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China's evolving role in global production networks: the decoupling debate revisited

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Abstract

This paper examines the implications of the evolving role of China in East-Asia centred global production networks for regional and global integration of the Chinese economy. The main focus is on the 'decoupling' thesis, the notion that China's rise has been instrumental in reshaping the East-Asian region as a self-contained economic entity with potential for maintaining growth dynamism independent of the developed economies. The analysis is based on a new dataset that permits delineating the role of the other East Asian countries as suppliers of parts and components for assembly bases in China and China's dependence on third-country markets. We find that China's reliance on East Asian neighbours for parts and component supply has significantly declined in recent years, reflecting deepening of China's engagement in production networks. China is also emerging as a significant supplier of parts and components within global production networks. There has been a notable geographic diversification of China's assembly exports with a significant increase in the shares of extra-regional developing countries, but Western countries still absorb a sizeable share.

Key words: China, global production networks, trade patterns, decoupling thesis

JEL codes: F11, F14, F23, M16

China's evolving role in global production networks: the 'decoupling' debate revisited[1]

1. INTRODUCTION

Global production networks have been the prime mover of China's rise as an export powerhouse over the past three decades. Trade data showing the phenomenal shift in the composition of China's exports away from standard labour intensive products towards seemingly 'high-tech product lines within global production networks was widely interpreted at the early stage of export transition as an indication of China's becoming an advanced-technology superpower, with the sophistication of its export basket rapidly approaching the levels of those of most advanced industrial nations (Lall and Albaladejo, 2004; Yusuf et al , 2007; Rodrik, 2006). This perceived export prowess of China, coupled with the rapid increase in intra-regional trade within China-centred production networks as depicted by the standard trade data, soon led to the view the East Asian region was becoming a self-contained economic entity with the potential for maintaining its own growth dynamism independent of the economic outlook for the traditional developed market economies (the 'decoupling' thesis). Subsequent studies, which analysed the data by taking into account cross-border linkages within global production networks challenged this view (Ferranini and Scaramozzino, 2015 2015; Athukorala, 2009; Yao, 2009; Bergsten et al., 2006; Roach 2009; Ravenhill, 2014; Schott, 2008). These studies demonstrated the decoupling enthusiasts had missed the point that China was, in fact, rapid consolidating its role in the final assembly stages of East Asia-centred global production networks of vertically-integrated global 'high-tech' industries. Even though East Asian economies had become the major suppliers of parts and components for assembly operations in China, the destination of finished products remained predominantly markets outside the region. It was, therefore, too early to proclaim that China and the East Asian region was decoupling from the global economy.

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[1] Revised version of a presented at the conference, *China: Wealth & Power*, College of Asia and the Pacific, Australian National University, 7-8 April 2016. We would like to thank Ligang Song, Jane Golley and other conference participants for valuable comments.

The purpose of this paper is to revisit this debate by extending the data coverage to more recent years and clearly delineating patterns of parts and component and final assembly exports within global production networks[2] (henceforth referred to as 'network trade'). Our analysis is motivated by a sizable recent literature on the deepening of China's engagement in global production sharing. There is evidence coming from firm level studies that firms engaged in final assembly in China have begun to procure inputs from domestic sources. The process has been underpinned by the relocation of manufacturing facilities to China by component producing firms from neighbouring countries (in particular Taiwanese and Korean firms) to supply the rapidly expanding final assembly activities in China. Also domestic parts and component supply seem to have been increasing as production bases expand to the interior regions in the country driven by wage increases in the coastal regions and aided by the improvements in trade-related infrastructure (Upward et al., 2013; Yang and Hayakawa, 2015; Yang and Tsou 2015; Kong and Kneller 2016; Kang and Shen 2016; Kee and Tang 2016). There is also evidence of a notable decline in the share of the foreign invested enterprises (FIEs) in domestic manufacturing as a result of the rapid expansion of the operations of local firms, which presumably have a greater propensity to procure inputs domestically ((Lardy, 2014). However, so far no attempt has been made to examine whether these structural changes in domestic manufacturing have begun to change patterns of network trade. Filling this gap is important for broadening our understanding of economic performance and structural changes in China and their potential impact on inter-state relations.

The paper is structured as follows. The procedures followed in separating data on trade taking place within global production networks from the standard trade data are discussed in Section 2. Section 3 provides an overview of China's emergence as a global export powerhouse. This is followed by an analysis of the emerging patterns of China's engagement in global production sharing, focussing on both the charging commodity composition and the geographic profile of trade (Section 4). The final section summarises the key findings and offers some policy inferences.

[2] We used the terms 'global production networks' and 'global value chain' interchangeably in this paper.

2. TRADE DATA COMPILATION

A prerequisite for analysing patterns and determinants of trade within global production networks (GPN trade) is the systematic delineation of parts and components and final assembly from the standard (Customs-records based) trade data. Following the seminal paper by Yeats (Yeats, 2001), it has become common practice to use data on parts and components to measure GPN trade. However, there has been a remarkable expansion of production sharing from parts and component to encompass final assembly. Moreover, the relative importance of these two tasks within production networks varies among countries and over time in a given country, making it problematic to use data on the parts and components trade as a general indicator of the trends and patterns of GPN trade over time and across countries. In this study we define network trade to incorporate both components and final (assembled) goods exchanged within the production networks.

The data used in this study for all countries except Taiwan are compiled from the *UN Comtrade* database. The data for Taiwan (a country which is not covered in the UN trade data reporting system) come from the database of the Council of Economic Planning and Development, Taipei. The data are compiled at the 5-digit level of the Standard International Trade Classification (SITC) based on SITC Revision 3 three and Revision 4 for the periods 1992-2006 and 2007-2014 respectively. Data based on SITC Rev. 3 are directly available for the entire period, but the UN conference liking the two series have left out a sizable number of 5-digit items in the period 2007-14.

Parts and components are delineated from the reported trade data using a list compiled by mapping parts and components in the intermediate products subcategory of the UN Broad Economic Classification (BEC) with the Standard International Trade Classification (SITC).[3] It is important to note that parts and components, as defined here, are only a subset of intermediate goods, even though the two terms have been widely used interchangeably in the

[3] The lists are available from the authors on request.

recent literature on global production sharing. Parts and components unlike the standard intermediate inputs, such as iron and steel, industrial chemicals and coal, are 'relationship-specific' intermediate inputs; in most cases they do not have reference prices, and are not sold on exchanges and are more demanding on the contractual environment ((Hummels, 2002; Nunn, 2007). Most (if not all) of parts and components also do not have a 'commercial life' on their own unless they are embodied in a final product.

