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Global Value Chains and the Changing Pattern of North-South Trade: Apparel, Electronics and Automotive Sectors in 2005-2014*

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Abstract

Manufacturing production shifted to developing countries over the last decades, giving rise to global value chains (GVCs). It increased manufacturing exports from the Global South to the North, reshaping the pattern of international trade and division of labor. However, since the global economic crisis of 2007-2008, a new trend called "shifting end markets" has emerged, or the rise of the South as end markets in GVCs. Yet, economic growth began to slow down over the past few years in many emerging economies. This paper examines the changing patterns of North-South trade, focusing on three GVCs - apparel, electronics and automotive - in 2005-2014. Using bilateral trade statistics from UN Comtrade, the patterns of North-South trade are analyzed for both intermediate and finished goods in each sector. The paper confirms the rise of South-to-North manufacturing exports although the growth pattern differed significantly across the sectors. It also finds that North-South trade patterns have become stabilized since 2012 with pre-crisis dynamics moderated particularly in finished goods. Finally, the relative role of Northern and Southern countries in South-bound exports varied across the sectors, while South-South linkages appear more robust in the face of the recent slowdown in emerging market economies.

Keywords: Global Value Chains, International Division of Labor, North-South Trade, Shifting End Markets

JEL Classifications: F14, F15, F60, L16

Ⅰ. Introduction

Manufacturing production has gradually shifted to developing economies, the "Global South," over the last several decades. Production was fragmented or sliced into narrower tasks or value-adding activities, which dispersed to firms in different countries

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through foreign direct investment (FDI) and offshore outsourcing (Arndt and Kierzkowski, 2001; Choi Nam-Suk, 2016; Timmer, Erumban, Los, Stehrer and de Vries, 2014). The fragmentation and decentralization of production has given rise to "global value chains" (GVCs) and manufacturing exports from the South to the "Global North," or advanced industrialized economies, have increased (Gereffi, 2005). Advanced eco- nomies increasingly play a role of supplying upstream inputs like highvalue-added parts and components, while developing country firms export finished goods produced based on imported inputs to consumer markets in the North. They try to capture more gains by taking part in lower value-added, typically labor-intensive, nodes of the value chains and gradually upgrading to higher value-added activities, such as research and development (R&D) and branding (Humphrey and Schmitz, 2002). A notable example of such success was East Asia's export-based economic growth (Gereffi and Wyman, 1991). With the expansion of GVCs, GVC participation and upgrading has emerged as an effective tool for economic development (Zhan, Bolwijn, Casella and Fujita, 2013), reshaping the international trade and division of labor.

Over the last decade, a new trend has emerged in GVCs, a phenomenon called "shifting end markets" (Cattaneo, Gereffi and Staritz, 2010; Kaplinsky and Farooki, 2010). It casts light on the rise of the South, especially large emerging economies such as China, Brazil, Russia, and India, as end markets in many GVCs. It contrasts with stagnant demand growth in advanced economies after the global economic crisis of 2007-2008. The rise of the South is two-fold: one is the rapid expansion of large domestic markets and growing consumer demand in emerging economies, and the other is the South's rising import of intermediate goods. As countries like China and India have emerged as the center of global production, they import an increasing amount of raw materials, parts, and components for further processing. In this sense, shifting end markets occurs in both the upstream and downstream of GVCs (Lee and Gereffi, 2015).

However, little research has been conducted to empirically examine the timing and magnitude of these shifts in international trade between the North and South. While the share of South-to-South trade more than doubled in 1995-2012, from 12% to 26% of world trade (Horner, 2016), it remains unclear whether there is any sectoral differences in the changing pattern of North-South trade. Furthermore, there has been a growing signal of economic slowdown in emerging markets in recent years, which could decelerate the shift of end markets to the South (The Economist, 2013). China ended its 25-year streak of high GDP growth rates in 2015. Brazil experienced economic and political turmoil following a decade of economic boom. All these changes raise the question of whether North-South trade has been undergoing another important shift.

This paper attempts to answer that question by examining North-South trade and its temporal patterns and sectoral variations. Using international trade statistics, it focuses on the changing patterns of North-South trade in three manufacturing sectors: apparel, electronics, and automotive. These sectors are similar in that GVCs play a key role in shaping the geographic and organizational patterns of production, trade and investment. But, they are also different. Apparel is relatively a low-tech and labor-intensive sector, while

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automotive and electronics are more intensive in terms of capital and technology. Also, offshore outsourcing and contract manufacturing is much more prevalent in the apparel and electronics industries than in the automotive sector. By analyzing changing trade patterns from 2005 to 2014, this paper also focuses on a period interspersed by the global economic crisis and the ensuing recession in the world economy.

This paper is organized as follows: Section II discusses the rise of GVCs and the historical patterns of North-South trade. Section III outlines the data used in the analysis. Section IV presents the findings from three sets of analysis: (1) sectoral exports and imports by income groups; (2) the longitudinal patterns of North-South trade; and (3) the composition of major exporting countries to the South. Section V summarizes and synthesizes the findings.

Ⅱ. Global Value Chains and the Pattern of North-South Trade

The global economy has become increasingly integrated as the flow of goods and services, as well as capital and people, now extends beyond national borders. The global integration was facilitated by a series of trade liberalizations, the rise of FDI, and the expansion of multinational enterprises (MNEs) over the past decades (Dicken, 2011). Simultaneously, the international division of labor has become more sophisticated as regions, countries and firms go beyond simply exchanging one product with another, or wine with clothes (Escaith and Inomata, 2011). Nowadays, these entities trade an increasing number of intermediate goods and value-adding tasks at the varying stages of production, eventually producing a finished good through a web of complex inter-firm networks on a global scale, known as global value chains (Gereffi and Fernandez-Stark, 2011). In GVCs, production is fragmented into narrower tasks, a phenomenon called “slicing up the value chains” (Timmer et al., 2014), and these tasks are dispersed to be conducted by firms in different countries (Arndt and Kierzkowski, 2001).

With the rise of GVCs, the pattern of international division of labor has also changed. For much of the period since the onset of the modern capitalist economy, a major division of labor in the world economy has occurred between the industrialized West, or the so-called “core,” and the remaining under-developed, less industrialized, part of the world, or the “periphery.” The periphery provided the core with raw materials like minerals and agricultural commodities, while the core produced manufactured goods based on those inputs from the periphery and some of the manufactured products were then exported back to the periphery (Shannon, 1989). This long-standing structure, however, was set to change in a post-war economy as manufacturing gradually shifted away from developed economies in North America, Western Europe and Japan to newly industrializing economies in East Asia and Latin America (Martin, 1990). Firms in the North moved production to the South in search of lower production costs and weaker regulations abroad, giving rise to the “new industrial division of labor” (Fröbel, Heinrichs and Kreye, 1980).

This geographic shift of manufacturing began in the 1960s from labor-intensive, light

manufacturing of products such as apparel, footwear, and toys, and gradually expanded to other sectors such as electronics. MNEs, mostly from the North, built factories in developing countries and exported products to their home market and other advanced economies, turning the South into a "global factory" (Buckley, 2009). Also, offshore sourcing facilitated the emergence of the new North-South division of labor (Appelbaum, Smith and Christerson, 1994; Gereffi, 1999). Northern firms contracted out some part of the production process, mostly the labor-intensive parts, to overseas suppliers in developing countries, expanding their supply chains beyond the developed world. Other brands, like Nike, even started out as "factory-less" firms, entirely relying on offshore suppliers for production (Donaghu and Barff, 1990). The expansion of offshore outsourcing was assisted by advances in international communication and logistics (e.g., cargo containers), as well as trade deregulations such as lowering of tariffs. As a result, a more complex pattern of North-South trade has emerged; manufactured goods are increasingly exported from the South, while advanced intermediate goods are imported from the North to be assembled with other parts and components from developing economies.

