

## ORIGINAL RESEARCH ARTICLES

# Empirical Evidence of Structural Change The Case of Vietnam's Economic Growth

Hieu C. Nguyen

*This study examines the patterns of structural change in economic development by drawing insights from the case of Vietnam. Empirical evidence from literature indicates that developing countries are likely to gain from structural transformation to boost the growth of labour productivity. While most East Asian countries have enjoyed significant structural transformation bonus, many African and Latin American economies, often endowed with rich natural resources, have benefited negligibly from this process. Vietnam, in particular, has gained substantially from its growth promoting structural transformation, contributing to nearly half of overall labour productivity improvement between 1990 and 2013. This structural change effect was modest in 1990–2000, strongest in 2000–07, and declining (but still significant) in 2007–13. The process has been associated with rapid expansion of the manufacturing and service sectors, change in export composition towards higher share of medium- and high-tech manufactures, and integration into global value chains. The expected slowdown in structural change suggests that the country would have to rely more on within-sector productivity improvement to enhance growth.*

**Keywords:** Structural change, labour reallocation, productivity growth, industrialization, Vietnam.

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### 1. Introduction

Structural change has been regarded as one of the most important drivers of economic growth, especially in developing economies. Countries successful in economic development are usually characterized by the rapid transformation of the structure of their economies. In fact, the pace of structural transformation is the key factor that differentiates successful nations from unsuccessful ones (McMillan and Rodrik 2011). The term “structural change” (or “structural transformation”) has been widely used in research, though it may

**Hieu C. Nguyen** is Research Associate at the Saigon Center for International Studies (SCIS), University of Social Sciences and Humanities, Ho Chi Minh City, 10-12 Dinh Tien Hoang Street, District 1, Ho Chi Minh City, Vietnam; email: nguyenchihieu82vn@gmail.com

have different meanings and interpretations. In development economics, structural change is commonly understood as “the different arrangements of productive activity in the economy and different distributions of productive factors among various sectors of the economy, various occupations, geographic regions, types of product, etc.” (Silva and Teixeira 2008, p. 275, citing Machlup 1991). The process of structural transformation, in which labour and capital are continuously shifted between firms, sectors and countries, driven by changes in domestic demand and international trade patterns, has long been documented (Kuznets 1966; Chenery, Robinson and Syrquin 1986). The most common pattern of structural change is the shift of labour and capital from the production of primary goods to manufacturing and services (Timmer and de Vries 2009). It is also observed that, in most low-income countries, the productivity level and growth of the primary sector are significantly lower than those of the rest of the economy (Syrquin 1984). This suggests that the reallocation of resources from lower to higher productivity industries would boost the aggregate productivity growth, a bonus that was identified in classical dual economy models (Lewis 1954; Fei and Ranis 1964).

The classical and neoclassical economists have different views about structural change and its implications. The former consider the reallocation of labour from traditional activities such as agriculture to modern industries as a major driving force of economic development. In contrast, neoclassical economists, with the belief in the allocative efficiency of the market, view structural change as an automatic result of market development rather than a necessary condition for development (Memedovic and Iapadre 2009). Rodrik (2006), however, argues that structural change is a relevant target for industrial policy, as suggested by empirical evidence. A better understanding about structural change, therefore, allows reframing necessary industrial policies especially in developing countries, which would help boost the transformation and growth. In this view, policymakers in developing countries like Vietnam should pay attention to structural transformation as an important channel of improving growth and development. The recent slowdown of Vietnam’s economy has raised concerns about the productivity issue and its slow pace of enhancement. Therefore, a deeper examination of the pattern of structural change and productivity improvement would offer not only more insights into the problem, but also important policy implications for promoting growth.

This study aims to empirically investigate the patterns and determinants of structural transformation by reviewing extant literature, and then analyse the case of Vietnam. The research furthers the work of McCaig and Pavcnik (2013) on Vietnam by extending the investigation to the recent period after 2008 when the country’s economy underwent a significant growth slowdown. The paper proceeds as follows. The second section examines the empirical patterns of structural transformation. The subsequent section investigates the case of Vietnam — using the shift-share analysis and the examination of the changing composition of exports, the participation in the global value chains, and the industrialization of the national economy. The fourth section looks at the factors that have helped foster structural transformation in Vietnam. Concluding remarks and policy implications are provided in the final section.

## **2. Patterns of Structural Change: Empirical Investigations**

This segment examines the patterns of structural change, drawing from the empirical studies of groups of countries as well as of individual economies. Pages (2010), analysing labour productivity growth in Latin America, revealed changing patterns of structural transformation in the region over 1950–2005. In the early period (1950–75), the region exhibited rapid labour productivity growth of almost 4 per cent per annum, with roughly a half contributed by structural change. The region then suffered a debt crisis and experienced a “lost decade”, with negative productivity growth during 1975–90. Latin America bounced back after 1990, but productivity growth was significantly lower compared to the pre-1975 level. This was entirely due to the fact that the contribution of structural change had turned negative. While

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the within-sector component of productivity growth in this period was almost equal to that of 1950–75 (about 1.8 percentage points per annum), the structural change component declined substantially to –0.2 percentage points in 1990–2005, compared to 2 percentage points during 1950–75.

In a comparative study using nine-sector data, McMillan and Rodrik (2011) investigated the role of structural change over 1990–2005 in nine high-income nations and twenty-nine developing countries in Asia,<sup>1</sup> Latin America, and Africa. The study revealed a mixed picture. In the developed countries, it was recorded that structural change made negligible contribution (positive or negative) to the growth of the economy-wide labour productivity. This is justified given the fact that, in general, the gap in labour productivity among sectors becomes smaller when an economy attains high-income level. Moreover, with these advanced economies, labour shift usually occurs from manufacturing to services, which eventually has little effect on overall productivity. The main driver of the economy-wide labour productivity growth in these economies is the productivity improvement within each individual sector.

With regard to developing countries, structural change played an important role in all three regions but in different ways. McMillan and Rodrik (2011) showed that Asia is the only region where structural change has made a positive contribution to labour productivity enhancement. Structural change in this region, on average, claimed 0.57 percentage points (about 15 per cent) of the 3.87 per cent overall labour productivity growth. Specifically, the role of structural change was observed to be prominent in Thailand, Hong Kong, Indonesia, China and India with a contribution of 1 percentage point or more. Both Latin America and Africa, in contrast, experienced growth-reducing structural change. In Latin America, on average, while within-sector productivity growth contributed 2.24 percentage points, structural change component was –0.88 percentage points, lowering the overall productivity growth to only 1.35 per cent. The negative effect of structural change in sub-Saharan Africa was even worse at –1.27 percentage points, while the contribution of within-sector effect was 2.13 percentage points, making the overall productivity growth as low as 0.86 per cent.<sup>2</sup>

It should be noted, however, that the patterns of structural change by region discussed above are aggregated from member countries, while the performance of individual economies may differ significantly. The following studies reveal more insights into some specific cases.

In the case of Brazil, Firpo and Pieri (2017) showed that the country experienced rapid structural change from the 1940s until the 1970s. Under the predominance of import-substitution policies during this period, manufacturing and services expanded dramatically as agriculture shrank (manufacturing accounted for 45 per cent of GDP by the late 1970s). From the 1980s, however, the room for further structural transformation had been exhausted, which made productivity growth rely on within-sector improvements.