There is no hard and fast rule for delineating final goods assembled within global production networks from the standard trade data. The only practical way of doing this is to focus on the specific product categories in which GPN trade is heavily concentrated. Once these product categories are identified, trade in final assembly can be approximately estimated as the difference between parts and components, which are directly identified based on our list, and the total trade of these product categories.

Guided by the available literature on production sharing, we identified ten product categories: power generating machinery (SITC 71), specialised industrial machines (SITC 72), metal working machines (SITC 73), general industrial machinery (SITC 74)., office machines and automatic data processing machines (SITC 75), telecommunication and sound recording equipment (SITC 76), electrical machinery (SITC 77), road vehicles (SITC 78), other transport equipment (SITC 79), travel goods (SITC 83), clothing and clothing accessories (SITC 84), footwear and sport goods (SITC 85), professional and scientific equipment (SITC 87) and photographic apparatus (SITC 88). Of these SITC 83, SITC 84 and SITC 85 can been classified as products predominantly traded with buyer-driven production networks and the rest as belonging to producer-drive production networks. It is quite reasonable to assume that these product categories contain virtually no products produced from start to finish in a given country. The difference between the value of total exports of these categories and the value of total parts and components falling under these categories was treated as the value of final assembly. However, admittedly the estimates based on this list do not provide full coverage of final assembly in world trade. For instance, outsourcing of final assembly does take place in various miscellaneous product categories such as clothing, furniture, sporting goods, and leather products. It is not possible to meaningfully delineate parts and components and assembled goods in reported trade in these product categories because they contain a significant (yet unknown) share of horizontal trade.

A number of recent studies have analysed trade patterns using 'value added' trade data derived by combining the standard trade data with national input-output tables ((Johnson, 2014) provides a survey). The underlying rationale is that, in a context of rapidly expanding cross-border trade in parts and components driven by global production sharing, the standard (gross) trade data (trade data based on Customs records) tend to give a distorted picture of bilateral trade imbalances of a given country and the geographic profile of its global trade linkages (Lamy, 2013). This approach is, however, not relevant for the present study, which aims to examine patterns and determinants of global production sharing. The pertinent approach is to analyse data on the reported (gross) exports, separated into parts and components and final assembly. Trade and industry policies have the potential to influence only a country's engagement in a given slice of the value chain; domestic value addition evolves over time as the country becomes integrated into the value chain over time.

3. CHINA IN GLOBAL PRODUCT NETWORKS: AN OVERVIEW

The rise of China as a major trading nation is one of the most momentous developments in the post-Second World War era, surpassing even the stunning rise of Germany and Japan. Total merchandise exports from China increased from US$ 8 billion (around 1% world exports) in 1978 when the process of liberalization reforms started to US$1220 billion (9.4%) in 2007 and to 2200 billion (13.7%) in 2014.[4] In 1990, China's merchandise exports (US$62 bn) amounted to only a fifth of exports from Japan. In 2004, China overtook Japan to become the third largest exporter in the world, and in another three years became the second largest exporter surpassing the USA. From 2009 China has been the largest exporting nation ahead of Germany. The exports to GDP ratio of China currently stands at 33% compared to an average level of around 10% for other major continental economies such as the US, India and Brazil.[5]

[4] The data reported in the paper are in current US$ and come from the UN Comtrade database, unless otherwise stated.

[5] The export-GDP ratio tends to overstate the degree of export dependence in the presence of global production sharing because trade flows are recorded on a gross value basis (including the value of the intermediate inputs that are embodied in a product) whereas GDP, in contrast, is a value added concept. Given multiple-border crossing of parts and components, China, which serves as an assembly base, gets credited with a disproportionate share of exports from the multicounty supply chain. However the use of value added export

China's phenomenal export expansion has been underpinned by a dramatic shift in the commodity composition away from primary products and towards manufacturing. The share of manufactures in total merchandise exports increased from less than 40% in the late 1970s to over 90% from about the late 1990s, compared to a global average of around 70%. China accounted for more than half of the increase in total global manufacturing exports between 1992 and 2014.

Until about the early 1990 the expansion of manufacturing exports from China took place predominantly within 'buyer-driven' production networks.[6] The product mix therefore remained heavily concentrated in traditional labour-intensive manufactures such as apparel, footwear, toys and sporting goods. Hong Kong manufacturing firms, which relocated manufacturing plants in the newly established special economic zones in the Chinese mainland played a pivotal role in linking China to these production networks (Song and Sung, 1995; Roach, 2014)).

Since then, there has been a palpable shift in the export composition away from conventional labour-intensive products and towards assembly operations within 'producer driven' production networks, in particular, those within the broader category of machinery and transport equipment. Within a few years, the increase in the rate of market penetration of China in world machinery trade turned out to be faster than in traditional labour-intensive manufacturing. Within these networks China engaged largely in final assembly stages within East Asia centred production networks, based on parts and components produced elsewhere within the networks, mostly in Japan and the other East Asia countries which had already consolidated their operations within global value chain of these products.

Ample supply of relatively cheap and trainable labour and the SEZ-centred trade liberalisation and trade related infra-structure provision were the main drivers of China's emergence as the premier global assembly centre. Relating to labour supply, China had the specific advantage of the availability of supervisory manpower to complement the vast pool of

data (from *stats.**oecd**.org/index.aspx?queryid=47807)* to calculate this ratio does not alter China's ranking (22% for China compared to an average of 9% for the other countries).

[6] On the analytical distinction between 'buyer-driven' and 'producer-driven' production networks, see (Gereffi, 1999).

unskilled workers. Assembly processes within production networks requires middle-level supervisory manpower (in addition to the availability of trainable low-cost unskilled labour) much more than is required in the traditional labour intensive manufacturing.[7] Under global production sharing, developed countries normally shift to developing countries low-skill-intensive parts of the value chain. But, the least skill-intensive activities in the developed country can be more skill-intensive than the most-skill-intensive activities in the developing country (Feenstra, 1998).

Participation in global production sharing would not have occurred if the costs of service links associated with production sharing— costs involved in arrangements for connecting/coordinating activities into a smooth sequence resulting in the production of the final good—- outweighed the gain from the favourable labour market conditions ((Jones and Kierzkowski, 2004). These extra costs refer to transportation, communication, and other related tasks involved in coordinating the activity in a given countries with what is done in other countries within the production network. The SEZ-centered trade and foreign investment policy reforms in China were successful in meeting this requirement.

