

Changing GVC in Post-Pandemic Asia: Korea, China and Southeast Asia

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Abstract

This paper has provided some overview of the changing GVC in Asia, especially since the outbreak of Covid-19, focusing on the phenomena of reshoring and nearshoring. It first discussed the role of the three factors responsible for changing and shaping GVC in Asia, and they are digitalization with Industry 4.0 since the 2010s, the US-China trade conflict since 2018, and the Covid-19 since 2020. Thus, an emerging trend is that FDI firms in China and Asia are either reshoring their factories back to their home bases or relocating to nearby locations, such as Vietnam and other Southeast Asian economies. These changes are also associated with MNCs' move to increase the resiliency of their value chains and by the national government to promote domestic jobs by offering incentives to reshoring.

Investigating the cases of reshoring involving Korean firms getting out of China or SEA, the paper identifies three types, 1) reshoring of production of labour-intensive products requiring monetary or tax incentives, 2) reshoring getting possible by flattening of GVC by innovation, such as skipping a stage where semi-finished products are processed in foreign countries, and 3) large scale automation or transformation into Smart Factory, which requires considerable investment and innovation capabilities. These cases and typology suggest that effective reshoring requires not just monetary incentives but also technical assistance to realize the potentials for innovation and automation. In the meantime, some FDI firms are moving out of China and relocating into nearby SEA countries mainly for labour-saving reasons and avoiding tariffs imposed by the US on made-in-China products. Such exit from China might mean a new opportunity for SEA, as exemplified by Vietnam receiving many FDI firms out of China. It could be a new opportunity for SEA to overcome the challenges posed by 4IR and keep existing FDI (onshoring) and/or attract new factories getting out of China (nearshoring).

Keywords: Reshoring; Near-shoring; China; Korea; Southeast Asia; Digital Factory;

1. Introduction

The Covid-19 pandemic has been a significant shock to the world economy and its constituent economies, including the varieties of capitalist economies. A big blunt has been observed in the Western economies, compared to the Asian economies such as China, Korea, Taiwan and Japan (Popov, 2020). One of the Western world's common weaknesses is its reliance on East Asia for the production of masks and other medical devices, including the test kits. Thus, despite the US-China trade conflicts, exports by China to the world and the US somewhat increased after the Covid-19, owing to the western or global reliance on medical and health products made in China. The existing modes of Global Value Chain (GVC) have also revealed weakness associated with too widespread fragmentation over diverse countries. Thus, the resilience of GVC has become the central concern.

Further, Covid-19 also signals the Anglo-Saxon style shareholder capitalism's retreats that have driven globalisation or neoliberalism since the 1980s (K. Lee, 2020). Since the 1980s, the efficiency or profit maximisation forced by shareholders seeking short-term profit has resulted in a high degree of globalisation of production chains. Lazonick (2010, 2014) points out that the US economy had kept manufacturing until the 1980s, but the rise of shareholder capitalism and financialisation since then has forced US firms to relocate their factories abroad to meet the demands of shareholders and increase profitability. From an emerging economy perspective, a more in-depth look at the global trends reveals that few countries have benefited from the growing global interconnectedness (Primi and Toselli, 2020). This is because merely joining the GVC does not guarantee to upgrade (Lee et al. 2018). An economy might be stuck in low-value activities without functional upgrading, causing the so-called middle-income trap (World Bank, 2010; Lee, 2013).

In the meantime, one of the significant changes that have happened in the global development landscape since the 1990s has been the steady and fast upsurge of China as an emerging global power. The rise of China is redefining the game's global rules at a time in which digital technologies and the Fourth Industrial Revolution (4IR) are expanding, amplifying its potential impact (Lee, Malerba and Primi, 2020). China has kept changing from a 'factory for the world', a 'market for the world' and now an 'investor for the world.' With the rise of wages rates in China reaching half of that of South Korea, FDI firms have been moving out of China, either back to their home countries or nearby economies in Southeast Asia (SEA). Thus, China's economic changes have a major impact on developing economies in SEA economies as both opportunities and threats.

Along this line, Primi and Toselli (2020) analyzes how the more interconnected world (with goods and services crossing multiple borders to then be embodied in final outputs to be delivered globally) has redefined not only the geography of trade, investment and production but also the power relationships among different economic systems (Gereffi, 2014; 2018; Ahmad and Primi 2017; World Bank, 2017). Using the trade in value added data (OECD/WTO TiVA database), the paper identifies different patterns of participation to GVCs. On the one hand, they identified a group of countries “climbing the ladder” in terms of increasing more proportionally the domestic value-added embodied in foreign exports than the foreign value-added embodied in domestic exports. On the other hand, they identify another group of countries “deepening in assembly” where increase in foreign value-added embodied in domestic exports increases more proportionally than the domestic value-added embodied in foreign exports.

The changes in the patterns of value creation and distribution brought about by digital technologies' diffusion mark an epochal shift in industrial development, opening up opportunities previously not available and not imaginable (OECD, 2017). Besides, these changes are happening in a context where mixed trends are observed with a growing number of companies trying to re-shore manufacturing back to the rich/developed world and exploring new manufacturing locations in cheaper wage developing economies beyond China. Simultaneously, the 4IR may open up new windows of opportunity (Perez and Soete, 1988) by bringing in diverse forms of disaggregation and disintegration of the manufacturing process (Schwab, 2016: 62). It could open up new entry points for latecomers. In sum, the 4IR could be both a new window of opportunity and an additional source of difficulties for emerging and developing economies. The final impact will depend on these economies' capacity to recognise that Industry 4.0 and the 4IR need to assume a prominent role in the definition of their development strategies. It will also be determined by the policies and partnerships that these economies will put in place to shift from being users and adopters of innovations to innovators themselves.

This paper reviews and updates the changing GVC in Asia, especially since the outbreak of Covid-19 with a focus on the phenomena of reshoring and nearshoring, besides offshoring or onshoring. Looking back in the 2010s and into the 2020s, we can see three factors shaping new GVC in Asia. In the order of their appearance in time, the three elements are, digitalisation with 4IR since the 2010s, the US-China trade conflict since 2018, and the Covid-19 since 2020. Inter-relationships are as follows.

First, while the new digitalisation trend with 4IR has enabled reshoring, reshoring has not yet become a major decisive trend or remained as interesting cases until recently. However, the US-China trade conflicts and the Covid-19 has arrived as a major shock that has triggered radical changes in GVC, including reshoring and nearshoring. An emerging trend is that FDI firms in China and Asia are either reshoring their factories back to their home bases or relocating to nearby locations, such as Vietnam and other SEA economies. These changes can also be seen associated with a broad move by multinational corporations (MNCs) to increase the resiliency of their value chains and by the national government to promote domestic jobs by offering incentives to reshoring.

In what follows, we first discuss these three factors shaping GVC in Asia in section 3, and section 4 delves into three alternative modes of changing GVS, such as reshoring, nearshoring, and offshoring. Then, section 4 focuses on the Korean case to discuss the ongoing economic changes since the Pandemic and Korean firms' reshoring phenomena. Section 5 takes up the issue of nearshoring of MNCs escaping from China and into SEA economies. Section 6 concludes the paper by providing summaries and implications.

2. Three Factors for Changing GVC: Digitalization, US-China Conflict, and Covid-19

2.1. From Digitalization to Reshoring

Industry 4.0 or its broader version, the 4IR, was first noted by Schwab (2016) to refer to the new waves of innovations using different modern technologies, such as 3D printing, Internet of things (IoT), artificial intelligence (AI), big data, and cloud computing. If we take the term Industry 4.0, then industry 3.0 (or the 3rd Industrial Revolution: 3IR) is generally perceived to refer to ICT (information and communication technology) revolution since the 1990s (Taalbi, 2019). One issue is to what extent 4IR technologies are different from 3IR technologies (Lee and Lee, 2021).

The first dimension of difference between 4IR and 3IR can be addressed in terms of the degree of confluence (Schwab 2016: 1; OECD: 23), convergence (Kagermann et al., 2013), or combination of diverse emerging technologies in the 4IR era. For instance, EPO (2017) observed that “in contrast with the early days of digitization, the truly disruptive nature of 4IR originates in the combined use of a wide range of new technologies in a large variety of sectors of the economy.” Schwab (2016: 52) also mentioned that 4IR represents innovation based on the combination of multiple technologies in a novel way and a shift from simple digitization

that characterized the 3rd revolution. Moreover, convergence refers to the intersection between a new wave of operational technologies with internet-driven IT (Kagermann et al., 2013).

Another difference between the two eras might be observed in terms of the concept of general-purpose technology (GPT) (Helpman, 1998; Teece, 2018). GPT refers to technologies that are pervasive, exhibit strong complementary abilities, and thus can be used in a multitude of applications (Bresnahan and Trajtenberg, 1995). 4IR technologies might be considered GPT, given their transformative potential involving digitalisation and automation (Teece, 2018). This transformation may then lead to another paradigm shift (Dosi, 1982), which often involves new “key factor inputs.” Key factor inputs exhibit low and falling relative cost, supply availability over long periods, and potential for the use or incorporation in various products and processes throughout the economic system. The arrival of such inputs could result in a substantial boom in capitalist economies (Dosi, 1982) or serve as new engines of growth (Bresnahan and Trajtenberg, 1995).

Most importantly, the existing modes of GVC will change with the digitalisation trend associated with the 4IR in several aspects. First, 4IR is rewriting the manufacturing rules, as the cost of automation plummets, the cost of labour is becoming a less binding factor in location choice of production facilities. Thus, second, digitalisation with the 4IR is enabling a strong tendency toward reshoring manufacturing back to the rich world is possible (e.g., Apple in the US and Adidas making shoes in Germany). Third, global supply chains are expected to become flat, regional, and even national to reduce delivery time and be responsive to local tastes and local demand conditions. This phenomenon potentially reduces the level of economies of scale required for worldwide production, which is also an encouraging factor for reshoring.

‘Reshoring’ refers to the opposite concept of ‘offshoring,’ which denotes the situation in which firms leave their original country and decide to produce and manufacture their goods in different countries (Londsdale and Cox, 2000; Kakabadse and Kakabadse, 2002; Kinkel and Maloca, 2009; Stentoft et al., 2016; Piatanesi and Arauzo-Carod, 2019). On the other hand, reshoring is a phenomenon where firms return the production and manufacturing of goods to their country of origin (Gray et al., 2013; Ellram et al., 2013; Tate 2014; Fratocchi et al., 2014). For several years, reshoring has been an influential agenda for many countries. Countries like the US and Japan, have managed to obtain positive results from the policies that encouraged their firms’ reshoring (Y.Jung, 2020).

In case of the US, the *2015 Reshoring Initiative* reported that “combined reshoring and related foreign direct investment (FDI) trends continued strongly in 2015, up about 20 per cent

from record levels in 2013” (Pickett, 2020). The *2018 Reshoring Initiative* announced that “the combined reshoring and related FDI ... [added] more than 145,000 jobs, with an additional 36,000 in revisions to the years 2010 through 2017” (Reshoring Initiative, 2020). In terms of the number of firms that participated in reshoring, “reshoring and FDI in 2018 was up 38% from 2017 to 1,389 companies” (Moser, 2019). For the US firms, one of the most important motivating factors seems to access to markets and customers, given the immense size of the domestic markets and monetary incentives by the government (see Table 1). The CEO of Ford, one of the biggest companies in the US that are carrying out reshoring plans, stated in the interview that “[they] see a more positive US manufacturing business environment under President-elect Trump and the pro-growth policies and proposals that he’s talking about” (Cruickshank, 2017).