Unlike East Asian countries, African nations seem to have bypassed industrialization. In a study on Ghana, Osei and Jedwab (2017) indicated that structural change accounted for about a third of the country's labour productivity growth of 3 per cent between 1992 and 2010 — with the period 2000–06, in fact, experiencing negative contribution. However, in this process most of the labour released from agriculture shifted to low-productivity services, resulting in a limited effect on overall productivity improvement. Contrary to expectations, the role of manufacturing in boosting overall productivity growth was negligible. This sector was characterized by informality, with at least 90 per cent of its employees demonstrating productivity over twenty times lower than that of the formal sector in 2000. Osei and Jedwab (2017) concluded that Ghana had experienced structural change without industrialization, resulting in marginal impact on overall productivity enhancement.

Zambia and Nigeria seemed to follow a similar path. In Zambia, Resnick and Thurlow (2017) pointed out that there was a reverse movement of workers from urban jobs back to agriculture, leading to growth-reducing structural change during the negative growth period of the 1990s. The country witnessed positive structural change during the recovery period (2002–10), but it was mainly services that absorbed workers leaving the farms. In Nigeria, Adeyinka, Salau and Vollrath (2017) claimed that labour shifted

from agriculture and wholesale and retail trade to other services and manufacturing, but structural change contributed less than a fifth of the overall productivity growth between 1996 and 2009.

Within Asia, the performance of India, in terms of structural change, has been strikingly different from those of the East Asian countries. As Ashad and Mitra (2017) noted, during the forty-five-year period between 1960 and 2004, agriculture employment shrank by only 10 percentage points (from 71.5 per cent to 61.5 per cent) while manufacturing's share expanded negligibly by 2.6 percentage points (from 9.8 per cent to 12.4 per cent). The 1991 reforms in India, indeed, fostered structural change but its impact on enhancing overall productivity was modest. This is because structural change was mainly driven by the expansion of highly skill-intensive services such as finance, insurance, and business and information technology services, which were unable to absorb the vast majority of the Indian workforce. Vietnam, by contrast, seemed to follow the experience of the East Asian countries. McCaig and Pavcnik (2013) analysed the Vietnamese economy from 1990 to 2008, and revealed that structural transformation contributed a third to the aggregate labour productivity growth of 5.1 per cent during this period. The process was associated with the remarkable employment expansion of services and manufacturing at the expense of agriculture.

Among the East Asian countries that have been highly industrialized, Hong Kong stood out as the economy to experience the most dramatic deindustrialization. Its manufacturing declined rapidly from the early 1990s, shifting over 20 per cent of the labour force to services (Asian Productivity Organization 2015). This structural change was indeed growth promoting because the displaced labour found employment in services such as wholesale and retail trade, finance, insurance and business services with even higher levels of productivity. The case illustrates that the shift to services that promotes overall productivity growth may occur at a later stage of development when the economy has accumulated human capital and other fundamental capabilities (Rodrik 2013). The case of Malaysia is quite the opposite; the nation has faced premature deindustrialization since 2000, with the labour shifting to low-productivity services (Rasiah 2011; Tan and Ng 2017).

### 3. Structural Change and Vietnam's Economic Performance

This section examines the overall economic performance of Vietnam during 1990–2013 and the pattern and contribution of structural change to the economy-wide labour productivity improvement. Structural transformation is investigated through a shift-share analysis, examination of the evolving composition of exports, participation in global value chains, and industrialization of the economy.

#### 3.1 Overview of Economic Growth and Structural Transformation

Vietnam initiated its radical political and economic reforms (known as *Đổi mới*) in 1986 towards a market-oriented economy after a long time under the centrally planned system. After some turbulence in the late 1980s, the economy picked up speed in the early 1990s, together with the contraction of the state-owned sector, boom of private enterprises, and inflow of foreign direct investment (FDI). The country maintained rather high GDP growth at about 7 per cent on average in the 1990s despite the Asian Financial Crisis in 1997–98. The 2000–07 period witnessed even more impressive growth at 7.5 per cent, and the country integrated strongly into the world economy with the Bilateral Trade Agreement (BTA) signed with the United States in 2000 and access to the World Trade Organization (WTO) in 2007. The reforms paved the way for Vietnam to transform itself from one of the poorest nations in the world in the early 1990s into a lower middle-income country in less than twenty years (World Bank 2011).

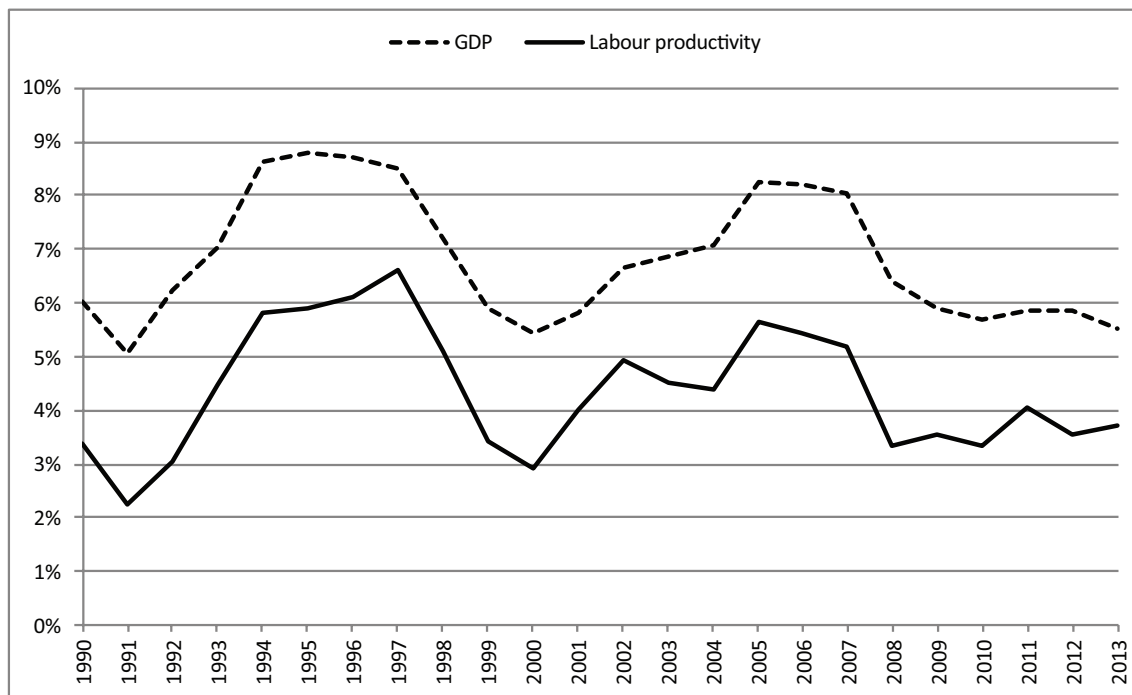
Growth, however, slowed down significantly after 2007, registering a moderate rate of 5.6 per cent during 2007–13. This was partially due to the impact of the Global Financial Crisis in 2008–09, but also

because of the structural problems of the economy itself (Vu 2014, 2015). The economy sustained high labour productivity growth at nearly 5 per cent on average throughout 1990–2007, but it dropped to only 3.5 per cent in the post-2007 slowdown period (Figure 1).

The *Đổi mới* reforms strongly promoted urbanization and transformation of the country's economic structure. In the early 1990s, about 80 per cent of the population lived in rural areas and the economy was dominated by agricultural activities, accounting for over 70 per cent of total employment — this was nearly three times the labour in manufacturing and services combined at that time.

