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IDE DISCUSSION PAPER No.1005

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

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Abstract

Foreign direct investment (FDI) in manufacturing industries creates jobs in labor-abundant developing economies, but does it also promote human capital 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. FDI alters local labor markets directly, and also indirectly by stimulating growth and jobs in domestic firms. We estimate local FDI employment multipliers for total jobs and for labor by level of educational attainment. Our study seeks to fill a knowledge gap on the contribution of "factory to the world" strategies to human capital formation and economic growth.

Keywords: local labor market, multiplier, FDI, skill premium, Vietnam
JEL classification: O12, F16, F21, J23, J24

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CHIBA 261-8545, JAPAN

Draft for discussion and comments: please do not share or cite

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Abstract

Foreign direct investment (FDI) in manufacturing industries creates jobs in labor-abundant developing economies, but does it also promote human capital 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. FDI alters local labor markets directly, and also indirectly by stimulating growth and jobs in domestic firms. We estimate local FDI employment multipliers for total jobs and for labor by level of educational attainment. Our study seeks to fill a knowledge gap on the contribution of "factory to the world" strategies to human capital formation and economic growth.

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[1] The first author acknowledges financial support from IDE-JETRO in the project entitled "Net effects of foreign investment on employment and demand for skills: Vietnam." The authors 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. Contacts: hangbanh@nus.edu.sg; ian_coxhead@ide.go.jp; vuong.nguyen.ge@u.tsukuba.ac.jp.

1. Introduction: economic and policy setting

Vietnam's government aspires that the country reach upper-middle income by 2035 and high income by 2045. To reach these goals will require sustained high rates of labor productivity growth, something that 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 has raised productivity mainly through the first channel. Greenfield FDI projects have led this change, with investment inflows into export-oriented manufacturing helping to create millions of jobs and inducing large-scale movement of labor out of agriculture. Indeed, FDI and export-oriented manufacturing are almost synonymous in Vietnam: 61% of FDI inflows go to manufacturing, and in 2022, exports from FDI firms accounted for a remarkable 74% of total exports. However, Vietnam's rural labor force is shrinking fast, so the era of productivity gains achieved through reallocation of existing labor will soon end. The path to high-income status runs through the second productivity growth channel. Faster growth will require (among other changes) a big increase in the skills embodied in the labor force as well as increased opportunities for their productive employment.

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. The geographic distribution of FDI jobs is uneven, ranging from near zero in some remote districts to over 40% in parts of Binh Duong province, near Ho Chi Minh City. Overall, the provincial average FDI employment share is correlated with higher earnings per worker and a shift from informal to 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.[2] Informally employed or self-employed non-farm workers dominate a wide variety of sectors from construction to food, accommodation and transport services, and personal services. Informality is almost synonymous with low productivity: the majority of firms in these industries have 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

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

combination motivates the question addressed in our paper. What is the net effect of FDI on employment and skills demand?

The remainder of this paper is structured as follows. In section 2 we position our study relative to the literature on labor market impacts of investment and comparable shocks, including that drawing on Vietnamese data. In section 3 we describe the data and explore recent trends. In section 4 we address the first question, of the effects of FDI on employment and skills demand. We introduce and estimate local employment multipliers, including those differentiated by skill. In section 5 we examine evidence on the possible effects of FDI on the supply of skilled workers. Section 6 offers some conclusions and directions for further research.

2. Relation to the literature

2.1. Wages and skill premia

Economists' interest in the effects of trade on labor markets has risen along with trade shares in developing-country GDP and the availability of data with which to analyze effects (Topalova 2010; Dix-Carneiro and Kovak 2019). In Vietnam, a rich set of country studies has focused on the effects of trade and/or FDI on employment and wages (Edmonds and Pacvnik 2006; McCaig 2011; Fukase 2013; Nguyen 2019; Nguyen et al. 2020; Tafese et al. 2025) and on school-to-work transitions influenced by new job creation (Coxhead and Shrestha 2017; Coxhead et al. 2022).

On skill premia, Goldberg and Pavcnik (2007) reviewed studies assessing the effect of 1990s trade liberalizations in a 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 the opposite effect, in Indonesia (Amiti and Cameron, 2012; Coxhead and Shrestha, 2016), Bangladesh (Robertson et al., 2020), and China (Li, 2018). In Vietnam, McCaig (2011) and Fukase (2013) exploit provincial variation in trade exposure to find that increased exports are associated with relatively faster increases in demand for lower-skill labor and reductions in skill premia. 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. Such findings are nominally consistent with the Stolper-Samuelson theorem's prediction that greater trade exposure in a labor-abundant economy will reduce the skill premium. Of course, the effects of a trade or FDI shock on skilled labor demand or the relative price of skills depends greatly on the nature of the shock as well as on labor force and complementary

conditions, so heterogeneous findings are to be expected. Effects in a specific setting must be discovered from the data.

2.2. Local labor markets

The foregoing studies report *overall* labor market effects of trade or FDI inflows.[3] To understand the mechanisms at work, it is important to distinguish direct and indirect components of the overall change. Direct effects are those measured in the industry that is "shocked" by FDI inflows or a change in trade conditions. Indirect effects operate through changes in derived labor demand in industries upstream and downstream from the directly affected industry. Most indirect effects concern demand for services, and manufacturing and services are known to employ capital, skills and blue-collar labor in different proportions. Net job creation, and thus the overall effect on skills demand and skill premia, thus depends on local labor market effects.

