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Value Added Exports and the Local Labour Market: Evidence from Vietnamese Manufacturing Firms[§]

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Abstract: *The formation of global value chains (GVCs) has reshaped production processes across countries. This paper investigates the relationship between GVCs and firms' employment by using panel data on Vietnamese small manufacturing firms for 2005–2011. The results suggest that increased foreign value added in exports results in higher wages, increased productivity, and a greater share of production workers in domestic small and medium-sized enterprises. In addition, it brings about a lower share of professionals and makes smaller firms retrain their existing workers. At the same time, domestic value added in the export of intermediate products has negative impacts on employment and increases wages, particularly in medium-sized firms. All of these may come from the increased competition for labour from larger firms.*

***Keywords*:** Trade, small and medium-sized enterprises, global value chain, Viet Nam

***JEL Classification*:** F16, O24

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Highlights

- Higher foreign value added in total exports leads to higher wages, increased productivity, and greater share of production workers in small firms
- Higher foreign value added in total exports lowers the share of professionals and makes smaller firms retrain their existing workers
- Higher domestic value added in total exports of intermediate products has negative impacts on employment and leads to higher wages, especially for medium-sized firms

1. Introduction

The increasing international fragmentation of production that has occurred in recent decades has challenged the conventional wisdom on how we look at and interpret trade. The traditional way of measuring international trade based on gross trade flows (exports and imports) fails to reflect the complexities of the global supply chain, where the design, manufacturing, and assembly of products involve many countries (Cattaneo et al., 2013; Organisation for Economic Co-operation and Development (OECD) and World Trade Organization (WTO), 2012). Furthermore, since many countries have developed comparative advantages in specific parts of the value chains – not necessarily on final goods – standard trade statistics may present an inaccurate picture of the importance of trade to economic growth and employment.

For emerging and developing countries, small and medium-sized enterprises (SMEs)[1] account for two thirds of formal non-agricultural private employment (WTO, 2016). The fragmentation of production has created new opportunities for developing economies and SMEs to access global markets as components or services suppliers, without having to build the entire value chain of a product. Even if they cannot participate directly in global value chains (GVCs), they can benefit from subcontracting for incumbent firms or foreign companies.

[1] The definition of SMEs in this study is based on the World Bank classification. The World Bank divided firms into three groups: micro-, small-, and medium-scale. Micro-enterprises have up to 10 employees, small-scale enterprises have up to 50 employees, and medium-sized enterprises have up to 300 employees.

Despite their importance for developing economies, the effects of GVCs on SME employment are understudied because of the difficulty of obtaining data on intra-network transactions. Most of the extensive research that has been carried out in other disciplines on GVCs and related concepts tends to be based on case studies, rather than data and quantification (Shepherd, 2013).

Banga (2016) examined the industry-level impact of linking into GVCs for the Indian labour market, spanning 1995–2011. Using methodologies of fixed effects and the generalised method of moments estimations, Banga analysed the employment impacts of value added, which are foreign value added (FVA) in exports (backward linkages) and domestic value added (DVA) in exports of intermediate goods and services (forward linkages). The results showed that while backward linkages have negatively impacted employment in India, forward linkages did not have any statistically significant impact.

Jakubik and Stolzenburg (2018) used the value added decomposition of exports to study the United States (US) local labour market impact of increased trade with China. They found evidence that Chinese value added drives negative labour market impacts. Similarly, Shen and Silva (2018) investigated the effects of Chinese export value added on the US labour market. They showed that an increase in US exposure to value added exports from China has negative effects on the share of manufacturing employment in more downstream industries, while the same effect is not present in the case of low downstream industries. Their results also suggest that the effects of an increase in US exposure to value added exports from China – on average wages and unemployment levels – depend on the position of the Chinese industry in the GVC.

The purpose of this paper is to describe the evolution of GVCs in Viet Nam. At the same time, this study examines firm-level impacts by linking GVCs with Vietnamese small manufacturing firms. Viet Nam is not different from other countries, as its SMEs account for 98% of all enterprises, 40% of gross domestic product, and 50% of employment (Vietnam Briefing, 2017). In addition, Viet Nam has emerged as an Asian manufacturing powerhouse (Nakamura, 2016). Viet Nam grew its own DVA, embodied in gross exports, by 16.6% annually from 1995 to 2011, just below what had been achieved by China. Participation in GVCs also plays an important role in structural transformation, contributing to the creation of more productive, higher-

quality, and higher-earning jobs. Viet Nam is making GVCs more inclusive by moving up the value chain into higher value added functions (Hollweg, Sturgeon, and Taglioni, 2017). However, reaping the benefits of GVC integration does not come automatically, and the dynamics shaping the emergence and development of GVCs may also represent a threat to sustainable, quality employment, particularly for people without portable skills or who face labour market segmentation. GVC integration is also likely to have distributional impacts, both through employment effects as well as through effects on wages and working conditions (Farole, 2016).

This analysis uses a unique data set, combining the Viet Nam Small and Medium Enterprise (VSME) survey with trade in value added data to construct a panel for about 16 manufacturing industries, covering 2005–2011. The panel allows for a firm-level analysis of the causal relationship between GVCs and employment, while controlling for firm and time fixed effects. Particularly, this paper analyses the employment impact of FVA in exports (backward linkages) and DVA in exports of intermediate goods and services (forward linkages). The analysis also attempts to break down the available results according to skill level, which makes it possible to look not just at aggregate effects on employment levels and payments received by workers, but also at issues such as changes in labour composition (skilled and unskilled labour), labour productivity, training, and female workers. The results suggest that FVA in exports results in higher wages, increased productivity, and a greater share of production workers in domestic SMEs. In addition, it brings about a lower share of professionals and makes smaller firms retrain their existing workers. At the same time, DVA in exports of intermediate products has negative impacts on employment and increases wages, particularly in medium-sized firms. All of these may result from increased competition for labour from larger firms.

This study is expected to add to the existing literature in two important ways. First, it supplements the few empirical studies that estimate the effects of GVCs on labour demand using firm-level data. Second, it provides evidence on the effects of GVCs on different aspects of SME employment such as wages, employment, labour composition, and productivity in Viet Nam.

