Inward foreign direct investment and local wages: The case of Vietnam's wholesale and retail industry

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A B S T R A C T

While Vietnam's low labour cost offers a major incentive to attract foreign direct investment (FDI) and unambiguously benefits foreign firms themselves, there is scant evidence on whether inward FDI raises local incomes in any general sense. This study contributes to filling the gap by quantifying the impact of FDI on wages paid by domestic firms in the wholesale and retail trades. Firm level data are analyzed for the period 2009–2013 using a generalized method of moments estimator with Bartik-type instruments to address potential endogeneity. The findings suggest that an increased presence of foreign firms tends to lower wages paid by domestic firms. Disaggregated estimations reveal that the negative wage impact is borne by private firms, although not state owned firms, and by firms operating in low wage activities even as those in high wage activities experience a wage boost. These findings suggest a more cautious approach to attracting FDI by capitalizing on a low labour cost position.

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1. Introduction

Foreign direct investment (FDI) inflows to Vietnam have mounted following initiation in 1986 of a transformative reform program known as 'Doi Moi' (Renovation) followed in 1987 by enactment of the Law on Foreign Direct Investment. Registered foreign capital surged from 735 million US dollars in 1990 to 35.88 billion US dollars in 2017 (General Statistics Office of Vietnam (GSO), 2017a). Along with the comprehensive open-door policy, Vietnam possesses key competitive advantages to become a favoured investment destination. Notable among these are socio-political stability; a growing domestic market; a strategic geographic location; rich natural resources; and an abundant, young, and inexpensive workforce. Notably, Vietnam has the world's 11th largest labour market with nearly 60 million workers, over 70% of whom are below age 50. Furthermore, labour cost in Vietnam remains highly competitive, being among the lowest in the Asia region and only half that in China (PWC & VCCI, 2019; Hayakawa & Tsubota, 2014; Leung, 2015; Tongzon, 2005).

While Vietnam's low labour cost offers a major investment incentive and unambiguously benefits foreign invested firms, scant evidence has been marshalled so far on whether such firms boost the incomes of local workers by raising wages in domestic firms. The wage effect of FDI is crucial from both analytical and policy perspectives since it is closely associated with the welfare of workers, households, and recipient economies at large. Of concern, the competition among countries in

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labour cost advantage can result in a race-to-the-bottom, adversely affecting local workers, particularly those in developing labour-abundant countries (Crotty, Epstein, & Kelly, 1998; Mosley, 2010; Olney, 2013). Therefore, further evidence as to the impact of FDI on local wages can deepen understanding and enable policymakers to better assess the rationale for FDI incentives.

This study develops insights into the impact of inward FDI on Vietnam's labour market by quantifying the effect of foreign invested firms on local wages. In addition, the paper sheds light on the differential effect of FDI on wages in low versus high wage industries. The empirical analysis makes use of a generalized method of moments estimation technique with Bartik-type instrumental variables (IV-GMM) applied to a panel dataset of firms in Vietnam's wholesale and retail industries for the period 2009–2013. Commerce has a leading role within the services sector in terms of both employment and inward FDI. By 2017, wholesale and retail trade created about 7 million jobs, accounting for approximately 40% of total employment within services (General Statistics Office of Vietnam (GSO), 2017b). Furthermore, commerce plays a dominant role in luring services FDI, accounting for 33% of total FDI by project numbers and 20% of registered capital. Thus, empirical findings for this key service industry have important implications for the Vietnamese labour market.

Although the data show higher wages paid by foreign firms, this study finds that foreign firms exert overall downward pressure on local wages in the wholesale and retail trades. A one percentage point increase in the share of foreign employment is associated with a decrease in the average wage of domestic firms of 4.5 percent. Additional estimation results suggest that the negative wage effect is transmitted from foreign to domestic private firms but not to state-owned counterparts. Moreover, divergent effects of foreign firms are felt at different ends of the wage scale with downward pressure at the lower end and upward pressure at the higher end.

The remainder of the paper consists of five sections. Section 2 reviews the related literature on FDI and wages in host labour markets. Section 3 describes the dataset. Section 4 specifies the econometric model and estimation technique. Section 5 presents empirical results and analysis. Finally, Section 6 provides concluding remarks.

2. Literature review

The entry and increased presence of foreign firms can exert significant impact on recipient countries in various respects. One of these is the potential impact on host labour markets. Policymakers generally expect FDI inflows, notably by large multinational firms, to create large-scale employment, enhance labour productivity, and raise wages and incomes for the local workforce (Arnal & Hijzen, 2008; Navaretti, Venables, & Barry, 2006). These widespread expectations may explain the considerable competition among host governments to offer incentives for attracting foreign investors. While host governments largely expect that inward FDI will generate beneficial outcomes in labour markets, empirical evidence for both developed and developing economies is far from consistent on this point.

