CORVINUS
ECONOMICS
WORKING
PAPERS

04/2026

István Kónya and Judit Krekó

Labor share, FDI and Productivity

https://unipub.lib.uni-corvinus.hu/13271

CORVINUS UNIVERSITY OF BUDAPEST

Labor share, FDI and Productivity

István Kónya,* Judit Krekó†

August 2026

This paper examines how foreign direct investment affects the labor share through productivity differences between foreign- and domestically owned firms. We develop a search-and-matching model in which more productive foreign firms acquire domestic firms. Foreign ownership raises productivity and wages, but incomplete pass-through of the productivity advantage to workers reduces the labor share. Using European industry-level data, we find that greater foreign employment penetration is associated with lower labor shares and that the foreign productivity premium substantially exceeds the foreign wage premium. Hungarian administrative firm data show the same pattern: foreign-owned firms have higher productivity and labor costs but lower labor shares. Event-study estimates around foreign acquisitions are less precise but are consistent with this mechanism at longer horizons. Our results show how economies with a large foreign-owned sector can combine relatively high wages with relatively low labor shares and highlight persistent foreign–domestic productivity differences as a potential explanation for labor-share differences across Europe.

Keywords: foreign direct investment; foreign ownership; labor share; labor productivity
JEL Codes: F21, F23, J31, J42, E25

*ELTE Centre for Economic and Regional Studies, Hungary, and Corvinus University of Budapest, Hungary. Email: konya.istvan@krtk.elte.hu.

†ELTE Centre for Economic and Regional Studies, Hungary, and Budapest Institute, Hungary. Email: kreko.judit@krtk.elte.hu.

[0]**Acknowledgments.** The project was supported by the National Research, Development and Innovation Office of Hungary (grant no. K-143420). We thank Gábor Oblath for helpful guidance and comments, Márta Bisztray for help with firm level data and estimation, Balázs Tibor for excellent research assistance, and the Databank of the ELTE Centre for Economic and Regional Studies for providing access to the data and assistance with their use.

1. Introduction

The labor share of income has declined in many advanced and emerging economies over recent decades, generating a large literature on the forces behind the changing distribution of value added between labor and capital (see Grossman and Oberfield (2022) for a review). Proposed explanations include capital deepening and automation (Karabarbounis and Neiman, 2014; Acemoglu and Restrepo, 2018), globalization and the fragmentation of production (Elsby et al., 2013; Dao et al., 2017), declining worker bargaining power (Stockhammer, 2017; Guschanski and Onaran, 2022), and rising market power and the reallocation of production toward low-labor-share "superstar" firms (Autor et al., 2020; Barkai, 2020). These mechanisms are not mutually exclusive, and their importance differs substantially across countries and industries.

This heterogeneity is particularly pronounced within Europe. Kónya et al. (2020) show that labor shares are systematically lower in the Central and Eastern European EU member states than in the older member states, both in the aggregate and within broad sectors.

Moreover, labor shares are positively and significantly associated with the level of economic development. Part of this relationship can be explained by productivity differences, particularly in the investment goods sector. However, these findings also suggest that additional mechanisms may be at play.

One potentially important factor is foreign direct investment (FDI). Foreign-owned firms are typically substantially more productive than domestic firms and also pay higher wages (Arnold and Javorcik, 2009; Hijzen et al., 2013; Fons-Rosen et al., 2021a; OECD, 2022). However, higher wages do not imply a higher labor share. If the productivity advantage of foreign firms exceeds their wage premium, foreign firms have lower labor shares, and increasing foreign penetration can reduce the aggregate labor share even while raising average wages. Evidence from Central and Eastern Europe is consistent with such incomplete pass-through: for the Czech Republic, Eriksson and Pytlikova (2011) find that the foreign productivity differential is approximately twice as large as the wage differential, while Hungarian evidence documents sizable foreign wage premia alongside substantial productivity differences between foreign- and domestically owned firms (Earle and Telegdy, 2008; Earle et al., 2018). Incomplete pass-through from foreign firms' productivity advantage to wages therefore provides a simple link between FDI, productivity, and the labor share. This mechanism is particularly relevant for Central and Eastern Europe, where foreign-owned firms account for a large share of production and persistent productivity differences between foreign and domestic firms have been a salient feature of the post-transition economy.

In this paper, we examine this mechanism theoretically and empirically. We first develop a simple search-and-matching model in which more productive foreign firms acquire domestic firms. Search frictions imply that foreign firms need to pass only part of their productivity advantage on to workers. Foreign acquisition therefore raises both productivity and wages, but productivity rises more, reducing the labor share. At the same time, the presence of higher-paying foreign firms improves workers' outside options and puts upward pressure on wages also in domestic firms. The model thus separates a productivity effect that reduces the labor share from a labor-market competition effect that works in the opposite direction.

We then examine these mechanisms using two complementary empirical approaches. First, we use harmonized European industry-level data to relate foreign penetration to labor shares and, crucially, to compare the foreign–domestic productivity and wage differentials underlying this

relationship. Second, we use Hungarian administrative firm-level data for 2003–2020. The microdata allow us to compare labor shares, productivity, and labor costs across foreign and domestic firms and to exploit changes in ownership when domestic firms are acquired by foreign owners. Hungary provides an informative setting because foreign firms account for a particularly large share of manufacturing activity and display a persistent productivity advantage over domestic firms.

Our results show that foreign-owned firms pay substantially higher wages than domestic firms, but their productivity advantage is even larger. As a consequence, they have systematically lower labor shares. The event-study evidence around foreign acquisitions is less precise, but at longer horizons the pattern is consistent with the same mechanism: productivity increases more strongly than labor costs, accompanied by a decline in the labor share. Thus, the association between FDI and a lower labor share does not arise because foreign firms pay low wages. Rather, foreign firms pay high wages but generate still more value added per worker. Persistent productivity differences between foreign and domestic firms can therefore contribute to persistently low aggregate labor shares in economies with a large foreign-owned sector.

Our paper contributes to the literature on the determinants of the labor share and, more specifically, to the growing literature linking FDI and international production to the distribution of value added between labor and capital. FDI can affect the labor share through several distinct channels. First, and most directly related to our analysis, foreign firms can lower the aggregate labor share through a productivity-composition effect. Multinationals possess technological, managerial, organizational, and intangible assets that make them more productive than domestic firms. If this productivity premium is only partly reflected in wages, foreign firms have lower labor shares and their expansion shifts value added toward low-labor-share producers. Decreuse and Maarek (2015) formalize closely this mechanism in a frictional labor market: at low and intermediate levels of FDI penetration, foreign productivity increases faster than wages and the labor share falls, while sufficiently strong competition for workers can eventually reverse the relationship.

Second, foreign ownership may change technology and capital intensity. Multinationals tend to use more capital-intensive technologies (Sun, 2020), while acquisitions can induce investment, restructuring, and automation. Recent evidence from Spanish manufacturing shows that multinational acquisitions reduce the labor share and increase robot adoption, with automation accounting for part of the post-acquisition decline (Leone, 2026).

Third, FDI can increase competition for workers. Foreign firms generally pay higher wages than domestic firms (Aitken et al., 1996; Hijzen et al., 2013; Javorcik, 2015), and their entry may improve workers' outside options and raise wages also in domestic firms. This channel tends to increase rather than decrease the labor share and is an important countervailing force in our model.

Fourth, international mobility can alter bargaining power. The possibility of relocating production or sourcing inputs elsewhere strengthens firms' outside options relative to workers', potentially reducing the fraction of productivity gains passed through to wages. This mechanism is emphasized in the literature on globalization and labor bargaining (Onaran and Stockhammer, 2008; Petreski, 2021; Guschanski and Onaran, 2022). Petreski (2021), in particular, finds that globalization is associated with lower manufacturing labor shares in transition economies, especially in low-skill industries.

Finally, FDI can affect wages and productivity outside the foreign-owned firms themselves. Productivity spillovers may arise through supplier relationships, imitation, competition, and

worker mobility. The evidence for horizontal productivity spillovers is mixed, whereas backward linkages to domestic suppliers provide more consistent evidence of productivity gains (Javorcik, 2004; Havránek and Iršová, 2011; Gorodnichenko et al., 2014; Alfaro-Ureña et al., 2022). Worker mobility and competition can also transmit knowledge and wage gains to domestic firms (Balsvik, 2011; Poole, 2013). Whether these spillovers raise or lower the labor share again depends on the relative response of wages and productivity.

Among these channels, our paper focuses on the productivity–wage pass-through mechanism. A large microeconomic literature establishes separately that foreign firms are more productive and pay higher wages than domestic firms, but much less evidence considers these two premia jointly from the perspective of the labor share. Foreign acquisitions often raise productivity, although the magnitude and timing of the effects vary across settings (Arnold and Javorcik, 2009; Damijan et al., 2015; Fons-Rosen et al., 2021b). Particularly relevant for the CEE context, Damijan et al. (2015) document post-acquisition productivity improvements in seven new EU member states. Foreign wage premia are likewise well documented (Hijzen et al., 2013; Earle et al., 2018). Eriksson and Pytlikova (2011) find for the Czech Republic that the foreign productivity differential is approximately twice as large as the wage differential, while Hungarian linked employer–employee evidence shows positive wage effects of foreign acquisition but also substantial selection of firms and workers into foreign ownership (Earle and Telegdy, 2008; Earle et al., 2018). More recent Hungarian evidence shows that foreign acquisitions also affect the returns to skills and are associated with changes in production technology (Pető and Reizer, 2025). Related evidence from foreign acquisitions points to the same mechanism. Conyon et al. (2002) find for the United Kingdom that foreign acquisition raises both labor productivity and wages, but that the productivity increase exceeds the wage increase. Although they do not interpret this differential explicitly through the labor share, their findings are consistent with incomplete productivity–wage pass-through.