A notable example of economies that succeeded in the midst of this shift are export-oriented East Asian countries, including South Korea, Taiwan, Hong Kong, and Singapore (Amsden, 1989; World Bank, 1993). These "Asian Tigers" experienced rapid export growth since the 1960s by taking part in expanding global value chains, which linked local suppliers in these economies to Northern buyers and their consumers in advanced markets (Feenstra and Hamilton, 2006). For example, in apparel, local producers initially entered a lower value-added chain segment like "cut-make-trim" (CMT), relying on imported inputs like textile and machinery provided by foreign buyers, and then gradually building their own capabilities to move upstream along the chain by sourcing inputs independently or domestically, or downstream by selling their own branded products (Gereffi, 1999). As these economies moved upward in the 1990s in the global economy, the role they assumed in GVCs have relegated to other developing Asian countries, notably China, Vietnam, and Bangladesh, who are currently leading the world in garment exports. These advanced Asian economies have turned to exporting textile and other high value-added inputs to garment-producing countries (Fukunishi and Yamagata, 2014), as seen in <Fig. 5>.

Over the last several years, GVC scholars have begun to observe a further change in the pattern of North-South trade, particularly shifting end markets to the South (Cattaneo, Gereffi and Staritz, 2010; Kaplinsky and Farooki, 2010). Until recent years, the end market for finished goods had been mainly the North, i.e., advanced industrialized countries in North America, Western Europe and affluent parts of other regions. However, several new developments over the last decade or so have spurred the rise of the South as the end market for many GVCs. First, as the capabilities of Southern suppliers have advanced and even the production of high-end components has been moved or farmed out to developing country suppliers, China and other emerging economies like Brazil, South Africa, and India rapidly expanded their imports of raw materials and intermediate goods from

other developing countries to produce their own finished goods (Kaplinsky, Terheggen and Tijaja, 2011), in effect increasing South-South trade in intermediate goods.

At the same time, decades of fast economic growth has fueled the rise of the urban middle class and the rapid expansion of domestic markets in many emerging economies, turning them into lucrative destinations for consumer goods. MNEs have found these fast-growing markets to be critical for their success in the face of the stagnant growth of consumer demand in advanced markets, especially after the global economic crisis and the following recession. Emerging market MNEs (EMNEs) have joined the competition by expanding across Southern markets (Ramamurti and Singh, 2009). In 2005-2010, merchandise imports grew much faster in large emerging economies like Brazil (147%), India (129%), and China (111%) as compared to advanced markets like the European Union (27%) and the U.S. (14%), indicating an expansion in South-bound trade (Escaith and Maurer, 2011). In 1990, 60% of world trade was between developed economies, 30% was between the North and the South, and South-South trade was only 10% (Lamy, 2013). In 2012, the share of South-South trade had risen to 26% of world trade (Horner, 2016).

A more recent development in emerging economies, however, indicates that shifting end markets may be slowing down, if not being reversed. In recent years, large emerging economies, which had caused the recent demand growth of both intermediate and finished goods, experienced a significant slowdown in economic growth. In 2015, China's annual GDP growth rate came down below 7% to end a 25-year streak of high growth, and the Chinese government is preparing a "New Normal" with slower growth of the economy (Hu, 2015). Other emerging economies like Brazil and Russia also posted lower GDP growth rates in recent years than in the previous decade (The Economist, 2013). At the same time, some developed economies began to bounce back from the aftermath of the global economic crisis. The U.S. economy posted a 2.4% in GDP growth in 2014, the strongest since 2010, while the Eurozone has escaped since 2012 from the debt crisis, notably in Greece (Sharf, 2015). Therefore, these latest developments may moderate, if not reverse, the expansion of South-bound trade both from developed and developing country exporters.

Ⅲ. Data

The analysis used trade data compiled from the United Nations Commodity Trade (Comtrade) Statistics Database (UNSD, 2016), one of the most extensive databases of international trade from 1962. The data consists of an annual series of bilateral trade data from 2005 to 2014, a near-decade period interspersed by the global economic crisis of 2007-2008 and its fallouts in the ensuing years. The distinction of the North and the South is based on the World Bank's classification of countries and lending groups. The North consists of the countries in the high-income group, both OECD (Organization for Economic Co-operation and Development) and non-OECD countries, while the South includes low- and middle-income groups. For the amount of bilateral trade (nominal value in U.S. dollar), the analysis used the data reported by the importing country, which are

Table 1. SITC Codes Used for Each Product Category

GVCs	Intermediate Goods	Finished Goods
Apparel	Textile SITC 65: Textile yarn, fabrics, made-up articles, nes, and related products	Garment SITC 84: Articles of apparel and clothing accessories
Electronics	Electronic components SITC 759: Parts, nes of and accessories for machines of headings 751 or 752 SITC 764: Telecommunication equipment, nes; parts and accessories, nes SITC 776: Thermionic, microcircuits, transistors, valves, etc	Electronic products SITC 751: Office machines SITC 752: Automatic data processing machines and units thereof SITC 761: Television receivers SITC 762: Radio-broadcast receivers SITC 763: Gramophones, dictating machines and other sound recorders
Automotive	Automotive components SITC 784: Motor vehicle parts and accessories, nes	Motor vehicles SITC 781: Passenger motor vehicles (excluding buses) SITC 782: Lorries and special purposes motor vehicles SITC 783: Road motor vehicles, nes

Note: nes (not elsewhere specified).
Source: UNSD (n.d.).

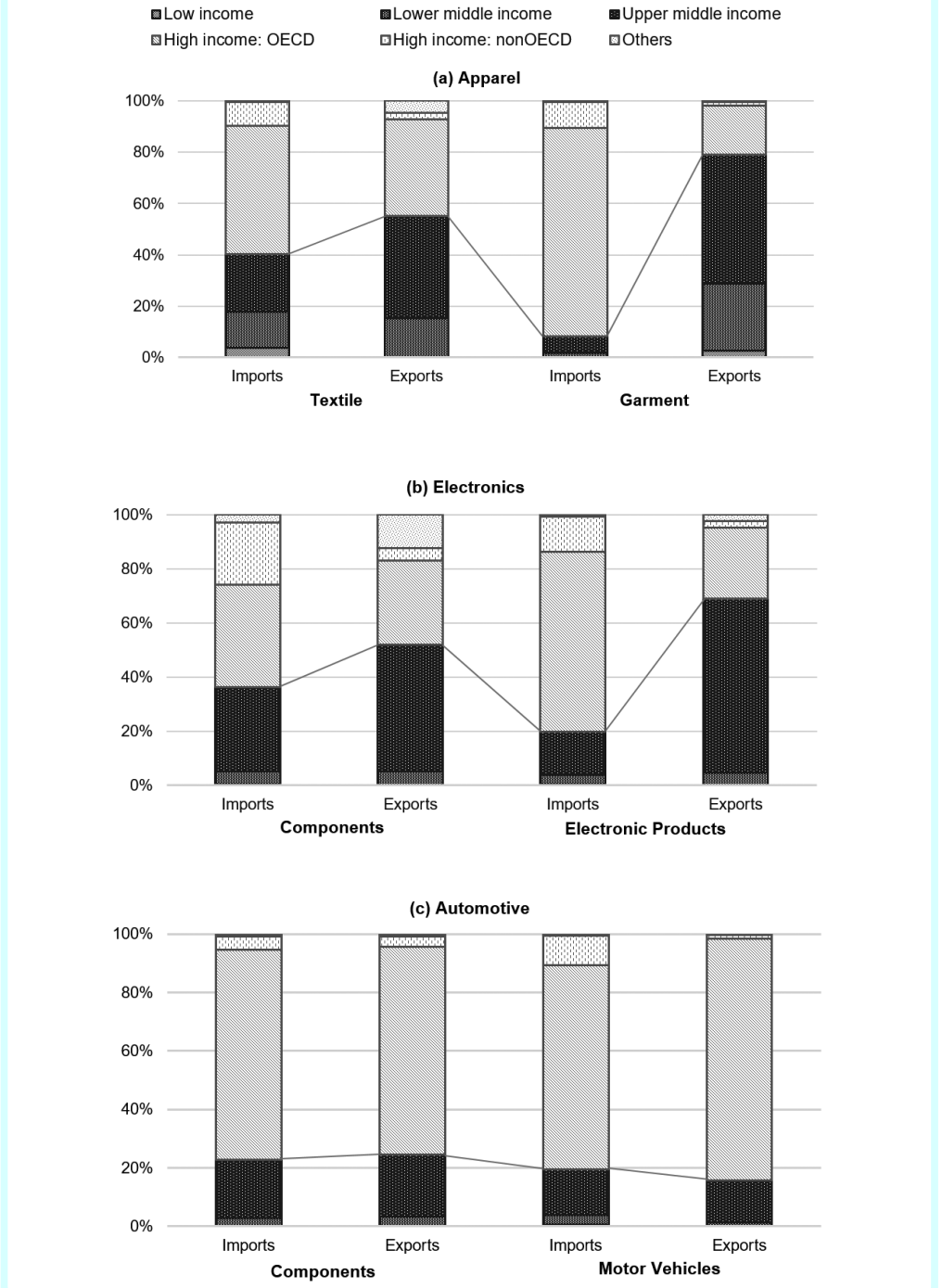
generally considered to be more accurate and reliable than data reported by the exporting partner. Included in the analysis are all the countries and territories that reported their imports at least once during the period in a given product category.