In addition to these factors, improvement in the overall investment climate as a result of the cessation of the Cold War and the accession to the World Trade Organisation in 2001 provided a conducive setting for the smooth functioning of the China-centred production networks.[8] The decision of a firm to outsource production processes to another country—either by setting up an affiliated company or establishing an arm's length relationship with a local firm—entails 'country risks'. This is because supply disruptions in a given overseas location could disrupt the entire production chain. Such disruptions could be the product of shipping delays, political disturbances, or labour disputes (in addition of course to natural disasters). In many instances it is impossible to fully offset these risks by writing *complete contracts* (Helpman, 2006; Spencer, 2005). Country risk considerations, therefore, have a much greater

[7] See also Steve Jobs' discussion with President Obama on Apple's assembly operations in China in Isaacson (2011), p. 546. 'At that time, Apple had 700,000 factory worker employed in China, and that was because it needed 30,000 engineers on-site to supervise those workers. If you could educate these engineers, he said, we could move more manufacturing plants here'.

[8] Country risk considerations during the Cold-War era is considered as a possibly reason why US electronics MNEs favoured Singapore (and subsequently Malaysia, Thailand and the Philippines) in setting up assembly plants at the initial stage of their overseas operations (in the 1960s and 1970s) while bypassing Korea, Taiwan, and Hong Kong (in particular Hong Kong, a country that followed almost laissez-faire economic policy throughout), countries which were more familiar to them (Athukorala and Kophaiboon 2014).

bearing on any corporate decision to deviate from these well-established global practices compared to simple relative cost considerations.

4. TRADE PATTERNS

Data on manufacturing exports from China, disaggregated into components, final assembly and total network exports, and Chian's world market shares in these product groups are plotted in Figures 1 and 2. Data on commodity composition of these exports and their world market shares are summarised in Tables 1 and 2.

Insert Table 1 about here
Insert Table 2 about here2

Exports of network products increased from US$47bn in 1992-03 to US$ 1.5 trillion in 2013-14[9], when these products accounted for over 70% of total manufacturing exports. Within network products, final assembly (assembled products) account for a larger share compared with parts and component throughout the period. In 2013-14, assembled goods accounted for nearly two-thirds of total network exports. This pattern reflects China's dominant role as an assembly centre within global production networks. However, parts and components account also for a sizeable share and it has increased in recent years, reflecting deepening of the domestic production bases (Figure 1).

Figure 1 about here

A close look at the time patterns over the period, however, shows a slowing down of network exports from about 2005/06 (allowing for the contraction in 2009 in the aftermath of the global financial crisis) compared to the first half of the decade. For instance, the share of network product in China's total merchandise exports increased from 67% in 1992-93 to 73% in 2005/06 and declined to 70% in 2012-14. Whether this slowdown, which has also been identified in total world network imports, reflects a structural, rather than a cyclical

[9] In order to minimise possible random shocks and measurement errors, two year averages are used in inter-temporal comparison throughout this section.

phenomenon has become the subject of debate in recent years.[10] Various possible structural factors suggested include saturation of opportunities for global production sharing; a move away from highly-fragmented, globally-spanning production networks towards a greater reliance on regional production networks; adoption of new technologies such as 3D printing ('adaptive manufacturing'); and a decline in imports of parts and components by China as domestic supply capabilities developed.

Our hypothesis is that data in current US$ terms tend to understate the relative importance of network trade in total manufacturing trade. Global production sharing essentially means restructuring production processes across countries mainly in order to reap relative cost advantages (tasks are located where they can be performed more cheaply). The global spread of the production process of a given product also means that increasing returns can take place throughout the industry (rather than at the individual firm level).[11] If the production is fully integrated (that is, the entire production process takes place in one location), achieving scale economies is limited by volume at the end product level. However, with global production sharing it is possible to achieve a level of production beyond the absorption capacity of the domestic market. This will enhance the gains from scale. Consequently, we would expect products traded within global production networks to experience slower price increases relative to other traded products which are produced from beginning to end within given national boundaries.

To test this hypothesis, we calculated the share of network products in total manufacturing exports from China using constant-price (real) export values. For this purpose we constructed price indices separately for total manufacturing and network exports by applying Chinese export weights to four-digit import price indices (based on the HS system) available from the US Bureau of Labour Statistics. The constructed price indices for network products shows a clear declining trend over the past one-and-a half decades. In real terms, network exports accounted for over 75% of China's manufacturing exports, up from 73% in 2005-06.

[10] See Constantinescu et al. (2014) and various contributions in Hoekman (2015).
[11] Allyn Young (1928) was the first to draw attention to this possibility in a seminal contribution to the debate in the 1920s and 1930s concerning the concept of a downward sloping supply curve facing firms.(YOUNG, A. A. 1928. Increasing returns and economic progress. *The economic journal*, 38**,** 527-542.)

From about the early 1990s, China's world share of network product continued to remain above its world share of total manufacturing exports (Figure 2). This difference has become prominent from about 2005. In 2013-14, China accounted for 27% of total network product exports in the world compared with an 18% share in total world manufacturing exports. Interestingly, shares of both final assembly and parts & components were notably higher compared with the aggregate world export share.

Figure 2 about here

Commodity composition

As regards the composition of network exports, export within producer-driven networks has been much larger compared to those within buyer-driven networks. And the difference between the two figures has widened over time (Table 1, Figure 2). In 2013, exports within producer drive networks accounted for nearly three-quarters of total network exports. Information technology products (classified under the three SITC 75, 76 and 77) accounted for over 45% of total network exports in 2013-14. The data do not show significant product diversification with network exports during the past two decades. Interestingly, textiles and apparel still account for a sizeable share of exports among the SITC-2 digit exports listed in the table. Textiles accounted for 14% of parts and component exports and apparel for 28% of assemble product exports in 2013-14.

Figure 3 about here

China's shares of world exports of most products at the two-digit SITC level have increased over time, notwithstanding the widely perceived decline in China's international competitiveness owing to rising domestic wages (Table 2). Within producer-driven exports, IT products showed the fastest rates of world market penetration. Interestingly, world market shares of buyer-driven exports have recorded notable increases, even though their production is considered relatively more labour intensive. China accounted for a staggering 48% of world market share in apparels in 2013-14, up from 40.3% in 2005-06.

An important facet of China's engagement in global production networks that has implications for its economic links with neighbouring East Asian countries is the dependence of Chinese assembly bases on parts and components imported from these countries. As noted

at the outset of this paper, there is some scattered evidence that China's manufacturing base may have deepened over the years, which may have reduced its import dependence. Two data series, which we compiled to shed light on this issue are plotted in Figure 4.

