The involvement in global value chains and its policy implication in Vietnam

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Abstract

This article examines the involvement pattern in global value chains (GVCs) with its policy implication in Vietnam, in comparison with those of the other Asian countries, by using the OECD value-added-trade data. The study first identified the "smile curve" as the average pattern of the Asian GVCs development paths in total manufactures, 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 2,015 US dollars as per capita GDP. The study then found that the Vietnamese economy stood at the critical position in its GVCs development path, such that the Vietnamese current per capita GDP is very close to 2,015 US dollars, the Asian average turning point in total manufactures. The sectoral analysis in Vietnam also implied that sophisticated manufacturing sectors needs to be transformed from only assembling activities toward developing domestic capacities to produce parts and components. The Government policies in Vietnam thus matter to nurture local productive capacities, and the "enterprise clustering" and "linkages development" should be the key strategies to facilitate technological transfers from international firms to local ones in line with the GVCs involvement.

Keyword: Global value chains, Vietnam, Value-added-trade data, Manufactures, Local productive capacities

JEL Classification Codes: F14, L60, O53

1. Introduction

The global value chains (hereafter GVCs) have been one of the driving forces for the economic growth in East Asia over the past two decades. According to the World Investment Report 2013[1] (hereafter WIR, 2013), the GVCs are characterized by the fragmentation of production processes and the international dispersion of tasks and activities among the economies with diversified development stages. The fragmentation theory, proposed by Jones and Kierzkowski (1990, 2005), tells us that a firm's decision on whether to fragment its production processes depends on the differences in location advantages (e.g. the differences in factor prices like wages) and the level of the service-link costs for linking fragmented production processes. The large differences in factor prices and the low service-link costs encourage a firm to facilitate its fragmentation behavior. In this context, the East Asia seems to have the greatest momentum for the GVCs to spread over its area, since the East Asia includes a variety of economies with different factor prices under different development stages and has made policy efforts to reduce the service-link costs through its infrastructure development. In this sense, the East Asia can be said to be the most suitable area for the GVCs, and the GVCs extension and deepening have actually contributed to the economic growth and the greater convergence between the economies in East Asia (see e.g. Kimura, 2006).

Vietnam is not an exception as an economy involved in the GVCs extension. Since the Vietnamese economy has been classified into the latecomers in the ASEAN economies in terms of the lower per capita GDP and wage level, it has been an attractive target for foreign manufacturing industries to relocate their production processes with labor-intensive activities, thereby having accepted a lot of foreign direct investments during the recent decades. In fact, the participation in the GVCs has facilitated the Vietnamese economic growth and accelerated its catch-up momentum toward the ASEAN forerunner economies such as Malaysia and Thailand.

From the long-term perspective, however, the GVCs participation in the form of labor-intensive production activities will not necessarily make the Vietnamese economy sustain its economic growth. As Gill and Kharas (2007) argued in the context of "middle income trap", the growth strategies 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 heavy dependence on labor inputs for growth through the GVCs

[1] The World Investment Report was published by the United Nations Conference on Trade and Development (UNCTAD). See the website below:
http://unctad.org/en/pages/DIAE/World%20Investment%20Report/WIR-Series.aspx.

participation would simply lead to the "diminish returns" from them. Now that the Vietnamese economy has joined the middle-income group since 2009,[2] it might encounter the danger of "middle income trap", as long as the economy stuck to the labor-intensive activities in the GVCs involvement. There comes the necessity for the Vietnamese economy to transform its structure from factor-driven growth to productivity-driven one through industrial upgrading. In the context of the involvement in GVCs, while the Vietnamese economy accepts foreign investors in its manufacturing activities, it should upgrade its domestic productive capacities by obtaining the technological transfers from foreign investors.

This article examines how the Vietnamese economy has been involved in GVCs and discusses its policy implication, in comparison with those of the other Asian countries by using the OECD value-added-trade data[3]. The value-added-trade data developed recently by several organizations enable us to identify the contributions of domestic and foreign value added embedded in grow exports. By using this data, WIR (2013) and Taguchi (2014) described the development paths of GVCs for the host economies as follows: the initial stage of GVCs participation reduces domestic value added contribution to exports through depending on the imports of intermediate goods for exporting processed goods, but the domestic value added share for exports is restored at a later stage of GVCs involvement with expanding and upgrading domestic productive capacities including the production of parts and components. The purpose of this article is to clarify what position the Vietnamese economy now stay at in this development process of GVCs, and the policy implication to realize its industrial upgrading. The study also demonstrates the Vietnamese position by total manufactures and individual manufacturing sectors that are classified into eight categories such as food products, textile products, wood products, chemical products, metal products, machinery, electrical equipment and transport equipment.

The rest of the paper is structured as follows. Section 2 reviews previous studies on the economic impacts of GVCs in Asian countries, and clarifies this study's contribution. Section 3 represents the empirical evidence on the GVCs development paths in Asian economies and clarifies the position of the Vietnamese economy as well as its policy implication. Section 4 summarizes and concludes.

2. Literature Review and this Study's Contribution

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

This section reviews previous studies on the economic impacts of GVCs in Asian countries, and clarifies this study's contribution.

There have been rather a plenty of literature on the "firm and industry level" analyses of GVCs impacts through some kinds of case studies. Picking up some examples, Nadvi et al. (2004) traced how Vietnamese garment and textile firms are inserted into global garment and textile value chains, and examined how the nature of insertion into global value chains leads to differentiated gains for state owned and private enterprises, and for textile and garment workers. Lee and Gereffi (2013) examined how the GVCs of mobile phone manufacturing have changed the dynamics of trade, production and value creation in developing countries, and how those dynamics have affected the social upgrading of workers in GVCs in terms of employment and wages; and finally found that GVCs participation has a significant impact in terms of generating employment, but a limited impact on wage increase. Backer (2011) examined the distribution of value added within GVCs focusing on China, but referred only to the commonly cited study of the Apple iPod, showing that the actual value added in China – that from the pure assembly of parts and components imported from Japan, U.S. and Korea, represented a fraction of the final retail price in U.S..

The literature on the "country" level analyses of GVCs impacts has, on the other hand, been scarce probably because such analytical instruments as value-added-trade have been just recently developed by several organizations. It was WIR (2013) that addressed, for the first time, the country level analyses of GVCs impacts in the comprehensive angles by utilizing the UNCTAD-Eora value-added-trade data.[4] Chapter IV of WIR (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

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

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 in Figure 1.

Taguchi (2014) applied the aforementioned county-level analyses of GVCs effects in WIR (2013) to Asian developing economies for the reason that Asia can be 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 such more sophisticated way 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 GDP growth, which was consistent with the first outcome above in WIR (2013). Second, the GVCs development paths have followed the "smile curve" with the bottom being 5,651 U.S. dollars as per capita GDP as shown in Figure 2. 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 capita GDP than those of food, textile, and wood products.

This study contributes to updating the empirical analysis of the GVCs development paths, namely, the "smile curve" presented by Taguchi (2014). To be specific, this study samples the annual data from 1995 to 2014 so that the smile curve can be estimated more accurately than that of Taguchi (2014) with the discrete sample of 1995, 2000, 2005 and 2008. This study also examines the position of the Vietnamese economy in the smile curve and extracts the policy implication, through investigating total manufactures and eight-categorized manufacturing sectors.