For each of the three GVC sectors (apparel, electronics, and automotive), product categories were identified based on the Standard International Trade Classification (SITC), a classification of goods for the purpose of trade analysis. <Table 1> summarizes the SITC codes used for intermediate and finished goods for each sector. In apparel, textile (SITC 65) was used to analyze trade of intermediate goods, while the trade of finished goods was analyzed with the garment category (SITC 84). For electronics GVCs, electronic components (SITC 759, 764, 776) and two groups of final products - information technology (IT) products (SITC 751, 752) and telecommunication products (SITC 761, 762, 763) - were used. Finally, for automotive GVCs, the motor vehicles (SITC 781, 782, 783) and auto components (SITC 784) categories were used.

Ⅳ. Patterns of International Trade in the Apparel, Electronics and Automotive Sectors

This section presents the findings from three sets of analysis. First, it presents the overall patterns of trade between the North and the South in each of the six product categories being studied. Second, the North-South trade patterns are analyzed over the period of 2005-2014. A final set of analysis zooms in on the role of the South as the end market by examining the major players in South-bound trade.

Fig. 1. World Trade of Intermediate and Finished Goods by Income Group, 2014



Source: Compiled from UNSD (2016).

1. Sectoral Exports and Imports by Income Groups

Each income group's share in the exports and imports of the six products in 2014 is shown in <Fig. 1>. First, in all the product categories, two income groups - high-income OECD countries and upper-middle (U-M) income countries - account for the majority of international trade although the relative importance of each group varies by product and trade flow. Second, the South as a whole - low- and middle-income groups (indicated by bars in dark grey in <Fig. 1>) - plays a greater role in exports than in imports across the categories, indicating the rise of the South as exporters in the key manufacturing sectors. Particularly, the role of the U-M income group, which includes China, Turkey, Brazil and other emerging economies, is prominent.

Despite these commonalities, there are significant sectoral variations as well. The share of the South is generally greater in the order of apparel, electronics, and automotive. In apparel, not only U-M income countries but also lower-middle (L-M) income countries contribute considerably to the international trade of textile, representing 40% and 55% of the world's textile imports and exports in 2014, respectively. Also, the South, led by China, accounts for 79% of the world's garment exports, and about a half of the exports originated from L-M income countries, notably Bangladesh, India, and Vietnam. Compared to textile, the South only amounts to 8% of the world's garment imports. This is mainly because some of the large garment markets in the South like China and India are also the major garment producers that supply their own domestic market.

In electronics, the overall pattern is quite similar to apparel, but the share of the South is slightly lower than in apparel. Low and middle-income groups account for 36% and 52% of the world's imports and exports of electronic components, and 52% and 69% of finished products. Finally, the automotive sector shows a different picture. In both intermediate and final goods, the North (bars in light gray in <Fig. 1>) represents the majority of the trade, specifically high-income OECD countries like Germany, the United States, and Japan. The South's share in the world's automotive trade is much lower than in the other two sectors: 23% and 24% of the world's imports and exports of auto components, and 20% and 16% of finished motor vehicles, respectively. China, Mexico, Thailand, and Brazil are the major trading countries in this sector from the South.

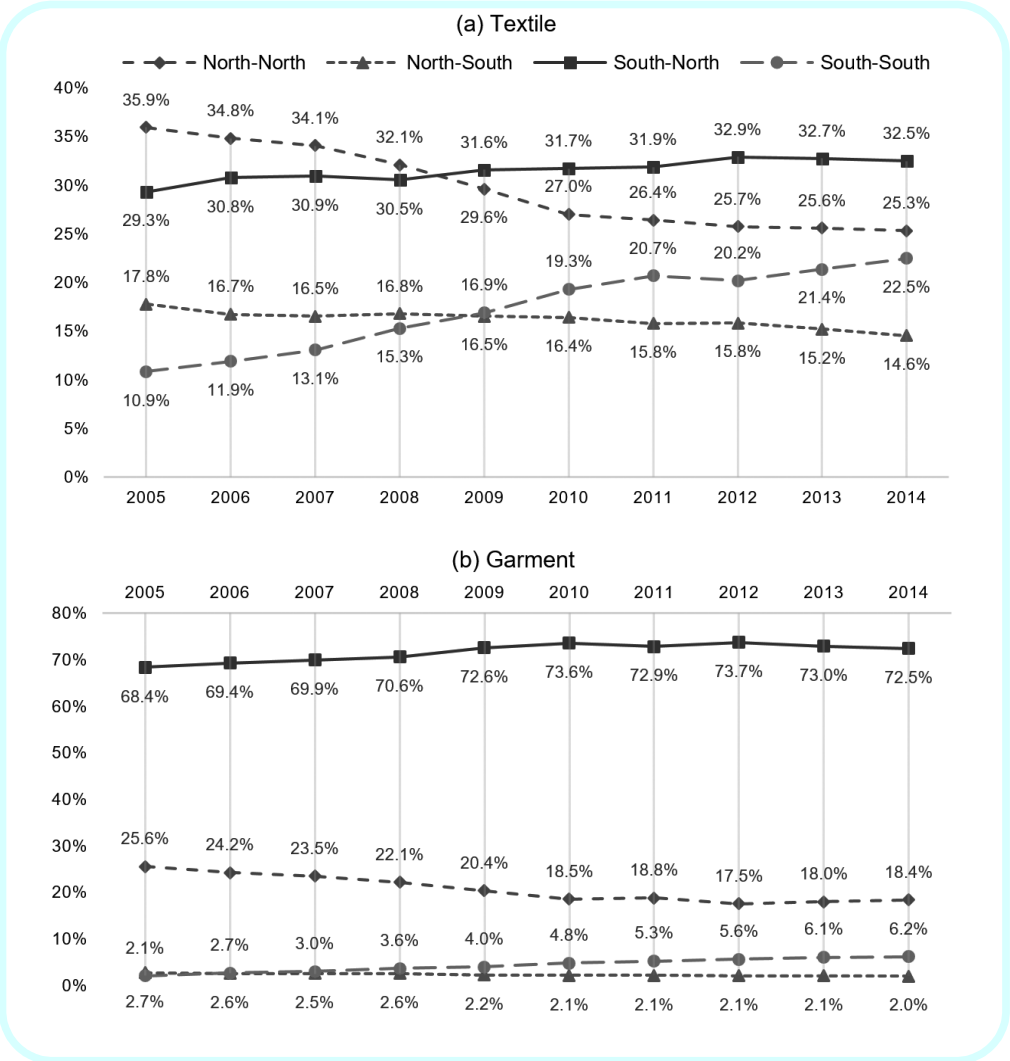
2. Patterns of North-South Trade by Sector

