ERIA Discussion Paper Series

No. 298

Global Value Chains and Formal Employment in Viet Nam

Trinh Q. LONG
Ton Duc Thang University and ADBI
Matthias HELBLE
Asian Development Bank
Le T. TRANG
Banking Academy of Viet Nam

September 2019

Abstract: *This study investigates the impacts of integration into global value chains (GVCs) on formal and informal employment in Viet Nam. Utilising the Viet Nam Household Living Standard Surveys and the Organisation for Economic Co-operation and Development's Trade in Value Added database (in 2010, 2012, and 2014), we examine how GVCs' engagement affects the share of formal employment (through a fixed effects estimator) and the likelihood of being a formal employee (through a probit estimator). Our estimation results show a positive relationship between the level of GVC engagement and the share of formal employment at the provincial level. While the GVC participation index (measured as the sum of backward and forward participation indices) does not have a statistically significant effect on the share of formal employment at the provincial level, each component of GVC participation (i.e. backward and forward participation) has effects at the provincial level in different directions. At the individual level, we find that provincial GVC engagement is also positively correlated with individuals' likelihood of being formally employed. However, the probability of being a formal employee (individual) is not directly affected by GVC engagement at the provincial level, but is indirectly affected through the local labour market. Such results indicate that individual and household characteristics are robust determinants of being employed as a formal employee.*

***Keywords*:** Global value chains, GVC position, backward participation, forward participation, informal employment, Viet Nam

***JEL Classification*:** F16; F66; J21; J46

1. Introduction

While it is commonly recognised that international trade is one of the key drivers of economic growth, the impact of international trade on employment in general and on employment composition in particular is still controversial. The increasing fragmentation of the production process makes the relationship between international trade and employment more complicated, since the labour content in a country's international trade consists of not only two traditional components (the domestic labour contained in a country's exports and the foreign labour contained in a country imports) but also three additional components (the foreign labour contained in exports, the domestic labour in imports, and the third-country labour associated with a country's imports) (Jiang and Milberg, 2013).

Despite such complexity, a number of studies have tried to measure the effects of global value chains (GVCs) on employment (Jiang and Milberg, 2013; Gasiorek, Azubuike, and Mendez-Parra, 2015; and ILO, 2015). Empirical evidence shows that, in general, participation in GVCs has a positive impact on employment in developing countries since it facilitates either structural transformation or generates new linkages in and around the value chain. Using the Organisation for Economic and Co-operation and Development (OECD)'s World Input–Output Tables for 40 countries (33 developed countries and seven emerging economies), the International Labour Organization (ILO, 2015) estimated that 453 million people were employed in GVCs in 2013, a significant increase from 296 million in 1995. Of these, 73% of new jobs in the GVCs were created in emerging economies.

While there is a consensus that GVCs have a positive effect on employment, it is still not clear if increasing participation in GVCs helps to reduce the share of disadvantaged employees such as informal employees in the labour force. Theoretically, increasing engagement in international trade and participation in GVCs may help to reduce employment informality (Sinha, 2014). In reality, however, the share of informal employment has been persistent in many developing countries in recent decades. For example, in Bangladesh, 85% of all workers are employed informally, as the export growth of this country has increased significantly in recent years (Artuc et al., 2019). Similarly, during 1999–2011, most new jobs created in India were informal jobs (Artuc et al., 2019). This phenomenon is usually explained by the argument that firms in the formal sector, in responding to increased foreign competition, have tried to reduce their labour costs by cutting worker benefits, replacing permanent workers with part-time labour, or subcontracting with firms in the informal sector. Another argument is that rigid labour laws prohibit a smooth adjustment to changes in the demand for labour resulting from

trade opening. Instead of increasing the number of formal workers, firms prefer to hire additional workers on informal contracts. However, such evidence on the relationship between GVC participation and employment and between GVC participation and employment composition is mostly from case studies rather than rigorous empirical analysis. Furthermore, the effects of trade liberalisation and participation in GVCs on labour market outcomes has been shown to be highly country-specific (Sankaran, Abraham, and Joseph, 2010). This suggests the necessity for additional studies on this issue at the national level. This paper, in acknowledging this direction, studies the case of Viet Nam.

This study attempts to quantitatively investigate the impacts of integration into GVCs on labour reallocation between formal and informal jobs in Viet Nam at the provincial level. Utilising the Viet Nam household data from 2010 to 2014, the OECD World Input–Output Tables, and trade data for the same period, our research aims to answer the question: does the integration into GVCs increase informal labour in Viet Nam?

This study contributes to the literature in several aspects. First, while a growing number of studies examines the role of international trade on informality, few look directly at the effect of participating in the GVCs on the informality of an emerging economy. Some studies have investigated the effects of foreign direct investment (FDI) on informality in the host countries (e.g. Cuevas et al., 2009; Bacchetta, Ernst, and Bustamante, 2009). However, FDI inflows do not fully reflect how a country participates in GVCs since many FDI projects are only undertaken to serve the local market (Bacchetta, Ernst, and Bustamante, 2009). Furthermore, FDI inflows do not say much about the position of a country/sector (i.e. whether a country/sector is in an upstream or downstream position) in the GVCs. Actually, literature has shown that the position of a country or a sector in the GVCs will affect the implications of GVC participation for the labour market. To our knowledge, our study is amongst the very few that quantitatively investigate how the GVCs engagement influences informality in the subnational labour market in a developing country.

Second, in addition to the subnational level analysis, we examine the effects of the GVC participation and position in the GVCs at the individual level. Taking into account the individual characteristics in the analysis provides more accurate information regarding the role of GVC participation and GVC position in informality in the labour market. The specific analysis at the individual level (for Viet Nam), together with its relationship with the provincial level, brings out the useful and unique contribution of this study.

Third, this study contributes to a growing literature on the effects of international trade and participation in global production networks at the household level in Viet Nam. Bui et al.

(2016) investigated the effects of FDI on household income and income inequality in Viet Nam and found a weak linkage (if any) between FDI and household income and income inequality in Viet Nam. Hoang and Tiberti (2016) studied the effect of liberalisation of agricultural input on rural household welfare and found a positive relationship. Helble, Le, and Long (2018) investigated the impact of import competition from China on household income and income inequality and found that increased import competition has lowered inequality. The present study is different from the above studies – instead of using indirect measures of GVC participation (such as FDI inflows or imported intermediate goods), we use direct indicators of GVC participation as well as the position in the GVCs to examine the effects on household welfare.

This paper is structured as follows. Section 2 briefly presents the related literature on GVCs and employment. The data and empirical approach are discussed in section 3, followed by some stylised facts on GVCs and formal and informal employment in Viet Nam in section 4. Section 5 reports our empirical results. Section 6 offers concluding remarks.

2. GVCs and Employment: Related Literature

One of the phenomena observed in the world economy in the last 30 years is the emergence of the global production network, in which production processes are distributed around the world. Businesses in all industries, workers, and consumers around the world are linked by regional value chains or GVCs. The emergence of GVCs provides an unprecedented opportunity for developing countries to integrate deeply into the global economy. The benefits of participation in GVCs, however, largely depend on a country's degree of engagement in the production process (i.e. trade in intermediary goods and services). Another determinant of the benefits is the location in the value chains. Recent empirical studies (e.g. Baldwin and Robert-Nicoud 2014) have shown that the value added in manufacturing is largest in the upstream (e.g. research and development) or downstream (retail and marketing). The lowest value added is in the manufacturing stage of the good (e.g. assembly), which often takes place in developing countries.

The employment effects of participating in GVCs is one of the most discussed issues. Many studies and estimations have shown that GVC participation creates jobs in developing countries. For example, using the 39-country World Input–Output Database (WIOD), Jiang

and Milberg (2013) found that in these 39 countries, about 88 million jobs were generated by integrating into GVCs in 2009. Of these jobs, 44% were for medium-skilled workers and 43% were low-skilled workers. Gasiorek, Azubuike, and Mendez-Parra (2015) also used the WIOD data to explore India's integration into GVCs and examined the employment embedded in India's exports to the world and its top five partners. They found that value-added trade played a significant role in India's employment generation, with 'export jobs' rising from 37.9 million in 1995 (10% of total employment) to 75.3 million in 2011 (16% of total employment).

Participation in the GVCs can benefit the labour market through several channels. Taglioni and Winkler (2016) identified three main channels: (i) demand effects, where GVC participation increases demand for skilled labour to provide specialised services, such as research and development or branding; (ii) training effects, which lead firms in GVCs to provide training in technology and skill development to local participating firms, thereby increasing their productivity; and (iii) the labour turnover effect, with the dispersion of knowledge from the labour force of participating firms to other local firms. The GVCs also affect the labour market through job reallocations, both across and within countries (OECD, 2013). At the global level, many labour-intensive manufacturing activities have been outsourced to developing countries with low-cost human resources, especially in East Asia, and recently South Asia and Africa.