3. Empirical Evidence

This section first confirms the hypothesis of the GVCs development paths, provides the empirical evidence on the updated GVCs development paths in Asian economies, and clarifies the position of the Vietnamese economy as well as its policy implication.

3.1 Hypothesis of GVCs Development Paths

We herein confirm the hypothesis behind the GVCs development paths. Figure 3 illustrates the dynamic evolution process of domestic value added creation for GVCs participants. DVX and DVY represents "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 its 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.

When we focus 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 two 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 other is "per capita GDP (PCY)", denoting the development stage of local economies. The data of DVX are retrieved from OECD value-added-trade data, and those of PCY are from World Economic Outlook Database (WEO) October 2017 of International Monetary Fund (IMF)[5] by the series of "Gross domestic product per capita, current prices, U.S. dollars".

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, 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 and PCY are converted into natural logarithm form for the estimation to avoid the heteroskedastic in the error terms.

Before conducting the VAR model estimation, we investigate the stationary property of each data by employing a panel unit root test. For the test, we adopt the Levin, Lin and Chu unit root test (developed by Levin et al., 2002), which assumes that the parameters of the series lagged are common across cross sections. We specify the test equation by containing "individual intercept" and "individual intercept and trend", and by adopting automatic lag length selection. The test result in Table 1 showed that all the data were stationary at conventional significant levels when the equation focuses on the one containing "individual intercept and trend". The data is thus justified for a panel estimation.

[5] See the website: http://www.imf.org/en/data.

Based on the panel data, the association between DVX and PCY will be examined by a quadratic equation as well as a linear one, so that the applicability of the "smile curve" can statistically be compared with that of linear correlation.

3.3 Empirical Evidence on Updated GVCs Development Paths

Table 2-1 to 2-9 and Figure 4-1 to 4-9 represent the estimation outcomes on the GVCs development paths on total manufactures and eight manufacturing sectors. In all cases, the random-effect model is applied in the panel estimation, following the Hausman-test statistics (see Hausman, 1978).

Focusing on the case of total manufactures in Table 2-1 and Figure 4-1, the estimation by a linear equation shows that the coefficient of PCY is insignificant. On the other hand, the estimation by a quadratic equation indicates that the coefficient of PCY is significantly negative; the one of a square of PCY is significantly positive; and the turning point in PCY is in a reasonable level of PCY, namely, 2,015 US dollars with DVX being 55.3%. This means that the U-shaped smile curve is clearly identified while the linear correlation is not found, as the GVCs development path of Asian economies. This outcome seems to be consistent with Taguchi (2014), although there is some difference in the turning point of per capita GDP. It could also be observed from Figure 4-1 that such forerunners as Malaysia, China, Thailand, Indonesia and Philippines are already passing the turning point by regaining DVX, whereas such latecomers as Cambodia, India and Vietnam are still staying at the declining phase of DVX, during their GVCs participation.

Regarding the analysis of eight manufacturing sectors in Table 2-2 to 2-9 and Figure 4-2 to 4-9, 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 the reasonable levels, in all sectors. On the other hand, in the linear estimation, the coefficients of PCY are insignificant except for only the cases of wood products and transport equipment. The association between DVX and PCY can, therefore, be said to follow the 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 1,270 to 3,283 US dollars. For instance, the PCYs in textile products (1,448) and food products (1,774) are below the average, while those in metal products (3,283) and transport equipment (2,802) are above the average. Second, the DVXs in their turning points also have a wide range from 45.0 to 79.5 percent. The DVXs in food products (79.5) and wood products (68.1) are above the average, whereas those in electrical equipment (45.0) and machinery (50.6) 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.

From the perspective of individual Asian economies, Figure 4-2 to 4-9 display some variety in the locational positions of smile curves among manufacturing sectors. In the textile products, for instance, all of the economies except Cambodia already pass the turning point in their smile curves. In the metal products, on the other hand, only the smile curves of Malaysia, China and Thailand go through the turning point whereas the others still stay at the stage before the turning point.

To sum up, in total manufactures, 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 with the turning point being at 2,015 US dollars as per capita GDP and at with 55.3% as domestic value share to exports. Looking at 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, so that the majority of individual economies does not pass the turning point.

3.4 Vietnamese Position in GVCs Development Path and its Policy Implication

This section clarifies the position of the Vietnamese economy in the GVCs development paths and extract its policy implication. Focusing on total manufactures in Figure 4-1 again, Vietnam now stands at the critical position such that its per capita GDP in 2014, 2,049 US dollars, is very close to the Asian average turning point, 2015 US dollars. This means that Vietnam faces the branching-off point on whether the domestic value share to exports regains itself or continues to decline, since the smile curve is not necessarily realized automatically as was mentioned before. On that point, the Government policies to enhance domestic productive capacities matter to keep the smile curve.

Looking at each manufacturing sector, the Vietnamese positions are various and roughly summarized as follows: food products and textile products already pass the average turning point and the textile products particularly enters the phase of regaining the domestic value share to exports; wood products and chemical products nearly reach the turning point and start to regain domestic value share to exports; metal products and transport equipment are far behind the turning point and still stay at the declining phase

of domestic value share to exports; and machinery and electrical equipment already pass the average turning point of per capita GDP but still continue to have domestic value share to exports declines. The Vietnamese positions in each manufacturing sector imply that the Government needs to take double-track actions in its GVCs involvement: to consolidate the recovery of domestic value share to exports in the sectors depending local resources such as food and textile products by the maximum use of local productive capacities, and to transform domestic value share to exports into its regaining phase in the sectors depending on sophisticated technologies such as machinery and transport equipment through obtaining technology transfers intensively from foreign investors.

The Vietnamese positions in the GVCs involvement can be illustrated by another angle, i.e., the degree of development in supporting industries in manufacturing sectors. Figure 5 compares the trade structure of transportation equipment and textile products between Vietnam and Thailand. Focusing on transportation equipment in Vietnam in terms of trade value, the import of intermediate goods including parts and components has been far exceeding the export of final goods, while both have been in increasing trends.[6] It is in clear contrast to the case of Thailand where the export of final goods has been exceeding the import of intermediate goods. It implies that Vietnam has less domestic capacities to produce parts and components due to the underdevelopment of supporting industries in the transportation equipment sector. Regarding textile sector, on the other hand, the export of final goods has been more than the import of intermediate goods in Vietnam as well as in Thailand. As for its export-import ratio, that of Vietnam even exceeds that of Thailand. This evidence also suggests the needs for the sectors depending on sophisticated technologies to be transformed from only assembling activities toward developing domestic capacities to produce parts and components.

The serious question then arises on how to nurture local productive capacities in sophisticated manufacturing sectors in the context of the GVCs involvement in Vietnam. WIR (2013) proposed the following key strategies as well as such general policies as workforce skills development, for building domestic productive capacities of developing economies: “enterprise clustering” and “linkages development”. The enterprise clustering enables the local small and medium-sized enterprises (SMEs) to enjoy “collective efficiency” to enhance their productivity with clustered firms. The linkage development provides the local SMEs with the necessary externalities for successful participation in GVCs as first, second, or third-tier suppliers. These two strategies in line with the GVCs involvement facilitate technological transfers from international firms to local ones,

[6] It should be noticed that the import of intermediate goods are used not only for export of final goods but also for their domestic selling.

thereby contributing to enhancing the local productive capacities even in sophisticated manufacturing sectors. Kuchiki (2005, 2008) also emphasized the significance in industrial cluster policy for promoting economic restructuring. The Vietnamese Government has so far promoted enterprise agglomeration by setting up special economic zones and inviting foreign investors, and so how to materialize the key strategies, enterprise clustering and linkages development, should be further investigated in the existing policy framework.