The wage effect of inward FDI is closely linked with the income and welfare of individual workers, households, and entire economies. For many developing countries, inward FDI has greatly contributed to poverty reduction by providing local workers with regular and decent incomes (Bui, Nguyen, & Pham, 2019; Feliciano & Lipsey, 2006; Girma, Greenaway, & Wakelin, 1999). Workers in foreign firms are the first to gain direct benefits from the wage effects of FDI. Furthermore, the host economy can arguably be boosted once these additional incomes are spent on domestic consumption (Elliott & Zhou, 2015). These effects can be profound as the empirical literature shows strong evidence that foreign firms tend to pay higher wages than domestic firms (Aitken, Harrison, & Lipsey, 1996; Conyon, Girma, Thompson, & Wright, 2002; Doms & Jensen, 1998; Girma et al., 1999; Görg, Strobl, & Walsh, 2007; Ramstetter, 2004).

Aitken et al. (1996) conducted comparisons of wages across domestic and foreign firms in Mexico, Venezuela, and the U.S. The findings showed that foreign firms paid on average 30 percent more than their domestic counterparts. The wage differentials remained, though to a lesser degree, after controlling for labour skill mix, industry composition, location of foreign affiliates, firm size, and capital intensity. Similar results of foreign wage premiums have been supported by empirical studies for both developed and developing host countries (Barry, Gorg, & Strobl, 2005; Chen, Démurger, & Fournier, 2005; Conyon et al., 2002; Elliott & Zhou, 2015; Eren, 2009; Feliciano & Lipsey, 2006; Girma et al., 1999; Huttunen, 2007).

It is, however, worth mentioning that econometric estimation of the impact of FDI on local wages may be distorted due to endogeneity problems in modeling. The existence of a foreign wage premium may be attributable to foreign firms selecting more highly qualified employees; acquiring higher paying domestic firms; operating in higher wage industries or regions; or carrying over compensation practices from their home countries. For instance, Bandick (2008) revealed that foreign firms paid more than domestic firms in the Swedish manufacturing sector due to their cherry-picking higher wage firms for acquisition. Likewise, Balsvik and Haller (2010) investigated the case of Norwegian manufacturing firms and suggested that foreign investors tended to acquire larger, higher wage, and higher productivity domestic firms. Using a difference-in-difference propensity score matching method, Girma and Görg (2007) found that in the UK, a foreign wage premium in the electronics and food industries was limited to domestic firms acquired by US multinationals.

While the foreign-domestic wage differential is extensively researched and largely consistent across industries and countries, it is unclear as to whether and to what extent foreign invested firms boost wages in domestic firms. Recent evidence suggests that foreign entrants exert an indirect impact on wages of domestic firms. Such an effect can take place through labour market competition and productivity spillovers. This occurs as the entry of higher–paying foreign firms shifts up the labour demand, triggering domestic firms to increase wage rates to attract and retain workers, particularly higher quality labour (Aitken et al., 1996; Driffield & Taylor, 2006; Girma et al., 1999; Hoi & Pomfret, 2010). Moreover, the existence

of productivity spillovers from FDI may be crucial in generating wage spillovers (Barry et al., 2005; Görg & Greenaway, 2004; Robert E Lipsey & Sjöholm, 2005). Given the entry of more technologically competent multinational firms (Castellani, Castellani, & Zanfei, 2006), domestic firms can learn to adapt to the foreign presence and enhance labour productivity, enabling them to pay higher wages too. Conversely, negative productivity spillovers may force domestic firms to cut costs, including wages, to sustain their operation.

Empirical findings on the impact of FDI on incomes of workers in local firms are mixed for both developed and developing host economies. Notably, foreign firms have been found to exert a positive impact on domestic wages in the US (Aitken et al., 1996; Axarloglou & Pournarakis, 2007), the UK (Driffield & Girma, 2003; Driffield & Taylor, 2006), Mexico (Villarreal & Sakamoto, 2011), Indonesia (Robert E. Lipsey & Sjöholm, 2004; Tomohara & Takii, 2011), China (Elliott & Zhou, 2015; Hale & Long, 2011), India (Chidambaran Iyer, 2012), Thailand (Srithanpong, 2014), and Vietnam (Hoi & Pomfret, 2010). However, an insignificant or negative impact of FDI on local wages has been found by studies of Ireland (Barry et al., 2005), Spain (Muñoz-Bullón & Sánchez-Bueno, 2013) and Italy (Pittiglio, Reganati, & Sica, 2015).

It should also be noted that previous studies on the impact of FDI in general, and on wages in particular, largely focused on manufacturing whereas little evidence has been provided for other sectors. Of the limited literature on FDI in service sectors, Brouwer and Mariotti (2014); Mariotti (2015) suggested that compared to domestic counterparts, foreign multinationals in Italy exhibited higher efficiency and profitability, which enabled them to exert significant influence on the local transport and logistics industry. Regarding the effects of inward services FDI on wages, Feliciano and Lipsey (2006) and Hale and Long (2011) included data on various sectors in the US and China, respectively. While the US study found a positive wage impact of FDI on non-manufacturing firms, the China study offered similar results across all sectors.

Given the heterogeneous character of the diverse sectors within services, a need remains for in-depth analyses of particular sectors. The present study focuses on wholesale and retail trade to gain insights based on a relatively homogeneous set of firms.