The job reallocation within countries tends to be more difficult to calculate because the GVC participation is more or less pronounced across sectors. For example, service industries generally have a lower foreign content because trade barriers in services tend to be high. In addition, depending on the role of labour as an input in each industry, the same value added exported can have a lower or higher job content in each industry. Thus, the employment effects of the GVC participation may vary greatly amongst sectors since each sector has its own production structure and thus, different mix of workers. For example, agriculture involves a large proportion of small-scale, low-skilled, and labour-intensive production as well as a small share of high-skilled technology-intensive work. In manufacturing, while some industries are labour-intensive and dominated by informal sectors, others are more advanced and require more skilled labour. The same patterns are observed in the service sector.

The situation is further complicated by the relationship between international trade and the informal economy – the sector that accounts for a large number of jobs in developing countries. Theoretically, there are three major perspectives on international trade and the informal sector: dualist, legalist, and structuralist (Chen, 2012). While the dualistic view states that international trade has no effects on formality in the labour market because the formal and informal segments

of the labour market are not directly linked, the legalistic view argues that international trade may reduce the informality since the cost associated with formality has decreased. Different from the dualistic view and legalistic views, the structuralist view asserts that the informal economy serves as a refuge or a residual strategy for those who are excluded from the formal economy, and consequently, the informal and formal economies are two connected and interdependent segments. Using each of the three perspectives on the existence of informality, empirical evidence on the informal economy provides mixed evidence. For instance, Marjit and Acharyya (2003) found that when capital is mobile between the formal and informal economies in a dualistic model, the opening up of trade raises wages in the informal economy, whereas with immobile capital, trade depresses wages in the informal economy. Marjit and Maiti (2005) observed that wages may decline even with an increase in employment in the informal economy if capital is immobile across sectors. If capital is mobile, however, wages improve significantly in the informal economy as activities and employment in this sector increase. Similarly, Goldberg and Pavcnik (2003) noted a reallocation of production from the formal to the informal economy with the opening up of trade. Consequently, employment shrinks in the formal sector and new employment is created in the informal economy, but wages in the formal sector rise while those in the informal economy fall. Cimoli and Porcile (2009) noted that with the opening up of trade in Latin America, production units in the formal sector started specialising in goods for export and that the production of non-export goods and services was relegated to the informal economy. While this led to an expansion of the formal sector, it may not have a strong effect on the growth of formal employment if productivity gains in the formal sector do not translate into overall productivity gains across the economy.

Although the literature does not provide a clear-cut answer about the effect of international trade and participation in GVCs on employment composition, one can derive several observations. First, two competing effects should be considered: (i) the substitution effect, i.e. domestic employment is replaced with foreign employment; and (ii) the productivity effect, i.e. firms that participate in GVCs become more productive and produce more, thus increasing their demand for labour. These predictions are in line with traditional trade models and the new trade theory with heterogenous firms (e.g. Melitz, 2003). Trade opening and GVC participation will give new opportunities to some sectors and firms, while others face strong competition and therefore shrink or exit the market. These standard trade models are mute about the reallocation of workers across industries and firms.

The existence of these two competing effects and potential labour reallocation across industries means that we cannot formulate a clear hypothesis on the relationship between the

change in GVC participation and the change in employment at the level of the overall economy. One should observe an increase in employment in some industries and firms and a decrease in others. First, as economies develop a manufacturing sector, informal workers in agriculture might move into manufacturing and services and some of them into formal employment. However, as the economy develops and manufacturing and services firms move to higher value-added activities (e.g. from apparel to information technology), the share of low-skilled and small-scale work may decline considerably (Barrientos, Gereffi, and Rossi, 2010). Second, low-skilled jobs, which are predominately found in the informal sector, tend to be more affected. Moreover, firms in lower positions in the GVCs may outsource part of their tasks to the informal sector or rely on a large number of irregular, low-skilled, low-paid workers to remain cost-competitive. Firms may also upgrade their technology to move to a higher position in the value chain and, consequently, low-skilled labour has to find new jobs in the formal or informal labour markets.

In summary, the majority of the theoretical models show that trade liberalisation increases informal employment in developing countries, and most of the empirical studies find that trade reforms in developing countries often coincide with higher informality. However, the number of empirical studies is limited and mainly focused on Latin America. This paper examines the case of Viet Nam and focuses on the impact of participation in GVCs on formality of employment.

3. Empirical Approach

3.1 Data

This study uses several databases to examine the role of participation in GVCs in employment formality (and informality). For household level data, we use the Viet Nam Household Living Standard Surveys (VHLSS), collected in 2010, 2012, and 2014. These databases are collected biannually from 2002 by the General Statistics Office of Viet Nam. The survey instruments are similar to those of the World Bank's Living Standards Measurement Study. In the VHLSS surveys, the information is collected through face-to-face interviews with the household heads, household members, and key commune officials; and includes information on demography, employment, labour force participation, education, health, income, expenditure, housing, fixed assets and durable goods, involvement in poverty alleviation programs, general economic conditions, agricultural production, local infrastructure

and transportation, and social problems. While the data are available from 2002, only three recent surveys in 2010, 2012, and 2014 have adequate information to measure the formal status of eligible employees that we adopted in this study. About 9,400 households and 37,000 individuals in each survey are used in this study.

For constructing provincial exposure to trade, we use the 1999 Population and Housing Census data (Census 1999), which was conducted in 2000 by the General Statistics Office. The Census 1999 reports the industry of employment at the 3-digit International Standard Industrial Classification (ISIC) version, but for some individuals, it is only reported at the 2-digit level. The Census 1999 sample is limited to individuals over 13 years old since individuals below that age were not asked about their employment status.

We also use the OECD's World Input–Output Table (version 2016), to calculate the level of GVC participation at the industry level. The OECD's World–Input Output Tables were only available from 1995 to 2011, so we could only calculate the GVC participation in 2009; for other years, we used OECD estimations.

3.2 Estimation Strategy

Two levels of analysis, including at provincial level and at individual level, will be used in this study to examine the role of trade in value added on formal employment. For the provincial level of analysis, we will estimate the following equation:

$$formal_{jt} = \alpha_0 + \alpha_1 TiVA_{jt} + X'_{jt}\alpha_2 + u_j^1 + \epsilon_{jt} (1)$$

where $formal_{jt}$ is the share of the population aged 15–60 years who worked as a formal employee in province j at time t. $TiVA_{jt}$ is the level of GVC engagement in province j at time t. X'_{jt} is a vector of control variables in province j at time t; u_j is the provincial fixed effects; and ϵ_{jt} denotes the error terms. Control variables, X'_{jt}, consist of variables that may affect the share of formal employees in the total working population in provinces. These variables include the provincial gross domestic product (GDP) per capita, the share of agricultural production in the total provincial GDP, the population, and the working age population. We will discuss the dependent variables and GVC engagement in the subsequent subsection.

At the individual level, we estimate the probability of being a formal employee using the following equation:

$$\Pr(for_{ijt} = 1) = \Phi(\beta_0 + \beta_1 TiVA_{jt} + CON'_{ijt}\beta_2 + \mu_t + \theta_j) \quad (2)$$

where for_{ijt} is a dummy variable, which takes the value of one if individual i worked as a formal employee in province j in year t and zero otherwise; $TiVA_{jt}$ is the level of GVC

engagement in province j in year t; CON'_{ijt} is a vector of control variables at the individual and household level; θ_j denotes province fixed effects; and μ_t is the time fixed effects. Control variables, CON'_{ijt}, are variables that have affected the decision to become a formal employee. These variables include individual age, education level, gender, household size, and share of household members as formal employees.

A potential issue with the estimation of the effect of GVC participation on the probability of being a formal employee is endogeneity bias. Provinces which are more engaged in GVCs might have different characteristics from those less engaged in GVCs, and such characteristics may potentially affect the decision of being a formal employee. To mitigate this bias, we use the lagged value of GVC participation (i.e. trade in value added (TiVA) at $t-1$) instead of the contemporaneous value of GVC participation (i.e. at time t). We also control for province fixed effects to control for unobserved provincial-level time-invariant variables. The province fixed-effects estimator might still be biased if the operations and performance of firms in such provinces have correlated with time-variable unobservable factors which are both correlated with the level of GVC engagement and the individual's probability of being a formal employee. Although we are seeking evidence of a causal effect of GVC participations on formal employment, we are fully aware of the difficulties of estimating causal effects.

3.3 Measuring Employees' Formality Status

Several concepts are usually adopted to measures the formality status of a worker. While some concepts identify whether an employee is formal or informal through the formality of the firm where the employee works (i.e. informal employees work in informal firms), others determine an individual's formal status based on their employment (Artuc et al., 2019). For this study, we adopted the ILO's definition of the informality status of an employee: a worker's 'employment relationship is, in law or in practice, not subject to labour regulation, income taxation, social protection or entitlement to certain employment benefit' (ILO, 1993; 2015). Based on this definition, we define a formal worker as a person of working age (from 15 to 60) who has (i) a paper contract, (ii) health insurance, and (iii) paid leave. Employees who are not identified as formal employees are informal employees. Thus, unpaid family workers are classified as informal workers. Own-account workers or casual workers could also be classified as informal workers if they do not have a formal written contract with employers and are not entitled to sick leave and paid annual leave. This suggests that even employees in formal firms may also be informal workers.