A large empirical literature estimates local labor market multipliers associated with investment and related economic shocks. It addresses effects on employment in local tradable and nontradable industries (Moretti 2010, and many others); on wages and/or productivity (Lipsey and Sjoholm 2004 and many others); and in some developing-country cases, on the composition of employment, especially between formal and informal contracts (Robertson et al. 2020; McCaig et al. 2024). Although this is primarily an empirical literature, many studies are motivated by normative or policy questions such as the welfare effects of investments, or the merits of policies intended to stimulate local economic activity through subsidies, tax breaks or similar measures. Our main focus is on the effects of investments on labor demand and in particular on the relative demand for skills, though other welfare and policy questions are also of interest.

Following the literature, we focus on local labor market effects. 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 (for example, Autor et al. 2016).[4] Over a longer period, effects are dissipated through

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[3] Dix-Carneiro and Kovak (2019) examine trade-driven movement over formal-informal and tradeable-nontradable margins, but do not distinguish labor by skills. In Vietnam, McCaig and Pavcnik (2018) examine within-industry transitions from informal to formal employment resulting from an export demand shock.

[4] 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

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 appear to be muted, at least for less-skilled workers (McCaig 2011).

What does the employment multiplier literature reveal? In an influential early contribution, Moretti (2010) estimated the multiplier effects of manufacturing sector job growth in U.S. cities and found that for each such job created, another 1.6 jobs were created in nontradable sectors in the same city. Subsequent studies have yielded similar values (van Dijk 2017; Wang and Chanda 2018). As for local tradable sector multipliers, Moretti (2010) found no effect, consistent with the observation that since tradable products can be sourced from many locations, changing local demand need not induce a local supply response. Moretti's estimates also varied by the skill level of manufacturing jobs, finding a higher nontradable multiplier (2.5) associated with skilled job creation in tradable sectors, and a much lower one (1) with unskilled jobs. This differential was also confirmed in US data by van Dijk (2017), and in Chinese data by Wang and Chanda (2018). As might be expected, values of the local employment multiplier appear to vary along with observable constraints on local business expansion, most notably limitations on labor mobility.

A much smaller literature specifically estimating employment effects of FDI has produced a disparate range of estimates (Lipsey and Sjoholm 2005). 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. On the other hand 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. Both these studies, however, are focused on investments in resource extractive activities. 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 address mainly advanced economies and examine firm-level, rather than labor market-level outcomes (Blonigen and Slaughter 2001; Bandick and Hansson 2009; Koch and Smolka 2019). With heterogeneous FDI types, data sources

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applied general equilibrium models. However, there is scope for semi-structured speculation on general equilibrium effects, and we present some later in this paper.

and estimates, there are no "universal" multiplier predictions (Lipsey and Sjoholm 2005). Estimates from data are necessary.

3. Data

3.1. Labor Force Survey

The Vietnam Labor Force Survey (LFS) 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 64 provinces) but contains district identifiers, so can be constructed for econometric purposes as a repeated cross-section of district-level data. Importantly, the LFS sample includes all workers regardless of employment status. This is in contrast to employment data reported by firms in the annual Enterprise Surveys, since these draw data only from registered firms.

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 12 years in the data, FDI employment averaged 5.9% 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[5] 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 13.1% 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 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%.

[5] Non-FDI jobs in manufacturing are 14.3% of all non-FDI jobs, which are in turn 94.1% of all jobs.

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 more formal estimates later in this paper.

3.2. Industrial Zones and employment

Most FDI employment takes place within formally constituted industrial zones (IZs). The presence of an IZ in a district is thus an indicator of FDI inflow (or potential inflow). We collected IZ data, mainly from the Vietnam Industrial Zone (VIZ) Portal[6] as well as from other online sources. The dataset contains information for 736 IZs in Vietnam from 1991 to 2022, including their locations at district level, year of establishment, investors, current status, and area.[7] Of these 736 IZs, 64 IZs were missing information on establishment year and 141 are still in the planning stage at the time of data acquisition. Vietnam's IZs date back to the early 1990s, but their numbers increased dramatically after 2000 as the result of changes

[6] Vietnam Industrial Zone (VIZ) Portal: https://www.vietnamindustrialzone.com/

[7] The original dataset contains a total of 761 IZs, with expansion phases recorded as separate entries from the original phases. We removed the expansion-phase records.

to legislation governing FDI inflows and foreign presence, and changes in global investors' preferences for Vietnam as a production base.

3.3. Effects of IZ establishment: event studies

Does the establishment of a new IZ alter employment in local (district-level) labor markets? FDI-based manufacturing in IZs accounts for about 80% of total FDI inflows. We use the data on establishment of new IZs as described in section 3.2. We assume that for investors, the choice of a given district as a host for greenfields investment is driven by considerations such as location and infrastructure—notably access to ports, roads, water supplies and other physical characteristics. As seen earlier, employment in Vietnam's FDI firms is dominated by workers of only moderate educational attainment; therefore it is quite reasonable to suppose that the investment decision is not influenced by differences in the quantity or skill mix of local labor supply.