4. Concluding Remarks

This article examined the involvement pattern in GVCs with its policy implication in Vietnam, in comparison with those of the other Asian countries, by using the OECD value-added-trade data.

The study first identified the "smile curve" as the average pattern of the Asian GVCs development paths in total manufactures, 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 2,015 US dollars as per capita GDP. Regarding the sectoral analysis, the sectors depending on sophisticated technologies and long production processes, such as metal products and transport equipment, tended to reach the turning point at the higher per capita GDP with the lower domestic value share to exports, compared with the sectors depending on local resources, such as textile and food products.

The study then found that the Vietnamese economy stood at the critical position in its GVCs development path, such that the Vietnamese current per capita GDP is very close to 2,015 US dollars, the Asian average turning point in total manufactures, thereby facing the branching-off point on whether the domestic value share to exports regains itself or continues to decline. The sectoral analysis in Vietnam also implied that sophisticated manufacturing sectors needs to be transformed from only assembling activities toward developing domestic capacities to produce parts and components.

The Government policies in Vietnam thus matter to nurture local productive capacities, and the "enterprise clustering" and "linkages development" should be the key strategies to facilitate technological transfers from international firms to local ones in line with the GVCs involvement.

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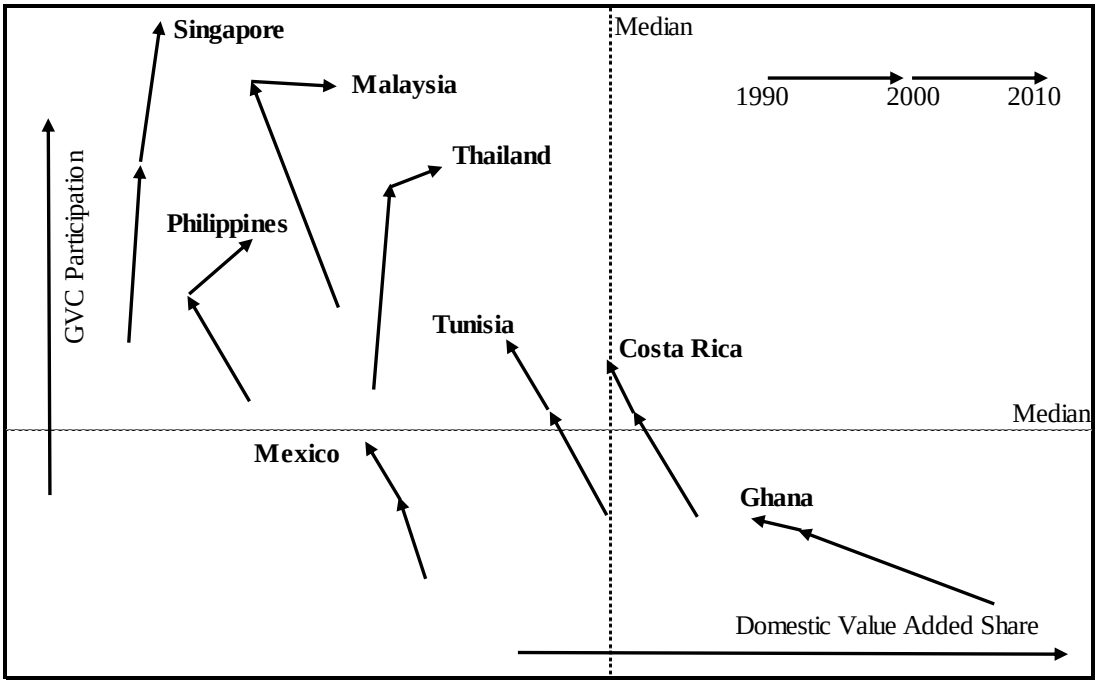
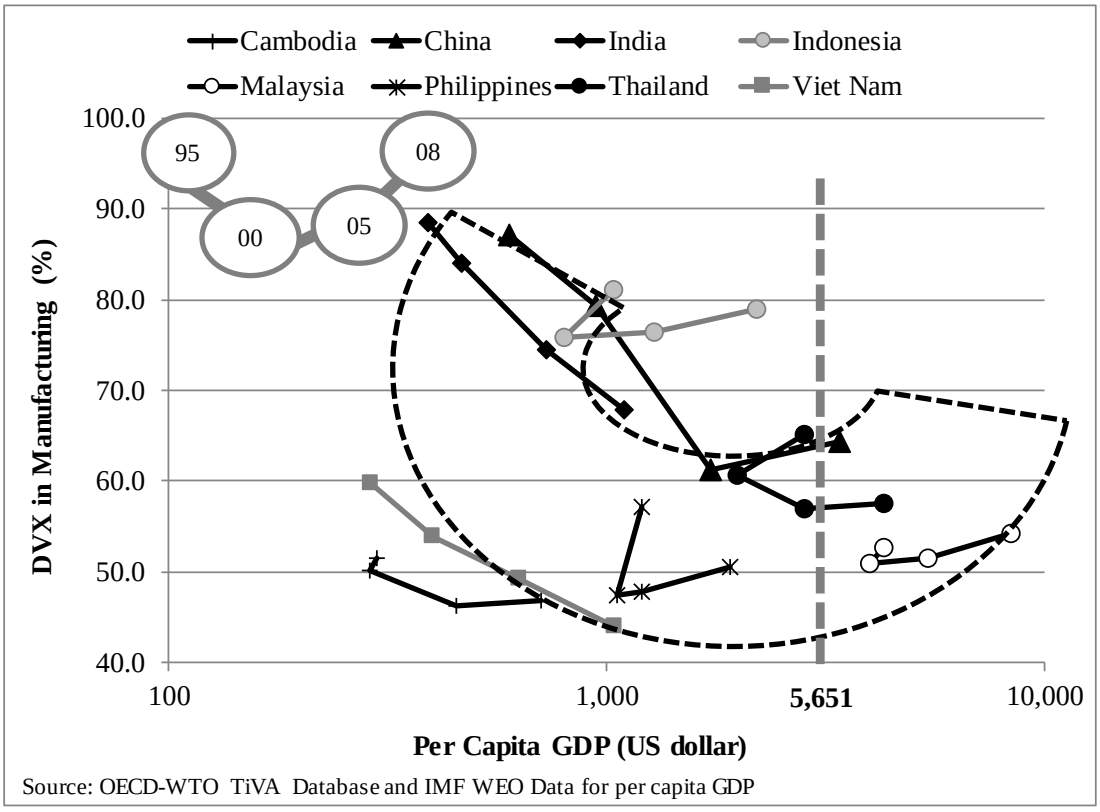
Figure 1 GVC Development Paths: Country Example