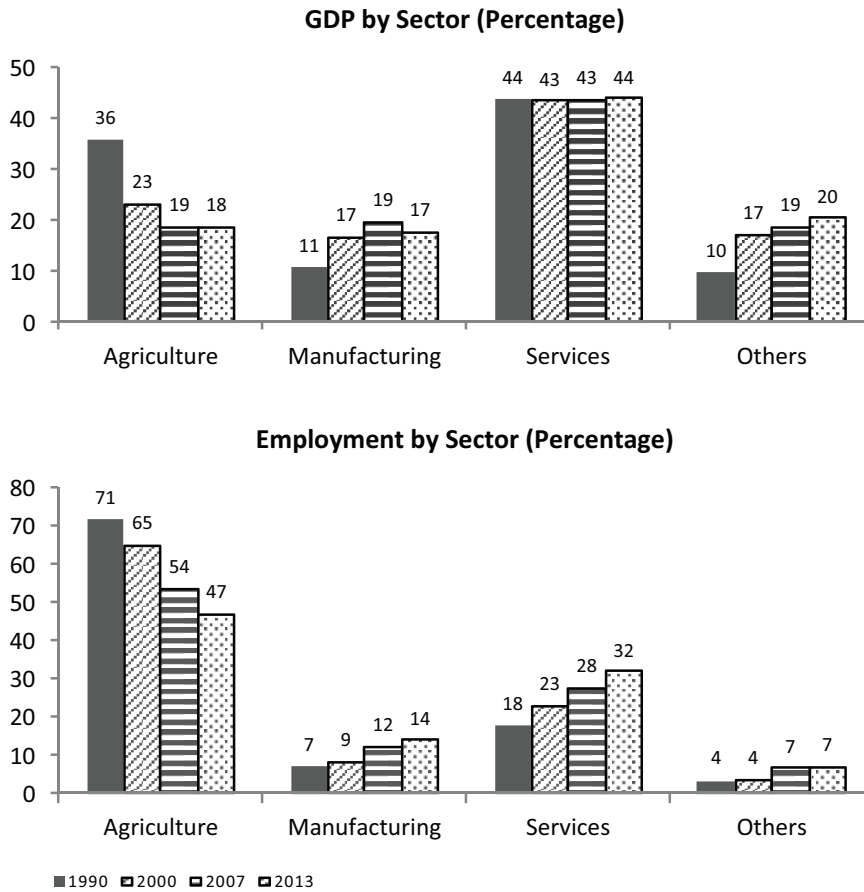
The structure of the economy transformed rapidly in the following decades, with agriculture shrinking substantially and other sectors rising accordingly. Employment in the primary sector declined sharply, accounting for less than half of total employment in 2013, while the labour share of manufacturing and services nearly doubled over the same period (Figure 2) and urban population exceeded 30 per cent of the total (World Bank 2016). The structure in terms of GDP changed accordingly. It is noted, however, that the GDP share of services remained stable despite having pulled in a large amount of labour. The manufacturing sector, in the latest period (2007–13), also exhibited declining GDP share though it absorbed more labour. These indicate that, while structural change continued to occur, labour productivity of these two sector stagnated.

FIGURE 1  
Growth of Vietnam's GDP and Labour Productivity (3-year Moving Average)



SOURCE: Author, data from Asian Productivity Organization (2015).

FIGURE 2  
Share of GDP and Employment by Economic Sector



NOTE: “Others” include Mining, Utilities, and Construction sectors.  
SOURCE: Author, data from Asian Productivity Organization (2015).

### 3.2 Structural Change: A Shift-Share Analysis

3.2.1 Method and Data. The contribution of structural change to Vietnam’s economy-wide labour productivity growth can be quantified using a shift-share analysis technique.<sup>3</sup> To make the analysis more straightforward, this exercise adopts the modified shift-share method, which decomposes labour productivity growth into only two sources: within-sector productivity improvement (*within effect*); and between-sector labour reallocation (*between effect* or *structural change effect*).<sup>4</sup> Using this approach, the aggregate labour productivity growth of an economy with  $n$  sectors over period  $[0, T]$  can be decomposed as:

$$\frac{\Delta P}{P^0} = \frac{P^T - P^0}{P^0} = \sum_{i=1}^n \frac{(P_i^T - P_i^0)\bar{S}_i}{P^0} + \sum_{i=1}^n \frac{(S_i^T - S_i^0)\bar{P}_i}{P^0} \tag{1}$$

where

- $P_i^0$  and  $P_i^T$  are the labour productivity of sector  $i$  in year 0 and  $T$ , respectively; and  $\bar{P}_i$  is the average labour productivity of sector  $i$  over the period  $[0, T]$ . Labour productivity is computed as the value-added divided by the number of employees.<sup>5</sup>
- $S_i^0$  and  $S_i^T$  are the employment share of sector  $i$  in the economy's total employment in year 0 and  $T$ , respectively; and  $\bar{S}_i$  is the average employment share of sector  $i$  over the period  $[0, T]$ .

The two terms on the right-hand side of Equation (1) can be interpreted as the two sources of overall labour productivity growth. Specifically:

- The term  $\sum_{i=1}^n \frac{(P_i^T - P_i^0)\bar{S}_i}{P^0}$  captures the contribution of within-sector productivity improvement, which is driven by capital deepening, technological progress, or reduction of misallocation across plants (McMillan and Rodrik 2011). This term is also referred to as the *within effect*.
- The term  $\sum_{i=1}^n \frac{(S_i^T - S_i^0)\bar{P}_i}{P^0}$  captures the contribution of reallocation of employment among sectors. This term can be referred to as the *between effect* or the *structural change effect*.

Equation (1) can be rewritten to combine the two effects for each sector as follows:

$$\frac{\Delta P}{P^0} = \frac{P^T - P^0}{P^0} = \sum_{i=1}^n \left( \frac{(P_i^T - P_i^0)\bar{S}_i}{P^0} + \frac{(S_i^T - S_i^0)\bar{P}_i}{P^0} \right) = \sum_{i=1}^n C_i \quad (2)$$

where

- $C_i = \frac{(P_i^T - P_i^0)\bar{S}_i}{P^0} + \frac{(S_i^T - S_i^0)\bar{P}_i}{P^0}$  is the total contribution of sector  $i$  to the economy-wide labour productivity growth.

For a certain sector, the magnitude of the within effect depends on the change in labour productivity and the average employment share of the sector; the magnitude of the between effect is proportional to the change in employment share and the average labour productivity level of the sector. That is, the total contribution of a given sector to the aggregate labour productivity growth depends not only on the changes in labour productivity and employment share, but also on the levels of labour productivity and employment share of that sector in the economy.

Data from the Asian Productivity Organization (APO) is used for conducting this analysis. The data set includes nine sectors and spans from 1990 to 2013. The analysis time frame is divided into two sub-periods: 1990–2000 and 2000–13. However, as Vietnam's growth slowed down considerably after 2007, the latter subperiod is further divided into 2000–07 and 2007–13.