Table1: Factors for Reshoring/Offshoring in the US and South Korea

	Positive factor for reshoring	Negative factor for Reshoring (leading to offshoring)
US (Number of companies)	Government Incentives (844)	Quality/rework/warranty (301)
	Proximity to customers/market (818)	Freight cost (199)
	Skilled workforce availability/training (673)	Total cost (155)
	Image/brand, Made in USA (615)	Delivery (105)
	Eco-system synergies/Supply chain optimization (581)	Inventory (94)
South Korea (Proportion of respondents)	Tax cut	Disadvantages in market access (77.1%)
	Government subsidies	High wage cost (16.7%)
	Governmental human resources support	Rigid labour market (4.2%)
		Lack of incentives (0.7%)

Sources: (Kim, 2020), (Kim, 2018), ("Reshoring Initiative 2018 Data Report: A Record 1389 Companies Announce the return of 145,000 Jobs | Reshoring Blog | Reshoring Initiative", 2020)

In the Japanese case, a study by Inoue showed that the reshoring trend was visible from 2003 (Nakayama, 2014). Since 2015, many major Japanese manufacturers, such as Panasonic, Sharp, Canon, and Honda, have shown tendencies to increase domestic production of their goods (Kazuyoshi, 2019). Recently, the Tokyo city is known to have set aside 243.5 billion

Yen to use it as a "stimulus package to help Japanese companies move production out of China" (Kuo, 2020).

In contrast to the US and Japan, Korea had been less successful in reshoring despite some government efforts, and Korea's reshoring policies were often criticized for their ineffectiveness (Lim, 2020; J Lee, 2020). Compared to the US, Korea's disadvantage has first to do with the smaller size of domestic markets (see Table 1), and the second vital factors seem too high wage rates in Korea. According to Yang (2017), the proportion of negative evaluations of the Korean government's reshoring policies was more than double the proportion of positive evaluations. However, there are some signs that this will be changed, especially after the Covid-19, which will be discussed in the next section (3.2 and 3.3).

2.2.The US-China Trade Conflicts and FDI/Trade Diversion

Now, the second factor of re-shaping GVC in Asia is the US-China trade conflict since 2018. With Trump elected as the US president in autumn 2016, the tension between the US and China escalated, and the actions of the US toward China has led to a trade war. The US charged 25% tariff on \$34 billion of Chinese goods imported into the American market in spring 2018 and again on \$16 billion imports in late August, which immediately led China to retaliate in a similar manner (Steinbock 2018). The US-China trade war escalated until late 2019 with a compromising deal that halted escalation temporarily. Now with the new US president, Biden, it remains to be seen how the conflict will evolve into the future in power.

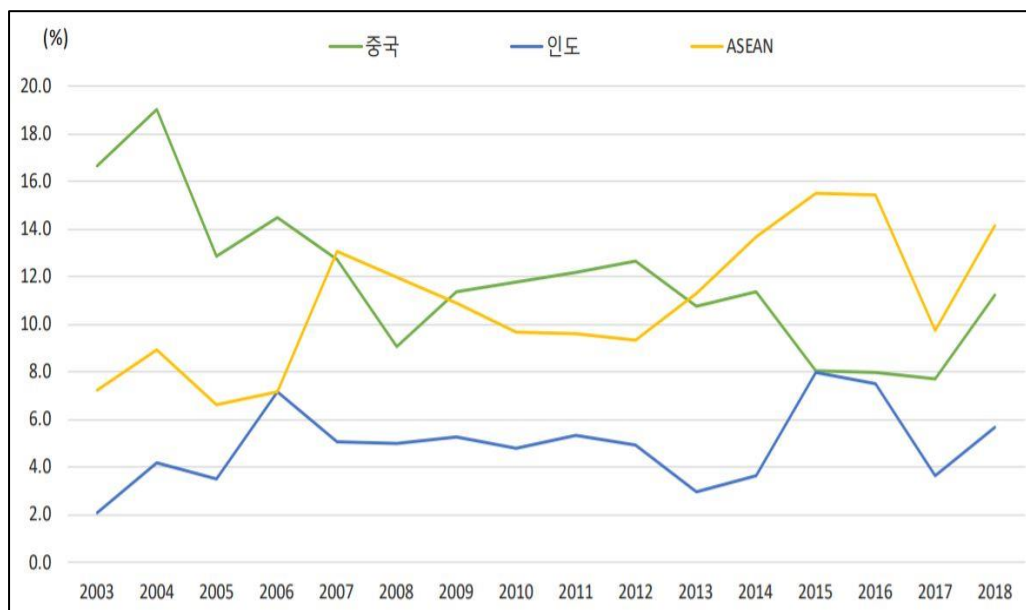
However, one noticeable phenomenon is the so-called trade and/or FDI diversion effect in which FDI firms in China relocate their factor out of China into a nearby country (a form of nearshoring), like Vietnam, or back into their home bases (reshoring). Also, an estimate by computable general equilibrium model by Wang and Yang (2019) is that China will be affected negatively by increased tariffs on its products by the US and that however, an increasing trade diversion will occur in terms of widening GVC-based indirect exports of made-in-China products via increased exports to the US by third countries adopting Chinese intermediate goods. Thus, when such indirect trade increases, the US might not succeed much in reducing China's export unless tariffs will be imposed on third countries that import intermediates from China. China is already the number one trading partner of most major economies in Asia and around the world, including EU economies.

In other words, the US-China trade conflicts would have trade diversion effects, such that third countries trading with the US may increase. Consequently, these third countries would

import more from China as they increase trade with the US. Thus, the sum of China’s direct and indirect trade with the US would not decrease very much to the extent that the volumes of such indirect or GVC-based trades increase (Wang and Yang, 2019). Furthermore, whereas China’s value-added exports of apparel and electronics to the US market may decline, China may increase its value-added exports to other third-country destinations as these countries increase their exports to the US. This kind of trade diversion also means a change in the GVC, and Vietnam is already rising to host more factories that are being relocated out of China. Such a trade diversion happened to Japanese trade after the 1985 Plaza Accord, which appreciated Japanese Yen suddenly (Liu and Woo, 2018).

In this trade/FDI diversion scenario, the SEA countries may emerge as the renewed hosting destination for FDI. Actually, [Figure 1] shows that green field FDI in SEA is already getting more prominent than those in China or India.

Figure 1: Percentage Shares in total Green field FDI to Emerging Economies
(note: the bottom line is for India; the top line from the far left is China)



2.3. The Covid-19 and the Resilient GVC

While the two factors discussed above, digitalisation with 4IR and the US-China trade conflict, have triggered the significant change in GVC in Asia toward reshoring, or nearshoring, the final impetus for such trend came with the Covid-19. The Covid-19 pandemic has been a critical shock to the world economy and its constituent economies, including the varieties of capitalist economies. Western countries have not recovered as quickly as Asian economies,

whereas they relied on East Asia to produce masks and other medical devices, including the test kits (Popov, 2020).

While the current GVC have revealed weakness associated with too widespread a fragmentation over diverse countries, the pandemic has been the final blow to globalisation, or over-fragmented GVC. The two preceding blows were the 2008-09 global financial crisis (GFC) and the US-China trade war. The GFC was the first blow to financial globalisation, followed by the setback against trade globalisation of the US-China trade war. Finally, the pandemic outbreak signalled a significant setback to production globalisation, and is re-writing new economics, namely *coronomics* as a combination of coronavirus and economics.

Coronomics means several new trade-offs, such as those between health safety by the lock-down and economic growth, and the one between efficient vs resilient GVC. Further, a national economy is forced to think hard a new optimal balance between manufacturing (plus agriculture) and services as the service-orientation meant more exposure to Coronavirus. Disruption of GVC in the post-pandemic era posts both additional difficulties and new opportunities for emerging countries seeking new modes of development and catch-up. Whatever alternative modes are possible, one point of the agreement would be a need to rely more on domestic resources for a more resilient domestic value chains development pattern if possible.

The next section discusses Korea's cases in terms of how Korea has been affected by these three factors and responded to the challenges of the Pandemic in particular.

3. Three Options for Changing GVC: offshoring, reshoring, and nearshoring

The trend of internationalisation and globalisation in the 1990s and 2000s was accompanied by moving manufacturing activity from the high-cost countries to low-cost emerging economies. This phenomenon referred to offshoring and was a dominant manufacturing location decision during that time (Ocicka, 2016). There are several motives to adopt offshoring, for instance, production cost saving, diversification of suppliers, and access to local markets (Londsdale and Cox, 2000; Kakabadse and Kakabadse, 2002; Kinkel and Maloca, 2009; Stentoft et al., 2016; Piatanesi and Arauzo-Carod, 2019).

However, global manufacturing firms recently are moving back to home countries en masse. This trend, as a counter-movement to offshoring, is referred to as *reshoring* (Gray et al., 2013; Ellram et al., 2013; Tate 2014; Fratocchi et al., 2014), *backshoring* (Kinkel, 2014; Canham and Hamilton, 2013) or *back-reshoring* (Fratocchi et al., 2015). We choose to use the term

reshoring among them in this study and define this term as “the company decision for relocating activities back to the home country regardless of the ownership of the activities relocated” in line with Ellram et al. (2013) and Gray et al. (2013).

One of the primary reasons many manufacturing firms have chosen reshoring was the national-level programs to revive the manufacturing sector, such as Germany’s “Industry 4.0” and the US’s “Make it in America”. Both programs provide grants to support reshoring firms (Stentoft et al., 2016). The reshoring trend has been receiving substantial attention in the academic society as well as the press, and consulting studies. The following factors have been suggested by researchers, as drivers of reshoring decision.

- Rise the fuel and transportation costs due to the long transport durations (Gray et al., 2013; Martínez-Mora and Merino, 2014).
- Rise the labour cost in host countries (Kinkel and Maloca, 2009; Gray et al., 2013; Tate et al., 2014).
- Grow concerns about environmental and workforce conditions in host countries (Mueller et al., 2011; Gray et al., 2013; Tate, 2014).
- Improve the home country’s labour productivity (Kinkel and Maloca, 2009; Gray et al., 2013; Tate et al., 2014).
- Gain “made in home country” effect, which may take both prestige and the possibility of charging premium prices (Vanchan et al., 2018).
- Increase government incentives from the home countries (Gray et al., 2013; Vanchan et al., 2018).
- Upgrade manufacturing technologies using the home country’s skilled labours and high-techs (Piatanesi and Arauzo-Carod, 2019).
- Slow the global supply chain due to the shipping industry adoption of slow steaming (Hull, 2005).
- Increase real and anticipated volatility in currency valuation (Ellram et al., 2013).
- Increase the potential failures of intellectual property protection from host country firms (Dholakia et al., 2012; Gray et al., 2013; Tate, 2014).
- Harm innovation because of the geographical distance between R&D centres in the home country and production centres in the host country (Tate, 2014).
- Offer the fast response time and leaner supply chain associated with locating manufacturing closer to the end consumers (Williamson, 2012).

Gray et al. (2013) introduced four options of reshoring: (1) *in-house reshoring*, in which manufacturing activities transfer from wholly-owned offshore facilities to wholly owned home-based facilities; (2) *reshoring for outsourcing*, in which manufacturing activities transfer from wholly-owned offshore facilities to home-based suppliers; (3) *reshoring for insourcing*, in which manufacturing activities transfer from offshore suppliers to wholly owned home-based facilities; (4) *outsourced reshoring*, in which manufacturing activities transfer from offshore suppliers to home-based suppliers.

Meanwhile, it is found out that the nearshoring is another alternative for reshoring in the circumstance that bringing back production facilities to the home country was not ideal because of enormous production cost gaps between home and host countries (Piatanesi and Arauzi-Carod, 2019). This term's origin, nearshoring, is unclear, but it was most likely to be coined by Softtek, a Mexican IT solution firm, in 1997 (Purkayastha and Samad, 2014). Nearshoring refers to a relocation of previous overseas activities to countries close to the home country to achieve advantages of both offshoring and reshoring, but without suffering from the limitation of either. Nearshoring aims to reduce geographical, cultural, and linguistic distances, as an intermediate strategy between moving back entire production facilities and keeping them in host countries far from home countries.