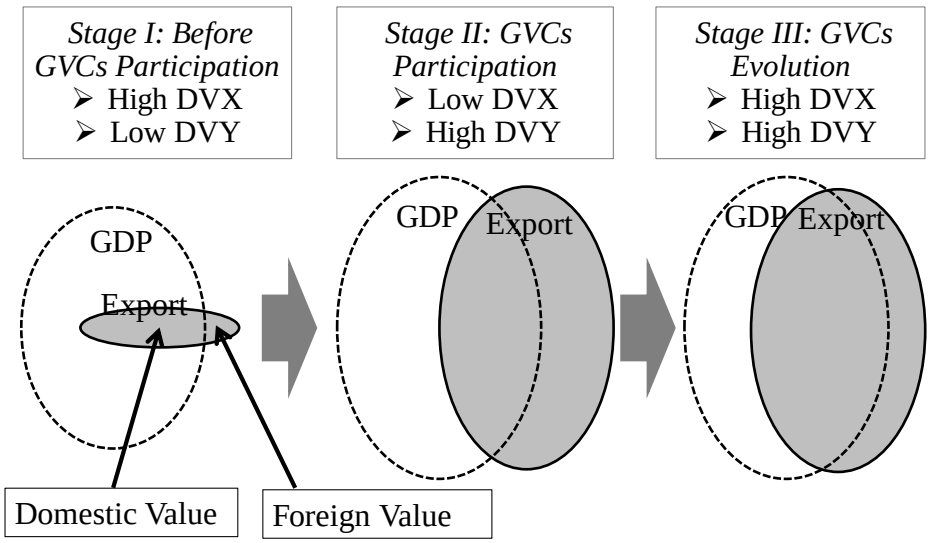
Source: WIR (2013)

Figure 2 GVCs Development Paths: Estimation in Asian economies



Note: DVX denotes domestic value added as a share of gross exports.
Source: Taguchi (2014)

Figure 3 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 Unit Root Test for DVX and PCY

	Unit Root Test (Levin, Lin & Chu Test)	
	Individual intercept	**Individual intercept & trend**
PCY	**1.891**	**-2.846 *****
DVX		
Total manufactures	**-4.016 *****	**-2.487 *****
Food products	**-3.278 *****	**-2.880 *****
Textile products	**-1.649 ****	**-1.453 ***
Wood products	**-2.574 *****	**-2.104 ****
Chemical products	**-3.109 *****	**-1.544 ***
Metal products	**-2.991 *****	**-3.908 *****
Machinery	**-3.801 *****	**-5.012 *****
Electrical equipment	**-3.832 *****	**-2.804 *****
Transport equipment	**-2.332 *****	**-3.761 *****

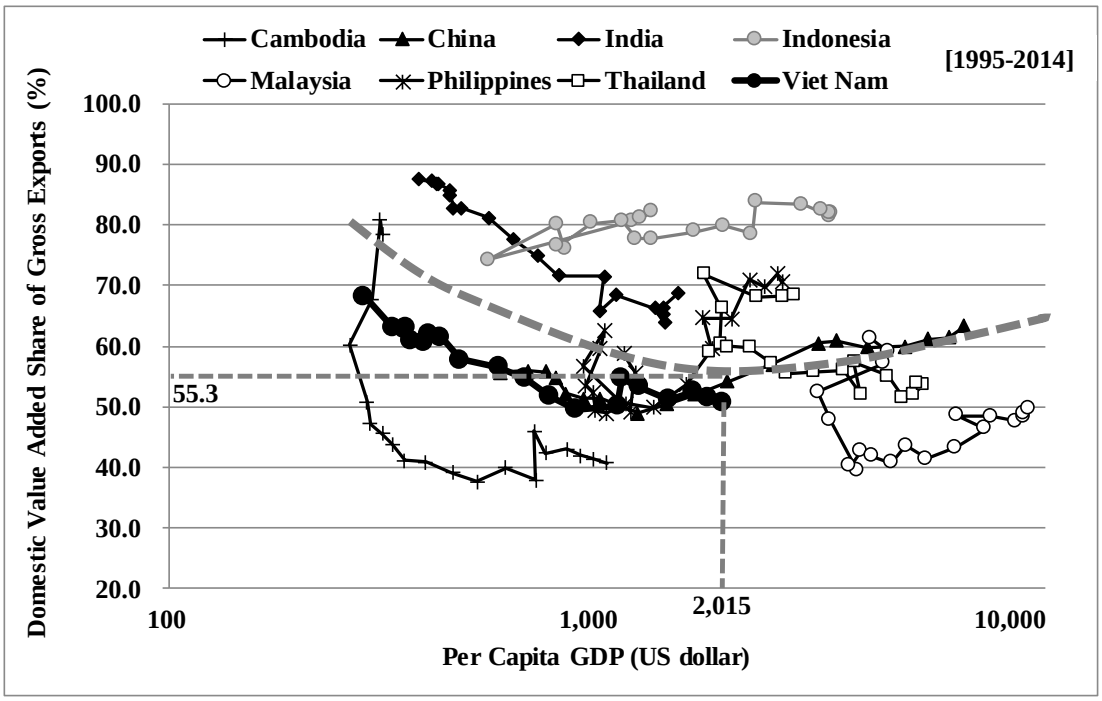
Note: DVX denotes domestic value added as a share of gross exports, and PCY denotes per capita GDP. ***, **, * denote the rejection of null hypothesis at the 99%, 95% and 90% level of significance.
Source: Author's estimation based on OECD value-added-trade data and World Economic Outlook Database of International Monetary Fund

Table 2-1 Estimation on Total Manufactures

Variales	DVX	DVX
Const.	4.258 ***	7.604 ***
	(21.625)	(12.295)
PCY	-0.025	-0.943 ***
	(-1.007)	(-5.603)
PCY^2		0.062 ***
		(5.405)
Turning Point USD (share %)		2,015 (55.3)
Adj R^{**2}	0.000	0.166
Sample size	160	160
Hausman Test		
Chi-Sq. Statistic	0.032	0.000
Chi-Sq. d.f.	1	2
Prob.	0.857	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.
Source: Author's estimation based on OECD value-added-trade data and WEO of IMF

Figure 4-1 GVCs Development Path on Total Manufactures



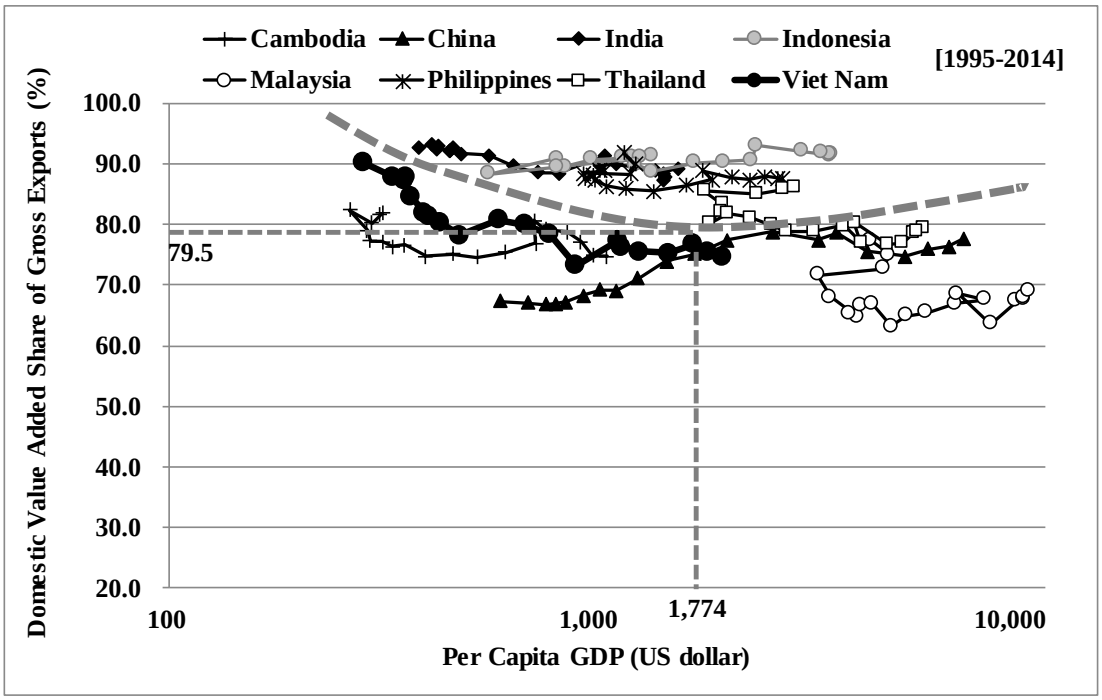
Source: OECD value-added-trade data and WEO of IMF