**3.2.2 Results and Discussion.** The results of the shift-share analysis are reported in Table 1. In general, Vietnam's growth model followed those of the East Asian economies where structural change played a growth-promoting role. The findings of the analysis are basically consistent with the study of McCaig

TABLE 1  
Structural Change (SC) and Contribution to the Economy-wide Labour Productivity Growth

(A) Economy-wide labour productivity growth and contribution by sector (percentage points)

	1990–2013			1990–2000			2000–13			2000–07			2007–13		
	Total	Within	SC	Total	Within	SC	Total	Within	SC	Total	Within	SC	Total	Within	SC
<i>Economy</i>	4.5%	2.5%	2.0%	4.8%	3.9%	0.9%	4.2%	1.2%	3.1%	4.8%	0.6%	4.3%	3.5%	2.2%	1.4%
Agriculture	0.4%	0.9%	-0.5%	0.1%	0.4%	-0.3%	0.5%	1.0%	-0.5%	0.4%	0.9%	-0.6%	0.6%	1.0%	-0.4%
Manufacturing	0.9%	0.5%	0.4%	1.2%	1.0%	0.2%	0.8%	0.2%	0.6%	1.3%	0.4%	0.9%	0.3%	-0.1%	0.4%
Mining	0.7%	0.9%	-0.2%	0.8%	1.0%	-0.3%	0.6%	0.6%	-0.01%	0.4%	0.1%	0.4%	0.8%	1.3%	-0.5%
Utilities*	0.2%	0.1%	0.1%	0.3%	0.3%	-0.04%	0.2%	-0.01%	0.2%	0.2%	-0.1%	0.3%	0.2%	0.1%	0.1%
Construction	0.3%	0.1%	0.2%	0.4%	0.3%	0.1%	0.2%	-0.1%	0.3%	0.5%	-0.03%	0.5%	0.03%	-0.1%	0.1%
Services**	2.0%	-0.03%	2.0%	2.0%	0.9%	1.2%	1.9%	-0.6%	2.5%	2.1%	-0.7%	2.8%	1.6%	-0.1%	1.7%
Trade, hotels and restaurants	0.8%	0.3%	0.5%	0.7%	0.1%	0.6%	0.9%	0.5%	0.4%	0.9%	0.7%	0.3%	0.8%	0.2%	0.6%
Transport, storage and communications	0.2%	0.2%	0.01%	0.2%	0.2%	0.1%	0.2%	0.2%	-0.03%	0.3%	0.3%	-0.1%	0.1%	0.04%	0.02%
Finance, real estate and business services	0.5%	-0.8%	1.2%	0.6%	0.2%	0.4%	0.4%	-1.4%	1.8%	0.5%	-1.6%	2.1%	0.3%	-0.7%	1.0%
Community, social and personal services	0.5%	0.3%	0.2%	0.6%	0.4%	0.1%	0.4%	0.1%	0.3%	0.4%	-0.1%	0.5%	0.5%	0.4%	0.1%



(B) Economy-wide labour productivity growth = 100 per cent

	1990–2013			1990–2000			2000–13			2000–07			2007–13		
	Total	Within	SC	Total	Within	SC	Total	Within	SC	Total	Within	SC	Total	Within	SC
<i>Economy</i>	100%	56.1%	43.9%	100%	82.0%	18.0%	100%	27.5%	72.5%	100%	11.5%	88.5%	100%	61.2%	38.8%
Agriculture	8.6%	19.6%	-11.0%	2.1%	8.1%	-6.0%	12.0%	24.6%	-12.6%	7.7%	19.4%	-11.7%	17.2%	29.1%	-11.9%
Manufacturing	21.2%	12.0%	9.3%	26.0%	21.1%	4.9%	18.8%	3.8%	15.0%	26.4%	7.4%	19.0%	9.5%	-1.5%	11.0%
Mining	15.2%	19.3%	-4.1%	16.0%	22.0%	-6.0%	14.8%	14.9%	-0.1%	8.7%	1.2%	7.4%	22.2%	36.9%	-14.7%
Utilities*	4.7%	3.2%	1.5%	5.8%	6.6%	-0.8%	4.1%	-0.4%	4.5%	3.8%	-1.8%	5.6%	4.5%	2.0%	2.5%
Construction	6.3%	2.6%	3.8%	7.5%	6.2%	1.2%	5.8%	-1.2%	7.0%	9.8%	-0.7%	10.5%	0.9%	-2.3%	3.2%
Services**	43.9%	-0.6%	44.4%	42.5%	17.9%	24.6%	44.5%	-14.2%	58.8%	43.6%	-14.0%	57.6%	45.7%	-2.9%	48.6%
Trade, hotels and restaurants	18.7%	7.1%	11.6%	14.3%	2.0%	12.3%	21.0%	10.9%	10.0%	19.2%	13.5%	5.7%	23.1%	6.0%	17.0%
Transport, storage and communications	4.1%	3.8%	0.3%	4.5%	3.3%	1.2%	3.9%	4.6%	-0.7%	5.6%	7.1%	-1.5%	1.7%	1.2%	0.5%
Finance, real estate and business services	10.2%	-17.3%	27.5%	12.1%	3.6%	8.6%	9.2%	-32.8%	42.0%	10.4%	-32.9%	43.3%	7.7%	-20.7%	28.3%
Community, social and personal services	10.9%	5.8%	5.1%	11.6%	9.1%	2.6%	10.6%	3.1%	7.5%	8.4%	-1.7%	10.1%	13.2%	10.4%	2.8%

NOTE: \*Utilities comprise electricity, gas and water supply; \*\*Services is aggregated from four industries: Wholesale and retail trade, hotels and restaurants; Transport, storage and communications; Financial intermediation, real estate, renting and business activities; and Community, social and personal services.

SOURCE: Author; calculation from data of Asian Productivity Organization (2015).

and Pavcnik (2013) for the period 1990–2008. Structural change played a modest role in driving aggregate labour productivity from 1990 to 2000, while within-sector productivity improvements were significant for most sectors. Structural change became a dominant driver during 2000–07, in contrast to the declining within effect associated with the drop in labour productivity growth of many sectors, including manufacturing. In the latest period (2007–13), structural change effect was diminishing — but still remarkable — amid the considerable improvement of within-sector productivity of many sectors such as agriculture, unlike the further deterioration of manufacturing's labour productivity.

Over the 1990–2013 period, on average, the economy-wide labour productivity rose at a rate of 4.5 per cent per annum, of which 2 percentage points (44 per cent contribution share) was due to the reallocation of labour from lower to higher productivity sectors. The structural change effect was positive for all sectors, except for mining.<sup>6</sup> That is, there was a clear trend of employment expansion in higher productivity sectors. It is also noted that all sectors experienced positive within-sector productivity improvement, with the exception of finance, real estate, renting and business services. This sector, in fact, incurred productivity deterioration of –4 per cent per year on average over this period.

Coming to the contribution by sector, the service industries claimed the lion's share in driving structural change, followed by manufacturing. This was mainly because the service industries absorbed the bulk of the released labour from agriculture (with 14.3 percentage points of employment share expansion, of which trade, hotels and restaurants, and community, social and personal services claimed the majority, with 8.8 and 4.2 percentage points, respectively). Meanwhile, manufacturing expanded, with 6.7 percentage points over the same period. The total sectoral contribution, i.e., the sum of structural change effect and within effect, to economy-wide productivity growth was largest for service industries (44 per cent) and manufacturing (21 per cent), followed by mining (15 per cent), agriculture (9 per cent), construction (6 per cent), and utilities (5 per cent). It is worth noting, however, that the contribution of service industries to productivity improvement was solely driven by structural change effect, i.e., absorbing more labour, while the combined within effect was even slightly negative during 1990–2013. More specifically, the finance, real estate, renting and business services seemed to attract a considerable amount of labour into low-productivity activities, while the within-sector productivity deteriorated substantially. This deterioration, however, was offset by the improved within-sector productivity of other service industries. The mining sector, by contrast, seemed to experience restructuring as its employment share contracted amid the improved within-sector productivity.

The pattern of structural change, however, was quite contrasting over the two subperiods, 1990–2000 and 2000–13. Structural change was modest in 1990–2000 but still sizeable, with a contribution of nearly 20 per cent to the overall productivity growth of 4.8 per cent. It is noted that structural change effect was quite weak for manufacturing and negative for mining and utilities, which was a result of modest employment share expansion in manufacturing (1.3 percentage points) and employment share contraction in mining and utilities. However, due to strong productivity growth of manufacturing (7.4 per cent), mining (15.5 per cent), utilities (14.9 per cent), and construction (6.9 per cent),<sup>7</sup> their within effect was significant, far outweighing the negative between effect in case of mining and utilities. Consequently, their total sectoral contribution to overall productivity improvement was remarkable, with 26 per cent for manufacturing, 16 per cent for mining, 7 per cent for construction, 6 per cent for utilities, and 2 per cent for agriculture. For services, all exhibited significant within effect and structural change effect, adding up to 43 per cent of overall productivity growth.