3. Data

This research employs a panel dataset of firms in the wholesale and retail sector for the years 2009 to 2013. The sector comprises activities listed in Section G of the Vietnam Standard Industrial Classification (VSIC, 2007). Section G includes 20 three-digit industries and is the largest and most diverse section within the services sector. The sample of firms was extracted from the comprehensive enterprise survey database administered by the General Statistics Office (GSO) of Vietnam. Following data screening, the constructed sample is a five-year unbalanced panel. Monetary variables are converted to constant prices using the consumer price index. Statistical software package Stata 14 is employed for data management and analysis.

Table 1 presents the distribution of firms by ownership type and three-digit industry code. Overall, firms are more concentrated in the wholesale than the retail sector with the share of the former at 78%. The top three industry codes by firm numbers are G466 (other specialized wholesale), G465 (wholesale of machinery, equipment and supplies), and G464 (wholesale of household goods). These activities account for over 60% of firms in the sample. In the retail sector, the top

Table 1
Number of firms by ownership type and three-digit industry code.

VSCI Code	Three-digit industry	Domestic		Foreign	Total
		State	Private		
G451	Sale of motor vehicles	25	5,694	81	5,800
G452	Maintenance and repair of motor vehicles	8	3,480	7	3,495
G453	Sale of motor vehicle part and accessories	1	4,185	30	4,216
G454	Sale, maintenance and repair of motorcycles and related parts and accessories	14	6,150	20	6,184
G461	Wholesale on a fee or contract basis	7	3,140	49	3,196
G462	Wholesale of agricultural raw materials (except wood, bamboo) and live animals	63	7,248	56	7,367
G463	Wholesale of rice, food, beverages and tobacco	167	18,451	131	18,749
G464	Wholesale of household goods	124	39,861	223	40,208
G465	Wholesale of machinery, equipment and supplies	149	59,400	508	60,057
G466	Other specialized wholesale	355	74,454	397	75,206
G469	Non-specialized wholesale trade	75	2,542	36	2,653
G471	Retail sale in non-specialized stores	27	1,779	63	1,869
G472	Retail sale of food, beverages and tobacco in specialized stores	0	3,295	11	3,306
G473	Retail sale of automotive fuel in specialized store	31	5,072	4	5,107
G474	Retail sale of information and communication equipment in specialized stores	12	12,130	3	12,145
G475	Retail sale of other household equipment in specialized stores	7	19,962	15	19,984
G476	Retail sale of cultural and recreation goods in specialized stores	37	3,353	0	3,390
G477	Retail sale of other goods in specialized stores	27	15,835	46	15,908
G478	Retail sale via stalls and markets	2	219	1	222
G479	Retail sale not in stores, stalls or markets	2	2,108	0	2,110
Total		1,133	288,358	1,681	291,172

industry code is G475 (retail sale of other household equipment in specialized stores), which accounts for about 32% of all retail firms. While domestic private firms are present and dominant across all industry codes, their state counterparts exhibit relatively modest numbers throughout and no presence at all in industry code G472 (retail sale of food, beverages and tobacco in specialized stores). Foreign firms are mainly attracted to the wholesale sector with over 90% of them there while they have no presence within two of the retail codes (G467 and G479).

Table 2 reports the average real wage by ownership type and three-digit industry code for the study period. In general, the wholesale sector pays higher wages than the retail sector. Nonetheless, the highest paying category is in retail, namely G471 (retail sale in non-specialized stores), which includes emerging forms of modern supermarkets and shopping malls. The second and third highest paying categories are in wholesale, namely G465 (wholesale of machinery, equipment and supplies) and G464 (wholesale of household goods). The three lowest paying categories are G473, G476, and G475, which are all in retail. Notably, the figures show that for the most part across all industry codes, foreign firms pay more than domestic firms. Overall, they pay double the average wages of state firms and triple the average wages of domestic private firms.

Table 3 presents the distribution of firms in the panel dataset across years and regions. Firm numbers increase overtime in all regions. In total, the number of firms in 2013 (74,638) is nearly double that in 2009 (38,964). These figures suggest strong growth of firms in the wholesale and retail trade. Among regions, South Central Coast exhibits the most remarkable surge (2.24 times). Firms are highly concentrated in two regions, namely Red River Delta (including the capital city of Hanoi) and Southeast (including the economic hub of Ho Chi Minh City). Of note, the unbalanced nature of the panel dataset captures firm entry and exit over the study period.

Table 4 shows variations in foreign firm penetration by region. As Vietnam's regions are highly heterogeneous in a wide array of aspects, the regional presence of foreign firms is also expected to vary markedly. Similar to the distribution among all firms (Table 3), foreign firms are mostly located in the two leading regions of Southeast and Red River Delta. Notably, Southeast attracts more than 54 percent of Vietnam's foreign firms in the wholesale and retail sector. Foreign firms have a disproportionately large share in employment in the Southeast and the Central Highlands regions, although the number of firms in the Central Highlands is very low. They have the lowest shares in employment in the Northern Midland and Mountain and the South Central Coast regions.