To ascertain the dynamic treatment effects of new IZ establishment, we use an event study approach. The dynamic two-way fixed-effects model for estimation takes the form

$$Y_{it} = \alpha_i + \gamma_t + \sum_{r \neq -1} \beta_r \times 1[D_i = 1] \times 1[t = r] + \epsilon_{it}, \quad (1)$$

where Y_{it} is the outcome of interest for district i in year t, α_i are district fixed effects, and γ_t are year fixed effects. D_i is a dummy variable which equals 1 if district i acquires its first IZ between 2011 and 2020. In this regression, r ranges from -3 to 3. This allows us to examine pre-trends as well as post-establishment trends, albeit over a tightly restricted interval.

Using the Labor Force Surveys 2011-2020,[8] we estimate model (1) at district level, where treatment districts are those that established their first IZ in 2011-2020, and the control group includes districts that still hosted no IZ as of the end of 2023. The parameters of interest are β_r; these show fluctuations of outcome variables in the years before and after establishment of the first IZ in a district. Outcomes of interest include total employment, employment by enterprise ownership, and share of employment by levels of educational attainment (tertiary, upper secondary, incomplete secondary or below).

The event study approach provides a dynamic difference-in-differences estimation of the impacts of establishment of an IZ on outcome variables. An underlying assumption of this method is that of parallel trends between the treatment and control groups. This assumption might not always hold in this setting, because districts without IZ during the studied period might not have the same geography, infrastructure,

[8] The data series was truncated to remove the effects of Covid-era limitations on economic activity.

or amenities as districts with IZs. One example is that districts with easy access to seaports and roads are more likely to have an IZ.

The estimation should also allow for the possibility of spillovers between districts. Districts in Vietnam encompass both urban and rural areas and vary greatly by size and population density. The national average district size is 470 km^2. However, urban districts (wards) are far smaller than this; Ho Chi Minh City, for example, in 2022 had 16 inner-city districts within an area of 493 km^2. In such metro areas we might expect substantial inter-district spillover effects as compared with rural areas, where populations are sparse and commuting distances and costs are much higher.[9] For each district, we identify neighboring districts located within a 50-kilometer radius from its centroid and calculate FDI employment in those districts. To take account of differences between urban and rural districts we use two measures: FDI_{jt}^{0-30} for FDI employment in districts whose centroid is up to 30 kilometers from the centroid of district j, and FDI_{jt}^{30-50} for those 30-50 kilometers away. These measures are included as controls in the event study estimates.

The event study estimates are shown in Figures 4-6. Almost uniformly, they show no evidence of differential trends between treatment and control districts. The plot in panel (a) of Figure 4 shows that establishment of a new IZ does not change total district employment relative to districts without IZs. Panel (f) in the same figure shows that a new IZ does increase the number of workers who work for FDI firms, in the second year after establishment. Domestic private firms (panel (e)) also increase jobs, but this effect becomes statistically significant only in the third year after IZ establishment. There are no measurable trends in enterprises under other forms of ownership.

Figure 5 repeats the event study for data organized by sector of employment. In this figure, estimates confirm a significant rate of new job creation in manufacturing (panel (b)), again after a lag, but reveal no discernible trends in either agriculture or services. Finally, Figure 6 shows event study estimates for labor by educational attainment. Once again, these show no statistically different trend in employment, for any educational level, between districts hosting IZs and those without. Summing up, it seems that merely recording the establishment of an IZ, as captured in the binary treatment variable used here, not does account for measurable labor market effects. This result is less surprising when we consider that there is great variation across IZs in terms of size and scale of operation, occupancy rates, and other variables that capture their impact on a local economy.

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[9] The radius of a circle with area 470 km^2 – the average size of a district, or approximately the combined size of the 16 districts in the inner HCM City area – is 12.5 km.

4. FDI employment multipliers

In this section we shift focus from a binomial indicator of IZ presence to effects based on scale, as measured by numbers of FDI-sector jobs created in each district.

4.1. 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*; 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. Models (1) and (2) both include province-level fixed effects. Model (1) also includes year fixed effects; Model (2) uses a time trend instead. Model (3) uses province-year fixed effects. Each of Models (1) – (3) also includes a vector of district-level demographic variables.[10] 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. We are agnostic on the advantages of the IV strategy. According to Goldsmith-Pinkham, Sorkin and Swift (2020), an estimate using Bartik's instrumental variable 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 caused by omitting districts' time-invariant characteristics, using the shares constructed from pre-period data means the estimation model is not able to account for time-variant variables. Therefore, we prefer OLS estimates with location and time fixed effects. These fixed-effect estimators are likely to capture the major sources of omitted variables bias and are not vulnerable to endogeneity.

[10] 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.

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 1.0 and 1.12, indicating that for every 100 new FDI jobs created, between 100 and 112 new non-FDI jobs are created in the same district. This number seems to fall toward the lower end of the range of comparable estimates in the literature reviewed above.

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 meaningful effect on district-level agricultural employment. There is significant new job creation in manufacturing: local multipliers take values from 0.36 to 0.39, meaning that 36-39 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 61-70 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 46-55 jobs appear in non-farm household enterprises, depending on the model specification. A slightly smaller share of new jobs (40-42 per 100 FDI jobs) are 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 doctoral 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 with 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 effect on prices for locally-provided services, and so on labor demand among the firms and sectors producing them.