The period 2000–13, on the other hand, witnessed a very strong effect of labour reallocation, accounting for nearly three-quarters of the aggregate labour productivity growth — a result of the contraction of nearly 18 percentage points of agriculture employment share. All other sectors experienced rapid employment share expansion, except for mining, transport, storage and communications with marginal shrinkage.

Consequently, structural change made up 3.1 percentage points of the overall labour productivity enhancement of 4.2 per cent. By contrast, due to weak or negative productivity growth of manufacturing (0.9 per cent), utilities (−0.4 per cent), construction (−1 per cent), and finance, real estate, renting and business services (−8 per cent), the contribution of within-sector effect was modest at 1.2 percentage points (less than 30 per cent contribution share). This within-sector effect was driven mainly by agriculture (1 percentage point), mining (0.6 percentage points) and trade, hotels and restaurants (0.5 percentage points), while improvements were very weak or negative in manufacturing and other sectors. Regarding the sectoral contribution to overall productivity growth, services still played the most important role with a 45 per cent contribution share, followed by manufacturing (19 per cent), mining (15 per cent), agriculture (12 per cent), construction (6 per cent), and utilities (4 per cent). The above findings illustrate that, while the overall picture of the economy-wide labour productivity improvement over 2000–13 looked impressive, many of its sectors faced challenges in enhancing their within-sector productivity (which is related to capital deepening, technological change or resource allocation).

A closer look at the 2000–13 subperiod reveals interesting insights into the dynamics of structural transformation. Overall, labour productivity growth during 2000–07 remained high at 4.8 per cent as in the previous decade, but declined significantly — to only 3.5 per cent — in 2007–13. Structural change was observed to be strongest ever in 2000–07, contributing 4.3 percentage points (nearly 90 per cent contribution share) to the economy-wide productivity growth, in contrast to the weak performance of within-sector improvement of only 0.6 percentage points. But this pattern almost reversed in 2007–13 when the structural change contribution dropped to only 1.4 percentage points (nearly 40 per cent contribution share) while the within-sector improvement was up to 2.2 percentage points. This implies that the labour reallocation from agriculture to other sectors has slowed down in recent years.

One of the most prominent observations over the 2000–13 period is the diminished role of the manufacturing sector in driving productivity growth. Its total contribution to aggregate labour productivity improvement at 1.3 percentage points during 2000–07 was comparable to that in 1990–2000, but decreased steeply to only 0.3 percentage points in 2007–13. This deterioration was driven by the decline in both the within and between effects. The contribution of structural change effect decreased from 0.9 percentage points in 2000–07 to 0.4 percentage points in 2007–13, which was comparable to that in 1990–2000. However, the sharp decline in labour productivity growth of manufacturing, from 7.4 per cent in 1990–2000 to 2 per cent in 2000–07 to −0.3 per cent in 2007–13, led to the decreasing within effect from 1 to 0.4 to −0.1 percentage points, respectively. A similar trend was also observed for utilities and construction, where their within and between effects both diminished, except for the within effect of utilities with slight improvement. The mining sector, by contrast, seemed to undergo significant restructuring with the structural change effect reducing from 0.4 in 2000–07 to −0.5 percentage points during 2007–13, while its within effect increased from 0.1 to 1.3 percentage points, associated with the hike in its labour productivity growth of 12.5 per cent in 2007–13.

The between effect was observed to diminish considerably for finance, real estate, and business services, and community, social and personal services, resulting in the declining structural change effect of service industries from 2000–07 to 2007–13. Unlike the positive role in 1990–2000, the services had a negative contribution to within-sector productivity improvement in 2000–13, though their combined within effect enhanced from more negative to less negative over the period.

Another notable point is that, with the highest employment share, the agriculture sector consistently played an important role in driving within-sector productivity improvement, with increasing contribution from 0.4 percentage point in 1990–2000 to 1 percentage point throughout 2000–13. In addition, agriculture was also the largest contributor to within-sector productivity improvement during 2000–13, thanks to its high labour productivity growth of 5 per cent over the period.

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### 3.3 Export Composition, Technological Upgrading, and Global Value Chains

Another channel to examine structural transformation is to look at the change in the country's export composition and its participation in global value chains (GVCs). Vietnam's economy has been quite successful in diversifying its export basket, evolving towards the production of more manufacturing goods during the past two decades. The share of manufacturing goods in total merchandise exports increased substantially by 14 percentage points, from 65 per cent in 1995 to 72 per cent in 2007, and to 79 per cent in 2014, with the share of mining products shrinking accordingly (Table 2, Panel A). Consequently, the share of manufactures in domestic value-added of exports increased considerably by 10 percentage points, from 58 per cent in 1995 to 68 per cent in 2014 (Table 2, Panel B). During this time, while the role of mining was diminishing, agriculture improved its importance in terms of both value and domestic value-added of the country's exports.

Interestingly, structural change also occurred with a positive trend within the manufacturing sector. In terms of value of exports, the share of medium- and high-tech products increased significantly, especially after 2000. In particular, the medium-tech industries expanded their share by almost 20 percentage points — from less than 10 per cent in 2000 to nearly 30 per cent in 2014. The recent period 2007–14 witnessed the rise of the high-tech industries, with the share in export value gaining 6 percentage points, from 6 per cent in 2007 to 12 per cent in 2014, thanks to the booming electronics industry with giant FDI investors like Samsung.<sup>8</sup> In contrast, the share of low-tech manufactures contracted by 9 percentage points, from 46 per cent in 2000 to 37 per cent in 2014 (Table 2, Panel A).

With respect to domestic value-added of exports, as most of Vietnam's manufactures are still assembly-based, one may anticipate that the country could only reap limited value-added from its rising manufacture exports. As illustrated in Figure 3, unlike the hike in manufacture exports discussed above, the share of domestic value-added in exports tended to decline. This share was only 25 per cent for high-tech, 35 per cent for medium-high-tech, and 45 per cent for medium-low-tech products in 2014. As a result, the

