The impact of Foreign Direct Investment on Economic Performance in the Enlarged Europe: a Meta-Regression Analysis

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The aim of this paper is to combine, explain and summarize a large number of results on the impact of Foreign Direct Investments on economic performance in the Enlarged Europe by means of a Meta-Regression Analysis. This paper discusses some of the more recent findings from the empirical literature focusing on the FDI-growth relationship at the firm level. Our results show: the existence of a positive impact of FDI on productivity and ultimately on economic growth in EU; the limited size of this relationship, measured *via* the partial correlation coefficient; and the more important role of New Member States in the contribution towards this effect after 2001.

Keywords: Meta-regression Analysis, Enlarged Europe, Indirect Effect of FDI

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1. Introduction

Foreign Direct Investments (FDI) inflows in 2011 increased in all major economic groups, developed, developing and transition economies (UNCTAD, 2012). Developing countries accounted for 45% of global FDI inflows in 2011, of which East and South-East Asia accounted for almost half. Inflows to the transition economies of South-East Europe, the Commonwealth of Independent States (CIS) and Georgia accounted for six per cent. In fact, the overall increase was driven by East, South-East Asia and Latin America. In 2001 FDI outflows to developed countries also grew strongly, reaching $748 billion, up 21% from 2010. FDI flows to Europe increased by 19%, mainly owing to large cross-border mergers and acquisitions by foreign multinational corporations (MNCs).

There is a vast literature on the relationship between FDI and economic performance and a quite substantial number of empirical studies on European countries, both for the old member and New Member States (Meyer and Sinani, 2009; Havrenek and Irsova 2010, 2011). Some theoretical models, mainly focused on advanced economies (Bruno and Campos, 2011; Bruno and Falk 2012), predict a favourable FDI impact on the host country: FDI might produce positive externalities towards domestic firms, by enhancing their productivity and ultimately economic growth. In recent years, policy makers around many countries have decided to liberalize their policies in order to attract investments from foreign MNCs and therefore to stimulate growth on a wider scale. At the same time, new regulatory and industry-targeted measures have been introduced instead of across the board (UNCTAD, 2012). As a consequence of this renewed interest towards FDI by scholars, policy makers, practitioners as well as businessmen, governments seem to have responded by lowering entry barriers and by offering incentives schemes (tax breaks, subsidies, co-investments, etc.) to attract FDI. In other words, governments increasingly recognize the importance of cultivating FDI because they have witnessed how knowledge brought by foreign investors can *spill-over* to indigenous firms, upgrade the technological capabilities, bolster skills in the local workforce, and consequently increase the overall competitiveness of their economies (World Bank Group, 2010).

Despite the theoretical rationale for these positive FDI spill-overs[1] on host country productivity and economic growth, empirical analyses have provided inconclusive or at least inconsistent evidence on the growth/productivity enhancing promotion effect of FDI. In other words many studies show that the impact is ambiguous (positive, negative or not significant). From a policy perspective, the lack of robust empirical evidence is particularly delicate and it is probably due to the relevant differences among studies in datasets, sample sizes, models specification, etc.

This paper provides a survey for evaluating and combining the empirical results from a group of studies on the Enlarged Europe and tries to measure the strength of the FDI-performance relationship. There is a vast literature on the economic impacts of FDI in EU at the firm, industry and country level. Given the considerable amount of empirical studies dealing with this subject matter, we will limit our review as follows. On the one hand, we focus on the *indirect* impact of FDI on host countries and therefore we do not consider all the other possible *direct* impacts on the host country's productivity and growth. On the other hand, we only take into account studies based on firm-level data: while rapid growth and high ratios of inward FDI to GDP tend to be witnessed together, causality

[1] For a comprehensive survey of literature see De Mello (1997).

mechanisms are not discernible through aggregate analysis because FDI is often associated with other growth-promoting factors, for example the ratio of investment to GDP and the degree of openness of the economy, among other factors. Finally we focus on EU, given the recent surge in FDI, and the political and economic resources devoted by EU governments to remove the still large -explicit and implicit- restrictions to foreign investment (World Bank Group, 2010). We believe that our findings contribute to shed some lights to the debate on the impact of FDI in Europe, which remains one of the main receipts of FDI in the advanced economy world.