Direct firm-level evidence on foreign ownership and labor shares remains relatively limited. Yang and Tsou (2021) find for Chinese manufacturing that foreign-invested firms have higher labor shares in between-firm comparisons, but that obtaining a foreign investor reduces the labor share within firms. More recently, Leone (2026) find that foreign acquisitions reduce labor shares in Spanish manufacturing, partly through increased robot adoption. At the same time, the empirical relationship is not universal: studies document substantial heterogeneity across countries, sectors, and types of foreign investment, and some find positive effects of foreign investment on the labor share or no post-acquisition productivity gains (van Treeck and Wacker, 2020; Feng and Wen, 2023; Gregori et al., 2024).

This finding has two implications. The first concerns the interpretation of the labor share as an indicator of inequality or worker welfare. Labor shares are informative about the functional distribution of income, and declining shares can signal a shift of income toward capital owners. The labor share is often interpreted as a key indicator of income inequality, reflecting the idea that capital income is more concentrated at the top of the income distribution ((Piketty, 2014)). In an open economy with substantial capital flows, however, the distributional implications of labor share changes are ambiguous. In economies with extensive foreign ownership, a low labor share can partly reflect the concentration of production in exceptionally productive foreign firms whose workers receive higher wages than workers in domestic firms. Indeed, there is extensive evidence that wages in foreign-owned firms exceed those in domestic firms, including for Hungary (Earle et al., 2017; Köllő et al., 2020). In this setting, a lower labor share need not imply that workers are worse off in absolute terms.

The second implication concerns the persistence of labor-share differences across Europe. The-

oretical and empirical work suggests that the relationship between productivity, FDI, and the labor share may change over the course of economic development (Decreuse and Maarek, 2015; Maarek and Orgiazzi, 2020). If the productivity advantage of foreign firms diminishes as domestic firms catch up, the foreign–domestic productivity gap and the associated composition effect of FDI should also weaken. Labor shares could therefore recover as productivity differences narrow. The durability of the foreign–domestic productivity gap is therefore central to understanding the long-run labor-share consequences of FDI.

Our contribution is fourfold. First, on the theoretical side, we develop a search-and-matching model in which foreign entry occurs through the acquisition of existing domestic firms rather than through additional firm entry. This separates the effect of foreign productivity on workers' outside options from a mechanical increase in labor-market tightness and shows how foreign entry can raise wages at both foreign and domestic firms while reducing the aggregate labor share through incomplete productivity–wage pass-through. Second, we connect two literatures that have largely developed separately: the literature on FDI, productivity, and foreign wage premia, and the literature on declining labor shares. Existing studies provide substantial evidence on productivity changes following foreign acquisition and on foreign wage premia, but relatively little work jointly examines productivity, compensation, and the labor share around foreign ownership, particularly in Central and Eastern Europe. We make the gap between the foreign productivity and wage premia the central object of interest and relate it explicitly to differences in the labor share. Third, we provide evidence at complementary levels of aggregation. Harmonized European industry data show whether the mechanism is relevant for cross-country differences in labor shares, while Hungarian administrative microdata allow us to examine the firm-level relationship and ownership transitions underlying these aggregate patterns. Fourth, our results chanllange the usual distributional interpretation of the labor share. In FDI-intensive economies, a low labor share can coexist with high wages and may partly reflect persistent productivity heterogeneity between foreign and domestic firms rather than a simple deterioration in workers' economic position.

The remainder of the paper proceeds as follows. Section 2 develops the search-and-matching model and derives the effect of foreign productivity penetration on wages and the labor share. Section 3 presents the European sector-level evidence. Section 4 uses Hungarian firm-level data to examine the underlying firm-level mechanisms and ownership transitions. Section 5 concludes.

2. A simple model

We start the analysis with a simple search-and-matching framework to illustrate the main ideas. We focus on how the entrance of more productive foreign firms impacts the average industry wage and hence the industry labor share. To keep things simple, we start with the basic closed-economy version of the Diamond-Mortensen-Pissarides model (Pissarides, 2000) and quickly reproduce the equilibrium conditions. Then we allow for foreign firms, who acquire an exogenous fraction of the existing domestic firms. This way we keep the number of vacancies fixed, and focus on the role of wage bargaining in the presence of heterogenous firms. We abstract away from greenfield FDI and endogenous entry and exit for simplicity. Adding these would be tractable, but not necessary for our main point.

For a related, but distinct treatment see Decreuse and Maarek (2015). Our approach differs from Decreuse and Maarek (2015) in both the mode of foreign entry and the wage-setting mechanism.

In their static model, financial openness induces the entry of foreign firms and thereby increases competition for workers. Wages rise because workers are more likely to receive competing offers. We instead model foreign entry as the acquisition of a fraction of existing domestic firms, holding the aggregate number of vacancies fixed. Consequently, foreign entry does not directly increase labor-market tightness. Wages are determined through Nash bargaining in a dynamic search-and-matching environment. More productive foreign jobs raise the expected value of unemployment and hence workers' outside option, which increases wages at both foreign and domestic firms. Thus, whereas the positive wage effect in Decreuse and Maarek operates through greater employer competition, in our model it operates through the general-equilibrium effect of foreign productivity on the value of search.

2.1. The closed economy

Since this part of the model is completely standard, we skip the detailed derivation. We use a discrete-time version of the baseline treatment in Pissarides (2000), Chapter 1. Labor market search frictions are captured by a constant returns to scale Cobb-Douglas matching function:

$$m_t = \xi u_t^{\sigma} v_t^{1-\sigma},$$

where u_t is the number of the unemployed who search for a job, and v_t is the number of open job vacancies. The two crucial probabilities, the job finding rate f_t and the job filling rate q_t can be written as:

$$f_t = \frac{m_t}{u_t} = \xi \theta_t^{1-\sigma} \tag{1}$$

$$q_t = \frac{m_t}{v_t} = \xi \theta_t^{-\sigma}, \tag{2}$$

where $\theta = v/u$ stands for labor market tightness.

The flow equation for unemployment combines an endogenous job finding rate and an exogenous job destruction rate ρ:

$$u_t = (1 - f_t)\, u_{t-1} + \rho\,(1 - u_{t-1}),$$

where we assume that the labor force is constant and normalized to unity ($n_t + u_t = 1$). Evaluating the equation in steady state[1] leads to the equilibrium unemployment rate of

$$u = \frac{\rho}{\rho + f}. \tag{3}$$

Firms create vacancies that are filled via the job search process. The value functions of filled and open vacancies are given by:

$$J_t = z_t - w_t + \beta\left[(1-\rho)\, J_{t+1} + \rho V_{t+1}\right]$$
$$V_t = -\kappa + \beta\left[q_t J_{t+1} + (1 - q_t)\, V_{t+1}\right],$$

where z_t is labor productivity, w_t is the wage rate, and κ is the cost of maintaining an open vacancy. Assuming for now free entry to create vacancies ($V_t \equiv 0$) leads to the well-known job creating condition:

$$\frac{\kappa}{q_t} = \beta\left[z_{t+1} - w_{t+1} + \frac{(1-\rho)\,\kappa}{q_{t+1}}\right].$$

[1] From now on, variables without a time substrict will refer to steady state quantities.

Evaluating this steady state yields

$$[1-\beta(1-\rho)]\frac{\kappa}{q}=\beta(z-w). \tag{4}$$

To derive the wage rate, define the value functions for employed and unemployed workers:

$$\begin{aligned} W_t &= w_t+\beta\left[(1-\rho)W_{t+1}+\rho U_{t+1}\right] \\ U_t &= b+\beta\left[f_t W_{t+1}+(1-f_t)U_{t+1}\right], \end{aligned}$$

where b is the flow benefit when being unemployed. The net value of holding a job is then given by

$$W_t-U_t=w_t-b+\beta(1-\rho-f_t)(W_{t+1}-U_{t+1})].$$

We assume that wages are given by the Nash-bargaining solution, where workers receive a fixed share of the total surplus generated by a match:

$$W_t-U_t=\eta(J_t-V_t).$$

After standard derivation, we arrive at the wage equation. Evaluating it at the steady state gives

$$w=\eta(z+\kappa\theta)+(1-\eta)b. \tag{5}$$

Substituting out the job finding and job filling rates via equations (1) and (2), conditions (3), (4) and (5) determine the steady state levels of unemployment, the wage rate, and labor market tightness.

2.2. Foreign entry

As discussed above, we assume that foreign entry takes the form of acquisitions of a p share of domestic firms. Since we leave the total number of firms and vacancies fixed, from (1) and (3) it is easy to see that both unemployment and tightness remain unchanged. This also leaves the job filling rate q at its original level. The only things that change at this point are the wage bargaining process and the new equilibrium wages. Note that we no longer assume free entry, so the vacancy values will remain in the upcoming calculations.

