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Abstract

This paper examines how the Chinese economy has been involved in global value chains from the perspective of domestic value creation, by using the OECD value-added-trade data (OECD TiVA database). This study contributes to the existing literature by decomposing the domestic value creation into a direct effect from export industries and an indirect effect from the other supporting industries. The empirical estimation first identified the "smile curve" in the "indirect" domestic value creation in total manufactures as the average pattern of the Asian GVCs development paths, in which the domestic value share to exports declines at the early development stage and regains itself at the later stage with the turning point being at 1,830 US dollars as per capita GDP. Then the analysis confirmed the position of Chinese economy, which has already passed the Asian average turning point and has entered the phase of regaining the domestic value share to exports. Finally, the analysis found that the domestic value creation in China has originated from the development of supporting industries, in particular, service industries, which might reflect the progress in basic infrastructure there.

Keyword: Domestic value creation, Global value chains, China, Value-added-trade data, Manufactures, Supporting industries
JEL Classification Codes: F14, L60, O53

1. Introduction

China has recorded high economic growth during a few recent decades. According to the income classification presented by the World Bank[1], China joined a middle income group in the late 1990s, and has stepped up to an "upper" middle income group since 2010. One of the driving forces in the rapid growth in China is said to be her participation in "global value chains (hereafter GVCs)". As a matter of fact, the integration with GVCs in China has induced a lot of inward foreign direct investment, has provided a plenty of job opportunities and has promoted her exports in the world market.

The GVCs themselves, however, do not necessarily guarantee sustainable growth in the long run. A typical example that has been often referred to is the value composition of Apple iPod and iPhone exported by China. Several studies (e.g. Backer, 2011; Linden et al., 2009; and Xing and Detert, 2010) showed that in the production of these items in China, the domestic value added created by the pure assembly accounted for a small fraction of the selling price to foreign markets, and the dominant value added came from foreign economies such as Korea, Japan and US in terms of the imported parts and components. If the participation in the GVCs provided the opportunities of developing only labor-intensive production activities such as assembly just like the example above, it would not contribute to industrial upgrading, thereby not leading to a long-term growth.

As Gill and Kharas (2007) argued in the context of "middle income trap", the growth based on factor accumulation are likely to deliver steadily worse results, which is a natural occurrence as the marginal productivity of factor inputs declines. The dependence on labor inputs for growth through GVCs participation would simply lead to the "diminish returns" from them. Now that the Chinese economy has joined a middle-income group, it would encounter the danger of "middle income trap", as long as the economy has stuck to labor-intensive activities in GVCs participation. Thus a critical question is whether the Chinese economy has just participated in the GVCs in the form of labor-intensive production activities, or has upgraded its domestic productive capacities by obtaining technological transfers from foreign investors through the involvement in GVCs.

This paper aims to examine how the Chinese economy has been involved in GVCs from the perspective of domestic value creation, by using the OECD value-added-trade data (OECD TiVA database)[2]. The value-added-trade data developed recently by several organizations enable us to identify the contributions of domestic and foreign value added

[1] It is based on "Income Classifications" by World Bank: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519.
[2] See the website of OECD Stat.: https://stats.oecd.org/.

embedded in grow exports, and thus to quantify the country-leveled domestic value creation through GVCs involvement.

The rest of the paper is structured as follows. Section 2 reviews previous studies on the impacts of GVCs involvement on industrial upgrading focusing mainly on China, and clarifies this study's contribution. Section 3 represents empirical evidence on the GVCs development paths with a focus on domestic value creation in Asian economies, clarifies the position of the Chinese economy, and analyses the composition of domestic value creation there. Section 4 summarizes and concludes.

2. Literature Review and this Study's Contribution

This section reviews previous studies on the impacts of GVCs involvement on industrial upgrading focusing mainly on China, and clarifies this study's contribution.

There have been rather a plenty of literature on "firm and industry level" analyses of the GVCs impacts through case studies. In traditional industries, some upgrading effects were identified in the context of GVCs. Picking up selected examples, Frederick and Gereffi (2011) argued that apparel exporters in Chine and Asia have outperformed those in Mexico and Central America due to market diversification by joining the GVCs. Rasiah (2011) picked up moving-up case of button manufacturing in Qiaotou-city cluster in China in the context of joining GVCs. Zheng and Sheng (2006) showed a case study of the Yunhe wood toy cluster in Zhejiang in China, in which the GVCs has provided external channels of knowledge and learning opportunities for local firms.

As for more sophisticate industries, several studies presented that China has been still behind in industrial upgrading. Wang (2010) pointed out that Chinese passenger car parts enterprises have still been in low-end value link in GVCs. Regarding commonly-cited sophisticated items of the Apple iPod and iPhone, as was mentioned in the introduction, several studies such as Backer (2011), Linden et al. (2009), Xing and Detert (2010) argued: the products are designed and conceived in developed countries and manufactured in emerging countries like China with inputs sourced from other third countries; thus manufacturing/ assembly constitutes only a small part of the value added which is a direct result of the offshoring of these activities to lower-cost countries; and so being integrated in the GVCs is a necessary but not a sufficient condition for capturing value within the GVCs.

The literature on "country" level analyses of GVCs impacts on industrial upgrading has, on the other hand, been scarce probably because such analytical instruments as value-added-trade have been just recently developed by several international organizations.

It was UNCTAD (2013) that addressed, for the first time, the country level analyses of GVCs impacts on domestic value creation in comprehensive angles by utilizing the UNCTAD-Eora value-added-trade data.[3] Chapter IV of UNCTAD (2013) demonstrated the GVCs economic impacts in terms of local-value capture, job creation, technology dissemination as direct effects as well as of upgrading and building long-term productive capabilities as indirect effects. We herein pick up two major analytical outcomes related to the country-level contributions of domestic value added in GVCs participation. First, a statistical analysis of GVCs participation and per capita GDP growth rates showed their significant and positive relationship for both developed and developing economies, even while GVCs participation requires higher imported contents. Second, the combinations of GVC participation and domestic value added creation, derived from value added trade patterns of 125 developing countries over 20 years, suggested that there might be a set of distinct "GVCs development paths" in host countries participating GVCs; some economies have managed, often after participating GVCs at the cost of domestic value share to exports, to regain the domestic value share, by upgrading within GVCs and by expanding into higher-value chains, as in the Philippines, Malaysia and Thailand.