Figure 4 about here

Imports of parts and components as a percentage of total exports of assembled products increased from 38% in the mid-1980 to over 90% by 2005. This was the period of rapid structural transformation of the network export mix from buyer-driven exports to producer-driven exports. Since then the figure has shown a notable decline, reaching 60% by 2013-14.

Exports of parts and components amounted to only about 60% of imports in the early 1990s. This figure increased continuously during the ensuing years. In 2013-14, parts and component exports exceeded imports almost by 25%. This is indicative of a deepening of China's engagement in global production sharing.[12] In sum, the data are not consistent with the widely held view that China is predominantly a final goods assembly centre within global production networks. Two-way trade in parts and components (imports and export) has become an integral feature of the country's engagement in global production sharing.

Geographic profile

Data on the destination-country composition and the source-country composition of China's network exports and imports are summarised in Tables 3 and 4, respectively. A number of interesting developments relating to China's geographic patterns of engagement in global production networks can be observed.

Table 3 about here

Table 4 about here

[12] Constantinescu et al (2014) also report a decline in the ratio of parts and component imports to total manufacturing exports from China from about 55% in the mid-1990 to about 35% 2012. What they have observed is broadly consistent with patterns shown in Figure 3, even though the denominators used in calculating the ratios are different. Surprisingly, without looking at what has been happening to component exports, they interpret these figure as indicative of 'diminishing fragmentation of the production process 'and diminishing scope for productivity growth through a more efficient international division of labour' (pp. 40-41)

On the export side, there has been a notable decline in the share of exports destined to developed countries, even though these countries still absorb almost a half of the total Chinese network exports. The sharpest decline is in exports of assembled products, from 70% in 1992-03 to 50% in 2013-14. Export shares accounted for by Japan both in parts and components and assembled good have declined at a faster rate compared to those accounted for by North America and the EU. While market shares of all developing countries/regions, other than that of Taiwan, have increased across the board, the degree of export penetration in Africa, Latin America and the Caribbean, and Western Asia (the Middle-East) countries was much sharper, though from a low base. Reflecting the inter-regional differences in the degree of market penetration, the share of exports destined to the East Asian developing countries (Korea, Taiwan, the countries in South East Asia) has increased at a slower rate (from 21.5% in 1992-03 to 20.5% in 2013-14) compared to the share of other developing countries (from 21.5% to 28.6%). In 2013-14, total network exports to the other developing countries (US$439 bn) was 44% larger than those to the East Asian developing countries (US$304 bn).

On the import side, the share accounted for by developed countries has declined at a much faster rate (from 70% in 1992-03 to 47.8% in 2013-14) compared to what we observed on the import side. The major gainers of market share in China are Korea and Taiwan and the countries in Southeast Asia, with Korea recording the biggest gain. By contrast Japan's share of total network imports has declined sharply from 28.8% in 1992-93 to 15.4% in 2013-2014. The data clearly show the heavy concentration of China's imports of parts and components from the neighbouring East and South East Asia countries (including Japan) (Figure 5). The share accounted for by these countries in total parts and component imports increased from 53% to 62% between 1992-93 and 2013-04. However, the share of parts and components exports to Chana in total manufacturing exports (exports to the world) of these countries are much smaller than commonly thought (Figure 6). Moreover the recent years have shown a notable decline in these shares as input requirements of final assembly in China are increasingly being met from domestic sources.

Figure 5 about here

Figure 6 about here

5. CONCLUDING REMARKS

This paper examines the implications of the evolving role of China in East-Asia centred global production networks for regional and global integration of the Chinese economy, and for the stability of regional international relations.

Consolidation of its role within Asian-centred global production networks has been the prime mover of China's rapid export growth. Contrary to the view held in some policy circles, there is no evidence of slowing down of network exports from China during the post GFC era. The deepening of production bases within global production networks is evident from the notable decline in parts and component imports relatively total processed products exported from China and its emerging role as a net exporter of parts and components.

Reflecting deepening of domestic supply bases, China's reliance on its East Asian neighbours for parts and component supply has significantly declined in recent years, reflecting deepening of China's engagement in production networks. China is also emerging as a significant supplier of parts and components within production networks in the East Asian region and beyond. The shares of parts and components exports to Chana in total manufacturing exports (exports to the world) of the neighbouring East Asian countries are much smaller than commonly thought. Moreover the recent years have shown a notable decline in these shares as input requirements of final assembly in China are increasingly being met though domestic sourcing.

There has been a notable geographic diversification of final assembly exports from China, but Western countries still account for a sizeable share of these exports. The shares accounted for by developing countries have generally increased across the board, the degree of China's market penetration in Africa, Latin America and the Caribbean, and Western Asia (the Middle-East) countries was much sharper, though from a low base, compared to East Asian countries: the is no evidence of an East Asia bias in China's evolving export patterns. There is no evidence that China's rise is reshaping the East-Asian region as a self-contained economic entity with potential for maintaining growth dynamism independent of the developed economies.

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Table 1: Commodity composition of China's network exports, 1992-93, 2005-06 and 2013-14 (%)[1]

Products[2]	Parts and components			Assembled products			Total GPN products		
	1992-93	2005-06	2013-14	1992-93	2005-06	2013-14	1992-93	2005-06	2013-14
(a) Exports with producer drives networks	55.5	87.6	85.3	26.7	62.8	64.5	35.5	74.7	73.6
Chemical (5)	0.3	0.3	0.7	---	---	---	0.1	0.1	0.3
Textile parts (6 - 651 to 657)	0.6	0.4	0.7	---	---	---	0.2	0.2	0.3
Power generating machines (71)	5.0	3.1	5.6	0.3	0.2	0.5	1.7	1.6	2.7
Specialised industrial machines (72)	1.3	1.0	2.0	1.6	2.3	3.7	1.5	1.7	3.0
Metal working machines (73)	0.3	0.3	0.4	0.7	0.5	0.7	0.6	0.4	0.6
General industrial machinery (74)	3.8	4.9	8.1	2.4	5.3	7.2	2.8	5.1	7.6
Automated data processing machines (SITC 75)	7.3	28.7	14.9	1.0	14.5	15.9	2.9	21.3	15.5
Telecomm and sound recording instruments (76)	15.5	21.9	22.3	6.0	16.1	8.7	8.9	18.9	14.6
Electrical machinery (77)	15.9	21.7	22.0	4.1	9.4	10.1	7.7	15.3	15.2
Road vehicles (78)	1.9	3.7	6.1	2.8	4.8	4.6	2.6	4.3	5.3
Other transport equipment (79)	0.6	0.4	0.4	1.8	2.2	4.1	1.4	1.4	2.5
Professional and scientific instruments (87)	0.4	0.6	1.2	1.1	5.7	7.2	0.9	3.3	4.6
Photographic apparatus (8)	2.6	0.7	0.8	4.9	1.7	1.9	4.2	1.2	1.4
(b) Exports within buyer-drive networks	44.5	12.4	14.7	73.3	37.2	35.5	64.5	25.3	26.4
Textiles (656 to 657)	44.4	11.9	14.2				13.6	5.7	6.1
Apparel and clothing accessories (84)	0.1	0.4	0.5	53.7	27.7	24.4	37.3	14.7	14.1
Footwear (85)	…	---	---	14.7	6.8	7.3	10.2	3.6	4.1
Travel goods (83)	---	---	---	4.9	2.7	3.8	3.4	1.4	2.1
Total (a + b)	100	100	100	100	100	100	100	100	100
Total, US$ bn	14.4	276.0	602.7	32.7	301.9	911.7	47.1	578.0	1,514.5