As indicated before, foreign firms are more productive with $z_f > z_d$. Using $i=f,d$ to denote foreign and domestic firms, and focusing on the stationary equilibrium, the firm value functions are given by:

$$\begin{aligned} J_i &= z_i-w_i+\beta\left[(1-\rho)J_i+\rho V_i\right] \\ V_i &= -\kappa+\beta\left[qJ_i+(1-q)V_i\right]. \end{aligned}$$

These can be solved for the net job values as:

$$J_i-V_i=\frac{z_i-w_i+\kappa}{1-\beta(1-\rho-q)}. \tag{6}$$

We assume that searching workers cannot identify foreign firms before they meet them in a match. Given this, we can write the values of foreign and domestic jobs and unemployment as:

$$\begin{aligned} W_i &= w_i+\beta\left[(1-\rho)W_i+\rho U\right] \\ U &= b+\beta\left[(1-f)U+f\bar{W}\right], \end{aligned}$$

where $\bar{W} = (1-p)W_d + pW_f$ is the average (expected) job value. Using also $\bar{w} = (1-p)w_d + pw_f$, the expected net value of a job is:

$$\bar{W} - U = \frac{\bar{w} - b}{1 - \beta(1 - \rho - f)}. \tag{7}$$

The Nash solution for each firm type still requires that

$$(1 - \eta)(W_i - U) = \eta (J_i - V_i).$$

Taking averages, and using (6) and (7), we can define the average wage as

$$\frac{\bar{w} - b}{1 - \beta(1 - \rho - f)} = \frac{\eta}{1 - \eta} \frac{\bar{z} - \bar{w} + \kappa}{1 - \beta(1 - \rho - q)} \tag{8}$$

It is instructive to derive the foreign-domestic wage gap. To do that, use $W_f - W_d$ and combine it with the Nash condition to get:

$$w_f - w_d = \frac{\eta [1 - \beta(1 - \rho)]}{1 - \beta(1 - \rho) + (1 - \eta)\beta q}(z_f - z_d). \tag{9}$$

Combining (8) and (9) yields the individual wages, but the equations are not particularly illuminating. It is possible, however, to express the domestic wage relative to the original, closed-economy value w:

$$w_d = w + p \frac{\eta(1 - \eta)\beta f [1 - \beta(1 - \rho - q)]}{[1 - \beta(1 - \rho) + (1 - \eta)\beta q] [1 - \beta(1 - \rho) + (1 - \eta)\beta q + \eta\beta f]}(z_f - z_d). \tag{10}$$

Our goal is to derive the impact of foreign penetration on the labor share. To arrive at reasonable magnitudes, we now introduce capital into the model. Assume that each firm-vacancy combines its single worker with capital, using a Cobb-Douglas production function:

$$y_i = A_i k_i^{\alpha},$$

where k denotes capital and A is total factor productivity. Assuming a rental rate of capital r and a competitive capital rental market, capital demand is given by:

$$k_i = \left(\frac{\alpha A_i}{r} \right)^{\frac{1}{1-\alpha}}.$$

With simple algebra it is also easy to show that the labor productivity term used in the previous analysis can be written as:

$$z_i = (1 - \alpha) A_i^{\frac{1}{1-\alpha}} \left(\frac{\alpha}{r} \right)^{\frac{\alpha}{1-\alpha}},$$

which implies that a foreign TFP advantage ($A_f > A_d$) is magnified by a higher capital intensity. From these, we can also see that $z_i = (1 - \alpha) y_i$.

The aggregate labor share is given by:

$$LS = \frac{(1 - p)w_d + pw_f}{(1 - p)y_d + py_f}.$$

Using the average wage definition and substituting out y_i, we can rewrite this as:

$$LS = \frac{(1 - \alpha)\bar{w}}{\bar{z}}. \tag{11}$$

2.3. Calibration

The main mechanism of the impact of foreign penetration on the labor share can be discussed using equations (9) and (10). First, foreign firms pay a higher wage than domestic ones due to their higher productivity. The premium, however, is less than the productivity gap, because the outside option of unemployed searchers depends on the common unemployment benefit, and the expected average wage that includes possible domestic matches as well. The elasticity of the wage gap with respect to the productivity gap depends on the calibration, but with $\beta \approx 1$ and ρ close to zero it is likely to be small. Given the bargaining setup, foreign firms pass on only a fraction of their higher productivity to wages. This is because (i) unemployed workers may meet domestic firms, who play lower wages, and (ii) the unemployment value b is not linked to productivity. One way to justify this latter assumption is that much of b may reflect the value of home production (or non-wage self-employment), which is likely to be linked to domestic productivity and not to foreign productivity.

Note, however, that the domestic wage also rises, since the second term in eq. (10) is positive. This is because the unemployed have a chance to meet foreign firms who pay a higher wage, hence their outside option is higher than in the closed-economy benchmark. Again, the precise value depends on the calibration, so we now quantify the model with a reasonable calibration.

Our goal is not to formally match particular countries and sectors, but to gauge the model's ability to deliver a declining labor share. The parameter values are therefore partly chosen from the literature, and partly selected to represent the Hungarian manufacturing sector. The Hungarian labor market is fairly representative of the EU average, less flexible than the Scandinavian economies, but less rigid than the Mediterranean countries. Also, in our firm-level analysis we rely on Hungarian data. Reasonable variations in the calibration are expected to produce similar results.[2]

The discount factor is set to $\beta = 0.98$, the unemployment elasticity is $\sigma = 0.5$, and workers' exogenous bargaining power is $\eta = 0.6$. We normalize the labor productivity of domestic firms to $z_d = 1$, and set the capital elasticity of output to $\alpha = 0.4$. The rental rate of capital is chosen to be $r = 0.04$. These values are well within the range of admissible choices in the literature.

We set the initial unemployment rate to $u = 0.04$, the vacancy rate to $v = 0.02$, and the job separation rate to $\rho = 0.015$. These together imply a job finding rate of $f = 0.36$, a job filling rate of $q = 0.72$, a tightness value of $\theta = 0.5$ and $\xi = 0.51$. Finally, we assume that $b/w = 0.9$, which is much higher than reasonable unemployment replacement rates. Adding the value of leisure and home production is one way to justify the higher value, using a Hagedorn and Manovskii (2008) type calibration is another. Ultimately the choice was motivated by a reasonable vacancy cost value of $\kappa = 0.12$, which implies that the expected cost of filling a vacancy in terms of wages is $\kappa/(wq) = 0.1686$, in line with common estimates (Abowd and Kramarz, 2003). A lower value of the flow unemployment benefit would lead to unrealistically high vacancy costs. The equilibrium wage and κ are calculated using (4) and (5), the former being $w = 0.9941$. Finally, the implied labor share is close to the capital elasticity parameter, $LS = 0.5964$.

Given that vacancies, unemployment and tightness do not change with foreign penetration, the new wages can be calculated directly from (8) and (9). Again using Hungarian manufacturing as a reference, we set the share of foreign employment to $p = 0.48$ (the 2008-2019 average). Foreign

[2]Some calibration choices were also guided by having meaningful derived values, such as job finding and filling rates below unity, and vacancy costs that are not too high. Further details are available from the authors upon request.

labor productivity is more difficult: the raw value in the Hungarian manufacturing data is 2.11. But this is somewhat misleading, since foreign firms use more skilled workers, while the current model assumes that labor is homogeneous. Controlling for various sources of heterogeneity, the gap may fall to as low as 1.24 (Earle et al., 2018). As a fairly conservative, but somewhat higher value, we opt for $z_f = 1.46$. Finally, recall that labor productivity also depends on capital intensity; the implied TFP difference is $A_f/A_d = 1.255$.

2.4. Results

Given the calibration above, the foreign productivity advantage and the penetration rate (see Table 1), the average wage is $\bar{w} = 1.091$. The domestic wage is $w_d = 1.077$, and the foreign wage is $w_f = 1.107$. Therefore, the domestic wage rises significantly, due to the strong pressure from foreign employment. The foreign wage premium is quite small, mostly because foreign firms do not directly compete with each other for workers. While raw wage premia are much larger in the data[3], the model lacks various mechanisms that inflate the observed wage gap, such as skill differences between workers employed at domestic and foreign firms. Controlling for such sources of heterogeneity, Earle et al. (2018) finds a quite modest pure foreign wage premium of 6%.

Using (11), the calculated average labor share is $LS = 0.5363$, around 6 percentage points lower than in the closed economy baseline. The main reason is that while wages rise, they increase by much less than average productivity. With heterogeneous productivity, and unemployment benefits and vacancy costs anchored by the initial calibration, there is no need for foreign firms to pass on their productivity advantage.

It is important to highlight that this result is likely to be a short-run phenomenon. First, the relative productivity of domestic firms may improve over time, due to increased innovation or spillovers (Bruno and Cipollina, 2018; Saurav and Kuo, 2020). Alternatively, persistent gaps in efficiency should eventually lead to domestic exit and foreign expansion. Either way, average productivity would rise, and the productivity gap would narrow, leading to an ultimate wage increase. Although wages and productivity may diverge in the short and medium run, long-run evidence points to a strong relationship between productivity growth and average compensation growth (Stansbury and Summers, 2019). Persistent differences in their growth rates generally require changes in the labor share or in the distribution of labor income (Schwellnus et al., 2017).

Second, the outside option of workers (the flow value of unemployment) should also rise with wages. This may be a sluggish process in the short-run, but over time, the parameter should increase proportionally. With a higher external bargaining power workers can demand higher wages, pushing up the labor share. In the long-run, therefore, the labor share is expected to partly or fully recover from its initial decline. How quickly this happens is ultimately an empirical question, and we now turn first to European sector-level data, and finally to form-level evidence from Hungary.

[3] In a time average between 2008-2019 (the sample we use below), the foreign wage premium in Hungarian manufacturing is 1.64, compared to a raw labor productivity advantage of 2.11.

