesia: Motor vehicles and other transport equipment; Philippines: Motor vehicles and other transport equipment; Singapore: Electrical and general machinery; Singapore: Precision instruments; Singapore: Motor vehicles and other transport equipment; Philippines: Precision instruments; Thailand: Construction; Thailand: Electrical and general machinery; Viet Nam: Transport, storage and communications; Malaysia: Metal and metal products; Malaysia: Construction; Viet Nam: Agriculture, hunting, forestry and fishing; Singapore: Trade; Philippines: Metal and metal products; Malaysia: Other manufacturing

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Annex table 2. **Partner countries that may influence vulnerability of upstream part of GVCs by ASEAN industry, 2017** (Concluded)

Partner country	HHI	Number of industries	ASEAN country/industry[a]
Republic of Korea	>1,500	None	None
	200-1,500	1	Philippines: Metal and metal products
United States	>2,500	None	None
	1,500-2,500	None	None
	200-1,500	18	Philippines: Financial intermediation and business activities; Philippines: Trade; Malaysia: Unspecified; Malaysia: Public administration and defence; Singapore: Unspecified; Malaysia: Community, social and personal service activities; Malaysia: Financial intermediation and business activities; Malaysia: Other services; Philippines: Other services; Malaysia: Trade; Indonesia: Financial intermediation and business activities; Malaysia: Transport, storage and communications; Malaysia: Mining, quarrying and petroleum; Malaysia: Education, health and other services; Malaysia: Electricity, gas and water; Philippines: Education, health and other services; Philippines: Hotels and restaurants; Philippines: Food, beverages and tobacco
Indonesia	>200	12	Singapore: Wood and wood products; Singapore: Food, beverages and tobacco; Singapore: Textiles, clothing and leather; Singapore: Electricity, gas and water; Singapore: Hotels and restaurants; Singapore: Construction; Singapore: Publishing, printing and reproduction of recorded media; Singapore: Community, social and personal service activities; Singapore: Other services; Singapore: Other manufacturing; Singapore: Agriculture, hunting, forestry and fishing; Singapore: Petroleum, chemical and non-metallic mineral products.
Malaysia	>1,500	None	None
	200-1,500	8	Indonesia: Petroleum, chemical and non-metallic mineral products; Brunei Darussalam: Electricity, gas and water; Indonesia: Mining, quarrying and petroleum; Brunei Darussalam: Petroleum, chemical and non-metallic mineral products; Singapore: Wood and wood products; Brunei Darussalam: Hotels and restaurants; Brunei Darussalam: Financial intermediation and business activities; Brunei Darussalam: Transport, storage and communications
Singapore	>1,500	None	None
	200-1,500	10	Brunei Darussalam: Wood and wood products; Brunei Darussalam: Financial intermediation and business activities; Brunei Darussalam: Electrical and general machinery; Brunei Darussalam: Trade; Brunei Darussalam: Petroleum, chemical and non-metallic mineral products; Brunei Darussalam: Construction; Brunei Darussalam: Transport, storage and communications; Brunei Darussalam: Public administration and defence; Brunei Darussalam: Motor vehicles and other transport equipment; Brunei Darussalam: Metal and metal products
Thailand	>2,500	3	Lao PDR: Petroleum, chemical and non-metallic mineral products; Lao PDR: Trade; Lao PDR: Transport, storage and communications
	1,500-2,500	8	Lao PDR: Public administration and defence; Lao PDR: Electricity, gas and water; Lao PDR: Wood and wood products; Lao PDR: Education, health and other services; Lao PDR: Financial intermediation and business activities; Lao PDR: Construction; Lao PDR: Textiles, clothing and leather; Lao PDR: Metal and metal products
	200-1,500	27	Lao PDR: Electrical and general machinery; Lao PDR: Mining, quarrying and petroleum; Lao PDR: Motor vehicles and other transport equipment; Lao PDR: Other manufacturing; Lao PDR: Agriculture, hunting, forestry and fishing; Lao PDR: Hotels and restaurants; Lao PDR: Food, beverages and tobacco; Cambodia: Petroleum, chemical and non-metallic mineral products; Cambodia: Trade; Cambodia: Electricity, gas and water; Cambodia: Transport, storage and communications; Cambodia: Food, beverages and tobacco; Lao PDR: Community, social and personal service activities; Cambodia: Agriculture, hunting, forestry and fishing; Cambodia: Mining, quarrying and petroleum; Cambodia: Textiles, clothing and leather; Lao PDR: Other services; Cambodia: Public administration and defence; Cambodia: Hotels and restaurants; Cambodia: Wood and wood products; Cambodia: Metal and metal products; Lao PDR: Recycling; Cambodia: Construction; Cambodia: Education, health and other services; Cambodia: Financial intermediation and business activities; Cambodia: Other manufacturing; Cambodia: Recycling
Viet Nam	>200	3	Lao PDR: Food, beverages and tobacco; Lao PDR: Hotels and restaurants; Lao PDR: Unspecified