3.4. Measuring GVC Engagement

We follow the previous literature, including McCaig (2011) and Topalova (2010), amongst others, to calculate the GVC engagement at the provincial level as follows:

$$TiVA_{jt}^{1} = \sum_{k=0}^{N} \omega_{kj} * GVC_{kt} \quad (3)$$

The provincial-level GVC engagement consists of two components: GVC indicators and provincial-level weights, which are calculated as follows.

3.4.1 Two indicators of GVCs

Countries can engage in the GVCs in two directions: upstream and downstream. Upstream engagement is the direction in which a country can import intermediate goods from foreign countries and then use these intermediate goods to produce and export their own goods (backward GVC participation). The downstream direction, on the other hand, means that a country can export their intermediate goods to foreign trading partners, which ultimately use them to produce their own exports (forward GVC participation).

Koopman et al. (2011) decomposed gross exports into two main components: (i) the foreign value-added content of intermediate imports embodied in gross exports; and (ii) the domestic value added, which is the value of domestically produced exports. This second component is decomposed into three subcomponents: (i) direct domestic value added, i.e. the value added embodied in exports of final goods and intermediates, absorbed by direct importers; (ii) indirect domestic value added, i.e. the value added embodied in intermediates reexported to third countries; and (iii) reimported domestic value added, i.e. the value added from exported intermediates that are reimported. Of these components, forward participation in the GVCs corresponds to the second components of the domestic value added, i.e. indirect domestic value added. This indicator captures the domestic value added contained in inputs sent to foreign countries for further processing and exports in the value chain. Meanwhile, backward GVC participation refers to the foreign value-added content of the exports components.

To capture both directions of GVC engagement, Koopman et al. (2011) proposed a GVC participation index as the sum of backward participation and forward participation. Therefore, the participation index is defined as the sum of the foreign value added (FVA) embodied in a country's exports and the indirect value added (IVA) exports, expressed as a percentage of gross exports. Mathematically, the GVC participation index can be written as below:

$$GVCPar_{kt} = \frac{FVA_{kt}}{EXP_{kt}} + \frac{IVA_{kt}}{EXP_{kt}} \qquad (4)$$

where FVA_{kt} is the foreign value added in the exports of industry k at time t; IVA_{kt} is the indirect domestic value added in industry k at time t ; and EXP_kt is the export of industry k at time t.

Given the definition of the participation index, two countries can have identical participation in GVCs but their position along the supply chain may be significantly different. In other words, countries can participate in a GVC by specialising in activities upstream or downstream in the production network. To further distinguish the nature of GVC participation, Koopman et al. (2011) proposed a GVC position index that indicates if a country specialises in the first or the last steps of production. If a country is upstream in the production network (first stages of production), it is likely that it has a high value of forward participation relative to backward. If a country specialises in the last steps of production (downstream), it is likely that it imports a lot of intermediate goods from abroad and therefore it has high backward participation. The GVC position index is constructed in such a way that countries with high forward relative to backward participation record a positive value. These countries lie more upstream in a supply chain.

$$GVCPos_{jt} = \ln\left(1 + \frac{IVA_{kt}}{EXP_{kt}}\right) - \ln\left(1 + \frac{FVA_{kt}}{EXP_{kt}}\right) \qquad (5)$$

Thus, positive values indicate upstream specialisation in the GVC phases of the production process which are remote from final demand (e.g. production of intermediate products used by other countries in their exports), while negative values denote downstream specialisation in phases close to final demand (e.g. the use of intermediates to produce final goods for exports).

3.4.2. Provincial weights

We use two measures to calculate the provincial-level GVC-exposure weight. First, following Topalova (2010), provincial variation in exposure to the GVCs is calculated based on the structure of employment as follows:

$$\omega_{kj}^{1} = \frac{L_{kj}}{L_j} \quad (6)$$

where L_{kj} is the total number of workers in sector k of province j ; and L_j is the total number of workers in province j. To ensure the exogeneity of the employment structure, and given our period of studies from 2002 to 2014, we use the Viet Nam Population Census 1999 to calculate our weight.

This weight, however, does not account for the variations in trade in general and in GVC participation in particular across provinces. Endowment differences across provinces will determine their own comparative advantage, thus each province tends to specialise in the production of goods or services for which they enjoy a comparative advantage. Therefore, similar to Helble, Le, and Long (2018), we propose an additional provincial weight which takes into account the variations in trade and GVC participation across provinces as follows:

$$\omega_{kj}^{2} = \frac{L_{kj}}{L_j} * \frac{L_{kj}}{L_k} \quad (7)$$

where L_{kj} and L_j are similar to equation (6) and L_k is the total (national) number of workers in sector k.

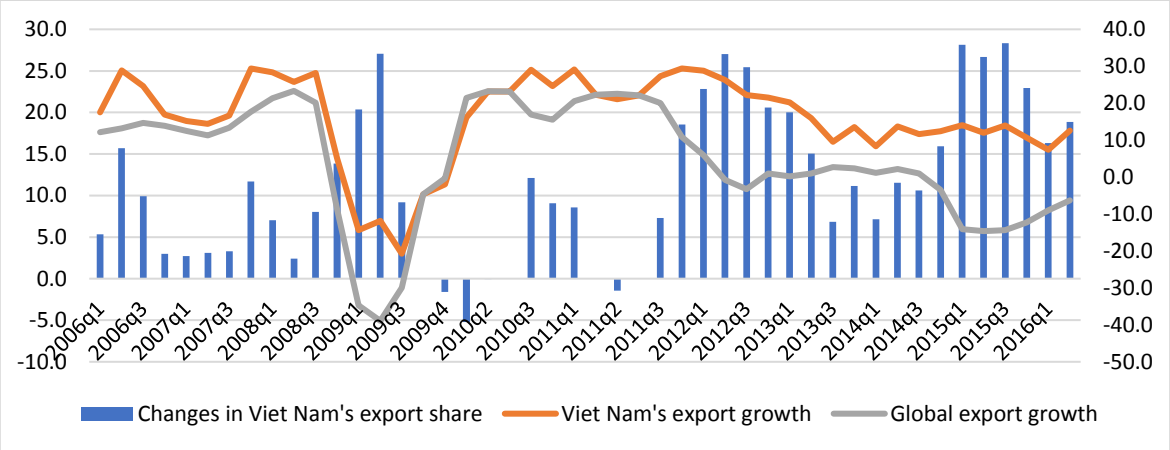
4. GVCs and Informal Employment in Viet Nam: Some Stylised Facts

4.1. Viet Nam's Integration into GVCs

Viet Nam is commonly considered a successful case of gaining from trade. Its export performance has outperformed world export growth consistently over the past decade, demonstrating increased export competitiveness (Figure 1). From 2006 to 2014, Viet Nam's global export market share grew at an annual rate of 9.8%, exemplifying the country's dynamism. Trade developed on the backbone of GVCs, allowing Viet Nam to grow its own domestic value added through exports. Viet Nam has shown high integration in GVCs as a buyer and seller since 1995. This is best exemplified by the concept of importing to export, where one country imports goods or services that are incorporated in the exports to another country. Measures of importing to export consider that much of a country's exports consist of

value that was added in another country from a buyer or seller perspective. Foreign value added embodied in Viet Nam's gross exports as a share of gross exports increased from 20.9% to 36.3% from 1995 to 2011, while Viet Nam's domestic value added embodied in gross exports of third countries increased from 13.1% to 16.0% over the same period.