Table 1: Calibration and equilibrium outcomes

Symbol	Description	Closed economy	Foreign entry
Panel A:	*Calibrated parameters*		
β	Discount factor	0.980	
σ	Matching elasticity	0.500	
η	Worker bargaining weight	0.600	
α	Capital elasticity	0.400	
r_k	Rental rate of capital	0.040	
ρ	Separation probability	0.015	
b/w_0	Replacement rate	0.900	
κ	Cost of filling a vacancy	0.121	
z_d	Domestic labor productivity	1.000	
z_f/z_d	Foreign productivity advantage	–	1.460
p	Foreign share of firms	0.000	0.480
Panel B:	*Equilibrium outcomes*		
u	Unemployment rate	0.040	0.040
v	Vacancy rate	0.020	0.020
θ	Labor-market tightness	0.500	0.500
f	Job-finding probability	0.360	0.360
q	Vacancy-filling probability	0.720	0.720
$\bar{z}$	Average labor productivity	1.000	1.221
w_d	Domestic wage	0.994	1.077
w_f	Foreign wage	–	1.107
$\bar{w}$	Average wage	0.994	1.091
b	Unemployment income	0.895	0.895
LS	Aggregate labor share	0.596	0.536

Notes: Foreign entry occurs through the acquisition of existing domestic firms, holding the aggregate number of vacancies fixed. Average productivity is $\bar{z} = (1-p)z_d + pz_f$, average wages are $\bar{w} = (1-p)w_d + pw_f$, and the aggregate labor share is $LS = (1-\alpha)\bar{w}/\bar{z}$.

3. Industry panel

3.1. Data

Our first empirical approach is to utilize a broad dataset at the level of single digit industries for countries of the European Union. The main limitation of the data is availability before 2008. Eurostat publishes information on foreign controlled enterprises in three different tables (FATS): the current one starts in 2021, the previous one covers 2008-2020 using NACE rev. 2 industry classification, and a historical one covers 2003-2007 using NACE rev. 1 categories. Given the disruptions caused by Covid and then the war in Ukraine, we restrict attention to the period before 2020.

Our main country-industry panel uses the 2008-2019 table[4], because this allows for a reasonable number of industries to be retained. Concordances between NACE rev. 2 and rev. 1 can only be made at highly aggregated industries, plus the 2003-2007 data is quite patchy at the country level. We supplement the FATS table with data on indutry totals using Eurostat's Structure

[4] FATS 2008-2020

of Business Statistics (SBS).[5] This guarantees that we use the same variable definitions and comparable business populations for foreign and domestic enterprises.

Given that we are interested in the impact of foreign penetration on the labor share, we focus on market industries where this is a non-trivial occurance. We therefore retain the following:

- C: Manufacturing
- F: Construction
- G: Wholesale and retail trade; repair of motor vehicles and motorcycles
- H: Transportation and storage
- I: Accommodation and food service activities
- J: Information and communication
- M: Professional, scientific and technical activities.

We use all 27 countries of the European Union; for this period data is reasonably complete.

Our main variables are employment (V16110, *emp*), employees (V16130, *empe*), gross value added at factor cost (V12150, *gva*), and compensation of employees (V13310, *comp*). These are defined the same way in FATS and SBS. The labor share measure is adjusted for self-employment:

$$LS = \frac{comp}{gva}\frac{emp}{empe}.$$

Foreign penetration is measured by the employment share at foreign controlled enterprises. Given our main mechanism explored in the previous section, we also calculate the average wage ($w = comp/empe$) and labor productivity ($lp = gva/emp$). Given industry averages and foreign firm averages, we can back out the average wage and productivity for domestic firms, and then calculate the relative advantage of foreign companies as:

$$rw = \frac{w^f}{w^d}$$
$$rlp = \frac{lp^f}{lp^d}.$$

A big part of our motivation comes from the rapidly increasing foreign presence at the former planned economies of Central and Eastern Europen economies (CEE)[6]. Unfortunately, while big changes mostly took place prior to 2008, as we explained above, there is limited data availability. The main source we rely on prior to 2008 is the OECD's Activity of Multinational Enterprises (AMNE)[7] dataset, which records foreign owned firm statistics until 2007. While there is partial coverage going back to 1985 for some countries, in case of transition economies the earliest available year is 1995, and most observations are missing until 2003. Even for 2003-2007, sectoral coverage is patchy. Therefore, we use only the manufacturing industry from AMNE, where data is best available, and where foreign penetration is the highest.[8]

[5] SBS 2005-2020

[6] Unless othewise noted, the countries are: Bulgaria, Croatia, Czechia, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia.

[7] Historical AMNE data

[8] The 2008-2019 sample suggests that the other such sector is J, but it has no equivalent in NACE rev. 1, which is used by AMNE.

As for the later sample, we supplement AMNE data with the relevant historical SBS table from Eurostat.[9] Since AMNE only has information on employees, in the historical analysis of manufacturing we work with the unadjusted labor share. Similarly, we define labor productivity relative to employees (and not employment). According to the SBS, self-employment in manufacturing is marginal, so any bias in our relative productivity measure should be minimal. Out of the 11 CEE countries, only six has (partial) AMNE coverage[10]. For countries that were Eurozone members in 2015, AMNE reports nominal indicators in millions of euros, while for other countries national currencies are used. Since nominal SBS variables are always in millions of euros, we convert the relevant AMNE values with the respective nominal exchange rates.

3.2. The country-industry panel, 2008-2019

As discussed above, our main sample contains the 27 EU countries, 7 industries, and the years 2008-2019. Table 2 presents country-year means for each sector for the four main variables: the aggregate labor share, foreign penetration (measured by the employment share of foreign-controlled enterprises), relative productivity and relative wage at foreign firms compared to domestic ones.

Table 2: Descriptive statistics for the main indicators

	Lab. sh.		For. emp.		Rel. prod.		Rel. wage	
Industry	Mean	S.D.	Mean	S.D.	Mean	S.D.	Mean	S.D.
C	0.64	0.08	0.28	0.12	1.69	0.37	1.40	0.21
F	0.79	0.16	0.05	0.02	1.90	0.80	1.67	0.46
G	0.71	0.12	0.17	0.07	2.17	0.94	1.64	0.36
H	0.69	0.12	0.12	0.07	1.53	0.66	1.28	0.21
I	0.83	0.16	0.08	0.04	1.80	0.67	1.53	0.37
J	0.62	0.11	0.28	0.11	2.21	1.20	1.48	0.30
M	0.84	0.15	0.10	0.05	2.04	0.64	1.83	0.50

As the table shows, there is significant heterogenity across industries both in the labor share and in the extent of foreign presence. The latter is highest in manufacturing and info-communication, as we indicated earlier.[11] These sectors also show the most variability in foreign share, hence they are likely to be crucial identification. It is reassuring for our proposed mechanism that in all cases relative productivity is well above unity. The same is true for relative wages, but in each industry the latter lag behind the former. Since the labor share can be mechanically decomposed into contributions of productivity and wages, in an aggregate sense it must be the case that the foreign productivity advantage is not completely passed through to workers, leading to a lower labor share.

To dig deeper, we now turn towards former estimation. We work with two sets of equations: first, a direct regression of the industry labor share on foreign employment share, and second, a regression of relative wages on relative foreign productivity. The former can be viewed as a

[9] Historical SBS data

[10] Czechia, Estonia, Hungary, Poland, Slovakia and Slovenia

[11] See also Figure 1, which also highlights the importance of sectors C and J.

reduced form test, while the second looks at our preferred mechanism. It is important to note that neither regression should be viewed as causal, given the possible endogeneity and potentially complex dynamic relationship between the various variables. Our data is too coarse to carry out such an exercise, thus our results in this section remain descriptive. We pick up causal analysis when we look at firm-level data in Hungary in the next section.

Our first regression is given by:

$$LS_{cit} = \alpha + \beta \frac{emp^f_{cit}}{emp_{cit}} + \eta_c + \mu_i + \delta\, GFC_t + \epsilon_{cit}, \tag{12}$$

where c, i and t denote countries, industries, and time. We present various speecifications that vary with the included fixed effects. We also show a specification where instead of the country dummies we add country groups, testing for significant differences in the labor share across broad regions.[12] Finally, we add a dummy for the global financial crisis: in 2008 $GFC = 1$, while it is zero otherwise.

Table 3: Foreign employment penetration and the total labor share

	(1)	(2)	(3)	(4)	(5)
Foreign employment share	-0.649***	-0.704***	-0.330***	-0.191***	-0.269***
	(0.026)	(0.026)	(0.036)	(0.042)	(0.037)
Global financial crisis	-0.064***	-0.054***	-0.058***	-0.045***	-0.053***
	(0.013)	(0.011)	(0.012)	(0.010)	(0.011)
Southern Europe					-0.028**
					(0.009)
Central and Eastern Europe					-0.086***
					(0.006)
Num.Obs.	2284	2284	2284	2284	2284
R2	0.212	0.445	0.312	0.546	0.363
R2 Within		0.253	0.043	0.017	0.114
Country fixed effects	No	Yes	No	Yes	No
Industry fixed effects	No	No	Yes	Yes	Yes

$+p < 0.1$, $*p < 0.05$, $*p < 0.01$, $***p < 0.001$

Table 3 contains the results of our 5 specifications. In all cases, the extent of foreign penetration has a significant negative impact on the industry labor share. The raw coefficient without any fixed effect indicates that a 10 percentage point (0.1) rise in the foreign employment share reduces the labor share by 6.5 percentage points. This is a very large coefficient, but it remains at this level even after adding country dummies. The impact drops significantly with industry fixed effects. When both country and industry fixed effects are controlled for, the estimated coefficient is a more muted, but statistically and economically still highly significant at -0.19. Replacing the country fixed effect with the group dummies has only a moderate impact on β, but we find that CEE economies have a significantly lower labor share (the same is true, albeit to a smaller degree, for the Southern member states).

[12] In addition to the CEE economies, we also separate the Meditarrenean group of Cyprus, Greece, Malta, Portugal and Spain. The remaining "old" members are used as the reference group.

Although we find consistently significant parameters, the within variation is small, once we controll for country and industry effects. This means that most of the variation comes for the two-dimensional cross-section. The reason could be the sample period, which as we have stressed earlier, does not contain the transition years for the CEE economies. Also, the short-run dynamics of the impact of foreign penetration on the labor share can be complex and heterogeneous, which our data is not equipped to handle. Finally, even in an ergodic stochastic steady state there can be continuous entry and exit of more productive foreign firms, making their productivity advantage a persistent and renewed phenomenon.