Taguchi (2014) applied the aforementioned county-level analyses of GVCs effects in UNCTAD (2013) to Asian developing economies for the reason that Asia has been the area which has the greatest potential for GVCs to spread all over the area. In addition, Taguchi (2014) modified the analysis of "GVCs development paths" into more sophisticated way such as estimating a non-linear, quadratic curve in the relationship between domestic value added share to exports and development stage (per capita GDP) so that the regaining point of domestic value share to exports could be identified in the dynamic GVCs participation process. The analysis covered the samples of the discrete four years (1995, 2000, 2005 and 2008) for eight Asian economies on eight-categorized manufacturing sectors as well as total manufactures, based on the data available in the OECD value-added-trade data. The findings of the study were summarized as follows. First, an economy's participation in GVCs in manufacturing sectors allowed an absolute domestic value added for exports to contribute to pushing up GDP growth, which was consistent with the first outcome above in UNCTAD (2013). Second, the GVCs development paths have followed the "smile curve" (which will be explained in later section) with the bottom being 5,651 U.S. dollars as per capita GDP. Third, the turning points of smile curves differed according to manufacturing sectors: the sectors of machinery, electrical, and transport equipment reached the turning point at the higher per

[3] The UNCTAD-Eora database was built by UNCTAD in collaboration with the Eora project.

capita GDP than those of food, textile, and wood products.

This study contributes to the reviewed literature as follows. First, this study updates the one of Taguchi (2014), i.e., the empirical analysis of the GVCs development paths in connection with domestic value creation in Asian economies. To be specific, this study samples the annual data from 1995 to 2014 so that the GVCs development paths can be estimated more accurately than that of Taguchi (2014) with the discrete sample of 1995, 2000, 2005 and 2008. Second, this study, different from Taguchi (2014), decomposes the domestic value creation into a direct effect from export industries and an indirect effect from the other supporting industries so that the origin of domestic value creation can be identified in more details. Third, this study focuses on the domestic value creation in Chinese economy. To be specific, the empirical section clarifies the position of the Chinese economy in the GVCs development paths of Asian economies, and examines the composition of the domestic value creation in terms of the direct and indirect effects.

3. Empirical Evidence

This section first illustrates the hypothesis of the GVCs development paths, provides empirical evidence on the updated- and modified- GVCs development paths in Asian economies, clarifies the position of the Chinese economy, and finally investigates the detailed composition of the domestic value creation in Chinese economy.

3.1 Hypothesis of GVCs Development Paths

This section describe a hypothesis behind the GVCs development paths based on Taguchi (2014). Figure 1 illustrates the dynamic evolution process of domestic value added creation for GVCs participants. DVX and DVY represent “domestic value added as a share of gross exports” and “domestic value added in exports as a ratio of GDP”, respectively.

At the early stage before GVCs participation, an economy stays at high DVX and low DVY, in which most of exports are domestically produced and their contribution to GDP is small. When an economy participates in GVCs, it moves to the stage with low DVX and high DVY, since an economy’s production for its exports has to depend highly on imports of parts, components and machineries from foreign countries, whereas the economy’s absolute production value for exports contributes a lot to GDP expansion. At the matured stage of GVCs involvement, an economy can enjoy a combination of high DVX and high DVY; its production for exports continues to contribute to GDP growth,

and at the same time, the dependence on imports of intermediate goods for exports declines due to the expansion of domestic productive capacities.

The process of enhancing local productive capacities may involve a number of mechanisms. First, the key exporting industries that are often developed by foreign investors may provide opportunities for local industries to participate in GVCs, which will lead to generating additional domestic value added through local outsourcing within and across industries. Second, local industries may contribute to producing and supplying parts and components by obtaining technological transfers from the key exporting industries and foreign investors, which will help local economies develop and consolidate their supporting industries. Third, the key exporting industries including supporting industries themselves attain their industrial upgrading through technology dissemination and skill building, which improves their productivity and facilitates their entries and expansions towards higher valued sectors. In particular, the latter two mechanisms could be a significant momentum to transform local economic structures from "thin" industrialization with low-value added tasks and activities towards "thick" industrialization with high-valued production, thereby contributing to avoiding "middle income trap". It should be noted that these development paths are not always realized automatically and its achievements differ according to the characteristic of the GVCs and the involved economies. Government policies also matter to optimize the economic contributions of the GVCs participation and involvement.

Focusing on the evolution process of DVX in the GVCs development hypothesis, the DVX would follow not one-off moves but such a sequence of moves as high, low and high ones along development process, thereby creating the "smile curve".

3.2 Data and Methodologies

For estimating the GVCs development paths in Asian economies, the following variables are targeted for the estimation. One is "domestic value added as a share of gross exports (DVX)" in manufacturing sectors, representing domestic productive capacities to produce export goods. The DVX is further decomposed into a "direct" domestic value added as a share of gross exports (DDVX) and an "indirect" domestic value added as a share of gross exports (IDVX).[4] The DDVX represents the domestic value creation from export industries, while the IDVX shows the one from the other supporting industries, so

[4] The precise composition of the "domestic value added" is the "direct domestic value added", the "indirect domestic value added" and the "re-imported domestic value added". Since the last one has a small share to gross exports, it is omitted in this study's analysis.

that the origin of domestic value creation could be further identified. The other key variable is "real per capita GDP (PCY)", denoting the development stage of local economies. The data of DVX, DDVX and IDVX are retrieved from OECD value-added-trade data (See Note 2), and those of PCY are from UNCTAD STAT[5] by the series of "Gross domestic product per capita, US Dollars at constant prices (2010)".