Figure 1: Change in Viet Nam's Export Market Share



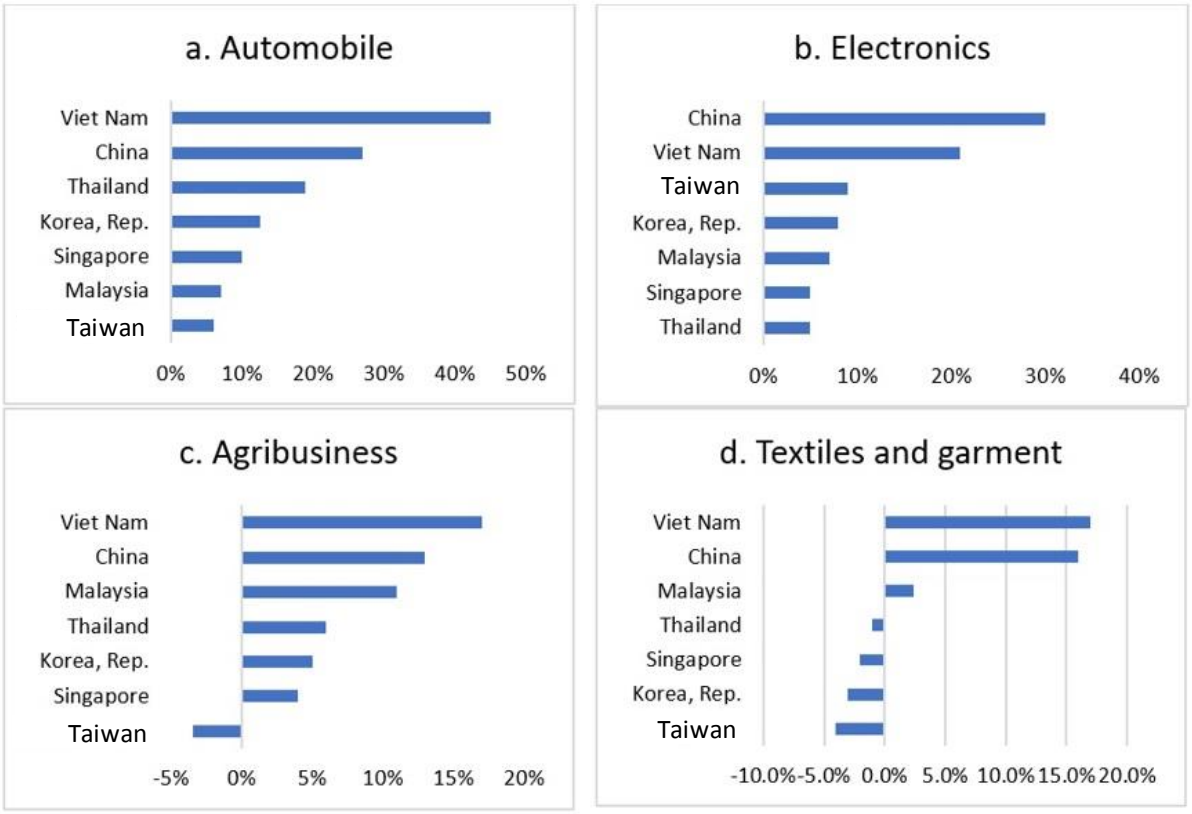
Q = quarter.
Source: World Bank, Measuring Export Competitiveness database, Export Growth. https://mec.worldbank.org/export-growth/VNM/2006q1/2015q4 (accessed 30 August 2019).

In addition, its export basket is already more diversified than a decade ago, reflecting a transition from exporting primary commodities to exporting low- and medium-tech manufactured goods (apparel, furniture, and footwear) and then more sophisticated products (machinery and electronics). At the sectoral level, Viet Nam's domestic value added in gross exports grew at two-digit rates in most sectors, exhibiting the highest growth rates amongst its peers (Figure 2). However, Viet Nam's value added embedded in its exports are rather low, reflecting its upstream position in the GVCs. As a result, most export jobs remain in the unskilled worker range, where the unskilled component of labour value added is much larger in Viet Nam than in other Asian economies. This pattern is seen across most sectors, including processed foods, machinery and equipment, and textiles and apparel.

Figures 3a and 3b present the level of Viet Nam's participation in the GVCs. We see that, on average, from 1995 to 2006, Viet Nam gradually increased its participation in global production. The participation index rose from 0.47 in 1995 to 0.53 in 2006, but increased more rapidly from 2005 to 2010, shortly before and after Viet Nam joined the World Trade Organization. However, since 2010, the participation rate has been rather flat, at 0.60. This

may be driven by the decline in the participation rate of the mining and quarrying sector. However, this also suggests that Viet Nam could no longer depend on natural resources (mostly crude oil and coal) for its growth, as in the early 2000s.

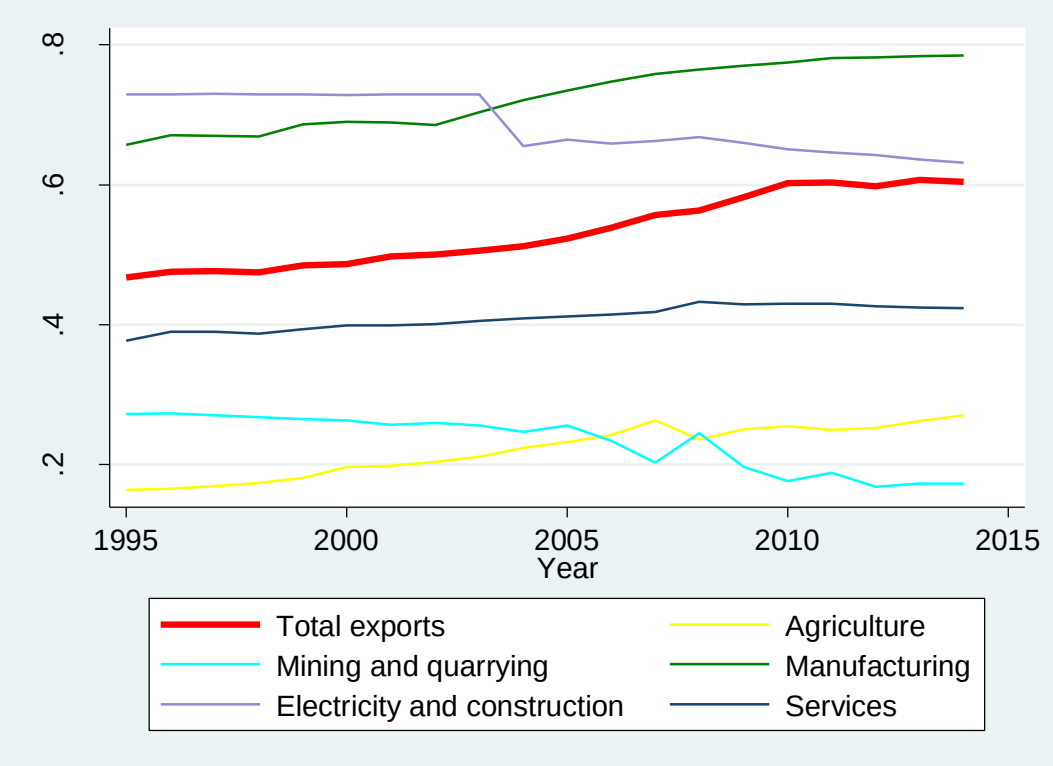
Figure 2: Growth of Domestic Value Added Embodied in Gross Exports – Selected Economies, 1995–2011



Note: Compound annual growth rate (%).
Source: Kummritz, K., G. Santoni, D. Taglioni, and D. Winkler (2016), 'Vietnam's Integration in Global Value Chains', Background Note to World Bank (2016), *Vietnam 2035: Toward Prosperity, Creativity, Equity, and Democracy*. Washington, DC: World Bank.

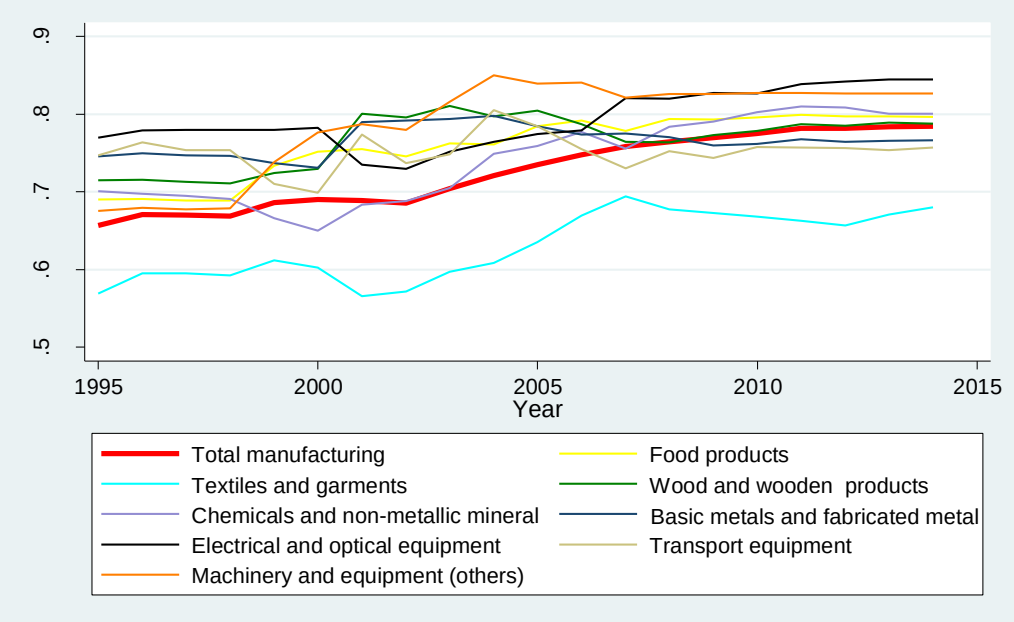
The manufacturing sector shows signs of increasing participation in the GVCs. The participation index of this sector increased from 0.65 in 1995 to 0.78 in 2014. Participation in the GVCs accelerated from 2002 onwards, 1 year after Viet Nam and the United States signed a bilateral trade agreement. However, we also observe that the manufacturing sector has showed some signs of slowing down. From 2007 to 2014, the participation rate increased slowly from 0.75 to 0.78. This may imply the existence of structural factors that hinder further participation in the GVCs of this sector.