Does the arrival of FDI employment 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, 62-73 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 22-24 per 100 FDI jobs, and for workers with any post-secondary education, 14-17 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. Based on the means of estimates across all four models, we find by adding FDI and non-FDI job creation that each 100 new FDI jobs in a district yields a total of 204 new jobs: 113 (55% of the total) for workers with incomplete secondary; 63 (31%) for workers with complete secondary, and 28 (14%) for tertiary-educated workers. Employment in the FDI sector itself is only 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. The net effect on demand for labor by educational attainment is roughly zero.

4.2. 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. Effects on educational incentives

Do changes in relative skills demand exert an influence on educational investments? Again, standard trade theorems provide initial guidance. If FDI inflows take the form of capital used exclusively in less skill-intensive sectors, then the Rybczinski theorem predicts rising relative demand for low-skill labor. The Stolper-Samuelson theorem predicts that higher relative prices for products of low-skill sectors should raise low-skill wages relative to returns to skilled labor. If these predictions are borne out, then specialization in low-skill activities may discourage educational development by raising the opportunity cost of schooling and lowering expected returns (Findlay and Kierzkowski 1983).

A panel study of more than 100 countries found that specialization in low-skill industries translates into reduced educational attainment (Blanchard and Olney, 2017). Foreign direct investment (FDI) inflows were found to reduce enrollment rates in Mexico (Atkin, 2016) and Vietnam (Coxhead and Shrestha, 2017; Coxhead, Vuong, and Nguyen, 2022). A study using Chinese data found significantly negative effects of WTO accession on high school enrollment rates (Helble et al. 2023). Relatedly, Coxhead and Vuong (2023) examined the influence of local FDI job creation on incentives for education, as revealed in test-taking rates for entry to upper-secondary school, and found a negative association.

Nationwide in Vietnam, rapid increases in household income have undoubtedly contributed hugely 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 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 rate was equal to that of Vietnam in 2011, has showed steady increases and by 2024 had a tertiary enrollment rate of 77%.[11]

Given that household incomes are still low on average, it seems relevant that while incomes have risen, the skill premium has not. In fact, labor market returns to education have declined since WTO accession

[11] World Bank: World Development Indicators Online.

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.

6. 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 net job growth, and especially its effect on the composition of labor demand by skills, has been less closely studied. A lack of clear information about employment effects feeds controversy over the net economic benefits of playing host to 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 continued education. 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. There is, therefore, a premium on understanding the nature of FDI-induced labor market change.

Our initial examination of trends in data covered by the LFS from 2011-2023 uncovered no evidence of differential growth rates in labor demand in districts where industrial zones have been established, versus districts yet to host an IZ. Total employment effects become significant only in the third year after IZ

establishment, and there are no discernible differential trends in the demand for labor by educational attainment. FDI enterprises appear to demand labor more or less in the same proportions as it is supplied to the Vietnamese labor market. A deeper look using regression found that skill composition of non-FDI job creation in response to FDI job growth is actually somewhat less skill-intensive than the labor force itself. FDI job creation is slightly more skill-intensive than the average, but this effect is offset since the majority of new non-FDI jobs are created in local service sector industries, and these are overwhelmingly dominated by family-scale firms employing mainly low-skill workers. To the extent that FDI job creation has general equilibrium effects in labor markets, the combination of direct and indirect labor demand changes may have at best no effect, and at worst a depressing effect, on relative demand for skills.

While FDI inflows are welcome additions to the stock of productive capital, policymakers must worry about whether, or to what extent, to let the (labor) market drive individual decisions over educational attainment. The risk they face is that investments that reduce skill premia and raise the opportunity cost of schooling may undermine potential long-run growth by depressing the rate at which the labor force upskills itself. Vietnam, like Mexico, Thailand, and some other middle-income countries, has experience of slowdowns in educational attainment associated with booms in blue-collar-intensive FDI.

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, "offsets" and other conditions placed on potential investors may discourage investment more than it boosts skills demand. But other measures designed around incentive-compatibility show more promise. Among these, provision of infrastructure and services to support not merely production, but skill-intensive production, are intriguing innovations. "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, 2011-2022

	Obs	Mean	Std. dev.	Min	Max	Share (%)
FDI workers	7,380	4270	15597	0	376101	5.9
Non-FDI workers	7,380	68272	45168	0	506409	94.1
In farm households	7,380	25676	20378	0	159466	35.6
In non-farm household firms	7,380	24957	23705	0	236102	34.6
In private firms	7,380	9483	16991	0	209552	13.2
In government	7,380	7722	9054	0	98696	10.7
Non-FDI employment by sector						100.0
In agriculture	7,380	26042	20537	0	160885	38.5
In manufacturing	7,380	9684	13362	0	198044	14.3
In services	7,380	31889	33734	0	309144	47.2
Non-FDI workers by education						100.0
Post-secondary completion	7,380	9199	14787	0	179072	13.5
Upper-secondary completion	7,380	13026	13112	0	153896	19.1
Lower-secondary or less	7,380	46046	29281	0	362983	67.4

Shares in final column are calculated from district-year means. Source: Authors' calculations from LFS 2011-2022.