The paper is organised as follows. Section 2 begins by describing the trends of trade in value added in Viet Nam's manufacturing sector. Section 3 illustrates the

conceptual framework. Section 4 discusses our data, along with descriptive analyses of trends in the main variables, while section 5 presents the empirical strategy and estimation results. Section 6 summarises the key findings and concludes.

2. Trade in Value Added by Small Manufacturing Firms

2.1. Trade in Value Added in the Manufacturing Sector

Since 'Doi Moi', Viet Nam has actively participated in international economic integration and increased access to foreign markets for socio-economic development.[2] It signed a trade agreement with the European Union in 1992; and joined the Association of Southeast Asian Nations (ASEAN) and the ASEAN Free Trade Area in 1995, and Asia-Pacific Economic Cooperation (APEC) in 1998. The process of economic integration has accelerated since 2000, when Viet Nam and the United States signed a bilateral trade agreement. That was Viet Nam's first comprehensive trade agreement, which brought higher levels of trade and investment liberalisation. Accession to the WTO in 2007 and the negotiation and implementation of a number of regional free trade agreements continued to strengthen the confidence of both the domestic and international investor community regarding Viet Nam's trade liberalisation and international integration.[3]

Figure 1: Viet Nam's Exports and Imports, 2005–2015

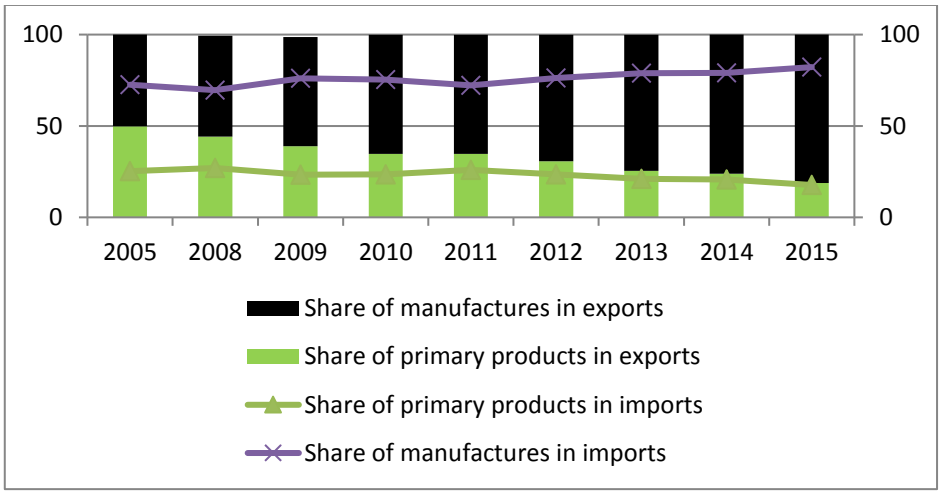
[2] 'Doi Moi' refers to the economic reforms initiated in Viet Nam in 1986 to transform its centrally planned economy to a socialist-oriented market economy.

[3] These free trade agreements include the ASEAN–Australia–New Zealand Free Trade Agreement, the ASEAN–Japan Comprehensive Economic Partnership Agreement, the formation of the ASEAN Economic Community, the Comprehensive and Progressive Agreement for Trans-Pacific Partnership, the European Union–Vietnam Free Trade Agreement, and the Regional Comprehensive Economic Partnership.

Source: General Department of Vietnam Customs.

As a result of liberalisation, international trade had been expanding rapidly. As shown in Figure 1, exports grew at an average annual rate of 26.4% from 2005 to 2015, while imports grew by 22.5% over the same period, increasing the share of trade turnover to nearly 170% of gross domestic product in 2015. The effects of the global financial crisis and economic recession led to a drop in import and export growth in 2009, before their recovery in the following years.

Figure 2: Composition of Merchandise Trade (%)



Notes:
1. The share of primary products in exports and the share of manufactures in exports are presented on the left-hand axis.
2. The share of primary products in imports and the share of manufactures in imports are presented on the right-hand axis.

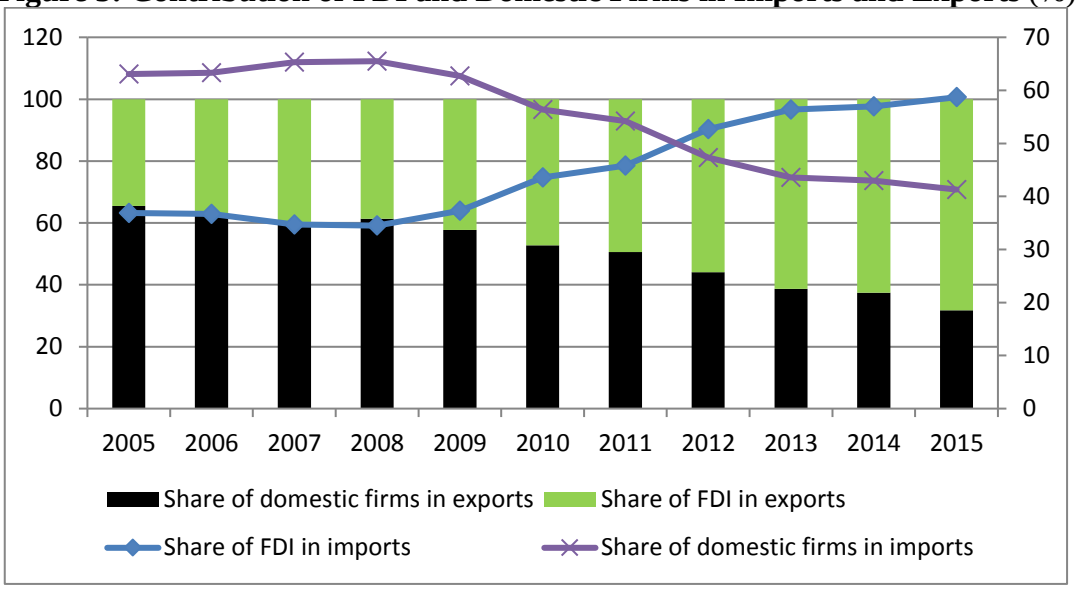
Source: General Statistics Office of Viet Nam.