Figure 3a: Viet Nam's Participation in the GVCs, by Sector



GVC = global value chain.
Source: Authors' calculation using OECD's World–Input Output Tables.

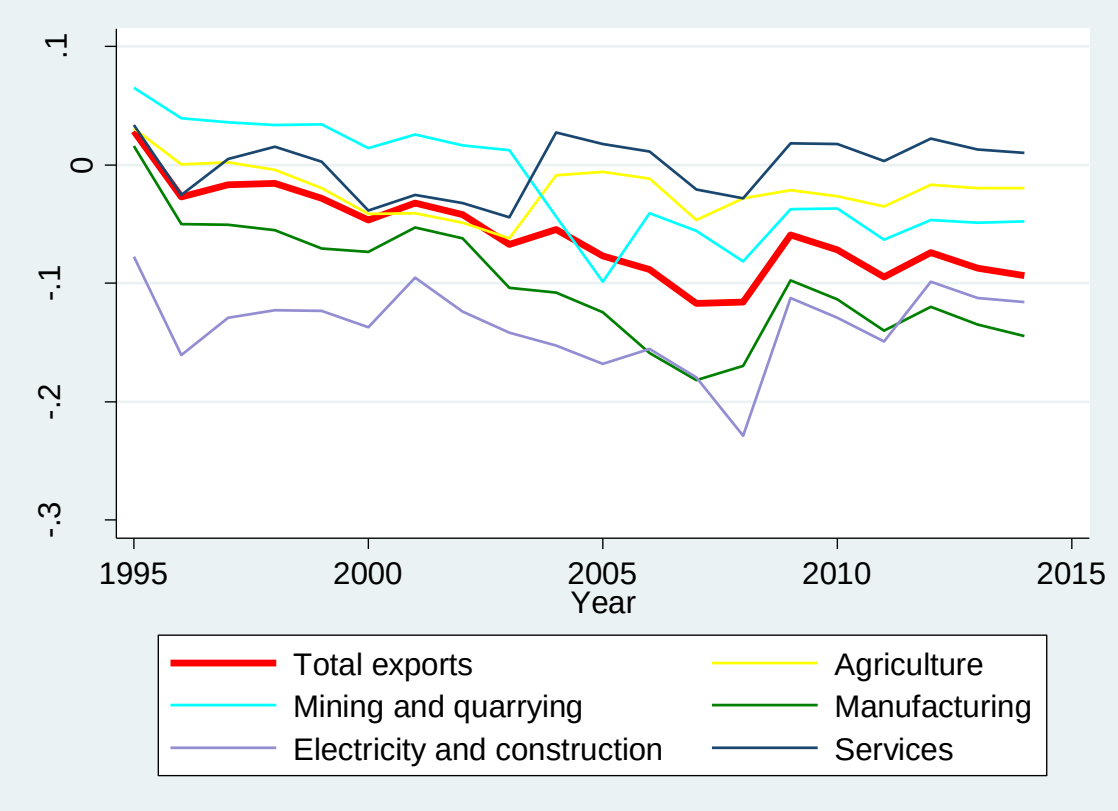
Figure 3b: Viet Nam's Participation in the GVCs, by Manufacturing Sector



GVC = global value chain.
Source: Authors' calculations.

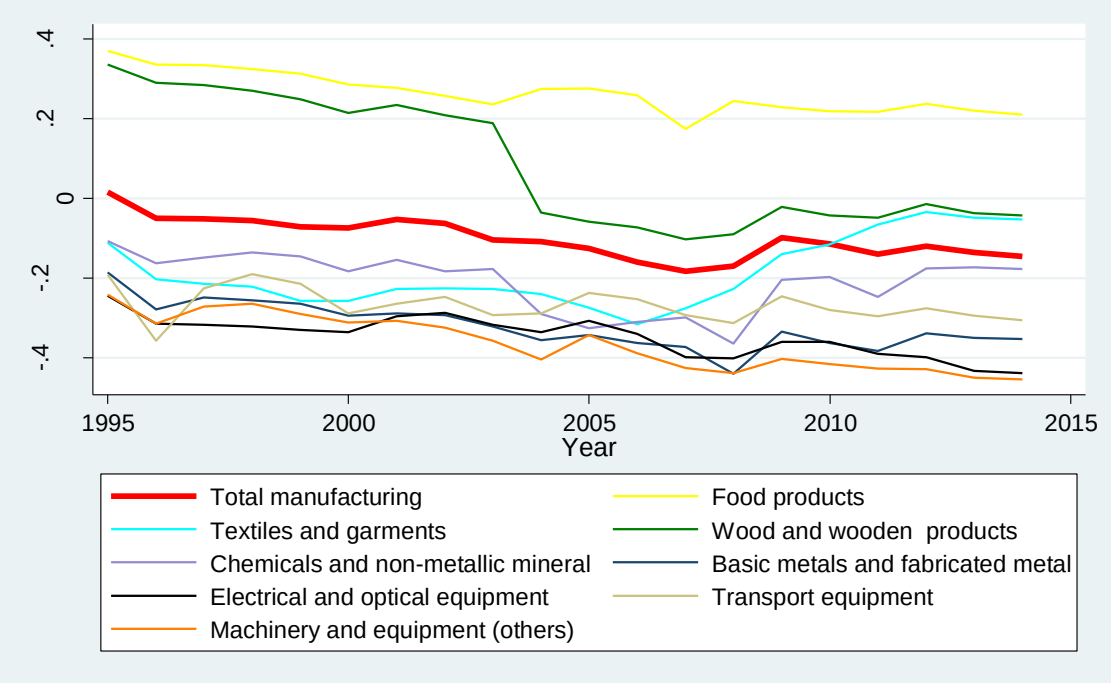
Figure 3b shows heterogeneity in different manufacturing sectors' participation in GVCs. Machinery and equipment was a subsector that ranked amongst the lowest participation rates at the beginning of the period, but reached the second highest level at the end of the period. Textiles and garments grew rapidly after the United States–Viet Nam free trade agreement was enacted in 2002, but have stagnated since 2007. Electrical and optical equipment was leading the pack in 1995 and came first at the end of the period. Massive FDI in Viet Nam helped to integrate this sector tightly into GVCs. Samsung alone had spent $13.1 billion in manufacturing facilities by 2015.

Figure 4a: Viet Nam's Position in the GVCs, by Sector



GVC = global value chain.
Source: Authors' calculation.

Figure 4b: Viet Nam's Position in the GVC, by Sector



GVC = global value chain.
Source: Authors' calculation.

We further examine Viet Nam's position in the GVCs (Figures 4a and 4b). The figures confirm the pattern observed in Figures 3a and 3b. From 1995, Viet Nam has moved itself farther from producing most final products (upstream) towards producing more intermediate products (downstream). Of all the sectors, the manufacturing sector experienced the largest transformation. However, as shown in Figure 4b, there is large heterogeneity across industries. While food-related industries mostly served the upstream market, other industries (e.g. chemical and non-metallic production, machinery and equipment production, transport, and equipment) are likely to have a lower position than other sectors, i.e. they are more likely to engage in the production network.

4.2. Formal and Informal Employment in Viet Nam

Table 1 lists a large number of developing countries with their respective shares of informal employment in non-agricultural employment, as defined and reported by the ILO. The share varies substantially across countries and regions. Viet Nam has a share of 68.2%, which was much higher than Thailand's share.

Table 1: Share of Informal Employment by Country

Country, Year	Persons in informal employment, share of non-agricultural employment (%)	Country, Year	Persons in informal employment, share of non-agricultural employment (%)
Argentina (2009 Q4)	49.70	Madagascar (2005)	73.60
Armenia (2009)	19.80	Mali (2004)	81.80
Bolivia (2006)	75.10	Mexico (2009 Q2)	53.70
Brazil (2009)	42.20	Nicaragua (2009)	65.70
Colombia (2010 Q2)	59.60	Panama (2009 August)	43.80
Costa Rica (2009 July)	43.80	Paraguay (2009)	70.70
Dominican Republic	48.50	Sri Lanka (2009)	62.10
Ecuador (2009 Q4)	60.90	South Africa (2010)	32.70
Egypt (2009)	51.20	Thailand (2010)	42.30
El Salvador (2009)	66.40	Turkey (2009)	30.60
Honduras (2009)	73.90	Viet Nam (2009)	68.20
India (2004/2005)	83.50	Zambia (2008)	69.50
Liberia (2010)	60.00		

Note: Q2 and Q4 denote the second and fourth quarters of a given year.
Source: World Development Indicators, Informal Employment (% of total non-agricultural employment). https://data.worldbank.org/indicator/SL.ISV.IFRM.ZS (accessed 30 August 2019).