This section illustrates the longitudinal change of trade patterns between the North and the South from 2005-2014. Four types of trade flows - North-North (N-N), North-South (N-S), South-North (S-N), and South-South (S-S) - are examined for each product category.

2.1. Apparel

The apparel sector is characterized by the growing role of the South in international trade, specifically in textile imports and exports, as well as garment exports (as evidenced earlier in <Fig. 1(a)>). Further analysis shows that, first, in textile, a dramatic shift in North-South trade took place over the last decade. The share of S-N trade steadily increased from 29.3% of the world's total

Fig. 2. North-South Trade Flows in Apparel, 2005-2014



Source: Compiled from UNSD (2016).

textile trade in 2005 to overtake N-N trade in 2009, further expanding to 32.5% of the world trade in 2014. In contrast, N-N trade declined over the same period from 35.9% to 25.3%, and the decline was much steeper before than after 2010 (<Fig. 2(a)>). This indicates that much of textile production has moved from developed countries to developing countries over the last few decades, through FDI and offshore outsourcing.

At the same time, the share of South-South textile trade more than doubled during the period, from 10.9% to 22.5%, and the rise was particularly strong in 2005-2011. Meanwhile, the North's textile exports to the South (N-S) gradually decreased in terms of the world's

share, from 17.8% to 14.6%. This suggests that Southern countries have become the major sources of textile for developed countries, but also that the South increasingly traded with each other. Given the fact that the South has become the dominant exporter of garments (see <Fig. 1(a)>), it also indicates that Southern garment exporters rely more on other Southern trade partners to source textile inputs, strengthening a South-South tie along the apparel GVC.

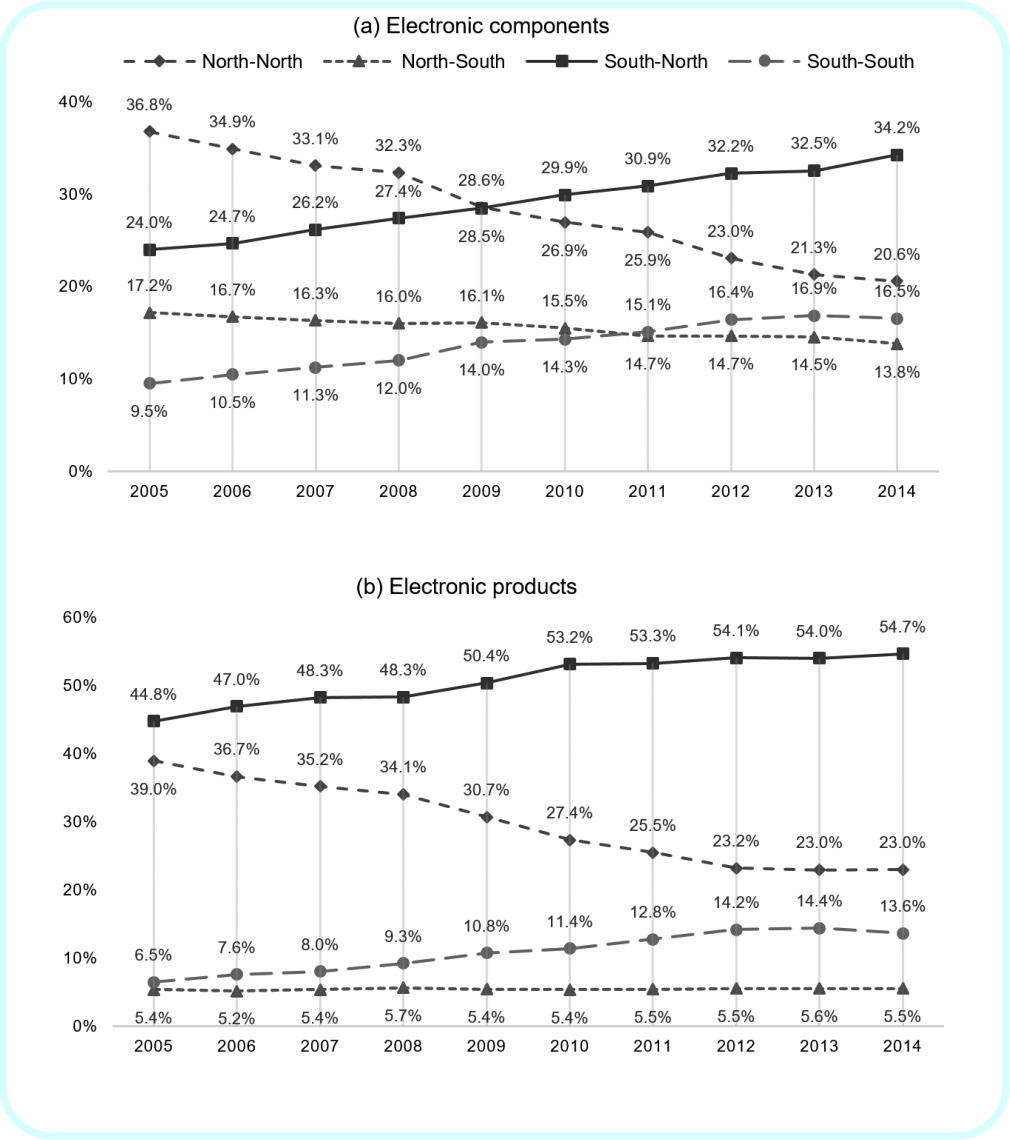
In the garment sector, the North-South trade pattern is strikingly different (<Fig. 2(b)>). S-N trade was dominant and continued to be with 72.5% of the world's total garment trade in 2014, indicating the persisting role of the South as the production center for Northern consumer markets. The share of S-N trade increased from 68.4% to 73.7% in 2005-2012, and slightly declined in the subsequent years. In contrast, the share of trade between Northern economies (N-N) steadily declined, from 25.6% to 17.5% in 2005-2012, although it has slightly bounced back since. As indicated in <Fig. 1(a)>, the South's imports amount to a small fraction of international garment trade. It is partly related to the fact that many Southern garment exporters like China and India also have their own large domestic market, which reduces the worldwide demand for garment imports. Yet, the portion of S-S trade steadily increased almost three times, from 2.1% to 6.2% in 2005-2014, while the share of N-S trade slightly declined to about 2% of the world trade. The recent growth of S-S trade, while its scale is still much smaller compared to S-S textile trade or S-N garment exports, highlights the growing role of Southern markets for developing country exporters as the destination of finished goods as well as textile and other inputs.

2.2. Electronics

The role of developing economies in world trade is smaller in electronics than in apparel but still significant, as shown in <Fig. 1(b)>. A closer examination of North-South trade shows that its role was on the rise over the last decade in both intermediate and finished goods in a similar pattern as in apparel (<Fig. 3>).