Note: 1. Two-year averages. 2. Commodity codes of the Standard International Trade Classification (SITC) are given in brackets. --- Zero or negligible.

Source: Compiled from UN Comtrade database

Table 2: China's share in world network trade, 1992-93, 2005-06 and 2013-14 (%)[1]

Products[2]	Parts & components			Final assembly			Total network products		
	1992-93	2005-06	2013-14	1992-93	2005-06	2013-14	1992-93	2005-06	2013-14
(a) Exports with producer drives networks	1.2	10.5	17.8	1.2	9.5	16.2	0.8	6.6	11.5
Chemical (5)	0.6	3.0	11.9	---	---	---	0.6	3.0	11.9
Textile parts (6 - 651 to 657)	1.1	4.5	10.4	---	---	---	1.1	4.5	10.4
Power generating machines (71)	0.9	3.6	9.1	1.6	2.9	8.5	0.5	1.8	4.8
Specialised industrial machines (72)	0.6	3.4	8.4	0.6	3.6	9.7	0.5	2.7	7.1
Metal working machines (73)	0.6	4.2	8.9	1.2	3.2	8.1	0.8	2.7	6.4
General industrial machinery (74)	0.8	6.8	13.4	1.1	8.2	16.3	0.6	5.0	9.8
Automated data processing machines(SITC 75)	0.8	21.4	29.9	1.3	49.7	71.3	0.5	14.9	27.8
Telecom and sound recording instruments (76)	4.2	20.9	45.3	3.0	25.8	33.4	2.4	14.2	25.4
Electrical machinery (77)	1.2	8.8	19.2	2.9	18.4	30.6	0.9	5.8	12.9
Road vehicles (78)	0.3	3.9	8.6	0.4	2.1	3.7	0.3	2.1	4.0
Other transport equipment (79)	0.3	2.0	2.9	0.7	3.7	11.1	0.5	2.7	7.5
Professional and scientific instruments (87)	0.6	3.9	10.5	0.8	9.6	16.1	0.6	7.2	13.2
Photographic apparatus (8)	5.4	13.7	18.5	4.3	7.2	13.3	3.9	7.1	12.0
(b) Exports within buyer-drive networks	6.7	19.2	30.1	18.5	35.4	46.2	11.8	27.5	39.6
Textiles (656 to 657)	6.8	20.2	33.6	15.1	31.4	42.9	6.8	20.4	34.4
Apparel and clothing accessories (84)	---	---	---	21.5	40.3	48.1	21.5	40.3	48.1
Footwear (85)	0.7	16.7	20.6	14.8	30.5	42.6	14.3	29.4	40.5
Travel goods (83)	0.0	0.0	0.0	14.6	32.7	41.8	14.6	32.7	41.8
Total (a + b)	1.8	11.2	20.6	3.7	12.8	25.8	2.0	8.2	16.7

Note: 1. Two-year averages. 2. Commodity codes of the Standard International Trade Classification (SITC) are given in brackets. --- Zero or negligible.

Source: Compiled from UN Comtrade database

Table 3: Destination-country composition of China's network exports, 1992-93, 2005-06 and 2013-14 (%)[1]

	Parts & components			Assembled goods			Total GPN products		
	1997-98	2005-06	2013-14	1997-98	2005-06	2013-14	1997-98	2005-06	2013-14
Japan	19.9	11.3	9.4	15.3	10.5	7.1	17.8	10.9	8.1
Korea, Rep	4.5	5.2	7.1	2.8	3.8	4.8	3.8	4.5	5.8
Taiwan	5.9	3.6	2.7	3.9	2.6	2.6	5.0	3.1	2.6
Southeast Asia	11.4	10.7	11.5	8.6	8.4	12.5	10.1	9.6	12.1
South Asia	2.4	2.9	5.0	2.6	2.8	4.2	2.5	2.9	4.6
India	0.4	1.8	3.1	0.5	1.3	2.4	0.5	1.5	2.7
Western Asia	1.8	2.4	4.3	2.5	3.4	5.0	2.1	2.9	4.7
Central Asia	0.1	0.2	0.6	0.1	0.5	0.8	0.1	0.4	0.7
Oceania	1.1	1.3	1.6	1.7	2.3	2.5	1.4	1.8	2.1
Australia	1.0	1.2	1.5	1.5	1.9	2.0	1.2	1.5	1.8
North America	27.3	29.3	24.8	30.9	29.5	23.5	29.0	29.4	24.1
USA	26.1	28.0	23.4	29.7	27.7	22.2	27.7	27.8	22.7
Canada	1.1	1.3	1.4	1.3	1.8	1.3	1.2	1.6	1.4
EU	21.1	26.1	18.9	21.4	25.8	19.9	21.2	26.0	19.5
Non-EU Western Europe	0.4	0.3	0.3	1.6	0.7	0.6	1.0	0.5	0.5
Commonwealth of Independent States	0.3	1.3	3.2	0.6	2.4	3.7	0.4	1.9	3.4
Russian Federation	0.1	0.8	2.1	0.4	1.4	2.3	0.3	1.1	2.2
Africa	1.6	1.7	3.5	3.2	2.9	4.6	2.3	2.3	4.1
Latin America & the Caribbean	2.3	3.6	6.9	4.4	4.2	7.9	3.3	3.9	7.5
Brazil	0.8	1.2	2.0	0.9	0.8	2.4	0.8	1.0	2.2
Mexico	0.6	1.3	2.2	0.7	0.9	1.9	0.6	1.1	2.0
Total	100	100	100	100	100	100	100	100	100
US$	14.4	276.0	602.7	32.7	301.9	911.7	47.1	578.0	1,514.5
Memorandum items									

Developed countries[2]	69.1	65.6	52.0	70.3	66.7	50.0	69.7	66.1	50.9
Developed countries excluding Japan	49.3	54.3	42.6	54.9	56.2	43.0	51.9	55.2	42.8
NAFTA	27.8	30.6	27.0	31.7	30.4	25.3	29.6	30.5	26.1
Developing countries[2]	30.9	34.4	48.0	29.7	33.3	50.0	30.3	33.9	49.1
East Asian developing countries[3]	21.8	19.6	21.3	15.3	14.8	19.9	18.8	17.2	20.5

Note: 1. Two-year averages.