Using a Meta-regression Analysis (MRA) approach this paper provides pooled estimates, obtained from fixed and random effects models[2], of the FDI's effect on growth in the EU. The MRA methodology reviews the literature and tries to explain why there is variation in the empirical results reported in the economic studies that supposedly investigate the very same phenomenon. *Regression analysis of the existing regression analyses* represents a methodology for quantitatively combining all these estimates (commonly referred to as the "effect size"), investigating the sensitivity to variations in the underlying assumptions, identifying and filtering out possible biases, and explaining the diversity in the studies' results in terms of heterogeneity of their features (Rose and Stanley, 2005).

The rest of the paper is organized as follows. Section two briefly reviews the relevant empirical literature. Section three presents key methodological points regarding the MRA approach. Section four assesses the size of the so called "publication bias". Section five discusses the econometric results. Section six draws some conclusions and policy implications.

2. Literature Review: effects of FDI on productivity and performance

FDI can provide direct financing for the acquisition of new plants and equipment, and be an important catalyst of economic restructuring. It can also directly transfer technology to foreign affiliates, as well as indirectly diffuse or "spill over" into local economies. The impact can be direct (on the foreign subsidiary) or indirect (on domestic firms). In the latter case, the indirect effect can be horizontal (intra-industry effect) or vertical (inter-industry). Finally, the vertical effect can be divided into forward linkages (downstream domestic customers) and backward linkages (upstream domestic suppliers).

Although FDI is potentially capable of producing all the aforementioned effects this does not mean it necessarily does or having the potential does not guarantee that these positive externalities will be actually present. Whatever the direct and indirect impact FDI has on a given host economy, the effect produced will be conditional upon the nature of FDI and the reasons why MNCs make such investments (distinguishing among market, resource, efficiency, and strategic assets seeking FDI); the nature and capacity of the host country (broadly speaking, absorptive capacity); and the mode of entry, for example greenfield; takeover, merger and acquisition; size of entry majority/minority shares in domestic firms (Magai, 2012). As far as the FDI direct effect is concerned, i.e. FDI brings capital to the host country, there is widespread consensus on the positive effect on the host countries' firms and the empirical literature provides quite robust findings (Blomstrom and Kokko, 1998; Eichengreen

[2] RobuMeta command in STATA.

and Kohl, 1998; Holland et al, 2000; Navaretti and Venables, 2004). On the other hand, the unintended indirect impact (spill-overs or externalities) on host countries has been characterized by less conclusive findings, depending on the economic growth and development effect, the employment and working conditions effect, the environmental effect, and finally the technology transfer potential towards domestic firms. In fact, the indirect effect of FDI on host countries has been largely studied from the perspective of economic growth and development (e.g. in low income countries, Bruno and Campos, 2011), employment/working conditions (labour mobility), the business environment, and technology transfer from foreign to domestic firms, etc. It is widely documented that FDI inflows has the potential to upgrade the technological capabilities, skills, and competitiveness of established domestic firms in the host countries generating positive externalities.

The channels through which FDI may spill-over from foreign affiliates to other firms in an economy have been analysed in detail in a number of papers (Markusen and Venables, 1999; Kokko, 1992; Javorcik, 2004; Blomström and Kokko, 1998). The main channels identified by the literature are the imitation/demonstration, movement of workers, competition. Let analyse them in order:

a) Through imitation (or eventually through collaboration), domestic firms can learn how to export and reach foreign markets by their proximity to foreign firms by facilitating their learning process;
b) Movement of labour entails movement of skills *via* acquisition (i.e. internal mobility) since a MNC has to train the employees in the host country to transfer practices or technology to affiliates. In fact, a number of empirical studies suggest that the movement of workers within and between firms is one of the most important mechanisms for technology and knowledge spill-overs (Barry, Görg, and Strobl, 2004 for Ireland; Pesola, 2011 for Finland; and Martins, 2011 for Portugal);
c) Another channel is the competition effect. It is argued that the entrance of a MNC (owning better technology and managerial practices) will force the host country's firms to use existing technology and resources more efficiently and/or upgrade to more efficient technologies. If they fail, the externality will be negative. Indeed, not all of the associated effects are positive: competitive pressure can force domestic firms to exit the industry due to what so-called crowding-out or business-stealing effects (Dunning, 1994).

The closer the economy is to the world technology frontier, the more important innovation is with regard to imitation. Keller and Yeaple (2008) show that the complexity of technology makes knowledge costly to transfer, and the problem is exacerbated if the affiliate does not have the absorptive capacity to adapt the new technical knowledge. In the context of the EU-27, these concepts can be considered particularly relevant for New Member States, which implemented very serious and rapid economic reforms in order to catch up with their neighbours Old Member States.