Table 2: FDI Employment multipliers, total employment

	Total non-FDI workers			
	(1)	(2)	(3)	(4)
FDI Employment	1.064***	1.025***	1.124***	1.001***
	(0.071)	(0.077)	(0.075)	(0.112)
Province FE	Yes	Yes		
Year FE	Yes			Yes
Province x Time trend		Yes		
Province x Year FE			Yes	
District FE				Yes
Observations	7,380	7,380	7,380	7,380
R-squared	0.509	0.848	0.529	0.711

Dependent variable: non-FDI employment. 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	0.021	-0.034	0.037*	0.032
	(0.024)	(0.035)	(0.022)	(0.030)
Province FE	Yes	Yes		
Year FE	Yes			Yes
Province x Time trend		Yes		
Province x Year FE			Yes	
District FE				Yes
Observations	7,380	7,380	7,380	7,380
R-squared	0.416	0.746	0.468	0.582
			Manufacturing	
FDI Employment	0.371***	0.375***	0.382***	0.359***
	(0.035)	(0.035)	(0.032)	(0.052)
Province FE	Yes	Yes		
Year FE	Yes			Yes
Province x Time trend		Yes		
Province x Year FE			Yes	
District FE				Yes
Observations	7,380	7,380	7,380	7,380
R-squared	0.604	0.739	0.626	0.769
			Services	
FDI Employment	0.666***	0.676***	0.698***	0.607***
	(0.058)	(0.056)	(0.069)	(0.066)
Province FE	Yes	Yes		
Year FE	Yes			Yes
Province x Time trend		Yes		
Province x Year FE			Yes	
District FE				Yes
Observations	7,380	7,380	7,380	7,380
R-squared	0.681	0.831	0.691	0.826

Dependent variable: non-FDI employment. 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	0.023	-0.031	0.039*	0.034
	(0.023)	(0.033)	(0.021)	(0.026)
Province FE	Yes	Yes		
Year FE	Yes			Yes
Province x Time trend		Yes		
Province x Year FE			Yes	
District FE				Yes
R-squared	0.417	0.745	0.469	0.583
		Non-agricultural household firms		
FDI Employment	0.521***	0.528***	0.548***	0.465***
	(0.037)	(0.036)	(0.046)	(0.061)
Province FE	Yes	Yes		
Year FE	Yes			Yes
Province x Time trend		Yes		
Province x Year FE			Yes	
District FE				Yes
R-squared	0.583	0.802	0.599	0.756
		Private firms		
FDI Employment	0.402***	0.415***	0.405***	0.416***
	(0.036)	(0.036)	(0.036)	(0.045)
Province FE	Yes	Yes		
Year FE	Yes			Yes
Province x Time trend		Yes		
Province x Year FE			Yes	
District FE				Yes
R-squared	0.692	0.759	0.714	0.839
		Government		
FDI Employment	0.117***	0.108***	0.129***	0.084***
	(0.021)	(0.022)	(0.020)	(0.032)
Province FE	Yes	Yes		
Year FE	Yes			Yes
Province x Time trend		Yes		
Province x Year FE			Yes	
District FE				Yes
R-squared	0.588	0.756	0.609	0.753
Observations	7,380	7,380	7,380	7,380

Dependent variable: non-FDI employment. 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	0.680***	0.620***	0.728***	0.648***
	(0.066)	(0.075)	(0.061)	(0.094)
Province FE	Yes	Yes		
Year FE	Yes			Yes
Province x Time trend		Yes		
Province x Year FE			Yes	
District FE				Yes
Observations	7,380	7,380	7,380	7,380
R-squared	0.417	0.819	0.452	0.608
	Upper secondary			
FDI Employment	0.231***	0.237***	0.240***	0.218***
	(0.030)	(0.029)	(0.036)	(0.027)
Province FE	Yes	Yes		
Year FE	Yes			Yes
Province x Time trend		Yes		
Province x Year FE			Yes	
District FE				Yes
Observations	7,380	7,380	7,380	7,380
R-squared	0.594	0.793	0.611	0.777
	Post-secondary			
FDI Employment	0.152***	0.167***	0.157***	0.135***
	(0.032)	(0.031)	(0.036)	(0.018)
Province FE	Yes	Yes		
Year FE	Yes			Yes
Province x Time trend		Yes		
Province x Year FE			Yes	
District FE				Yes
Observations	7,380	7,380	7,380	7,380
R-squared	0.668	0.749	0.690	0.829

Dependent variable: non-FDI employment. 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. 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 A1: FDI Employment multipliers by industry, 2011-2023, with district spillover effects

	(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)
Province FE	Yes	Yes		
Year FE	Yes			Yes
Province x Time trend		Yes		
Province x Year FE			Yes	
District FE				Yes
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)
Province FE	Yes	Yes		
Year FE	Yes			Yes
Province x Time trend		Yes		
Province x Year FE			Yes	
District FE				Yes
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)
Province FE	Yes	Yes		
Year FE	Yes			Yes
Province x Time trend		Yes		
Province x Year FE			Yes	
District FE				Yes
R-squared	0.679	0.829	0.690	0.828