To look at the particular driver of these effects that we emphasize in our model, we estimate a second set of regressions:

$$\log rw_{cit} = \alpha + \beta \log rlp_{cit} + \eta_c + \mu_i + \epsilon_{cit}. \tag{13}$$

Note that we dropped the crisis dummy, and we also omit the country groups. These turned out to be insignificant, but we are happy to report the additional specifications upon request.

Table 4: Relative productivity and relative wages

	(1)	(2)	(3)	(4)
Relative productivity	0.422***	0.321***	0.403***	0.265***
	(0.010)	(0.011)	(0.010)	(0.010)
Num.Obs.	2257	2257	2257	2257
R2	0.422	0.645	0.511	0.746
R2 Within		0.290	0.413	0.242
Country fixed effects	No	Yes	No	Yes
Industry fixed effects	No	No	Yes	Yes

$+p < 0.1$, $*p < 0.05$, $**p < 0.01$, $***p < 0.001$

Table 4 presents the results, with various combinations of country and industry fixed effects. The key parameter of interest, the elasticity of the relative wage with respect to relative productivity lies in a fairly narrow range of 0.27-0.42. Foreign firms appear to pass on significantly less than half their productivity advantage to wages, which – as we argued above – leads to a decline in the labor share as foreign penetration increases. The magnitude is also consistent with firm-level evidence from another transition economy. Using Ukrainian manufacturing data and an instrumental-variable approach, Shepotylo and Vakhitov (2020) estimate a wage–productivity elasticity of approximately 0.15. While their parameter is not directly comparable to our foreign–domestic relative productivity specification, both results point to substantially incomplete pass-through of firm productivity differences into wages. Some caution is in order: it is not obvious that as more foreign firms enter, they maintain the same efficiency advantage as previous entrants. Also, there may be heterogeneity along many dimensions, across industries and countries, and possibly between acquisitions and greenfield investment. Still, our results are at the very least highly suggestive that foreign penetration indeed lowers the labor share, as the higher productivity of foreign firms is only partially reflected in the wages they pay.

To conclude this part, we found that higher foreign employment is associated with a lower labor share. Most of the variation comes from country and industry differences, but time variation also contributes. More productive foreign firms do not fully pass on this advantage to workers, which supports the mechanism we explored in the model section. To gain more insight from earlier years, we now turn towards manufacturing.

3.3. Results for manufacturing, 1995-2007

Our second set of regressions looks at earlier data, starting in 1995. AMNE has sporadic availability before that, but the SBS historical series does not. In any case, for most countries even the second half of the 1990 has very limited manufacturing coverage (the other sectors are much worse). As in the previous case, we estimate both the labor share regression on foreign employment share, and the relative wage regression on relative foreign productivity. Since we now work with a single sector, we vary the inclusion of only the country fixed effect.

Since the panel is much less balanced than the post-2008 sample, we face a choice of which periods to include. Figure 2 provides a visual representation of data coverage for one of the key bottlenecks, the foreign employment share. Inspired by that figure, we estimate each regression for the full 1995-2007 sample, and separately for the 2003-2007 subsample. Austria has only two available years, but since we have no good reason to drop it, we keep it in the estimation. Since we have relatively few observations, and because we only have two Southern European countries in the sample, we only separate the six available CEE economies, and include a CEE dummy in two of our six labor share regressions.

Table 5: Foreign employment penetration and the manufacturing labor share

	(1)	(2)	(3)	(4)	(5)	(6)
Foreign employment share	-0.539***	-0.175*	-0.505***	-0.547***	-0.179+	-0.489***
	(0.073)	(0.086)	(0.073)	(0.101)	(0.099)	(0.109)
Central and Eastern Europe			-0.048*			-0.035
			(0.020)			(0.026)
Num.Obs.	155	155	155	83	83	83
R2	0.266	0.924	0.292	0.265	0.975	0.282
R2 Within		0.029			0.049	
Country fixed effects	No	Yes	No	No	Yes	No

$+p < 0.1$, $*p < 0.05$, $**p < 0.01$, $***p < 0.001$
(1)-(3): 1995-2007; (4)-(6): 2003-2007. Central and Eastern Europe: CZ, EE, HU, PL, SI, SK

Table 5 shows the results for the manufacturing labor share. In the first column, without country fixed effects, we see a highly significant and large coefficient on foreign penetration. Adding those lowers the coefficient, and significance drops to 5%. While again CEE countries have lower labor shares on average, the coefficient is smaller than in the previous, three-dimensional panel, and it is also significant only at the 5% level. We can thus conclude that most of the variation in the labor share is across countries, and the time dimension is adding relatively little to identification. Figure 3 in the Appendix shows, however, that the raw correlation – captured also by column (1) in the regression table – is visible and quite strong.

Restricting the sample period to 2003-2007 does not materially change the conclusions. The number of observations drops by a bit less than half, reflecting the fact that coverage is more even in the last 5 years. The estimated magnitudes are almost the same, although some significance is lost, in particular when we add country fixed effects. Interestingly, the within explanatory power almost doubles, but even so country variation remains dominant. The CEE dummy has the expected negative coefficient, but it is no longer significant.

We wrap up this section by the relative wage regressions. As before, the country group dummy is ommitted, since it is not significant. We use both the full period and the post-2003 subsample, and show results with or without country fixed effects. Table 6 contains the details. Notice that the sample sizes are much lower than for the previous regressions, since AMNE has more missing observations for GVA and compensation of employees than for employee numbers.

Table 6: Productivity and wages, manufacturing

	(1)	(2)	(3)	(4)
Relative productivity	0.503***	0.203***	0.522***	0.271**
	(0.045)	(0.054)	(0.064)	(0.083)
Num.Obs.	98	97	57	56
R2	0.561	0.923	0.550	0.937
R2 Within		0.146		0.197
Country fixed effects	No	Yes	No	Yes

$+p < 0.1$, $*p < 0.05$, $**p < 0.01$, $***p < 0.001$
(1)-(2): 1995-2007; (3)-(4): 2003-2007.

Again, the overall picture is very similar to the case with multiple sectors. Productivity pass-through is very incomplete, and when we control for country effects, the elasticity is only 0.2. The coefficients are a bit higher for the post-2003 sample, but not dramatically so. Even though we have a very small sample, the estimated coefficent remains significant at the 1% level throughout. While country effects pick up most of the labor share variation, the within part is relatively high, around 20% in the shorter period.

To conclude, the current manufacturing sample delivers much the same results as the three-dimensional panel for the more recent period. The apparent stability of the estimated coefficients, and the fact that in both cases we find stronger cross-sectional identification suggests that our findings are more likely to capture a persistent, longer-term relationship. As we discussed earlier, industry-level data does not seem to be informative enough about possibly complex and heterogenous dynamic patterns. To investigate these, we now turn to detailed, firm-level Hungarian data.

4. Firm-level evidence from Hungary

4.1. Hungarian firm data

The second empirical analysis is based on the corporate tax data set of Hungarian double-entry bookkeeping firms. The database contains administrative tax files data collected by the National Tax and Customs Administration (NAV) of all double-keeping Hungarian firms from 2003-2020. Tax files comprise detailed balance sheet and income statement data of firms as well as firm characteristics, such as industry, region, number of employees, ownership structure.[13]

[13]The administrative database used in this paper is owned by the National Tax and Customs Administration. The data was processed by the Databank of the ELTE Centre for Economic and Regional Studies.

4.2. Pooled firm-level regressions

We estimate pooled OLS regressions at the firm-year level for 2003–2020, restricting the sample to firms with at least 10 employees and to the sectors covered by industry level European estimation (Section 3). The specifications first relate foreign ownership to the logarithms of the labor share, labor productivity, and average labor costs, and then relate the logarithms of the labor share and average labor costs to log labor productivity; all models include year fixed effects, sector fixed effects are included where indicated, and standard errors are clustered by firms reported.

Labor share, *value added*, *labor costs*, and *labor productivity* are constructed at the firm level using information from firms' annual financial statements. *Value added* is defined as sales revenue minus material costs and the cost of purchased services, plus the capitalized value of own production. *Total labor costs* are measured by personnel expenses, including gross wages and salaries, employers' social security contributions, and other personnel-related payments.

Average labor cost is calculated as total personnel expenses divided by the average annual number of employees, while *labor productivity* is defined as value added per employee. The *labor share* is calculated as the ratio of total personnel expenses to value added.

All indicators are constructed at an annual frequency. To limit the influence of extreme observations, all indicators are winsorized at the 1st and 99th percentiles. In addition, the *labor share* is capped at one: in firm-year observations in which total personnel expenses exceed value added, the *labor share* is set equal to one.

4.3. Results-pooled sample regressions

Table 7 reports descriptive statistics for the pooled analysis sample by ownership and year; depending on the year, the sample contains between 19,058 and 24,426 domestic firms and between 3,140 and 3,961 foreign firms. Throughout 2003–2020, the average labor share was lower among foreign firms (0.587–0.644) than among domestic firms (0.663–0.728), with an annual gap of approximately 5.2–12.0 percentage points; foreign firms also had consistently higher average labor productivity and personnel costs, although these comparisons do not control for differences in firm composition.

Table 8 presents firm-level estimates based on Hungarian microdata for the period 2003–2020. The sample includes firms with at least 10 employees. All specifications control for calendar year fixed effects and, where indicated, sector fixed effects; standard errors are robust. The results are consistent with the prediction of our model.

Column (1) shows that foreign-owned firms exhibit significantly lower labor shares than domestic firms. The estimated coefficient implies an approximately 11 percent lower labor share in foreign-owned firms, conditional on sector and time effects. This result indicates that ownership structure is systematically related to the functional distribution of income at the firm level.