4. Econometric approach

The previous discussion suggests that foreign firms tend to pay higher wages and that FDI in the wholesale and retail sector is likely to affect pay levels of domestic firms. To capture such an effect, a standard approach adopted in the literature is to regress the wage of domestic firms on a measure of foreign presence and various control factors (Aitken et al., 1996; Driffield & Girma, 2003; Hoi & Pomfret, 2010; Robert E. Lipsey & Sjöholm, 2004). The following specification is posited to estimate the effect of FDI on wages in domestic wholesale and retail firms in Vietnam:

$$l(AW_{ikjt}) = f(FP_{kjt}, \ Z_{ikjt} \ , IND_k, \ REG_j, YEAR_t, \xi_i, \zeta_{ikjt}) \tag{1}$$

Table 2
Average real wage by ownership type and three-digit industry code (million VND per year).

VSCI Code	Three-digit industry	Domestic		Foreign	Total
		State	Private		
G451	Sale of motor vehicles	40.8	30.3	108.5	31.7
G452	Maintenance and repair of motor vehicles	60.9	23.3	33.7	23.4
G453	Sale of motor vehicle part and accessories	74.8	26.1	115.7	26.8
G454	Sale, maintenance and repair of motorcycles and related parts and accessories	43.8	23.4	80.7	23.7
G461	Wholesale on a fee or contract basis	39.6	30.2	59.5	30.8
G462	Wholesale of agricultural raw materials (except wood, bamboo) and live animals	49.3	29.8	85.1	30.5
G463	Wholesale of rice, food, beverages and tobacco	50.1	31.2	109.2	31.9
G464	Wholesale of household goods	45.9	37.0	109.9	37.5
G465	Wholesale of machinery, equipment and supplies	54.5	37.3	100.5	38.0
G466	Other specialized wholesale	60.4	30.4	124.4	31.1
G469	Non-specialized wholesale trade	41.3	30.3	166.9	32.8
G471	Retail sale in non-specialized stores	41.0	44.5	41.0	44.3
G472	Retail sale of food, beverages and tobacco in specialized stores	N/A	23.9	39.2	24.0
G473	Retail sale of automotive fuel in specialized store	42.8	19.9	28.4	20.1
G474	Retail sale of information and communication equipment in specialized stores	27.4	25.2	96.5	25.2
G475	Retail sale of other household equipment in specialized stores	26.4	21.8	57.4	21.8
G476	Retail sale of cultural and recreation goods in specialized stores	35.6	20.8	N/A	21.0
G477	Retail sale of other goods in specialized stores	51.6	24.7	49.5	24.9
G478	Retail sale via stalls and markets	28.8	22.0	33.6	22.1
G479	Retail sale not in stores, stalls or markets	22.8	22.0	N/A	22.4
Total		51.2	31.0	103.3	31.6

Note: N/A indicates no firms present.

Table 3
Sample size by year and region.

Region	2009	2010	2011	2012	2013
Red River Delta	14,876	17,786	20,893	29,068	29,091
Northern Midland and Mountain	324	357	439	628	629
North Central Coast	723	838	934	1,151	1,249
South Central Coast	992	1,435	1,853	1,916	2,218
Central Highlands	316	353	384	445	486
Southeast	20,839	25,947	32,802	34,495	39,158
Mekong River Delta	891	1,168	1,334	1,528	1,807
Total	38,961	47,884	58,639	69,231	74,638

Table 4
Foreign firm penetration by region.

Region	Number of foreign firms	Employment share of foreign firms (%)
Red River Delta	671	1.35
Northern Midland and Mountain	23	0.18
North Central Coast	20	0.34
South Central Coast	17	0.19
Central Highlands	10	2.12
Southeast	913	1.97
Mekong River Delta	27	0.28
Total	1,681	1.63

where $l(AW_{ikjt})$ is the average wage of domestic firm i in three-digit wholesale and retail industry k in region j at time t, expressed in log terms. Excluding foreign firms in $l(AW_{ikjt})$ can eliminate possible bias caused by higher foreign wages (Aitken et al., 1996; Barry et al., 2005; Pittiglio et al., 2015). The variable of interest is foreign presence, FP_{kjt}, which is proxied by the employment share of foreign firms. This measure of foreign presence has been widely used to capture the impact of foreign firms on local labour markets (Chidambaran Iyer, 2012; Hale & Long, 2011; Pittiglio et al., 2015). Foreign firms are defined by the GSO as having foreign equity participation, either through full foreign ownership or joint venture participation. Variations across three-digit industries, regions, and years are controlled for with dummy variables, IND_k, REG_j, and $YEAR_t$, respectively. Firm fixed-effects are captured with ξ_i which controls for unobserved firm characteristics (Muñoz-Bullón & Sánchez-Bueno, 2013; Sjöholm & Lipsey, 2006). The error term is denoted by ζ_{ikjt}. Robust standard errors are computed to address potential heteroskedasticity with clustering at the industry, region, and year level to account for possible correlation in firm shocks.