Table 2-2 Estimation on Food Products

Variales	DVX	DVX
Const.	4.402 ***	5.188 ***
	(67.907)	(23.077)
PCY	-0.001	-0.217 ***
	(-0.242)	(-3.550)
PCY^2		0.014 ***
		(3.482)
Turning Point USD (share %)		1,774 (79.5)
Adj R^{**2}	-0.005	0.063
Sample size	160	160
Hausman Test		
Chi-Sq. Statistic	0.000	0.000
Chi-Sq. d.f.	1	2
Prob.	1.000	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.
Source: Author's estimation based on OECD value-added-trade data and WEO of IMF

Figure 4-2 GVCs Development Path on Food Products



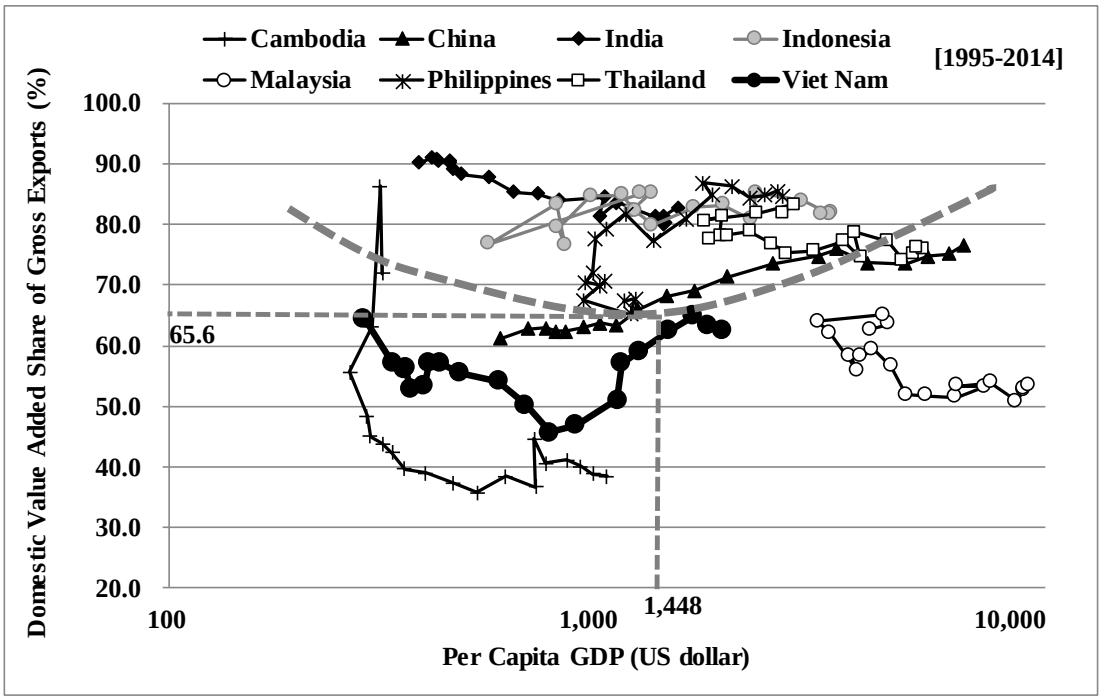
Source: OECD value-added-trade data and WEO of IMF

Table 2-3 Estimation on Textile Products

Variales	DVX	DVX
Const.	4.207 ***	5.508 ***
	(28.995)	(9.004)
PCY	-0.000	-0.364 **
	(-0.009)	(-2.176)
PCY^2		0.025 **
		(2.195)
Turning Point USD (share %)		1,448 (65.6)
Adj R^{**2}	-0.006	0.017
Sample size	160	160
Hausman Test		
Chi-Sq. Statistic	0.000	0.000
Chi-Sq. d.f.	1	2
Prob.	1.000	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.
Source: Author's estimation based on OECD value-added-trade data and WEO of IMF

Figure 4-3 GVCs Development Path on Textile Products



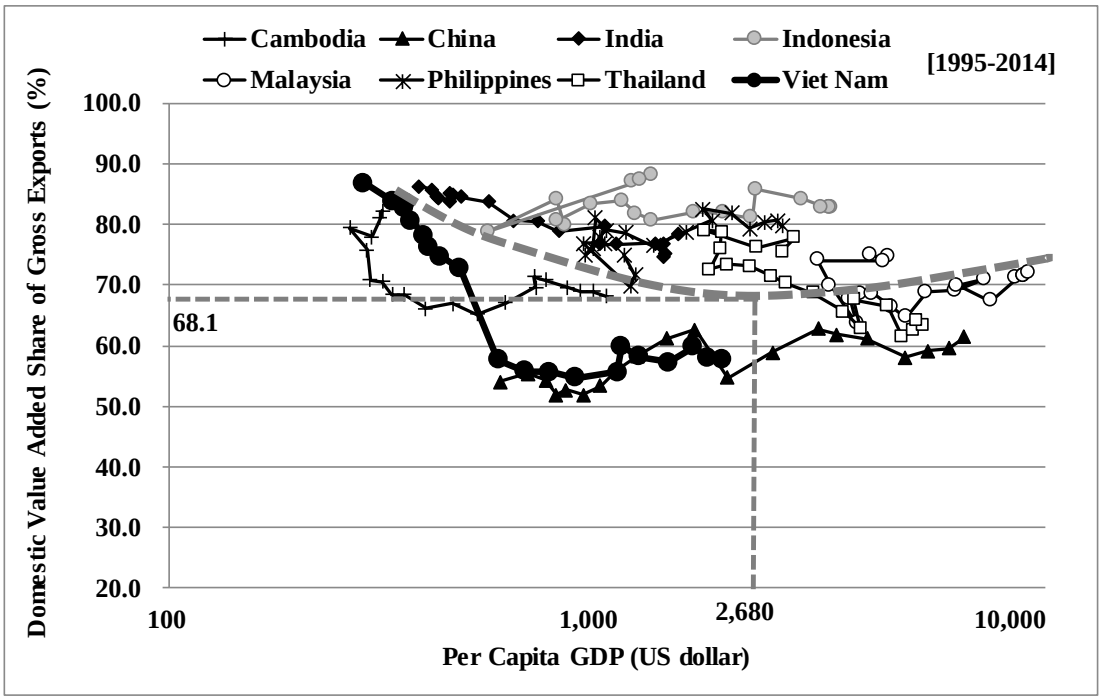
Source: OECD value-added-trade data and WEO of IMF