At the same time, column (2) shows that foreign ownership is associated with substantially higher average labor costs. The magnitude of the coefficient implies a wage premium of roughly 59 percent relative to domestic firms. Taken together, columns (1) and (2) indicate that higher wages in foreign-owned firms coexist with lower labor shares, consistent with the presence of sizable productivity advantages that are not fully transmitted to labor compensation. Columns (3) show that foreign ownership is also associated with substantially higher labor productivity.

Table 7: Descriptive statistics for domestic and foreign firms in the pooled sample, 2003–2020

	Domestic firms				Foreign firms			
Year	Firms	Labor share	Log labor productivity	Log personnel costs	Firms	Labor share	Log labor productivity	Log personnel costs
2003	20,456	0.707	7.636	7.318	3,140	0.587	8.571	8.002
2004	22,543	0.712	7.674	7.380	3,294	0.607	8.582	8.047
2005	23,511	0.707	7.731	7.429	3,439	0.618	8.644	8.153
2006	24,301	0.699	7.835	7.501	3,615	0.609	8.742	8.209
2007	24,426	0.710	7.926	7.613	3,827	0.632	8.769	8.276
2008	24,088	0.722	7.962	7.669	3,961	0.644	8.822	8.327
2009	22,247	0.728	7.926	7.639	3,885	0.638	8.871	8.354
2010	22,577	0.717	7.939	7.643	3,857	0.617	8.915	8.355
2011	22,565	0.717	8.047	7.712	3,933	0.620	8.964	8.402
2012	21,400	0.724	8.082	7.767	3,858	0.630	9.007	8.457
2013	21,652	0.704	8.174	7.819	3,844	0.611	9.081	8.503
2014	22,794	0.686	8.254	7.862	3,838	0.603	9.131	8.535
2015	24,005	0.678	8.355	7.938	3,853	0.601	9.200	8.600
2016	23,509	0.694	8.361	7.998	3,725	0.612	9.225	8.639
2017	22,396	0.681	8.511	8.107	3,638	0.603	9.333	8.722
2018	21,730	0.673	8.626	8.204	3,685	0.615	9.394	8.796
2019	21,217	0.668	8.736	8.308	3,685	0.616	9.465	8.879
2020	19,058	0.663	8.814	8.371	3,600	0.598	9.541	8.926

Notes: The table reports annual firm counts and employment-weighted means. The sample consists of non-state-owned domestic and foreign firms with at least 10 employees in the sectors included in the European empirical analysis. Labor share is the adjusted labor-share measure used in the empirical analysis. Labor productivity and personnel costs per employee are expressed in natural logarithms. Firm counts are unweighted.

The productivity differential, at about 76 log points, is considerably larger than the labor-cost differential of about 60 log points, consistent with lower labor shares at foreign firms.

Columns (4) and (5) examine the role of labor productivity. Column (4) shows a strong and statistically significant negative relationship between labor productivity and the labor share, while column (5) documents a positive association between productivity and average labor costs. A 1 percent increase in labor productivity is associated with an approximately 0.33 percent decline in the labor share and a 0.49 percent increase in average labor costs. Because labor costs increase less than proportionally with productivity, higher productivity is associated with a lower labor share. These results imply that productivity gains are shared with workers, but less than proportionally relative to value added, resulting in a declining labor share as productivity increases.

Overall, the results show that foreign-owned firms and more productive firms pay higher wages but have lower labor shares. This evidence helps reconcile rising real wages with declining labor shares and underscores the role of ownership-related productivity differentials in shaping labor share dynamics.

4.4. Foreign acquisitions and event-time dynamics

The pooled firm-level regressions above show substantial differences between foreign- and domestically owned firms in labor productivity, labor costs, and the labor share. While the rich set of firm-level controls accounts for important observable differences between foreign and domestic firms, a causal interpretation remains difficult, as foreign ownership may also be related to

Table 8: Pooled regressions: relationship between labor share, labor productivity ans average wages

	(1) Log labor share	(2) Log labor productivity	(3) Log average labor costs	(4) Log labor share	(5) Log average labor costs
Foreign-owned firm	-0.105^{***}	0.749^{***}	0.602^{***}		
	(0.025)	(0.046)	(0.026)		
Log labor productivity				-0.330^{***}	0.488^{***}
				(0.015)	(0.011)
Constant	-0.511^{***}	7.771^{***}	7.361^{***}	2.121^{***}	3.690^{***}
	(0.024)	(0.046)	(0.021)	(0.113)	(0.088)
Observations	457,264	457,344	471,044	457,264	457,264
R^2	0.124	0.298	0.394	0.531	0.699
Year fixed effects	Yes	Yes	Yes	Yes	Yes
Sector fixed effects	Yes	Yes	Yes	No	No

Notes: The table reports pooled OLS estimates for 2003–2020. The sample is restricted to firms with at least 10 employees and to the sectors covered by Section 3. The dependent variables are indicated in the column headings. All continuous variables are expressed in natural logarithms. Standard errors clustered by firms are reported in parentheses. $^{***}p < 0.01$, $^{**}p < 0.05$, $^{*}p < 0.1$.

unobserved firm characteristics. To complement these results, and to move closer to identifying changes associated with foreign ownership, we exploit transitions from domestic to foreign ownership in an event-study framework. By following the same firms before and after acquisition, this analysis allows us to examine whether changes in productivity, labor costs, and the labor share around foreign acquisition are consistent with the patterns found in the pooled firm-level analysis. This approach follows a broader empirical literature exploiting foreign acquisitions to study within-firm changes in productivity, wages, and other firm outcomes (Arnold and Javorcik, 2009; Damijan et al., 2015; Fons-Rosen et al., 2021b; Görg and Lehr, 2024).

The event-study approach also has limitations. Ownership changes occur for only a small and highly selected subset of firms. This limitation is particularly relevant in the Hungarian context. Using related Hungarian administrative data, Köllő et al. (2021) report that only 5.3 percent of firms changed majority owner during their observation period and emphasize that firms undergoing acquisition are non-randomly selected. The authors show that firms switching ownership differ systematically from both always-domestic and always-foreign firms. The event-study estimates should therefore be interpreted as evidence on the dynamics of firms that are actually acquired by foreign owners, rather than as an estimate that necessarily generalizes to the full population of domestic firms.

We define the acquisition year as the first year in which a previously domestically owned firm becomes foreign-owned, and denote event time by

$$k = t - T_i,$$

where T_i is the year of foreign acquisition of firm i. We examine the evolution of outcomes from three years before to five years after acquisition. The year immediately preceding the acquisition, $k = -1$, is used as the reference period. The analysis is restricted to the same set of sectors as the preceding firm-level regressions.

For labor productivity, we estimate the dynamic specification

$$\ln LP_{it} = \alpha_i + \lambda_t + \sum_{\substack{k=-3 \\ k\neq -1}}^{5} \beta_k^{LP} \mathbf{1}\{t - T_i = k\} + X_{it}'\gamma^{LP} + \varepsilon_{it}^{LP}, \tag{14}$$

where α_i denotes firm fixed effects, λ_t calendar-year fixed effects, and X_{it} denotes the set of additional firm-level controls. The coefficients β_k^{LP} trace changes in log labor productivity around foreign acquisition relative to the year immediately preceding the acquisition.

We estimate the corresponding specification for average labor costs:

$$\ln W_{it} = \alpha_i + \lambda_t + \sum_{\substack{k=-3 \\ k\neq -1}}^{5} \beta_k^{W} \mathbf{1}\{t - T_i = k\} + X_{it}'\gamma^{W} + \varepsilon_{it}^{W}, \tag{15}$$

where $\ln W_{it}$ is the logarithm of average labor costs per employee. Finally, for the labor share we estimate

$$\ln LS_{it} = \alpha_i + \lambda_t + \sum_{\substack{k=-3 \\ k\neq -1}}^{5} \beta_k^{LS} \mathbf{1}\{t - T_i = k\} + X_{it}'\gamma^{LS} + \varepsilon_{it}^{LS}. \tag{16}$$

Estimating the three outcomes separately allows us to examine directly the mechanism highlighted by the model and the cross-sectional results. In particular, if foreign acquisition is followed by an increase in productivity that exceeds the corresponding increase in labor costs, the labor share should decline after acquisition. The event-time coefficients also allow us to inspect the pre-acquisition dynamics of the three outcomes, which is important given the non-random selection of firms into foreign acquisition.

4.5. Results-event time analysis

The results are displayed in Table 9. The estimates are imprecise, reflecting the relatively small number of domestic firms that undergo foreign acquisition, and the confidence intervals are correspondingly wide. Nevertheless, the post-acquisition dynamics are broadly consistent with the mechanism highlighted by the model and the results form the pooled regressions. In particular, four years after foreign acquisition, labor productivity is about 8.5 percent higher than in the year preceding acquisition, while average labor costs are only about 3.3 percent higher. The relatively delayed emergence of the productivity effect is consistent with evidence that productivity gains following foreign acquisition may materialize only gradually (Fons-Rosen et al., 2021b). The productivity effect is statistically significant at the 5 percent level and the labor-cost effect at the 10 percent level. Consistent with the larger increase in productivity than in labor costs, the estimated effect on the labor share is negative at this horizon, although it is small and not statistically significant. Thus, while the event-study estimates are not sufficiently precise to provide strong evidence on the dynamic effects of foreign acquisition, they do not contradict the pooled firm-level results and, particularly at longer horizons, display the productivity–wage pattern predicted by the model.