In electronic components, as in textile, S-N trade steadily increased over the period, from 24.0% to 34.2% of the world's total trade in 2005-2014, which coincided with the decline of N-N trade. S-N trade surpassed N-N trade in terms of world share in 2010 and the gap has widened since (<Fig. 3(a)>). Similarly, N-S trade decreased steadily over the period, from 17.2% to 13.8% of the world total trade, while the South has expanded its import of electronic components from other Southern economies, leading to the growth of S-S trade. In 2005, S-S trade only represented less than a tenth of the world's total trade in this upstream part of the electronics GVC. In 2014, its share grew to 16.5%, although most of the growth took place in 2005-2012. This points out that the majority of electronic components are now produced in the South and are exported to developed countries and, increasingly, to other developing countries. This was attributed to the geographic shift of production in electronics GVCs over the last few decades through FDI and outsourcing. But, the fact that the share of S-S trade recorded an annual decline in 2014 for the first time since 2005 may indicate that this is the effect of the recent slow-down of demand in emerging markets.

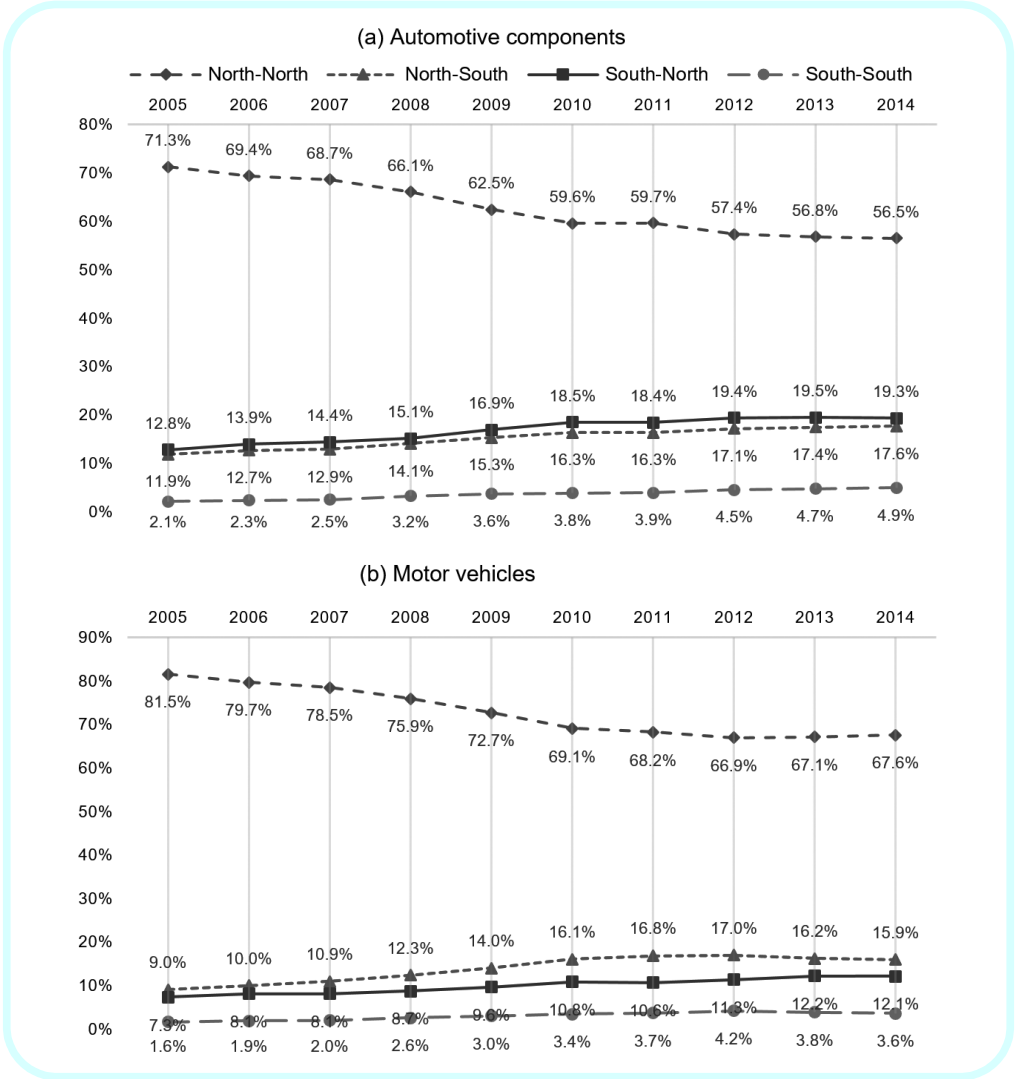
Fig. 3. North-South Trade Flows in Electronics, 2005-2014



Source: Compiled from UNSD (2016).

In finished products, S-N trade has become dominant as its share increased during the second half of the last decade - it rose from 44.8% of the world's electronics trade to 53.2% in 2005-2010, although the growth slowed down markedly after 2010 (<Fig. 3(b)>). Meanwhile, the share of N-N trade significantly decreased, from 39.0% to 23.0% of the world trade, but the rate of decline was substantially lowered in the last few years. At the same time, the share of S-S trade doubled from 6.5% to 14.4% in 2005-2013, but, similar

Fig. 4. North-South Trade Flows in Automotive, 2005-2014



Source: Compiled from UNSD (2016).

to component trade, it experienced the first year-to-year decline since 2005 in 2014, going down to 13.6%.

Overall, interesting similarities and differences are observed between apparel and electronics in terms of North-South trade patterns. S-N trade has become the leading type of trade flow in both intermediate and finished goods in the two sectors. Yet, the timing of S-N trade surpassing N-N trade appears different; it occurred much earlier in the garment sector than in the finished electronic goods sector. This reflects the fact that the offshoring of garment production to developing countries started much earlier than that of electronics manufacturing. How-

ever, the last decade marked a significant shift in intermediate goods trade in both sectors; S-N trade overtook N-N trade in the midst of the recent global economic turmoil and the gap continued to widen. At the same time, the growth of S-S trade is found in all of the four categories despite the difference in its pace and scale.

2.3. Automotive

Unlike the other two GVCs, the North still plays a leading role in the international trade of automotive products, both components and motor vehicles (<Fig. 1(c)>). Similarly, the changing pattern of North-South trade in automotive GVCs is significantly different from the one found above. Overall, automotive trade is still highly clustered within the North, with limited engagement by the South in the trade of automotive goods. However, it does share a commonality with the other sectors in terms of timing and rate of change. The relative shares of trade flows between the North and the South changed dramatically during the last half of the 2000s, and the change has decelerated since then, with growth even being reversed as in the N-S motor vehicle trade.

In automotive components, N-N trade is still the biggest part of international trade, although its share declined considerably, from 71.3% to 56.5% in 2005-2014. The decline was much steeper before 2010 than after (<Fig. 4(a)>). Meanwhile, S-N and N-S trade steadily increased, and in both cases the growth was much faster in the first half of the period. This likely reflects the increase of assembly production in the South based on imported parts, as well as the growth of component manufacturing in developing countries for export, mainly to developed countries. S-S trade was the smallest portion of world trade, and its growth rate was less impressive, relative to the other trade flows.

