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Employment effects of foreign direct investment. New Evidence from Central and Eastern European Countries

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Résumé:

Ce papier examine le rôle des investissements directs étrangers (IDE) comme déterminant de l'emploi à travers un modèle dynamique de demande de travail appliqué à un échantillon de 20 pays d'Europe centrale et orientale (PECO) au cours de la période 1995-2012. Nos résultats montrent que les IDE conduisent à un phénomène de destruction créatrice sur le marché du travail. L'introduction de nouvelles technologies plus productives conduit initialement à un effet négatif sur l'emploi, alors que l'intégration verticale progressive des filiales étrangères dans l'économie locale permet un effet de long terme positif. Cependant, ce phénomène n'est observé que dans les pays membres de l'UE. Notre analyse donne ainsi un soutien partiel à l'hypothèse que IDE peuvent dans certaines conditions nuire à l'emploi. Pourtant, l'importance relative des IDE comme déterminant de l'emploi dans les PECO est modeste par rapport au progrès dans la transition économique et à la dynamique de l'activité. Enfin, nos résultats montrent une préférence des filiales étrangères pour l'emploi des plus qualifiés, car le capital humain semble accélérer la contribution positive des IDE à l'emploi.

Mots clé: IDE, emploi, demande de travail, pays en transition, panel dynamique

Classification JEL: F23, J23

Abstract :

This paper examines the role of foreign direct investment (FDI) as a determinant of employment by using a dynamic labor demand model applied for a panel of 20 Central and Eastern European Countries during the period 1995-2012. Our results indicate that FDI leads to a phenomenon of creative destruction. The introduction of labor saving techniques leads to an initial negative effect on employment, while the progressive vertical integration of foreign affiliates into the local economy eventually converges towards a positive long run effect. However, this phenomenon is only observed in EU countries. Our analysis thus gives partial support to the worries that FDI may displace jobs. Still, the relative importance of FDI as a determinant of employment is modest compared to economic restructuring and output growth. Finally, our results show evidence of a skill bias of production in foreign affiliates, as human capital favors a positive contribution of FDI to employment.

Keywords: FDI, employment, labor demand, transition countries, dynamic panel

JEL classification: F23, J23

Non-technical summary

The severe increase in unemployment that accompanied the recent economic crisis has led policy makers to search for viable solutions in order to stimulate labor demand and regain the path towards long-term growth. Since foreign direct investment (FDI) was already considered a major factor in the restructuring of Central and Eastern European countries (CEEC), it appeared as a natural candidate to boost activity and employment levels.

However, the overall impact of FDI on employment appears ambiguous, due to opposite effects. On one hand, foreign affiliates can crowd-out domestic firms due to increased competition or by replacing local suppliers with imported inputs. On the other hand, the integration of foreign affiliates into the local supply chains can lead to job creation due to increased demand. The lack of consensus is clearly illustrated by empirical studies, which provide evidence of both positive and negative effects of FDI on employment.

The aim of this paper is therefore to investigate the impact of FDI on aggregate employment in CEEC, based on a theoretical model where FDI influences the efficiency of capital and labor. In fact, the technology flow that accompanies FDI could influence total factor productivity, and therefore employment dynamics. For empirical purposes, we estimate a dynamic labor demand model on a sample of 20 CEEC covering the period 1995-2012.

Our results indicate that FDI leads to a two stage creative destruction phenomenon on the labor markets in CEEC. The introduction of labor saving techniques and the competition pressures lead to an initial negative effect on employment, while the progressive integration of foreign affiliates into the local economy eventually leads to a positive long run effect. Still, the relative importance of FDI as a determinant of employment appears modest compared to other determinants specific to the transition context, namely economic restructuring. Moreover, we only identify this phenomenon for EU countries, whereas FDI is largely insignificant for employment in non-EU countries.

Additionally, international trade seems to condition the effect of FDI on employment. We find the export orientation of foreign affiliates and their preference for labor intensive industries to foster job creation. Adversely, strong import competition displaces domestic suppliers and causes jobs losses. Finally, our results show evidence of a skill bias of production in foreign affiliates in favor of skilled employees.

Our analysis thus gives partial support to the worries that FDI may displace jobs. The relatively low contribution to employment growth, even in the long run, indicates that FDI

alone would not be an effective tool to regain employment. However, policies encouraging market seeking FDI and a minimum local content of production could be useful to preserve employment levels. An improved business environment could attract greenfield FDI, with a stronger job creation potential, and industrial policies designed to upgrade local producers could favor linkages between foreign affiliates and domestic firms.

1. Introduction

The recent economic crisis has conducted, besides financial aspects, to a severe increase in unemployment in a large number of countries. Policy makers are therefore in search of viable solutions in order to increase labor demand and regain the path towards a long-term growth. The implications are all the more important for Central and Eastern European countries (CEEC), who have witnessed both job creation and job destruction during the fundamental changes that accompanied transition from planned to market economy.

The relatively rapid output growth experienced by CEEC during the nineties was accompanied by massive labor shedding. High foreign direct investment (FDI) inflows in the region were accompanied by a euphoric expectation that foreign investors would accelerate the restructuring process, by an infusion of both capital and new technology, and that they would also maintain employment (Hunya and Geishecker, 2005). However, the impressive speed of integration into the European Economic Community through international trade and FDI has not prevented job losses, generating growth without creating new jobs (Schadler et al. 2006; Boeri and Garibaldi, 2006). Foreign affiliates often replaced local suppliers by imported inputs and domestic firms downsized due to intensified competition from more productive foreign firms (Hunya and Geishecker, 2005). However, after the initial phase of restructuring, the vertical integration of foreign affiliates into the local economy was associated with job creation (Radosevic et al. 2003), within foreign firms at the beginning, but also within domestic firms in a later stage. However, the overall impact of FDI on employment is still difficult to disentangle, as effects of opposite directions are at work.

If there seems to be a general consensus regarding the benefits of FDI on host country's productivity and wage levels (Hanousek et al. 2011), empirical research has failed so far to provide consistent results about the overall effect of FDI on employment. Empirical studies

have found both positive (Radosevic et al. 2003; Bandick and Karpaty, 2011) and negative effects (Girma, 2005; Jenkins, 2006).

In our paper we investigate the impact of foreign direct investment on the aggregate employment in CEEC, using a dynamic panel framework. Our estimation is based on an extension of the theoretical model of Greenaway et al. (1999), where we substitute trade for FDI as a measure of international integration. According to this theoretical model, we anticipate a role of FDI not only in the accumulation of capital and labor, but also in the efficiency of their use, as FDI could potentially influence total factor productivity through technology transfer. As employment depends on productivity, we further expect FDI to influence employment in host countries.