Source: Compiled by AJC based on AJC-UNCTAD-Eora database on ASEAN GVCs.
Note: According to U.S. Department of Justice, an increase of HHI by 200 points is the level by which market power is enhanced in highly concentrated markets. HHI of more than 100 points potentially raise significant competitive concerns in moderately concentrated markets.
[a] Ranked in the order of HHI (from large to small).

Annex table 3. **Partner countries that may influence vulnerability of downstream part of GVCs by ASEAN industry, 2017**

Partner country	HHI	Number of industries	ASEAN country/industry[a]
Australia	>1,500	1	Thailand: Education, health and other services
	200-1,500	3	Singapore: Other services; Singapore: Education, health and other services; Viet Nam: Education, health and other services
China	>1,500	None	None
	200-1,500	11	Cambodia: Wood and wood products; Viet Nam: Mining, quarrying and petroleum; Lao PDR: Agriculture, hunting, forestry and fishing; Thailand: Community, social and personal service activities; Thailand: Publishing, printing and reproduction of recorded media; Singapore: Electrical and general machinery; Thailand: Mining, quarrying and petroleum; Malaysia: Agriculture, hunting, forestry and fishing; Myanmar: Agriculture, hunting, forestry and fishing; Singapore: Precision instruments; Malaysia: Electrical and general machinery
Japan	>1,500	2	Philippines: Mining, quarrying and petroleum; Brunei Darussalam: Transport, storage and communications
	200-1,500	22	Brunei Darussalam: Financial intermediation and business activities; Brunei Darussalam: Mining, quarrying and petroleum; Brunei Darussalam: Electricity, gas and water; Brunei Darussalam: Motor vehicles and other transport equipment; Brunei Darussalam: Construction; Brunei Darussalam: Other services; Brunei Darussalam: Trade; Brunei Darussalam: Petroleum, chemical and non-metallic mineral products; Brunei Darussalam: Metal and metal products; Brunei Darussalam: Wood and wood products; Brunei Darussalam: Other manufacturing; Brunei Darussalam: Electrical and general machinery; Brunei Darussalam: Community, social and personal service activities; Philippines: Motor vehicles and other transport equipment; Brunei Darussalam: Education, health and other services; Brunei Darussalam: Agriculture, hunting, forestry and fishing; Brunei Darussalam: Recycling; Brunei Darussalam: Food, beverages and tobacco; Indonesia: Mining, quarrying and petroleum; Brunei Darussalam: Hotels and restaurants; Viet Nam: Precision instruments; Malaysia: Mining, quarrying and petroleum
Republic of Korea	>1,500	None	None
	200-1,500	17	Brunei Darussalam: Hotels and restaurants; Brunei Darussalam: Mining, quarrying and petroleum; Brunei Darussalam: Electricity, gas and water; Brunei Darussalam: Construction; Indonesia: Mining, quarrying and petroleum; Brunei Darussalam: Other services; Brunei Darussalam: Metal and metal products; Brunei Darussalam: Motor vehicles and other transport equipment; Brunei Darussalam: Petroleum, chemical and non-metallic mineral products; Brunei Darussalam: Financial intermediation and business activities; Brunei Darussalam: Food, beverages and tobacco; Brunei Darussalam: Other manufacturing; Brunei Darussalam: Wood and wood products; Brunei Darussalam: Electrical and general machinery; Malaysia: Mining, quarrying and petroleum; Brunei Darussalam: Agriculture, hunting, forestry and fishing; Brunei Darussalam: Recycling
Germany	>1,500	None	None
	200-1,500	26	Philippines: Public administration and defence; Cambodia: Hotels and restaurants; Cambodia: Education, health and other services; Cambodia: Transport, storage and communications; Cambodia: Textiles, clothing and leather; Philippines: Wood and wood products; Cambodia: Construction; Viet Nam: Public administration and defence; Myanmar: Textiles, clothing and leather; Thailand: Construction; Cambodia: Community, social and personal service activities; Cambodia: Financial intermediation and business activities; Thailand: Precision instruments; Singapore: Hotels and restaurants; Thailand: Public administration and defence; Cambodia: Electricity, gas and water; Singapore: Construction; Thailand: Other manufacturing; Cambodia: Other services; Philippines: Construction; Cambodia: Petroleum, chemical and non-metallic mineral products; Philippines: Hotels and restaurants; Lao PDR: Textiles, clothing and leather; Cambodia: Public administration and defence; Cambodia: Trade; Philippines: Precision instruments
Netherlands	>1,500	None	
	200-1,500	7	Philippines: Hotels and restaurants; Philippines: Food, beverages and tobacco; Philippines: Education, health and other services; Thailand: Food, beverages and tobacco; Philippines: Agriculture, hunting, forestry and fishing; Thailand: Agriculture, hunting, forestry and fishing; Thailand: Hotels and restaurants
Indonesia	>1,500	None	
	200-1,500	2	Singapore: Motor vehicles and other transport equipment; Malaysia: Mining, quarrying and petroleum