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, 2011-2023, with district spillover effects

	(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)
Province FE	Yes	Yes		
Year FE	Yes			Yes
Province x Time trend		Yes		
Province x Year FE			Yes	
District FE				Yes
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)
Province FE	Yes	Yes		
Year FE	Yes			Yes
Province x Time trend		Yes		
Province x Year FE			Yes	
District FE				Yes
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)
Province FE	Yes	Yes		
Year FE	Yes			Yes
Province x Time trend		Yes		
Province x Year FE			Yes	
District FE				Yes
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)
Province FE	Yes	Yes		
Year FE	Yes			Yes
Province x Time trend		Yes		
Province x Year FE			Yes	
District FE				Yes
R-squared	0.591	0.761	0.606	0.761

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 2011-2023, 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)
Province FE	Yes	Yes		
Year FE	Yes			Yes
Province x Time trend		Yes		
Province x Year FE			Yes	
District FE				Yes
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)
Province FE	Yes	Yes		
Year FE	Yes			Yes
Province x Time trend		Yes		
Province x Year FE			Yes	
District FE				Yes
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)
Province FE	Yes	Yes		
Year FE	Yes			Yes
Province x Time trend		Yes		
Province x Year FE			Yes	
District FE				Yes
R-squared	0.672	0.756	0.691	0.834

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.