Our paper contributes to the scarce literature on FDI and employment in general, and to the strand of literature investigating FDI in CEEC in particular. We first build a simple theoretical framework to reveal the influence of FDI on labor demand. Compared to the existing literature, we further adopt a different empirical approach, by estimating a labor demand equation in growth rates instead of levels, which are subject to non-stationarity concerns. We consider a sample of 20 CEEC, both members and non-members of the European Union (EU). As opposed to Onaran (2008), who focused on the manufacturing sector, which accounts for only half of FDI in CEEC, we extend the sample to the whole economy, therefore considering potential effects on employment in the service sector as well. Next, we provide an updated evidence for the FDI-employment relationship in CEEC, as we consider late transition and post-transition period (1995-2012). Research conducted so far was dealing almost exclusively with the transition context (Hunya and Geishecker, 2005; Radosevic et al. 2003; Bruno et al. 2006) and had focused on leading CEEC like Hungary, Poland or the Czech Republic. These studies usually adopted an industry level approach, while we adopt a macroeconomic approach. This allows to extend the country coverage, but

also to better capture total employment dynamics, as FDI may induce changes across sectors through vertical linkages. Finally, we consider some additional determinants of employment, like economic restructuring or human capital, which could be relevant for employment in CEEC.

Our main results indicate that FDI leads to a form of creative destruction on the labor markets in CEEC. A short-term job destruction effect is followed by long term job creation. However, this phenomenon seems limited to the EU countries. Furthermore, the importance of FDI as a determinant of employment appears to be limited compared to economic restructuring and output growth. Overall, the internationalization of production, as given by both trade and FDI, seems to lead to a decrease in the labor intensity of production in CEEC.

The paper is organized as follows: section 2 provides an overview of the literature on FDI and employment in CEEC, as well as a discussion on the main channels through which FDI could influence employment. Section 3 presents the theoretical framework of our analysis, while section 4 describes the empirical methodology and the data being used. Results are presented in section 5 and the main conclusions are highlighted in section 6.

2. Literature review

When investigating the effects of globalization on employment, most studies focus on international trade (see a review by Pflüger et al. 2013), while only surprisingly few papers address FDI induced changes in employment. Moreover, studies dealing with the labor market effects of FDI essentially focus on productivity and wages (Aitken and Harisson, 1999; Girma et al. 2002), while the employment issue has been only marginally addressed when studying spillover effects.

Several channels may be at work when analyzing the influence of FDI on employment. First, FDI can increase employment by directly creating new jobs in foreign affiliates. Greenfield investment is supposed to have the highest potential for employment creation, as it

creates new jobs that did not exist before. In the case of mergers and acquisitions, the immediate effects on employment seem negligible (Dunning, 2008). Direct job creation is naturally higher when foreign investors enter in labor intensive sectors (Jenkins, 2006). In the case of privatizations though, firm restructuring could arise on the short term, accompanied by job losses (Hunya and Geischeker, 2005).

Second, increased FDI inflows can have a negative impact on employment due to their higher efficiency in the use of labor. Multinationals are thought to possess certain intangible firm-specific assets, which are productivity enhancing. To the extent that these assets are transferred to their affiliates, the latter enjoy higher productivity, needing less labor per unit of output (Holland et al. 2000, Conyon et al. 2002; Girma et al., 2002). In this perspective, more productive foreign firms would create less employment than local firms.

Third, beyond the boundaries of the foreign affiliate, FDI can also influence the labor demand of domestic firms, through both competition effects and productivity spillovers. If FDI entry creates a competition pressure that crowds-out domestic firms, the labor intensity of the receiving industries might be negatively affected (Mencinger, 2003). To the extent that foreign affiliates source locally, demand addressed to upstream sectors could increase (Javorcik, 2004) and thus stimulate employment. Spillovers are all the more important when MNEs source locally, as they encourage local suppliers to produce higher quality inputs (Uzagalieva et al. 2012) and often provide them with technical assistance. Finally, local linkages created by foreign affiliates within the local economy can lead to productivity spillovers for domestic firms (Aitken and Harrison, 1999; Javorcik, 2004) and potential job creation. However, if spillovers in upstream sectors are generally positive, spillovers downstream sectors have often been shown to be negative (Hanousek et al. 2011).

As these channels may act in opposite directions, the net effect of FDI on employment depends on the relative importance of the net creation of activity, the productivity

improvements and the spillovers to domestic firms. Holland et al. (2000) pointed out that FDI inflows during the nineties have "improved the overall growth potential of the recipient economies, but primarily through productivity improvements within the foreign affiliates themselves, rather than through increased capital investment or technology spillovers to domestic firms." This might explain the mechanism of jobless growth highlighted by the Schadler et al. (2006) and Boeri and Garibaldi (2006) for CEEC.

Empirical studies on the employment effects of FDI in host countries bring forward mixed results. Most studies find a positive relationship between inward FDI and employment (Radosevic et al. 2003; Walkkirch et al, 2009; Bandick and Karpaty, 2010; Villa, 2010), while others find negative effects (Jenkins, 2006; Girma, 2005) or even a lack of a significant impact of FDI on employment (Onaran, 2008).

Radosevic et al. (2003) showed that foreign affiliates have more employment capability than their domestic counterparts, thus acting as buffers to reductions in overall employment during transition. Focusing on the manufacturing industry in 6 CEEC during 1993-1999, they find that during early transition, FDI has led to a reduction in employment, while the later stages of transition fostered a job creation effect. Additionally, they argue that domestic firms do not perform better in expanding employment in industries where foreign affiliates are not able to or not interested in doing so.

On the contrary, Onaran (2008) found mixed evidence on the contribution of FDI to employment, concluding to an overall insignificant impact. While considering manufacturing industries within 8 CEEC during the period 1997-2004, she concluded that FDI had a significant positive effect on employment only in Lithuania and in some medium and low skill sectors in Slovakia. Contrary to traditional wisdom, she does not find labor demand to be particularly sensitive to wage dynamics.

The idea of a two stage effect of FDI on employment, initially argued by Radosevic et al. (2003), has been confirmed by several studies. Hunya and Geishecker (2005) supported the hypothesis of job destruction in CEEC during the early stages of transition, arguing that multinationals only moved faster in the restructuring process and thus laid off workers at an earlier stage than domestic firms. As the transition process evolved, privatizations were replaced by greenfield investment, which created new production capacities and new jobs. The idea of creative destruction was reiterated by de Loecker and Konigs (2004) for Slovenia, arguing that privatization has eliminated unproductive jobs and replaced them at a later stage with more productive ones. Adversely, Villa (2010) reached the opposite conclusion for FDI in Moldova during 1999-2007, concluding to a short run job creation effect, which becomes insignificant in the long run.

Finally, FDI has been found in some cases to generate an overall negative effect on employment. Pfaffermayr (2001) for Austria and Jenkins (2006) for Vietnam showed that the introduction of labor-saving techniques has attenuated the job creation potential of FDI. Moreover, they also found evidence of minimal or even negative spillover effects on domestic firms' employment.

