ACI Research Paper #13-2026

Local labor market effects of FDI: job growth and skills demand in Vietnam

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August 2026

Please cite this article as:

Coxhead, Ian, Nguyen Dinh Tuan Vuong, and Thi Hang Banh, "Local labor market effects of FDI: job growth and skills demand in Vietnam", Research Paper #13-2026, *Asia Competitiveness Institute Research Paper Series (August 2026)*.

Local labor market effects of FDI: job growth and skills demand in Vietnam[1]

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Abstract

Foreign direct investment (FDI) in manufacturing industries creates jobs in labor-abundant developing economies, but does it also promote acquisition of the human capital essential to long-term development? We investigate the net contribution of FDI to employment and demand for skills in Vietnam, a country undergoing an economic boom driven by dramatic growth in export-oriented manufacturing. Nearly all job growth within this sector is due to FDI, so direct employment growth and skill mix outcomes largely reflect external choices over production scale and technology. However, FDI growth also alters local labor demand indirectly through job creation in domestic non-FDI enterprises. We estimate local FDI employment multipliers and find that each new FDI job adds approximately 1 new non-FDI job. However, most non-FDI jobs are created in household enterprises supplying services and employing low-education workers for blue-collar occupations, with limited evidence of skill upgrading and little support for rising skill premia; thus, the *net* effect of FDI on the composition of labor demand by skills is neutral or even negative. These findings suggest a search for development strategies capable both of generating new jobs and raising incentives for increased human capital investment.

JEL codes: O12, F16, F21, J23, J24

Key words: local labor market, multiplier, FDI, skill premium, Vietnam

Competing interests: The authors declare they have no competing interests. .

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[1] The authors acknowledge financial support from IDE-JETRO in the project entitled "Net effects of foreign investment on employment and demand for skills: Vietnam." We are grateful to seminar and conference participants at the Vietnam Economists Association Annual Meeting (VEAM), December 2024; DEPOCEN, February 2026; and IDE-JETRO for comments on earlier drafts. This paper supersedes IDE Discussion Paper No. 1005 with the same title. Contacts: ian.coxhead@wisc.edu; vuong.nguyen.ge@u.tsukuba.ac.jp; hangbanh@nus.edu.sg.

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1. Introduction

Vietnam's government aspires that the country attains upper-middle income by 2035 and high income by 2045. To reach these goals will require sustained high rates of labor productivity growth. This is achieved both by raising the quantity of complementary factors like capital and technology, and by improving the quality of labor itself. In the *doi moi* era, the economy's opening to global trade and capital flows has raised productivity mainly through the first channel. Greenfields FDI has led this change: 61% of FDI inflows go to manufacturing, and in 2022, exports from FDI firms accounted for a remarkable 74% of total exports. FDI has created millions of jobs, but the pool of transferable labor is shrinking and the era of productivity gains through reallocation of existing workers will soon end. Faster growth in future will require, among other changes, more skills embodied in the labor force as well as increased opportunities for their productive employment.

The international economic community is optimistic that productivity growth will lift Vietnam to its growth targets. For example, the Harvard Growth Lab's 2026 Atlas of Economic Complexity, which identifies Vietnam as the world's fastest-growing economy, prominently highlights its very rapid rise through the global rankings of economic complexity[1] based on an index that "captures the diversity and sophistication of the productive capabilities embedded in each country's exports."[2] In a contradictory trend, however, returns to educational investments contributing to a more highly skilled labor force in Vietnam have been in decline for well over a decade. This apparent paradox motivates a deeper inquiry into the links between FDI and prospects for sustained future growth.

Employment in FDI enterprises is the fastest-growing segment of the Vietnamese labor market. The share of the wage labor force employed directly by foreign-owned firms increased dramatically through WTO accession (2007) and beyond, from nearly zero before 2000 to about 10% in 2023. Overall, provincial average FDI employment shares are correlated with higher earnings per worker and higher rates of formal wage employment (McCaig and Pavcnik 2018; Tafese et al. 2025). Yet despite these trends, informal employment and micro-enterprises still dominate labor force engagement. Nationwide, 36% of non-farm employment is in unregistered firms.[3] Informally employed or self-employed workers are prevalent in a wide variety of sectors from construction to food, accommodation, transport, and personal services. Informality is almost synonymous with low productivity: the majority of firms in these industries have

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[1] https://atlas.hks.harvard.edu/press-release

[2] https://atlas.hks.harvard.edu/rankings.

[3] Data cited in this paragraph are from the Labor Force Survey, described in more detail later in the paper.

little fixed capital or modern technology and corresponding to this, average educational attainment in the non-farm informal labor force is also very low. Nearly four in five (78%) informal workers have no more than 9th grade schooling, and only 3% have any tertiary training.

FDI job growth and informal sector employment are linked. FDI expansion creates factory jobs, but also raises demand for services supplied by enterprises that employ mainly low-skill workers. This motivates our central research question: what is the net effect of FDI on employment and skills demand?

In the next section we frame our research within the literature on labor market impacts of investment and comparable shocks, offering a simplified model to highlight key features. In section 4 we explore related empirical literature, and in section 4 we describe the Vietnam data and recent trends. In section 5 we quantify effects of FDI on employment and skills demand. We introduce and estimate local employment multipliers, including those differentiated by sector, occupation, and enterprise ownership. In section 6 we examine a second margin of adjustment: changes in occupational composition, wages, and the skill premium associated with FDI growth. These results complement the employment multiplier estimates by showing whether FDI expansion is associated with broader skill upgrading in local labor markets. Section 7 offers some conclusions and directions for further research.

2. Conceptual framework

Most labor market movement is local, even in rapidly changing economies. In Vietnam, for example, migrants make up 8% of the labor force, but 38.4% of those who were counted as migrants between 2019 and 2024 moved within a district, while an additional 19.3% moved between districts within the same province (NSO 2025). Moretti (2010, 2011) provides an analytical roadmap for the study of local labor markets. His framework distinguishes between tradable and locally nontradable industries (the latter including housing) and between labor of different types, for example low and high skill. The response of the local labor market to an employment-generating shock depends on the nature of the shock and the supply elasticities of both labor and nontradables. The shock creates additional local jobs and generates additional local income, which causes localized price rises for local nontradable services such as housing. Thus, even if the supply of labor is very elastic, local employment and nominal wage effects will still be important given that the supply of nontradables is necessarily less than perfectly elastic.

A localized shock creating new tradable sector jobs raises local demand for nontradables first because total income increases (as the result of additional job creation) and second, by increasing local wages. As Moretti (2011) points out, the size of the local labor market multiplier depends on three sets of parameter values. First are preferences for nontradables, and the technology of their production. If (as usual)

services are income-elastic, then demand will rise faster than the rate of total income growth. And if (again, as expected) services are labor-intensive relative to other sectors, then the local employment effect will also be correspondingly larger. Second, the multiplier may vary according to the type of labor that is expanding; if growth is mainly in skilled jobs, then additional spending growth per job created will also be larger since skilled wages are higher. Third, there may be general equilibrium effects contingent on the supply elasticities of labor and services. Very high values of each will reduce the local labor multiplier, in effect spreading the gains from location-specific job growth more broadly throughout the economy.[4]

A stylized model formalizes this framework and captures the key drivers of price and wage changes conditional on an FDI investment shock. It shows that the signs and magnitudes of wage changes for each type of labor by skill depend on the size of the shock as well as spillover to local nontradable sectors. We are especially interested in induced changes in the skill premium (the relative wage of skilled to unskilled labor) since this influences educational decisions, i.e., investments in future human capital. The model's bottom line is that even if new FDI capital raises wages for both low and high skill labor, and even if the FDI sector is intensive in the use of skilled labor, the *net* effect of sector-specific investment on the skill premium may differ after taking account of adjustment in the market for locally produced and consumed services.

Since our focus is on income and price effects, we use the dual approach with profit (revenue) functions describing industry behavior. Notation largely follows that in the standard reference, Dixit and Norman (1980). The economy consists of a representative consumer who earns income from the services of labor and consumes a utility-maximizing bundle of goods with prices p. The expenditure function dual to utility maximization, written as $e(p,u)$, describes the expenditure required to attain target utility u given prices p. There are two production sectors. One is the FDI sector, which employs labor of both low and high skill as well as capital, and produces goods that are traded at world market prices. The other sector uses only low and high skill labor and produces local nontradable services such as construction, accommodation, food and personal services, trade, and transport. We assume homothetic demand and uniform technology for services, which allows us to proceed as if there is just one local nontradable good n. To keep the focus on local labor market adjustments we assume the local economy's labor endowments are fixed, and that there are no other "leakages" in the form of savings or remittances. We relax the fixed endowment assumption in the discussion and show results are qualitatively robust.

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[4] A fourth determinant of local multiplier effects is the extent (if any) of agglomeration externalities or other endogenous productivity gains from the initial shock.

In the aggregate, profit maximization by firms subject to prices and primary factor endowments yields a total revenue (or GDP) function $y = g(p,v)$, where v is a vector whose elements are low-skill labor L, high-skill labor H, and FDI sector capital (K). We choose quantity units such that the initial value of total income is unity, that is, $y = 1$. The derivatives of $e(p,u)$ and $g(p,v)$ with respect to prices give, respectively, compensated consumer demand functions and domestic supply functions for goods and services. These are shown below using notation such as $e_j = \partial e(p,u)/\partial p_j$, $g_j = \partial g(p,v)/\partial p_j$ for each j, $g_v = \partial g(p,v)/\partial v$ for each $v \in (L,H,K)$; $e_u = \partial e(p,u)/\partial u$ is the cost of a marginal increase in utility, that is, the inverse of the marginal utility of income. Demand and supply functions have the usual derivative properties: their second derivatives with respect to own price are negative (positive) for demand (supply), while cross-price derivatives are positive (negative) for demand (supply). Derivatives of the revenue function with respect to factor endowment quantities give factor returns: $\partial g(p,v)/\partial v_i = w_i$ for each factor i. Using this notation, equilibrium is satisfied when aggregate income is equal to expenditure and markets for local nontradable goods clear, as in equations (1) and (2):[5]

$$e(p,u) = g(p,v) \tag{1}$$

$$e_n(p,u) = g_n(p,v) \tag{2}$$

When (1) and (2) both hold, then the value of exports from this economy is just equal to that of imports and by Walras' Law, external trade is also in balance.

We are interested in the effect of an increase in foreign capital investment, or $dK > 0$, holding labor endowments and the prices of tradable goods constant. The total derivative of (1), with $dL = dH = 0$ gives

$$e_u du = g_k dK.$$

Derivatives with respect to prices do not appear in this expression: the prices of tradables are assumed not to change, and the market for nontradables clears by (2), which requires that $(e_n - g_n)dp_n = 0$. Since y defines total income (or equivalently by (1), total expenditure) we have $e_u du = dy$, a money-metric of welfare change. Converting this expression to growth rates (that is, log changes) denoted by a "hat", for example $\hat{y} = dy/y$, we have

[5] By assumption, capital in the FDI sector is supplied entirely by foreign entities and all earnings are repatriated. We ignore second-order economic effects of foreign capital, i.e. those occurring other than through production and employment.

$$\hat{y} = \epsilon_{yk}\hat{K}, \tag{3}$$

where $\epsilon_{yk} > 0$ is the elasticity of output with respect to a change in the capital endowment. The increase in FDI capital raises total income and expenditure by an amount proportional to the contribution of capital services to total local income.