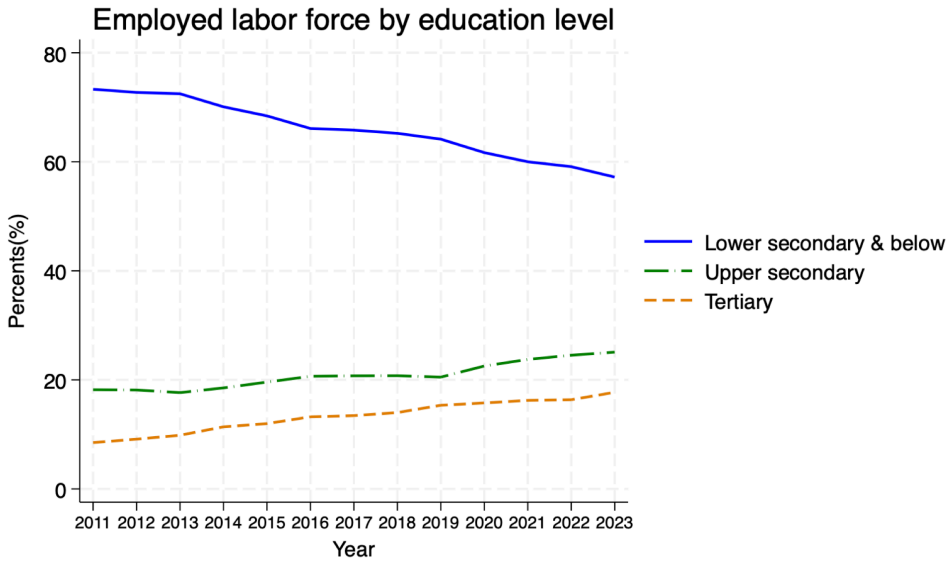


Figure 1: Composition of the labor force by completed educational level, by year

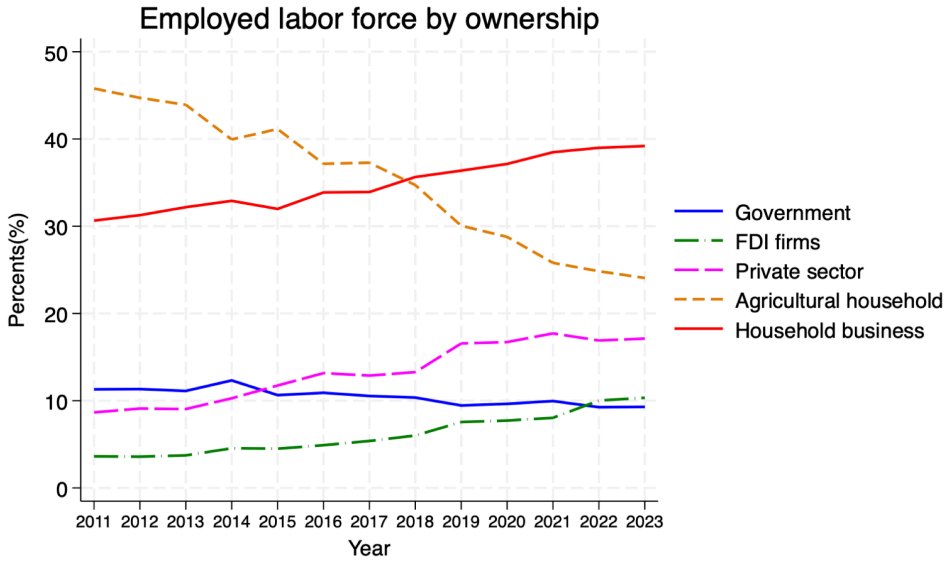
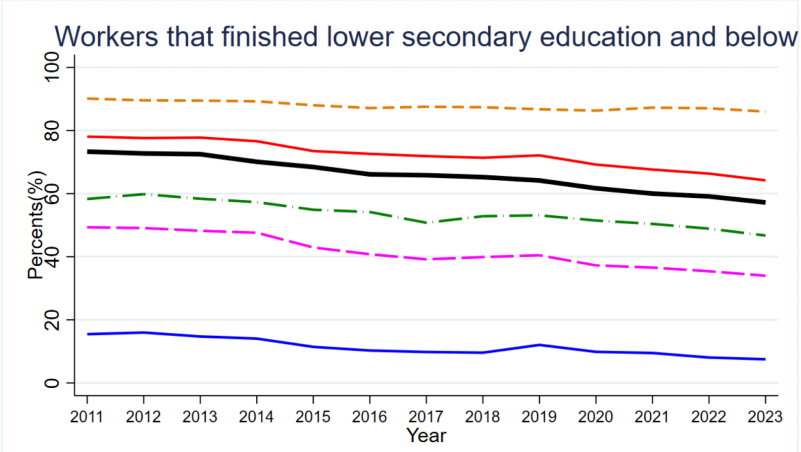
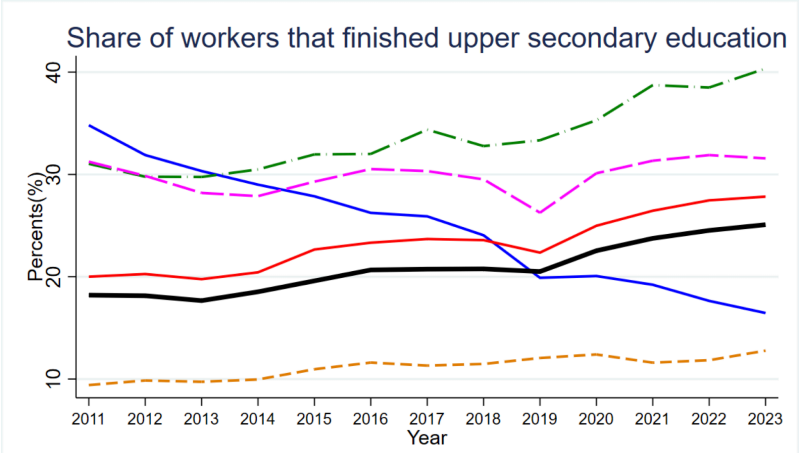


Figure 2: Composition of the labor force by enterprise ownership, by year





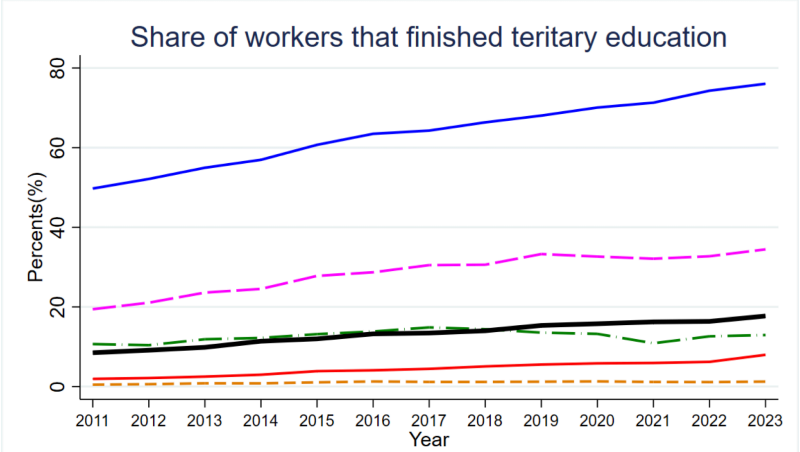
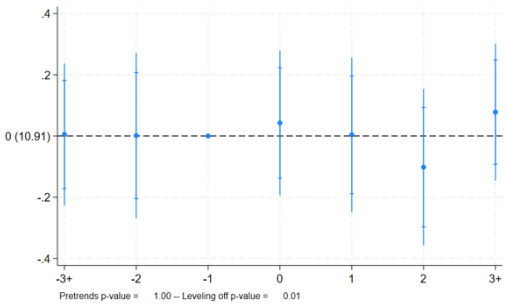
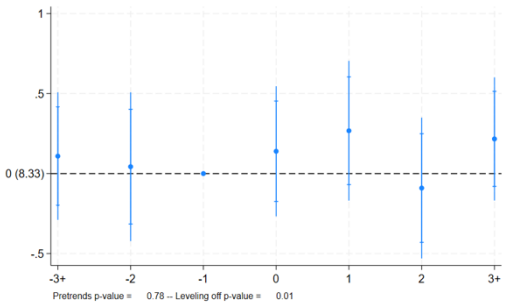


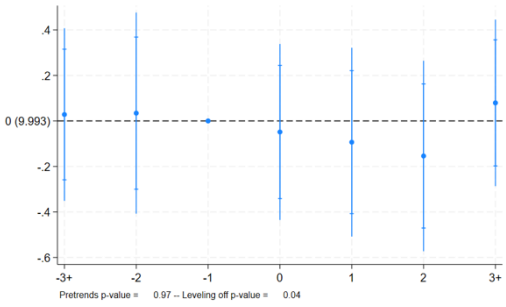
Figure 3: Composition of the labor force by education, by ownership, by year