3. Theoretical framework

We address the issue of FDI induced changes in employment starting with a simple model of labor demand, extended to include FDI. If the Hecksher-Ohlin framework gives some straightforward predictions regarding the effect of international trade on employment, theoretical implications induced by FDI are somewhat still ambiguous. As stated in the previous section, FDI is known to improve the efficiency of labor use, both within the industry (Girma et al. 2002) and across industries (Javorcik, 2004). In order to take this aspect into account, we follow the theoretical literature on employment effects of

international trade (Milner and Wright, 1998; Greenaway et al. 1999; Stehrer, 2004) and proceed with the construction of a labor demand function, where total factor productivity is a function of FDI.

We assume a profit maximizing firm, representative for the country *i* at time *t*, that has a technological constraint given by a Cobb-Douglas production function:

$$Y_{it} = A^{\gamma} K_{it}^{\alpha} L_{it}^{\beta} \quad (1)$$

Where *Y* represents the real output, *K* the capital stock, *L* the number of employees, *A* technical progress. α and β represent the elasticity of output with respect to capital and labor. The coefficient γ allows factors to change the efficiency *A* of the production process (Greenaway et al., 1999).

The profit maximizing firms will use inputs so that their marginal revenue equals their price. Therefore, the labor marginal revenue equals the wage (*w*) and the capital marginal revenue equals the cost of capital (*c*). Since the estimation of the capital stock at aggregate level is problematic and the interest rate is a poor proxy for the cost of capital, we proceed by eliminating capital stock from equation (1):

$$Y_{it} = A^{\gamma} (\frac{\alpha}{\beta} N_{it} \frac{w_{it}}{c_{it}})^{\alpha} L_{it}^{\beta} \quad (2)$$

N represents the employment level. Taking logarithms on both sides and rearranging the terms, we obtain the labor demand of country *i* at time *t*:

$$\ln L_{it} = \phi_0 + \phi_1 \ln Y_{it} + \phi_2 \ln \frac{w_i}{c_i} \quad (3)$$

Where we noted $\phi_0 = -(\gamma \ln A + \alpha \ln \alpha - \alpha \ln \beta)/(\alpha + \beta)$; $\phi_1 = 1/(\alpha + \beta)$; $\phi_2 = -\alpha/(\alpha + \beta)$.

Concerning the role of FDI, it is well documented that FDI can influence the technical efficiency parameter *A* (Borensztein et. al, 1998). Therefore, we can assume that the technical efficiency of production increases over time and its evolution can be influenced by

technology transfer through FDI. Greenaway et al. (1999) argued in favor of trade induced technological change and modeled the technical efficiency factor in accordance. Similar to Greenaway et al. (1999) and focusing on FDI induced technological change, we model technical efficiency as a function of FDI:

$$A_{it} = e^{\delta_o T_i} FDI_{it}^{\delta_1} \tag{4}$$

FDI is the stock of FDI in country *i* at time *t*, *T* is the time trend and $\delta_0, \delta_1 > 0$. Taking logarithm of A_{it} and replacing it in equation (3), we obtain the following:

$$\ln L_{it} = \lambda + \phi_1 \ln Y_{it} + \phi_2 \ln \frac{w_i}{c_i} + \phi_3 \ln FDI_{it} + \phi_4 T \tag{5}$$

where $\lambda = -(\alpha \ln \alpha - \alpha \ln \beta)/(\alpha + \beta)$; $\phi_3 = \mu\delta_1$; $\phi_4 = \mu\delta_0$; $\mu = -\gamma/(\alpha + \beta)$.

As in Milner and Wright (1998) and Onaran (2008), we assume the cost of capital to vary only over time, avoiding the problem of reliable data on capital cost. This theoretical simplification will be addressed in the empirical estimation by including time dummies, therefore capturing the variation over time.

Bresson et al. (1996) and Hamermesh (1993) develop partial adjustment models of labor demand, based on the assumption of rational expectations. They argue that, due to adjustment costs, labor is not a fully flexible production factor. Therefore, as adjustment to equilibrium takes place, the level of employment may deviate from its steady state. In order to take this into account, lagged employment is introduced as an additional determinant of current employment. The lagged structure is also justified by different adjustment costs when using aggregated measures of employment across different skill categories (Nickell, 1986) or in the case of serially correlated technology shocks (Greenaway et al. 1999). We proceed by transforming equation (5) into a dynamic labor demand model:

$$\ln L_{it} = \lambda + \phi_0^* \ln L_{i,t-1} + \phi_1 \ln Y_{it} + \phi_2 \ln \frac{w_i}{c_i} + \phi_3 \ln FDI_{it} + \phi_4 T \tag{6}$$

Equation (6) has the form of a dynamic adjustment process, similar to an error correction model, allowing us to highlight both short and long term dynamics. In order to follow a convergence process towards equilibrium, we expect the coefficient of lagged employment, ϕ_0^*, to be smaller than one. Values of ϕ_0^* above one imply an unstable dynamics, with accelerating divergence away from equilibrium (Blundell and Bond, 1998). Including lags of employment implicitly assumes that a change in an explanatory variable generates a common evolution of employment. This is not always a realistic assumption; therefore we relax this assumption by adding a distributed lag structure for the independent variables, as in Walkkirch et al. (2009).

Since labor demand follows a lagged pro-cyclical behavior (Smith, 2003), we expect employment to be positively correlated with output and negatively correlated with wages. As discussed earlier, the potential contribution of FDI to employment runs in both directions. Therefore, clarification of the role of FDI as a determinant of labor demand is ultimately an empirical question we will address in the next section.

4. Methodology and data

4.1 Empirical methodology

In order to analyze the determinants of employment in CEEC, we will use panel data techniques. Existing empirical work on the effects of FDI on labor demand (Onaran, 2008) use an equation derived directly from a similar theoretical model as the one presented in equation (6). However, the series in levels are far from being stationary (gross domestic product, wages, employment) and thus invalidate classical econometric assumptions. Though in short panels the question of unit root is less problematic, the longer time dimension in our panel (18 years) leads us to prefer a growth rate specification, as following:

$$\Delta L_{it} = \phi_0 \Delta L_{i,t-1} + \phi_{11} \Delta Y_{it} + \phi_{12} \Delta Y_{i,t-1} + \phi_{21} \Delta W_{it} + \phi_{22} \Delta W_{i,t-1} + \phi_{31} \Delta FDI_{it} + \phi_{32} \Delta FDI_{i,t-1} + \upsilon_i + e_{it} \quad (7)$$

where ΔL_{it} –employment growth in country i at time t; ΔY_{it} – real GDP per capita growth; ΔW_{it} – real average wage growth; ΔFDI_{it} – the change in the inward FDI stock[4] ; λ_t –time fixed effects; υ_i –individual fixed effects, e_{it} –error term. We deflate all monetary variables to 2005 prices. In order to make the coefficient for FDI comparable with the coefficients for output and wages, we consider the growth rate of the real stock of FDI, computed as the nominal stock of FDI deflated by the price index of gross capital formation[5]. Finally, country dummies intend to capture time invariant specific factors, like labor regulation or taxation.