Because local factor markets clear, rising labor demand in the FDI sector creates competition that raises costs in sectors producing local nontradables. In addition, incomes of local residents increase and so their spending, including that on nontradables, also rises. These forces will, respectively, reduce supply and increase demand for nontradables, whose price must then rise to clear the market. The price rise will in turn influence factor prices.[6] To see this, first solve the nontradables' price change from (2) by taking the total differential as before, again holding labor endowments and tradables' prices constant:

$$e_u du = -z_{nn} dp_n + g_{nk} dK,$$

where $z_{nn} = \partial(e_n - g_n)/\partial p_n < 0$ and $g_{nk} = \partial^2 g/\partial p_n \partial K < 0$.

Converting to log changes results in[7]

$$\widehat{p_n} = \frac{\epsilon_{nk} - \epsilon_{yk}}{\epsilon_{nn}}\hat{K} > 0. \tag{4}$$

The term $\epsilon_{yk} > 0$ is the elasticity of income (and thus total spending) w.r.t the capital endowment, from equation (2). $\epsilon_{nk} < 0$ is the elasticity of supply for *n* w.r.t. *K*, which is negative since an increase in *K* increases demand for *L* and *H,* raising costs in *n*. Finally, $\epsilon_{nn} < 0$ is the own-price elasticity of excess demand for *n.* Equation (4) says that an export price increase unambiguously raises nontradables' prices, but that the magnitude of the increase depends both on the magnitude of the investment shocks, and on parameters governing sectoral income and substitution effects.

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[6] Quantity effects, such as changes in sectoral output and employment, can be recovered from the cost function dual to the revenue function.

[7] To get from (3) to (4) we use $e_{nu} du = c_n dy$, the marginal utility gain from additional spending on good N in expenditure terms. Noting that in equilibrium $c_n = g_n$, define $\epsilon_{nj} = \left(\frac{\partial e_n}{\partial p_j}\frac{p_j}{c_n} - \frac{\partial g_n}{\partial p_j}\frac{p_j}{c_n}\right)$ as the elasticity of excess demand for n w.r.t. price pj. Note that $\epsilon_{nj} \geq 0$ for j≠n and <0 for j=n. Substituting from (3), solve for p_n.

Using (4), we can now find the effect of the trade shock and subsequent change in nontradables' prices on returns to labor. Intuitively, this will depend on sectoral factor intensities as well as parameters governing the magnitude and intersectoral transmission of the shock. Recall that $w_i = \partial g(p, v)/\partial v_i$ for each factor *i.* In log change form, the response of wages to the FDI shock is

$$\widehat{w_i} = \gamma_{in}\widehat{p_n} + \gamma_{ik}\widehat{K} > 0 \qquad i = L, H \tag{5}$$

where $\gamma_{in} = \frac{\partial w_i}{\partial p_n}\frac{p_n}{w_i}$ is the elasticity of a rise in p_n on returns to labor of type *i.* The sign and the magnitude of this elasticity are determined by sector labor-intensity. If production technology in sector *j* is intensive in the use of labor of type *i* then $\gamma_{ij} > 0$, and vice versa. If the export sector makes intensive use of skilled labor, for example, then the direct effect of new capital investment will be to raise relative demand for *H,* and thus also $\widehat{w}_H$.

The change in the local skill premium is $\hat{w}_H - \hat{w}_L$. Substituting for $\hat{p}_n$ from (4) in (5), we have:

$$\frac{\widehat{w}_H - \widehat{w}_L}{\widehat{K}} = (\gamma_{Hk} - \gamma_{Lk}) + \psi_n(\gamma_{Hn} - \gamma_{Ln}), \tag{6}$$

in which $\psi_n = \frac{\epsilon_{nk} - \epsilon_{yk}}{\epsilon_{nn}} > 0$ from (4). The sign and magnitude of this relative wage change depends on sectoral factor intensities modified by the contributions of sectors and trade to local income and on the extent to which the capital investment shock induces adjustment in the market for locally produced and consumed nontradables. The first right-hand term captures the direct effect of new capital investment. The second term captures indirect effects through changes in the price of nontradables, caused by income and substitution effects as described above. Thus, even though the new investment raises the prices of both types of labor, and even if the FDI sector is intensive in the use of skilled labor so that $(\gamma_{Hk} - \gamma_{Lk}) > 0$, the total effect of the increase on the skill premium may differ after taking account of adjustment in the market for nontradables.

To further build intuition, the special case of Cobb-Douglas technology shows how the key parameter values relate to observable data. Under the Cobb-Douglas assumption output elasticities are equal to factor cost shares in each sector, so we can rewrite (3) as $\hat{y} = S^f \alpha_K^f \widehat{K}$, where S^f is the share of the foreign-invested sector in total income and α_K^f is the cost share of K in the same sector. Also, under Cobb-Douglas technology the parameter γ_{in} in (5) is the share of factor *i* in total costs of industry *n*. These terms then carry through the remainder of the analysis.

This simple modeling exercise highlights the adjustment mechanisms and outcomes associated with an investment shock in a local economy with inelastically supplied labor as well as locally nontradable services. In the longer run, of course, additional adjustment mechanisms such as interregional labor migration will come into play (for example, Robertson et al. 2020 explore longer-term interregional labor market adjustments to growth of the export-oriented garment sector in Bangladesh). If the labor supply elasticity is low, then an investment shock will raise nominal wages (real wages will rise by less due to higher local cost of living; see Moretti 2010). Conversely, the more elastic is labor supply, the less real wages will increase. Even if labor supply is perfectly elastic, however, local spending increases will still drive up prices of housing and other nontradables, meaning that even in the case of perfect labor mobility, nominal wage offers will still need to be higher in the expanding location.[8]

3. Related literature

3.1. Labor multiplier estimates and issues

Regions within a national economy are heterogeneous in terms of resources and industries. Evaluating the effects of any innovation such as a productivity or investment shock in a specific industry begins with partial equilibrium effects on labor demand and price (see, for example, Autor et al. 2016).[9]

Estimates of local labor multipliers come mainly from wealthy-country data. In benchmark empirical work with US data, Moretti found local labor multipliers whose values depended on the source of job growth. Each new manufacturing sector job added 1.6 new jobs in nontradables. Each new job filled by a college-educated worker added 2.5 nontradable jobs, and each new unskilled job added one (Moretti 2010). Intuitively, new jobs for unskilled workers have smaller effects because remuneration per job is lower.

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[8] That is, after taking into account any differences in non-market sources of utility, for example air and water quality, policing, and traffic congestion.

[9] Over a longer period, effects are dissipated through migration and changes in labor force participation rates. Robertson et al. (2020) document longer-run migration responses in Bangladesh, and Erten et al. (2019) document changes in labor force participation in South Africa. In Vietnam, however, labor force participation rates are consistently very high, and long-distance migration responses to changes in labor demand are small in relation to local adjustments (NSO 2025). Broader general equilibrium consequences, for example through changes in prices, investments and policy, may differ from partial equilibrium effects (Moretti 2011). These are best evaluated in counterfactual experiments using applied general equilibrium models. However, there is scope for semi-structured speculation on general equilibrium effects, and we present some later in this paper.

Subsequent empirical studies, focusing on issues of data and estimation that are claimed to impart upward bias, seem to converge on values around half those in Moretti (2010). Osman and Kemeny (2022) provide an extensive review of this literature covering estimates, issues with data, and methods. Their own estimates of local multipliers using US data yield values about the magnitude of those in Moretti (2010). On the effects of FDI specifically, Setzler and Tintelnot (2021) estimated a local employment multiplier of just 0.5 for foreign investment in the United States, perhaps reflecting less elastic labor supply. There are very few studies of net changes in the skill composition of employment attributable to FDI, and those that do this use data from advanced economies and examine firm-level, rather than labor market-level outcomes (Blonigen and Slaughter 2001; Bandick and Hansson 2009; Koch and Smolka 2019).

There are remarkably few published studies of local labor multipliers in the developing world. Intuition might suggest that if labor-abundant countries use more labor-intensive technologies, then multipliers would be higher than in wealthy, labor-scarce economies. This could be especially true when investments occur in light manufacturing, which is highly labor-intensive. This effect could be countered by low average skill levels of new jobs. Moreover, backward linkages are typically low for low value-added assembly; however, since tradable intermediates need not be sourced locally, labor multipliers for local traded sectors are usually negligible (Moretti 2011; Dijk 2017). Perhaps because conditions vary, multiplier estimates also range widely. Queiroz et al. (2026), using Brazilian manufacturing data, find multiplier values generally higher than unity, especially when the industries that expand, or the regions that host them, are higher on measures of complexity. Hernandez and Rojas (2024) also find relatively large effects of tradable sector growth on nontradable sector labor demand in Mexico; their estimates also point to a strong pro-skill job creation effect. In contrast, Wang and Chanda (2018) estimated the local nontradable employment multiplier due to manufacturing sector expansion in China at 0.34 — that is, for every 100 new manufacturing jobs, only 34 more jobs are created in local nontradable sectors. The low value may be related to limitations on labor mobility within China. Their outcome variable is total employment, and so generates no insights on changes by skill or job type.

3.2. Trade, FDI, employment and schooling in developing countries

While developing-country estimates of employment multipliers are scarce, many studies have focused on closely related outcome variables such as wages, skill premia, and school-to-work transitions. Economists' interest in the effects of trade and international integration on developing-country labor markets has risen along with trade shares in developing-country GDP and the availability of data with which to analyze its effects (Topalova 2010; Edmonds, Pavcnik and Topalova 2010; Dix-Carneiro and

Kovak 2019). Our study connects with this literature, examining changes in the composition of labor demand by education attributable to FDI.

On the relation between international trade and skills demand, many studies reach findings consistent with the Stolper-Samuelson prediction, that greater trade exposure in a labor-abundant economy will reduce the skill premium. Nevertheless there is considerable ambiguity in findings from country studies. Goldberg and Pavcnik (2007) reviewed studies assessing the effect of 1990s trade liberalizations in a small group of countries and concluded that the skill premium increased in almost every case. Li (2018) found the same for regions of China that specialized in skill-intensive exports. Other country studies, however, have found opposing effects: in Indonesia (Amiti and Cameron, 2012; Coxhead and Shrestha, 2016), Bangladesh (Robertson et al., 2020), and China (Li, 2018). Looking at outcomes in terms of the skill endowment of the labor force, a panel study of more than 100 countries found that specialization in low-skill industries translates into reduced educational attainment (Blanchard and Olney, 2017).

In the case of FDI the theoretical focus shifts toward the Rybczinski prediction, that an increase in the economy's endowment of some productive factor will raise returns to complementary factors, and reduce those to other factors. There are many fewer studies of the effects of FDI on employment and wages in developing country manufacturing industries (Lipsey and Sjoholm 2005).[10] The benchmark study is Atkin's (2016) examination of the effects of FDI in Mexican export-oriented manufacturing industries. The primary focus of this important article rests on adolescents' choices between schooling and entry into the labor force. FDI is complementary with low-skill labor, so the opening of new export-oriented manufacturing enterprises creates jobs that can be filled by workers with basic education. Atkin finds that expansion of export-oriented manufacturing increases local school-to-work transitions by children attaining the age of legal wage employment.

In Vietnam, empirical studies also find that FDI inflows are associated with reduced school enrollment rates (Coxhead and Shrestha, 2017; Coxhead, Vuong, and Nguyen, 2022) and on diminished incentives to continue in education, as revealed in test-taking rates for entry to upper-secondary school (Coxhead and Vuong 2023). Other Vietnam studies have focused on the effects of trade and/or FDI on employment and wages (Edmonds and Pavcnik 2006; McCaig 2011; Fukase 2013; Nguyen 2019; Nguyen et al. 2020;

[10] There is a richer set of studies examining effects of FDI in extractive sectors such as mining. Toews and Vezina (2020) find very large multipliers associated with FDI linked to resource discoveries in Mozambique: for each new FDI job, 4.4 other jobs are created. In a contrasting study, Sayour and Schroder (2021) examined FDI inflows to Mongolia, again in the context of a resource boom, and found evidence of large-scale displacement, with a multiplier of -5.5.