While FDI flows may go hand-in-hand with economic success, they do not tend to exert an *independent* effect on growth (Choe, 2003; Carkovic and Levine, 2005; Alfaro et al., 2009).[3] For

[3] Using a panel VAR model to explore the interaction between FDI and economic growth in 80 countries in the period 1971-1995, Choe (2003) finds evidence that FDI Granger cause economic growth, but the opposite is also true and it is economically and statistically stronger. Carkovic and Levine (2005) use GMM to study a large sample of countries between 1960 and 1995, and find no robust causal effect between foreign investment inflows and economic growth.

example, the macro-/industry-level literature focuses on human capital (Borensztein et al., 1998), on financial markets (Alfaro et al, 2004), on the difference in the variety of intermediate goods, on the impact the communication distance between headquarters and production plants and more in general on the *absorption capacity* (Rodriguez-Clare, 1996). Using a meta-regression analysis, Meyer and Sinani (2009) study the simultaneous effect produced by level of development, institutional frameworks and human capital. Recent studies have explored more specific externality transmission channels: level and rate effect of spill-overs (Liu, 2008), meditating factors and FDI heterogeneity (Smeets, 2008), and multiple simultaneous channels (Javorcik, 2008), to name just a few. Furthermore, recent systematic meta-regression analyses of the updated evidence (Havrenek and Irsova, 2010, 2011; Bruno and Campos, 2011, Bruno and Falk 2012) further dissect the differential impact of horizontal, backward, and forward spill-overs. Meta-analyses suggest that spill-overs are mainly created through backward linkages to affiliates' suppliers and not forward linkages to their customers. These backward linkages to suppliers suggest that global production networks play an important role in facilitating knowledge transfer.

3. Empirical Strategy

With reference to the distinction between the direct and indirect effect of FDI, mentioned in section two, we consider only papers focusing on the estimation of the indirect impact. The heterogeneity of approaches and specifications of academic papers studying the host country effects of FDI at the firm level is impressive, but it is also possible to consider the "representative" FDI spill-over regression as follows (*z*, *j*, and *t* subscripts stand for firm sector and time):

$$\ln\left(productivity_{zjt}\right) = ß^{h}_{jt}\, horizontal_{jt} + ß^{b}_{jt}\, backward_{jt} + ß^{f}_{jt}\, forward_{jt} + ß^{X}_{zjt}\, X_{jt} + \varepsilon_{zjt}\,, \qquad (.1)$$

where *horizontal* is usually defined as the ratio of foreign presence in firm *z*'s own sector; *backward* is the ratio of *z*'s output sold to foreign firms (foreign presence in downstream sectors) and *forward* is the ratio of *z*'s output purchased from foreign firms (foreign presence in upstream sectors). Using the MRA approach, we evaluate and combine empirical results from different studies and test the null hypothesis that different point estimates, treated as individual observations ($ß^{fdi}_{jt}$), are equal to zero when the findings from this entire area of research are combined.[4]

The first step of the analysis is to construct a point estimates database of the FDI-growth impact relationship. Then, we select papers using the following criteria: (i) written in English, (ii) data based on EU countries, (iii) use of firm-level data[5], and (iv) publications between 2000 and 2012. "Data Points" are selected via an extensive search in Google Scholar (http://scholar.google.com) to identify studies in both unpublished and published papers, as well as in research published in peer-reviewed journals of the major commercial publishers using the 'EconLit', 'Web of Science' and 'Scopus

Similarly, Alfaro et al. (2009) find no significant evidence of a positive impact of FDI on growth, except for some financially developed countries.

[4] Under the null hypothesis of no effect ($\gamma = 0$), no publication selection and independence, the statistic minus twice the sum of the logarithms of the p-values is distributed approximately as a χ^2 with $2n$ degrees of freedom (Fisher, 1932).

[5] We exclude papers at the aggregate cross-country level.

databases'. Table 1 contains information on mean, median, max and min of the "effect" in the studies on the impact of FDI on domestic performance based on firm-level data for EU countries included in our meta-analysis dataset[6]. Table 2 adds a richer set of general information on each and every paper[7].