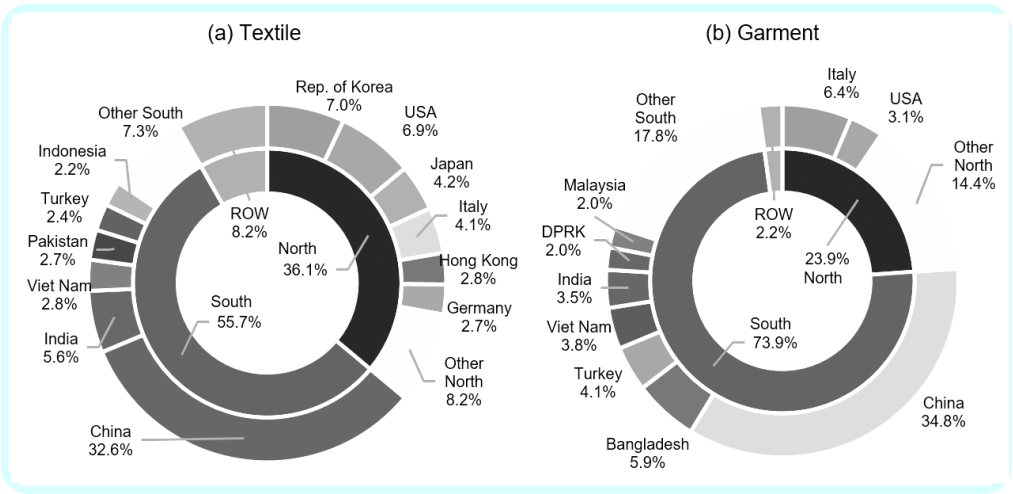
A similar pattern is found in motor vehicle trade. Within the North trade is the largest, but it significantly declined particularly in 2005-2010, while the share of both N-S and S-N trade increased steadily, despite a recent slowdown. In contrast, S-S trade grew over the period, but remained the smallest part of the trade, only amounting to 3.6% of the world trade in 2014 (<Fig. 4(b)>).

3. South-bound Trade: Major Exporting Countries

The South, as shown above, has become the place for manufacturing in many global industries, and it has spurred South-North trade, linking Southern producers with Northern buyers and consumers. While the Northern market is still bigger, our analysis also highlights the rise of South-South trade in both intermediate and finished goods. The South plays a growing role not only as manufacturing centers but also as final markets, which is a phenomenon called “shifting end markets”. Thus, the final segment of this section focuses on the trade flows heading for the South. It examines which countries play a key role exporting intermediate and finished goods to the Southern market. It also analyzes the change of the countries’ intensity in trade with the South to see whether they relied more or less on the Southern market for exports during the period of the study.

The leading apparel exporting countries to the South in 2014 are presented in <Fig. 5>. Reflecting the rise of S-S trade in textile, the majority of exports to the South (55.7%) came

Fig. 5. Major Apparel Exporting Countries to the South, 2014

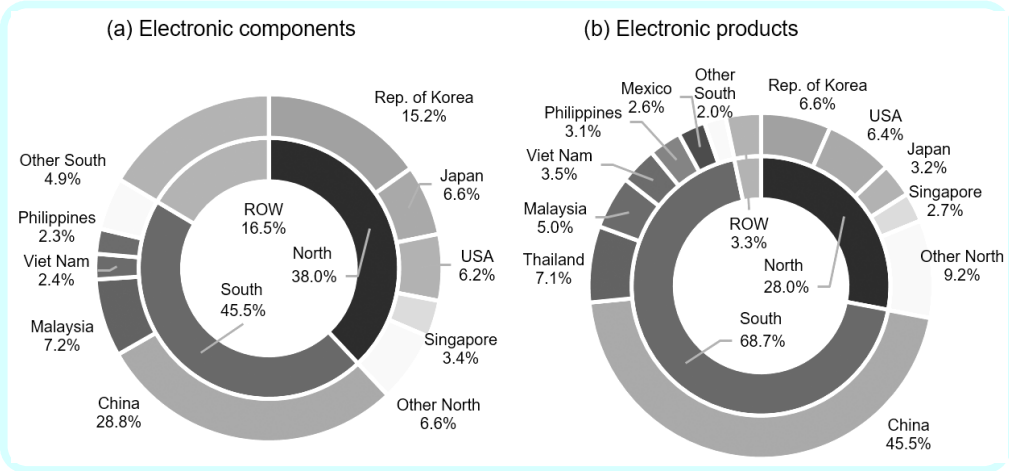


Source: Compiled from UNSD (2016).

from other Southern economies. More than a half of the S-S trade was from China. Other major textile exporters include India, Vietnam, Pakistan, Turkey and Indonesia. The major Northern textile exporters to the South are South Korea, the U.S., Japan and Italy. Northern exporters together accounted for 36.1% of textile exports destined to the South. In the garment sector, S-S trade is more dominant, representing 73.9% of Southern garment imports. Some of the garment exporters to the South are also the major textile exporters, such as China, Turkey, Vietnam and India, while others like Bangladesh are mainly garment producers with little capacity for textile production. The North only accounted for 23.9% of Southern garment imports, with Italy and the U.S. leading N-S trade.

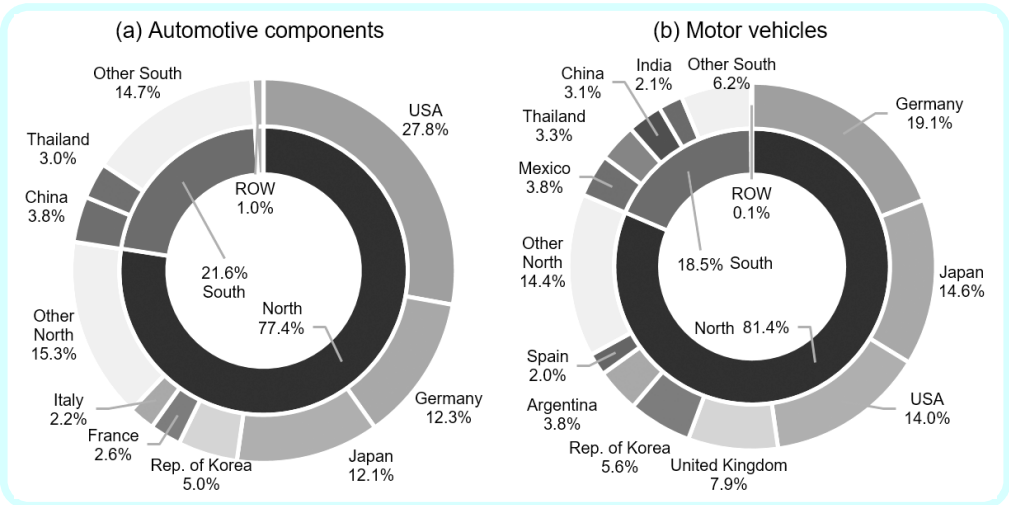
Similarly, the electronics sector, the South imports more from other developing countries than from developed countries. In 2014, the share of S-S trade was bigger in finished products than in intermediate goods <Fig. 6>. As in apparel, China is also dominant in S-S trade in both electronics categories (28.8% in components and 45.5% in final goods). In components, a handful of other Southern exporters like Malaysia, Vietnam and the Philippines have a much smaller but notable share in S-S trade. As in textile, South Korea, Japan and the U.S. are the leading Northern exporters, and collectively the North accounted for 38% of the South's total electronic component imports in 2014. In finished goods, the share of the South is much greater, amounting to 68.7% of the total Southern imports. Other Asian developing countries trailed China to be the major exporters to the Southern market, including Thailand, Malaysia, Vietnam and the Philippines, many of which are also the leading component exporters. Similarly, the same set of Northern countries that play a key role in component trade, namely South Korea, the U.S., Japan and Singapore, is also prominent in finished electronic products. Meanwhile, Western European countries are notably absent in any of the

Fig. 6. Major Exporting Countries of Electronics to the South, 2014



Source: Compiled from UNSD (2016).