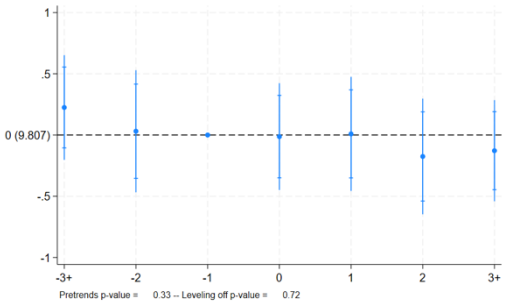
(a) All employers



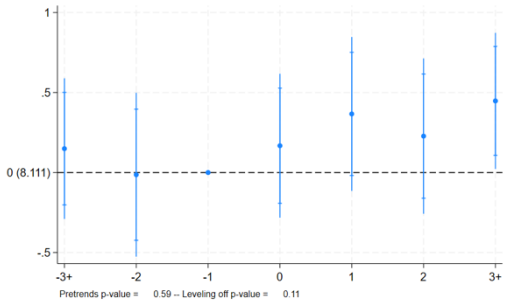
(b) Government



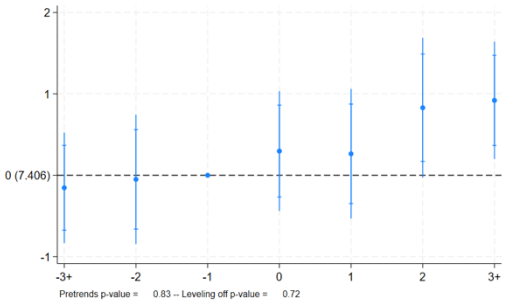
(c) Non-farm household firms



(d) Farm household firms

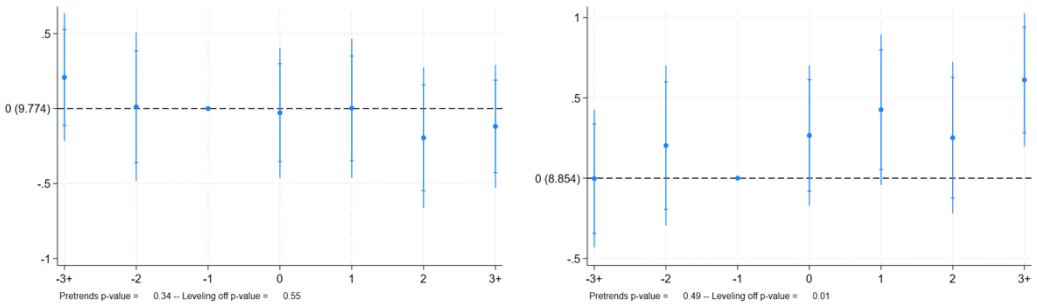


(e) Private firms

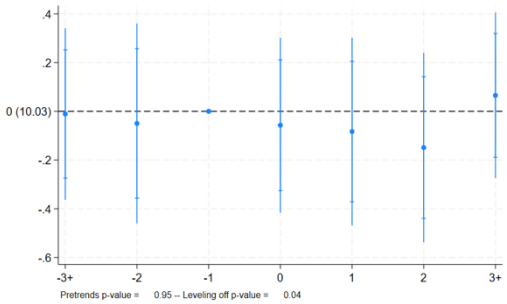


(f) FDI firms

Figure 4: Event study plots with the log of employment as dependent variable, by ownership.

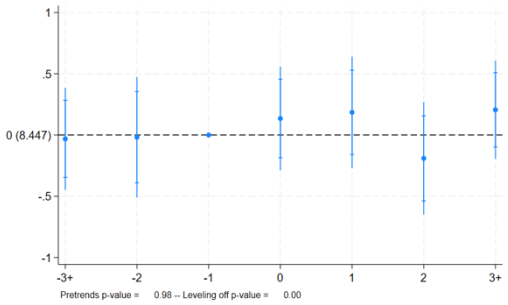


a) Agriculture (b) Manufacturing

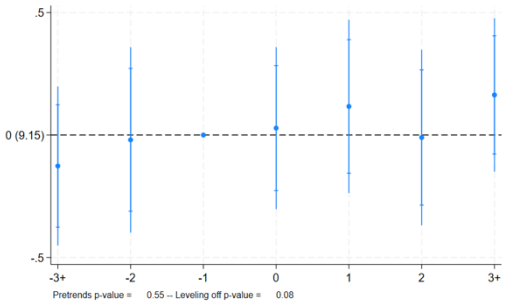


(c) Services

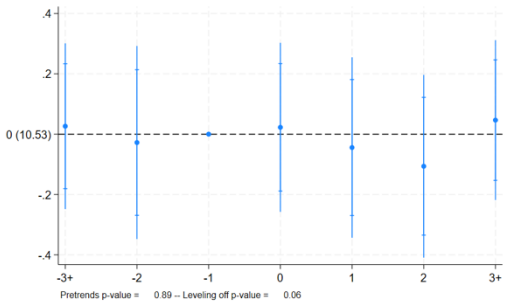
Figure 5: Event study plot with the log of employment as dependent variable, by industry.



a) Post-secondary education



b) Upper secondary education



c) Lower secondary education or lower

Figure 6: Event study plot with the log of employment as dependent variable, by completed educational level.