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Annex table 3. **Partner countries that may influence vulnerability of downstream part of GVCs by ASEAN industry, 2017** (Concluded)

Partner country	HHI	Number of industries	ASEAN country/industry[a]
Malaysia	>1,500	None	None
	200-1,500	9	Singapore: Metal and metal products; Singapore: Construction; Singapore: Publishing, printing and reproduction of recorded media; Singapore: Transport, storage and communications; Cambodia: Agriculture, hunting, forestry and fishing; Singapore: Textiles, clothing and leather; Singapore: Electrical and general machinery; Singapore: Petroleum, chemical and non-metallic mineral products; Singapore: Electricity, gas and water
Singapore	>2,500	1	Brunei Darussalam: Textiles, clothing and leather;
	1,500-2,500	4	Indonesia: Electrical and general machinery; Malaysia: Publishing, printing and reproduction of recorded media; Indonesia: Petroleum, chemical and non-metallic mineral products; Indonesia: Precision instruments
	200-1,500	47	Indonesia: Metal and metal products; Indonesia: Publishing, printing and reproduction of recorded media; Malaysia: Financial intermediation and business activities; Malaysia: Transport, storage and communications; Malaysia: Precision instruments; Indonesia: Education, health and other services; Malaysia: Petroleum, chemical and non-metallic mineral products; Malaysia: Metal and metal products; Indonesia: Electricity, gas and water; Indonesia: Other services; Malaysia: Textiles, clothing and leather; Malaysia: Education, health and other services; Malaysia: Community, social and personal service activities; Malaysia: Electricity, gas and water; Indonesia: Motor vehicles and other transport equipment; Malaysia: Electrical and general machinery; Indonesia: Transport, storage and communications; Malaysia: Construction; Indonesia: Financial intermediation and business activities; Indonesia: Public administration and defence; Malaysia: Trade; Malaysia: Food, beverages and tobacco; Indonesia: Trade; Malaysia: Other manufacturing; Malaysia: Mining, quarrying and petroleum; Indonesia: Construction; Indonesia: Other manufacturing; Philippines: Electrical and general machinery; Malaysia: Wood and wood products; Malaysia: Hotels and restaurants; Indonesia: Mining, quarrying and petroleum; Malaysia: Motor vehicles and other transport equipment; Philippines: Transport, storage and communications; Philippines: Education, health and other services; Malaysia: Public administration and defence; Malaysia: Recycling; Philippines: Other services; Indonesia: Wood and wood products; Malaysia: Agriculture, hunting, forestry and fishing; Brunei Darussalam: Community, social and personal service activities; Indonesia: Food, beverages and tobacco; Philippines: Electricity, gas and water; Cambodia: Community, social and personal service activities; Philippines: Publishing, printing and reproduction of recorded media; Indonesia: Agriculture, hunting, forestry and fishing; Indonesia: Textiles, clothing and leather; Cambodia: Textiles, clothing and leather
Thailand	>2,500	3	Lao PDR: Wood and wood products; Myanmar: Mining, quarrying and petroleum; Cambodia: Recycling
	1,500-2,500	2	Lao PDR: Agriculture, hunting, forestry and fishing; Lao PDR: Electricity, gas and water
	200-1,500	29	Myanmar: Financial intermediation and business activities; Myanmar: Construction; Lao PDR: Petroleum, chemical and non-metallic mineral products; Cambodia: Mining, quarrying and petroleum; Lao PDR: Electrical and general machinery; Lao PDR: Mining, quarrying and petroleum; Myanmar: Electrical and general machinery; Lao PDR: Recycling; Philippines: Motor vehicles and other transport equipment; Myanmar: Metal and metal products; Myanmar: Petroleum, chemical and non-metallic mineral products; Lao PDR: Financial intermediation and business activities; Lao PDR: Metal and metal products; Myanmar: Motor vehicles and other transport equipment; Cambodia: Food, beverages and tobacco; Myanmar: Transport, storage and communications; Lao PDR: Other services; Lao PDR: Food, beverages and tobacco; Myanmar: Electricity, gas and water; Cambodia: Metal and metal products; Myanmar: Trade; Lao PDR: Other manufacturing; Malaysia: Recycling; Myanmar: Other manufacturing; Myanmar: Other services; Lao PDR: Construction; Myanmar: Community, social and personal service activities; Lao PDR: Trade; Brunei Darussalam: Mining, quarrying and petroleum
Viet Nam	200-1,500	1	Lao PDR: Trade