Viet Nam is a populous country, with a large share of the working population in the informal sector. Informal employment accounted for 68.2% of total non-agricultural employment in 2009 (Table 1). As mentioned earlier, a formal worker is an employee of working age (15–60 years) who has (i) a paper contract, (ii) health insurance, and (iii) paid leave. In this study, we apply the same standard as the ILO, with a relaxation of the paid leave condition.

Using the Labour Force Survey for 2007 and 2009, research by Hanoi National Economics University shows that in 2007, amongst the 25 million laborers working in non-agricultural economic activity, 76.3% were informal. In 2009, it shows a similar pattern of informal employment in both the non-agricultural and agricultural sectors. The figures are even higher, which implies an increase in informal labour during the latter years (Table 2).

Table 2: Overview of Formal Employees by Characteristic

(% share of total)

Variable		2010		2012		2014	
		Formal	Informal	Formal	Informal	Formal	Informal
By Region							
	Red River Delta	17.69	82.31	18.81	81.19	19.96	80.04
	North-east	10.82	89.18	11.13	88.87	12.57	87.43
	North-west	8.36	91.64	6.91	93.09	8.60	91.40
	North Central Coast	9.05	90.95	10.75	89.25	10.29	89.71
	South Central Coast	14.42	85.58	15.07	84.93	16.63	83.37
	Central Highlands	9.03	90.97	9.13	90.87	9.74	90.26
	South-east	20.98	79.02	24.13	75.87	26.72	73.28
	Mekong River delta	9.42	90.58	9.35	90.65	10.17	89.83
By Residence							
	Urban	29.33	70.67	29.59	70.41	30.63	69.37
	Rural	7.53	92.47	8.31	91.69	9.39	90.61
By Education							
	Below high school	3.86	96.14	4.50	95.50	5.30	94.70
	Below college	30.14	69.86	29.13	70.87	27.16	72.84
	Higher education	79.15	20.85	73.81	26.19	72.04	27.96
By Sector							
	Agriculture	0.68	99.32	0.78	99.22	0.83	99.17
	Manufacturing	24.27	75.73	30.83	69.17	38.07	61.93
	Services	25.10	74.90	24.84	75.16	25.33	74.67

Source: Authors' calculation.

4.3. Relationship Between GVC Engagement and Employment Formality

Appendix 1 presents the correlation between various indicators of GVC engagement and formal employment in Viet Nam during the studied period. As presented in Appendices 1a, 1c, and 1d, there is a positive and strong correlation between the share of formal employment and each of three indicators – GVC participation, backward participation, and forward participation – at the province level. Appendix 1b suggests that the GVC position may be negatively correlated with the share of formal employment, but this negative correlation is not statistically significant, and this correlation may change when we control for other factors that affect both formal employment and GVC position variables.

5. Empirical Results

Before discussing the effects of GVC participation on employment formality, we will examine the descriptive statistics of variables used in the empirical analysis. Table 3 presents some of the descriptive statistics of variables used in our estimation in 2010, 2012, and 2014. From this table, we notice that the proportion of individuals having a formal job increased slightly to 17% in 2014 from 14% in 2010. During the period of study, the education level of labourers also increased slightly to 8.12 years of school from 7.83 years.

Table 3a: Descriptive Analysis – By Employee Formality

Variable	Informal		Formal		Total	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Age	37.656	12.230	35.075	10.186	37.261	11.976
Residency (urban = 1)	0.217	0.412	0.554	0.497	0.269	0.443
Gender (male = 1)	0.511	0.500	0.496	0.500	0.509	0.500
Education attainment	7.346	3.504	11.005	2.061	7.907	3.576
GVC participation (standard weight)	0.326	0.049	0.362	0.072	0.332	0.055
GVC participation (new weight)	0.010	0.017	0.021	0.032	0.012	0.021
GVC position (standard weight)	0.017	0.006	0.018	0.007	0.017	0.006
GVC position (our weight)	0.001	0.002	0.002	0.003	0.001	0.002

GVC = global value chain, SD = standard deviation.
Source: Authors' calculation.

Table 3b: Data Description

Variable	2010		2012		2014	
	Mean	**SD**	**Mean**	**SD**	**Mean**	**SD**
Urban = 1	0.260	0.440	0.270	0.450	0.280	0.450
Education grade	7.830	3.560	7.970	3.540	8.120	3.530
Age	36.630	11.940	37.290	11.990	38.060	11.920
Gender (male = 1)	0.510	0.490	0.510	0.500	0.510	0.500
Have formal job (formal = 1)	0.140	0.350	0.150	0.360	0.170	0.380
GVC participation (standard weight)	0.330	0.060	0.330	0.060	0.340	0.050
GVC participation (our weight)	0.010	0.020	0.010	0.020	0.010	0.020
GVC position (standard weight)	0.020	0.005	0.010	0.000	0.020	0.000
GVC position (our weight)	0.00	0.002	0.000	0.000	0.000	0.000
Number of observations	19,384		19,253		18,699	

GVC = global value chain, SD = standard deviation.
Source: Authors' calculation.

5.1 GVCs and Formal Employment at the Provincial Level

Table 4 reports the estimation results for the effect of GVC participation, GVC position, backward participation, and forward participation on the share of formal employment at the province level. The weight in columns 1–3 is calculated using equation (7) while the weight in columns 4–6 is calculated using equation (6). The dependent variable in these equations is the change in the share of employment in the formal sector in the total employment in each province. The estimation results show that GVC participation does not have a statistically significant effect on the share of formal employment at the province level. This result may be because GVC participation is the sum of two components: backward participation and forward participation. A province at the same level of GVC participation may be significantly different if one province specialises in backward participation, i.e. produces mostly intermediate goods for export, while another province specialises in producing final products for export. The former provinces seem to be more advanced than the latter provinces and therefore capture more value added. This explanation is confirmed by the positive effects of GVC position on the share of formal employment. A province that specialises in producing intermediate goods for export (i.e. higher value of indirect domestic value added in equation (5) and thus higher GVC position) seems to have higher growth of formal employment than provinces that specialise in producing final goods.

This could be explained by firm behaviour. Firms that engage more in the production network may need to recruit more skilled workers to improve their productivity level or to be sustainable in the production network. Firms that have lower productivity may not be able to join the production network or could be pushed out if they were already in the network. The result in column 3 corroborates the results in column 2. A province at the downstream position in the GVCs, reflected by a higher GVC position index, tends to have a higher share of formal workers than provinces at the upstream GVC position.

With regards to other variables, we find that real GDP per capita has a nonlinear relationship with the change in the share of formal employment at the provincial level. As the per capita income increases, the share of formal employment declines. However, to a certain level of per capita income, this share may increase. This may be explained by the fact that some affluent provinces, especially in the Mekong River Delta, tend to have large agricultural production and thus have a higher share of informal employees. However, the negative sign of coefficients on squared per capita income growth indicates that provinces which experience the highest growth are associated with the highest increase in the formal sector.

Table 4: Effects of GVC Participation and Position on Formal Employment – Provincial Fixed-Effects Estimation

	(1)	(2)	(3)	(4)	(5)	(6)
Weight used		**Our weight**			**Topalova's approach**	
GVC participation	-0.181			-0.093		
	[0.411]			[0.583]		
GVC position		1.613***			2.959***	
		[0.500]			[0.911]	
Backward participation			1.089*			2.295**
			[0.567]			[0.943]
Forward participation			-1.391**			-2.310**
			[0.554]			[0.900]
Share of rural population	-0.108	-0.010	-0.005	-0.109	-0.061	-0.062
	[0.073]	[0.076]	[0.077]	[0.074]	[0.071]	[0.073]
GDP per capita	-0.403*	-0.517**	-0.453*	-0.430*	-0.426**	-0.412*
	[0.237]	[0.199]	[0.229]	[0.258]	[0.199]	[0.248]
GDP per capita squared	0.224**	0.292***	0.266**	0.234**	0.237**	0.231**
	[0.111]	[0.099]	[0.108]	[0.117]	[0.098]	[0.113]
Total population	0.392**	0.257	0.258	0.388**	0.319*	0.318*
	[0.176]	[0.174]	[0.175]	[0.178]	[0.170]	[0.173]
Labour force	-0.223**	-0.195**	-0.198**	-0.222**	-0.210**	-0.210**
	[0.089]	[0.086]	[0.087]	[0.090]	[0.086]	[0.086]
Intercept	-0.881	-0.165	-0.146	-0.872	-0.482	-0.483
	[1.026]	[1.006]	[1.016]	[1.073]	[0.987]	[1.040]
Number of observations	180	180	180	180	180	180

GDP = gross domestic product, GVC = global value chain, HH = household.

Notes: Standard errors are in brackets. *, **, and *** denote statistically significant at the 10%, 5%, and 1% levels, respectively. GVC participation, GVC position, backward participation, and forward participation are calculated based on equation 7 (columns 1, 2, and 3) and equation 6 (columns 4, 5, and 6). The fixed effects estimator is used. The number of provinces is 60. The number of time periods is 3. We control for year dummies in all specifications.