Tafese et al. 2025). Banh et al. (2024) investigate explanations for declining skill premia. They reject standard supply-side explanations such as increased numbers of graduates, declining quality of education and changing choice of college majors, and conclude that the most likely explanation for lower skill premia lies in shifts in relative demand for skills.

4. Data

In the previous section we laid out a conceptual framework and reviewed relevant literature on local labor market effects of shocks, especially those emanating from international trade or factor markets. We now turn to the effects of Vietnam's remarkable FDI boom.

The Vietnam Labor Force Survey (LFS) collected by National Statistics Office of Vietnam is our primary data source. It reports employment and demographic data for an annual sample of approximately 700,000 respondents. Reliable LFS data are available from 2011. LFS variables include the education, occupation and employment status and earnings of individuals of working age, regardless of labor force participation. For employed workers, the LFS reports (among other things) the ownership of the firm and the sector(s) in which it operates. The LFS sample is representative at province level (during the period covered, Vietnam had 63 provinces) but contains district identifiers, so can be constructed for econometric purposes as a repeated cross-section of district-level data. Importantly, the LFS includes all workers regardless of employment status. This is in contrast to employment data reported by firms in the annual Enterprise Surveys: these draw data only from registered firms, effectively excluding the majority of household enterprises.

Table 1 reports summary statistics for the LFS data to be used in estimation. The final column of the table provides a breakdown of the district mean data for all years by type of worker, employer and industry. These proportions show the labor force of an economy in transition. Over the 13 years in the data, FDI employment averaged 6.2% of total employment. Nearly all of this was in manufacturing, however. The non-FDI labor force in manufacturing made up 13.2% of total employment[11] so over this period, FDI jobs accounted for one third of all manufacturing employment. Similarly, since non-FDI workers in formal private firms are just 13.4% of the employed labor force, FDI employment accounts for one-third of total formal private sector employment.

How has Vietnam's employed labor force evolved? First, additions to the stock of educated workers are slowly transforming the labor force. Figure 1 shows the composition of the employed labor force by

[11] Non-FDI jobs in manufacturing are 14.4% of all non-FDI jobs, which are in turn 94.1% of all jobs.

educational attainment over the span of our data (2011-2023). As recently as 2011, workers with tertiary and upper-secondary credentials accounted for only about one-fourth of the total labor force. This share increased steadily to a combined total of about 45% of the labor force by 2023, with tertiary-educated workers alone making up about 18%.

Where are Vietnam's workers employed? Figure 2 shows the composition of the labor force by ownership of the employing enterprise. The decline of agricultural households as employers has been dramatic: from 2011 to 2023 it dropped by about 20 percentage points. Almost half of that decline has been taken up by household businesses (including self-employment), and the remainder has been shared more or less equally by gains in domestic private firms and foreign-invested enterprises. FDI firms' share in total employment has more than doubled since 2011, to about 10% of the total labor force, or almost 14% of the non-farm labor force. Job creation in FDI firms thus accounts for a large share of overall growth in non-farm employment during the data period.

Combining the foregoing information, in Figure 3 we display levels and trends in the skill composition of the labor force by educational attainment and ownership of employing enterprises. The three panels in the figure, one for each broad level of school attainment, reveal that with the exception of government, trends in the composition of each sector's labor force by education closely follow changes in the composition of the total labor force (shown in each figure as a solid black line). The strongest trends in the overall labor force are in the declining share of workers with incomplete secondary education (top panel), and corresponding rise in the share with completed secondary education (middle panel). As the figures show, the composition of each sector's labor force changes almost in parallel with these trends. The only exception is government, where the tertiary-educated share has risen much more rapidly while the share of secondary-educated workers has declined. For FDI firms, trends in employment shares by education follow those in the total labor force very closely, a visual impression that will be supported by estimates presented below.

5. FDI employment multipliers

5.1. Local employment multipliers: estimation

Using the LFS data, our goal is to estimate district average employment multipliers associated with FDI activity. The basic model for estimation is:

$$y_{ijkt} = \beta FDI_{jt} + \theta + \nu_{ijt},$$

where y_{ijkt} is employment of workers of type i in district j of province k in year t excluding all workers employed in foreign-invested enterprises; FDI_{jt} is FDI jobs in district j in year t, and v_{ijt} is an

idiosyncratic error term. The employment multiplier is β. It measures how many jobs of each type are created for each additional FDI job. The term θ is shorthand for combinations of fixed effects and district-level controls that vary by model, as follows.

A central concern is that FDI job creation may not be exogeneous, e.g., districts attracting more FDI may also experience unobserved local shocks that independently raise domestic employment. Our strategy is therefore to estimate reduced-form local employment multipliers under increasingly demanding sets of fixed effects and controls, and then to examine whether the core results survive a range of robustness tests. We estimate four baseline specifications that differ in their treatment of location and time effects. Model (1) includes province fixed effects and year fixed effects; Model (2) uses province-specific time trends instead. Model (3) uses province-year fixed effects. Each of Models (1) – (3) also includes a vector of district-level demographic variables.[12] Model (4) includes district and year fixed effects.

We use ordinary least squares (OLS) estimators. OLS is in principle vulnerable to omitted variable bias and endogeneity. Following Moretti (2010) and Edmonds et al. (2010), the literature has shown a preference for Bartik-type instrumental variables to address these issues. A Bartik, or shift-share, instrument predicts district-level FDI employment growth from pre-period local industry composition interacted with national industry-level FDI growth. Such instruments are common in the local labor-market literature as they isolate exposure to national sectoral shocks using predetermined local shares. According to Goldsmith-Pinkham, Sorkin and Swift (2020), an estimate using a Bartik IV is equivalent to using the local employment share as an instrument. In our setting, we can construct such an instrument using the data from 2009 Census of Population and Housing. Even though the instrument could solve endogeneity due to omitted time-invariant district characteristics, using shares constructed from pre-period data means the estimation model is not able to take time-varying information into account. Additionally, the exclusion restriction required for a Bartik design is difficult to defend. Pre-period industrial shares in Vietnam are strongly related to infrastructure, industrial zones, transport access, urbanization, and local development trajectories, all of which may independently affect subsequent non-FDI employment. In addition, national industry-level FDI growth may directly affect domestic employment through product-demand, supplier, input-output, and export-market channels, rather than only through local FDI employment. A district initially specialized in an industry receiving large national

[12] These are taken from Vu et al. (2022) and comprise the following indicators for adults aged 25-60 and the year 2009: share of women; share of married individuals, share of degree holders; share of migrants; disability prevalence; labor force participation rate; and average wealth index based on housing materials and ownership of appliances, vehicles etc.

FDI inflows may therefore experience non-FDI employment growth even in the absence of additional local FDI jobs. For this reason, a Bartik design would identify exposure to nationally expanding FDI-intensive industries, not necessarily exogenous variation in local FDI employment. Therefore, we prefer OLS estimates with location, time fixed effects, and district-level controls. These fixed-effect estimators should capture the major sources of omitted variable bias, including persistent differences across locations and common time shocks. However, they do not eliminate all endogeneity concerns, especially if FDI flows disproportionately to districts already on steeper growth trajectories. For that reason, we interpret the estimates as conditional relationships and report a range of robustness checks in Section 5.3, including district and province-year fixed effects, baseline characteristic-by-year interactions, placebo-lead tests, and sample exclusions.

OLS estimates are displayed in Table 2 to 5. Each column in these tables displays results from a different model specification. Table 2 reports employment multipliers for the total district-level labor force. Depending on the model, the estimated multiplier values range between 0.932 and 1.052, indicating that for every 100 new FDI jobs created, between 93 and 105 new non-FDI jobs are created in the same district. This number is very broadly similar to many estimates from the empirical literature reviewed earlier. It is considerably higher than that for China (0.34) in Wang and Chanda (2018), with the caveat that their estimate is for job creation attributable to (any) manufacturing expansion, and thus not directly comparable with our estimates.

Looking beyond aggregate effects, in Table 3 we estimate total employment effects by major industry group. Once again, the estimates vary little over model specifications. FDI job creation has no effect on district-level agricultural employment. There is significant new job creation in manufacturing: local multipliers take values from 0.33 to 0.36, meaning that 33-36 new jobs are created in local manufacturing industries per 100 new FDI jobs created. However, the largest multiplier values are found in services: for every 100 new FDI jobs, another 57-66 jobs are created in these industries. The much higher proportion of jobs created in services is consistent with Moretti's (2010) observation that local labor market effects will logically be concentrated in industries producing nontradables. As for the manufacturing sector results, additional work is required to distinguish tradable from nontradable components. For example, in standard classifications 'manufacturing' includes activities such as repair of vehicles and other transport equipment, which are probably more accurately classed as nontradable services.

Table 4 shows results by type of enterprise. Around half of new non-FDI jobs created are in non-farm household enterprises, including self-employment. For each 100 FDI jobs created, another 44-52 jobs appear in non-farm household enterprises, depending on the model specification. A slightly smaller share of new jobs (38-39 per 100 FDI jobs) is created in private firms. There is a small though significant effect

on government jobs. There are no meaningful effects of FDI job creation in agricultural enterprises. As with the sectoral decomposition just discussed, additional work is required to understand better the distribution of new jobs over private firms.

To the extent that there is some new job creation in domestic private firms and in manufacturing, our findings depart somewhat from studies finding little or no employment multiplier effect in tradable goods sectors. That we find such an effect and that it is non-trivial in magnitude, may possibly reflect stronger backward linkage impacts in Vietnam than are apparent in studies using wealthy-country data—conditional, that is, on the linkages being to sectors other than the example of vehicle repairs cited above. We do not as yet have any verifiable insights as to linkages effects; perhaps trade and transactions costs are higher in a developing-country setting; perhaps the investing firms have different preferences for local versus global suppliers; or perhaps other explanations are relevant; this is a potentially fruitful area for additional research. However, the much larger multipliers for jobs in services, and in the informal household enterprises that supply most services, fit the prediction that the effects of employment growth in FDI industries are greater in locally nontradable sectors than in sectors producing tradables. Increasing demand should have an effect on prices for locally provided services, and so on labor demand in the firms and sectors producing them.

Does FDI change the mix of skills demanded in local labor markets? In Table 5 we report local multiplier estimates by the educational attainment of workers. Once again, the results are robustly similar across model specifications. For each 100 new FDI jobs, 60-68 new jobs are created for workers with incomplete secondary education (that is, lower-secondary or less schooling). For workers with completed upper-secondary schooling, the rate is 21-23 per 100 FDI jobs, and for workers with any post-secondary education, 13-16 new jobs. These averages differ only modestly from the existing composition of the total Vietnamese labor force, as shown in Figure 1. From Figure 3, in 2023 the FDI labor force by education level comprised 47% with incomplete secondary, 40% with completed secondary and 13% with completed post-secondary schooling. So, the estimates in Table 5 indicate that adding 100 new workers to a district's FDI labor force in the same proportion essentially replicates the existing composition of the labor force by education. Looking across the estimates from all four models, we may conclude by adding FDI and non-FDI job creation together that each 100 new FDI jobs in a district yields a total of roughly 200 new jobs: 55% for workers with incomplete secondary; 31% for workers with complete secondary, and 14% for tertiary-educated workers. Employment in the FDI sector itself is only very slightly more skill-intensive than is the overall labor force, and the local labor market effect of expanded FDI employment creates disproportionately more jobs for low-skill workers than for workers with any higher-

level educational attainment. As in the theory model of section 2, the net effect on demand for labor by educational attainment is ambiguous.