The expected benefits of nearshoring are as follows (Piatanesi and Arauzi-Carod, 2019):

- Nearshoring is lower labour and production costs than reshoring.
- Nearshoring is lower transportation costs than offshoring.
- Nearshoring is better coordination than offshoring.
- Nearshoring is a quicker response to market change and volatile consumers' preferences than offshoring.
- Nearshoring is more geographical and cultural proximity to final customers than offshoring.

4. Reshoring Issues and the Korean Economy after the Covid-19 Outbreak

4.1. Overview of the Impact of the Pandemic in Korea

The Korean economy was expected to grow about 2% or less per annum before the outbreak of the Covid-19. According to the government forecast, the economy is expected to grow at minus one per cent per annum after the outbreak. However, some other forecasts are even lower than that, especially after the second outbreak in December 2020. The number of the infected people skyrocketed to more than 500 peoples per day in February 2020, with its peak being

813 in late February, but was soon reduced sharply to about less than 200 in March and then to less than 50 July 2020. But, the number re-rose to about 1,000 peoples in December 2020.

However, compared to the fact that the worldwide death rate of the Covid-19 is 5% or more (Worldometer, 2020), Korea has taken relatively reasonable control of the Covid-19. Such control was owing to the all-out efforts of health authorities, medical doctors and staffs who focused on the quick and comprehensive tests of the suspected people, and the organized system of treatment of the patients based on sound health infrastructure. Most importantly, Korea had suffered from several virus/disease cases in the recent years, such as SARS (severe acute respiratory syndrome) virus in 2002 and MERS (Middle East Respiratory Syndrome) virus in 2012, and thus built various systems to handle similar situations. Further, the society had switched to untact modes of businesses, schooling and all other social activities and gatherings, and strictly enforced the policy of demanding the citizens to wear masks in public spaces. All schools have switched to online teaching using zoom and other methods, whereas restaurants were never closed, unlike cities in other countries.

Despite the domestic situation being better than other severe countries, Korean businesses were badly hit by the Covid-19, especially service businesses that relied on people's physical activities, such as tourism, sports and entertainment industries. Manufacturing businesses were equally hit severely when their production relied on imports of intermediate parts in the form of the GVC spread over many countries. In contrast, some IT service companies offering diverse online-based serves, like SNS, game, streaming, etc., have prospered and their stock prices have kept increasing after some initial decline.

In the meantime, one of the early responses by the government was to distribute 'emergency support cash' of about 800 dollars per family so that they could boost consumption. Now, the Korean society, government, and economy expect the situation to last longer and thus are taking measures to bring in new practices and build new digital infrastructure, such as online education, health services, job markets, etc. As a part of measures, the Korean government announced the 'Korean New Deal' programme comprising three aspects: the green new deal, the new deal on social safety nets, and the digital new deal. Overall, Koreans are now trying to take advantage of the Covid-19 as momentum to facilitate the digital transformation of society, economy and business.

4.2. Korean firms' week response to reshoring but its increasing trend after Covid-19

Korean firms have started coming back home after the ‘*Act on Assistance to Korean Offshore Enterprises in Repatriation (the Act for Reshoring)*’ came into effect in January 2014. The accumulated number of Korean firms being returned to the home as of August 2020 is 80 firms. However, this number is much lower than those of the US and Japan. The total number of US firm reshoring the US is 3,327 for nine years, from 2010 to 2018. For Japan, the total number of reshoring firms is 6,714 for ten years, from 2009 to 2018 (see Table 2). However, in 2019 and 2020, the number has increased to 16, from only 9 in 2018.

Table 2: The number of reshoring firms by year: Korea, US, and Japan

(unit: firm)

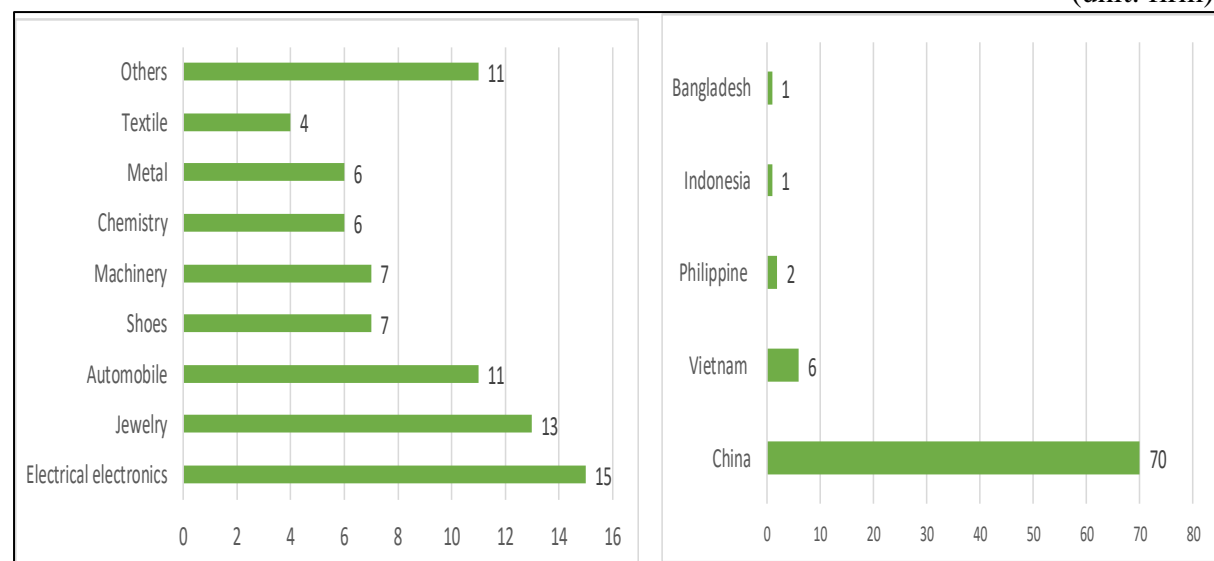
Country	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Korea	-	-	-	-	-	20	3	12	4	9	16	16	80
US	-	95	157	232	432	340	294	267	624	886	-	-	3,327
Japan	659	608	572	510	554	628	724	650	725	612	-	-	6,242

Source: KOTRA (Korea Trade-Investment Promotion Agency)’s internal report for Korea’s data; Reshoring Initiative (2018) for the US’s data; METI (Ministry of Economy, Trade and Industry)’s statistic report (2019) for Japan’s data; KIET (Korea Institute for Industrial Economics & Trade) (2020).

As [Figure 2] shows, Korean firms’ reshoring is frequently found in electrical electronics, Jewelry, and automobile industries, and they mostly came back from China.

Figure 2: Korean reshoring by industry (left) and by host country (right): 2014-August 2020

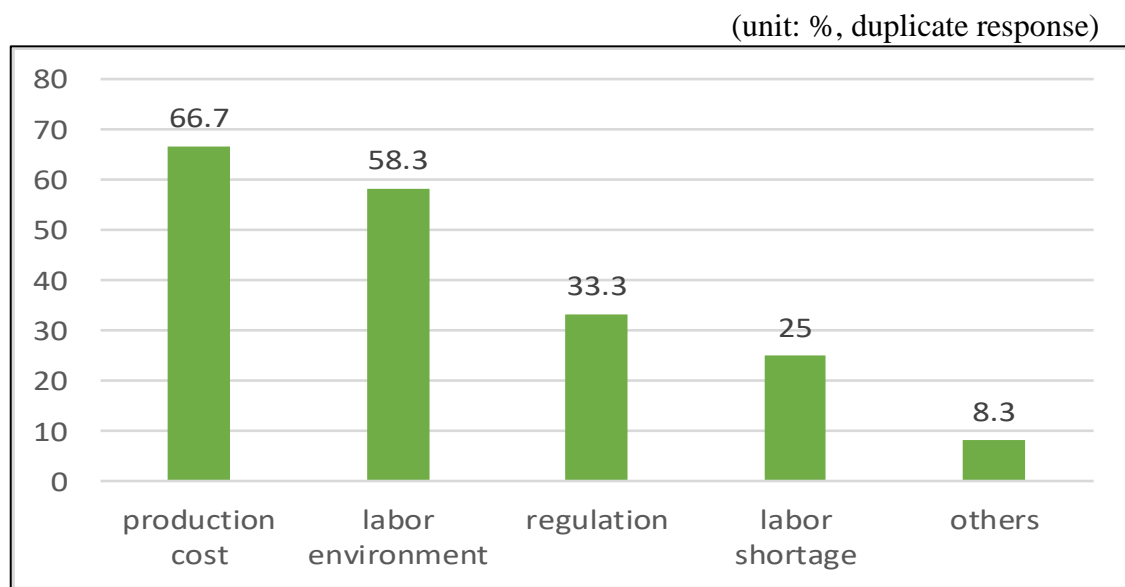
(unit: firm)



Source: KIET (Korea Institute for Industrial Economics & Trade) (2020).

According to survey results performed by a domestic media, Korea's firms have been reluctant to do reshoring because of several reasons (see Figure 3). The top four reasons that they have been hesitating to return to Korea are mostly related to labour. For instance, there is the increase of minimum wage, a decrease of statutory working hours, the hardship of hiring workers for the dirty, dangerous, demanding jobs, and the policies favoured to Labour Union. In short, Korea is a location where firms have to bear a considerable labour cost for business operation. Moreover, the Korean government strongly regulates industrial site volume in the metropolitan area and environmental protection and collects high corporate tax.

Figure 3: Reasons for being reluctant to execute reshoring: Korean firms

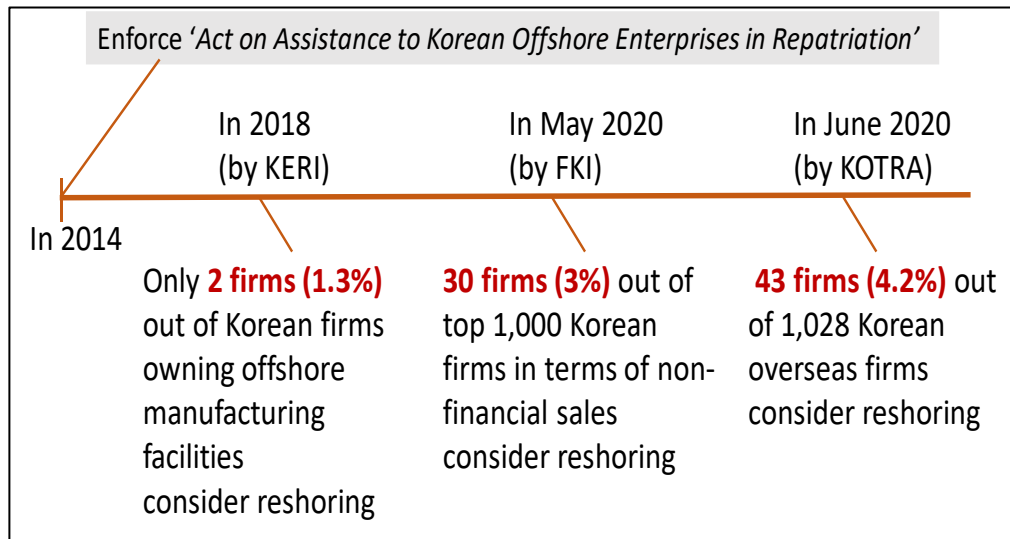


Source: Maekyung (news article on 19 June 2020).