Fig. 7. Major Exporting Countries of Automotive Products to the South, 2014



Source: Compiled from UNSD (2016).

categories, showing a stark contrast to the strong ties between developing and developed Asia.

In the automotive trade, as shown above, South-South trade is the smallest portion of world trade. The North still maintains its dominant role in the sector, and the share of N-S trade did not decline but rather increased in 2005-2014 <Fig. 4>. <Fig. 7> shows that the dominance of the North is also the case in trade with the South. Over three quarters of Southern automotive imports came from Northern economies in 2014. Nearly half of the imports were from three leading car-

Table 2. Average South-bound Export Intensity of Top 20 Exporting Countries

Product Category	Exporter	2005	2010	2012	2014	% change 2005-12	% change 2012-14
Textile	North	36.6%	40.5%	41.3%	40.2%	4.7%p	-1.1%p
	South	28.2%	40.7%	41.8%	42.7%	13.6%p	1.0%p
Garment	North	5.5%	6.1%	7.2%	6.4%	1.7%p	-0.8%p
	South	2.5%	5.6%	6.6%	7.2%	4.1%p	0.6%p
Electronic Parts	North	27.6%	29.6%	31.0%	30.6%	3.4%p	-0.4%p
	South	30.0%	34.3%	34.8%	35.4%	4.8%p	0.6%p
Electronic Products	North	18.1%	26.5%	31.7%	27.1%	13.6%p	-4.6%p
	South	10.3%	14.3%	16.2%	18.3%	6.0%p	2.0%p
Automotive Parts	North	10.5%	15.2%	15.8%	16.8%	5.3%p	1.0%p
	South	14.3%	16.8%	18.6%	22.3%	4.3%p	3.7%p
Motor Vehicles	North	8.4%	15.6%	16.9%	15.8%	8.5%p	-1.1%p
	South	23.2%	31.4%	32.3%	28.9%	9.0%p	-3.4%p

Source: Compiled from UNSD (2016).

making countries: the U.S., Germany and Japan. The U.S. was the largest exporter of auto parts while Germany led car exports to the South. Imports from other Southern countries were just 21.6% and 18.5% of the South's total imports of auto components and motor vehicles, respectively. Among developing countries, Thailand was strong in both upstream and downstream categories, while China was leading in auto parts and Mexico was leading in auto assembly.

The final part of the analysis is to determine whether the share of exports to the South increased among the major exporting countries, compared to their exports to the North. South-bound export intensity was measured as a percentage of a given country's exports to the South out of its total trade. This analysis focused on the top 20 exporting countries in each product category, which accounts for a large majority of world trade. For example, the top 20 exporting countries accounted for 94.4% of the world exports in electronic products at the highest, and 83.4% in auto components at the lowest.

The average percentage of Southern exports is presented in <Table 2>. The first observation is that it is generally higher in a product category with a greater share of N-S or S-S trade, such as textile and electronic components. Second, the average intensity of South-bound exports rose in 2005-2012 among the top 20 exporting nations in all the categories. It suggests that both Northern and Southern exporters increased their share of exports to the South, likely affected by stagnant market demands in post-crisis advanced economies and the relatively robust demand growth in emerging markets. How- ever, the share of Southern exports began to decline in 2012 in

leading Northern exporters in all the product categories except auto parts. In contrast, Southern exporters continued to expand their share of exports to the South in all products except motor vehicles. The share of exports to the South increased among Northern and Southern exporters of auto components, whereas it dropped for both in assembled cars.

Ⅴ. Conclusion

This paper examined the fragmentation of manufacturing production, the rise of GVCs and the changing pattern of North-South trade in the global economy from 2005 to 2014, the period interspersed by the global economic crisis and the subsequent recession. Using bilateral trade statistics from the UN Comtrade, it has focused on three manufacturing sectors, where GVCs play a key role (i.e., apparel, electronics, and automotive), and two product categories in each sector (intermediate and finished goods).

First, this study has confirmed the rise of manufacturing exports from the South but also highlighted a significant sectoral difference in the pattern of North-South trade. South-to-North trade has become the leading type of trade flows in apparel and electronics, where offshore outsourcing and contract manufacturing is prevalent. In contrast, S-N trade is growing but much less important in the automotive sector, where final assemblers with strong brand recognition still play an important role in manufacturing. In apparel, the South plays a strong role in manufacturing and exports both in textile and garment. Particularly, the analysis illuminates the expanding role of the South in textile production, an upstream segment of apparel GVCs. Thus, garment-producing countries are increasingly supplied by Southern input suppliers, tightening South-South GVC linkages. The pattern is highly analogous in electronics. S-N trade is much dominant in finished goods than components, but S-S trade in electronic components has increased significantly, facilitating the expansion of electronics value chains in the South. This has been assisted by the relocation of manu- facturing to the South by Northern component suppliers as well as the upgrading of Southern suppliers to upstream nodes of the chains. Overall, it indicates that the international division of labor has entered another new era in these GVCs, with the South having a much greater role in both upstream and downstream of the chains. Meanwhile, the automotive sector shows a very different picture in that N-N trade is still dominant. While the South's exports to the North steadily rose over the period, the gap between N-N trade and the other trade flows is still wide, with little indication that the dominance will be eroded in the near future, as seen in <Fig. 4>. Particularly notable is the fact that the gap was narrowed much slowly in recent years than before, or that it even widened again.

Second, the paper has found that the rate of change in North-South trade patterns was much greater in the earlier period from 2005 to 2010 and 2011. Since 2012, the earlier dynamics were significantly moderated, and the relative share of four different trade flows changed on a much smaller magnitude. It is notable that this temporal pattern is found across all the product categories, including automotive. In apparel, a gear shift came a little earlier, around 2010, and it came little later in electronics, in 2012. In automotive, the gear appears to have shifted in both years. In motor vehicles, the previous trends have even

been reversed since 2012 (<Fig. 4(b)>). Equally notable is that there is a difference between finished and intermediate goods in temporal patterns. The stabilization of trade patterns since 2010 or 2012 was very much evident in finished goods. In intermediate goods, at least for textile and electronic components, the trend of the last decade seemingly continued even after 2012, widening the gap between S-N trade and N-N trade. Overall, these findings highlight that the global economic crisis and its aftermath significantly affected the temporal pattern of North-South trade, slowing down and stabilizing the pre-crisis trends. One plausible explanation of this difference in temporal patterns between finished and intermediate goods is that the crisis made a direct, more immediate impact on final goods trade, but it took time for this impact to travel to the upstream part of the chains.

The final point of discussion is the pattern of South-bound trade. First, the trade flows observed in apparel confirm the pattern of role-shifting and upgrading among Asian economies, as described earlier in the paper (i.e., developed Asia supplying inputs like textile to developing Asian garment exporters). The analysis has shown that Korea, Japan and Hong Kong are the leading textile exporters to the South. More interesting though is the fact that China has already become the world's largest textile exporter to the developing world. Its South-bound exports closely matched the North's total exports to the South in 2014 (see <Fig. 5(a)>), although it is likely that part of China's exports are from Japanese, Taiwanese or Korean firms manufacturing textile in China for exports. China's leading role in South-bound trade is also found in electronics, and so is a strong intra-Asian tie between Japan, Korea and Singapore, and other developing countries in the region. Also notable is the engagement of the U.S. in exporting electronics to the South and the absence of Western Europe. This is partly related to the fact that Japan, Korea, and the U.S. are closely located to regional manufacturing hubs, such as China and Vietnam in Asia, and Mexico in North America, whereas most trade between Western and Eastern Europe is counted as N-N trade. The South-bound pattern in automotive is again distinctive. The North is strong in trade with the South, indicating that the South makes cars but largely with imported parts from the North, and most cars are still imported from traditional Northern auto-making nations. The analysis also points out that in the face of decelerating demand growth in emerging markets, a South-South tie appears more robust than a North-South tie, but only in apparel and electronics. In automotive, most leading exporters continued to expand their component trade with the South while reducing the share of South-bound car exports.