2. Based on the UN Standard Country Classification.
3. East Asia excluding Japan.

Source: Compiled from UN Comtrade database

Table 4: Sour-country composition of China's network imports, 1992-93, 2005-06 and 2013-14 (%)[1]

	Parts and components			Assembled products			Total GNP products		
	1997-98	2005-06	2013-14	1997-98	2005-06	2013-14	1997-98	2005-06	2013-14
Japan	28.9	27.7	21.2	28.8	19.0	12.8	28.8	22.4	15.4
Korea, Rep	8.0	15.0	14.1	5.3	16.6	19.4	6.7	16.0	17.8
Taiwan	16.0	12.0	11.4	12.4	19.9	19.6	14.3	16.8	17.1
Southeast Asia	9.7	16.0	14.9	3.5	15.4	12.9	6.8	15.6	13.5
South Asia	0.0	0.2	0.4	0.0	0.1	0.1	0.0	0.1	0.2
India	0.0	0.2	0.4	0.0	0.1	0.1	0.0	0.1	0.2
Western Asia	0.1	0.2	0.3	0.2	0.2	0.3	0.2	0.2	0.3
Central Asia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Oceania	0.3	0.2	0.2	0.4	0.2	0.1	0.3	0.2	0.1
Australia	0.2	0.2	0.1	0.4	0.2	0.1	0.3	0.2	0.1
North America	14.0	9.0	9.7	18.4	9.8	12.4	16.0	9.5	11.6
USA	13.0	8.4	9.2	17.4	9.3	11.9	15.0	9.0	11.1
Canada	1.0	0.6	0.4	1.0	0.5	0.5	1.0	0.5	0.5
EU	20.6	17.6	25.2	28.5	16.3	19.2	24.3	16.8	21.1
Non-EU Western Europe	0.8	0.7	1.1	1.3	1.2	1.3	1.0	1.0	1.2
Commonwealth of Independent States	1.2	0.1	0.1	1.2	0.1	0.1	1.2	0.1	0.1
Russian Federation	1.1	0.1	0.1	1.2	0.1	0.1	1.1	0.1	0.1
Africa	0.0	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1
Latin America & the Caribbean	0.2	1.2	1.2	0.1	1.0	1.8	0.2	1.0	1.6
Brazil	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Mexico	0.1	0.9	0.9	0.0	0.2	0.9	0.1	0.5	0.9
Total	100	100	100	100	100	100	100	100	100
Developed countries[2]	64.5	54.5	55.4	77.2	46.0	44.4	70.4	49.3	47.8

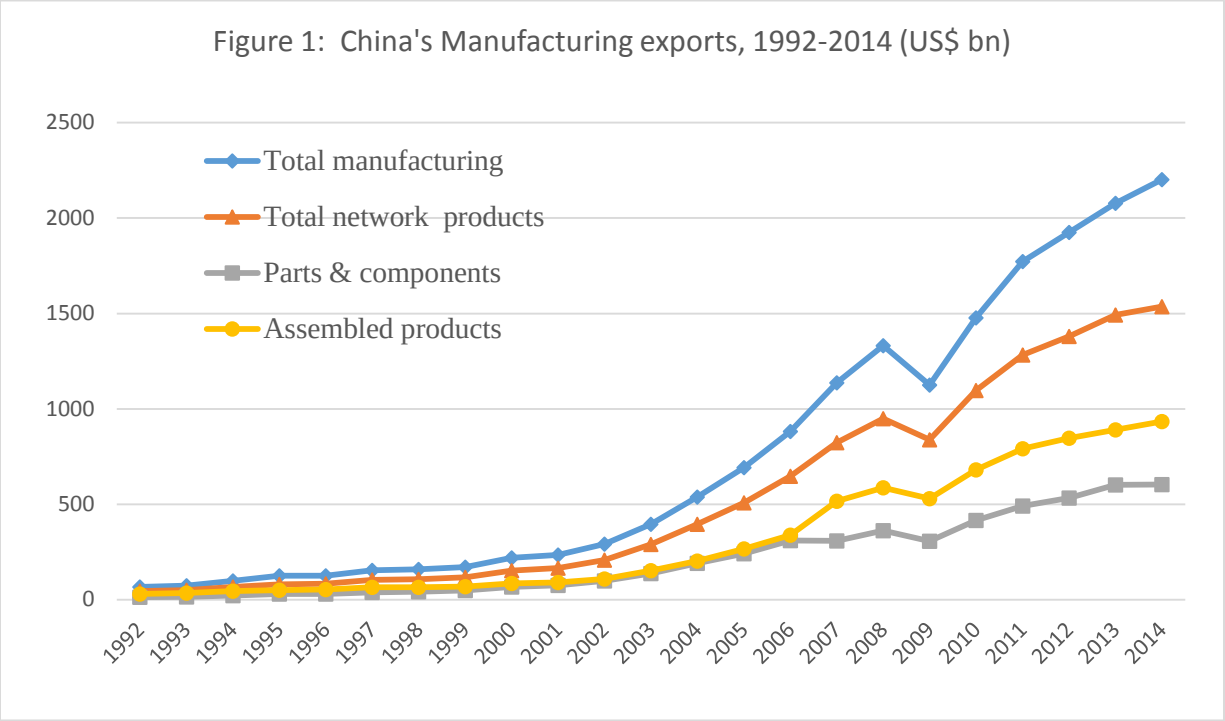
Developed countries excluding Japan	35.6	26.8	34.1	48.4	27.0	31.6	41.6	26.9	32.4
NAFTA	13.1	9.3	10.1	17.4	9.6	12.8	15.1	9.5	11.9
Developing countries[2]	35.5	45.5	44.6	22.8	54.0	55.6	29.6	50.7	52.2
East Asia excluding japan[3]	33.7	43.0	40.5	21.2	51.9	51.9	27.9	48.4	48.4

Note: 1. Two-year averages.