However, there is a sign of change in which Korean firms' intention of reshoring slightly increased after the Covid-19. This change has been witnessed three times in the survey from 2018 to 2020. As [Figure 4] presents, three different private or public institutions took a survey, which asked Korean firms about their reshoring intentions. In 2018, Korea Economic Research Institute (KERI), as Korea's first private economic research institute, asked the Korean firms who owned offshore facilities out of top 1,000 Korean manufacturing firms whether they intended to return to Korea. The result is that only two firms (1.3%) had been considering the reshoring. In May 2020, the Federation of Korean Industries (FKI), which consists of Korea's major conglomerates and associated members, took a survey targeting top 1,000 Korean firms in terms of non-financial sales. The 30 firms out of them (3%) responded to coming back to Korea. Also, the Korea Trade-Investment Promotion Agency (KOTRA), a state-funded organization aiming to facilitate Korea's rapid export-led economic development, in June 2020,

asked 1,208 Korean overseas firms whether they are considering the transfer of their offshore facilities to Korea. The number of firms positively responding to that question slightly increased up to 4.2%.

Figure 4: Korean firms' intention of reshoring over the time: from 2018 to June 2020



Source: Gyeonggi Research Institute (2020).

Such a rise of Korean firms' reshoring intention is primarily considered to be due to Covid-19 and two-times-revisions of the Act for Reshoring in 2019 and 2020. The Act newly adds the following clauses.

- Expand the reshoring support industries from only the manufacturing industry to including IT and knowledge service industries (in 2019) and the industries associated with preventing epidemics and immunities (in 2020).
- Relax sanctions on the rental of public land (in 2019) and easing location restriction (e.g., restriction of the metropolitan area) for accompanying returnee firms (in 2020).
- Permit 50 years-long-term rentals of public land (in 2019).
- Establish the support committee for reshoring firms and reinforcing the committee's role (in 2019).
- Enhance the support system for helping the reshoring firms (in 2019).
- Relax conditions of liquidation, disposition and downscale on offshore facilities only if the facilities belong to the high-tech or are indispensable for a stable domestic supply chain. (in 2020).
- Grant reshoring-support to the firm that the Foreign Investment Promotion Act has supported for ten years (in 2020).

- Add support programs for the cooperation-type returnee firms (in 2020).

4.3. Typology of Post-Pandemic Reshoring in Korea

Despite the domestic situation being better than other countries, manufacturing businesses were equally hit severely when their production relied on imports of intermediate parts in the form of the GVC spread over many countries. The manufacturing industry's main hardship was that the existing supply chain was disrupted. They had to find alternative solutions to handle the current situation.

One of the cases in which the Covid-19 severely hit the manufacturing industry was car factories. Wiring harness, an essential component in cars' production, is an assembly of electric cables that transmit all the necessary information for vehicles to function. Most car manufacturers in Korea used to have their wiring harnesses produced in China, but as the Covid-19 struck China, wiring harness factories in China had to shut down. Consequently, car factories could not operate since wiring harnesses are necessary for earlier car production processes. Thus, many car factories ended up temporarily shutting down until the issues regarding wiring harness supplies were properly addressed (Kim, 2020).

The firm that produces testing kits for the Covid-19, Solgent, also faced similar problems. As the virus spread quickly, Korean testing kits received spotlights from many countries due to their quality, speed, and relatively stable supply. As a result, the demand for Korean Covid-19 testing kits skyrocketed. However, the fact that they were relying on imports from Germany to supply the plastic tubes necessary for the production of testing kits became their obstacle. The German firm that used to supply the plastic tubes to Solgent suddenly broke the supply chain for the plastic tubes, and Solgent was now on the verge of not producing the testing kits until they arranged a new supply chain for the plastic tubes.

In response to these challenges set in front of Korean firms due to the Covid-19, many expect that reshoring of firms that have their manufacturing based in foreign countries could provide solutions to many of the ongoing issues. If the government manages to provide better labour environment and more flexible restrictions for the domestic manufacturers so that many firms are motivated to move their manufacturing base back to Korea, reshoring would not only resolve the issues concerning the safety of global supply chain under Covid-19 but also is expected to create more jobs in the domestic labour market (Kim, 2020).

Investigation of recent cases of reshoring involving Korean firms after the Covid-19 suggest that they could be categorized into three types: (1) reshoring of labour-intensive

products, (2) reshoring by flattening of GVC, and (3) reshoring accompanied by large scale automation of manufacturing process or smart factorization. The three types of reshoring will be further specified through case studies, and in the table form (see Table 3).

Table 3: Three types of reshoring in South Korea

	Definition	Cases	Policy measures in need
Type 1	Reshoring of labour-intensive products (From foreign production to domestic production)	THN (Wiring Harness)	Financial Assistance (Subsidies)
		Iksan Jewelry Production Cooperative	Tax Cut
Type 2	Reshoring by flattening of GVC (From foreign processing & domestic assembly to domestic processing & assembly)	Aju Steel	Financial Assistance (Subsidies)
		Solgent (Covid-19 testing kit)	Tax Cut
		OTOS (PAPR)	Technical Assistance
		Mask factories in Korea	
Type 3	Reshoring by large scale automation or smart factorization.	G&G Enterprise (Clothing manufacturer)	Financial Assistance (Subsidies)
		Treksta (Shoe manufacturer)	Tax Cut
		Hyundai Mobis	Technical assistance concerning automation

Source: the authors

Type 1: Reshoring of labor-intensive products

Reshoring of labour-intensive products would not be the dominant type, because wage rates in Korea are already very high (J. Lee, 2020) and might be relevant if the possibility of automation of the production process is limited. THN, a firm that produces wiring harnesses for major Korean car companies recently agreed with the local government of Daegu city and has moved its factory back to Korea (Koo, 2020). Because wiring harnesses require manual labour in many production processes, it is quite burdensome for the firms that produce wiring harnesses to return to Korea. To lighten the burden of firms, the government is concentrating on providing support for the partial automation of the manufacturing process so that its labour intensity is lowered (Yoo and Park, 2020). Still, there would have to be more support systems to attract more factories back to Korea since there are limitations to the extent to which automated manufacturing process could replace manual labour.

Another case in which a labour-intensive industry participated in reshoring is the jewellery industry that moved their factories to Iksan, Korea, where the government attempted to build a jewellery production cluster. Jewellery manufacturing also requires a lot of manual labour, so the government support was necessary for the reshoring of jewellery industry. However, government support for the jewellery producing firms were ill-managed. It was difficult for many firms to meet the conditions, such as meeting the quota of hiring a certain number of workers, due to various issues such as high labour costs and lack of information. Consequently, many factories in Iksan failed to receive subsidies and are no longer operating (Kim, Oh, and Kim, 2020).

Hardships that cases illustrated in type 1 of reshoring go through are mostly associated with market failures caused by imperfect information or high costs that firms cannot manage. Although the government may already be providing support for the automation of manufacturing processes and subsidies for the labour-intensive industries that are reshoring, it seems that the government will have to deal with the information failures, and come up with more flexible conditions for the subsidies and better support systems such as further reduction of tax or higher subsidies to attract more labour-intensive industries back to Korea.

Type 2: Reshoring by flattening of GVC

One notable example of reshoring that restructured the GVC was Aju Steel, a company that produces steel sheets, which moved its factory from the Philippines to Gimcheon, Korea (J. Park, 2020). Before moving the factory, Aju Steel has been exporting manufactured steel sheets to China to be processed in China and then be finally exported again to Japan. Returning to Korea, Aju Steel was able to automate the manufacturing process so that they would no longer have to have steel sheets processed in China. This automation enabled the simplification of the global value chain. Reshoring and the manufacturing process automation allowed the firm to export their products directly from Korea to other countries, like Japan, and the firm could now skip the step of exporting the products to China for processing. Furthermore, Aju Steel expects even more benefits after implementing smart technology in their manufacturing process and establishing a 'Smart Factory' (D. Lee, 2020a).

Another instance of reshoring that flattened the GVC is Solgent, which was mentioned above as one of the Korean manufacturers heavily impacted by the Covid-19. As a firm that has been working on a molecular diagnosis, Solgent was under high pressure of increasing their productivity during the earlier months of 2020 due to the spread of Covid-19. However, due to

the broken supply chain of plastic tubes necessary for the manufacturing process and imported from Germany, they were about to shut down the factory and were unable to supply the testing kits to other countries with which they made export contracts. While Solgent struggled to find alternative methods to supply plastic tubes, the CSR program of Samsung Electronics supported the manufacturing process improvement. Thanks to the support, Solgent was able to produce their plastic tubes in their factory located in Korea and were able to improve the efficiency of the packaging process, which eventually led to a 73% increase in productivity (Choi, 2020).; this increase in productive efficiency included reduction of the production line from 148 meters to 98 meters, which is a 34% decrease in its length.

Consequently, the number of testing kits being produced jumped from 11,900 kits a week to 20,571 kits a week, and the proportion of defective containers reduced by 40% (Choi, 2020). The domestic production of plastic tubes was able to restructure the GVC so that Solgent could fully domesticize the production of Covid-19 testing kits. Originally, Solgent had to rely on German firms to supply the plastic tubes, so there was an extra step of importing plastic tubes from Germany in their production process. However, as they became capable of supplying the plastic tubes on their own, they could restructure the GVC and skip the step of importation.

A similar case in which a major company supported the manufacturing process improvement is OTOS, a Korean firm specialising in protective eyewear and powered air purifying respirators (PAPR), a respiratory device mainly used for medical purposes. After the spread of Covid-19, PAPR has been a must-wear device for the medical workers of all parts of the world. However, most of the firms' factories being located in China or various countries other than the country they are based in, many countries, especially the US, had difficulties arranging to supply the PAPR for their medical staffs; the countries in which the factories were located limited the number of supplies going out of their countries to secure the supply of PAPR for their domestic usage. Meanwhile, OTOS also struggled to secure medical hose supply since they entirely relied on the imported supply of medical hoses coming from the US. To improve the manufacturing efficiency and productivity, the same CSR program of Samsung Electronics supported the productivity, quality, and physical distribution innovation of OTOS. The cooperation of OTOS and Samsung Electronics also managed to localize medical hose manufacturing, enabling the restructuring of GVC. OTOS could now skip importing the medical hoses from factories in the US and fully localized the manufacturing process (Ahn, 2020). This domestication of PAPR manufacturing process increased productivity, resulting in

the number of PAPR devices produced jumping from 50,000 to 260,000 per month (Korean Government, 2020).

Mask manufacturers also had their supply chain simplified thanks to the technology support provided by the government and Samsung Electronics. Most of the firms used to import the metal mould for masks from China but after they got support from Samsung Electronics, they were provided domestically produced metal moulds. They thus were able to build additional production lines with better production efficiency that led to a significant jump in productivity. Thanks to the technical assistance, they no longer had to rely on factories in China for metal moulds, and the defective proportion of final products declined while productivity rose. According to the statistics given by the Ministry of SMEs and Startups, productivity jumped by 20%, and time spent during the manufacturing process declined by 50% after the technical assistance increased the manufacturing efficiency.

A firm called Hwajin exemplifies the jump in manufacturing efficiency caused by the technical assistance – their work efficiency increased from 50% to 90% in only a few weeks. One of the firms even lacked the technology to install the manufacturing equipment they bought to increase productivity, but soon after the support staffs were put into the scene, installing the equipment was only a matter of time. There were various mask manufacturers each experiencing different hardships. However, thanks to the support of the government and Samsung Electronics, each firm could overcome their obstacles and manage to achieve a higher output level. After the technical assistance, the total output level of mask producing firms in Korea increased by 52%, from 710,000 masks to 1,080,000 masks per day (*Power of Connection, Implementation of Smart Technology on Masks*, 2020), (*Virtuous Circle of Sharing*, 2020).

Cases of reshoring type 2 are indicative of capability failures faced by the SMEs. As it can be seen from the cases illustrated above, their productivity and manufacturing efficiency jumped to a great extent once the technology of large major firm was implemented so that their potential could be entirely performed. The SMEs learned how to install more efficient equipment to the production line, use domestically produced metal moulds they received from Samsung, and shorten the length of their production line for better work efficiency. These instances suggest that financial assistance is not sufficient to resolve capability failures; both technological assistance and financial assistance should be provided to encourage the firms that are expected to go through both market failure and capability failure.