Source: Compiled by AJC, based on AJC-UNCTAD-Eora database on ASEAN GVCs.
Note: According to US Department of Justice, an increase of HHI by 200 points is the level by which market power is enhanced in highly concentrated markets. HHI of more than 100 points potentially raise significant competitive concerns in moderately concentrated markets.
[a] Ranked in the order of HHI (from large to small).

Annex table 4. **Risk intensity of supplier market concentration and buyer market concentration by six levels**

Industry	Brunei Darussalam		Cambodia		Indonesia		Lao PDR	
	Supplier market concentration	Buyer market concentration	Supplier market concentration	Buyer market concentration	Supplier market concentration	Buyer market concentration	Supplier market concentration	Buyer market concentration
Agriculture, hunting, forestry and fishing	0.01	0.01	0.01	0.05	0.01	0.05	0.01	0.5
Community, social and personal service activities	0.01	0.01	0.01	0.01			0.01	0.05
Construction	0.01	0.25	0.01	0.01	0.01	0.05	0.05	0.01
Education, health and other services	0.01	0.01	0.01	0.01	0.01	0.1	0.05	0.01
Electrical and general machinery	0.01	0.05	0.05	0.01	0.01	0.5	0.05	0.05
Electricity, gas and water	0.01	0.25	0.01	0.01	0.01	0.05	0.1	0.05
Financial intermediation and business activities	0.01	0.25	0.01	0.01	0.01	0.05	0.05	0.01
Food, beverages and tobacco	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.05
Hotels and restaurants	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.01
Metal and metal products	0.01	0.25	0.05	0.01	0.01	0.5	0.05	0.01
Mining, quarrying and petroleum	0.01	0.25	0.01	0.01	0.01	0.1	0.05	0.05
Motor vehicles and other transport equipment	0.05	0.25	0.05	0.01	0.01	0.05	0.05	0.05
Other manufacturing	0.01	0.01	0.01	0.01	0.01	0.01	0.05	0.05
Other services	0.01	0.25	0.01	0.01	0.01	0.05	0.01	0.01
Petroleum, chemical and non-metallic mineral products	0.01	0.25	0.05	0.01	0.01	0.5	0.1	0.05
Precision instruments					0.01	0.25		
Public administration and defence	0.01	0.1	0.01	0.01	0.01	0.05	0.1	0.05
Publishing, printing and reproduction of recorded media					0.01	0.25		
Recycling	0.1	0.05	0.05	1.0			0.01	0.05
Textiles, clothing and leather	0.01	0.1	0.01	0.01	0.01	0.01	0.05	0.01
Trade	0.01	0.01	0.01	0.01	0.01	0.05	0.1	0.01
Transport, storage and communications	0.01	0.25	0.01	0.01	0.01	0.05	0.1	0.05
Unspecified	0.1	0.01	0.1	0.1	0.1	0.1	0.05	0.05
Wood and wood products	0.01	0.05	0.01	0.01	0.01	0.05	0.05	0.1