As for exports, manufactured goods accounted for 50.3% in 2005 (Figure 2). Their share increased to 81.3% by 2015, mainly attributable to the expansion of light industrial and handicraft exports, in particular textiles and garments, footwear, and electronic products. Primary commodities decreased their share in exports from 49.7% to 18.7% in the same period, primarily owing to the decline in all food items and the decreased exports of fuels. Manufactures accounted for about 82.2% of Viet Nam's total merchandise imports in 2015, up from 72.5% in 2005. According to data from the General Statistics Office of Viet Nam (GSO), the main components of imports were iron and steel, ores, metals, fuels, machines and devices, and electronic and computer spare parts. The dependency on imports of industrial raw materials and equipment, whose ratio to imports is about 90%, reflects the low level of Vietnamese industrial development and low international competitiveness in capital goods.

At the same time, an important cause of Viet Nam's rapid growth in recent years has been the interrelated increases in international trade and multinational corporations (MNCs) (Dollar and Kraay, 2004). According to Athukorala (2006), whose paper examined the role of MNCs in the expansion of manufacturing exports from newly industrialised countries (the Republic of Korea, Taiwan, and Hong Kong) and latecomer exporting countries in Asia (including Viet Nam), there is a close positive relationship between the entry of MNCs and export growth.[4] MNCs have been responsible for a larger share of exports from latecomers to export-led industrialisation in Asia than the historical experience of East Asian newly industrialised countries.

[4] On average, the 1% increase in the share of foreign firms in total manufacturing exports is associated with a 0.96% increase in the degree of penetration of these countries in world manufacturing markets (Athukorala, 2006).

Figure 3: Contribution of FDI and Domestic Firms in Imports and Exports (%)



FDI = foreign direct investment.
Notes:
1. The share of FDI in exports and the share of domestic firms in exports are presented on the left-hand axis.
2. The share of FDI in imports and the share of domestic firms in imports are presented on the right-hand axis.
Source: General Department of Vietnam Customs.

Figure 3 indicates that foreign firms emerge as an important exporter. Their share in total exports increased from 34.5% in 2005 to 68.2% in 2015. This trend follows a boom in export-led foreign direct investment projects. The increased share of MNCs in exports which correspond to a larger export value – such as clothing and footwear; and electronics, parts, and component assembly – is important since it is initially labour-intensive but becomes skill-intensive as the country moves up the value chain, and the role of MNCs is relevant in terms of knowledge spillover. According to Viet Nam's Enterprise Census, the ratio of foreign firms' exports is about 60% of total sales in 2014. The share of imports by foreign firms also increases in the same period, from 36.9% in 2005 to 58.7% in 2015. Most increased imports were inputs for production, such as raw materials, machines, and equipment. This reflects the fact that foreign firms are taking advantage of cheap labour and financial incentives to assemble and export their products, especially in textiles, footwear, and electronics.

2.2. Trade in Value Added by SMEs

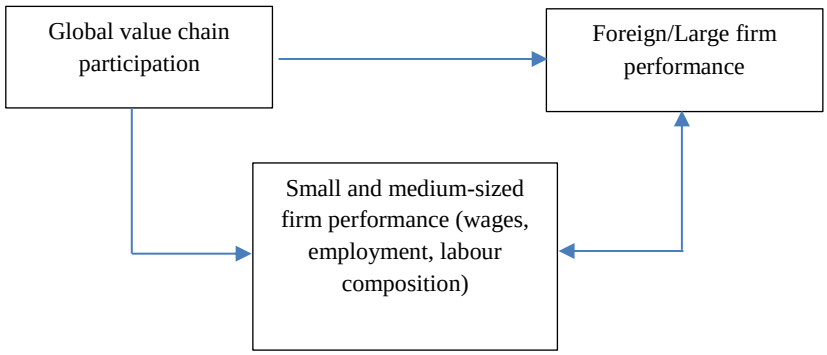
SMEs and private firms are seen as the engine of Viet Nam's economic growth and have shown impressive growth. According to the GSO, the number of enterprises in the manufacturing sector increased three times during 2003–2013 (GSO, 2007; 2014). Non-state enterprises accounted for about 59.3% of total business employment in 2013 – a threefold increase from 2003. The number of workers in the manufacturing sector increased from 2.6 million in 2003 to 5.3 million in 2013 (Central Institute for Economic Management (CIEM) et al., 2016). However, the Vietnam Chamber of Commerce and Industry reported that most SMEs cannot access the world market, and only 21% of them can participate in GVCs (Vietnamnet, 2017). Difficulties in gaining access to credit, as well as lack of technology and management skills, are major barriers preventing them from joining supply chains. Links amongst producers and distributors in supply chains are weak, making it more difficult for Vietnamese firms to participate in foreign markets. According to the Vietnam Small and Medium Enterprise survey, only 6% of local firms have exports and more than half of them export indirectly to foreign markets. Only about 3% of firms directly import materials from foreign markets for their businesses.

3. Conceptual Framework

GVCs may affect SMEs through different channels and perspectives. First, GVC participation increases demand for skilled labour, especially in developed countries, to provide specialised services such as research and development and branding. At the same time, labour-intensive manufacturing activities have been outsourced to developing countries with cheap labour costs, which could increase low-skilled jobs in developing countries (Taglioni and Winkler, 2016). Jiang and Milberg (2013) found that the jobs created as a result of trade in GVCs accrue more to low- and medium-skilled workers than high-skilled labour. Of the jobs generated globally by GVCs in 2009, they found that only 13% were high-skilled while 44% were medium-skilled and 43% were low-skilled. Second, women may benefit from GVCs because a large share of jobs is created when firms participate in labour-intensive value chains. Almost

all sectors most intensely traded in GVCs – such as apparel, footwear, and electronics – have a large share of lower-skilled, young, female workers (WTO et al., 2019). Third, the labour market may work more effectively as a result of higher competition in demand for labour. This reduces the job-seeking time and increases employment matching and stability in the labour market. Fourth, the shift in labour composition has been accompanied by changes in wages and the bargaining power of workers, especially low-skilled workers. Participation in a GVC can lead to the creation of better jobs through higher wages and better working conditions, as firms seek to comply with global standards on health, safety, and treatment of workers (WTO et al., 2019). GVC participation also promotes learning and skills development. Lead firms in GVCs provide training in technology and skill development to SME firms (Gyeke-Dako et al., 2017), while knowledge from the labour force of participating firms disperses to other local firms. Learning effects also occur as employees use more sophisticated technology (MacGarvie, 2006). All of these contribute to increased productivity and higher wages.