Type 3: Reshoring by large scale automation or smart factorization

Reshoring accompanied by large scale automation of the manufacturing process, or smart factorization provides a solution for many firms that are reluctant to come back to Korea due to high labour costs. Although it may be difficult for labour-intensive industries as shown in the first category, other industries or product whose manufacturing and production of goods could be automated and whose production technologies have a place for the implementation of smart technology are likely to benefit from reshoring. It is possible because they will be able to receive subsidies for factory automation or transformation into Smart Factor from the government.

For instance, G&G Enterprise, a company that mainly produces clothes, recently moved its factory from Indonesia to Iksan, Korea. Returning to Korea, G&G Enterprise received subsidies and invested a considerable amount of money so that they could build a ‘Smart Factory’ where they could hire fewer employees but still produce high-quality goods with better productivity and efficiency (D. Lee, 2020c). The smart technology manages all production processes. By implementing 3D knitting technology, the firm accelerated the manufacturing process and managed not to overburden the local government’s employment concerns by hiring young people in charge of the 3D knitting machines. They also managed to use eco-friendly machines in their factory to not leave any wastewater after the manufacturing process (D. Lee, 2020b).

Another case of reshoring with the smart production process and factory automation is the shoe factories in Busan. Beginning from Treksta, many shoe factories that used to be based in countries with low labour costs returned to Korea. However, many companies except for Treksta failed to settle due to high labour costs, and Treksta ended up being almost the only successful case of reshoring among the shoe factories that returned to Busan (Ko, Seo, Jeon, Kim, Ahn, and Boo, 2017). Treksta managed to automate the production process based on the competency they used to have. It became a successful case since it could gain competitiveness by raising productivity with better technology (Ko, Seo, Jeon, Kim, Ahn, and Boo, 2017). For more firms to participate in the reshoring and manage to settle, there would have to be some supplementation in the system so that the firms that are not competent enough could also enhance their capabilities and compete in the market and settle in Korea.

The last case of reshoring with the smart production process and factory automation is an affiliate of Hyundai Motors, namely Hyundai Mobis, one of the first large businesses that took part in reshoring (D. Lee, 2020d). Hyundai Mobis invested a tremendous amount of money for

automating the factory and implementing smart technology. However, given the inflexible policies and rules for reshoring subsidies, the government department refused to give the subsidies that they said would give when Hyundai Mobis first began building its factory in Ulsan, Korea (Seo and Hwang, 2020). Even though Hyundai Mobis is a big business with stable revenues, they said that this cancellation of government subsidies greatly affected the firm negatively (Lim, 2020; Joo, 2020). The government will have to reassess their standards for reshoring firms and their conditions for government support so that other firms will not have to go through situations in which they suddenly become unable to receive what they expected to receive due to circumstances that they do not have any control over.

4.4. Implications for Reshoring Policies

Regarding the type 1 case with labour-intensive products, reshoring might not require complicated technological steps to encourage the firms to return, other than strong monetary or tax incentives. Because there is a limit to which the firms can automate the process or increase the productivity and manufacturing efficiency, the factory's location would not make much difference for the firms in the labour-intensive industry except for the total cost of production. In other words, these firms could have already had their factories operating in Korea, but the only reason they were manufacturing their goods in other countries was the high labour costs that they had to pay if they produced their goods domestically. Therefore, policies that provide them with financial assistance and other measures to decrease the production costs will be enough to encourage the firms in the labour-intensive industry to take part in reshoring. For instance, the CEO of THN, one of the firms that were categorized as the firm that took part in reshoring type 1, answered in the interview that the various financial incentives provided by the local government induced the firm to decide to return its factories to Korea (Shim, 2020).

However, as discussed above, type 2 and 3 should be dealt with more complexity than type 1. Many reshoring cases introduced in reshoring type 2 and 3 were possible thanks to the cooperation among the government agencies, leading companies (e.g., Samsung), and smaller enterprises for technological assistance. For instance, Solgent, OTOS, and mask producing factories were all able to automate and domesticize the manufacturing process, thanks to the government subsidies and Samsung's technical support. After the technical support, the productivity of smaller enterprises jumped by a significant percentage. This jump shows that many smaller enterprises were performing under their potential due to lack of know-how and

competencies. Therefore, we can observe that reshoring types 2 and 3 need both financial assistance and technical support to overcome their capability failures.

Although the South Korean economy has shown rapid growth in the last few decades, there is still a long way to go in terms of the persistent competence gap between large and small or medium-sized enterprises. In emerging countries, the lack of capability in small and middle-sized enterprises is so severe that many of them are underperforming their potential. This productivity gap could be best seen through the case of Solgent, since their productivity jumped by 73% in only six weeks thanks to the technical development made through the help of Samsung. Mask producing firms can also provide empirical evidence of how much the middle-sized firms in Korea were underperforming. E&W, one of the mask manufacturers, could not even install the new equipment they purchased due to lack of capability. However, as soon as Samsung provided them with technical assistance, issues concerning the installation of new equipment were quickly resolved (*Power of Connection, Implementation of Smart Technology on Masks*, 2020), (Virtuous Circle of Sharing, 2020). Without the help of major large firms, small and middle-sized firms cannot raise their productivity due to this lack of capability. These cases show that government support for reshoring types 2 and 3 should not stop at the level of tax cuts or financial subsidies but should also be expanded to the extent of technological support. Therefore, now governmental supports focus on the third type of reshoring, namely smart factorization and large-scale automation of manufacturing processes.

Initially, the US's main driver of reshoring was tax cuts and tax incentives, and many firms in the US found these policies appealing. However, this was possible since the productivity gap between large and middle or small-sized firms in the US was not so big, and the issue of capability failure in middle or small-sized firms was not severe. In Korea, the productivity gap between the large and middle or small-sized firms is very big. Since many middle or small-sized firms are lacking in capability, just providing tax cuts and financial assistance would not be enough to bring these firms to the home countries; they need technical assistance, too.

5. Nearshoring in Asia: From China to Southeast Asia?

5.1. The exodus from China through nearshoring and reshoring

Many global firms who had placed the production bases in China are recently moving out of China to SEA countries (nearshoring) or returning to their home countries (reshoring). The following six factors can explain their exodus from China:

1. Avoid the disadvantages caused by the US-China trade conflicts.
2. Decline China's attractiveness as both production and sales bases due to the increase of China's wage, the decrease of China's demand, and the rise of market competition in China.
3. Take advantage of incentives provided by the home country government.
4. Respond quickly to change in customers' preferences.
5. Increase production quality and production flexibility through using highly advanced technology (e.g., smart factory).
6. Protect intellectual property from Chinese firms.

The above first and second factors equally drive global firms to do both nearshoring and reshoring, while the third, fourth, fifth, and sixth factors, as pull factors of the home country, induce them to do reshoring. The significant number of cases which carried out nearshoring or reshoring due to the above factors is found. The cases of an exodus from China consist of three categories: (1) global firms' relocation to SEA; (2) global firms' reshoring back to home countries; (3) Chinese firms' nearshoring to neighbouring countries. [Table 4] presents several cases in each category.

As [Table 4] shows, the countries toward which global firms move from China are mostly SEA countries, such as Vietnam, Thailand, Indonesia, Philippine, and India. The most preferred country is Vietnam, and the most frequent reason for the relocation of manufacturing activity to SEA is avoiding US-China trade conflicts. The nearshoring happened in various production items, such as a toy, sports shoes & equipment, electronics, IT H/W, automobile and so on.

Reshoring going back to the home country was found in diverse industries and many advanced economies, U.S. Japan, Germany, Italy, Austria, Taiwan, and South Korea. The effort of transferring manufacturing activity to a better location than China is not exceptional for Chinese firms, as other global firms. Therefore, Chinese firms in bike, tire, aluminium and steel sectors moved their manufacturing activities to Vietnam, Siberia, and South Korea.

Table 4: Cases of exodus from China through reshoring and nearshoring

Category	Firm name	Production item	Home country	Moving to	Reasons for relocation
	Hasbro Inc.	Toy	U.S.	Vietnam	US-China trade conflicts
	Brooks Sports Inc.	Sports shoes	U.S.	Vietnam	US-China trade conflicts

Category	Firm name	Production item	Home country	Moving to	Reasons for relocation
Global firms' relocation (China→SEA)	Apple Inc.	Electronics	U.S.	Vietnam, Indonesia, India, and Malaysia	US-China trade conflicts Lack of labours
	Ever Win International Co.	Smartphone & PC components	U.S.	Philippine	US-China trade conflicts Increase of China's wage
	Ricoh	Camera & office equipment	Japan	Thailand	US-China trade conflicts
	Sharp	LCD display	Japan	Vietnam	US-China trade conflicts
	Olympus	Optics & camera	Japan	Vietnam	Decrease of Chinese market attractiveness
	Kyocera	Copier & multi-function printer	Japan	Vietnam	US-China trade conflicts
	Sony	Smartphone	Japan	Thailand	Increase of China's wage
	Panasonic	Car audio	Japan	Thailand	US-China trade conflicts
	Hyundai-Kia	Automobile	South Korea	Indonesia	US-China trade conflicts
	Lotte Chemical	Chemical	South Korea	Malaysia	US-China trade conflicts
	Head International	Sports equipment	Austria	Philippine	US-China trade conflicts Increase of production cost in China
	Delta Electronics Inc.	Electronics & IT H/W	Taiwan	India	US-China trade conflicts
Global firms' reshoring (China→Home country)	Intel Co.	Semiconductor	U.S.	U.S.	US government's incentives (corporate tax reduction)
	Apple Inc.	Smartphone	U.S.	U.S.	US government's incentives (corporate tax reduction)
	Adidas AG	Sports wear	Germany	Germany	Increase of production quality Increase of production flexibility Improvement of proximity to customers
	Electrostar GmbH	Electronics	Germany	Germany	Increase of production quality Increase of production flexibility Quick response to change of customers' needs
	Autec AG	Adventure toy	Germany	Germany	Increase of production quality Increase of production flexibility Quick response to change of customers' needs Protection of IP from Chinese firms
	Piquadro S.p.A	Luxury leather bags	Italy	Italy	Increase of production quality

Category	Firm name	Production item	Home country	Moving to	Reasons for relocation
					Increase of China's wage
	Mitsubishi Electric Co.	Electronics	Japan	Japan	US-China trade conflicts
Chines firms' nearshoring (China→neighbouring country)	Xinlong Car Materials	Bike components	China	Vietnam	US-China trade conflicts Increase of China's wage
	Shandong Linglong Tier Co.	Tire	China	Serbia	US-China trade conflicts Increase of China's wage
	Mingtai	Aluminium	China	South Korea	US-China trade conflicts
	Tshingshan Iron & Steel	Iron & Steel	China	South Korea	US-China trade conflicts

Source: KOTRA (2019); Jung (2020); ChosunBiz (news article on 27 January 2021); Seoul Economic Daily (news article on 22 January 2021).