The OECD value-added-trade data confine the sample period, countries and manufacturing sectors as follows. The data are divided into the series of "Trade in Value Added (TiVA) – December 2016" for 1995-2011, and those of "TiVA Nowcast Estimate" for 2012-2014. The sample period should thus be for 1995-2014 by combining these two series. The sample countries focus on Asian eight economies available in the OECD data: Cambodia, China, India, Indonesia, Malaysia, the Philippines, Thailand and Vietnam. The sample manufacturing sectors are composed of the following eight categories as well as total manufactures: "Food products, beverages and tobacco (hereafter food products)", "Textiles, textile products, leather and footwear (textile products)", "Wood, paper, paper products, printing and publishing (wood products)", "Chemicals and non-metallic mineral products (chemical products)", "Basic metals and fabricated metal products (metal products)", "Machinery and equipment, nec (machinery)", "Electrical and optical equipment (electrical equipment)" and "Transport equipment". In sum, we construct panel data with eight Asian countries for 1995-2014 in each of eight manufacturing sectors and total manufactures. The data for DVX, DDVX, IDVX and PCY are converted into natural logarithm form for the estimation to avoid the heteroskedastic in the error terms.

Based on the panel data, the study first investigates the association between DVX and PCY, and also the associations between DDVX and PCY and between IDVX and PCY, focusing on total manufactures. The associations are examined by a quadratic equation as well as a linear one, for the purpose of identifying the "smile curve" in the GVCs development paths in Asian economies. In case that the "smile curve" is identified in any combinations between DVX, DDVX or IDVX and PCY, the estimation on total manufacturers is further disaggregated into eight categories of manufacturing sectors.

3.3 Empirical Evidence on GVCs Development Paths

Table 1-1 to 1-3 and Figure 2-1 to 2-3 represent estimation outcomes of the GVCs development paths on total domestic value creation (DVX) and on its direct (DDVX) and

[5] See the website: http://unctadstat.unctad.org/EN/.

indirect (IDVX) value creations, for total manufactures. In all cases, a random-effect model is applied in the panel estimation, following the Hausman-test statistics (see Hausman, 1978).

Looking at the coefficients of PCY and a square of PCY, the case of IDVX in Table 1-3 has an insignificant coefficient of PCY in a linear equation but significant coefficients of PCY (negative) and a square of PCY (positive) in a quadratic equation, while the cases of DVX and DDVX in Table 1-1 and 1-2 have significant coefficients of PCY and a square of PCY in linear and quadratic equations. Focusing on the case of IDVX in Table 1-3, the turning point is in a reasonable level of PCY, namely, 1,830 US dollars with the IDVX being 22.7%. This estimation outcomes suggest that it is only in the case of indirect domestic value creation that the U-shaped smile curve is identified while the linear correlation is not found, as the GVCs development path of Asian economies. It could also be observed from Figure 2-3 that such forerunners as Malaysia, China, Thailand, Indonesia and Philippines are already passing the turning point by regaining domestic value creation, whereas such latecomers as Cambodia, India and Vietnam are still staying at the declining phase of domestic value creation during their GVCs participations.

The study further disaggregates the estimate of indirect domestic value creation (IDVX) into eight categories of manufacturing sectors. According to Table 2, the quadratic estimation shows that the coefficients of PCY are significantly negative; the ones of a square of PCY are significantly positive, and the turning points represent reasonable levels, in all sectors. The association between IDVX and PCY can, therefore, be said to follow the U-shaped smile curve in all manufacturing sectors. The smile curves differ, however, in their shapes and turning points according to sectors in the following ways. First, the PCYs in their turning points range from 721 to 2,953 US dollars. For instance, the PCYs in textile products (721) and food products (983) are below the Asian average in total manufactures, while those in metal products (2,953) and transport equipment (2,062) are above the average. Second, the IDVXs in their turning points also have a wide range from 14.4 to 46.1 percent. The DVXs in food products (46.1) and wood products (29.2) are above the average, whereas those in electrical equipment (14.4) and machinery (17.9) are below the average. It can roughly be argued that the sectors depending on local resources, such as textile and food products, tend to have the lower per capita GDP and the higher domestic-value share to exports in their turning points, whereas the sectors depending on sophisticated technologies and long production processes, such as metal products and transport equipment, are inclined to have the higher per capita GDP and the lower domestic-value share to exports in their turning points.

To sum up, it is in the case of "indirect" domestic value added that the smile curve in

which the domestic value share to exports declines at the early stage and regains itself at the later stage is clearly identified as the GVCs development path of Asian economies. It means that the domestic value creation proposed by Taguchi (2014) has originated from the domestic value created by the supporting industries for exporting industries. The smile curves differ, however, in their turning points according to the eight-categorized manufacturing sectors: the sectors depending on sophisticated technologies, compared with those depending on local resources, reach the turning point at the higher per capita GDP with the lower domestic value share to exports.

3.4 Chinese Position in GVCs Development Path and its Domestic Value Composition

This section first confirms the position of the Chinese economy in the GVCs development path in Asian economies in Figure 2-1 to 2-3. Except for the case of the direct domestic value creation (DDVX) in Figure 2-2, Chinese economy has already passed the average turning point and has entered the phase of regaining the domestic value share to exports, in the case of total domestic value creation (DVX) in Figure 2-1 and indirect one (IDVX) in Figure 2-3.

The composition of the domestic value creation in Chinese economy could further be examined in more details for 1995-2011 by another section of the OECD value-added-trade data: the "origin of value added in gross exports". Table 3 and Figure 3 represent the changes in origin of value added in gross exports for 1995-2011 by eight categories of manufacturing sectors in China, and provide the following findings. First, the share of domestic value added increases whereas that of foreign value added decreases in all manufacturing sectors. Second, among the domestic value creation, the contributions of supporting industries are greater than those of exporting industries in all sectors. Third, among the domestic value created by supporting industries, the contributions of service sector (trade, utility, other business and public services) are the greatest in all sectors except food and metal products in which primary sectors such as agriculture and mining have the greatest contributions.