In order to refine our analysis, we introduce some additional determinants in an augmented version of the labor demand equation. As stated by several studies (Hunya and Geishecker, 2005; Onaran, 2008; Boeri and Garibaldi, 2006), the process of job creation and job destruction in CEEC has been considerably dependent on the economic restructuring and the institutional change that accompanied transition. Therefore, we consider a variable of progress in transition, proxied by the *Governance and enterprise restructuring index* from the European Bank for Reconstruction and Development (EBRD), to capture the structural changes that affected CEEC during this period. Additionally, we include the growth rates of exports and imports as determinants of employment, as trade openness may induce changes in the labor intensity of domestic production (Greenaway et al. 1999). Given the comparative advantage of CEEC in labor-intensive industries, higher imports may lead to a reduction in employment, while increased exports should lead to job creation. Finally, we seek to find if

[4] We consider FDI stock instead of FDI flow as the stock metric captures accumulated activity of both new and already established foreign affiliates within the host country. As discussed in the literature review section, the effect of FDI on employment could differ between the short and the long run. The use of the FDI stock seems better suited to capture this type of two stage effect. Moreover, some spillover channels that might act on local firms' employment need a longer time to materialize and an accumulated foreign activity (vertical linkages, the mobility of workers trained in multinationals). Finally, FDI flows are more volatile and could also suffer from endogeneity problems, as new inflows are often attracted by local growth perspectives.

[5] An alternative would have been to deflate the nominal FDI stock by the GDP deflator. However, since we are interested in the potential of FDI to create employment, which is closely related to the creation of new production capabilities, we consider the gross capital formation deflator to be more appropriate.

the effect of FDI on employment depends on some host country characteristics, such as imports, exports, human capital, the size of the technology gap or the EU membership status. For example, in a context of rising imports, foreign affiliates may crowd-out local suppliers by replacing them with imported inputs, therefore leading to job losses. More, a large technological gap[6] could harm the ability of local firms to face increased competition from more advanced foreign affiliates.

Considering the time period in our empirical analysis (1995-2012), we also include a dummy variable to capture employment shocks due to the turmoil of the recent economic crisis. The dummy takes the value 1 for years 2009, 2010, 2011 and 2012 and zero otherwise.

The econometric estimations for CEEC are subject to several difficulties. The fundamental shift in the organization of the economy and the different timing of joining the EU had potentially caused breaks in the data series, which render traditional time series or cross-sectional analysis challenging. The empirical literature generally addresses these issues by working with panel data, with special attention to endogeneity or omitted variable bias. In our empirical analysis, we test the hypothesis of a structural break linked to the accession of some of these countries to the European Union (in 2004 and 2007) by including a dummy variable that takes the value 1 for each year a country has been a member of the EU and zero otherwise.

Since we are also interested in the long run impact of FDI on employment, we further introduce a lagged dependent variable in order to compute long-run elasticities.[7]. We thus estimate a dynamic version of equation (7). The presence of the lagged dependent variable gives rise to a dynamic panel bias[8]. Although the fixed effects are eliminated by first

[6] We proxy the technology gap as the gap between US GDP per capita and host country GDP per capita (in PPP terms) relative to host country GDP per capita.

[7] Technically, in order to compute the long term elasticity, the speed of adjustment to the steady state of employment is needed.

[8] The coefficient estimate for lagged employment is inflated by attributing a predictive power that actually belongs to the country's fixed effect. In our panel T max = 18. If T were significantly larger, the impact of one

differencing, lagged employment is still correlated with the disturbances and therefore violates OLS assumptions. A reliable solution for the efficient estimation of dynamic panels was set by Arellano and Bond (1991) by the use of the Generalized Method of Moments (GMM). We prefer the System GMM estimator to the Difference GMM estimator as it has proved to have better properties in finite samples (Blundell and Bond, 1998). We limit the number of instruments to the second and third lag of employment, as the consistency of the Sargan test of over-identification is weakened by too many instruments (Roodman, 2009).

Additionally, causality may run in both directions as labor demand may influence wages, therefore creating an endogeneity bias when estimating equation (7). We thus consider wages to be endogenous and depict the independent effect on labor demand by instrumenting wages with the first two available lags.

4.2 Data description

Our sample consists of an unbalanced panel, covering 20 countries over a period of maximum 18 years (1995-2012). We have made the choice of avoiding the early years of transition (1990-1994), as the economic turmoil that accompanied the fall of the socialist regime led to some erratic behavior in macroeconomic variables (Schadler et al. 2006). The data we use comes from United Nations Economic Commission for Europe (UNECE), United Nations Conference on Trade and Development (UNCTAD), the World Bank (WDI) and the European Bank for Reconstruction and Development (EBRD). Variables' description and the descriptive statistics of the sample are presented in Tables A1 and A2 in appendix.

year's shock on the country fixed effect would dilute and the endogeneity problem would become less important.

The sample includes 11 countries members of the European Union (Bulgaria, Croatia[9], Czech Republic, Estonia, Hungary, Latvia, Lithuania, Poland, Romania, Slovakia and Slovenia) and 9 non-members (Albania, Belarus, Bosnia and Herzegovina, Macedonia, Moldova, Russia, Serbia, Turkey and Ukraine). Most of the existing studies on CEEC use industry level data, in national or cross-country panels, and focus on leading CEEC like Hungary, Poland or the Czech Republic, where the OECD membership ensures comfortable data availability. By extending the sample to the Baltic countries, Romania and Bulgaria, we face the lack of disaggregated data on wages and FDI, which becomes all the more stringent as we include non-EU countries. We therefore use macroeconomic level data, as Boeri and Garibaldi (2006). The lack of homogenous wage data for white collar and blue collar workers impeded us to estimate labor demand equations by skill category.

Schadler et al. (2006) stated that the CEECs' growth experience during the nineties was unusual with respect to emerging markets standards, as output growth was accompanied by massive labor shedding. Employment dropped significantly at the beginning of the nineties and only modestly recovered afterwards (see fig. 1). As output initially fell faster than employment, early transition was accompanied by a decline in labor productivity. Restructuring eventually led to a rebound in output after 1995, while employment stagnated, leading to the so called phenomenon of "jobless growth". Employment finally started to recover during the 2000s, until the economic crisis brought in a second sharp correction in both employment and output levels.

[9] Even though Croatia has become a member of the EU only on the 1th of July 2013, we include it in our EU sample, as its development level and main macroeconomic indicators are quite similar to those of EU countries.