Firm specific characteristics that might affect wages are captured by Z_{ikjt} (Aitken et al., 1996; Driffield & Girma, 2003; Elliott & Zhou, 2015; Feliciano & Lipsey, 2006; Pittiglio et al., 2015). These serve as proxies for domestic firms' absorptive capacity, enabling them to gain beneficial spillovers through the process of adapting to, learning from, and competing effectively with foreign firms. Six variables are included:

$$Z_{ikjt} = \{EXPER_{ikjt}, OWN_{ikjt}, CAPINT_{ikjt}, SIZE_{ikjt}, HFI_{ikjt}, PROGAP_{ikjt}\} \tag{2}$$

Firm experience, $EXPER_{ikjt}$, denotes the number of years in operation in log form. Firm ownership structure, OWN_{ikjt}, is a dummy variable that takes the value of 1 for private and 0 for state ownership. Firm capital intensity, $CAPINT_{ikjt}$, is the log of the ratio of fixed assets to total employment. Firm size, $SIZE_{ikjt}$, is total sales in log form. Competition level, HFI_{ikjt}, is captured by the Herfindahl index, namely $\sum_{i=1}^{n} \left(y_{ikjt} / Y_{kjt} \right)^2$ where y_{ikjt} is the sales of domestic firm i and Y_{kjt} is the total sales of three-digit industry k in the local market in region j. This proxy of competition can also account for regional market size. Finally, productivity gap, $PROGAP_{ikjt}$, is defined as the difference in output per employee between domestic firm i and that of foreign firms on average in each three-digit wholesale and retail industry.

Market experience is expected to exert a positive effect on wages as older firms tend to gain a more secure foothold in product and labour markets, indicating their business success and better paying capacity (Brown & Medoff, 2003; Pittiglio et al., 2015). Compared to private firms, state counterparts may have advantages in funding access, allowing them to employ a higher quality and better paid workforce (De Fraja, 1993; Hale & Long, 2011). An increase in capital intensity suggests a lower labour share in total costs, enabling firms to recruit more competent and highly paid workers (Sjöholm & Lipsey, 2006; Villarreal & Sakamoto, 2011). Similarly, larger firms are more financially competitive and thus better able to pay higher wages (Arai, 2003; Pittiglio et al., 2015). Stronger competition (lower Herfindahl index) can put pressure on firms to cut costs by lowering wages; but it can also decrease monopsony power, pushing up wages (Balsvik & Sæthre, 2014; Egger & Kreickemeier, 2009; Hensvik, 2012; Hoi & Pomfret, 2010). Finally, a large productivity gap may indicate weak absorptive capacity, dampening positive spillovers and lowering domestic firm wages (Conyon et al., 2002; Pittiglio et al., 2015).

Estimation is by generalized method of moments with instrumental variables (IV-GMM). This technique can handle endogeneity to provide consistent, asymptotically normal, and efficient estimates (Doytch & Uctum, 2011; Hall, 2005; Yin, Ma, Liang, & Yuan, 2011). Endogeneity may occur for various reasons. It can be the result of simultaneous causality between foreign presence and domestic wages in the sense that just as foreign firms can affect local wages, local wages (as a proxy of labour cost and quality) can be a determinant of FDI (Cheng & Kwan, 2000; Villaverde & Maza, 2015). Endogeneity may also be due to exogenous shocks in an industry and/or region that impact both FDI and local wages. For instance, the establishment of a new port or airport can trigger FDI inflows to a region while at the same time raising the profitability of local firms, boosting labour demand, and pushing up wages.

For the IV-GMM estimator, using lagged values as instruments is relatively convenient but it may result in significant loss of information, particularly in studies relying on short panel datasets such as this one. Therefore, this research adopts a 'shift-share' or 'supply-push' approach to construct a Bartik-type instrument (Bartik, 1991; McLaren & Yoo, 2017; Moretti, 2010). First, the nationwide employment of industry k in region j (i.e., χ_{kj}) is calculated for the initial year of 2008. Second, for the 2009–2013 period, foreign firm employment nationwide in industry k for year t, given as ψ_{kt}, is used to construct the instrument as $\sum_k \chi_{kj} \psi_{kt}$. The adopted instrument is unlikely to be correlated with exogenous shocks in local labour demand and wages subsequent to 2008. This instrument is expected to be correlated with FDI presence as a foreign firm will tend to invest and employ workers in regions having established activities of the industry in which that firm is operating. In the following analysis, a *C-statistics* based test is conducted to check the existence of endogeneity, and the relevance of the instrument is tested by examining the fit of the first stage regression. The analysis also takes into account possible multicollinearity problems, and the significance of all model parameters is assessed with a *Wald* test.

5. Estimation results and analysis

5.1. Impact of foreign firms

Table 5 reports the IV-GMM estimation results for the impact of foreign presence and other factors on average wages of domestic firms in Vietnam's wholesale and retail industry. Given the overwhelming share of private firms (over 99%) in total domestic firm numbers, it is instructive to conduct separate regressions for the two ownership types to gain further insights into FDI impact. While the coefficient of foreign presence is negative across all estimations, it is not statistically significant for state firms. This suggests no impact of foreign firms on wages of domestic state firms in the wholesale and retail trades. The finding is unsurprising because state owned firms in Vietnam, unlike private firms, face a rigid wage setting mechanism. Thus, wage adjustment of state firms tends to be unaffected by labour market changes, including the increased presence of foreign firms. Generally, coefficients of other control variables in the three regressions are fairly consistent in sign and magnitude.