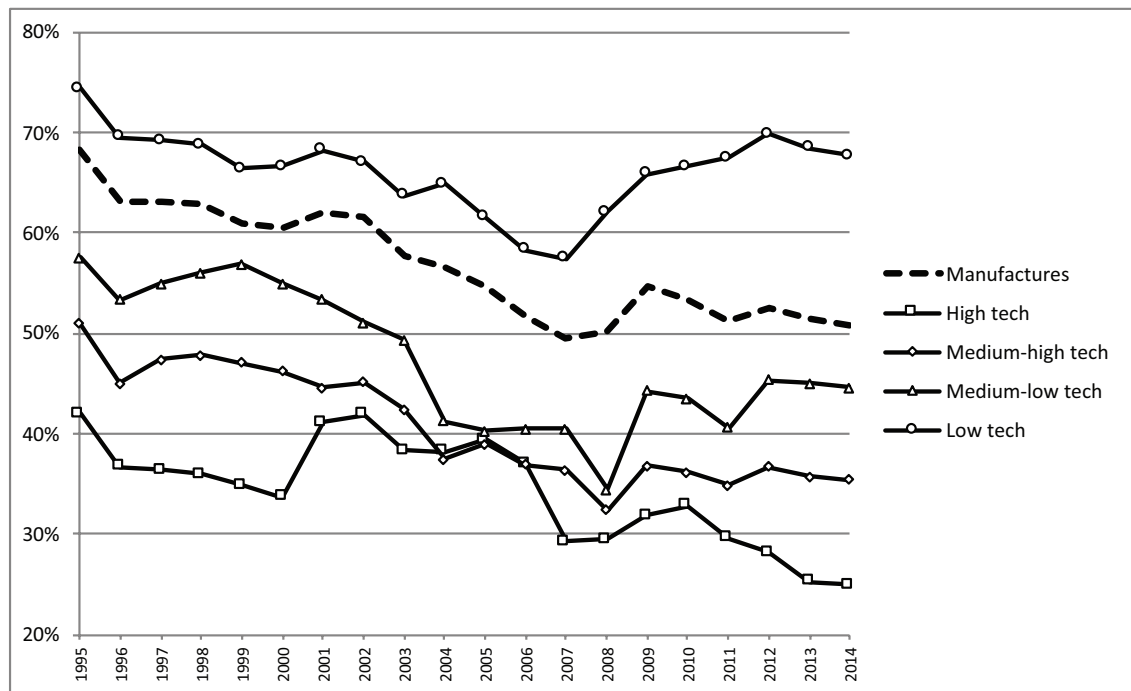
TABLE 2  
Vietnam's Merchandise Export Structure, 1995–2014

	<i>Panel A</i>				<i>Panel B</i>			
	<i>Share in Value of Exports</i>				<i>Share in Domestic Value-added of Exports</i>			
	1995	2000	2007	2014	1995	2000	2007	2014
<i>Total merchandise</i>	100%	100%	100%	100%	100%	100%	100%	100%
Agriculture	8.8%	9.4%	12.6%	11.1%	10.7%	11.7%	17.8%	16.2%
Mining	26.1%	28.1%	15.6%	10.4%	30.9%	34.8%	22.7%	15.7%
<i>Manufactures</i>	65.1%	62.5%	71.7%	78.6%	58.3%	53.5%	59.5%	68.1%
High tech	6.4%	6.9%	6.2%	12.3%	3.5%	3.3%	3.1%	5.3%
Medium-high tech	4.9%	5.1%	11.2%	14.0%	3.3%	3.4%	6.8%	8.5%
Medium-low tech	4.8%	4.3%	9.0%	15.5%	3.6%	3.3%	6.1%	11.8%
Low tech	49.1%	46.2%	45.2%	36.8%	47.9%	43.6%	43.5%	42.6%

NOTE: The categorization of manufacturing goods according to technology level follows the definition of OECD (2011).

SOURCE: Author, calculated from data of OECD (2016).

FIGURE 3  
Share of Domestic Value-added in Manufacture Exports, 1995–2014

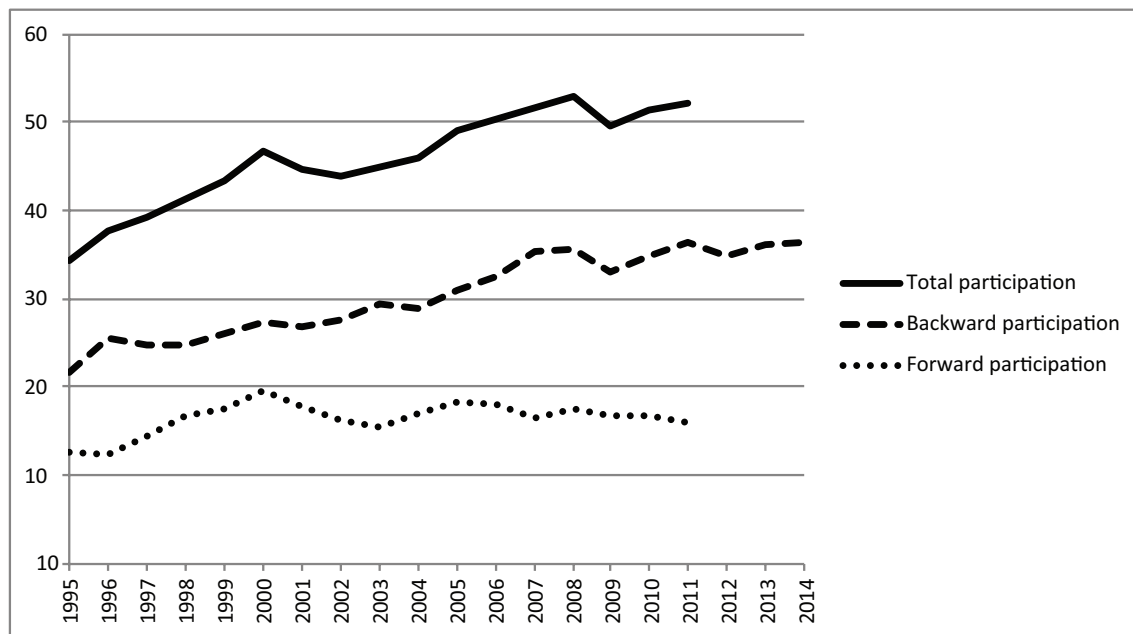


SOURCE: Author, data calculated from OECD (2016).

change in the structure of domestic value-added of manufacture exports was less impressive than that of value of exports. For example, the high-tech manufactures increased their share in domestic value-added of exports by 2 percentage points over 2007–14, compared to 6 percentage points of share expansion in terms of export value (Table 2, Panel B).

The discussion above also implies that the Vietnamese economy has strongly participated in GVCs. The degree of GVC participation can be assessed by the total GVC participation index. It is the sum of the backward GVC participation index — the share of foreign value-added content in exports, and the forward GVC participation index — the share of domestic value-added sent to third economies, serving as inputs for further processing and export through the value chain (OECD 2017). Figure 4 shows that the total GVC participation index of the whole economy has risen significantly between 1995 and 2011. With a score of 52 in 2011, Vietnam outweighed the average levels of developing countries (49) and developed economies (48). Vietnam also outperformed in terms of increasing the score by 21 points over 1995–2011, compared to 13 points of developing countries and 8 points of developed economies (WTO 2017). As indicated in Figure 4, the rise of the total participation index was primarily driven by the backward participation index, with an increase of almost 15 points over 1995–2014. The backward participation trend was prominent within manufacturing, especially the high-tech and medium-high-tech industries. As implied in Figure 3, in recent years, about three-quarters of the value of high-tech manufacture exports represents the inputs imported from foreign partners.

FIGURE 4  
GVC Participation Index of Vietnam's Economy



NOTE: Data on “forward GVC participation index” for 2012–14 is unavailable.

SOURCE: Author, data from OECD (2016).