5.2. Cases of nearshoring involving Korean firms

Samsung

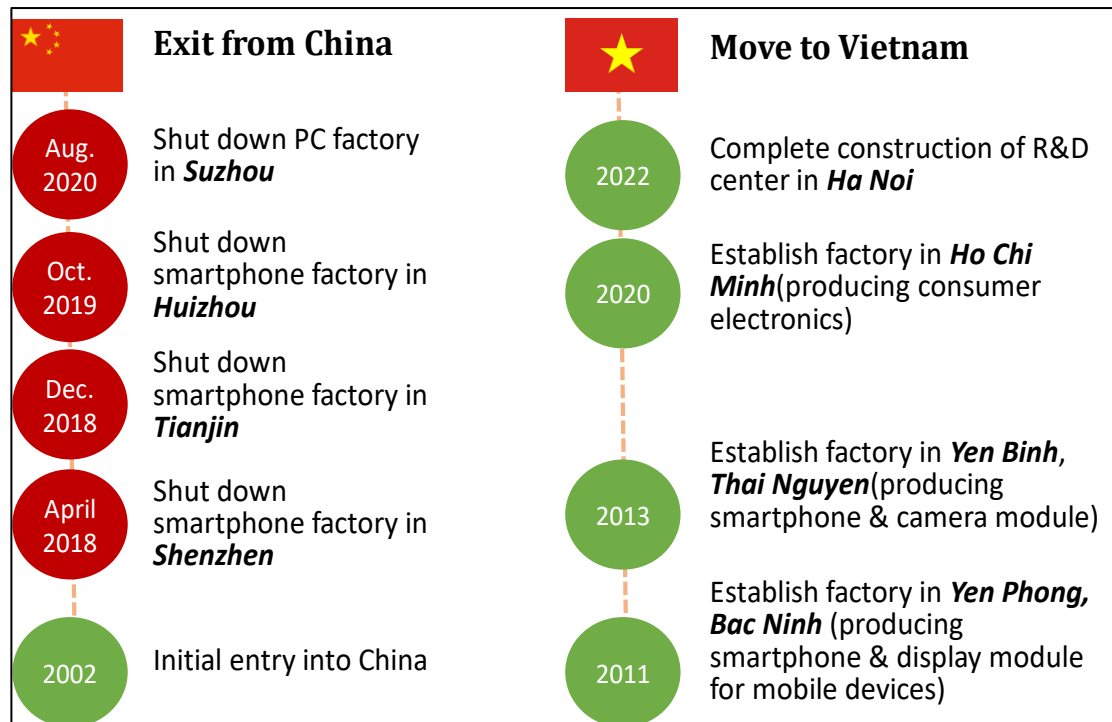
In 2002, Samsung first entered China and achieved acquiring 30% share of the Chinese smartphone market in 2012. However, its Chinese market share recently dropped up to 1% along with the rising of competitive Chinese smartphone brands since then. As Figure 5 shows, Samsung eventually has started shutting down Chinese factories, from Shenzhen, Tianjin, Huizhou, to Suzhou, consecutively from April 2018 to August 2020. The primary reasons why Samsung decided to exit from China are:

- The radical decrease in its market share in China,
- Higher production cost than that of Vietnam and India, and
- Increase of tariff risk due to US-China conflicts.

Samsung has moved its manufacturing facilities from China toward Vietnam since 2011. Samsung's first nearshoring was to establish a factory which produces smartphone and display module for mobile devices in Yen Phong, Bac Ninh, Vietnam. In 2013, Samsung also built the second factory manufacturing smartphone and camera module, in Yen Binh, Thai Nguyen, Vietnam. Moreover, it established a consumer electronics complex in 2020 and recently started producing TV from there.

Lastly, Samsung acquired the approval to establish an R&D centre in Ha Noi from Vietnam's government and planned that the construction of the R&D centre would complete by 2022. In conclusion, Samsung is now producing almost 60% of the smartphone in Vietnam. It means that Vietnam becomes the next promising manufacturing bases of Samsung thanks to the nearshoring from China to Vietnam.

Figure 5: Nearshoring of Samsung: from China to Vietnam



Source: Lee, Hyuntai and Jung, Dosook (2020); Financial News (news article on 6 April 2016).

Hyundai and Kia Motors

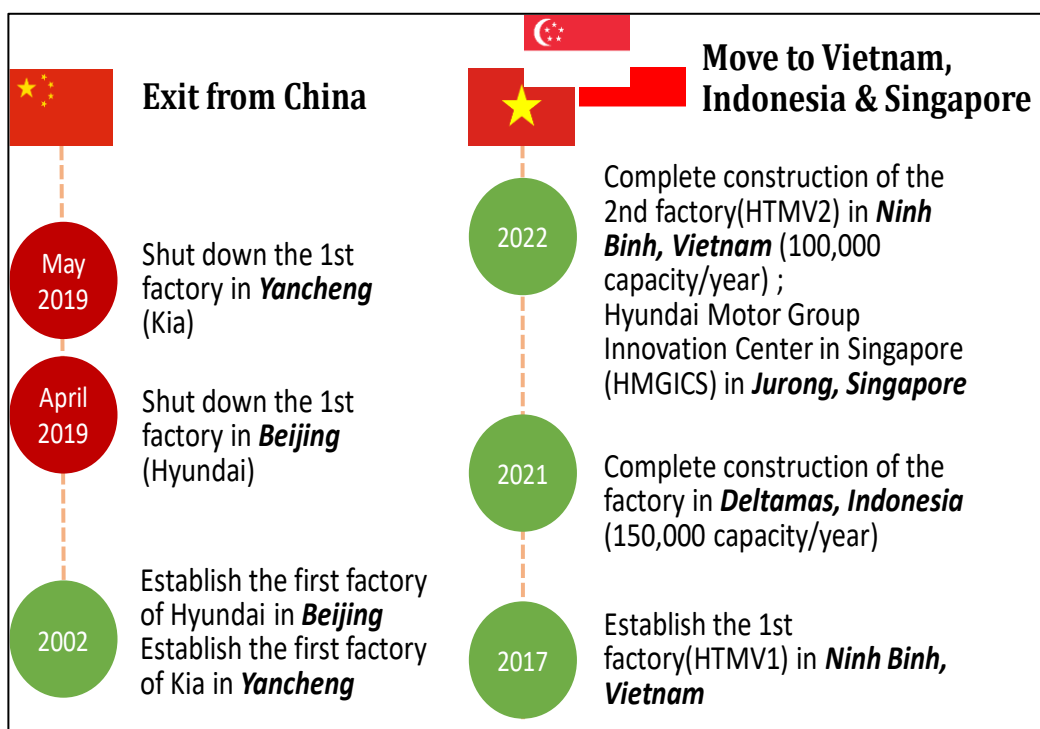
In 2002, Hyundai first entered China by setting up a joint venture with a Chinese carmaker, BAIC. This JV formed with 50:50 investment by each firm and was called Beijing Hyundai. The JV built five factories in China starting from Beijing 1 factory. The Beijing 1 factory is the first Chinese factory of Hyundai. In the same year, Kia also built the first factory in Yancheng, China by establishing a joint venture with Dongfeng Motors and Yueda group, called Dongfeng Yueda Kia.

However, Hyundai's total Chinese factory operation rate is the only 44.2%, and those of Kia also was operating at the level of 41.6%, as of February 2019. The sales of Hyundai and Kia in China radically decreased from 1.79 million cars in 2016 to 0.12 million cars in February 2019. For this reason, Hyundai-Kia decided to consecutively shut down Beijing 1 factory and Yancheng 1 factory in 2019. Moreover, Hyundai-Kia planned to focus on developing new markets in SEA.

As Figure 6 presents, the first movement of Hyundai's nearshoring was to establish a joint venture with Vietnamese Thanh Cong Group in 2017. This joint venture was called HTMV 1 (Hyundai Thanh Cong Vietnam Manufacturing Corporation) and located in Ninh Binh, Vietnam. The relationship between Hyundai and Thanh Cong Group backs to 2011. Since then,

Thanh Cong Group has imported Hyundai's car components, assembled them, and provided Hyundai's cars in the Vietnam market. After establishing the HTMV 1, Hyundai's car sales of the 1st quarter in 2020 surpassed those of Toyota in the Vietnam market. It was a huge success. Therefore, Hyundai decided to build the HTMV 2 factory in Ninh Vinh, Vietnam, by 2022 to sustain this success. The HTMV2 factory plans to have 100,000 production capacity per year. Furthermore, Hyundai is scheduled to build a factory in Deltamas, Indonesia, by 2021. This factory would have 150,000 production volume per year. The idle equipment of Beijing 1 factory which will shut down, plans to move toward the Deltamas factory. Lastly, Hyundai announced setting up the Hyundai Motor Group Innovation Center (HMGICS) in Innovation Cluster of Jurong, Singapore. It is expected that the HMGICS would discover the next mobility business and test them. Like Samsung, Hyundai-Kia also achieved great success in Vietnam market through transferring its manufacturing facilities from China to Vietnam.

Figure 6: Nearshoring of Hyundai-Kia: from China to Vietnam, Indonesia, and Singapore



Source: Joongangilbo (news article on 14 October 2020); Chosunilbo (news article on 26 November 2019); Naeil (news article on 4 April 2019).

Korean underwear brands

Several Korean underwear brands which placed a production base in China, have accelerated exodus from China. They chose China as a good manufacturing base because it enabled to reduce a considerable production cost in the past. However, they now turn their eyes to SEAs due to radical rise of Chinese wage and Chinese regulation unfavored for foreign firms. The main reason that nearshoring took place collectively in Korean underwear manufacturers is that the underwear business is one of the most sensitive to labour costs.

Goodpeople Co. is one of them. This firm decided to increase Cambodian production volume doubled but to decrease the Chinese production capacity by up to 20%. The Cambodian factory was set up in 2011 and has a production capacity of over 5million cloths per year (Korea Economic Daily, news article on 28 November 2019).

Another nearshoring was found in BYC Co. This firm planned to shut down the Chinese factories step by step and established a factory in Jakarta, Indonesia, in 2013. Moreover, BYC shut down a factory which has been a symbol of Korean local (Jeonju) economy in 2018. As a counter-movement of reshoring, the decision was for integrating Korean manufacturing activities into the factory in Jakarta (Yonhapnews, news article on 31 October 2017).

The last case of nearshoring was discovered in Cotton-Club Co. This firm has also been gradually shutting down the Chinese factories and reinforcing the production bases in Philippine, Cambodia, and Indonesia (Seoul Economic Daily, news article on 27 August 2012).

5.3. Implications for Southeast Asia

The trend of the exodus from China which has been frequently found in global and Korean manufacturing firms is characterized by relocating to SEA and reshoring to the home country. They moved their production facilities to SEA because the government's incentives and home country's business environments are not favourable enough for them to return home. It is also because of declining China's attractiveness as a production base resulting from US-China trade conflicts, the rise of China's wage, and the potential failures of intellectual property protection from China's firms.

In particular, reshoring of Korea's manufacturing firms is not easy due to the Korean government's limited incentives compared to other countries, and intense labour and environmental regulations. Moreover, the labour-intensive manufacturing firms, which pay great attention to reducing production costs, are unwilling to return home. Therefore, it is a workable decision to find a non-China neighbouring country that can provide skilled labour at

a lower price than China. After all, SEA countries are the best options for manufacturing firms who cannot return home due to some reasons.

From the SEA's perspective, such a nearshoring trend is an excellent opportunity for them. It seems to be newly opened the window of opportunity to the SEA. The extent of the SEA's economic growth and the level of the SEA's contribution to the GVC depends on how well the SEA can attract nearshoring firms in the future. SEA's governments and firms need to seize this opportunity by providing and promoting the benefits to satisfy their needs highly. Besides, for keeping nearshoring firms for a longer time, SEA countries have to invest in factory automation by collaborating with them.

6. Summary and Concluding Remarks

This paper has provided some overview of the changing GVC in Asia, especially since the outbreak of Covid-19, focusing on the phenomena of reshoring and nearshoring. It first discussed the role of the three factors responsible for changing and shaping GVC in Asia, and they are digitalization with Industry 4.0 since the 2010s, the US-China trade conflict since 2018, and the Covid-19 since 2020.

Whereas the digitalization of the production process with 4IR has enabled reshoring, the US-China trade conflicts and the Covid-19 have triggered radical changes in GVC, including reshoring and nearshoring. An emerging trend is that FDI firms in China and Asia are either reshoring their factories back to their home bases or relocating to nearby locations, such as Vietnam and other Southeast Asian economies. These changes are also associated with MNCs' move to increase the resiliency of their value chains and by the national government to promote domestic jobs by offering incentives to reshoring.