Education-based decompositions provide only one window on skills demand, since educational credentials and job content are not the same thing. Therefore, in section 6 we complement the education results with estimates by occupation. These show that the strongest local job creation effect from FDI growth are not concentrated in managers, professionals, or technicians, but rather in service/sales and blue-collar production work. This occupational evidence sharpens interpretation of the multiplier results: FDI growth creates local jobs, but not strong occupational upgrading.

5.2. Inter-district spillovers

The foregoing results are robust to more expansive definitions of the local labor market. We examine this using the measures of FDI employment in neighboring districts as described in Section 3. The regression model is now:

$$y_{ijkt} = \alpha + \beta FDI_{jt} + \Gamma_1 FDI_{jt}^{0-30} + \Gamma_2 FDI_{jt}^{30-50} + \theta + \nu_{ijt},$$

where all variables are defined as before. We once again estimate four variants according to which sets of fixed effects are included. The overall local market multipliers are shown in Table 6 and indicate existence of some labor market spillovers, mainly from more distant districts. These effects are very small in relation to the own-district estimates, and their inclusion does not meaningfully change the within-district FDI multiplier estimates. Results by sector, shown in Tables A1–A3, show a meaningful pattern: FDI job creation in more distant districts reduces local employment in agriculture and services, but not in manufacturing. Effects from nearby neighboring districts are small or zero, since these are mainly located in urban areas. Effects at greater distance almost certainly involve labor reallocation among rural districts.

5.3. Other robustness checks

In this subsection we report a range of checks on the robustness of the main results.

a) Control for interactions between baseline characteristics (wealth index, college share, migrant share) and year trends. These specifications allow districts with different baseline education, migration, or wealth levels to follow different time paths, which addresses the worry that FDI is just going to districts already on steeper development trajectories. Table A4 shows the results. Relative to the baseline models, the FDI multiplier estimates are slightly smaller but remain statistically significant. FDI job growth continues to predict sizable local employment gains concentrated in services, household businesses, private firms, and workers with lower schooling. This indicates that some part of the effects probably

does reflect more favorable district trajectories, but even after allowing for that, the core employment-multiplier pattern remains. In other words, the main result is not an artifact of province-wide shocks or simple differential trends by baseline education, migration, or wealth.

b) Lead placebo tests to answer the question whether future FDI predicts current non-FDI employment. This is an anticipation diagnostic. If next year's FDI strongly predicts this year's non-FDI employment, it may be an indication that treated districts were already trending differently before the measured FDI expansion. A mostly null one-lead result is reassuring because it weakens the story of obvious pre-existing domestic-employment run-ups.

This test is run for one-lead and two-lead FDI employment, as follows:

$$Y_{jt} = \beta_0 FDI_{jt} + \beta_1 FDI_{j,t+1} + \beta_2 FDI_{j,t+2} + \theta + \vartheta_{jt}$$

where Y_{jt} refers to non-FDI employment.

In specifications with a single lead (Table A5, panel A), future FDI employment is not significantly associated with current non-FDI employment. In specifications with two leads (panel B), the lead coefficients are mixed in sign and often offsetting, suggesting serial dependence in FDI timing rather than a stable monotonic pre-trend. These results do not fully eliminate selection concerns, but they do not support a simple story of steadily rising pre-treatment domestic employment in future high-FDI districts.

c) Dropping top FDI observations and urban-rural heterogeneity. In Table A6, panels A and B, we estimate multipliers separately for urban and rural districts.[13] Multipliers are positive in both samples, but substantially larger in urban districts, especially for manufacturing, private firms, and less-educated labor. This pattern is consistent with stronger supplier linkages and thicker labor markets in urban districts.

[13] The urban-rural district classification was constructed from the commune-level urban indicator in the LFS, where urban = 1 denotes an urban commune and urban = 2 a rural commune. Because commune identifiers are incomplete for some observations, the commune-level status was aggregated to the district level using the survey-weighted mean of the urban indicator across individuals within each district-year. This yields the share of the district population living in urban communes. To obtain a time-invariant district classification for heterogeneity analysis, we compute this urban share in the first year the district appears in the sample and define a district as urban if at least 50 percent of its population resides in urban communes in that baseline year; otherwise it is classified as rural.

Table A6, panel C shows that the results remain similar when excluding major FDI provinces (Hanoi, Bac Ninh, Binh Duong, HCMC, Dong Nai, and Bac Giang). That means the result is not driven exclusively by the most FDI-intensive provinces.

The coefficients get larger when excluding districts in the top 1% and 5% of FDI employment (panels D and E). This suggests that the baseline results are not inflated by extreme outliers and may instead understate local spillovers outside the largest FDI clusters.

6. Effects on educational incentives

6.1. Context

The employment multiplier results show that FDI growth creates substantial local spillovers, especially in services, household non-agricultural activity, and private firms. The next question is whether these spillovers are associated with skill upgrading and wages, which are important incentives to increase educational investments. We examine this issue using two complementary approaches. First, we estimate how FDI growth is associated with the occupational composition of local job creation. Second, we estimate how FDI intensity is associated with wages and the skill premium across education groups. These exercises do not directly identify the supply response of workers to FDI; rather they document how FDI growth is associated with the occupational and wage structure of local labor demand.

As usual, standard trade theorems provide initial guidance. If FDI inflows take the form of capital used exclusively in less skill-intensive sectors, then the Rybczynski theorem predicts rising relative demand for low-skill labor. The indirect effects of the FDI boom appear to be dominated by increased demand for local services, which if anything are even less skill-intensive. If these effects are sufficiently large to move the aggregate labor demand needle, then higher relative demand for low-skill labor should raise low-skill wages relative to returns to skills. In the longer run, specialization in low-skill activities may discourage educational development by raising the opportunity cost of schooling and lowering expected returns to learning beyond basic grades, as first modelled by Findlay and Kierzkowski (1983).

Nationwide in Vietnam, rapid increases in household income—attributable in part to the benefits of FDI inflows— have undoubtedly contributed to rising primary and secondary school enrollments, and the country has effectively achieved full enrollment for children up to age 15. However, the upper-secondary net enrollment rate falls well below cohort size at about 70% (Parajuli et al. 2020; Coxhead and Nguyen 2023), and secondary schooling completion rates are lower still. Likewise, between 2011 and 2023 tertiary enrollments fluctuated within a range of 26%–33% with no discernible trend. They jumped to

45% in 2024, but for comparison China, where the enrollment rate was equal to that of Vietnam in 2011, has showed steady increases and by 2024 had a tertiary enrollment rate of 77%.[14]

In spite of relatively slow progress in higher education enrollments, labor market returns to education have declined since about the time of WTO accession in 2007 (Doan and Gibson, 2012; Doan et al., 2018; Patrinos et al., 2018; Phan and Coxhead, 2020; McGuinness et al., 2021; Nguyen et al. 2025). Doan et al. (2018), for example, found that the selection-corrected return to schooling peaked in 2006–2008 at just over 11% and then fell to 6.5% by 2014, a drop of 40%. McGuinness et al. (2021) found that for men in Vietnam's labor force, returns to schooling in 2016 were 26%–30% lower than in 2008 for every level of education except postgraduate degrees (for which returns also declined, but by just 13%). Some studies have indicated that the skill premium decline is more pronounced in private-sector employment, where returns were lower to begin with, and where the majority of new job creation now occurs (Demombynes and Testaverde, 2018; Phan and Coxhead, 2020).

For wealthy households, education beyond the age of compulsory school attendance is a merit good rather than an economic decision, and the expected returns to educational investments are arguably irrelevant to decisions regarding their children's education. But for Vietnam's very large (and quite new) middle class, school expenses, expected returns, and the opportunity cost of remaining outside the full-time labor force while still in school are all relevant concerns. If some part of the observed skill premium decline is attributable to the effects of FDI inflows, then there are certainly grounds for policy concern, and there may be welfare gains in the long run from policy action.

The LFS data allow us to look at educational incentives from a number of angles. We begin by looking at the distribution of FDI-related job growth by broad occupational categories. Then we look more closely at employment by skill level. Finally, we attempt direct estimation of the skill premium effect.

6.2. Job growth by occupation and skill

Table 7 reports estimates of the influence of district-level FDI employment intensity on the distribution of jobs by broad occupational category.

Table 8 reports results for employment using the International Classification of Occupations (ISCO).[15] ISCO classifies jobs by skill level based on the nature of the work, formal educational credentials usually

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[14] World Bank: World Development Indicators Online.

[15] https://ilostat.ilo.org/methods/concepts-and-definitions/classification-occupation/#introduction.

required, and on-the-job training or experience required for competent performance of the required tasks. There are nine ISCO occupational categories (excluding armed forces) spanning four skill levels.

The main takeaway is that the local spillovers do not appear to be concentrated in high-skill cognitive occupations. In the broad occupation-group results, the addition of one hundred additional FDI jobs is associated with only about 13-15 extra non-FDI jobs in high-skill occupations, compared with roughly 27-31 in clerical/service occupations, 41-45 in production blue-collar occupations and 8-14 in elementary occupations. Agricultural occupations are essentially unaffected. So, the strongest occupational response seems to be in service/sales and manual production work, rather than in managers, professionals, or technicians. The signal to potential job market entrants is that the fastest growth in FDI-intensive areas is in occupations where secondary schooling, or perhaps basic vocational training, provide a sufficient credential. These results are consistent with the data cited earlier on declining returns to education in Vietnam during the period of very rapid increase in FDI-driven manufacturing.

6.3. Wages and the skill premium

Occupational outcomes reveal one dimension of skill demand, but they do not directly indicate whether FDI-intensive labor markets reward education more or less strongly. Therefore, we turn to wages and the skill premium. The wage analysis differs from the employment multiplier analysis in two respects. First, wages are observed at the individual level, so the estimating equation is a Mincerian wage regression rather than a district-level employment equation. Second, we use province-level FDI employment shares ("FDI intensity") rather than district-level FDI employment because province-level measures are more stable for wage analysis and better suited to capturing broader labor-market conditions affecting wage setting. Therefore, the wage results should be interpreted as complementary evidence on a different margin of adjustment rather than as a direct analogue of the district-level multiplier estimates.

To estimate the relationship of FDI with local skill premia, we adopt a Mincerian wage equation of the following form:

$$\log(wage_{ipmy}) = \beta_0 + \beta_1 educ_{impy} FDI_{py} + \beta_2 educ_{impy} + \beta_3 FDI_{py} + \theta X_{ipmy} + \gamma_m + \delta_y + \zeta_p + \varepsilon_{ipmy,}$$

where $wage_{ipmy}$ is the monthly income of individual i residing in province p, observed in month m of year y. Variable $educ_{ipmy}$ is the individual-level education attainment, and FDI_{py} is the fraction of workers employed in FDI firms in province p in year y. The vector X_{ipmy} includes individual-level controls: urban status, marital status, age, and age squared, as well as migration status and industry of

employment. The terms γ_m, δ_y, and ζ_p denote month, year and province fixed effects, respectively. Standard errors ε_{ipmy} are clustered at province level.

The parameters of interest, β_1 and β_3, capture wage premia associated with locations with higher FDI intensity. β_3 captures the wage premium of workers in FDI-intensive provinces and β_1 captures the additional premium accruing to more educated workers in those provinces. Together, they characterize the correlation between FDI intensity and the skill premium across education levels. These estimates are not, however, free of bias. The recruiting process sorts workers by potential productivity, which is unobservable in the data. If FDI firms select higher-productivity workers, then β_3 conflates the returns to working in FDI-intensive provinces with productivity sorting induced by FDI firms' recruitment practices and may thus be biased upward. With this caveat in mind, the headline result from our estimates is that across provinces, greater FDI intensity is generally associated with higher nominal wages. However, this premium is smaller—and in many cases significantly so—for workers educated to upper-secondary or higher levels. Moreover, as the model in section 2 makes clear, it is possible that a positive nominal wage premium reflects nothing more than compensation for higher living costs in locations where FDI expansion is driving up prices of local nontradables such as housing.