Source: Compiled by the AJC, based on AJC-UNCTAD-Eora database on ASEAN GVCs.
Note: Non-shaded area indicates the absence of data. Degradation of the colour implies the degree of the risk intensity. See tables 2 and 5 for explanation.

Malaysia		Myanmar		Philippines		Singapore		Thailand		Viet Nam	
Supplier market concentration	Buyer market concentration	Supplier market concentration	Buyer market concentration	Supplier market concentration	Buyer market concentration	Supplier market concentration	Buyer market concentration	Supplier market concentration	Buyer market concentration	Supplier market concentration	Buyer market concentration
0.01	0.01	0.01	0.05	0.01	0.01	0.5	0.01	0.01	0.01	0.01	0.01
0.05	0.01	0.01	0.1			0.1	0.01	0.05	0.05	0.01	0.01
0.1	0.05	0.01	0.5	0.01	0.05	0.1	0.01	0.01	0.01	0.1	0.1
0.01	0.01	0.01	0.05	0.01	0.1	0.05	0.01	0.01	0.05	0.01	0.01
0.1	0.05	0.01	0.1	0.1	0.1	0.1	0.05	0.05	0.05	0.1	0.05
0.05	0.05	0.01	0.1	0.01	0.1	0.05	0.05	0.01	0.05	0.01	0.05
0.01	0.05	0.01	0.25	0.01	0.05	0.1	0.05	0.01	0.05	0.01	0.01
0.1	0.01	0.01	0.01	0.01	0.05	0.1	0.01	0.01	0.01	0.05	0.01
0.1	0.01	0.01	0.05	0.01	0.01	0.1	0.01	0.01	0.01	0.01	0.01
0.1	0.1	0.01	0.1	0.05	0.05	0.1	0.05	0.01	0.01	0.1	0.05
0.01	0.1	0.01	1.0	0.01	0.5			0.01	0.05	0.01	0.05
0.1	0.01	0.01	0.1	0.05	0.25	0.1	0.01	0.5	0.01	0.1	0.05
0.1	0.01	0.01	0.05	0.01	0.01	0.1	0.01	0.1	0.01	0.1	0.01
0.1	0.01	0.01	0.05	0.01	0.1	0.05	0.05			0.01	0.1
0.05	0.1	0.01	0.05	0.05	0.1	0.1	0.05	0.01	0.05	0.1	0.05
0.1	0.05			0.05	0.01	0.1	0.01	0.05	0.01	0.05	0.01
0.1	0.01	0.01	0.1	0.1	0.05			0.01	0.1	0.01	0.01
0.1	0.25			0.01	0.1	0.1	0.05	0.01	0.01	0.1	0.05
0.1	0.1	0.01	0.1								
0.1	0.01	0.01	0.01	0.01	0.01	0.5	0.01	0.05	0.01	0.1	0.01
0.01	0.05	0.01	0.1	0.01	0.1	0.1	0.05	0.01	0.05	0.01	0.05
0.1	0.25	0.01	0.05	0.01	0.1	0.1	0.05	0.01	0.05	0.05	0.01
0.1	0.1	0.1	0.1	0.1	0.1	0.01	0.05	0.1	0.05	0.1	0.01
0.05	0.01	0.01	0.05	0.01	0.05	0.5	0.05	0.05	0.01	0.1	0.05

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