Figure 1. GDP and employment growth

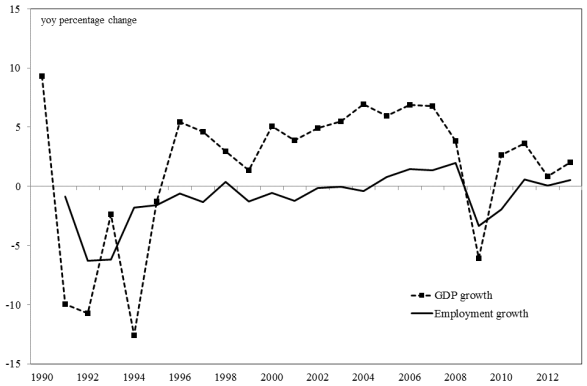
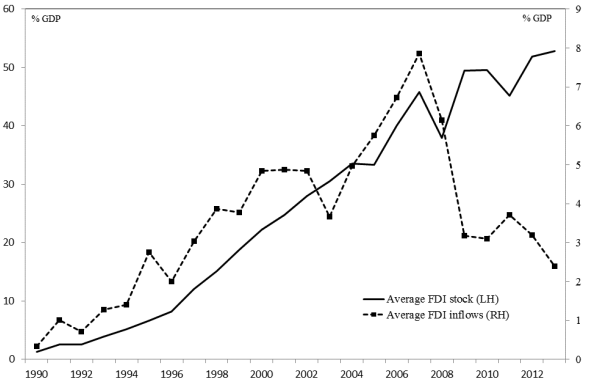


Figure 2. FDI stocks and flows



Note: Values refer to simple averages at the level of our entire sample of 20 CEEC.

The role of FDI in the restructuring of these economies is fully acknowledged, as foreign investors actively participated to the privatization process. However, privatizations were often followed by re-organization and a partial dismissal of personnel from oversized state owned enterprises. The majority of FDI during transition was hosted in labor-intensive and export oriented manufacturing industries, essentially motivated by efficiency seeking purposes. Once the privatization process over, a shift of FDI towards greenfield investment took place, as well as an orientation towards market seeking purposes, often in the service sector (Hunya and Geishecker, 2005). FDI inflows thus progressively increased from a yearly average of 1% of GDP during the early 1990s to around 7% before the crisis (fig. 2). Therefore, the average stock of FDI in CEEC exceeds 50% of GDP in 2013, while reaching more than 85% of GDP in Bulgaria, Hungary or Estonia.

5. Results and discussion

The econometric analysis in this paper is conducted within the framework of a simple profit-maximizing model of firm behavior, as presented in equation (7). In our preliminary estimations, we considered as main determinants of labor demand: the output growth, the increase in wages and the increase in the FDI stock, both in a contemporaneous and lagged

form. These preliminary results are reported in Table 1. Concerned by endogeneity issues, we use both the fixed effects estimator (columns 1-3) and the GMM estimator (columns 4-6). In our GMM estimations, we considered wages to be endogenous and we used the first and second lag to instrument them. This resulted in a number of 6 instruments, whose validity is confirmed by the Sargan test of over identification.

Table 1. Preliminary estimations of labor demand for CEEC (1995-2012)

Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)
Employment	Fixed effects estimations			GMM estimations		
Wage	-0.033			0.023		
	(0.029)			(0.040)		
Output	0.306***	0.289***		0.238***	0.248***	
	(0.043)	(0.037)		(0.048)	(0.038)	
FDI	-0.006	-0.006		-0.013**	-0.015**	
	(0.006)	(0.006)		(0.006)	(0.006)	
Wage (-1)		-0.022	-0.099***		-0.001	-0.017
		(0.023)	(0.029)		(0.029)	(0.041)
Output (-1)			0.292***			0.191***
			(0.043)			(0.049)
FDI (-1)			0.020***			0.020***
			(0.006)			(0.006)
Constant	-0.969***	-0.909***	-1.078***	-0.854***	-0.708***	-1.104***
	(0.258)	(0.259)	(0.266)	(0.261)	(0.263)	(0.277)
Observations	284	284	272	284	284	272
R-squared	0.184	0.197	0.181			
Countries	20	20	20	20	20	20
Instruments	.	.	.	6	6	6
Sargan p-value	.	.	.	0.583	0.425	0.177
AR2 p-value	.	.	.	0.651	0.844	0.861

Note: Standard errors are reported in brackets *** p<0.01, ** p<0.05, * p<0.1. Estimation is run using System GMM Blundell and Bond (1998). The Sargan test has the null hypothesis of exogeneity of the instrument set, while the AR2 test has the null of no second order serial correlation in the residuals.

As a general conclusion of our reduced form estimation, output growth appears as the main determinant of employment dynamics in CEEC, whereas wages do not seem to matter for employment. As opposed to some other studies focusing on the transition period (Boeri and Garibaldi, 2006), these preliminary results do not provide evidence of jobless growth. Additionally, the insignificant effect of wages on employment, even though against

traditional wisdom, is a result often obtained in transition countries. Onaran (2008) had also found mixed evidence on the effect of wages on labor demand, both across countries and across sectors. Preliminary results on the contribution of FDI to employment appear mixed. FDI has no contribution to employment creation in our fixed effects estimations, whereas the effect becomes negative in GMM estimations. Moreover, current increases in the FDI stock lead to job losses, while lagged values of FDI stimulate job creation.

Based on these preliminary results, we further proceed with the estimation of our augmented labor demand function. Results for this second set of GMM estimations are presented in Table 2. We first include the variable of progress in transition and a crisis dummy, and then progressively include export and import growth, human capital, the technological gap and a dummy accounting for EU membership. The Sargan test and the Arellano Bond auto-correlation test confirm that the models are correctly specified.

The results of our augmented labor demand function interestingly show that the main determinant of employment creation in CEEC during 1995-2012 was economic restructuring, as given by progress in transition. This gives credit to the idea that traditional labor determinants, as wages or output, were secondary for labor dynamics in CEEC, without however confirming the phenomenon of jobless growth. Nevertheless, the job content of economic growth seems relatively low, the coefficient for output growth ranging between 0.19 – 0.23. This means that a 1% increase in output should lead to around 0.2% increase in employment. The low elasticity could be explained by the productivity enhancing effects during late transition and post-transition periods. The coefficients for output are comparable with those obtained by Onaran (2008) based on industry level data (0.10 - 0.35), and considerably higher than the insignificant elasticities found by Boeri and Garibaldi (2006). Failing to control for economic restructuring could explain the absence of positive output elasticities in their estimations.

As previously seen, developments in wages have not affected employment, as their coefficient is insignificant in all regressions in Table 2. Onaran (2008) also showed that wages negatively affected employment only in Slovakia, Romania and Lithuania, the effect being insignificant in all other countries. During the nineties, both employment and real wages have decreased, while the 2000s have witnessed a surge in real wages, even though employment was recovering. Furthermore, the crisis period has seriously affected employment prospects in CEEC, as the corresponding dummy variable is negative and strongly significant in all regressions. Indeed, if we recall fig. 1, average employment fell from an average of +2% per year in 2008 to -3.4% in 2009.