Using the 2011–23 LFS data, we estimate the association between FDI and the wage premium across four educational categories: primary education and below (the reference group), lower-secondary, upper-secondary, and post-secondary education. Table 9 presents results using province-level FDI intensity as the treatment variable. Tables A7 – A9 explore variations, by restricting job growth to manufacturing sectors and replacing province-level intensity with individual-level indicators of FDI firm employment. We show estimates for the entire 2011-23 period as well as for three subsets of years. However, results for 2020-23 should be interpreted with caution as the COVID-19 pandemic may have disrupted manufacturing employment and FDI inflows.

In Table 9, point estimates for wage premia associated with FDI intensity are all positive, but among subperiods they are statistically significant only during 2016–19, when FDI inflows into Vietnam accelerated markedly. No significant premium is detected before or after this window. Looking at the lower half of the table, point estimates for FDI intensity for workers with upper-secondary or higher education are mostly negative, and significantly so in 2016-19. In that period, the FDI wage premium is attenuated for workers with upper-secondary and post-secondary education. Restricting the sample to manufacturing sector jobs (Table A7) yields a broadly similar finding. All workers in that sector benefit from a positive FDI-intensity wage premium in both 2011–15 and 2016–19, but the premium for workers

with upper-secondary education is lower in all periods; that for workers with post-secondary education is never higher, and is significantly lower in 2016-19.

Tables A8 and A9 use an individual-level indicator of FDI firm employment in place of province-level intensity. Workers directly employed by FDI firms consistently enjoy a positive wage premium relative to their counterparts in domestic firms, and this premium is quite stable across sub-periods. However, it is not uniform across educational levels: the interactions between FDI employment and all levels of secondary education are negative and mostly significant, implying lower premia relative to workers with only primary education. Limiting the sample to manufacturing (Table A9), the compression is evident for all three post-primary education groups and holds with high precision in nearly every case.

Taken together, the occupation and wage results suggest that the local labor market effects of FDI growth in Vietnam do not offer any strong pro-education incentives. The employment multipliers show substantial local job creation, but the occupation results indicate that these gains are concentrated mainly in services and blue-collar work rather than in high-skill cognitive occupations. The wage results show generally positive FDI premia. It is possible however, that these premia merely capture the additional compensation required to attract workers to higher-cost locations, as predicted in the model of section 2. Our estimates provide no evidence that an expanded FDI presence is associated with a higher skill premium; if anything, the association is neutral or compressive for more educated workers. It appears that in Vietnam, FDI growth expands local labor markets and raises employment, but not in a way that systematically strengthens incentives for investments in human capital acquisition.

7. Summary and conclusions

It is well-established that FDI in labor-intensive manufacturing contributes to employment growth and structural change in labor markets, but the extent and nature of FDI-related job growth, and especially its effect on the composition of labor demand by skills, remains poorly understood. We have investigated the net contribution of FDI to employment growth and demand for skills in Vietnam, using labor force survey data from the recent era of rapid FDI and GDP growth. Our estimates of the local FDI employment multiplier fall between 0.93 and 1.05: for every 100 new jobs in FDI establishments, roughly 100 additional jobs are created in other sectors. Decomposing the multiplier by industry and worker characteristics reveals, however, that while new job creation within FDI firms broadly reflects the skill mix of the existing labor force, the indirect effect of FDI is to create service-sector jobs mainly in household firms, employing workers with mainly below-average educational attainment. The net effect on

the skill premium--an important measure of incentives to attain education beyond basic levels—seems at best neutral and possibly negative.

Our findings suggest that FDI-led growth, by itself, is unlikely to generate strong skill upgrading. While FDI creates new jobs both directly and indirectly, the latter jobs are concentrated in services, household enterprises, private firms, and occupations that are not strongly skill-intensive. This pattern is consistent with the broader decline in returns to schooling observed in Vietnam during the same period (Banh et al., 2024). Such a growth path may weaken incentives for human capital investment even while continuing to generate employment and income growth.

A lack of clear information about employment effects feeds controversy over the net economic benefits of hosting FDI projects and may divert policy attention to second-order issues such as backward linkages in the supply chain. At the same time, the risks of overdependence on efficiency-seeking FDI that takes advantage of a large and low-skill labor force are real: countries that specialize in low-skill activities within the global value chain may face diminished their chances of moving up the skill ladder, if abundant low-skill jobs undermine the appeal of education beyond basic grades. For policymakers, robust growth in demand for blue-collar workers may run counter to attempts to increase educational attainment and build the more highly skilled labor force needed to sustain growth in the long run.

Among possible policy responses, measures to lower the cost and improve the quality of education are clearly vital to improving the supply of skilled workers. But such measures within the domain of "traditional" education policy will be more effective if accompanied by complementary measures on the demand side of the skills market. However, these measures must be incentive-compatible for investors. In a world where foreign capital can choose among many possible destinations, attempts by host-country policymakers to manipulate the skill-intensity of FDI through local content requirements or other conditions may discourage investment more than it boosts skills demand. Measures designed around incentive-compatibility may show more promise. Among these, provision of infrastructure and services to support not merely production, but skill-intensive production, offer intriguing possibilities. "New cities" designed to offer infrastructure, services and amenities that are complementary with a more highly skilled labor force, and including institutions engaged in research, vocational training and connectivity, appear to offer strong prospects to attract more skill-intensive investments, match them with workers, and thereby make both more productive. There may also be potential for productivity gains arising from agglomeration externalities, both among FDI enterprises and between these and local institutions such as universities. Exploring the design, benefits and costs of innovations of these kinds is a way forward for researchers and policymakers seeking successful and efficient pathways through middle income and beyond.

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Tables and Figures

Table 1: Summary statistics for key variables, 2011-2023

	Obs	Mean	Std. dev.	Min	Max	Share (%)
FDI workers	7,995	4,516	16,346	0	376,101	6.2
Non-FDI workers	7,995	678,65	45,603	0	506,409	93.8
In farm households	7,995	24,969	20,287	0	159,466	34.5
In non-farm household firms	7,995	25,162	24,028	0	240,589	34.8
In private firms	7,995	9,690	17,254	0	209,552	13.4
In government	7,995	7,641	8,966	0	98,696	10.6
Non-FDI employment by sector						100.0
In agriculture	7,995	25,326	20,446	0	160,885	37.3
In manufacturing	7,995	9,746	13,469	0	198,044	14.4
In services	7,995	32,169	34,168	0	309,144	47.4
Non-FDI workers by education						100.0
Post-secondary completion	7,995	9,404	15,118	0	179,072	13.9
Upper-secondary completion	7,995	13,142	13,326	0	153,896	19.4
Lower-secondary or less	7,995	45,317	29,319	0	362,983	66.8

Shares in final column are calculated from district-year means. Source: Authors' calculations from LFS 2011-2023.

Table 2: FDI Employment multipliers, total employment

	Total non-FDI workers			
	(1)	(2)	(3)	(4)
FDI Employment	0.992***	0.946***	1.052***	0.932***
	(0.081)	(0.087)	(0.087)	(0.112)
Province FE	Yes			
Year FE	Yes			Yes
Province × Time trend		Yes		
Province × Year FE			Yes	
District FE				Yes
Observations	7,995	7,995	7,995	7,995
R-squared	0.503	0.842	0.525	0.713

Dependent variable: non-FDI employment. Constant terms not reported. District-level demographic controls included in models (1)-(3). Robust standard errors clustered at district level. Source: Authors' estimates from LFS data. *** p<0.01, ** p<0.05, * p<0.1.

Table 3: FDI Employment multipliers, by industry

	(1)	(2)	(3)	(4)
		Agriculture		
FDI Employment	0.016	-0.044	0.032	0.027
	(0.023)	(0.032)	(0.021)	(0.029)
R-squared	0.417	0.736	0.472	0.583
		Manufacturing		
FDI Employment	0.345***	0.348***	0.357***	0.331***
	(0.031)	(0.030)	(0.031)	(0.046)
R-squared	0.595	0.733	0.617	0.766
		Services		
FDI Employment	0.626***	0.636***	0.657***	0.571***
	(0.068)	(0.066)	(0.078)	(0.066)
R-squared	0.675	0.827	0.686	0.827
		Included in all estimates		
Province FE	Yes			
Year FE	Yes			Yes
Province × Time trend		Yes		
Province × Year FE			Yes	
District FE				Yes
Observations	7,995	7,995	7,995	7,995

Dependent variable: non-FDI employment. Constant terms not reported. District-level demographic controls included in models (1)-(3). Robust standard errors clustered at district level. Source: Authors' estimates from LFS data. *** p<0.01, ** p<0.05, * p<0.1.

Table 4: FDI Employment multipliers, by enterprise ownership

	(1)	(2)	(3)	(4)
	Agricultural households			
FDI Employment	0.019	-0.041	0.034	0.029
	(0.021)	(0.030)	(0.021)	(0.025)
R-squared	0.417	0.735	0.473	0.584
	Non-agricultural household firms			
FDI Employment	0.489***	0.497***	0.517***	0.438***
	(0.043)	(0.042)	(0.051)	(0.056)
R-squared	0.576	0.797	0.592	0.759
	Private firms			
FDI Employment	0.377***	0.391***	0.381***	0.389***
	(0.033)	(0.032)	(0.035)	(0.039)
R-squared	0.688	0.757	0.710	0.838
	Government			
FDI Employment	0.105***	0.096***	0.118***	0.074**
	(0.023)	(0.024)	(0.021)	(0.032)
R-squared	0.580	0.751	0.603	0.750
	Included in all estimates			
Province FE	Yes			
Year FE	Yes			Yes
Province × Time trend		Yes		
Province × Year FE			Yes	
District FE				Yes
Observations	7,995	7,995	7,995	7,995

Dependent variable: non-FDI employment. Constant terms not reported. District-level demographic controls included in models (1)-(3). Robust standard errors clustered at district level. Source: Authors' estimates from LFS data. *** p<0.01, ** p<0.05, * p<0.1.

Table 5: FDI Employment multipliers, by completed educational level

	(1)	(2)	(3)	(4)
	Lower secondary or below			
FDI Employment	0.631***	0.564***	0.680***	0.599***
	(0.064)	(0.073)	(0.063)	(0.092)
R-squared	0.414	0.812	0.451	0.611
	Upper secondary			
FDI Employment	0.219***	0.226***	0.227***	0.207***
	(0.033)	(0.032)	(0.038)	(0.026)
R-squared	0.587	0.788	0.605	0.776
	Post-secondary			
FDI Employment	0.141***	0.157***	0.145***	0.126***
	(0.035)	(0.033)	(0.039)	(0.021)
R-squared	0.664	0.747	0.686	0.829
	Included in all estimates			
Province FE	Yes			
Year FE	Yes			Yes
Province × Time trend		Yes		
Province × Year FE			Yes	
District FE				Yes
Observations	7,995	7,995	7,995	7,995

Dependent variable: non-FDI employment. Constant terms not reported. District-level demographic controls included in models (1)-(3). Robust standard errors clustered at district level. Source: Authors' estimates from LFS data. *** p<0.01, ** p<0.05, * p<0.1.