### 3.4 Structural Change and Industrialization

One expected outcome of structural change is the industrialization of the economy with manufacturing at its core. Many studies have indicated that manufacturing plays a critical role in driving economic development by absorbing large amounts of labour, fostering technological innovation, promoting high-productivity services, and modernizing agriculture.<sup>9</sup> A recent study conducted by the Asian Development Bank (2013) revealed that no economy has reached high-income level without its manufacturing sector accounting for at least 18 per cent share of total employment. The study also indicated that an economy has a 42 per cent probability of achieving high-income status if its manufacturing claims at least 18 per cent share of output and employment; but this probability is just less than 5 per cent for an economy with a small manufacturing sector (in terms of both output and employment). Therefore, for a populous country like Vietnam, fostering industrialization is important not only for boosting the economy-wide productivity in the short run, but also for laying a foundation for modernizing other sectors of the economy in the long run.<sup>10</sup>

According to ADB (2013), an economy achieves industrialized status if its manufacturing shares in output and employment represent at least 18 per cent for any seven-year moving average.<sup>11</sup> With this criterion, ADB posited that Vietnam has been industrialized in terms of output but not employment. A re-examination with more updated data from the APO suggests the same conclusion (Figure 5). It is noted, however, that Vietnam's manufacturing share in output just marginally exceeded the threshold of 18 per cent and indicated declining trend in recent years. Moreover, this share is far below those of

East Asian peers at a comparable level of GDP per capita (Figure 5A). This value is only 18 per cent for Vietnam (2013), compared to 34 per cent of China (1999), 24 per cent of Indonesia (1992), 25 per cent of the Philippines (2002), and 22 per cent of Thailand (1985).<sup>12</sup> With regard to the manufacturing share in employment, this measure has increased significantly in the country from 7 per cent in the early 1990s to 10 per cent in the early 2000s, to 14 per cent in 2013 (Figure 5B). The employment share level of 2013 is comparable to those of Korea and China and higher than those of others at a comparable income level. It will be interesting to see whether Vietnam would industrialize in terms of employment in the years to come.

The above discussion on industrialization based on the criterion of ADB (2013) is indeed a retrospective perspective, and thus caution is always necessary when extrapolating into the future. Many recent studies have indicated that it is very difficult for developing countries today to break into the global manufacturing market in a big way as some successfully industrialized countries have done in the past (e.g., Felipe, Mehta and Rhee 2014; Rodrik 2016). In particular, it would be hard for the current developing Asian economies to replicate the industrialization path of OECD countries<sup>13</sup> or Asian Tigers (Hong Kong, Korea, Singapore and Taiwan), given the changing nature of the world economy with (a giant) China deeply participating in the GVCs. Therefore, it is unlikely that Vietnam's manufacturing sector will expand aggressively, especially in terms of employment share, in the coming years.

#### 4. Factors Fostering Structural Change in Vietnam

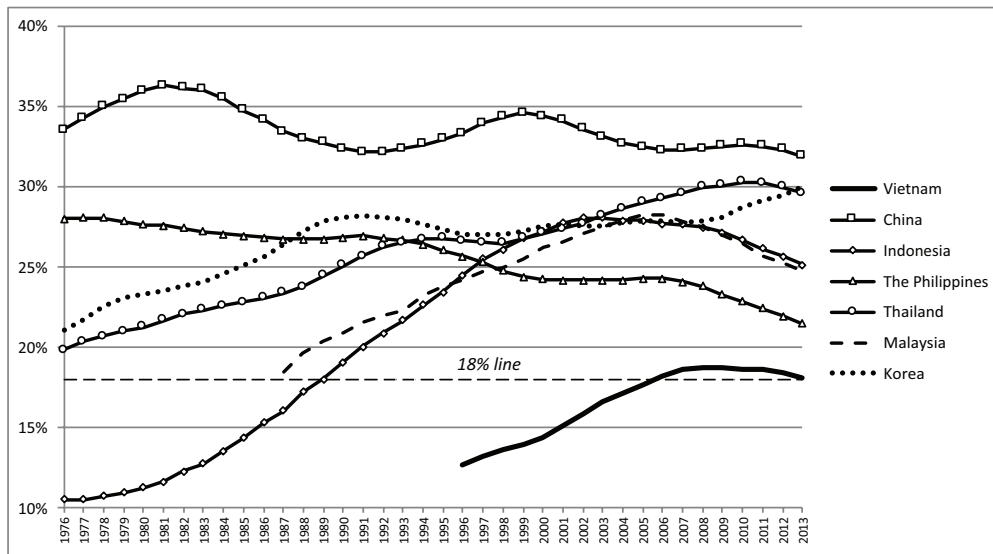
This section looks at the factors that have helped foster structural transformation of the Vietnamese economy. From an institutional perspective, structural change takes place when the economy works more efficiently (Sen 2016). The necessary conditions for this to occur can be systematically classified into two broad categories. The first relates to government failures that impede the functioning of labour, land, and product markets. The second involves market failures such as coordination problems in investment and technological acquisition, provision of credit, and human capital promotion.<sup>14</sup> Vietnam, with its abundant labour and limited natural resources, chose to advance by industrializing and diversifying the economy. The reforms on fundamental issues in the late 1980s and early 1990s had substantial impact on fostering structural transformation and economic growth.

The first was the reform in agriculture, under which the 1993 Land Law and agricultural market liberalization were achieved. The law strengthened the households' property rights on their land (including the rights to exchange, transfer, lease and inherit), creating greater incentive for the owners to use land more efficiently (Glewwe 2004). The liberalization of the agricultural market stimulated rice production, turning Vietnam from an importer of rice during the 1980s to an exporter in the mid-1990s (Minot and Goletti 2000). Similarly, the improvement in agriculture productivity freed up labour from agriculture to relocate to more productive activities (McCaig and Pavcnik 2013; Sen 2016).

The second fundamental reform was the formulation of a regulatory framework for firms to operate in Vietnam. The first initiative was the Foreign Investment Law in 1987 that allowed foreigners to invest in all sectors of the economy, save defence. This was followed by the introduction of the Private Business Law in 1990 to legalize the development of the private sector (Vu 2009). Between 1994 and 1998, the government also proceeded to restructure the state-owned enterprises (SOEs) — including gradual privatization. In fact, the state also established a legal framework, the first SOE Law in 1995, for SOEs to operate in a market economy (Vu 2009). In an effort to level the playing field for all actors in the economy and speed up privatization, the government introduced the unified Enterprise Law in 1999. Likewise, in the 2000s, other regulations were enacted, including the revised Enterprise Law and the Investment Law in 2005. The government also carried out financial reforms via: the introduction of the Law on State Bank, the Law on Credit Institutions, as well as the Law on Value-added Tax in 1997; and the establishment of the stock markets in 2000 (Vu 2009).

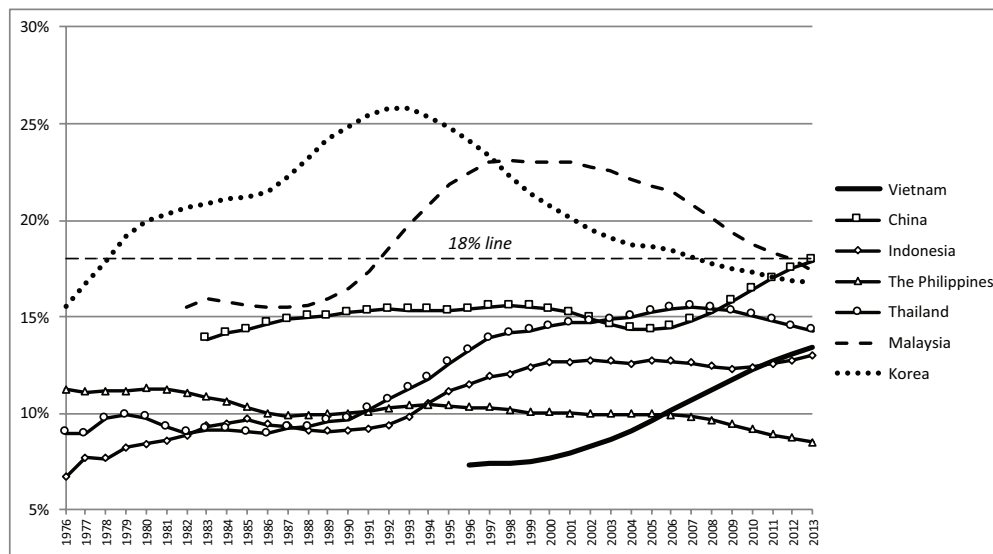
FIGURE 5  
Manufacturing Shares in Output and Employment (7-year Moving Average)

(A) Output Share



NOTE: All of these economies have been industrialized in terms of output.