Despite these findings, this paper has several limitations, which warrants further investigation. First, it has only examined three manufacturing sectors, i.e., apparel, electronics, and automotive. Despite the salience of GVCs in these sectors, a future study can benefit from studying a wider range of sectors, which could improve the generalizability of findings on the relationship between GVCs and North-South trade patterns. Second, this paper has focused on identifying pattern changes in North-South trade across sectors and over time. A more systematic statistical analysis, therefore, would help us determine the significance of the observed cross-sectoral and longitudinal variations and the mechanisms

driving the differences. Finally, given that all these latest developments are still unfolding, further analysis is needed to investigate whether the stabilized trade patterns observed recently persist in post-crisis GVCs.

References

Amsden, A. H. (1989), *Asia's Next Giant: South Korea and Late Industrialization*, New York, NY: Oxford University Press.

Appelbaum, R. P., D. Smith and B. Christerson (1994), "Commodity Chains and Industrial Restructuring in the Pacific Rim: Garment Trade and Manufacturing". In G. Gereffi and M. Korzeniewicz (Eds.), *Commodity Chains and Global Capitalism*, Westport, CT: Greenwood Press, 187-204.

Arndt, S. W. and H. Kierzkowski (Eds.) (2001), *Fragmentation: New Production Patterns in the World Economy*, Oxford: Oxford University Press.

Buckley, P. J. (2009), "The Impact of the Global Factory on Economic Development", *Journal of World Business*, 44(2), 131-143.

Cattaneo, O., G. Gereffi and C. Staritz (2010), "Global Value Chains in a Postcrisis World: Resilience, Consolidation, and Shifting End Markets". In O. Cattaneo, G. Gereffi and C. Staritz (Eds.), *Global Value Chains in a Postcrisis World: A Development Perspective*, Washington, DC: World Bank, 3-20.

Choi, Nam-Suk (2016), "Domestic Employment Effect of Global Value Chain Expansion: Evidence from Beijing Hyundai Motor Company's Partner Companies", *Journal of International Trade & Commerce*, 12(4), 801-817.

Dicken, P. (2011), *Global Shift: Mapping the Changing Contours of the World Economy* (6th ed.), New York, NY: Guilford Press.

Donaghu, M. T. and R. Barff (1990), "Nike Just Did It: International Subcontracting and Flexibility in Athletic Footwear Production", *Regional Studies*, 24(6), 537-552.

Escaith, H. and S. Inomata (2011), *Trade Patterns and Global Value Chains in East Asia: From Trade in Goods to Trade in Tasks*, Geneva: World Trade Organization.

Escaith, H. and A. Maurer (2011), *International Trade Statistics 2011*, Geneva: World Trade Organization.

Feenstra, R. C. and G. G. Hamilton (2006), *Emergent Economies, Divergent Paths: Economic Organization and International Trade in South Korea and Taiwan*, New York, NY: Cambridge University Press.

Fröbel, F., J. Heinrichs and O. Kreye (1980), *The New International Division of Labor: Structural Unemployment in Industrialised Countries and Industrialization in Developing Countries*, Cambridge, UK : Cambridge University Press.

Fukunishi, T. and T. Yamagata (Eds.) (2014), *The Garment Industry in Low-Income Countries: An Entry Point of Industrialization,* New York, NY: Palgrave Macmillan.

Gereffi, G. (1999), "International Trade and Industrial Upgrading in the Apparel Commodity Chains", *Journal of International Economics*, 48(1), 37-70.

Gereffi, G. (2005), "The Global Economy:

Organization, Governance, and Development". In N. J. Smelser and R. Swedberg (Eds.), *The Handbook of Economic Sociology* (2nd ed.), Princeton, NJ: Princeton University Press, 160-182.

Gereffi, G. and K. Fernandez-Stark (2011), *Global Value Chain Analysis: A Primer*, Durham, NC: Center on Globalization, Governance & Competitiveness. Available from http://www.cggc.duke.edu/pdfs/2011-05-31_GVC_analysis_a_primer.pdf

Gereffi, G. and D. L. Wyman (Eds.) (1991), *Manufacturing Miracles: Paths of Industrialization in Latin America and East Asia*, Princeton, NJ: Princeton University Press.

Horner, R. (2016), "A New Economic Geography of Trade and Development? Governing South-South Trade, Value Chains and Production Networks", *Territory, Politics, Governance*, 4(4), 400-420.

Hu, A. (2015), "Embracing China's New Normal", *Foreign Affair*, 94(May/June), 8-12.

Humphrey, J. and H. Schmitz (2002), "How Does Insertion in Global Value Chains Affect Upgrading in Industrial Clusters?", *Regional Studies*, 36(9), 1017-1027.

Kaplinsky, R. and M. Farooki (2010), "Global Value Chains, the Crisis, and the Shift of Markets from North to South". In O. Cattaneo, G. Gereffi and C. Staritz (Eds.), *Global Value Chains in a Postcrisis World: A Development Perspective*, Washington, DC: World Bank, 125-153.

Kaplinsky, R., A. Terheggen and J. Tijaja (2011), "China as a Final Market: The Gabon Timber and Thai Cassava Value Chains", *World Development*, 39(7), 1177-1190.

Lamy, P. (2013), *Global Value Chains, Interdependence, and the Future of Trade* (webpage). Available from http://www.voxeu.org/article/globalvalue-chains-interdependence-and-future-trade

Lee, Joon-Koo and G. Gereffi (2015), "Global Value Chains, Rising Power Firms and Economic and Social Upgrading", *Critical Perspectives on International Business*, 11(3/4), 319-339.

Martin, W. G. (Ed.) (1990), *Semiperipheral States in the World-economy*, New York, NY: Greenwood Press.

Ramamurti, R. and J. V. Singh (2009), *Emerging Multinationals in Emerging Markets*, Cambridge, UK: Cambridge University Press.

Shannon, T. R. (1989), *An Introduction to the World-system Perspective*, Boulder, CO: Westview Press.

Sharf, S. (2015, January 30), "U.S. 2.4% Economic Growth in 2014 Strongest since Recession", *Forbes*. Available from http://www.forbes.com/sites/samanthasharf/2015/01/30/u-s-economy-grew-2-6-in-fourth-quarter-2-4-in-2014

The Economist (2013, July 27), "When Giants Slow Down". Available from http://www.economist.com/news/briefing/21582257-most-dramatic-and-disruptive-period-emerging-market-growth-world-has-ever-seen

Timmer, M. P., A. A. Erumban, B. Los, R. Stehrer and G. J. de Vries (2014), "Slicing up Global Value Chains",

Journal of Economic Perspectives, 28 (2), 99-118.

United Nations Statistics Division (UNSD) (n.d.), *Commodity List* (Webpage). Available from https://comtrade.un.org/db/mr/rfCommoditiesList.aspx

United Nations Statistics Division (UNSD) (2016), *United Nations Commodity Trade Statistics Database* (Webpage). Available from https://comtrade.un.org/db

World Bank (1993), *The East Asian Miracle: Economic Growth and Public Policy*, New York, NY: Oxford University Press.

World Bank (2016), *World Bank Country and Lending Groups* (Webpage). Available from https:// datahelpdesk.worldbank.org/knowledgebase/articles/906519

Zhan. J., R. Bolwijn, B. Casella and M. Fujita (2013), "Global Value Chains and Development: Investment and Value Added Trade in the Global Economy", United Nations Conference on Trade and Development, Geneva.