Finally, the increase in the stock of FDI leads to a short run job destruction phenomenon, even though the coefficient is significant only at a 10% level (columns 1-2). An increase of 1% in the stock of FDI leads to a loss of employment of around 0.013%. The main explanation for this negative effect lies in the capital intensive technologies and the labor savings techniques transferred by foreign affiliates, while exerting a crowding-out pressure on domestic firms. Positive spillovers for some domestic firms in specific industries are not excluded, however firm or industry level evidence seems insufficient to generate an economy wide expansion in employment. Our results are somewhat different from the findings of Onaran (2008), who found that FDI had a broadly insignificant effect on employment in CEEC. A part from the smaller sample they use and the limited time horizon (five countries during 1999-2003), we argue that the lack of control for progress in transition or some other form of institutional change could explain the absence of significant results in their estimations.

Table 2. Labor demand estimations for CEEC (1995-2012) - System GMM

Dependent variable Employment	(1)	(2)	(3)	(4)	(5)	(6)
Wage	0.024	0.015	0.045	0.015	0.030	0.020
	(0.042)	(0.042)	(0.044)	(0.039)	(0.042)	(0.041)
Output	0.206***	0.234***	0.208***	0.189***	0.197***	0.210***
	(0.053)	(0.066)	(0.066)	(0.052)	(0.054)	(0.053)
FDI	-0.013*	-0.013*	-0.011	-0.064***	-0.016	-0.014*
	(0.007)	(0.007)	(0.008)	(0.019)	(0.010)	(0.008)
Transition	0.921***	0.826***	1.048***	0.842***	0.561	1.125***
	(0.312)	(0.315)	(0.320)	(0.317)	(0.361)	(0.410)
Crisis dummy	-1.294***	-1.398***	-1.522***	-1.963***	-1.330***	-1.230**
	(0.489)	(0.510)	(0.507)	(0.516)	(0.496)	(0.502)
Export growth		-0.037*	-0.070***			
		(0.022)	(0.026)			
Import growth		0.011	-0.057**			
		(0.024)	(0.028)			
FDI × Export			0.002**			
			(0.001)			
FDI × Import			-0.002***			
			(0.001)			
Human capital				-0.001		
				(0.013)		
FDI × Human capital				0.001***		
				(0.000)		
Gap					-0.042*	
					(0.021)	
FDI × Gap					0.000	
					(0.001)	
EU membership dummy						-0.585
						(0.646)
FDI × membership						0.005
						(0.024)
Constant	-2.823***	-2.457**	-3.184***	-2.308**	-1.403	-3.190***
	(0.984)	(0.994)	(1.019)	(0.975)	(1.216)	(1.130)
Observations	266	256	256	259	266	266
Countries	20	20	20	20	20	20
Instruments	8	10	12	10	10	10
Sargan p-value	0.118	0.388	0.221	0.326	0.110	0.129
AR2 p-value	0.988	0.957	0.878	0.937	0.975	0.993

Note: Standard errors are reported in brackets *** p<0.01, ** p<0.05, * p<0.1. Estimation is run using System GMM Blundell and Bond (1998). The Sargan test has the null hypothesis of exogeneity of the instrument set, while the AR2 test has the null of no second order serial correlation in the residuals.

While the job loss effect of FDI is moderate, we are wondering whether it depends on local conditions. We thus run regressions with interaction terms between FDI and some potential conditioning factors, such as import and export growth, human capital, the size of the technological gap and the EU membership. The results of these estimations are presented in columns 3-6 of Table 2.

Concerning international trade, both interactions are significant, the one with exports being positive, while the one with imports is negative. The export oriented nature of foreign affiliates in CEEC and the foreign penetration in labor intensive industries are responsible for the positive interaction with exports. Initial FDI inflows were in search of efficiency gains though the fragmentation of production in various locations. To the extent that foreign investors replaced traditional domestic suppliers with imported inputs (Hunya and Geishecker, 2005), jobs were lost in upstream sectors due to import competition. While Mencinger (2003) argued that multinationals during the nineties contributed more to imports than exports, our results show that the two effects compensate each other. Overall, foreign affiliates' engagement in international trade did not lead to significant changes in aggregate employment, even though job reallocation between sectors is not excluded.

Additionally, both import growth and export growth seem to have an independent negative effect on employment (columns 2-3). Onaran (2008) also failed to find a positive contribution of exports to job creation in CEEC. While the result might seem puzzling, especially concerning exports, it may point out a tendency of increased capital intensity of production due integration into world trade and internationalization of the production chain. Frensch et al. (2013) had actually provided evidence of the existence of international production networks in Europe, driven by trade-offs between labor and coordination costs, leading to extensive trade in parts and components of capital goods and increased employment volatility in the new EU member states.

Table 3. Dynamic labor demand estimations for CEEC (1995-2012) – System GMM

Dependent variable Employment	(1) Total sample	(2) Total sample	(3) Total sample	(4) EU sample	(5) Non EU sample
Employment (-1)	0.141**	0.117	0.135*	0.108*	0.074
	(0.068)	(0.093)	(0.079)	(0.064)	(0.130)
Wage	0.021		-0.035	0.045	-0.029
	(0.040)		(0.037)	(0.061)	(0.052)
Output	0.251***		0.301***	0.276***	0.213**
	(0.051)		(0.046)	(0.052)	(0.091)
FDI	0.001		0.005	0.011	0.003
	(0.007)		(0.006)	(0.008)	(0.010)
Output (-1)		0.171***	0.233***	0.373***	0.108
		(0.062)	(0.053)	(0.059)	(0.094)
Wage (-1)		-0.044	-0.044	-0.057	-0.031
		(0.042)	(0.033)	(0.049)	(0.046)
FDI (-1)		0.023***	0.017***	0.018**	0.016
		(0.008)	(0.007)	(0.009)	(0.010)
Transition	0.972***	0.880***	1.013***	1.474***	2.090**
	(0.311)	(0.319)	(0.320)	(0.460)	(0.877)
Crisis	-1.194**	-1.754***	-0.093	0.345	-0.799
	(0.475)	(0.541)	(0.497)	(0.652)	(0.867)
Constant	-3.263***	-2.622**	-4.686***	-7.237***	-5.440**
	(0.986)	(1.059)	(1.133)	(1.610)	(2.282)
Observations	260	251	248	149	99
Countries	20	20	20	11	9
Instruments	11	11	15	15	15
Sargan p-value	0.113	0.241	0.371	0.437	0.208
AR2 p-value	0.670	0.880	0.710	0.402	0.930
Long run elasticities					
Adjustment term	-0.859***	-0.883***	-0.865***	-0.892***	-0.926***
	(0.068)	(0.093)	(0.079)	(0.086)	(0.130)
Wage	0.024	-0.050	-0.091	-0.013	-0.064
	(0.043)	(0.047)	(0.055)	(0.078)	(0.081)
GDP growth	0.292***	0.194***	0.617***	0.728***	0.348**
	(0.061)	(0.062)	(0.068)	(0.069)	(0.140)
FDI	0.001	0.026***	0.025**	0.033**	0.021
	(0.008)	(0.009)	(0.009)	(0.011)	(0.015)

Note: Standard errors are reported in brackets *** p<0.01, ** p<0.05, * p<0.1. The adjustment term is computed as (1-φ) where φ is the coefficient of the lagged dependent variable. The long-run coefficients were calculated by dividing the sum of coefficients of the current and lagged variable, by one minus the coefficient of the lagged dependent variable. Estimation is run using System GMM Blundell and Bond (1998). The Sargan test has the null hypothesis of exogeneity of the instrument set, while the AR2 test has the null of no second order serial correlation in the residuals.