For the full sample, the F-statistic for all model parameters of 513.570 ($p < 0.01$) suggests the joint significance of coefficients. For Foreign Presence, the null hypothesis (*FP* is exogenous) is rejected at the one percent level given the *C*-statistic for the endogeneity test of 30.8 ($p < 0.01$). Furthermore, in testing the power of the instrument, the *F*-statistic (for the first-stage regression F-test) and the *Kleibergen-Paap rk LM* statistic (for the underidentification test) reveal the respective values of 587.3 and 583.6, which are both statistically significant at one percent level. These test results indicate that the selected instrument is relevant and the IV-GMM estimator is the appropriate method to account for the endogeneity bias.

Table 5
Estimation results for domestic wages.

Regressor	All firms		Private firms		State firms	
	Coef.	R.S.E.	Coef.	R.S.E.	Coef.	R.S.E
Experience	0.064***	0.004	0.065***	0.004	0.054	0.036
Ownership type	−0.125**	0.051	—	—	—	—
Capital intensity	0.064***	0.001	0.063***	0.001	0.052*	0.029
Foreign presence	−4.489***	0.856	−4.269***	0.848	−3.581	6.626
Size	0.044***	0.001	0.044***	0.001	0.066**	0.025
Competition	0.266**	0.064	0.274***	0.064	−0.283	0.485
Productivity gap	0.000**	0.000	0.000**	0.000	0.000***	0.000
Industry dummies	Yes		Yes		Yes	
Regional dummies	Yes		Yes		Yes	
Time dummies	Yes		Yes		Yes	
Endogeneity test	30.8***		28.2***		0.39	
First-stage F-test	587.3***		608.6***		4.47**	
Underidentification test	583.6***		604.5***		4.45**	
Model significance test	513.6***		526.3***		3.21***	
Obs	289,491		288,358		1,133	

Notes: Heteroskedasticity-robust standard errors (R.S.E.) are clustered at the industry, region, and time level;
*** $p < 0.01$, ** $p < 0.05$, and *$p < 0.1$.

Table 6
Correlation matrix of key explanatory variables.

	Experience	Ownership	Capital intensity	Foreign presence	Size	Herfindahl index	Productivity gap
Experience	1						
Ownership	−0.1166	1					
Capital intensity	0.0138	−0.0338	1				
Foreign presence	0.0043	−0.0138	0.0332	1			
Size	0.3415	−0.1386	0.0568	0.0201	1		
Herfindahl index	−0.0114	−0.0082	−0.0781	0.0029	−0.0535	1	
Productivity gap	−0.0278	0.0289	−0.0522	−0.0011	−0.1927	−0.0007	1

Table 6 and 7 show, respectively, the correlation matrix and variance inflation factors for key explanatory variables in the model. Severe multicollinearity can cause misleading estimates, weakening the statistical power of regressions. Multicollinearity is generally considered problematic if the absolute value of the correlation coefficient between two variables is greater than 0.7 or the variance inflation factor of a variable is greater than 10 (Alin, 2010; Dormann et al., 2013; Fox, 1991; Morrow-Howell, 1994). A severe multicollinearity problem is unlikely to affect the estimates in this study since the reported figures indicate relatively small correlation coefficients (<0.35) and low values of VIF (<2.0).

The estimation results in Table 3 provide evidence of a negative impact of foreign firms on domestic firms' wages in Vietnam's wholesale and retail industry. The estimated coefficient of the foreign presence variable is negative and statistically significant at the one percent level. This means that foreign firms put downward pressure on pay levels of domestic counterparts even though they themselves page higher wages. A one percentage point increase in foreign presence causes average wages of domestic firms to decline by 4.5 percent.[1] However, this spillover effect only exists from foreign firms to domestic private firms but to not state firms. While previous studies mostly found a positive impact of foreign firms on domestic wages, notably among developing host economies, including the case of Vietnamese manufacturing firms (Hoi & Pomfret, 2010), the evidence of a negative spillover to service firms found in the present study is interesting and worth noting.

This finding of a negative impact of foreign firms on domestic wholesale and retail wages in Vietnam might be attributable to the low absorptive capacity of domestic firms and the crowding-out effect of foreign firms in the labour market for the examined industry. The sample indicates that the majority of domestic firms are privately owned (99%), small, of low capital intensity, newly established, and less productive than foreign firms. Given these characteristics, domestic firms are less likely to benefit from foreign presence through adapting to, learning from, and competing effectively with foreign firms in both product and labour markets. Hence, an increased presence of foreign firms tends to lower average wages of domestic counterparts. Furthermore, an increased entry of foreign firms in the industry can intensify the crowding-out effect by poaching the best workers from domestic firms via higher wages, putting downward pressure on the wages of those who remain in the employment of domestic firms. As shown in Table 2, foreign firms pay much higher wages, on average more than three times that of domestic private firms.