To sum up, Chinese economy has already entered the phase of regaining the domestic value share to exports in its GVCs development path. The domestic value creation in Chinese economy has originated from the development of supporting industries, in particular, service industries. It could be speculated that the domestic value created by service industries reflects the progress in basic infrastructure in China.

4. Concluding Remarks

This paper examined how the Chinese economy has been involved in GVCs from the perspective of domestic value creation, by using the OECD value-added-trade data (OECD TiVA database). This study contributed to the existing literature by decomposing the domestic value creation into a direct effect from export industries and an indirect effect from the other supporting industries.

The empirical estimation first identified the “smile curve” in the “indirect” domestic value creation in total manufactures as the average pattern of the Asian GVCs development paths, in which the domestic value share to exports declines at the early development stage and regains itself at the later stage with the turning point being at 1,830 US dollars as per capita GDP. Then the analysis confirmed the position of Chinese economy, which has already passed the Asian average turning point and has entered the phase of regaining the domestic value share to exports. Finally, the analysis found that the domestic value creation in China has originated from the development of supporting industries, in particular, service industries, which might reflect the progress in basic infrastructure there.

References

Backer, K.D. 2011. Global Value Chains: Evidence, Impacts and Policy Issues. *Review of Business and Economic Literature*, 56(2): 110-128.

Frederick, S. and Gereffi, G. 2011. Upgrading and restructuring in the global apparel value chain: why China and Asia are outperforming Mexico and Central America. *International Journal of Technological Learning, Innovation and Development*, 4: 67-95.

Gill, I. and Kharas, H. 2007. *An East Asian Renaissance*. IBRD and World Bank.

Hausman, J. A. 1978. Specification Tests in Econometrics. *Econometrica*, 46, 1251–1272.

Linden, G., Kraemer, K.L. and Dedrick, J. 2009. Who Captures Value in a Global Innovation Network? The Case of Apple's iPod, *Communications of the ACM*, 52(3): 140-144.

Rasiah, R. 2011. Moving up in the global value chain in button manufacturing in China. Asia Pacific Business Review, 17(2): 161-174.

Taguchi, H. 2014. Dynamic Impacts of Global Value Chains Participation on Asian Developing Economies. *Foreign Trade Review*, 49(4): 313-326.

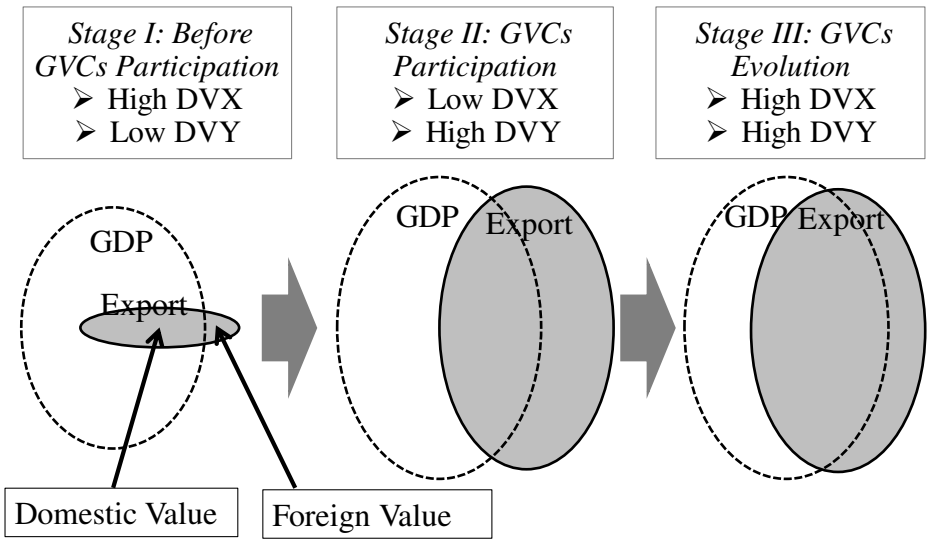
UNCTAD 2013. *World Investment Report - Global Value Chains: Investment and Trade for Development*. UNCTAD.

Wang, L. 2010. Research on Upgrading of China Passenger Car Parts Industry: Based on Global Value Chain. *Proceedings of the 7th International Conference on Innovation & Management*.

Xing, Y. and Detert, N. 2010. How the iPhone Widens the United States Trade Deficit with the People's Republic of China, *ADBI Working Paper Series*, No. 257.

Zheng Y. and Sheng, S. 2006. Learning in a local cluster in the context of the global value chain: A case study of the Yunhe wood toy cluster in Zhejiang, China. *Innovation: Management, Policy, & Practice*, 8: 120-127.

Figure 1 Hypothesis behind GVCs Development Paths



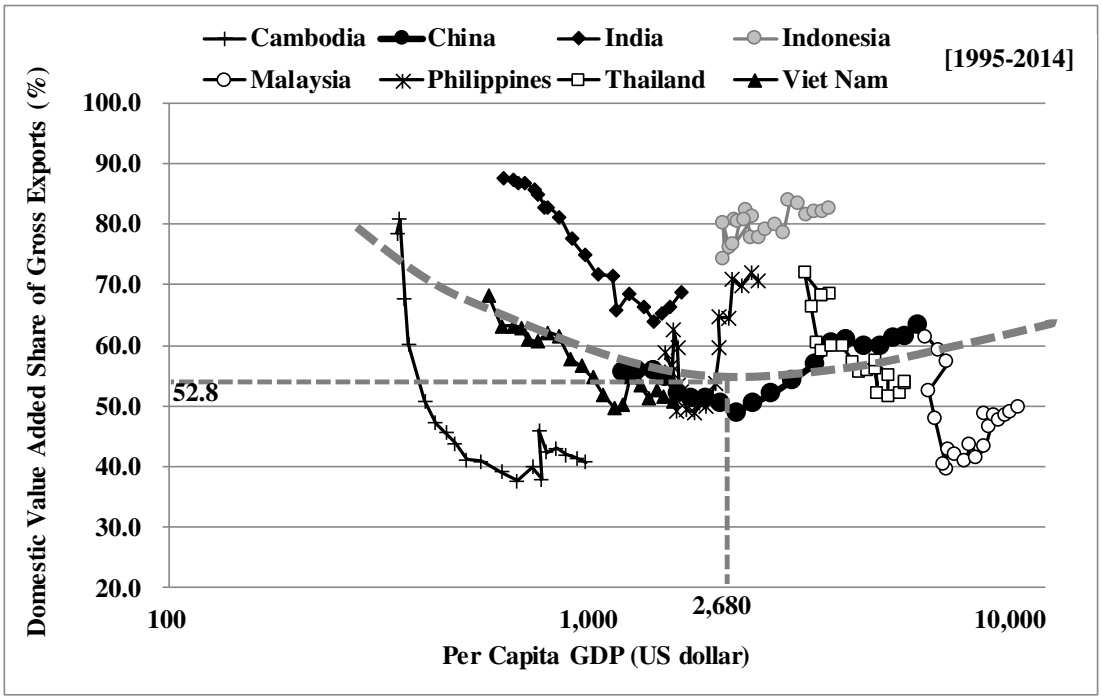
Note: DVX denotes domestic value added as a share of gross exports, and DVY denotes domestic value added in exports as a ratio of GDP.
Source: Taguchi (2014)