Figure 4: Impact of Global Value Chains on Labour Market



Source: Author's compilation.

However, if SMEs do not have the capacity to engage in GVCs, they may suffer negative impacts from GVCs. First, SMEs may have to compete with imported substitution products. Second, large firms or MNCs may compete with SMEs to attract employees, so the number of employees in SMEs may decrease. Higher demand for

labour pushes up market wages, which increases the production costs of SMEs. This may make small and less competitive firms close down or reduce their employment. In addition, more efficient firms survive and tend to be more skill-intensive. This results in an increase in the relative demand for high-skilled workers, widening the wage gap between low- and higher-skilled workers (Helpman, Itskhoki, and Redding, 2010). Therefore, whether SMEs can take advantage of GVC integration depends on their competitiveness as participants in the GVCs.

4. Empirical Methodology

4.1. Data Description

Trade in Value Added Data

To understand the impact of trade in GVCs, trade in value added data are measured by two types of trade flows: backward and forward linkages. The Trade in Value Added (TiVA) database launched by the OECD and the WTO in 2016 provides the source for 2005–2011.[5] Data collected from TiVA are matched to enterprise surveys for 16 manufacturing industries, using concordance matrices, and then used to analyse the impact of increasing GVC linkages on employment across all sectors.

In the TiVA database, backward linkage is defined as FVA embodied in gross exports, which reflects the FVA content of intermediate imports embodied in gross exports (i.e. other countries' DVA in intermediates used in exports). Forward linkage is defined as the DVA in the gross exports of intermediate products that can become part of the exports or consumption of a partner country, as a share of gross exports.

Table 1: Share of Foreign Value Added Embodied in Total Exports of Manufacturing Sector

Sectors	2005	2007	2009	2011

[5] TiVA statistics should be treated with great caution. As Nenci (2014) points out, the high level of industry aggregation in TiVA limits its analytic usefulness and can lead to erroneous interpretations if not supplemented by additional research. However, it is the best available data set to date.

C17T19: Textiles, textile products, leather, and footwear	49.69	53.11	42.91	37.47
C20: Wood and products of wood and cork	44.37	45.90	39.88	43.23
C20T22: Wood, paper, paper products, printing, and publishing	44.29	45.29	40.13	42.72
C21T22: Pulp, paper, paper products, printing, and publishing	44.04	44.05	40.60	41.32
C23: Coke, refined petroleum products, and nuclear fuel	65.53	57.37	56.84	58.21
C23T26: Chemicals and non-metallic mineral products	60.14	58.17	53.66	57.72
C24: Chemicals and chemical products	67.25	68.86	61.04	64.07
C25: Rubber and plastics products	59.30	58.67	53.89	60.44
C26: Other non-metallic mineral products	48.51	41.93	35.63	38.44
C27: Basic metals	73.31	71.71	65.94	68.39
C27T28: Basic metals and fabricated metal products	62.82	64.30	60.80	64.48
C28: Fabricated metal products	57.52	61.12	54.15	58.73
C29: Machinery and equipment	66.09	70.57	69.30	71.10
C30T33: Electrical and optical equipment	59.82	68.70	66.46	69.16
C30T33X: Computer, electronic, and optical equipment	60.53	70.74	68.08	70.40
C31: Electrical machinery and apparatus	58.69	65.63	64.07	66.39
C34: Motor vehicles, trailers, and semitrailers	54.87	55.10	51.54	55.05
C34T35: Transport equipment	55.64	56.31	53.92	58.01
C35: Other transport equipment	56.17	60.97	55.73	59.74
C36T37: Manufacturing; recycling	45.53	39.29	34.76	37.75
C40T41: Electricity, gas, and water supply	15.92	11.39	10.45	11.28
Average	**54.76**	**55.68**	**51.42**	**54.00**

Source: Author's calculations from Organisation for Economic Co-operation and Development–World Trade Organization, Trade in Value Added (TiVA) database. https://stats.oecd.org/Index.aspx?DataSetCode=TIVA_NOWCAST (accessed 24 July 2017).

Table 1 shows the pattern of FVA in the total exports of the manufacturing sector. As can be seen, the largest sources of FVA in exports in 2011 are in machinery and equipment. The figures show the highest growth in the share of FVA in electrical and optical equipment, from 59.8% in 2005 to 69.2% in 2011; and computer, electronic, and optical equipment, from 60.5% in 2005 to 70.4% in 2011. The share of FVA in textiles, textile products, leather, and footwear increases in the first year and then declines over time, from 49.7% in 2005 up to 54.4% in 2006 and down to 37.5% in 2011. This shows the relative expansion in the domestic value content of Vietnamese exports in these products. In general, although the manufacturing sector accounts for a large share of exports, domestic value made moderate contributions to the value added of exports.

Table 2: Share of Domestic Value Added in Exports of Intermediate Products Embodied in Total Exports