Table 2-4 Estimation on Wood Products

Variales	DVX	DVX
Const.	4.614 ***	6.717 ***
	(49.553)	(17.002)
PCY	-0.046 ***	-0.632 ***
	(-4.196)	(-5.869)
PCY^2		0.040 ***
		(5.456)
Turning Point USD (share %)		2,680 (68.1)
Adj R^{**2}	0.094	0.234
Sample size	160	160
Hausman Test		
Chi-Sq. Statistic	0.146	0.640
Chi-Sq. d.f.	1	2
Prob.	0.702	0.726
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.
Source: Author's estimation based on OECD value-added-trade data and WEO of IMF

Figure 4-4 GVCs Development Path on Wood Products



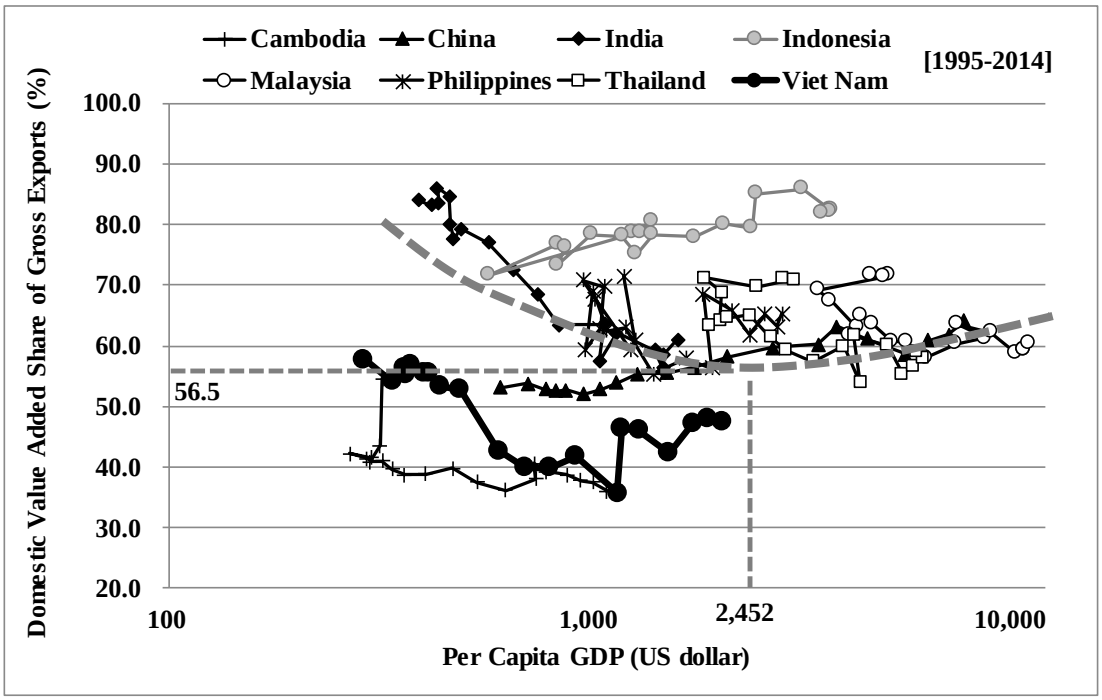
Source: OECD value-added-trade data and WEO of IMF

Table 2-5 Estimation on Chemical Products

Variales	DVX	DVX
Const.	4.280 ***	6.569 ***
	(28.106)	(13.375)
PCY	-0.027	-0.649 ***
	(-1.514)	(-4.878)
PCY^2		0.041 ***
		(4.586)
Turning Point USD (share %)		2,452 (56.5)
Adj R^{**2}	0.008	0.147
Sample size	160	160
Hausman Test		
Chi-Sq. Statistic	0.000	0.000
Chi-Sq. d.f.	1	2
Prob.	1.000	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.
Source: Author's estimation based on OECD value-added-trade data and WEO of IMF

Figure 4-5 GVCs Development Path on Chemical Products



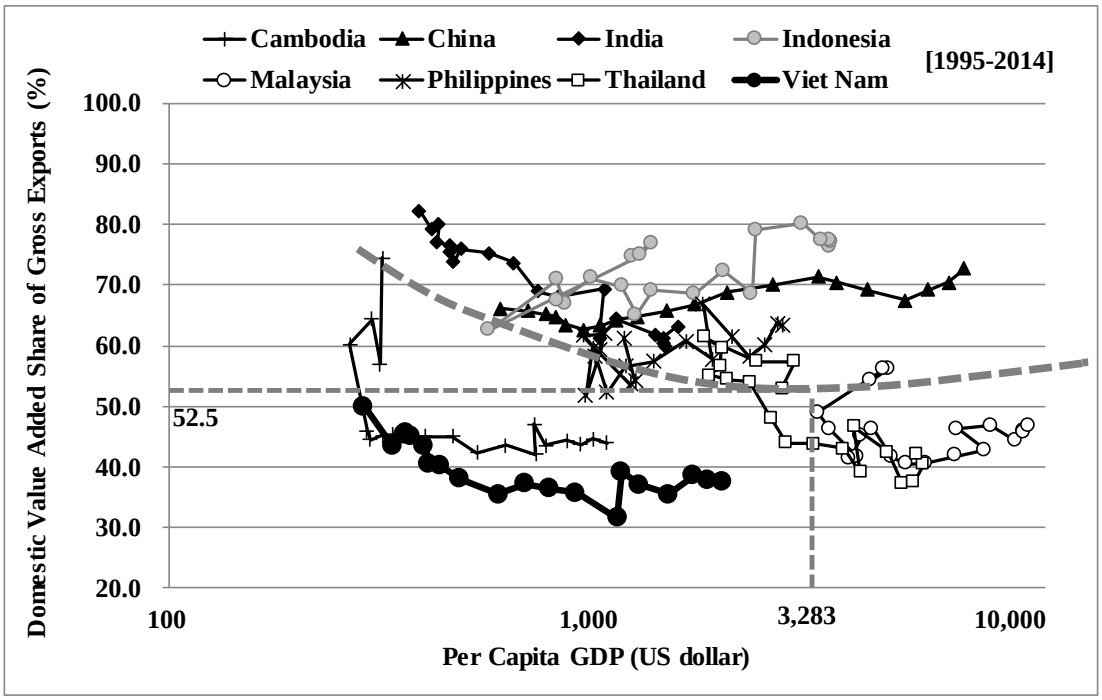
Source: OECD value-added-trade data and WEO of IMF

Table 2-6 Estimation on Metal Products

Variales	DVX	DVX
Const.	4.235 ***	5.871 ***
	(23.903)	(10.482)
PCY	-0.031	-0.471 ***
	(-1.509)	(-3.113)
PCY^2		0.029 ***
		(2.821)
Turning Point USD (share %)		3,283 (52.5)
Adj R^{**2}	0.007	0.078
Sample size	160	160
Hausman Test		
Chi-Sq. Statistic	0.000	0.000
Chi-Sq. d.f.	1	2
Prob.	1.000	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.
Source: Author's estimation based on OECD value-added-trade data and WEO of IMF