Table 6: FDI Employment multipliers, total employment 2011-2023, with district spillover effects

	Total non-FDI workers			
	(1)	(2)	(3)	(4)
FDI Employment	0.967***	0.961***	1.036***	0.940***
	(0.094)	(0.094)	(0.099)	(0.109)
FDI Employment in neighboring	0.020	0.011	0.008	-0.018
districts, 0-30 km	(0.023)	(0.022)	(0.028)	(0.023)
FDI Employment in neighboring	-0.038***	-0.048***	-0.047***	0.007
districts, 30-50 km	(0.015)	(0.015)	(0.015)	(0.020)
Province FE	Yes	Yes		
Year FE	Yes			Yes
Province x Time trend		Yes		
Province x Year FE			Yes	
District FE				Yes
Observations	7,995	7,995	7,995	7,995
R-squared	0.509	0.845	0.531	0.713

Dependent variable: non-FDI employment. Constant terms not reported. District-level demographic controls included in models (1)-(3). Robust standard errors clustered at district level. Source: Authors' estimates from LFS data. *** p<0.01, ** p<0.05, * p<0.1.

Table 7: FDI employment and Labor Force Survey occupations

	(1)	(2)	(3)	(4)
	High-skill cognitive non-FDI occupation (ISCO 1-3)			
FDI Employment	0.145***	0.145***	0.153***	0.131***
	(0.028)	(0.027)	(0.030)	(0.026)
R-squared	0.673	0.766	0.686	0.837
	Clerical/Service non-FDI occupation (ISCO 4-5)			
FDI Employment	0.297***	0.299***	0.309***	0.271***
	(0.033)	(0.033)	(0.039)	(0.033)
R-squared	0.642	0.798	0.656	0.794
	Agricultural non-FDI occupation (ISCO 6)			
FDI Employment	-0.011	-0.018	0.001	-0.008
	(0.010)	(0.011)	(0.008)	(0.016)
R-squared	0.405	0.569	0.587	0.535
	Production blue-collar non-FDI occupation (ISCO 7-8)			
FDI Employment	0.432***	0.437***	0.448***	0.407***
	(0.023)	(0.023)	(0.025)	(0.042)
R-squared	0.614	0.779	0.631	0.779
	Elementary non-FDI occupation (ISCO 9)			
FDI Employment	0.123***	0.075***	0.135***	0.124***
	(0.021)	(0.025)	(0.023)	(0.024)
R-squared	0.368	0.738	0.477	0.529
	Included in all estimates			
Province FE	Yes			
Year FE	Yes			Yes
Province × Time trend		Yes		
Province × Year FE			Yes	
District FE				Yes
Observations	7,995	7,995	7,995	7,995

Dependent variable is employment in ISCO category shown. District-level demographic controls included in models (1)-(3). Constant terms not reported. Robust standard errors clustered at district level. Source: Authors' estimates from LFS data. *** p<0.01, ** p<0.05, * p<0.1.

Table 8: FDI employment and ISCO occupations

	(1)	(2)	(3)	(4)
	Managers (ISCO 1; skill levels 3-4)			
FDI Employment	0.008***	0.008***	0.009***	0.005*
	(0.001)	(0.002)	(0.002)	(0.003)
R-squared	0.476	0.631	0.509	0.626
	Professionals (ISCO 2; skill level 4)			
FDI Employment	0.085***	0.087***	0.089***	0.069***
	(0.022)	(0.021)	(0.025)	(0.011)
R-squared	0.671	0.742	0.685	0.837
	Technicians (ISCO 3; skill level 3)			
FDI Employment	0.052***	0.050***	0.055***	0.057***
	(0.015)	(0.015)	(0.016)	(0.018)
R-squared	0.526	0.694	0.564	0.696
	Clerical (ISCO 4; skill level 2)			
FDI Employment	0.035***	0.036***	0.037***	0.035***
	(0.004)	(0.004)	(0.004)	(0.004)
R-squared	0.499	0.614	0.549	0.642
	Services/Sales (ISCO 5; skill level 2)			
FDI Employment	0.262***	0.263***	0.272***	0.236***
	(0.031)	(0.030)	(0.036)	(0.031)
R-squared	0.626	0.792	0.642	0.782
	Agricultural workers (ISCO 6; skill level 2)			
FDI Employment	-0.011	-0.018	0.001	-0.008
	(0.010)	(0.011)	(0.008)	(0.016)
R-squared	0.405	0.569	0.587	0.535
	Craft trades (ISCO 7; skill level 2)			
FDI Employment	0.233***	0.232***	0.243***	0.199***
	(0.014)	(0.014)	(0.015)	(0.023)
R-squared	0.530	0.749	0.555	0.725
	Operators (ISCO 8; skill level 2)			
FDI Employment	0.200***	0.205***	0.204***	0.208***
	(0.017)	(0.017)	(0.018)	(0.023)
R-squared	0.606	0.715	0.635	0.761
	Elementary (ISCO 9; skill level 1)			
FDI Employment	0.123***	0.075***	0.135***	0.124***
	(0.021)	(0.025)	(0.023)	(0.024)
R-squared	0.368	0.738	0.477	0.529
	Included in all estimates			

Province FE	Yes			
Year FE	Yes			Yes
Province × Time trend		Yes		
Province × Year FE			Yes	
District FE				Yes
Observations	7,995	7,995	7,995	7,995

Dependent variable is employment in ISCO category shown. Skill levels are ISCO-defined. District-level demographic controls included in models (1)-(3). Constant terms not reported. Robust standard errors clustered at district level. Source: Authors' estimates from LFS data. *** p<0.01, ** p<0.05, * p<0.1.

Table 9: FDI intensity and wage premia by educational level

	Log of monthly wage			
	2011-2023	2011-2015	2016-2019	2020-2023
Educational attainments				
Lower-secondary education	0.067***	0.051***	0.078***	0.069***
	(0.008)	(0.011)	(0.009)	(0.009)
Upper-secondary education	0.146***	0.130***	0.167***	0.135***
	(0.011)	(0.015	(0.010	(0.011)
Post-secondary education	0.355***	0.414***	0.357***	0.313***
	(0.027)	(0.025	(0.029)	(0.023)
FDI intensity	0.205*	0.093	0.413**	0.087
	(0.104)	(0.075)	(0.156)	(0.132)
Educational attainments × FDI intensity				
Lower-secondary education	-0.032	0.017	-0.051	-0.073
	(0.045)	(0.041)	(0.059)	(0.066)
Upper-secondary education	-0.100*	-0.023	-0.158**	-0.124*
	(0.050)	(0.045)	(0.066)	(0.066)
Post-secondary education	-0.04	0.071	-0.185*	-0.023
	(0.076)	(0.086)	(0.100)	(0.087)
Observations	582,863	175,517	211,392	195,954
R-squared	0.466	0.359	0.353	0.273

The sample is drawn from the Labor Force Surveys (2011–2023) and comprises wage workers currently employed at the time of survey, aged 25–60. FDI intensity is defined as the FDI share of provincial employment. Control variables include urban status, marital status, age, age squared, migration status, and industry of employment. All specifications include province, month, and year fixed effects. Standard errors (in parentheses) are clustered at the provincial level. *** p<0.01, ** p<0.05, * p<0.1.