Sectors	2005	2007	2009	2011
C17T19: Textiles, textile products, leather, and footwear	14.06	14.33	15.32	18.34
C20: Wood and products of wood and cork	52.53	51.26	56.97	53.81
C20T22: Wood, paper, paper products, printing, and publishing	50.43	47.18	53.03	51.96
C21T22: Pulp, paper, paper products, printing, and publishing	44.34	38.96	45.76	46.86
C23: Coke, refined petroleum products, and nuclear fuel	16.84	22.46	30.21	28.11
C23T26: Chemicals and non-metallic mineral products	32.60	34.93	37.81	33.95
C24: Chemicals and chemical products	24.53	23.63	29.86	27.87
C25: Rubber and plastics products	35.91	35.98	39.59	33.83
C26: Other non-metallic mineral products	46.81	53.58	59.83	57.36
C27: Basic metals	25.63	27.59	33.45	30.24
C27T28: Basic metals and fabricated metal products	26.16	30.92	32.35	29.18
C28: Fabricated metal products	26.43	32.35	30.94	27.63
C29: Machinery and equipment	13.52	14.10	16.16	14.21
C30T33: Electrical and optical equipment	23.48	18.36	19.38	18.25
C30T33X: Computer, electronic, and optical equipment	21.91	16.62	17.44	17.02
C31: Electrical machinery and apparatus	25.96	20.99	22.26	20.96
C34: Motor vehicles, trailers, and semitrailers	22.83	16.25	24.32	22.68
C34T35: Transport equipment	21.72	16.50	22.54	19.63
C35: Other transport equipment	20.95	17.47	21.19	17.86
C36T37: Manufacturing; recycling	17.94	20.32	27.56	26.37
C40T41: Electricity, gas, and water supply	5.90	5.83	0.99	0.46
Average	**27.16**	**26.66**	**30.34**	**28.42**

Source: Author's calculation from Organisation for Economic Co-operation and Development–World Trade Organization, Trade in Value Added (TiVA) database. https://stats.oecd.org/Index.aspx?DataSetCode=TIVA_NOWCAST (accessed 24 July 2017).

The DVA in the gross exports of intermediate products that can become part of the exports or consumption of a partner country, as a share of gross exports, is presented in Table 2. It is important to note that while gross exports have grown substantially, the growth of forward linkages has been much slower. In fact, for some sectors, the share of DVA in the gross exports of intermediate goods and services fell considerably in 2005–2011, such as in electrical and optical equipment and computer, electronic, and optical equipment. The figures in Table 2 reveal that DVA for electrical and optical equipment fell by almost 5.2 percentage points. Similar results can be seen

for computer, electronic, and optical equipment. The fall in DVA of this sector has been smaller – about 5 percentage points.

Employment Data

This study uses two enterprise surveys – the VSME survey and the Enterprise Census – for the empirical analysis. This section describes the two surveys and the sample selection.

A. VSME Sample

The VSME survey is conducted every 2 years to assess the characteristics of Viet Nam's business environment.[6] The survey is conducted in 10 provinces: Ho Chi Minh City, Hanoi, Hai Phong, Long An, Ha Tay, Quang Nam, Phu Tho, Nghe An, Khanh Hoa, and Lam Dong. The population of manufacturing enterprises is based on the Establishment Census in 2002 and the Industrial Survey, 2004–2006. The random sample was stratified by ownership type to include household establishments, private enterprises, collectives or cooperatives, and limited liability and joint stock companies. It includes only firms active in the manufacturing sector and with less than 300 employees. However, the survey may over-sample micro and household firms. In total, the panel data cover the micro-information of about 1,230 businesses in 22 manufacturing industries over 2005–2011, including food products, textiles, basic metals, other non-metallic products and apparel, and wood processing.

The surveys' section on employment includes detailed information on wages, the number of workers, labour productivity, the share of skilled and unskilled workers, the percentage of female workers, the stability of the labour force, on-the-job training, job rotation, difficulties in recruiting workers with the required/appropriate skills, and contributions to social insurance and other benefits.[7]

Table 3: Descriptive Statistics of Employment Variables

[6] The survey was conducted in collaboration between the CIEM of the Ministry of Planning and Investment; the Institute of Labour Science and Social Affairs of the Ministry of Labor – Invalids and Social Affairs; the Development Economics Research Group of the University of Copenhagen; and the United Nations University World Institute for Development Economics Research (UNU-WIDER).

[7] Variables used in the analysis are defined in the Appendix.

(Viet Nam Small and Medium Enterprise Survey)

Variables	2005	2007	2009	2011
Log of real wage	1.91	1.31	1.47	1.80
	(0.73)	(0.67)	(0.73)	(0.66)
Log of labour productivity	3.94	3.52	3.49	3.75
	(1.01)	(0.85)	(0.94)	(0.95)
Log of total labour force	2.00	2.02	2.03	1.91
	(1.11)	(1.14)	(1.17)	(1.14)
Share of female labour force	0.36	0.36	0.37	0.37
	(2.75)	(0.27)	(0.26)	(0.26)
Share of professionals	0.01	0.03	0.03	0.03
	(0.04)	(0.06)	(0.06)	(0.07)
Share of production workers	0.53	0.66	0.66	0.62
	(0.27)	(0.20)	(0.20)	(0.22)
Training for existing workers	0.05	0.06	0.04	0.06
	(0.22)	(0.24)	(0.19)	(0.24)
Job rotation	0.28	0.15	0.07	0.12
	(0.45)	(0.35)	(0.25)	(0.32)

Note: Wage and productivity variables are deflated using annual gross domestic product deflators.
Source: Author's calculations from the Viet Nam Small and Medium Enterprise Surveys, 2005–2011.

Table 3 reports the summarised statistics of employment variables for the VSME sample. Real wages decreased in 2007 and recovered in 2009 and 2011. Labour productivity – measured by the total firm's output over the number of employees – also declines in 2005–2009. The share of female workers is almost unchanged in 2005–2011 and accounts for 36%. Only 5% of local firms conduct training for existing workers in the same period.

B. Enterprise Census Sample

The GSO conducts Viet Nam's Enterprise Census annually. It is a national survey compiled across all 63 provinces and is used as part of the GSO's national accounts determination. The survey takes a census of firms with more than 30 employees and a representative sample of firms with less than 30 employees. However, to focus on small domestic manufacturing firms, this analysis is limited to SMEs with less than 300 employees.

Table 4: Descriptive Statistics of Employment Variables (Enterprise Census)

Variables	2005	2007	2009	2011
Log of real wage	1.81	2.40	3.06	3.64
	(0.73)	(0.71)	(0.61)	(0.76)
Log of labour productivity	3.97	4.52	5.00	5.64
	(1.40)	(1.26)	(1.37)	(1.39)
Log of total labour force	3.35	3.34	3.67	3.33
	(1.17)	(1.15)	(1.16)	(1.20)
Share of female labour force	0.34	0.29	0.30	0.32
	(0.23)	(0.21)	(0.21)	(0.21)

Note: Wage and productivity variables are deflated using annual gross domestic product deflators.
Source: Author's calculation from Enterprise Census, 2005–2011

The employment variables from the Enterprise Census sample are reported in Table 4. The evolution of employment variables is similar to those in the VSME sample, except real wages and labour productivity. The figures in Table 4 show that real wages and productivity increase over time. One possible explanation for these differences is the sampling between the two surveys. The VSME survey contains more micro- and informal enterprises whereas the Enterprise Census includes more SMEs.