Table 9: Event time two-way fixed effects regressions: effect of foreign acquisition on labour productivity, average labor costs and labor share

	(1)	(2)	(3)
VARIABLES	ln_prod_lab	ln_averwage	ln_lshare_adj
years relative to acq=-3	0.035	-0.010	-0.031
	(0.038)	(0.018)	(0.025)
years relative to acq=-2	-0.016	-0.050***	-0.035*
	(0.034)	(0.018)	(0.021)
years relative to acq=-1		*omitted*	
years relative to acq=0	0.043	0.041**	-0.030
	(0.038)	(0.017)	(0.025)
years relative to acq=1	0.043	0.058***	0.001
	(0.037)	(0.017)	(0.024)
years relative to acq=2	0.006	0.042**	0.018
	(0.040)	(0.018)	(0.024)
years relative to acq=3	0.046	0.043**	0.004
	(0.037)	(0.019)	(0.024)
years relative to acq=4	0.085**	0.033*	-0.020
	(0.038)	(0.018)	(0.027)
years relative to acq=5	0.043	0.019	-0.023
	(0.042)	(0.018)	(0.027)
Constant	8.060***	7.680***	-0.468***
	(0.008)	(0.005)	(0.005)
Observations	750,523	781,906	750,402
R-squared	0.778	0.868	0.670
Year FE	YES	YES	YES
Firm FE	YES	YES	YES

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Notes: The table reports event-time estimates around foreign acquisition. Event time 0 denotes the year in which a previously domestically owned firm becomes foreign-owned. Event time -1 is the omitted reference period. The sample is restricted to firms observed for at least three years before acquisition and remaining foreign-owned for at least four years after acquisition, and to the same sectors as in the preceding firm-level analysis. All specifications include firm and calendar-year fixed effects. Standard errors, clustered at the firm level, are reported in parentheses.

5. Conclusion

This paper examines the relationship between foreign ownership and the labor share, focusing on the role of productivity differences between foreign and domestic firms. We argue that higher wages at foreign firms need not imply a higher labor share. If foreign firms are substantially more productive than domestic firms and only part of this productivity advantage is passed through to workers, foreign firms can simultaneously pay higher wages and have lower labor shares.

Our empirical results are consistent with this mechanism. Using European industry-level data, we find that greater foreign employment penetration is associated with lower labor shares. Across countries and industries, foreign firms are substantially more productive than domestic firms and also pay higher wages, but the foreign wage premium is considerably smaller than the productivity premium. The earlier manufacturing data for European countries show a similar pattern, suggesting that this relationship is not specific to the more recent period.

The Hungarian firm-level evidence provides further support for the mechanism. Foreign-owned firms have substantially higher productivity and labor costs than domestic firms, while their labor shares are lower. The event-study analysis of foreign acquisitions is considerably less precise, reflecting the small and selected group of firms that change ownership. Nevertheless, the longer-run post-acquisition pattern is consistent with the model: productivity increases more strongly than labor costs, accompanied by a decline in the labor share. These results therefore complement the differences observed between foreign and domestic firms, although they should be interpreted cautiously given the imprecision of the estimates.

An important implication is that a low labor share in an economy with substantial foreign ownership does not necessarily imply low wages or deteriorating outcomes for workers. Foreign firms may pay considerably more than domestic firms while retaining a larger share of value added because their productivity advantage is even greater. The distributional interpretation of the labor share therefore depends partly on the sources of productivity differences and on who ultimately receives the associated capital income.

Finally, the persistence of the foreign–domestic productivity gap is central to the longer-run implications of this mechanism. If domestic firms gradually catch up through technological diffusion, worker mobility, or other spillovers, the productivity gap should narrow and the downward effect of foreign ownership on the aggregate labor share may weaken. If, instead, foreign affiliates maintain a persistent productivity advantage, economies with a large foreign-owned sector may also exhibit persistently lower aggregate labor shares, even without further increases in foreign penetration. Understanding the persistence of these productivity differences, and the extent to which they are eventually transmitted to wages, is therefore an important direction for further research.

References

Abowd, J. M. and F. Kramarz (2003). The costs of hiring and separations. *Labour Economics 10*, 499–530.

Acemoglu, D. and P. Restrepo (2018). The race between man and machine: Implications of technology for growth, factor shares, and employment. *American Economic Review 108*(6), 1488–1542.

Aitken, B. J., A. E. Harrison, and R. E. Lipsey (1996). Wages and foreign ownership: A comparative study of mexico, venezuela, and the united states. *Journal of International Economics 40*(3–4), 345–371.

Alfaro-Ureña, A., I. Manelici, and J. P. Vásquez (2022). The effects of joining multinational supply chains: New evidence from firm-to-firm linkages. *Quarterly Journal of Economics 137*(3), 1495–1552.

Arnold, J. M. and B. S. Javorcik (2009). Gifted kids or pushy parents? foreign direct investment and plant productivity in indonesia. *Journal of International Economics 79*(1), 42–53.

Autor, D., D. Dorn, L. F. Katz, C. Patterson, and J. Van Reenen (2020). The fall of the labor share and the rise of superstar firms. *Quarterly Journal of Economics 135*(2), 645–709.

Balsvik, R. (2011). Is labor mobility a channel for spillovers from multinationals? evidence from norwegian manufacturing. *Review of Economics and Statistics 93*(1), 285–297.

Barkai, S. (2020). Declining labor and capital shares. *Journal of Finance 75*(5), 2421–2463.

Bruno, R. L. and M. Cipollina (2018). A meta-analysis of the indirect impact of foreign direct investment in old and new EU member states: Understanding productivity spillovers. *The World Economy 41*, 1342–1377.

Conyon, M. J., S. Girma, S. Thompson, and P. W. Wright (2002). The productivity and wage effects of foreign acquisition in the united kingdom. *Journal of Industrial Economics 50*(1), 85–102.

Damijan, J., Č. Kostevc, and M. Rojec (2015). Growing lemons or cherries? pre- and post-acquisition performance of foreign-acquired firms in new EU member states. *The World Economy 38*(4), 751–772.

Dao, M. C., M. Das, Z. Koczan, and W. Lian (2017). Why is labor receiving a smaller share of global income? theory and empirical evidence. IMF Working Paper 17/169, International Monetary Fund.

Decreuse, B. and P. Maarek (2015). Fdi and the labor share in developing countries: A theory and some evidence. *Annals of Economics and Statistics* (119/120), 289–319.

Earle, J. S. and Á. Telegdy (2008). Ownership and wages: Estimating public-private and foreign-domestic differentials using linked employer-employee data. In *The Analysis of Firms and Employees: Quantitative and Qualitative Approaches*. University of Chicago Press.

Earle, J. S., Á. Telegdy, and G. Antal (2018). Foreign ownership and wages: Evidence from hungary, 1986–2008. *ILR Review 71*(2), 458–491.

Elsby, M. W. L., B. Hobijn, and A. Şahin (2013). The decline of the u.s. labor share. *Brookings Papers on Economic Activity 2013*(2), 1–63.

Eriksson, T. and M. Pytlikova (2011). Foreign ownership wage premia in emerging economies: Evidence from the czech republic. *Economics of Transition 19*(2), 371–395.

Feng, Y. and J. Wen (2023). Foreign direct investment and employee income share: Firm-level evidence. *Finance Research Letters 55*, 103893.

Fons-Rosen, C., Ş. Kalemli-Özcan, B. E. Sørensen, C. Villegas-Sanchez, and V. Volosovych (2021a). Quantifying productivity gains from foreign investment. *Journal of International Economics 131*, 103456.

Fons-Rosen, C., Ş. Kalemli-Özcan, B. E. Sørensen, C. Villegas-Sanchez, and V. Volosovych (2021b). Quantifying productivity gains from foreign investment. *Journal of International Economics 131*, 103456.

Görg, H. and J. Lehr (2024). Short and medium-term effects of foreign acquisitions on manufacturing firms: Evidence from germany. *Economics Letters 241*, 111826.

Gorodnichenko, Y., J. Svejnar, and K. Terrell (2014). When does fdi have positive spillovers? evidence from 17 transition market economies. *Journal of Comparative Economics 42*(4), 954–969.

Gregori, W. D., M. Martinez Cillero, and M. Nardo (2024). The effects of cross-border acquisitions on firms' productivity in the EU. *The World Economy 47*(1), 9–36.

Grossman, G. M. and E. Oberfield (2022). The elusive explanation for the declining labor share. *Annual Review of Economics 14*(Volume 14, 2022), 93–124.

Guschanski, A. and Ö. Onaran (2022). The decline in the wage share: Falling bargaining power of labour or technological progress? industry-level evidence from the oecd. *Socio-Economic Review 20*(3), 1091–1124.

Hagedorn, M. and I. Manovskii (2008). The cyclical behavior of equilibrium unemployment and vacancies revisited. *American Economic Review 98*, 1692–1706.

Havránek, T. and Z. Iršová (2011). Estimating vertical spillovers from fdi: Why results vary and what the true effect is. *Journal of International Economics 85*(2), 234–244.

Hijzen, A., P. S. Martins, T. Schank, and R. Upward (2013). Foreign-owned firms around the world: A comparative analysis of wages and employment at the micro-level. *European Economic Review 60*, 170–188.

Javorcik, B. S. (2004). Does foreign direct investment increase the productivity of domestic firms? in search of spillovers through backward linkages. *American Economic Review 94*(3), 605–627.

Javorcik, B. S. (2015). Does fdi bring good jobs to host countries? *World Bank Research Observer 30*(1), 74–94.

Karabarbounis, L. and B. Neiman (2014). The global decline of the labor share. *Quarterly Journal of Economics 129*(1), 61–103.

Kónya, I., J. Krekó, and G. Oblath (2020). Labor shares in the old and new eu member states: Sectoral effects and the role of relative prices. *Economic Modelling 90*, 254–272.