Figure 4-6 GVCs Development Path on Metal Products



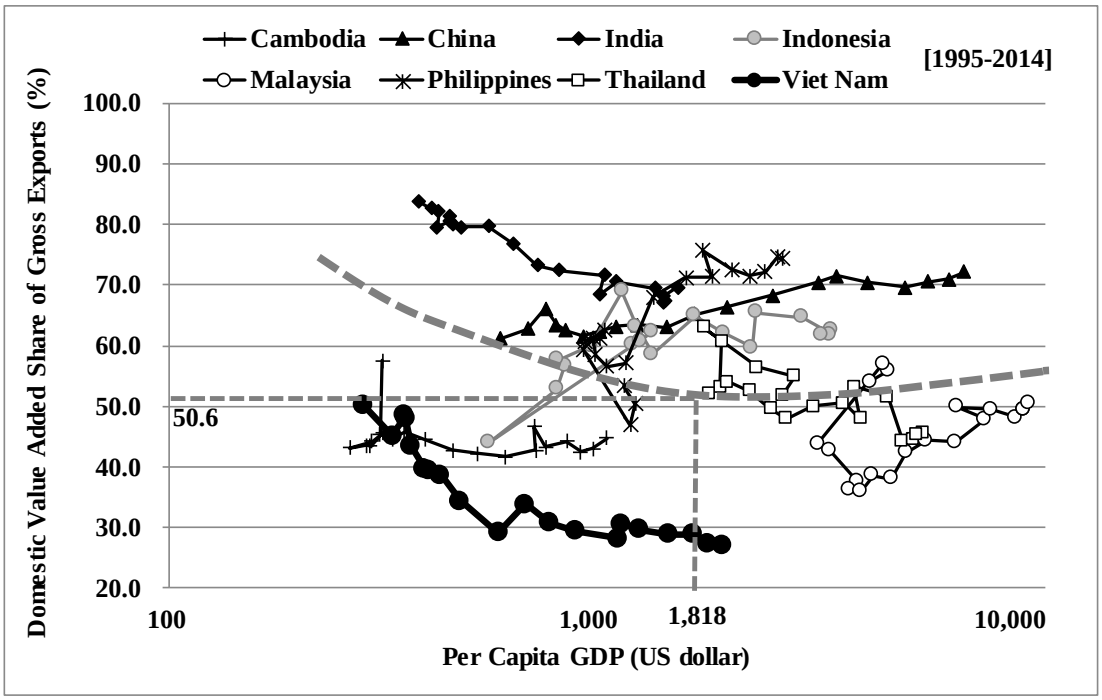
Source: OECD value-added-trade data and WEO of IMF

Table 2-7 Estimation on Machinery

Variales	DVX	DVX
Const.	4.163 ***	7.402 ***
	(26.293)	(11.991)
PCY	-0.024	-0.927 ***
	(-1.426)	(-5.520)
PCY^2		0.061 ***
		(5.397)
Turning Point USD (share %)		1,818 (50.6)
Adj R^{**2}	0.006	0.156
Sample size	160	160
Hausman Test		
Chi-Sq. Statistic	0.038	0.535
Chi-Sq. d.f.	1	2
Prob.	0.843	0.765
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.
Source: Author's estimation based on OECD value-added-trade data and WEO of IMF

Figure 4-7 GVCs Development Path on Machinery



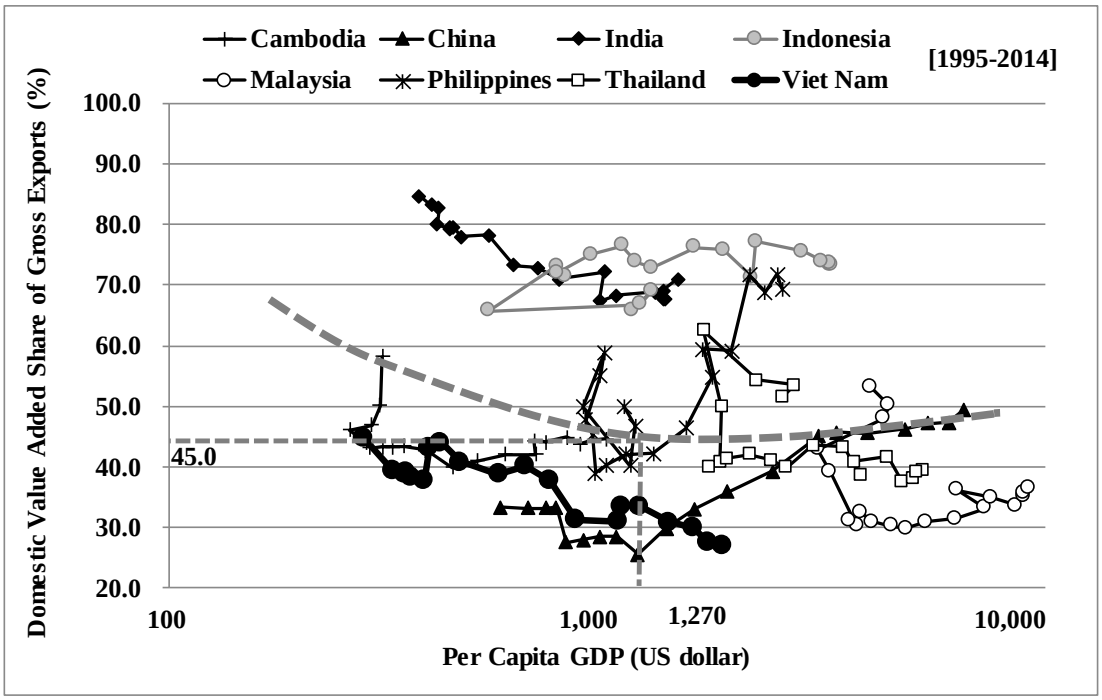
Source: OECD value-added-trade data and WEO of IMF

Table 2-8 Estimation on Electrical Equipment

Variales	DVX	DVX
Const.	3.707 ***	6.522 ***
	(18.177)	(8.153)
PCY	0.020	-0.760 ***
	(0.878)	(-3.490)
PCY^2		0.053 ***
		(3.584)
Turning Point USD (share %)		1,270 (45.0)
Adj R^{**2}	-0.001	0.067
Sample size	160	160
Hausman Test		
Chi-Sq. Statistic	0.000	0.000
Chi-Sq. d.f.	1	2
Prob.	1.000	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.
Source: Author's estimation based on OECD value-added-trade data and WEO of IMF