5.2. Impact of other factors

The estimation results in Table 5 also indicate the role of other factors in determining average wages among domestic firms in the wholesale and retail industry. Notably, the estimated coefficients of firm specific variables are all statistically significant at either one or five percent levels. Of these, firm experience in the market exerts a positive effect with a one percentage point increase in this factor resulting in a 0.064 percent increase in the average wage.[2] This result is unsurprising as previous literature largely suggests that compared to newly established firms, well-established firms tend to have greater business success and the capability to pay higher wages (Brown & Medoff, 2003; Hoi & Pomfret, 2010; Pittiglio et al., 2015).

Ownership structure plays an important role in explaining not only the impact of foreign firms on domestic wages but also underlying differences in domestic wages. The estimated coefficient suggests that on average, private firms pay 0.125 percent less than state counterparts in the examined industry. In fact, the data presented in Table 2 show higher average real wages of state firms versus private firms across the ranges of three-digit wholesale and retail industries. This finding is consistent with those of De Fraja (1993) and Hale and Long (2011), which imply that state firms may have more favourable funding access than private firms, allowing the former to employ more competent and productive workers.

Capital intensity and size also show significant influence on domestic wages. Specifically, for a one percentage point increase in capital intensity the wage increase is 0.064 percent, while for a similar increase in size the wage increase is 0.044 percent.[3] More capital intensive and larger firms tend to achieve stronger financial positions and better compensation capacity, allowing them to pay higher wages than smaller, more labour intensive firms. These findings are expected since the

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[1] As an alternative interpretation of the size of estimated coefficients, the relevant impact can be based on a change in standard deviation by multiplying each coefficient with one standard deviation of that variable. For example, in this case, a one-standard-deviation increase in foreign presence (of 0.0251) is associated with an 11.3-percentage-point decrease in domestic firms' average wages.

[2] Alternatively, if experience goes up by one standard deviation (0.760), average wage level rises by 4.9 percentage points.

[3] A one standard deviation increase in capital intensity (1.332) leads to an 8.5 percentage point increase in wages, and a similar increase in firm size (2.369) to a 10.5 percentage point increase.

Table 7
Variance inflation factors of key explanatory variables.

Regressor	Variance inflation factor
Experience	1.14
Ownership	1.03
Capital intensity	1.01
Foreign presence	1.00
Size	1.20
Herfindahl index	1.01
Productivity gap	1.04

Table 8
Estimation results for domestic wages by industry wage group.

Regressor	Low-wage industries		High-wage industries	
	Coef.	R.S.E.	Coef.	R.S.E.
Experience	0.024***	0.006	0.022***	0.007
Ownership type	0.185**	0.092	−0.253***	0.089
Capital intensity	0.048***	0.003	0.024***	0.002
Foreign presence	−13.190***	2.155	18.272***	1.298
Firm size	0.042***	0.002	0.009***	0.001
Competition	0.166***	0.107	−0.217**	0.110
Productivity gap	0.000***	0.000	0.000	0.000
Industry dummies	Yes		Yes	
Regional dummies	Yes		Yes	
Time dummies	Yes		Yes	
Endogeneity test	50.1***		382.3***	
First-stage F-test	109.8***		437.7***	
Underidentification test	109.1***		394.1***	
Model significance test	65.3***		60.0***	
Obs	148,028		141,463	

Notes: (1) Heteroskedasticity-robust standard errors (R.S.E.) are clustered at the industry, region and time level;
*(2) *** $p < 0.01$ and ** $p < 0.05$.*

related literature generally suggests a positive correlation between these two variables and wage levels (Arai, 2003; Girma et al., 1999; Hoi & Pomfret, 2010; Muñoz-Bullón & Sánchez-Bueno, 2013; Pittiglio et al., 2015; Sjöholm & Lipsey, 2006).

Finally, market competition and the domestic-foreign productivity gap are found to exert positive and statistically significant influences on wages in the wholesale and retail industry. Similar findings are also revealed by previous papers (Conyon et al., 2002; Hoi & Pomfret, 2010; Pittiglio et al., 2015). The estimates indicate that the effect of competition is relatively profound while that of the productivity gap is minimal. Specifically, a one percentage point increase in competitive pressure (i.e., lower Herfindahl index) causes domestic firms to lower average wages by 0.266 per cent.[4] As implied by bargaining models of wage determination and rent sharing between firms and workers (Balsvik & Sæthre, 2014; Egger & Kreickemeier, 2009), the more intense competition domestic firms encounter, the more they are forced to cut production and profitability, thereby putting a downward pressure on average wages.

5.3. Foreign firm impact by low and high wage industries

While firm-level features are closely investigated in the FDI-wage literature, the role of industry characteristics receives much less attention. Dummy variables are generally used to capture industry variations, which may merit further analysis. In fact, industries are heterogeneous in various respects, including average wage level. The literature also suggests that firm wages differ across industries, and that foreign firms tend to operate in high-wage industries (Balsvik & Haller, 2010; Hoi & Pomfret, 2010). As shown in Table 2, average wage varies substantially among three-digit industries with foreign firms more concentrated in high-wage industries. Thus, it is of analytical and policy interest to examine differential effects of foreign firms between high- and low-wage industries.