(B) Employment Share



NOTE: Only Korea and Malaysia have been industrialized in terms of employment.

SOURCE: Author, data from Asian Productivity Organization (2015).



Openness was a key factor of this transformation process. Besides the effort to attract FDI, Vietnam proactively integrated into the world economy — with the ASEAN membership in 1995, the BTA with the United States in 2000, and access to the World Trade Organization in 2007. McCaig and Pavcnik (2014) showed that the decline in export costs resulting from the U.S.–Vietnam BTA brought new export opportunities for Vietnamese enterprises. This, in turn, induced the reallocation of labour from household businesses with relatively low labour productivity to the formal enterprise sector with higher productivity. Simultaneously, trade regulation was also reformed, by simplifying trade licensing procedures, removing or reducing export duties for certain items, eliminating import permits for several products, and allowing private enterprises to engage directly in international trade (Srinivasan et al. 1996). With these policy deliberations, Vietnam’s trade volume rose steeply from about 80 per cent of GDP in 1990 to 170 per cent in 2014 (World Bank 2016). FDI stock also increased rapidly, from about 4 per cent of GDP in 1990 to 48 per cent in 2013 (UNCTAD 2015).

The labour policy of Vietnam can be evaluated by the rigidity of employment index of the World Bank’s *Doing Business*, the average of: the difficulty in hiring index; the difficulty in firing index; and the rigidity of hours index. On average over 2006–10, Vietnam scored 32 out of 100 in the rigidity of employment index (higher value means more rigid regulation) and ranked 97 out of 150 countries in the world.<sup>15</sup> This rank was almost on par with the overall rank of “the ease of doing business” (at 96) in this period. Moreover, the rigidity of employment regulation seemed to lessen over time, with the index decreasing from 51 in 2006 to 21 in 2010. This was driven by the enhancement in all three components: from 44 to 11 for the difficulty in hiring index; from 70 to 40 for the difficulty in firing index; and from 40 to 13 for the rigidity of hours index. All of these indicate that the labour market in Vietnam was quite conducive (or at least not an obstacle) for doing business, and thus made positive contribution to structural change. Regarding financing businesses, Vietnam’s rank in terms of getting credit in the World Bank’s *Doing Business* over the past decade was 38, compared to 90 of the overall rank of the ease of doing business. Moreover, this rank improved significantly, from 83 in 2007 to 32 in 2017.<sup>16</sup>

With a large and young population, Vietnam has the advantage of human capital, but its quality remains a concern. At a comparable income level, the country’s human capital level — proxied by mean years of schooling of adults — was found to be higher than those of India and Indonesia, but lower than those of China and the Philippines (UNDP 2014). It is noted, however, that Vietnam’s higher education quality has lagged behind and not met the market demand. The country has been consistently ranked low by the World Economic Forum in its *Global Competitiveness Reports* (GCRs); e.g., Vietnam was ranked 89th for quality of higher education and, in particular, 120th for quality of management and business education in the *GCR 2017–2018* (WEF 2017). The lack of an educated workforce was perceived by the business executives as the second most problematic factor for doing business in the country (WEF 2017). Moreover, Vietnam’s capabilities in science, technology and innovation have been weak, with a nascent, fragmented national innovation system. Research and development have not been given appropriate priority in both the business and public sectors (OECD and World Bank 2014). While these two problems might not have been of great concern over the past two decades (as the economy mainly engaged with low-productivity activities), they could prove to be detrimental to Vietnam’s growth in the coming years.

## 5. Conclusion and Policy Implications

This article examines the patterns and determinants of structural change in the process of economic growth using the example of Vietnam. Empirical evidence from extant literature suggests that developing countries are likely to gain from structural transformation of enhancing aggregate labour productivity by reallocating labour from agriculture to higher productivity sectors. A number of East Asian countries have experienced significant structural transformation with a healthy expansion of manufacturing that has

positively impacted the economy. Policies fostering structural transformation range from opening up the economy to attract FDI and promote export and technology acquisition, to effectively regulating labour, land and product markets. The government should also be proactive in correcting market failures such as coordination problems, provision of credit, and human capital promotion.

Vietnam, like other East Asian economies, has gained substantially from its growth-promoting structural change throughout its development journey since the economic reforms in the early 1990s. Nearly a half of overall productivity growth of Vietnam in 1990–2013 was attributed to structural transformation. This effect was modest in 1990–2000, dominant in 2000–07, and declining (but still significant) in 2007–13. This transformation process was driven by fundamental reforms in a wide range of areas to create a conducive environment for business activities, and by opening up the economy to attract FDI and foster exports. The process was also associated with the rapid expansion of the manufacturing and service sectors, the change in export composition towards higher share of manufactures (especially medium- and high-tech products), and the integration into GVCs. Despite achieving remarkable industrialization so far, it is unlikely that Vietnam's manufacturing sector will expand as much as the experience of successfully industrialized countries in the past. The country is also bound to face formidable challenges in the coming years, with the expected slowdown of structural transformation,<sup>17</sup> and the sluggish within-sector productivity improvement in manufacturing and services amid the weaknesses in human capital and technological capabilities. As Rodrik (2013) points out, the overall labour productivity growth can be enhanced through two channels: investment in the fundamentals like human resources and technologies (necessary for within-sector productivity improvement); and structural transformation. While it is crucial to maintain the conditions that help further foster structural transformation, to ensure sustained development in the long run, policy makers in Vietnam should pay more serious attention to upgrading human capital and improving technological capabilities.

## NOTES

1. It is noted that Vietnam is not included in this study.
2. The figures for regions are aggregated using unweighted averages.
3. This technique has been widely used for structural change analysis. See, for example, McMillan and Rodrik (2011), McMillan, Rodrik and Verduzco-Gallo (2014), and Vu (2017).
4. This approach was adopted by several studies. See, for example, Timmer and de Vries (2009) and Vu (2017).
5. The value-added and labour productivity are measured in constant prices. In conducting shift-share analysis, it is implicitly assumed that the value-added generated by each sector has the same price deflator as the economy's GDP deflator (Vu 2017).
6. In this analysis, the structural change effect of the agriculture sector is expected to be negative because agriculture in a developing economy tends to have lowest labour productivity, and labour is expected to shift from agriculture to other sectors that have higher productivity.
7. The sectoral labour productivity growth is calculated from the same data set.
8. It is noted, however, that most of these high-tech manufacturers are FDI companies with limited linkages with the less capable local suppliers.
9. See, for example, Fagerberg (2000), Peneder (2003), and Szirmai (2012).
10. In fact, while initiating economic reforms in the early 1990s, the government set the goal for Vietnam to become an industrialized country by 2020, with a focus on fostering industrialization.
11. The seven-year moving average is used to ensure that industrialization is sustained for a significant number of years and not just achieved for a very short period (ADB 2013).
12. The comparison is based on the level of GDP per capita of Vietnam at US\$1,929 in 2013.
13. The OECD countries' manufacturing output and employment shares peaked at about 26 per cent on average during the 1970s, in some cases reaching 30 per cent and above, before deindustrializing to about half of that (ADB 2013).
14. See Sen (2016) for a survey of literature about the determinants of structural change.

15. The data has been gathered from the World Bank's *Doing Business 2006–2010*, in which the indicators on rigidity of employment are available.
16. The data is gathered from the World Bank's *Doing Business 2007–2017*.
17. The decline of labour supply due to Vietnam's demographic conditions partly affects the pace of this transformation (McKinsey Global Institute 2012).

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