Table 1-1 Domestic Value Added (DVX) in Total Manufactures

Variales	DVX	DVX
Const.	4.901 ***	12.177 ***
	(16.347)	(11.428)
PCY	-0.108 ***	-2.080 ***
	(-2.845)	(-7.262)
PCY^2		0.131 ***
		(6.857)
Turning Point USD (share %)		2,680 (52.8)
Adj R^{**2}	0.042	0.294
Sample size	160	160
Hausman Test		
Chi-Sq. Statistic	1.093	0.000
Chi-Sq. d.f.	1	2
Prob.	0.295	1.000
Estimation Type	Random	Random

Note: DVX denotes domestic value added as a share of gross exports, and PCY denotes per capita GDP.
***, **, * denote the rejection of null hypothesis at the 99%, 95% and 90% level of significance.
T-statistics are in parentheses attached in the coefficients.
Source: Author's estimation based on OECD value-added-trade data and UNCTAD STAT

Figure 2-1 Domestic Value Added (DVX) in Total Manufactures



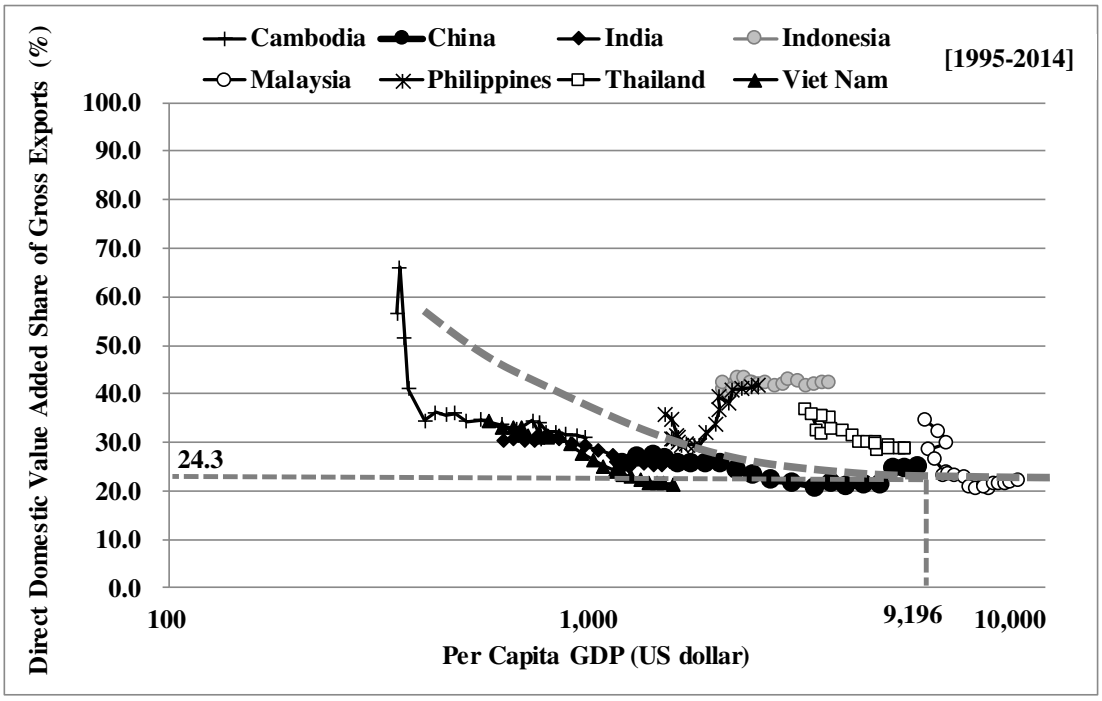
Source: OECD value-added-trade data and UNCTAD STAT

Table 1-2 Direct Domestic Value Added (DDVX) in Total Manufactures

Variales	DDVX	DDVX
Const.	5.176 ***	9.059 ***
	(20.310)	(8.530)
PCY	-0.232 ***	-1.285 ***
	(-7.242)	(-4.503)
PCY^2		0.070 ***
		(3.674)
Turning Point USD (share %)		9,196 (24.3)
Adj R^{**2}	0.244	0.360
Sample size	160	160
Hausman Test		
Chi-Sq. Statistic	3.386	0.000
Chi-Sq. d.f.	1	2
Prob.	0.065	1.000
Estimation Type	Random	Random

Note: DDVX denotes direct domestic value added as a share of gross exports, and PCY denotes per capita GDP. ***, **, * denote the rejection of null hypothesis at the 99%, 95% and 90% level of significance. T-statistics are in parentheses attached in the coefficients.
Source: Author's estimation based on OECD value-added-trade data and UNCTAD STAT