While the independent effect of FDI on employment is negative, higher human capital levels partially compensate this negative effect (column 4). Human capital acts as a feature of local absorptive capacity, thus enabling domestic firms to better face competition from foreign affiliates. Additionally, it can facilitate productivity spillovers at firm level (Hanousek at al. 2011), thus improving the economic performance of domestic firms and avoiding layoffs or even stimulating new employment. Moreover, foreign affiliates are more likely to source local inputs if domestic firms enjoy better educated workers that produce higher quality inputs. Finally, labor saving techniques brought by FDI do not generally apply to high skilled jobs, thus the job destruction effect appears limited. This result seems to favor the idea of increased skill bias of production due to FDI inflows, as highlighted by Feenstra and Hanson (1997) for Mexico. Onaran (2008) found that the effect of FDI on employment was negative in high skill sectors in Slovakia and Slovenia. However, their result was not valid for other CEEC. Adversely, Hunya and Geishecker (2005) and Villa (2010) have shown FDI in CEEC to create relatively more jobs for skilled workers than for the unskilled.

Additional interaction terms with the technological gap and the EU membership are not significant. While employment creation is overall more dynamic in technologically advanced countries, the size of the gap has no effect on the FDI-employment relationship. Moreover, we tested the hypothesis of a structural break in the labor demand function by including a dummy variable to account for EU membership. We found no evidence of such a break.

Robustness checks are performed by splitting the sample in EU and non-EU countries. Results presented in Tables A3 and A4 in appendix. The conclusions concerning the main employment determinants are the same for EU and non-EU countries. However, FDI leads to a short run job destruction effect only in EU countries, while the effect is insignificant in the non-EU sample. Moreover, the interaction of FDI with imports and exports is only significant

in EU countries, indicating a stronger integration through trade and FDI into the world economy. This higher degree of economic integration comes with the cost of job losses on the short run. Adversely, job losses were partly compensated once in the European Union, as EU membership has benefited these countries in terms of FDI led employment.

In the third step of our empirical analysis, we proceed by estimating a dynamic version of equation (7). We thus introduce lagged employment and instrument both lagged employment and wages with their first two lags. As in empirical research on labor demand, we simultaneously consider both current and lagged variables (Onaran, 2008; Bresson et al. 1996). The practical advantage of introducing the lagged dependent variable is the computation of long run elasticities for the main determinants of employment. These results are presented in Table 3, with columns 4 and 5 restricted to EU and non-EU samples.

Considering the first two columns of Table 3, the results are consistent with those presented in Table 1. Employment growth seems to present some form of path dependency, even though the coefficient on lagged employment is generally significant only at a 10% level. Coefficients in columns 3 - 5 should not be interpreted directly, but rather used to compute the long term elasticities, which are presented in the lower part of Table 3.

Among our variables of interest, only output growth and FDI present significant long run elasticities. The long run elasticity of employment to output growth is much higher than the short term one, reaching 0.62 for the whole sample (column 3). When looking at the two sub-samples, the output elasticity is even higher in the case of EU countries (column 4), reaching 0.73. These estimations are in line with previous results by Onaran (2008), who found for some EU countries a long run elasticity of employment to output around 0.7 -0.75.

The long run elasticity of employment to FDI is positive and significant (column 3). A 1% increase in the stock of FDI will accelerate employment creation by 0.025% in the long run. If we consider the average annual increase in the stock of FDI to be around 18%, this

would eventually lead to an annual increase of 0.5% in employment. To the extent that the short term negative effect on employment is followed by a long run positive effect, FDI leads to a form of creative destruction. This result confirms the argument of Hunya and Geishecker (2005), stating that cost reduction efforts finally led foreign subsidiaries to search for cheaper local inputs and encouraged foreign suppliers to produce in the host country, increasing the local content of production. Onaran (2008) does not provide long term elasticities of employment with respect to FDI.

The effect of FDI on employment is expected to strongly depend on the entry mode of foreign investors[10]. Mergers and acquisitions, which accounted for half of FDI inflows in CEEC during the nineties, were followed by restructuring and job losses, therefore explaining the negative short run impact of FDI. Moreover, greenfield investment, while leading to direct job creation within the foreign affiliates, induced a strong competition effect that reinforced job losses in domestic firms. Adversely, the positive long run impact of FDI on employment is explained by synergies created within the local market, as well as more competitive domestic firms surviving the initial competition phase. On the long run, mergers and acquisitions are expected to follow a long term stabilization path, while greenfield FDI is expected to continue to generate employment, by extending its activities and by nourishing linkages with domestic companies.

Finally, the effect of FDI on employment is limited to EU countries, as both the short and the long run elasticity of employment to FDI are insignificant in non-EU countries. Villa (2010) also found a temporary short run effect of FDI on employment in Moldova, which becomes insignificant in the long run.

[10] The short time span available for series on mergers & acquisitions and greenfield FDI (UNCTAD), as well as the difficulty of constructing associated stock variables, impeded us to run a separate empirical analysis on the two types of FDI.

6. Conclusions

Due to the social consequences of unemployment, policies designed to foster job creation have always been a priority in governments' agenda. Moreover, the need to correct the employment disequilibria caused by the recent economic crisis has led policy makers to actively search for solutions to reduce unemployment and enhance economic growth.

In this paper, we investigate the impact of FDI on aggregate employment in Central and Eastern Europe, while trying to assess whether FDI could become a useful lever to recover from the severe unemployment crisis. Our investigation is based on a simple theoretical model of labor demand, where FDI improves the efficiency of labor use. For our empirical analysis, we used panel data techniques applied on sample of 20 CEEC during 1995-2012.

Our results show that the main determinant of employment dynamics in CEEC was the economic restructuring and the institutional change that accompanied progress in transition. Traditional labor determinants, like output and wages, proved to be less important. While we do not confirm the hypothesis of jobless growth highlighted by some previous studies, we show that the job content of output growth is relatively low. Moreover, we confirm the fact that employment in CEEC does not respond to development in wages.

Our paper provides evidence of FDI leading to a form of creative destruction on the labor markets in CEEC. The competition pressure and the introduction of labor saving techniques lead to a negative short run effect on employment. The effect becomes however positive in the long run, as foreign affiliates progressively create linkages with domestic firms and increase the local content of their production. Nevertheless, the magnitude of both these effects is modest compared to the influence of economic restructuring and output growth.

The progressive integration of these countries into the world economy, through trade and FDI, seems to lead to a decrease in the labor intensity of production. However, foreign affiliates' strong engagement in international trade did not lead to additional changes in

aggregate employment, as job losses due to import competition were compensated by job creation in export oriented FDI. Finally, our results show evidence of a skill bias of production in foreign affiliates, as human capital favors a positive contribution of FDI to employment, partially compensating job losses for low skilled workers.