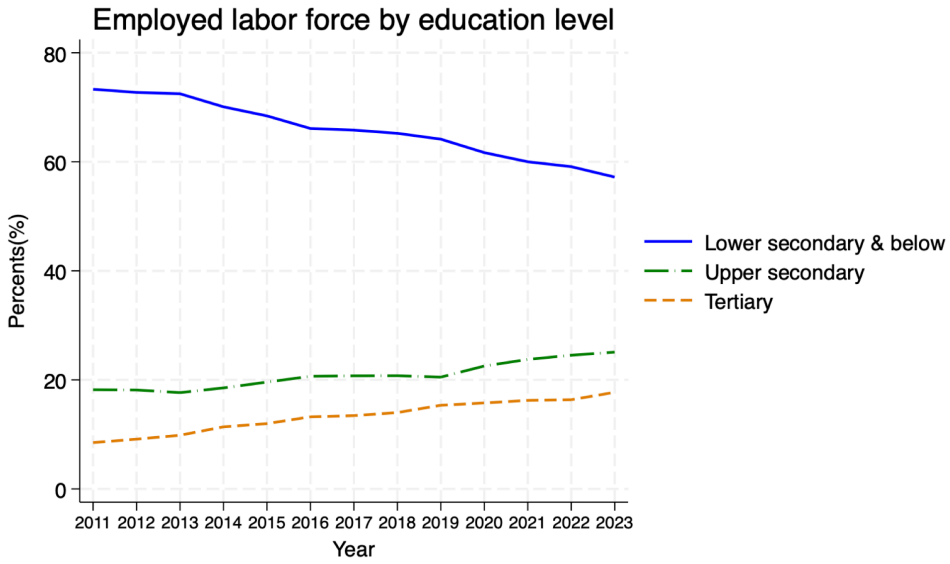

Figure 1: Composition of the labor force by completed educational level, by year

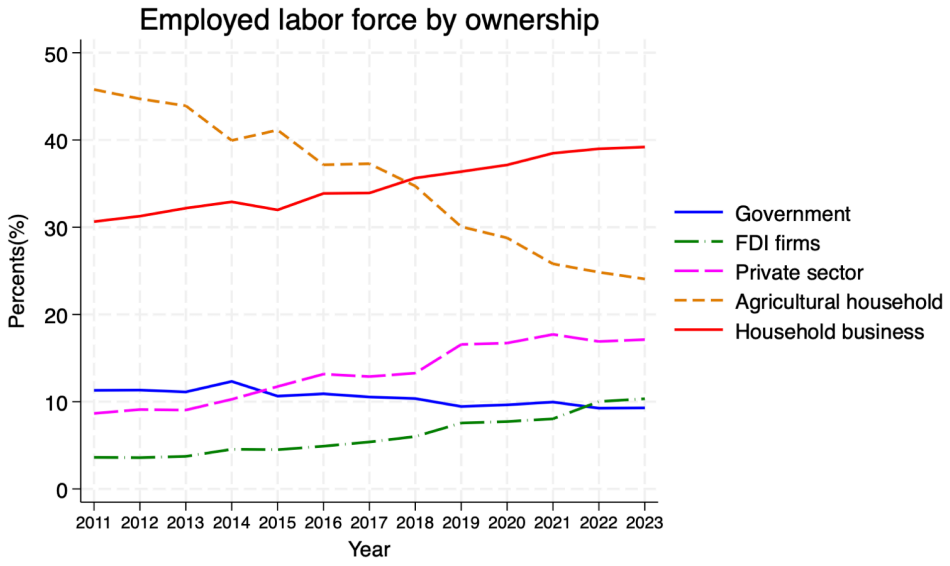

Figure 2: Composition of the labor force by enterprise ownership, by year

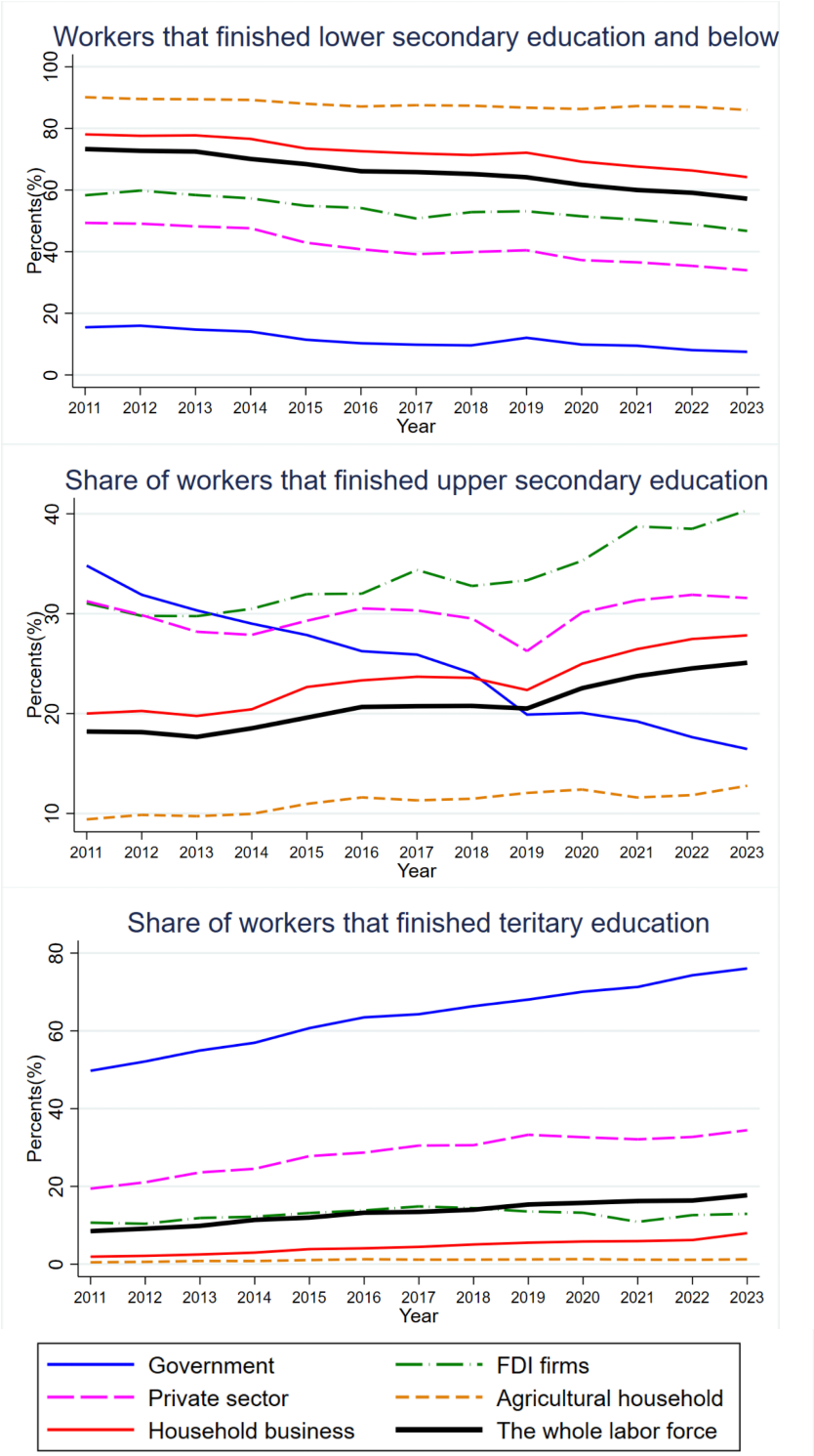

Figure 3: Composition of the labor force by education, by ownership, by year

Appendix Tables

Table A1: FDI Employment multipliers by industry 2011-23, with district spillovers

	(1)	(2)	(3)	(4)
		Agriculture		
FDI Employment	0.027	0.018	0.046**	0.031
	(0.023)	(0.020)	(0.020)	(0.029)
FDI Employment in neighboring	-0.003	-0.017***	-0.008*	0.005
districts, 0-30 km	(0.003)	(0.003)	(0.004)	(0.005)
FDI Employment in neighboring	-0.009***	-0.024***	-0.010***	-0.010**
districts, 30-50 km	(0.003)	(0.003)	(0.004)	(0.005)
R-squared	0.418	0.745	0.474	0.584
		Manufacturing		
FDI Employment	0.338***	0.339***	0.347***	0.335***
	(0.038)	(0.038)	(0.040)	(0.044)
FDI Employment in neighboring	0.005	0.006	0.005	-0.011
districts, 0-30 km	(0.007)	(0.007)	(0.009)	(0.007)
FDI Employment in neighboring	-0.007	-0.006	-0.008*	0.006
districts, 30-50 km	(0.005)	(0.005)	(0.005)	(0.006)
R-squared	0.598	0.734	0.619	0.767
		Services		
FDI Employment	0.596***	0.599***	0.637***	0.571***
	(0.070)	(0.070)	(0.078)	(0.067)
FDI Employment in neighboring	0.018	0.021	0.011	-0.011
districts, 0-30 km	(0.015)	(0.015)	(0.019)	(0.015)
FDI Employment in neighboring	-0.022**	-0.018*	-0.029***	0.011
districts, 30-50 km	(0.010)	(0.010)	(0.009)	(0.014)
R-squared	0.679	0.829	0.690	0.828
		Included in all estimates		
Province FE	Yes	Yes		
Year FE	Yes			Yes
Province x Time trend		Yes		
Province x Year FE			Yes	
District FE				Yes

Dependent variable: non-FDI employment. District-level demographic controls included in models (1)-(3). Robust standard errors clustered at district level. N=7,995. Source: Authors' estimates from LFS data. *** p<0.01, ** p<0.05, * p<0.1.

Table A2: FDI employment multipliers by enterprise ownership 2011-23, with district spillovers

	(1)	(2)	(3)	(4)
	Agricultural households			
FDI Employment	0.028	0.019	0.046**	0.033
	(0.021)	(0.019)	(0.020)	(0.025)
FDI Employment in neighboring	-0.002	-0.016***	-0.007*	0.005
districts, 0-30 km	(0.003)	(0.003)	(0.004)	(0.005)
FDI Employment in neighboring	-0.009***	-0.024***	-0.010***	-0.010**
districts, 30-50 km	(0.003)	(0.003)	(0.004)	(0.005)
R-squared	0.419	0.743	0.475	0.584
	Non-agricultural household firms			
FDI Employment	0.493***	0.496***	0.523***	0.446***
	(0.049)	(0.049)	(0.059)	(0.059)
FDI Employment in neighboring	0.002	0.005	-0.004	-0.016
districts, 0-30 km	(0.013)	(0.013)	(0.017)	(0.012)
FDI Employment in neighboring	-0.016*	-0.013	-0.021***	0.006
districts, 30-50 km	(0.008)	(0.008)	(0.008)	(0.012)
R-squared	0.580	0.798	0.597	0.760
	Private firms			
FDI Employment	0.324***	0.326***	0.344***	0.371***
	(0.051)	(0.051)	(0.051)	(0.042)
FDI Employment in neighboring	0.025**	0.027***	0.021**	0.009
districts, 0-30 km	(0.010)	(0.010)	(0.010)	(0.010)
FDI Employment in neighboring	-0.005	-0.002	-0.010*	0.014**
districts, 30-50 km	(0.005)	(0.005)	(0.005)	(0.006)
R-squared	0.700	0.768	0.718	0.843
	Government			
FDI Employment	0.120***	0.119***	0.122***	0.088***
	(0.021)	(0.021)	(0.020)	(0.026)
FDI Employment in neighboring	-0.005	-0.006**	-0.002	-0.015***
districts, 0-30 km	(0.003)	(0.003)	(0.004)	(0.004)
FDI Employment in neighboring	-0.008***	-0.010***	-0.007***	-0.003
districts, 30-50 km	(0.002)	(0.002)	(0.002)	(0.003)
R-squared	0.591	0.761	0.606	0.761
	Included in all estimates			
Province FE	Yes	Yes		
Year FE	Yes			Yes
Province x Time trend		Yes		
Province x Year FE			Yes	
District FE				Yes

Dependent variable: non-FDI employment. District-level demographic controls included in models (1)-(3). Robust standard errors clustered at district level. N=7,995. Source: Authors' estimates from LFS data. *** p<0.01, ** p<0.05, * p<0.1.

Table A3: FDI employment multipliers by completed educational level 2011-23, with district spillovers

	(1)	(2)	(3)	(4)
	Lower secondary or below			
FDI Employment	0.666***	0.657***	0.700***	0.629***
	(0.067)	(0.064)	(0.067)	(0.085)
FDI Employment in neighboring	-0.009	-0.023*	-0.012	-0.026*
districts, 0-30 km	(0.013)	(0.013)	(0.017)	(0.014)
FDI Employment in neighboring	-0.027***	-0.042***	-0.027***	-0.012
districts, 30-50 km	(0.009)	(0.009)	(0.009)	(0.013)
R-squared	0.423	0.821	0.456	0.616
	Upper secondary			
FDI Employment	0.200***	0.201***	0.216***	0.201***
	(0.034)	(0.033)	(0.037)	(0.026)
FDI Employment in neighboring	0.011	0.012*	0.006	-0.001
districts, 0-30 km	(0.007)	(0.007)	(0.008)	(0.006)
FDI Employment in neighboring	-0.007*	-0.006	-0.012***	0.007
districts, 30-50 km	(0.004)	(0.004)	(0.004)	(0.005)
R-squared	0.592	0.790	0.610	0.777
	Post-secondary			
FDI Employment	0.101***	0.103***	0.121***	0.109***
	(0.036)	(0.035)	(0.035)	(0.024)
FDI Employment in neighboring	0.019***	0.022***	0.014*	0.009
districts, 0-30 km	(0.007)	(0.006)	(0.007)	(0.008)
FDI Employment in neighboring	-0.003	0.000	-0.008**	0.012**
districts, 30-50 km	(0.004)	(0.004)	(0.004)	(0.005)
R-squared	0.672	0.756	0.691	0.834
	Included in all estimates			
Province FE	Yes	Yes		
Year FE	Yes			Yes
Province x Time trend		Yes		
Province x Year FE			Yes	
District FE				Yes

Dependent variable: non-FDI employment. District-level demographic controls included in models (1)-(3). Robust standard errors clustered at district level. N=7,995. Source: Authors' estimates from LFS data. *** p<0.01, ** p<0.05, * p<0.1.

Table A4: FDI Multipliers with Baseline Characteristic × Year Trends

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Total non-FDI	Non-FDI agri	Non-FDI manu	Non-FDI serv	HH agri	HH non-ag	Private	Govt	Lower educ	Upper sec	Post-sec
Panel A: Wealth Index × Year Interactions											
FDI emp't	0.840***	0.074***	0.280***	0.479***	0.074***	0.377***	0.319***	0.066***	0.596***	0.164***	0.080***
	(0.093)	(0.027)	(0.041)	(0.051)	(0.025)	(0.037)	(0.039)	(0.024)	(0.077)	(0.022)	(0.022)
Obs.	7,995	7,995	7,995	7,995	7,995	7,995	7,995	7,995	7,995	7,995	7,995
R-squared	0.754	0.652	0.808	0.851	0.653	0.792	0.876	0.788	0.669	0.807	0.868
Panel B: College Share × Year Interactions											
FDI emp't	0.869***	0.083***	0.281***	0.497***	0.084***	0.387***	0.326***	0.069***	0.605***	0.171***	0.093***
	(0.088)	(0.027)	(0.040)	(0.049)	(0.026)	(0.037)	(0.036)	(0.023)	(0.074)	(0.021)	(0.021)
Obs.	7,995	7,995	7,995	7,995	7,995	7,995	7,995	7,995	7,995	7,995	7,995
R-squared	0.753	0.651	0.809	0.850	0.652	0.793	0.875	0.788	0.669	0.807	0.865
Panel C: Migrant Share × Year Interactions											
FDI emp't	0.853***	0.080***	0.281***	0.486***	0.080***	0.383***	0.319***	0.067***	0.605***	0.166***	0.081***
	(0.094)	(0.028)	(0.041)	(0.052)	(0.026)	(0.038)	(0.039)	(0.024)	(0.077)	(0.022)	(0.023)
Obs.	7,995	7,995	7,995	7,995	7,995	7,995	7,995	7,995	7,995	7,995	7,995
R-squared	0.753	0.651	0.808	0.851	0.652	0.792	0.875	0.788	0.668	0.807	0.868
Included in all estimates											
District FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Prov×Yr FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Char×Yr trend	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Each cell reports the coefficient on FDI employment from a separate regression of the column outcome on FDI employment, district-level controls, district FE, province×year FE, and the baseline characteristic × year interactions listed in the panel header. Standard errors clustered by district in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table A5: Placebo / Lead Tests for FDI Multipliers