Figure 2-2 Direct Domestic Value Added (DDVX) in Total Manufactures



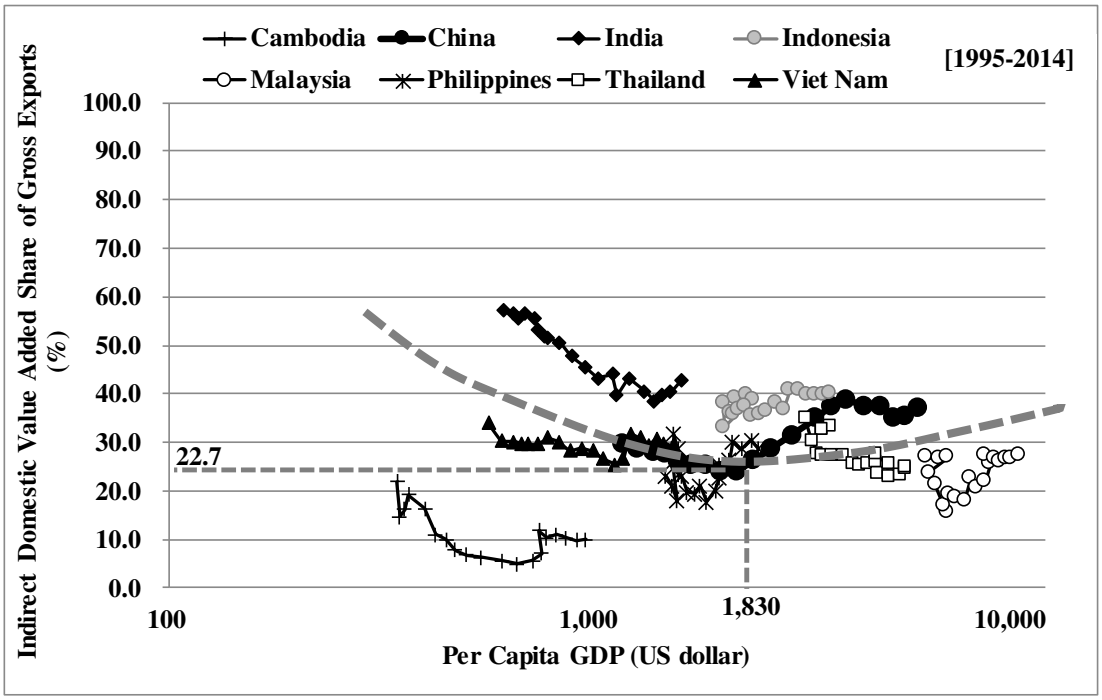
Source: OECD value-added-trade data and UNCTAD STAT

Table 1-3 Indirect Domestic Value Added (IDVX) in Total Manufactures

Variales	IDVX	IDVX
Const.	3.585 ***	14.712 ***
	(6.695)	(8.380)
PCY	-0.041	-3.086 ***
	(-0.615)	(-6.556)
PCY^2		0.205 ***
		(6.492)
Turning Point USD (share %)		1,830 (22.7)
Adj R^{**2}	-0.003	0.205
Sample size	160	160
Hausman Test		
Chi-Sq. Statistic	0.718	0.000
Chi-Sq. d.f.	1	2
Prob.	0.396	1.000
Estimation Type	Random	Random

Note: IDVX denotes indirect domestic value added as a share of gross exports, and PCY denotes per capita GDP. ***, **, * denote the rejection of null hypothesis at the 99%, 95% and 90% level of significance. T-statistics are in parentheses attached in the coefficients.
Source: Author's estimation based on OECD value-added-trade data and UNCTAD STAT

Figure 2-3 Indirect Domestic Value Added (IDVX) in Total Manufactures



Source: OECD value-added-trade data and UNCTAD STAT

Table 2 Industrial Estimation on Indirect Domestic Value Added (IDVX)

	Food	Textile	Wood	Chemical
Const.	7.472 ***	6.864 ***	11.545 ***	12.764 ***
	(11.722)	(3.256)	(7.276)	(8.255)
PCY	-1.056 ***	-1.128 **	-2.175 ***	-2.633 ***
	(-6.182)	(-1.992)	(-5.102)	(-6.350)
PCY2	0.076 ***	0.085 **	0.144 ***	0.180 ***
	(6.672)	(2.253)	(5.054)	(6.487)
Turning Point USD (share %)	983 (46.1)	721 (23.3)	1,831 (29.2)	1,467 (23.7)
Adj R**2	0.282	0.048	0.131	0.204
Sample size	160	160	160	160
Hausman Test				
Chi-Sq. Statistic	0.000	0.000	1.187	0.000
Chi-Sq. d.f.	2	2	2	2
Prob.	1.000	1.000	0.552	1.000
Estimation Type	Random	Random	Random	Random

	Metal	Machinery	Electrical	Transport
Const.	15.549 ***	14.792 ***	16.708 ***	11.282 ***
	(9.681)	(6.924)	(6.650)	(4.218)
PCY	-3.148 ***	-3.127 ***	-3.930 ***	-2.163 ***
	(-7.303)	(-5.444)	(-5.819)	(-3.008)
PCY2	0.197 ***	0.205 ***	0.275 ***	0.141 ***
	(6.798)	(5.322)	(6.064)	(2.938)
Turning Point USD (share %)	2,953 (19.5)	2,030 (17.9)	1,265 (14.4)	2,062 (20.6)
Adj R**2	0.317	0.152	0.200	0.044
Sample size	160	160	160	160
Hausman Test				
Chi-Sq. Statistic	0.000	0.000	0.000	0.000
Chi-Sq. d.f.	2	2	2	2
Prob.	1.000	1.000	1.000	1.000
Estimation Type	Random	Random	Random	Random

Note: PCY denotes per capita GDP. ***, **, * denote the rejection of null hypothesis at the 99%, 95% and 90% level of significance. T-statistics are in parentheses attached in the coefficients.