Figure 4-8 GVCs Development Path on Electrical Equipment



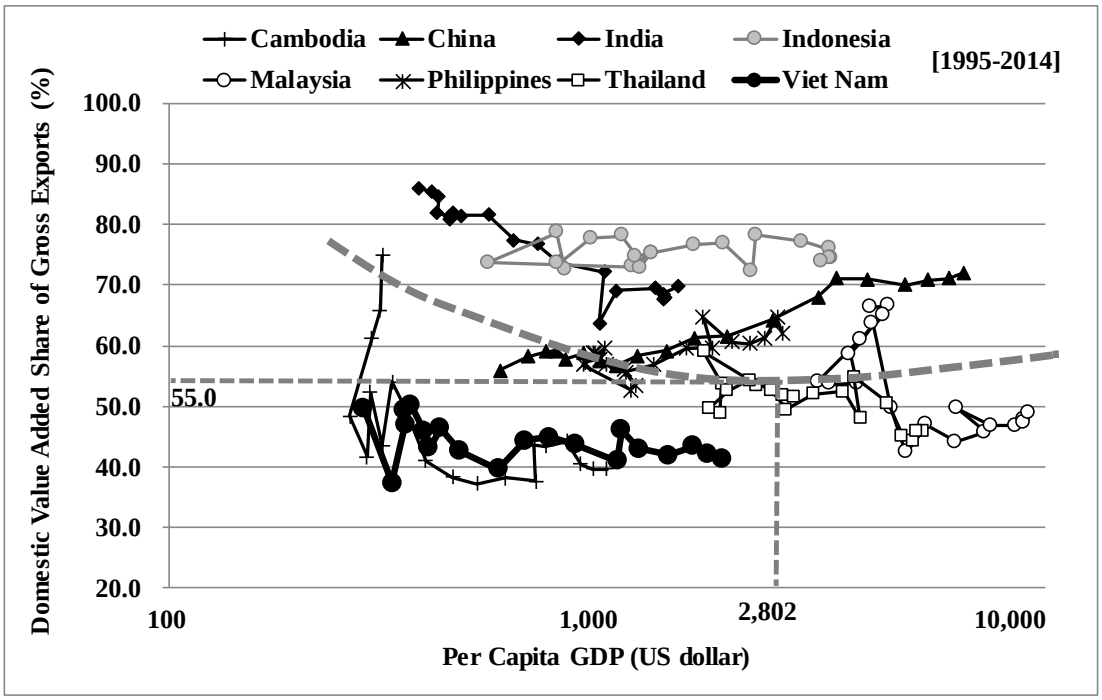
Source: OECD value-added-trade data and WEO of IMF

Table 2-9 Estimation on Transport Equipment

Variales	DVX	DVX
Const.	4.282 ***	5.759 ***
	(29.729)	(9.997)
PCY	-0.032 **	-0.441 ***
	(-2.044)	(-2.816)
PCY^2		0.027 **
		(2.604)
Turning Point USD (share %)		2,802 (55.0)
Adj R^{**2}	0.019	0.060
Sample size	160	160
Hausman Test		
Chi-Sq. Statistic	0.000	0.000
Chi-Sq. d.f.	1	2
Prob.	1.000	1.000
Estimation Type	Random	Random

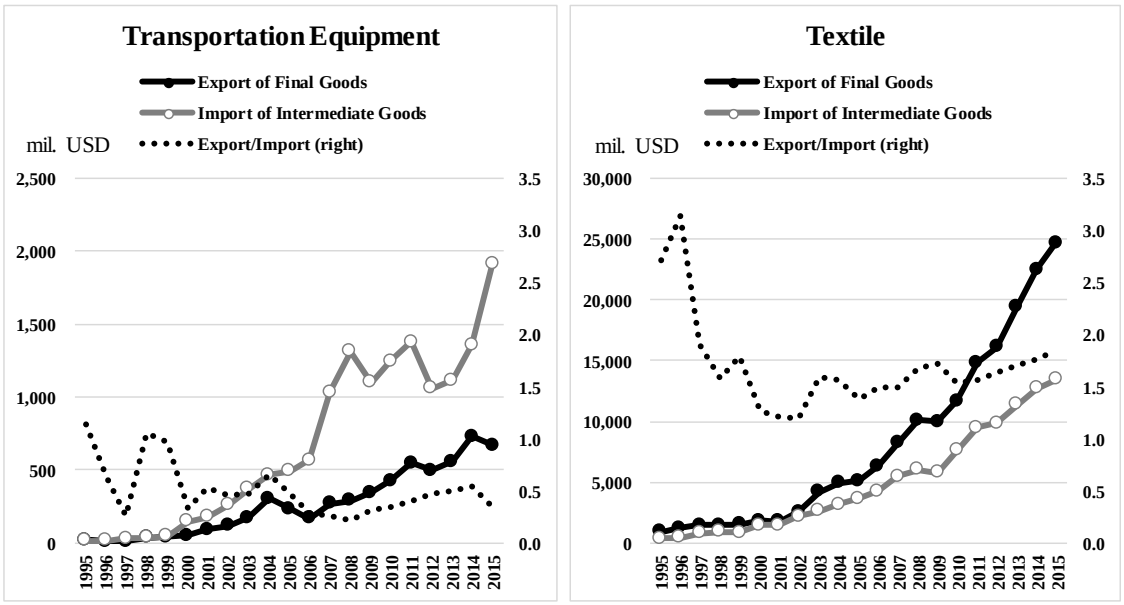
Note: DVX denotes domestic value added as a share of gross exports, and PCY denotes per capita GDP.
***, **, * denote the rejection of null hypothesis at the 99%, 95% and 90% level of significance.
Source: Author's estimation based on OECD value-added-trade data and WEO of IMF

Figure 4-9 GVCs Development Path on Transport Equipment

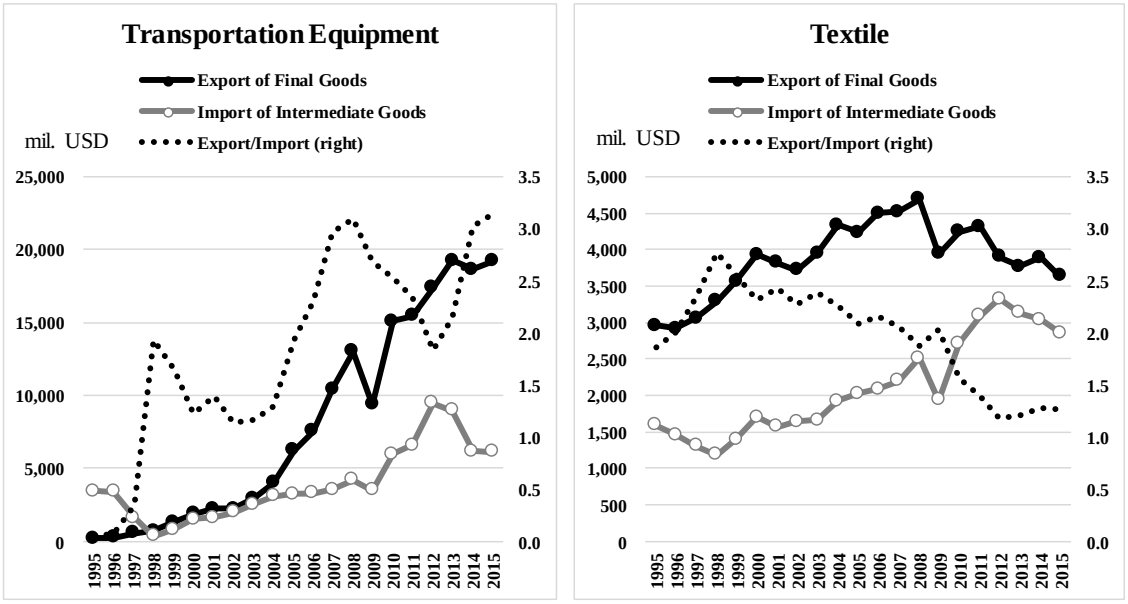


Source: OECD value-added-trade data and WEO of IMF

Figure 5 Comparison in Trade Structure between Vietnam and Thailand
[Vietnam]



[Thailand]



Source: RIETI-TID2015: http://www.rieti-tid.com/