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Total non-FDI	Non-FDI agri	Non-FDI manu	Non-FDI serv	HH agri	HH non-ag	Private	Govt	Lower educ	Upper sec	Post-sec
Panel A: One-period lead (FDI employment at t+1 only)											
FDI employment (t)	0.894***	0.075***	0.282***	0.533***	0.075***	0.404***	0.330***	0.084***	0.621***	0.175***	0.098***
	(0.065)	(0.023)	(0.036)	(0.043)	(0.021)	(0.036)	(0.039)	(0.015)	(0.056)	(0.023)	(0.017)
FDI employment (t+1)	0.014	0.008	0.032	-0.031	0.009	-0.004	0.018	-0.015	0.024	-0.001	-0.010
	(0.066)	(0.019)	(0.020)	(0.042)	(0.019)	(0.040)	(0.021)	(0.018)	(0.046)	(0.021)	(0.011)
Observations	7,380	7,380	7,380	7,380	7,380	7,380	7,380	7,380	7,380	7,380	7,380
R-squared	0.751	0.648	0.812	0.850	0.649	0.789	0.877	0.790	0.664	0.808	0.867
Panel B: Two-period leads (FDI employment at t+1 and t+2)											
FDI employment (t)	0.888***	0.076***	0.289***	0.518***	0.076***	0.395***	0.334***	0.082***	0.623***	0.174***	0.091***
	(0.065)	(0.024)	(0.036)	(0.040)	(0.022)	(0.035)	(0.037)	(0.016)	(0.060)	(0.022)	(0.017)
FDI employment (t+1)	0.171***	0.019	0.066**	0.083***	0.017	0.085***	0.045	0.020**	0.122***	0.018	0.030**
	(0.059)	(0.014)	(0.029)	(0.029)	(0.013)	(0.029)	(0.033)	(0.009)	(0.044)	(0.015)	(0.015)
FDI employment (t+2)	-0.226***	-0.016	-0.049	-0.164***	-0.010	-0.136***	-0.038	-0.044**	-0.15***	-0.029	-0.05***
	(0.080)	(0.014)	(0.032)	(0.052)	(0.013)	(0.036)	(0.032)	(0.019)	(0.047)	(0.029)	(0.017)
Observations	6,765	6,765	6,765	6,765	6,765	6,765	6,765	6,765	6,765	6,765	6,765
R-squared	0.749	0.646	0.814	0.850	0.647	0.789	0.879	0.792	0.662	0.811	0.867
Included in all estimates											
District FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province × Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wealth × Year trends	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Each panel reports contemporaneous and lead FDI coefficients from a regression of the column outcome on FDI employment (t), lead(s) of FDI employment, district-level controls, district FE, province×year FE, and wealth×year interactions. If t+1 and t+2 are insignificant, the exogeneity assumption is supported. Standard errors clustered by district in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table A6: FDI Multipliers — Sample Splits and Exclusion Robustness

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
	Total non-FDI	Non-FDI agri	Non-FDI manu	Non-FDI serv	HH agri	HH non-ag	Private	Govt	Lower educ	Upper sec	Post-sec
Panel A: Rural Districts											
FDI employment	0.811***	0.153**	0.149**	0.501***	0.150**	0.406***	0.192***	0.054***	0.548***	0.193***	0.070***
	(0.166)	(0.075)	(0.058)	(0.073)	(0.072)	(0.066)	(0.054)	(0.020)	(0.141)	(0.025)	(0.025)
Observations	6,110	6,110	6,110	6,110	6,110	6,110	6,110	6,110	6,110	6,110	6,110
R-squared	0.657	0.586	0.756	0.748	0.587	0.750	0.775	0.556	0.621	0.737	0.695
Panel B: Urban Districts											
FDI employment	1.154***	0.050***	0.437***	0.665***	0.049***	0.514***	0.467***	0.122***	0.795***	0.221***	0.138***
	(0.162)	(0.011)	(0.044)	(0.122)	(0.012)	(0.103)	(0.044)	(0.023)	(0.088)	(0.045)	(0.034)
Observations	1,469	1,469	1,469	1,469	1,469	1,469	1,469	1,469	1,469	1,469	1,469
R-squared	0.807	0.724	0.833	0.816	0.724	0.769	0.854	0.789	0.792	0.791	0.826
Panel C: Excluding High-FDI Provinces (Hanoi, Bac Ninh, Binh Duong, HCMC, Dong Nai, Bac Giang)											
FDI employment	0.964***	0.087	0.199**	0.669***	0.087	0.581***	0.205*	0.083**	0.573**	0.264***	0.127*
	(0.351)	(0.109)	(0.099)	(0.184)	(0.108)	(0.127)	(0.113)	(0.039)	(0.256)	(0.052)	(0.071)
Observations	6,890	6,890	6,890	6,890	6,890	6,890	6,890	6,890	6,890	6,890	6,890
R-squared	0.637	0.618	0.736	0.777	0.618	0.742	0.770	0.740	0.618	0.734	0.773
Panel D: Excluding Top 1% FDI District-Years											
FDI employment	1.642***	0.134*	0.435***	1.060***	0.133*	0.868***	0.424***	0.201***	1.037***	0.372***	0.233***
	(0.300)	(0.079)	(0.102)	(0.196)	(0.076)	(0.171)	(0.096)	(0.039)	(0.199)	(0.075)	(0.059)
Observations	7,914	7,914	7,914	7,914	7,914	7,914	7,914	7,914	7,914	7,914	7,914
R-squared	0.710	0.639	0.757	0.829	0.640	0.755	0.850	0.774	0.620	0.783	0.851
Panel E: Excluding Top 5% FDI District-Years											
FDI employment	2.258***	0.255*	0.454***	1.543***	0.243	1.225***	0.466***	0.312***	1.398***	0.511***	0.349***
	(0.305)	(0.152)	(0.087)	(0.182)	(0.151)	(0.156)	(0.080)	(0.056)	(0.231)	(0.072)	(0.067)
Observations	7,594	7,594	7,594	7,594	7,594	7,594	7,594	7,594	7,594	7,594	7,594

R-squared	0.708	0.644	0.765	0.836	0.644	0.762	0.857	0.781	0.623	0.788	0.855
Included in all estimates											
District FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Province × Yr FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Notes: Each cell reports the coefficient on FDI employment from a regression of the column outcome on FDI employment, district FE, and province×year FE within the sample described in the panel header. Time-invariant district controls are absorbed by the district fixed effect. Standard errors clustered by district in parentheses. *** p<0.01, ** p<0.05, * p<0.10.

Table A7: FDI intensity and wage premia by educational level in manufacturing

	Log of monthly wage			
	2011-2023	2011-2015	2016-2019	2020-2023
Educational attainment				
Lower-secondary education	0.067***	0.061***	0.071***	0.065***
	(0.007)	(0.011)	(0.009)	(0.008)
Upper-secondary education	0.141***	0.142***	0.147***	0.128***
	(0.009)	(0.013)	(0.009)	(0.009)
Post-secondary education	0.359***	0.472***	0.346***	0.300***
	(0.029)	(0.030)	(0.029)	(0.026)
FDI intensity	0.239**	0.128*	0.490***	0.086
	(0.109)	(0.075)	(0.159)	(0.143)
Educational attainment × FDI intensity				
Lower-secondary education	-0.047	0.003	-0.055	-0.084
	(0.042)	(0.038)	(0.050)	(0.061)
Upper-secondary education	-0.122**	-0.076*	-0.142**	-0.138**
	(0.053)	(0.041)	(0.066)	(0.065)
Post-secondary education	-0.166	-0.194	-0.272**	-0.045
	(0.112)	(0.122)	(0.111)	(0.117)
Observations	332925	94448	119947	118530
R-squared	0.49	0.352	0.346	0.252

The sample is drawn from the Labor Force Surveys (2011–2023) and comprises wage workers currently employed in manufacturing industries at the time of survey, aged 25–60. FDI intensity is defined as the provincial FDI employment share. Control variables include urban status, marital status, age, age squared, migration status, and industry of employment. All specifications include province, month, and year fixed effects. Standard errors (in parentheses) are clustered at the provincial level. *** p<0.01, ** p<0.05, * p<0.1.

Table A8: FDI employment and wage premia by educational level

	Log of monthly wage			
	2011-2023	2011-2015	2016-2019	2020-2023
Educational attainment				
Lower-secondary education	0.070***	0.050***	0.083***	0.076***
	(0.007)	(0.010)	(0.007)	(0.007)
Upper-secondary education	0.147***	0.129***	0.165***	0.139***
	(0.009)	(0.013)	(0.008	(0.009)
Post-secondary education	0.343***	0.392***	0.341***	0.314***
	(0.021)	(0.022)	(0.023	(0.018)
FDI employment	0.089***	0.087***	0.106***	0.070***
	(0.011)	(0.019)	(0.013	(0.009)
Educational attainment × FDI employment				
Lower-secondary education	-0.023***	0.009	-0.037***	-0.044***
	(0.008)	(0.010)	(0.009)	(0.007)
Upper-secondary education	-0.038***	-0.006	-0.053***	-0.050***
	(0.012)	(0.013)	(0.015)	(0.011)
Post-secondary education	0.042	0.138***	0.009	-0.003
	(0.028)	(0.040)	(0.024)	(0.015)
Observations	582,863	175,517	211,392	195,954
R-squared	0.469	0.367	0.356	0.275

The sample is drawn from the Labor Force Surveys (2011–2023) and comprises wage workers currently employed at the time of survey, aged 25–60. Control variables include urban status, marital status, age, age squared, migration status, and industry of employment. All specifications include province, month, and year fixed effects. Standard errors (in parentheses) are clustered at the provincial level. *** p<0.01, ** p<0.05, * p<0.1.

Table A9: FDI employment and wage premia by educational level in manufacturing

	Log of monthly wage			
	2011-2023	2011-2015	2016-2019	2020-2023
Educational attainment				
Lower-secondary education	0.075***	0.065***	0.079***	0.074***
	(0.006)	(0.009)	(0.007)	(0.006)
Upper-secondary education	0.149***	0.149***	0.151***	0.137***
	(0.007)	(0.012)	(0.007)	(0.007)
Post-secondary education	0.359***	0.457***	0.334***	0.312***
	(0.021)	(0.023)	(0.021)	(0.020)
FDI employment	0.086***	0.089***	0.097***	0.064***
	(0.011)	(0.017)	(0.014)	(0.009)
Educational attainment × FDI employment				
Lower-secondary education	-0.036***	-0.014	-0.041***	-0.045***
	(0.007)	(0.010)	(0.009)	(0.007)
Upper-secondary education	-0.056***	-0.043***	-0.056***	-0.058***
	(0.011)	(0.014)	(0.014)	(0.009)
Post-secondary education	-0.046***	-0.009	-0.053***	-0.044***
	(0.014)	(0.031)	(0.017)	(0.012)
Observations	332,925	94,448	119,947	118,530
R-squared	0.492	0.356	0.346	0.254

The sample is drawn from the Labor Force Surveys (2011–2023) and comprises wage workers currently employed in manufacturing industries at the time of survey, aged 25–60. Control variables include urban status, marital status, age, age squared, migration status, and industry of employment. All specifications include province, month, and year fixed effects. Standard errors (in parentheses) are clustered at the provincial level. *** p<0.01, ** p<0.05, * p<0.1.