Source: Author's estimation based on OECD value-added-trade data and UNCTAD STAT

Table 3 Origin of Value Added in Gross Exports in China

Food products	1995	2011	2011 / 1995
Gross exports, mil. USD	6,615	34,439	5.2
Decomposition into value added, a percentage of gross exports			2011-1995
Foreign value added	32.7	25.3	-7.4
Domestic value added	67.3	74.7	7.4
Exporting industry	35.8	26.2	-9.6
Supporting industry	31.5	48.5	16.9
Agriculture & Mining	18.4	27.9	9.5
Other manufacturing	5.4	6.2	0.8
Services	7.7	14.4	6.7

Textile products	1995	2011	2011 / 1995
Gross exports, mil. USD	27,542	200,976	7.3
Decomposition into value added, a percentage of gross exports			2011-1995
Foreign value added	38.9	26.5	-12.4
Domestic value added	61.1	73.5	12.4
Exporting industry	28.9	30.3	1.5
Supporting industry	32.3	43.2	10.9
Agriculture & Mining	10.6	13.9	3.3
Other manufacturing	8.9	9.6	0.7
Services	12.7	19.8	7.0

Wood products	1995	2011	2011 / 1995
Gross exports, mil. USD	2,535	25,609	10.1
Decomposition into value added, a percentage of gross exports			2011-1995
Foreign value added	46.0	42.0	-4.0
Domestic value added	54.0	58.0	4.0
Exporting industry	31.7	28.1	-3.6
Supporting industry	22.3	29.9	7.6
Agriculture & Mining	8.2	7.7	-0.5
Other manufacturing	6.4	9.6	3.2
Services	7.7	12.6	4.9

Chemical products	1995	2011	2011 / 1995
Gross exports, mil. USD	13,083	197,170	15.1
Decomposition into value added, a percentage of gross exports			2011-1995
Foreign value added	46.9	41.4	-5.5
Domestic value added	53.1	58.6	5.5
Exporting industry	34.1	27.9	-6.2
Supporting industry	19.0	30.7	11.7
Agriculture & Mining	6.6	10.9	4.3
Other manufacturing	4.2	5.4	1.3
Services	8.3	14.4	6.1

Metal products	1995	2011	2011 / 1995
Gross exports, mil. USD	9,303	129,501	13.9
Decomposition into value added, a percentage of gross exports			2011-1995
Foreign value added	33.9	32.5	-1.3
Domestic value added	66.1	67.5	1.3
Exporting industry	39.1	31.0	-8.2
Supporting industry	27.0	36.5	9.5
Agriculture & Mining	5.7	9.9	4.3
Other manufacturing	7.3	10.5	3.2
Services	14.1	16.1	2.0

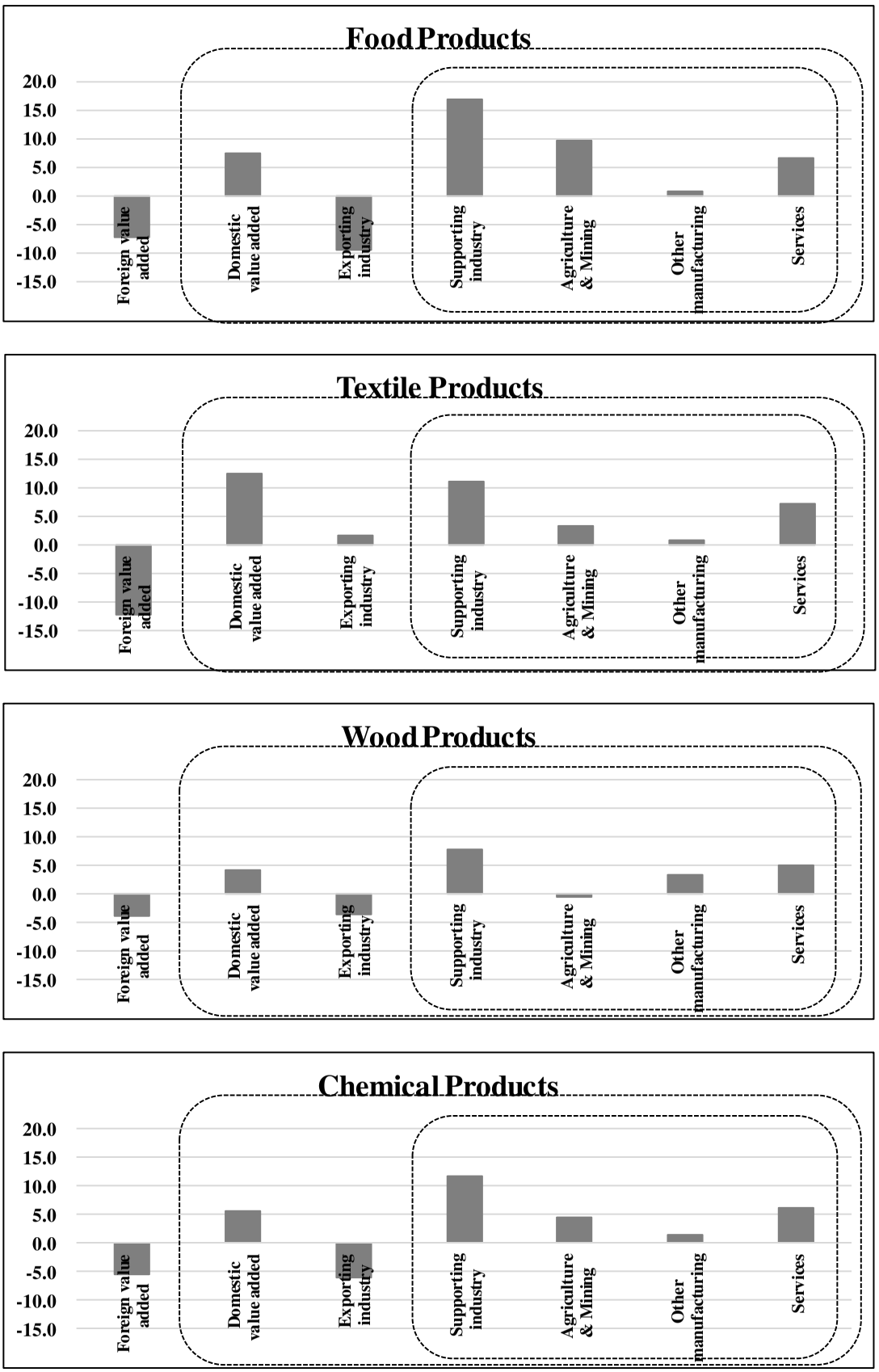
Machinery	1995	2011	2011 / 1995
Gross exports, mil. USD	4,909	145,725	29.7
Decomposition into value added, a percentage of gross exports			2011-1995
Foreign value added	38.9	30.4	-8.5
Domestic value added	61.1	69.6	8.5
Exporting industry	32.9	29.9	-2.9
Supporting industry	28.2	39.6	11.4
Agriculture & Mining	3.7	6.0	2.3
Other manufacturing	13.7	17.3	3.6
Services	10.9	16.3	5.5