Robustness checks have shown that the two stage effect of FDI on employment only holds for EU countries, while FDI has no significant contribution to labor demand in non-EU countries. Additionally, the relatively low contribution to employment growth indicates that FDI alone would not be an effective tool to regain employment. However, policies encouraging market seeking FDI and a minimum local content of production could be useful to preserve employment levels. An improved business environment could further attract greenfield FDI, with a stronger job creation potential, and industrial policies designed to upgrade local producers could favor linkages between foreign affiliates and domestic firms.

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Appendix

Table A1. Variables' description and data sources

Variable	Description	Data source
Employment	Employment growth, annual percentage change	UNECE
Output	Real GDP annual growth rate	WDI
Wage	Real Gross Average Monthly Wage growth, deflated with HICP	UNECE
FDI	The annual growth of the FDI stock, deflated with the price index for Gross fixed capital formation	UNCTAD
Export	Real export growth, computed as the annual growth rate of exports in constant US $	WDI
Import	Real import growth, computed as the annual growth rate of imports in constant US $	WDI
Transition	Progress in economic transition, as measured by the Governance and enterprise restructuring index	EBRD
Crisis	Dummy variable taking the value 1 for years 2009, 2010, 2011 and 2012 and zero otherwise	
Human capital	Tertiary school enrollment, as a percentage of gross school enrollment	WDI
EU membership	Dummy variable taking the value 1 for every year a country has been member of the European Union and zero otherwise.	
Gap	The gap between the US GDP per capita and host country GDP per capita divided by host country GDP per capita (in logarithm)	WDI

Table A2. Sample descriptive statistics

Variable	Total sample		EU sample		Non-EU sample	
	Mean	Std. Dev.	Mean	Std. Dev.	Mean	Std. Dev.
Employment	-0.3	3.3	-0.3	3.4	-0.3	3.2
Output	3.9	6.8	3.5	4.5	4.5	8.9
Wage	4.8	8.1	3.3	6.1	6.7	9.8
FDI	18.3	26.5	17.1	23.2	19.8	30.5
Transition	2.5	0.7	3.0	0.5	2.0	0.5
Export	8.7	13.9	8.2	9.6	9.2	17.7
Import	9.0	14.5	8.8	11.9	9.3	17.1
Human capital	47.9	19.2	51	18.4	43.5	19.5
Gap	11.1	12.2	4.9	3.1	18.6	14.7

Table A3. Estimation of labor demand for EU sample

Dependent variable Employment	(1)	(2)	(3)	(4)	(5)	(6)
Wage	0.007	0.028	0.062	-0.022	0.059	-0.011
	(0.080)	(0.088)	(0.081)	(0.077)	(0.086)	(0.080)
Output	0.247***	0.279***	0.321***	0.220***	0.247***	0.260***
	(0.077)	(0.098)	(0.090)	(0.076)	(0.076)	(0.077)
FDI	-0.023**	-0.020*	-0.033**	-0.069**	-0.054***	-0.031**
	(0.011)	(0.011)	(0.015)	(0.027)	(0.020)	(0.013)
Transition	1.372**	1.245**	1.326**	1.457**	1.186	1.446**
	(0.567)	(0.575)	(0.529)	(0.598)	(0.796)	(0.647)
Crisis dummy	-1.898***	-2.504***	-2.157***	-2.409***	-1.548**	-1.916**
	(0.708)	(0.775)	(0.719)	(0.746)	(0.725)	(0.761)
Export		0.058	-0.167**			
		(0.054)	(0.065)			
Import		-0.073	0.056			
		(0.050)	(0.054)			
FDI × Export			0.007***			
			(0.001)			
FDI × Import			-0.004***			
			(0.001)			
Human capital				-0.029		
				(0.019)		
FDI × Human capital				0.001*		
				(0.001)		
Gap					-0.610	
					(0.778)	
FDI × Gap					0.026	
					(0.025)	
EU membership dummy						-0.224
						(0.142)
FDI × membership						0.007*
						(0.003)
Constant	-4.159**	-3.848**	-3.722**	-2.556	-2.895	-4.024**
	(1.809)	(1.852)	(1.728)	(1.932)	(2.871)	(1.952)
Observations	159	149	149	156	159	159
Countries	11	11	11	11	11	11
Instruments	8	10	12	10	10	10
Sargan p-val	0.113	0.0526	0.372	0.260	0.126	0.134
AR2 p-value	0.879	0.997	0.617	0.931	0.881	0.802

Notes: Standard errors are reported in brackets. Symbols *, **, *** denote the significance levels of 10%, 5% and respectively 1%. Estimation is run using System GMM Blundell and Bond (1998). The Sargan test has the null hypothesis of exogeneity of the instrument set, while the AR2 test has the null of no second order serial correlation in the residual.

Table A4. Estimation of labor demand for non-EU sample

Dependent variable Employment	(1)	(2)	(3)	(4)	(5)
Wage	0.019	0.014	0.030	0.011	0.030
	(0.048)	(0.049)	(0.052)	(0.047)	(0.048)
Output	0.163**	0.187*	0.181*	0.157*	0.124
	(0.081)	(0.102)	(0.103)	(0.080)	(0.084)
FDI	-0.005	-0.002	-0.002	-0.059**	0.001
	(0.010)	(0.010)	(0.010)	(0.029)	(0.015)
Transition	1.674**	1.518*	1.604**	2.351***	1.433*
	(0.804)	(0.805)	(0.804)	(0.779)	(0.814)
Crisis dummy	-1.027	-0.709	-0.824	-2.034**	-1.490*
	(0.745)	(0.742)	(0.742)	(0.792)	(0.777)
Export growth		-0.057**	-0.062**		
		(0.027)	(0.030)		
Import growth		0.040	0.066*		
		(0.032)	(0.036)		
FDI × Export			0.000		
			(0.001)		
FDI × Import			-0.001		
			(0.001)		
Human capital				0.038**	
				(0.019)	
FDI × Human capital				0.001**	
				(0.001)	
Gap					-0.044*
					(0.025)
FDI × Gap					-0.001
					(0.001)
Constant	-4.051**	-3.870**	-4.263**	-6.817***	-2.357
	(1.872)	(1.868)	(1.887)	(1.986)	(2.027)
Observations	107	107	107	103	107
Countries	9	9	9	9	9
Instruments	8	10	12	10	10
Sargan p-value	0.412	0.377	0.538	0.984	0.390
AR2 p-value	0.891	0.586	0.703	0.828	0.829

Notes: Standard errors are reported in brackets. Symbols *, **, *** denote the significance levels of 10%, 5% and respectively 1%. Estimation is run using System GMM Blundell and Bond (1998). The Sargan test has the null hypothesis of exogeneity of the instrument set, while the AR2 test has the null of no second order serial correlation in the residual.

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