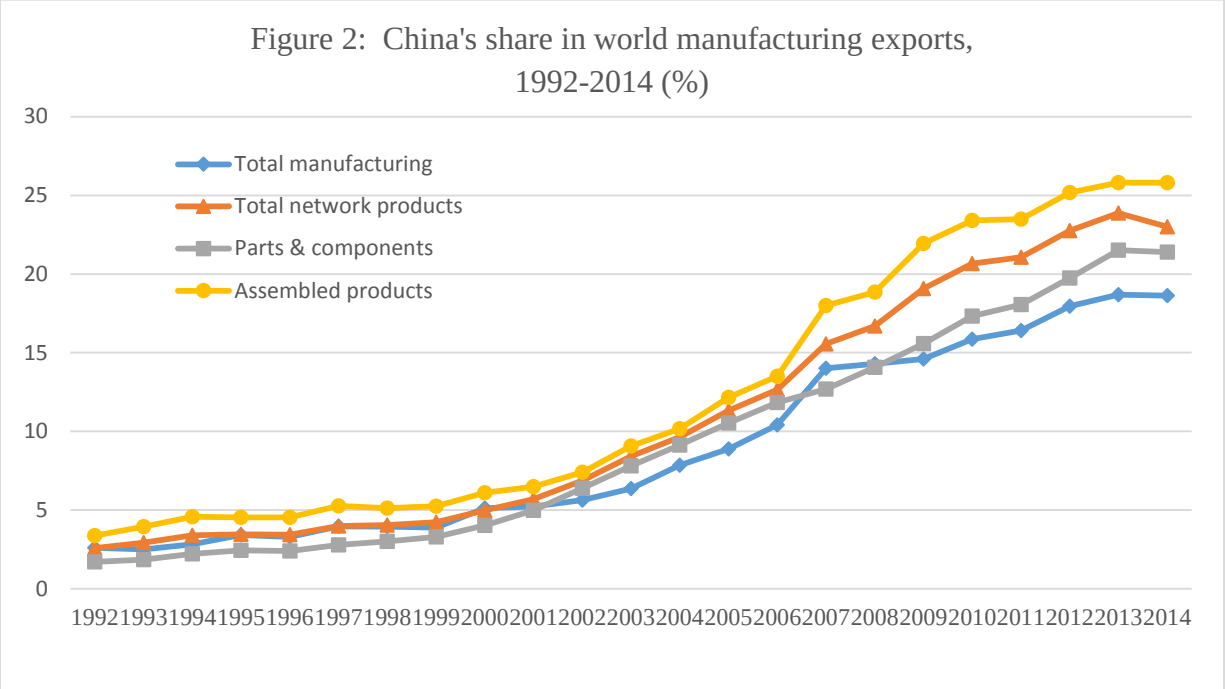
2. Based on the UN Standard Country Classification.