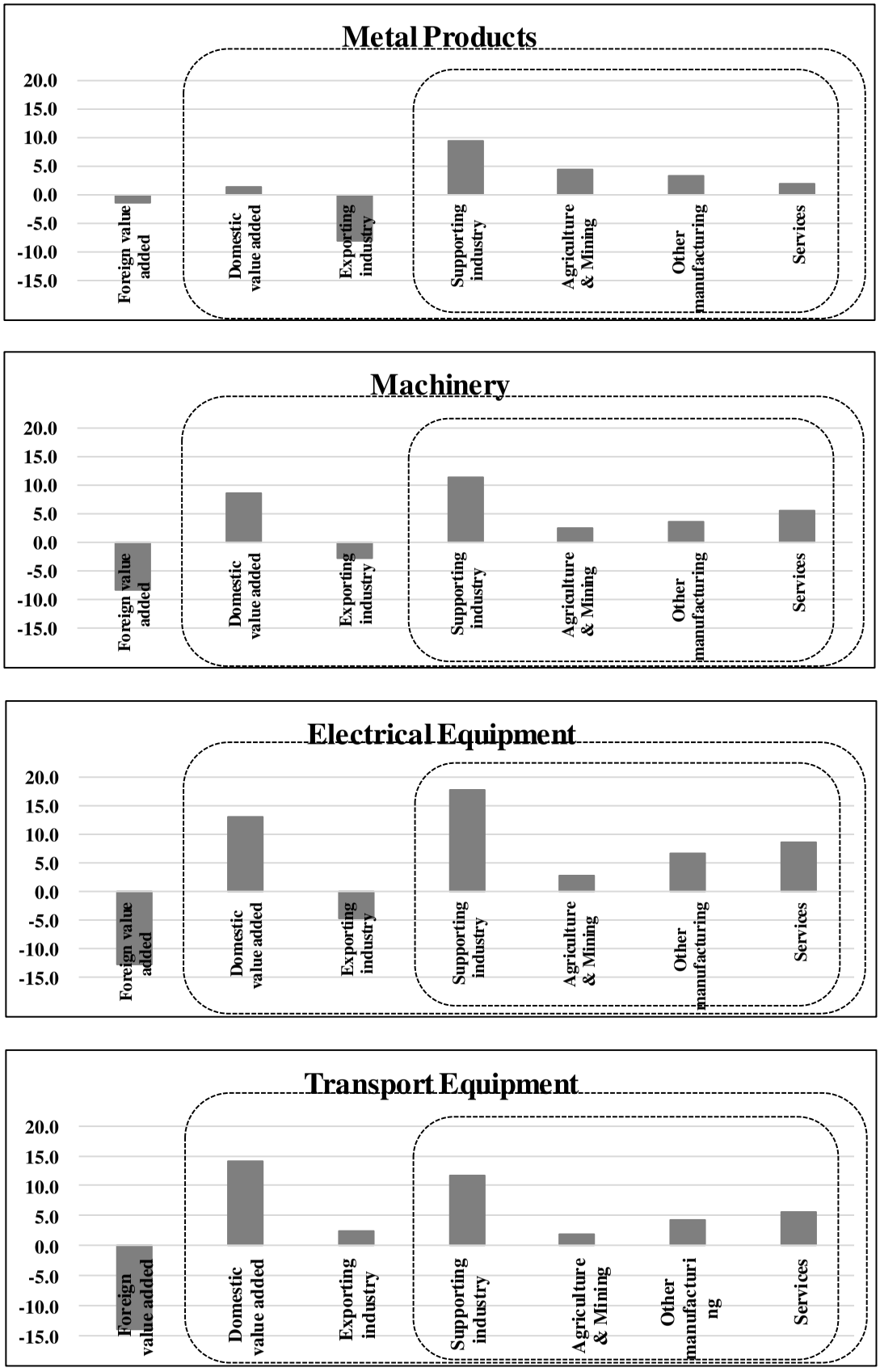
Electrical equipment	1995	2011	2011 / 1995
Gross exports, mil. USD	19,608	575,238	29.3
Decomposition into value added, a percentage of gross exports			2011-1995
Foreign value added	66.7	53.8	-12.9
Domestic value added	33.3	46.2	12.9
Exporting industry	24.8	20.0	-4.8
Supporting industry	8.5	26.2	17.8
Agriculture & Mining	0.9	3.6	2.7
Other manufacturing	3.5	10.2	6.6
Services	4.0	12.5	8.4

Transport equipment	1995	2011	2011 / 1995
Gross exports, mil. USD	3,090	101,908	33.0
Decomposition into value added, a percentage of gross exports			2011-1995
Foreign value added	44.1	30.0	-14.1
Domestic value added	55.9	70.0	14.1
Exporting industry	29.9	32.3	2.4
Supporting industry	26.1	37.8	11.7
Agriculture & Mining	3.0	5.0	2.0
Other manufacturing	14.3	18.5	4.1
Services	8.8	14.3	5.6

Source: Author's estimation based on OECD value-added-trade data

Figure 3 Origin of Value Added in Gross Exports in China





Source: Author's estimation based on OECD value-added-trade data