4.2. Empirical Model

This paper's econometric specification, which considers the effects of GVCs in employment and wage levels, is represented by the following equation:

$$y_{ijt} = \alpha + \beta TradeVA_{jt-1} + X'_{ijt}\tau + \lambda_i + \theta_t + \varepsilon_{ijt} \quad (1)$$

where y_{ijt} is the firm-level outcome of interest of firm *i* in industry *j* at time *t*, and $TradeVA_{jt-1}$ is the trade in value added of industry *j* at time *t-1*. β is the coefficient of this study's main measures, which indicates the relationship between GVCs and firms' employment outcomes. The main variable is included in the estimated

specification with a one-period lag to reduce potential simultaneity bias. At the same time, it reflects the possibility that firms' employment does not react immediately to trade shocks. The term X is a vector of interaction of dummies of firm sizes and trade in value added. λ_i and θ_t are firm and year dummy fixed effects, of which year dummies capture time-specific factors that are common to all firms while firm dummies control for time-invariant firm-specific characteristics. Standard errors are clustered by firm levels.

The challenge in estimating these equations is potential endogeneity between outcome variables and the trade in value added variables. The source of this endogeneity could be due to omitted variable biases. It is possible that unobserved characteristics of the firms will correlate with trade in value added variables and affect the firms' employment. Using firm-level fixed effects eliminates the potential for any time-invariant characteristics of firms to act as confounding factors in our analysis. Of course, it is possible that some omitted time-varying variable biases remain. However, with our main explanatory variable at the industry level and lagged by one period, we expect these potential biases to be small.

5. Empirical Results

The effects of trade linkages on firm employment shown in equation (1) are expected to have a different direction. The impact of higher backward linkages is expected to depend on the kind of backward linkages formed. If the FVA in exports leads to increases in total exports, by complementing the domestic firms, it may lead to higher demand for labour and wages in an industry. However, if it substitutes domestic production, it can lead to lower labour demand.

Table 5 presents the results of our analysis of the impact of FVA in total exports on different employment outcomes. All models include time dummies. To deal with potential contamination of the models by unobservable firm characteristics that may correlate with both trade in value added variables and employment outcomes, we use fixed effects estimation to control for potential time-invariant firm-specific omitted variables that may bias our results.

Table 5: Effects of Backward Linkages on Employment Outcomes
(Viet Nam Small and Medium Enterprise Survey)

Variable	(1) Ln(Real wage)	(2) Ln(Labour productivity)	(3) Ln(Employment)	(4) Share of Female workers	(5) Share of Professionals	(6) Share of Production workers	(7) Training existing workers	(8) Job rotation
Backward linkages	0.187**	0.007	0.064	0.020	-0.000	0.104***	-0.005	0.047
	(0.089)	(0.097)	(0.083)	(0.030)	(0.009)	(0.034)	(0.039)	(0.068)
Observations	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600
R-squared	0.216	0.143	0.009	0.003	0.048	0.160	0.005	0.095
Number of firms	1,229	1,229	1,229	1,229	1,229	1,229	1,229	1,229
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:
1. Standard errors in parentheses are robust to heteroscedasticity and clustered at the firm level.
2. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels.

Source: Author's calculation from the Viet Nam Small and Medium Enterprise Surveys, 2005–2011.

In the first column, the estimated coefficients for backward linkages are positive and significant. These indicate that FVA in exports increases wages. The coefficients suggest that a 10 percentage point increase in FVA in total exports is associated with a 1.9% increase in wages. The effects of FVA on wages may be either through higher demand for labour from small firms or more competition from larger firms in attracting labour, which increases wages. The results shown in columns (2) and (3) indicate that backward linkages have positive effects on the productivity and size of employment, although the signs of the coefficients are not statistically significant. This shows that higher wages may come from higher demand for labour from larger firms. All of these are consistent with the hypothesis that FVA in exports complements the domestic sector and increases domestic employment and wages through expanding country exports.[1] These results are also consistent with other empirical studies, which document that firms participating in trade tend to be more productive, larger, and pay higher wages (e.g. McCaig and Pavcnick, 2018).

The estimated coefficient in column (6) shows that backward linkages increase the share of production workers. This indicates that small firms can only participate in low value added chains and low-skilled jobs. However, there is no evidence of the impact of backward linkages on job training and rotation.

[1] The increase in FVA in total exports reflects that FVA grows faster than total exports.

Table 6: Effects of Forward Linkages on Employment Outcomes
(Viet Nam Small and Medium Enterprise Survey)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	**Ln (Real wage)**	**Ln (Labour productivity)**	**Ln (Employment)**	**Share of Female workers**	**Share of Professionals**	**Share of Production workers**	**Training existing workers**	**Job rotation**
Forward linkages	-0.014	0.059	-0.010	-0.015	-0.006	-0.051***	0.013	0.003
	(0.046)	(0.058)	(0.044)	(0.015)	(0.004)	(0.018)	(0.020)	(0.034)
Observations	3,600	3,600	3,600	3,600	3,600	3,600	3,600	3,600
R-squared	0.214	0.143	0.008	0.003	0.049	0.160	0.005	0.095
Number of firms	1,229	1,229	1,229	1,229	1,229	1,229	1,229	1,229
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:
1. Standard errors in parentheses are robust to heteroscedasticity and clustered at the firm level.
2. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels.

Source: Author's calculation from the Viet Nam Small and Medium Enterprise Surveys, 2005–2011.