3. East Asia excluding Japan.

Source: Compiled from UN Comtrade database

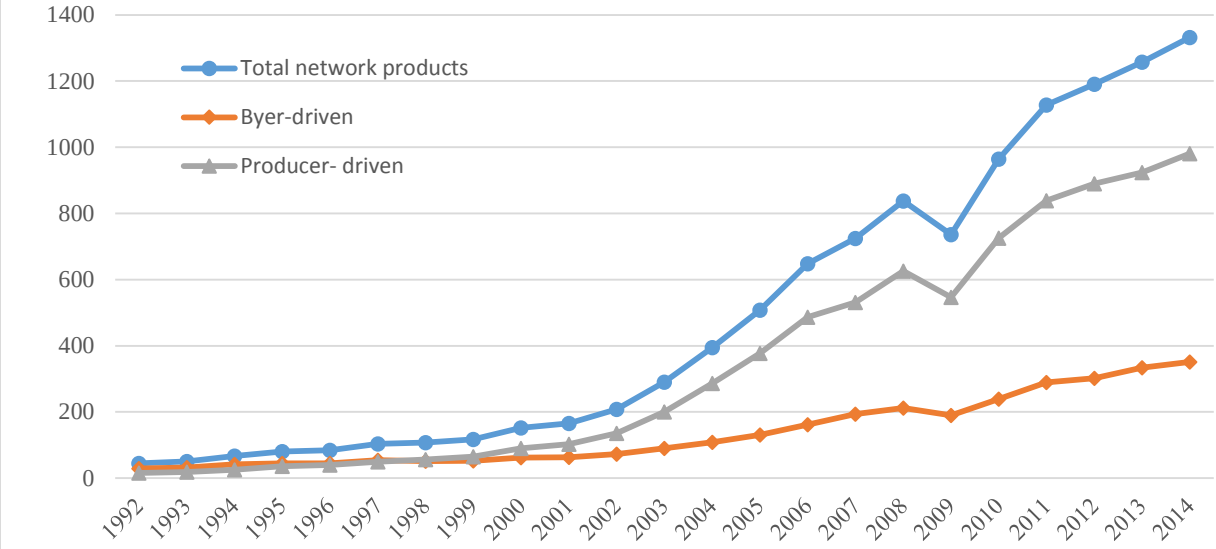


Source: Data compiled from UN Comtrade database



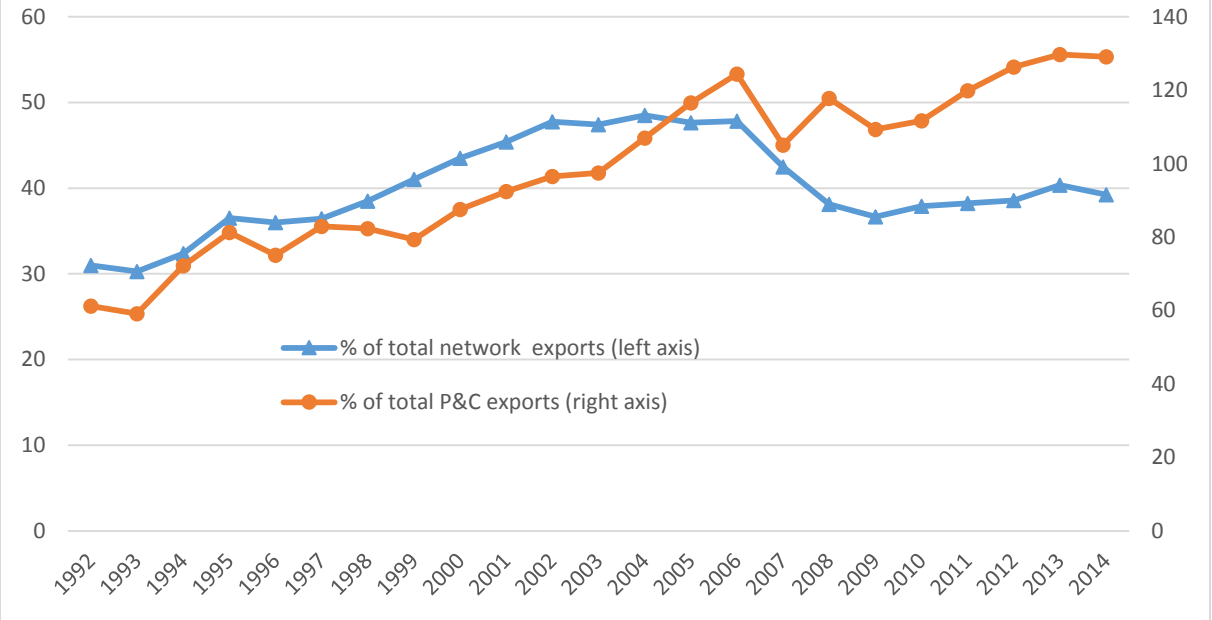
Source: Data compiled from UN Comtrade database

Figure 3: Producer-driven, buyer-driven and total netwrok exports from China, 1992-2014 (US$ bn)



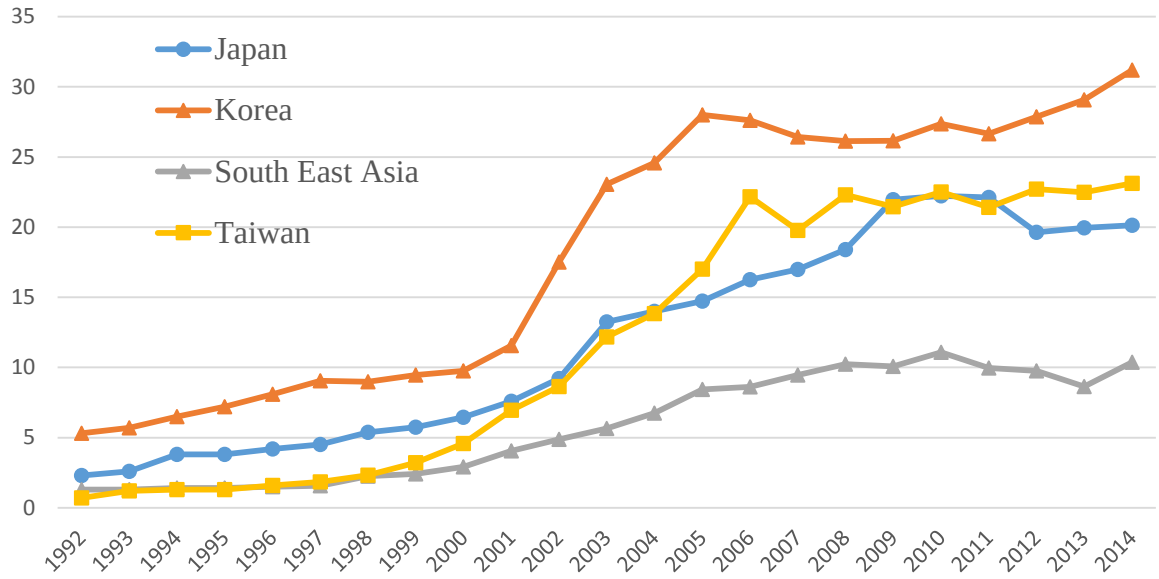
Source: Data compiled from UN Comtrade database

Figures 4: China: parts and components imports as a share of exports of GPN products (%)



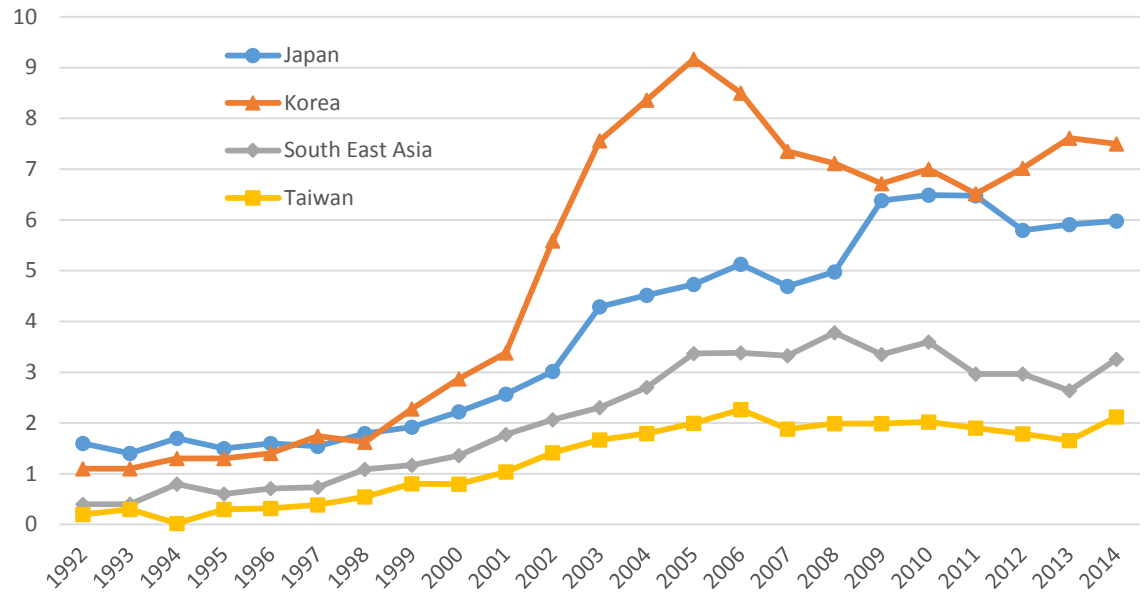
Source: Data compiled from UN Comtrade database

Figure 5: Shares Japan, Korea, Taiwan and South East Asian Countriesin Parts and Components Imports to China, 1992-2014 (%)



Source: Data compiled from UN Comtrade database

Figure 6: Exports of parts and components to China as a share of total manufacturing exports of Japan, Korea, Taiwan and South East Asian countries



Source: Data compiled from UN Comtrade database

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