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[4] A one standard deviation increase in competitive pressure (0.045) leads to a 1.2 percentage point reduction in average wage level.

In the following exercise, the sample is divided into two groups based on average wages by three digit industry code (see the Appendix for a listing). The low-wage group has average wage below the sample mean and the high-wage group above the mean. Table 8 summarizes the estimation results by group. The test statistics for overall model significance, endogeneity, and relevance of constructed instruments are all satisfactory for both groups. Due to the existence of endogeneity bias, the IV-GMM estimator is appropriate.

The results in Table 8 indicate that foreign firms exert downward and significant influence on average real wages of domestic firms operating in low-wage industries. By contrast, the effect is found to be positive and significant in the high-wage group. These divergent effects suggest workers in low-wage industries are made worse off by FDI while those in high-wage industries are made better-off. This finding might reflect stronger competitive pressure facing firms in low-wage industries as well as their weak absorptive capacity to benefit from any FDI-induced spillovers. The implication is that fierce competition tends to dampen local firms' pay level in the low-wage group while driving up wages of firms in the high-wage group.

6. Conclusion

While much prior evidence exists that foreign firms pay higher wages than domestic counterparts in host labour markets in developing countries, less is known about the impact of inward FDI on wages of local workers in domestic firms, particularly in the service sector. This study helps to fill the gap by quantifying the impact of foreign firms on local wages, using the case of the wholesale and retail industry in Vietnam for the period 2009–2013. This constitutes a leading industry in terms of both employment and inward FDI contribution in Vietnam. Following the literature, an econometric model is specified, including a measure of foreign presence based on employment share by three-digit industrial code, region, and year, plus a set of control variables as wage determinants. The IV-GMM estimation technique is determined to be appropriate in dealing with evident endogeneity. To gain further insights into the effect of foreign firms on wages, the model is estimated separately for private and state owned firms and for low-wage and high-wage industrial groups.

The empirical results suggest that while foreign firms pay higher wages, their presence exerts downward pressure on wages of domestic firms in the wholesale and retail trades. A one percentage point increase in foreign presence causes average wage levels of domestic firms to decline by approximately 4.5 percent. This finding might be explained by the weak absorptive capacity of domestic firms and the crowding-out effect of inward FDI in the labour market. Further, the estimation results indicate that firm wages increase in association with years since establishment, state ownership, capital intensity, size in terms of sales, and lesser competition in the industry as measured by the Herfindahl index. Estimations by disaggregated groups reveal that the negative wage effect exists only for private firms while state firms remain unaffected and only for low-wage industries while high-wage industries experience a positive wage effect.

The findings from this paper may warrant a more cautious approach toward attracting FDI by capitalizing on a low-labour cost position, particularly in the context of the wholesale and retail trades in Vietnam. While foreign firms pay markedly higher wages than both state and private domestic counterparts across the range of three-digit industries, foreign presence appears to generally lower wages of the local workforce. It is, however, worth noting that a selection effect might play a role in pushing down domestic firms' average wages. This is due to the possibility that more productive, higher-paid workers are selected to move from domestic firms to multinationals (see Krishna, Poole, and Senses (2014)) for evidence on selection effects and local wages). Subject to availability of a matched employer-employee dataset, future work could extend the analysis to examine the impact of the selection mechanism on local wages, thereby providing deeper insights into the FDI-linked wage effect.

The estimations also suggest a negative effect of FDI on wages for domestic private firms operating in low-wage industries. These firms are generally less competitive in both product and labour markets. These results imply that domestic firms and their workers are more likely to be vulnerable to entry of foreign firms in the studied industry. Hence, policy efforts should be directed towards private firms, notably those in low-wage activities, to mitigate any adverse impact. To provide a more nuanced understanding of the impact of FDI on wages, future research is needed with respect to other service industries, including high skilled and high paying industries, and with respect to the link between services FDI and manufacturing wages.

Acknowledgements

Appendix A. VSIC code groups by wage level

VSIC code	Low wage
G452	Maintenance and repair of motor vehicles
G453	Sale of motor vehicle part and accessories
G454	Sale, maintenance and repair of motorcycles and related parts and accessories
G461	Wholesale on a fee or contract basis
G462	Wholesale of agricultural raw materials (except wood, bamboo) and live animals
G466	Other specialized wholesale
G472	Retail sale of food, beverages and tobacco in specialized stores
G473	Retail sale of automotive fuel in specialized store
G474	Retail sale of information and communication equipment in specialized stores
G475	Retail sale of other household equipment in specialized stores
G476	Retail sale of cultural and recreation goods in specialized stores
G477	Retail sale of other goods in specialized stores
G478	Retail sale via stalls and markets
G479	Retail sale not in stores, stalls or markets

VSIC code	High wage
G451	Sale of motor vehicles
G463	Wholesale of rice, food, beverages and tobacco
G464	Wholesale of household goods
G465	Wholesale of machinery, equipment and supplies
G469	Non-specialized wholesale trade
G471	Retail sale in non-specialized stores

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