The estimates of forward linkages are reported in Table 6. The results show that the forward linkages negatively affect wages and employment, but not significantly. Forward linkages only significantly affect the labour composition. The estimate reported in column (6) shows that forward linkages are associated with lower shares of production workers. A 10 percentage point increase in DVA in intermediate exports is associated with a 0.5 percentage point decrease in the share of production workers. This could be because higher DVA in exports of intermediate goods may hurt domestic firms, especially small ones, when they cannot compete with large firms or MNCs in purchasing fewer inputs. However, the impacts are rather small.

At the same time, firms may have different capacities in engaging in GVCs, depending on their size. Firms with less advanced technologies or small firms may find it hard to join GVCs. Therefore, larger domestic firms may benefit more from increasing imports because of their generally more sophisticated technology and business processes, while smaller firms benefit less. The estimates in column (1) of Table 7 show that micro and small manufacturing firms tend to suffer less from backward linkages than medium-sized firms, although the coefficients are insignificant. In addition, micro and small firms have a lower share of professionals and have to give more training to existing workers as participating GVCs.

The results in Table 8 show that the forward linkages do not have a significant impact on employment outcomes, except the interaction of dummies for small firms and the size of the employment share of female workers and job rotation. The increase in the share of DVA in the export of intermediate products leads to lower levels of employment in small firms than other firms. This indicates that employees in small firms can be hurt more when increased DVA in the export of intermediate products. However, in other estimation specifications, joining GVCs has small and insignificant effects on the composition of workers.

Table 7: Effects of Backward Linkages on Employment Outcomes by Firm Sizes (Viet Nam Small and Medium Enterprise Survey)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Variables	**Ln (Real wage)**	**Ln (Labour productivity)**	**Ln (Employment)**	**Share of Female workers**	**Share of Professionals**	**Share of Production workers**	**Training existing workers**	**Job rotation**
Backward linkages	0.340*	0.262	-0.114	-0.004	0.044*	0.106	-0.249*	0.247*
	(0.197)	(0.265)	(0.102)	(0.058)	(0.023)	(0.065)	(0.145)	(0.139)
Backward linkages × Micro firms	-0.278	-0.462*	0.173	0.019	-0.047**	-0.000	0.274*	-0.217
	(0.201)	(0.268)	(0.107)	(0.058)	(0.023)	(0.063)	(0.144)	(0.135)
Backward linkages × Small firms	-0.087	-0.084	0.156	0.031	-0.049**	-0.002	0.247*	-0.228*
	(0.178)	(0.248)	(0.097)	(0.055)	(0.023)	(0.061)	(0.146)	(0.125)
Dummy for micro firms	1.216	2.344**	-2.502***	-0.066	0.187**	-0.062	-1.018*	0.728
	(0.771)	(1.027)	(0.404)	(0.221)	(0.087)	(0.244)	(0.552)	(0.516)
Dummy for small firms	0.462	0.674	-1.642***	-0.113	0.198**	-0.028	-0.913	0.854*
	(0.679)	(0.956)	(0.368)	(0.212)	(0.086)	(0.238)	(0.562)	(0.480)
Observations	3,601	3,601	3,601	3,601	3,601	3,601	3,601	3,601
R-squared	0.219	0.166	0.488	0.003	0.054	0.163	0.010	0.100
Number of firms	1,230	1,230	1,230	1,230	1,230	1,230	1,230	1,230
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

1. Standard errors in parentheses are robust to heteroscedasticity and clustered at the firm level.
2. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels.

Source: Author's calculation from the Viet Nam Small and Medium Enterprise Surveys, 2005–2011.

Table 8: Effects of Forward Linkages on Employment Outcomes by Firm Sizes (Viet Nam Small and Medium Enterprise Survey)

Variables	(1) Ln(Real wage)	(2) Ln(Labour productivity)	(3) Ln(Employment)	(4) Share of Female workers	(5) Share of Professionals	(6) Share of Production workers	(7) Training existing workers	(8) Job rotation
Forward linkages	-0.063	-0.031	0.087	0.034	-0.001	-0.106**	0.052	0.112
	(0.099)	(0.139)	(0.086)	(0.032)	(0.013)	(0.042)	(0.059)	(0.086)
Forward linkages × Micro firms	0.043	0.065	-0.055	-0.049	-0.008	0.044	-0.036	-0.110
	(0.114)	(0.151)	(0.093)	(0.034)	(0.013)	(0.046)	(0.060)	(0.092)
Forward linkages × Small firms	0.043	0.101	-0.157*	-0.067**	-0.004	0.066	-0.068	-0.142*
	(0.102)	(0.142)	(0.091)	(0.034)	(0.012)	(0.045)	(0.060)	(0.083)
Dummy for micro firms	0.027	0.391	-1.664***	0.173	0.034	-0.212	0.145	0.271
	(0.379)	(0.514)	(0.310)	(0.117)	(0.045)	(0.161)	(0.209)	(0.313)
Dummy for small firms	-0.014	0.016	-0.520*	0.228**	0.024	-0.257	0.255	0.463
	(0.335)	(0.477)	(0.302)	(0.115)	(0.041)	(0.160)	(0.212)	(0.286)
Observations	3,601	3,601	3,601	3,601	3,601	3,601	3,601	3,601
R-squared	0.217	0.162	0.489	0.005	0.052	0.165	0.007	0.100
Number of firms	1,230	1,230	1,230	1,230	1,230	1,230	1,230	1,230
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:

1. Standard errors in parentheses are robust to heteroscedasticity and clustered at the firm level.
2. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels.

Source: Author's calculation from the Viet Nam Small and Medium Enterprise Surveys, 2005–2011.

Robustness Check

A concern with our finding of the effects of trade in value added on firms' employment is that the VSME sample may not be nationally representative and may over-represent micro firms. To check the robustness of these results, we replicate the estimations in equation (1) with the national sample – the Enterprise Survey. The estimates are reported in Table 9, where we examine the impacts of trade linkages and break them into different firm sizes.

Columns (1)–(4) of Table 9 report the impacts of backward linkages on wages, labour productivity, employment, and the share of female employees. The FVA in total exports increases wages, productivity, and the share of female workers. The increase in labour productivity could be because SMEs are becoming more capital-intensive in response to rising wages. These findings are consistent with the findings in the previous estimations shown in Table 5. Columns (5)–(8) report estimates for different types of firms. The results in columns (5)–(6) show that backward linkages have higher impacts on the wages and productivity of micro and small firms than medium-sized firms. Higher demand for workers from larger firms creates more competition in attracting employees and pushes up wages in smaller firms. The result in column (8) also indicates that micro firms may suffer more from backward linkages as they have negative effects on the number of employees.