Source: Authors' estimation.

The results in columns 4–6, in which we use the approach of Topalova (2010) to calculate the weight of GVC participation at the provincial level, are consistent with the results obtained when we use the weight that we revised from Topalova (2010).

5.2 GVCs and Formal Employment at the Individual Level

Table 5 documents our estimation results (marginal effects) of equation (2). In this table, we use our approach to calculate weight to measure the level of GVC engagement at the provincial level. Except for variables related to GVC engagement, columns 1, 2, and 3 present the results with only individual and household characteristics, while we control for per capita GDP at the provincial level and the share of formal employment in columns 4, 5, and 6.

The estimation results presented in column 1 show that the chance of becoming a formal employee is higher in provinces that are more deeply engaged in the GVCs. However, this relationship is not statistically significant. Meanwhile, employees residing in provinces that have a higher position in the GVCs (or are more engaged in the production of intermediate goods to export) tend to have a higher chance of becoming a formal employee than their counterparts residing in provinces that engage in producing products near the final users. This result is confirmed by the result presented in column 3. We see that people living in provinces that engage in the production of intermediate goods for exports (backward participation) have a higher likelihood of becoming a formal employee. Meanwhile, individuals living in provinces that are more engaged in producing final goods for export (forward participation) also have a higher chance of becoming a formal employee, but their magnitude effects are not as strong as the effects of backward participation.

Our results also suggest that the characteristics of individuals and households are important determinants of being formal employees. We find that people living in urban areas have a higher chance of being formal employees than those living in rural areas, by 5.3 percentage points. Having one more year of education increases the chance of being a formal employee by 3.4 percentage points. However, older people tend to have a lower likelihood of being a formal employee. We also find that men have a lower likelihood of becoming a formal employee than women. This result may be explained by the spectacular growth in light industries such as textiles, garments, and food processing over the last 20 years. In Viet Nam, these industries tend to employ a larger number of female workers than male workers. Meanwhile, the results suggest that living in a big household may reduce the chance of becoming a formal employee. This could be explained by the fact that once a woman has more than two or three children, she is less likely to be able to work full-time and have a formal job.

Table 5: Effect of GVCs on the Likelihood of Becoming a Formal Employee (Marginal Effects)

Independent variables	(1)	(2)	(3)	(4)	(5)	(6)
GVC participation	0.220***			0.110		
	[0.016]			[0.255]		
GVC position		2.773***			0.254	
		[0.670]			[2.532]	
Backward participation			0.264***			-0.139
			[0.091]			[0.349]
Forward participation			0.180**			0.330
			[0.082]			[0.335]
Living in urban area	0.053***	0.057***	0.053***	0.055***	0.055***	0.055***
	[0.002]	[0.002]	[0.002]	[0.003]	[0.003]	[0.003]
Education	0.034***	0.034***	0.034***	0.034***	0.034***	0.034***
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
Age	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Gender (male = 1)	-0.017***	-0.017***	-0.017***	-0.017***	-0.017***	-0.017***
	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]
HH size	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
% of HH members having formal work	0.425***	0.437***	0.425***	0.401***	0.401***	0.401***
	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]
Provincial GDP per capita				0.009	0.011	0.005
				[0.020]	[0.019]	[0.020]
% of formal employment in province				0.406***	0.405***	0.435***
				[0.059]	[0.061]	[0.064]
Number of observations	62,955	62,955	62,955	62,955	62,955	62,955

GDP = gross domestic product, GVC = global value chain, HH = household.

Notes: Standard errors are in brackets. *, **, and *** denote statistically significant at the 10%, 5%, and 1% levels, respectively. GVC participation, GVC position, backward participation, and forward participation at the provincial level are calculated based on equation 7 (columns 1, 2, and 3) and equation 6 (columns 4, 5, and 6). We control for province dummies, and year dummies in all specifications (i.e. provincial fixed effects and time fixed effects).

Source: Authors' estimation.

Finally, our results show that a greater number of people in the family working as formal employees helps an individual become a formal employee. A reason for this result could be that family members help each other to access formal jobs.

The results in columns 4, 5, and 6 show that when we control for provincial level variables (provincial per capita GDP) and the share of formal employment (in the total provincial labour force), the effects of variables indicating the GVC engagement at the provincial level – including GVC participation, GVC position, and backward and forward participation – lose their significance. Meanwhile, individuals living in provinces with a larger share of formal employment have a higher probability of becoming formal employees. This result, together with the results we present in Table 4, suggest that GVC engagement at the provincial level does not have a direct effect, but only an indirect effect through the local labour market (i.e. through the share of formal employment at the provincial level) on the chance of becoming a formal employee.

Our estimation results also show that the effects of individual and household characteristics are not only changed in terms of magnitude and significance. This suggests that individual and household characteristics play an important role in the likelihood of being a formal employee.

Table 6 reports our robustness check. The structure of this table is similar to that of Table 6. In this table, we use the approach of Topalova (2010) to measure GVC engagement at the province level. The results presented in Table 6 are consistent with the results reported in Table 5. First, GVC engagement variables are only statistically significant when we do not control for provincial level data (i.e. provincial per capita GDP and the share of formal employment at the provincial level). Second, all individual and household characteristics have statistically significant effects on the likelihood of becoming a formal employee. Furthermore, the magnitude is quite consistent in all specifications and not significantly different from the results presented in Table 5.

Table 6: Effect of GVCs on the Likelihood of Becoming a Formal Employee (Marginal Effects) Robustness Check

Independent variables	(1)	(2)	(3)	(4)	(5)	(6)
GVC participation	0.367***			0.312		
	[0.030]			[0.300]		
GVC position		1.024***			-0.393	
		[0.319]			[0.703]	
Backward participation			0.736***			0.345
			[0.230]			[0.560]
Forward participation			-0.020			0.284
			[0.243]			[0.490]
Living in urban area	0.053***	0.058***	0.052***	0.055***	0.055***	0.055***
	[0.002]	[0.002]	[0.002]	[0.003]	[0.003]	[0.003]
Education	0.034***	0.034***	0.034***	0.034***	0.034***	0.034***
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
Age	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***	-0.002***
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
Gender (male = 1)	-0.017***	-0.017***	-0.017***	-0.017***	-0.017***	-0.017***
	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]	[0.002]
HH size	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***	-0.004***
	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]	[0.001]
% of HH members having formal work	0.429***	0.438***	0.429***	0.401***	0.401***	0.401***
	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]	[0.008]
Provincial GDP capita				0.006	0.011	0.006
				[0.020]	[0.019]	[0.020]
% of formal employment in province				0.415***	0.396***	0.413***
				[0.059]	[0.060]	[0.062]
N	62,955	62,955	62,955	62,955	62,955	62,955

GDP = gross domestic product, GVC = global value chain, HH = household.
Notes: Standard errors are in brackets. *, **, and *** denote statistically significant at the 10%, 5%, and 1% levels, respectively. GVC participation, GVC position, backward participation, and forward participation at the provincial level are calculated based on equation 7 (columns 1, 2, and 3) and equation 6 (columns 4, 5, and 6). We control for province dummies and year dummies in all specifications (i.e. provincial fixed effects and time fixed effects).
Source: Authors' estimation.

6. Concluding Remarks

International trade has been viewed as a key driver of economic growth and thus contributed to the reduction of informality in the economy (Sinha, 2014). However, the share

of informal employment has been persistent in many developing countries over recent decades and even increased in some countries. The relationship between international trade and informal employment has become more complicated with the emergence of GVCs.

This study attempted to quantitatively investigate the impacts of integration into GVCs on informal and formal employment in Viet Nam. Using the VHLSS for 2010, 2012, and 2014 and the OECD's World Input–Output Tables, the study examined how engagement in the GVCs affects informal and formal employment in Viet Nam. We used several indicators of GVCs engagement – such as GVC participation, GVC position, and backward and forward participation – and examined how such indicators are related to the share of formal employment at the provincial level as well as how they affect the decision to become a formal employee at the individual level.

Our estimation results show a positive relationship between the level of GVC participation and the share of formal employment at the provincial level. However, the results suggest that the relationship is not simple but depends on the direction of participation. While the GVC participation index (the sum of backward participation and forward participation) does not have a statistically significant effect on the share of formal employment at the province level, each component of GVC participation (i.e. backward and forward participation) has effects at the provincial level in different directions. Backward participation has a positive effect on the share of formal employment. Meanwhile, forward participation has a negative relationship with the share of formal employment. This, coupled with the positive relationship between the GVC position and the share of formal employment, implies that provinces that are more engaged in the downstream value chain have a higher share of formal employment. The results support previous studies which show that the effect of trade liberalisation on informal employment depends on the nature of international trade (Bacchetta, Ernst, and Bustamante, 2009).