Köllő, J., I. Boza, and L. Balázsi (2021, December). Wage gains from foreign ownership: evidence from linked employeremployee data. *Journal for Labour Market Research 55*(1), 1–21.

Leone, F. (2026). Multinationals, robots, and the labor share. *European Economic Review 186*, 105302.

Maarek, P. and E. Orgiazzi (2020, 02). Development and the labor share. *The World Bank Economic Review 34*(1), 232–257.

OECD (2022). *FDI Qualities Policy Toolkit*. Paris: OECD Publishing.

Onaran, Ö. and E. Stockhammer (2008). The effect of fdi and foreign trade on wages in the central and eastern european countries in the post-transition era. *Structural Change and Economic Dynamics 19*(1), 66–80.

Petreski, M. (2021). Has globalization shrunk manufacturing labor share in transition economies? *Journal of Comparative Economics 49*(1), 201–211.

Pető, R. and B. Reizer (2025, Jun). Fdi, technological progress and inequality. KRTK-KTI WORKING PAPERS 2510, Institute of Economics, Centre for Economic and Regional Studies.

Piketty, T. (2014). *Capital in the Twenty-First Century*. Harvard University Press.

Pissarides, C. A. (2000). *Equilibrium unemployment theory, 2nd ed.* The MIT Press.

Poole, J. P. (2013). Knowledge transfers from multinational to domestic firms: Evidence from worker mobility. *Review of Economics and Statistics 95*(2), 393–406.

Saurav, A. and R. C. Kuo (2020). Foreign direct investment and productivity: A literature review on the effects of FDI on local firm productivity. Technical report, World Bank, Washington, DC.

Schwellnus, C., A. Kappeler, and P.-A. Pionnier (2017). The decoupling of median wages from productivity in OECD countries. *International Productivity Monitor* (32), 44–60.

Shepotylo, O. and V. Vakhitov (2020). Market power, productivity and distribution of wages: Theory and evidence with micro data. Technical Report 387, Leibniz Institute for East and Southeast European Studies.

Stansbury, A. M. and L. H. Summers (2019). Productivity and pay: Is the link broken? In A. S. Posen and J. Zettelmeyer (Eds.), *Facing Up to Low Productivity Growth*, Chapter 8. Washington, DC: Peterson Institute for International Economics.

Stockhammer, E. (2017). Determinants of the wage share: A panel analysis of advanced and developing economies. *British Journal of Industrial Relations 55*(1), 3–33.

Sun, C. (2020). Multinational production with non-neutral technologies. *Journal of International Economics 123*, 103294.

van Treeck, K. and K. M. Wacker (2020). Financial globalisation and the labour share in developing countries: The type of capital matters. *The World Economy 43*(9), 2343–2374.

Yang, C.-H. and M.-W. Tsou (2021). Globalization and the labor share in china: Firm-level evidence. *The Manchester School 89*(1), 1–23.

A. Additional figures

Figure 1: Foreign penetration and the labor share, time averages

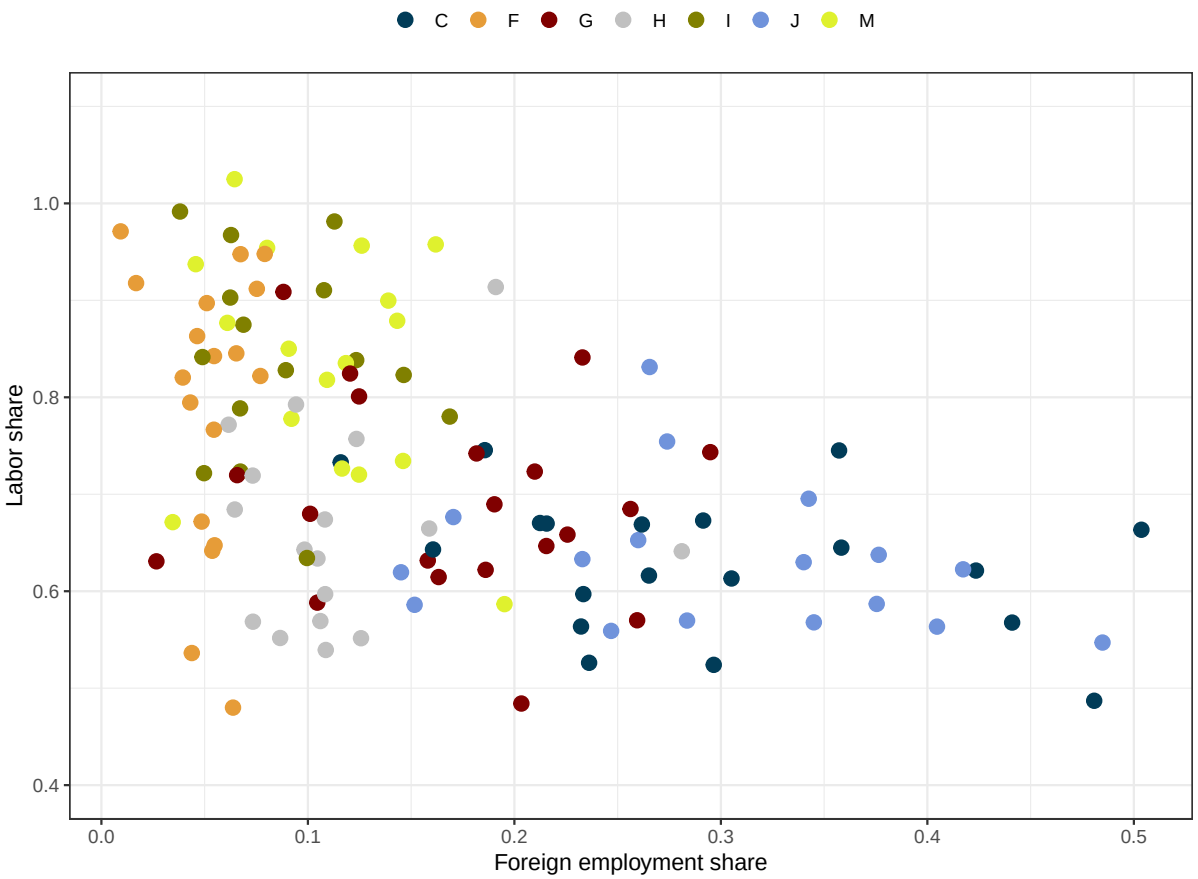

Figure 2: Manufacturing panel observations

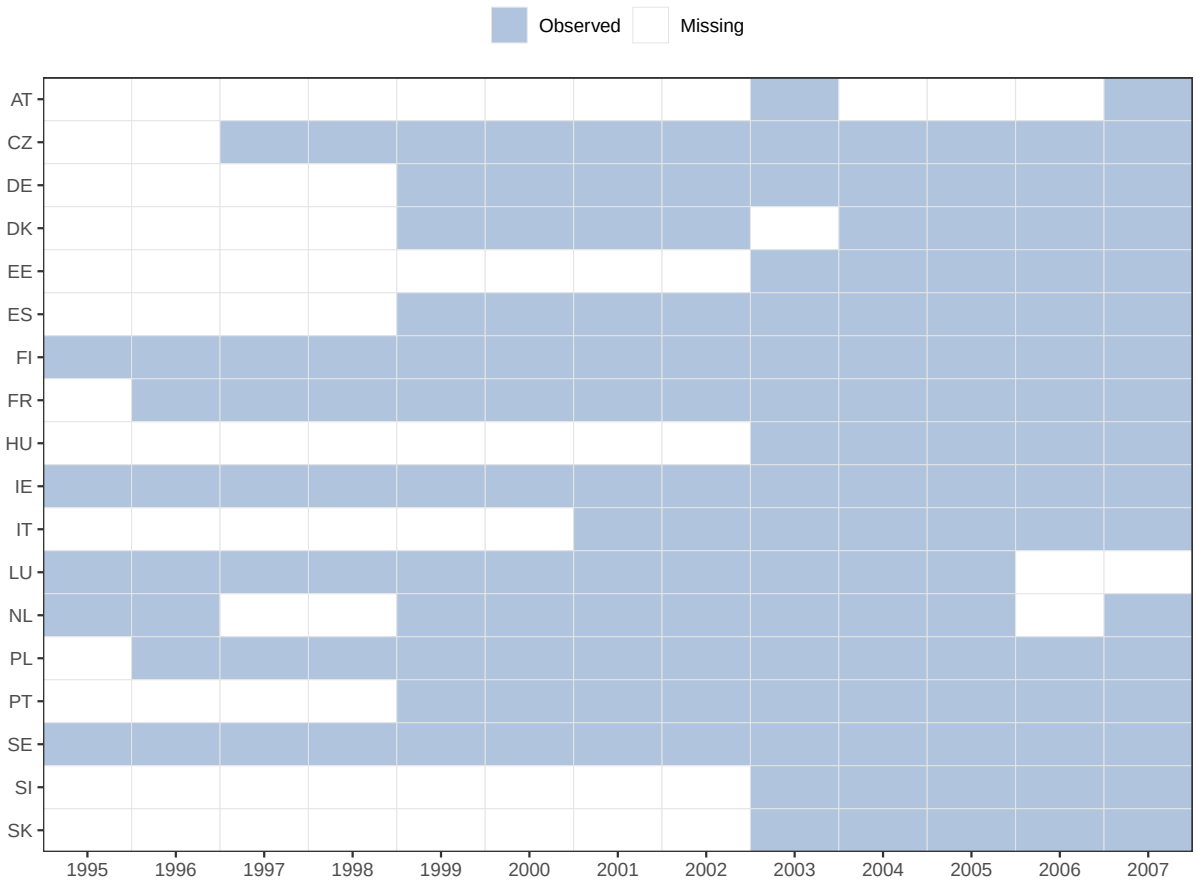

Figure 3: Foreign penetration and the labor share in manufacturing