Investigating the cases of reshoring involving Korean firms getting out of China or SEA, the paper identifies three types, 1) reshoring of production of labour-intensive products requiring monetary or tax incentives, 2) reshoring getting possible by flattening of GVC by innovation, such as skipping a stage where semi-finished products are processed in foreign countries, and 3) large scale automation or transformation into Smart Factory, which requires considerable investment and innovation capabilities. These cases and typology suggest that effective reshoring requires not just monetary incentives but also technical assistance to realize the potentials for innovation and automation.

In the meantime, some FDI firms are moving out of China and relocating into nearby SEA countries mainly for labour-saving reasons and avoiding tariffs imposed by the US on made-

in-China products. Such exit from China might mean a new opportunity for SEA, as exemplified by Vietnam receiving many FDI firms out of China. It could be a new opportunity for SEA to overcome the challenges posed by 4IR and keep existing FDI (onshoring) and/or attract new factories getting out of China (nearshoring). It is a new situation since the US-China conflicts and the Pandemic, given that the 4IR or digitalization used to be perceived as a threat for SEA because low labour costs become a less decisive factor for attracting FDI.

This possibility is in line with observation by Lee et al. (2020) that the 4IR can be rather a blessing (window of opportunity) for countries like Malaysia and Thailand that are facing labour shortages, which may hold the FDI firms with the introduction of factory automation (smart factory) or other labour-saving technologies heading toward the road of upgrading into higher segments with local spillovers. In the meantime, some other less-developed groups include countries, like Myanmar and Cambodia, with least level of human capital and wage rates that may compete even with automation (or cheap machines) although low levels of education and infrastructure sound unpromising to attract FDI.

In sum, whether a tripartite combination of digitalization, the US-China trade conflicts, and the Pandemic can be a new window of opportunity or a source for additional risk for the emerging economies depends on each country's responses and readiness, including digital literacy, skill and educational level compared with wage rates, population structure, domestic market size, and positioning in the GVC, as well as on the defined and implemented industrial development strategy (Lee, Malerba, Primi 2020). If emerging economies invest more, and more effectively, in innovation and strengthening their knowledge base, they could activate learning processes and even leapfrog traditional industrial pathways into emerging 4IR industries. The case studies of the electronic cluster in Malaysia and automobile cluster in Thailand suggests a positive possibility of upgrading into high-end segments and thus getting out of the middle-income trap. In both cases, a key factor for this optimistic scenario is the local institutions that have enabled training and upskilling of their local force, such as the PSCD and the CREST in electronics cluster in Penang, and the AHRDP in the auto cluster in Thailand (Lee et al., 2020).¹

¹. According to Lee et al (2020), in Penang, such institutions include the PSCD, a non-for-profit institution to provide technical knowledge, training program to engineers, and the CREST hosting multinationals and local firms, universities and research institute. In auto cluster in Thailand, the corresponding institutions include the AHRDP, a joint collaboration between Thailand and Japanese firms and public agencies to train workers and engineers in auto part manufacturers by training workers and engineers. Besides, Thailand has the TAI, which is as a sector-specific promotional and

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ANNEX: Tables and Figures

Table1: Factors for Reshoring/Offshoring in the US and South Korea

	Positive factor for reshoring	Negative factor for Reshoring (leading to offshoring)
US (Number of companies)	Government Incentives (844)	Quality/rework/warranty (301)
	Proximity to customers/market (818)	Freight cost (199)
	Skilled workforce availability/training (673)	Total cost (155)
	Image/brand, Made in USA (615)	Delivery (105)
	Eco-system synergies/Supply chain optimization (581)	Inventory (94)
South Korea (Proportion of respondents)	Tax cut	Disadvantages in market access (77.1%)
	Government subsidies	High wage cost (16.7%)
	Governmental human resources support	Rigid labour market (4.2%)
		Lack of incentives (0.7%)

Sources: (Kim, 2020), (Kim, 2018), ("Reshoring Initiative 2018 Data Report: A Record 1389 Companies Announce the return of 145,000 Jobs | Reshoring Blog | Reshoring Initiative", 2020)

Table 2: The number of reshoring firms by year: Korea, US, and Japan

(unit: firm)

Country	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	Total
Korea	-	-	-	-	-	20	3	12	4	9	16	16	80
US	-	95	157	232	432	340	294	267	624	886	-	-	3,327
Japan	659	608	572	510	554	628	724	650	725	612	-	-	6,242

Source: KOTRA (Korea Trade-Investment Promotion Agency)'s internal report for Korea's data; Reshoring Initiative (2018) for the US's data; METI (Ministry of Economy, Trade and Industry)'s statistic report (2019) for Japan's data; KIET (Korea Institute for Industrial Economics & Trade) (2020).

Table 3: Three types of reshoring in South Korea

	Definition	Cases	Policy measures in need
Type 1	Reshoring of labour-intensive products (From foreign production to domestic production)	THN (Wiring Harness)	Financial Assistance (Subsidies)
		Iksan Jewelry Production Cooperative	Tax Cut
Type 2	Reshoring by flattening of GVC (From foreign processing & domestic assembly to domestic processing & assembly)	Aju Steel	Financial Assistance (Subsidies)
		Solgent (Covid-19 testing kit)	Tax Cut
		OTOS (PAPR)	Technical Assistance
		Mask factories in Korea	
Type 3	Reshoring by large scale automation or smart factorization.	G&G Enterprise (Clothing manufacturer)	Financial Assistance (Subsidies)
		Treksta (Shoe manufacturer)	Tax Cut
		Hyundai Mobis	Technical assistance concerning automation

Source: the authors

Table 4: Cases of exodus from China through reshoring and nearshoring

Category	Firm name	Production item	Home country	Moving to	Reasons for relocation
Global firms' relocation (China→SEA)	Hasbro Inc.	Toy	U.S.	Vietnam	US-China trade conflicts
	Brooks Sports Inc.	Sports shoes	U.S.	Vietnam	US-China trade conflicts
	Apple Inc.	Electronics	U.S.	Vietnam, Indonesia, India, and Malaysia	US-China trade conflicts Lack of labours
	Ever Win International Co.	Smartphone & PC components	U.S.	Philippine	US-China trade conflicts Increase of China's wage
	Ricoh	Camera & office equipment	Japan	Thailand	US-China trade conflicts
	Sharp	LCD display	Japan	Vietnam	US-China trade conflicts
	Olympus	Optics & camera	Japan	Vietnam	Decrease of Chinese market attractiveness
	Kyocera	Copier & multi-function printer	Japan	Vietnam	US-China trade conflicts
	Sony	Smartphone	Japan	Thailand	Increase of China's wage
	Panasonic	Car audio	Japan	Thailand	US-China trade conflicts
	Hyundai-Kia	Automobile	South Korea	Indonesia	US-China trade conflicts
	Lotte Chemical	Chemical	South Korea	Malaysia	US-China trade conflicts
	Head International	Sports equipment	Austria	Philippine	US-China trade conflicts Increase of production cost in China
Delta Electronics Inc.	Electronics & IT H/W	Taiwan	India	US-China trade conflicts	
Global firms' reshoring (China→Home country)	Intel Co.	Semiconductor	U.S.	U.S.	US government's incentives (corporate tax reduction)
	Apple Inc.	Smartphone	U.S.	U.S.	US government's incentives (corporate tax reduction)
	Adidas AG	Sports wear	Germany	Germany	Increase of production quality Increase of production flexibility Improvement of proximity to customers
	Electrostar GmbH	Electronics	Germany	Germany	Increase of production quality Increase of production flexibility Quick response to change of customers' needs
	Autec AG	Adventure toy	Germany	Germany	Increase of production quality Increase of production flexibility Quick response to change

Category	Firm name	Production item	Home country	Moving to	Reasons for relocation
					of customers' needs Protection of IP from Chinese firms
	Piquadro S.p.A	Luxury leather bags	Italy	Italy	Increase of production quality Increase of China's wage
	Mitsubishi Electric Co.	Electronics	Japan	Japan	US-China trade conflicts
Chines firms' nearshoring (China→neighboring country)	Xinlong Car Materials	Bike components	China	Vietnam	US-China trade conflicts Increase of China's wage
	Shandong Linglong Tier Co.	Tire	China	Serbia	US-China trade conflicts Increase of China's wage
	Mingtai	Aluminium	China	South Korea	US-China trade conflicts
	Tshingshan Iron & Steel	Iron & Steel	China	South Korea	US-China trade conflicts

Source: KOTRA (2019); Jung (2020); ChosunBiz (news article on 27 January 2021); Seoul Economic Daily (news article on 22 January 2021).

Figure 1: Percentage Shares in total Green field FDI to Emerging Economies

(note: the bottom line is for India; the top line from the far left is China)

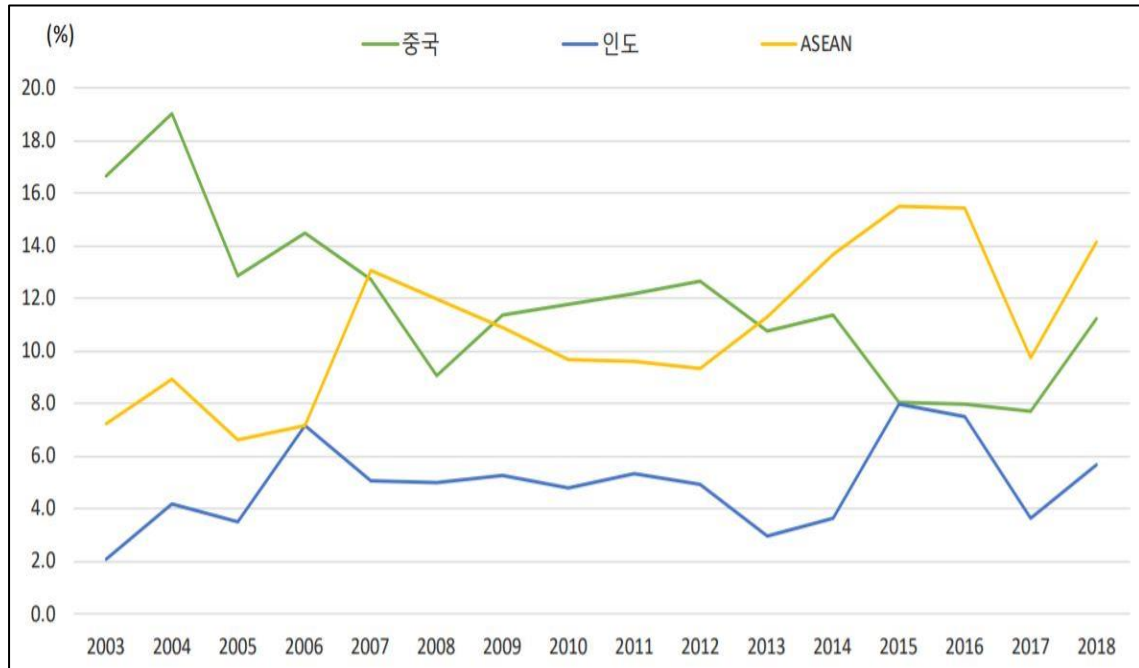
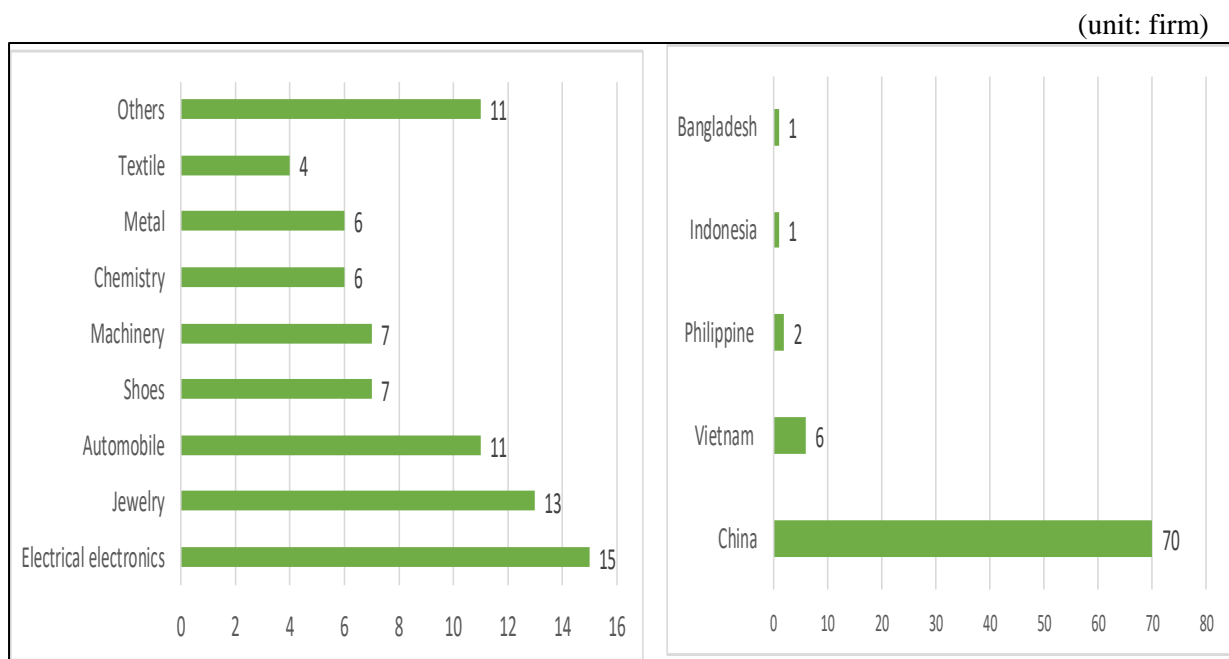