Table 10 reports the effects of forward linkages on employment outcomes using a nationally representative sample. The findings in column (3) also show that an increase in the share of DVA in the export of intermediate products has negative effects on employment. This could result from more competition for workers from larger firms. The findings in column (7) show that forward linkages mainly result in a reduction in employment at medium-sized firms. This result is associated with a decline in wages and productivity at micro and small firms, as indicated in column (5)–(6).

Table 9: Effects of Backward Linkages on Employment Outcomes (Enterprise Census)

Variables	(1) Ln (Real wage)	(2) Ln (Labour productivity)	(3) Ln (Employment)	(4) Share of Female workers	(5) Ln (Real wage)	(6) Ln (Labour productivity)	(7) Ln (Employment)	(8) Share of Female workers
Backward linkages	0.024**	0.034**	-0.004	0.007***	-0.017	-0.035	0.005	0.009**
	(0.011)	(0.017)	(0.011)	(0.002)	(0.018)	(0.024)	(0.013)	(0.003)
Backward linkages × Micro firms					0.088***	0.126***	-0.038**	-0.003
					(0.022)	(0.033)	(0.016)	(0.005)
Backward linkages × Small firms					0.038*	0.080***	0.001	-0.004
					(0.020)	(0.028)	(0.015)	(0.004)
Dummy for micro firms					-0.007	0.399***	-1.932***	0.065***
					(0.085)	(0.127)	(0.061)	(0.019)
Dummy for small firms					0.072	0.212**	-1.078***	0.024
					(0.076)	(0.106)	(0.057)	(0.016)
Observations	63,301	63,301	63,301	63,301	63,301	63,301	63,301	63,301
R-squared	0.654	0.402	0.008	0.016	0.660	0.432	0.600	0.030
Number of firms	21,488	21,488	21,488	21,488	21,488	21,488	21,488	21,488
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:
1. Standard errors in parentheses are robust to heteroscedasticity and clustered at the firm level.
2. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels.

Source: Author's calculation from Enterprise Census, 2005–2011.

Table 10: Effects of Forward Linkages on Employment Outcomes (Enterprise Census)

Variables	(1) Ln (Real wage)	(2) Ln (Labour productivity)	(3) Ln (Employment)	(4) Share of Female workers	(5) Ln (Real wage)	(6) Ln (Labour productivity)	(7) Ln (Employment)	(8) Share of Female workers
Forward linkages	-0.001	0.011	-0.019***	0.000	0.049***	0.126***	-0.084***	0.018***
	(0.005)	(0.009)	(0.006)	(0.001)	(0.009)	(0.013)	(0.007)	(0.002)
Forward linkages × Micro firms					-0.076***	-0.171***	0.118***	-0.033***
					(0.011)	(0.016)	(0.008)	(0.002)
Forward linkages × Small firms					-0.055***	-0.134***	0.077***	-0.015***
					(0.009)	(0.012)	(0.007)	(0.002)
Dummy for micro firms					0.515***	1.302***	-2.371***	0.139***
					(0.032)	(0.047)	(0.023)	(0.006)
Dummy for small firms					0.354***	0.851***	-1.268***	0.047***
					(0.026)	(0.035)	(0.019)	(0.005)
Observations	63,301	63,301	63,301	63,301	63,301	63,301	63,301	63,301
R-squared	0.654	0.402	0.009	0.016	0.660	0.433	0.603	0.036
Number of firms	21,488	21,488	21,488	21,488	21,488	21,488	21,488	21,488
Firm fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes:
1. Standard errors in parentheses are robust to heteroscedasticity and clustered at the firm level.
2. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% levels.

Source: Author's calculation from Enterprise Census, 2005–2011.

6. Conclusion

This paper examines the impact of linking into GVCs on SME employment in Viet Nam. GVCs offer a number of potential benefits to firms, including the potential for output and export growth and productivity spillovers. Along with this, GVCs may deliver jobs and earnings growth. However, the employment effects – even assuming growth in output and exports – are not always obvious. Therefore, with the impact of linking into GVCs on labour demand being multifold, it is important to analyse which type of backward and forward linkages a country should encourage. At the same time, the effects of GVCs on domestic firms, especially SMEs, depend on the extent to which firms can directly or indirectly participate in GVCs. Effective participation in value chains may increase labour production, wages, and employment. In contrast, GVCs may have negative impacts on employment, particularly on small enterprises.

Using fixed effects estimation, we find that forward linkages (DVA in the export of intermediate products) lower employment and increase wages, especially in medium-sized firms. They also reduce the share of production workers. Backward linkages (FVA in exports) that are complementary to the existing domestic resources may encourage more value addition to exports, leading to an increase in wages, productivity, and a higher share of production workers in domestic SMEs. In addition, backward linkages result in a lower share of professionals and make smaller firms retrain their existing workers. All of these may come from increased competition for labour from larger firms.

This empirical analysis shows that it may be less advantageous for SMEs than larger firms to participate in GVCs. It also implies that policies which improve the competitiveness of SMEs and assist them to take more advantage of participating in GVCs may benefit the development of domestic firms and the whole economy.

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Appendix: Description of Core Variables

Variable	Description
Trade in value added measures	
Backward linkages	Share of foreign value added embodied in gross exports (FVA) over gross exports
Forward linkages	Share of domestic value added (DVA) in gross exports of intermediate products over gross exports
Employment measures	
Ln (Employment)	Log of total number of workers
Ln (Real wage)	Log of real labour wages per capita
Ln (Labour productivity)	Log of output per worker
Share of professionals	Share of professionals over the total regular workforce
Share of production workers	Share of production workers over the total regular workforce
Share of female workers	Share of female workers over the total regular workforce
Train existing workers	Dummy indicator for whether firms train existing workers
Job rotation	Dummy indicator for job rotation

Source: Author's compilation.

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