We find that at the individual level, engagement in the GVCs at the provincial level is also positively correlated with being formally employed. However, our estimation results suggest that GVC engagement does not directly affect the likelihood of becoming a formal employee. The relationship is indirect, through the local labour market. Individuals living in provinces with a higher share of formal employment, which is partly determined by the level of GVC engagement, have a higher chance of being a formal employee. Our results also indicate that individual and household characteristics (such as education, gender, age, or household size) and the share of household members working formally are the main determinants for achieving formal employment. Most such determinants are consistent with the literature on formality of the labour force, such as individual age and education. In Viet Nam, men tend to have a lower

chance of becoming formally employed than women. The reason could be the rapid growth in the light industries, which are more likely to recruit female workers than male workers.

This study provides several important policy implications for the role of GVC participation in increasing the formality of employment in developing countries. First, the relationship between trade liberalisation and formality of employment is complex and depends on the nature of the trade relations. Engagement in the GVCs is important for formality, but the GVC position is equally important for reducing informality. Second, trade policies are not sufficient for reducing formality. Other policies, such as education policy, are also of interest. The Trans-Pacific Partnership agreement carries certain provisions on labour laws, including the freedom to form labour unions. Strengthening labour rights could also help to increase formal employment.

The study suffers from some limitations but offers suggestions for further studies, especially at the individual level. First, because of the structure of the data, we do not have panel data at the individual level. Having such data would allow us to further understand the role of GVC participation in the dynamics of formality of employment, given the time-invariant nature of some time-invariant individual characteristics. Second, this study does not look at the different effects of GVC engagement on the likelihood of being a formal employee by the skill level of the individual. Different groups of individuals may have been affected by GVC engagement differently because of the nature of GVC participation. The research agenda ahead is still long, but additional efforts are worthwhile. Efforts to increase economic integration have recently come under threat and even be reversed by some developed countries. A better understanding of globalisation will enable us to design policies that ensure that globalisation is as inclusive as possible and remains a key engine for economic and human development.

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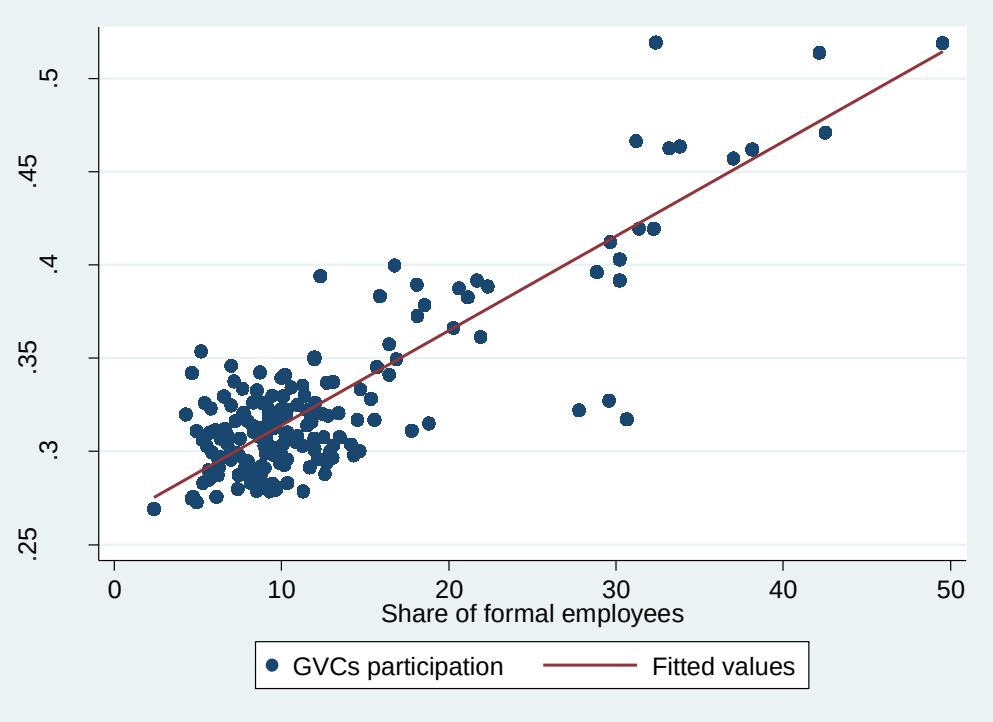
Appendix

Appendix 1a: Correlation Between GVC Participation and Formal Employment in Viet Nam

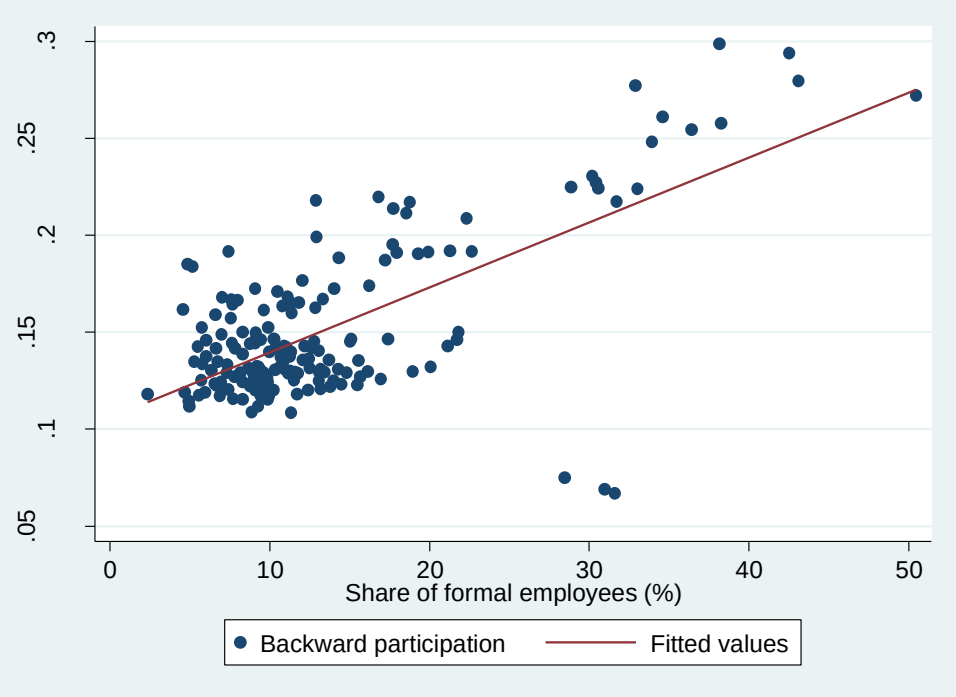


GVC = global value chain.
Source: Authors' calculation.

Appendix 1b: Correlation Between GVC Position and Formal Employment in Viet Nam

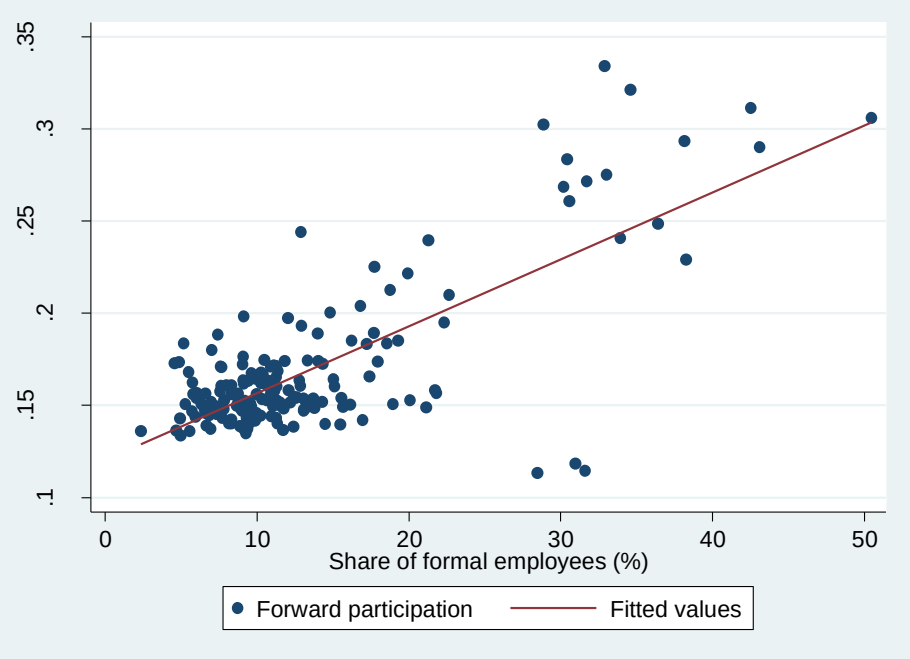
GVC = global value chain.
Source: Authors' calculation.

Appendix 1c: Correlation Between Backward Participation and Formal Employment in Viet Nam



GVC = global value chain.
Source: Authors' calculation.

Appendix 1d: Correlation Between Forward Participation and Formal Employment in Viet Nam



GVC = global value chain.
Source: Authors' calculation.

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