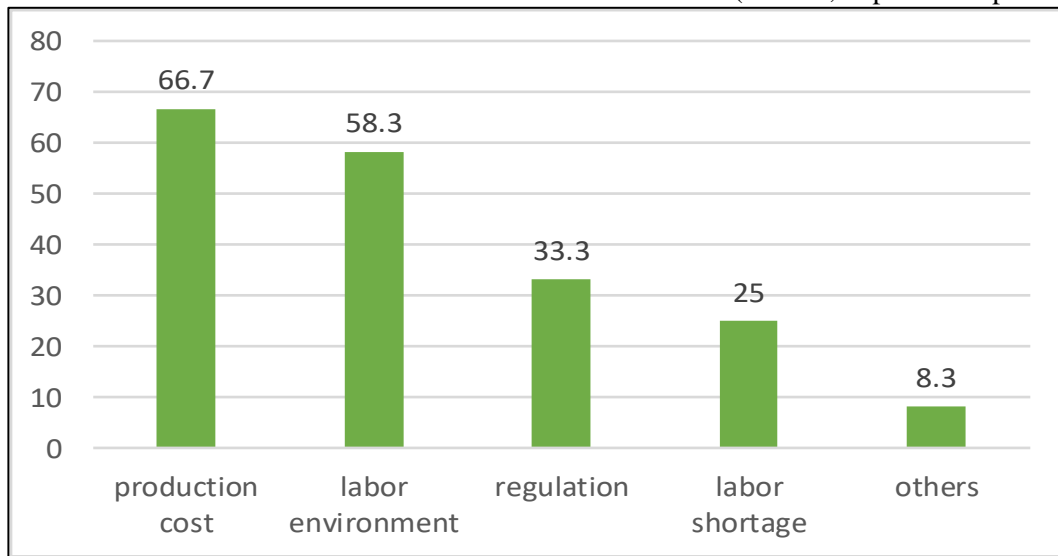
Figure 2: Korean reshoring by industry (left) and by host country (right): 2014-August 2020



Source: KIET (Korea Institute for Industrial Economics & Trade) (2020).

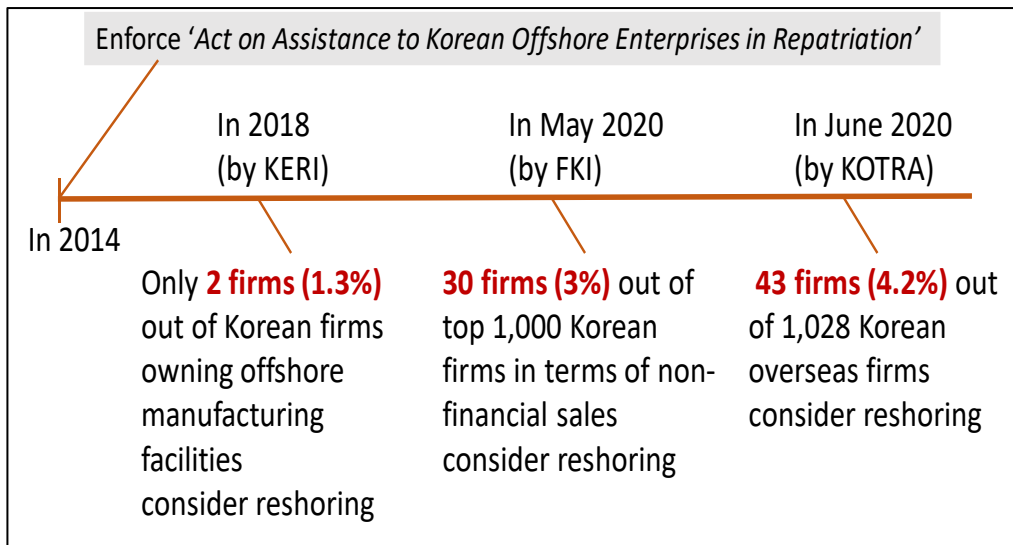
Figure 3: Reasons for being reluctant to execute reshoring: Korean firms

(unit: %, duplicate response)



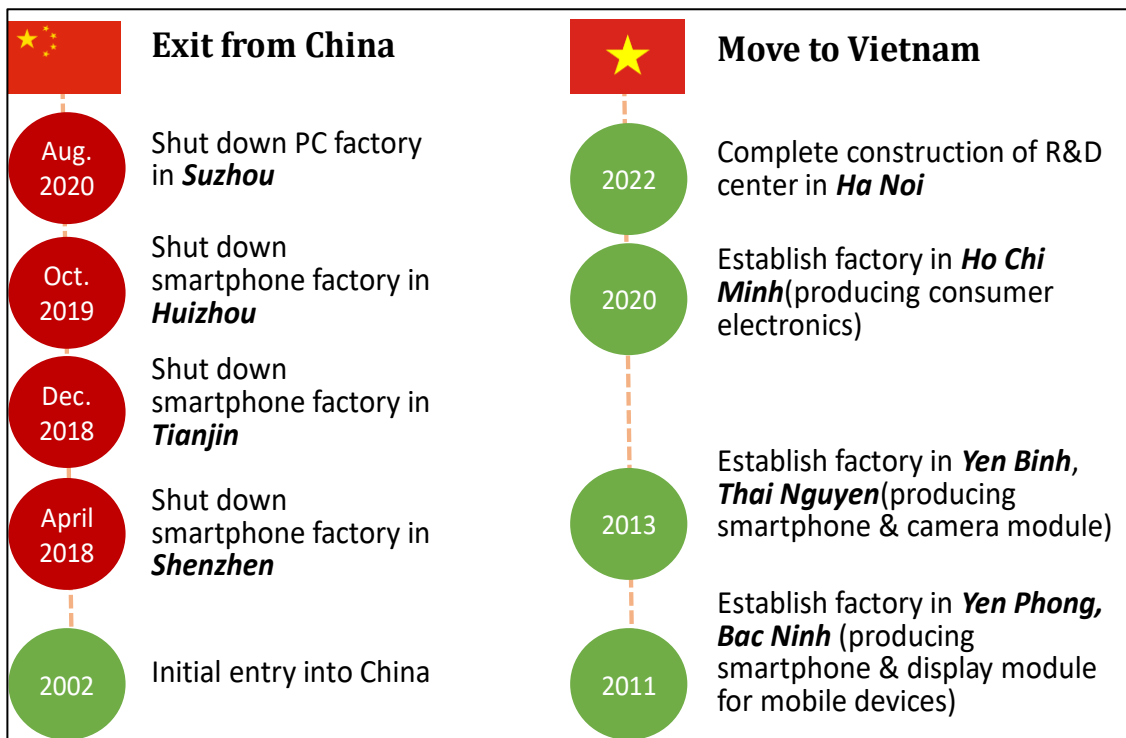
Source: Maekyung (news article on 19 June 2020).

Figure 4: Korean firms' intention of reshoring over the time: from 2018 to June 2020



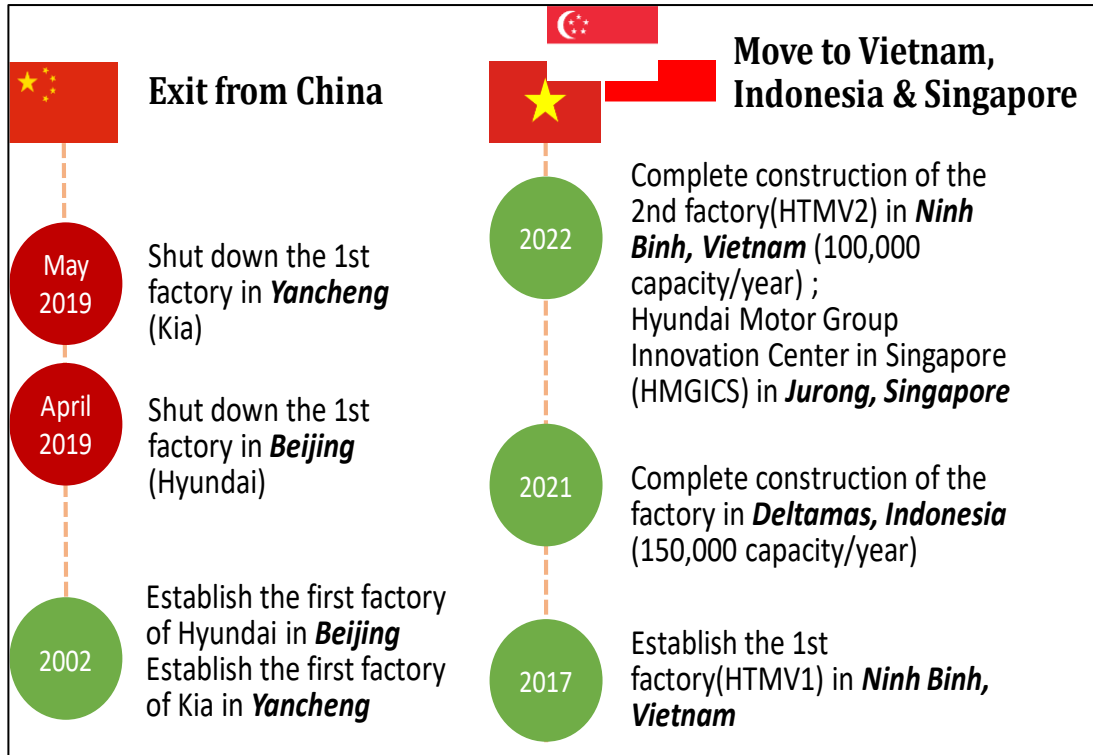
Source: Gyeonggi Research Institute (2020).

Figure 5: Nearshoring of Samsung: from China to Vietnam



Source: Lee, Hyuntai and Jung, Dosook (2020); Financial News (news article on 6 April 2016).

Figure 6: Nearshoring of Hyundai-Kia: from China to Vietnam, Indonesia, and Singapore



Source: Joongangilbo (news article on 14 October 2020); Chosunilbo (news article on 26 November 2019); Naeil (news article on 4 April 2019).