[Insert Table 1 about here]
[Insert Table 2 about here]

When a study provide multiple estimates of the effect under consideration the assumption that multiple observations from the same study are independent draws becomes too strong; on the other hand, important information is lost in the grouping process and it is not clear which estimate one should choose as "preferred" for each study (Jeppensen et al, 2002). According to MRA practise (and wide-spread use in the literature) we collect all estimates and account for both the within-study and between study heterogeneity. We can choose between a Fixed-Effect and a Random Effect Meta regression Model. A fixed effect (FE) model assumes that differences across studies are only due to within-variation. The single, "true" effect ($\hat{\mathrm{B}}_F$) is calculated as a weighted average of the individual estimate $\hat{\beta}_i$, where the weights are inversely proportional to the square of the standard errors, so that studies with smaller standard errors have greater weight than studies with larger standard errors (Higgins and Thompson, 2002):

$$\hat{\mathrm{B}}_F = \frac{\sum_{i=1}^{n} \frac{\hat{\beta}_i}{se(\hat{\beta}_i)^2}}{\sum_{i=1}^{n} \frac{1}{se(\hat{\beta}_i)^2}} \qquad (.2)$$

The random effect (RE) model assumes that the studies are a *random sample from the universe of all possible studies* (Sutton et al., 2000). A field of the literature showing high heterogeneity cannot be summarized by the fixed-effects estimate under the assumption that a single "true" effect underlies every study. As a consequence, the fixed-effects estimator is inconsistent and the random effects model is more appropriate[8]. The random-effects model assumes that there are real differences between all studies in the magnitude of the effect. Unlike the FE model, the individual studies are not assumed to be estimating a true single effect size, rather the true effects in each study are assumed to have been sampled from a distribution of effects, assumed to be Normal with mean zero and variance τ^2. The weights incorporate an estimate of the between-study heterogeneity, $\hat{\tau}^2$ (Higgins and Thompson, 2002).

4. Publication Bias

Researchers, referees, and editors tend to have a preference for statistically significant results so that a publication bias occurs, greatly affecting the magnitude of the estimated effect. In order to

[6] A complete list of the full sample of papers and detailed information on estimates are available from the authors.
[7] This has to be considered when our search has been brought to an end. Other papers might have been published more recently.
[8] We use the RobuMeta command for this purpose.

correct publication bias analysts use a Meta-regression Analysis (MRA) model that regresses estimated coefficients ($\hat{\beta}_i$) on their standard errors (Card and Krueger, 1995; Ashenfelter et al 1999). Meta-regression errors are likely to be heteroscedastic when studies in the literature differ greatly in data sets, sample sizes, independent variables, so the OLS estimates of the MRA coefficients might fail to be unbiased and consistent. A weighted least squares (WLS) obtained dividing regression equation by the individual estimated standard errors corrects the MRA for heteroscedasticity and permits to obtain efficient estimates:

$$\frac{\hat{\beta}_i}{se(\hat{\beta}_i)} = t_i = \beta_0 + \beta_1 \frac{1}{se(\hat{\beta}_i)} + \varepsilon_i \qquad (.3)$$

where t_i is the conventional t-value for $\hat{\beta}_i$ the intercept and slope coefficients are reversed and the independent variable becomes the inverse of $se(\hat{\beta}_i)$ (Stanley and Jarrell, 2005). Equation (3) is the basis for the Funnel Asymmetry Test (FAT): in the absence of publication selection the magnitude of the reported effect will vary randomly around the 'true' value, b_1, independently of its standard error, therefore β_0 will be zero. When the standard error of the effect of FDI is not significantly different from zero at any conventional level, the publication bias is not a major issue.[9] Another method to remove or circumvent publication selection is the Meta-Significance Testing (MST). It uses the relationship between a study's standardized effect (its t-value) and its degrees of freedom or sample size *n* as a means of identifying genuine empirical effect rather than the artefact of publication selection. When there is some genuine overall empirical effect, statistical power will cause the observed magnitude of the standardized test statistic to vary with *n* (Stanley, 2001). Alternatively, Card and Kruger (1995) publication bias test assesses whether the key independent variable, the log of the square root of the degrees of freedom, has a coefficient of one in absence of publication bias. The results of publication bias will be analysed in the next section after a description of the main variables used in the MRA and the sample.

5. Meta-Regression Analysis

5.1 Specification

In our Meta-analysis all papers selected contain one or more equations which estimate the indirect effect of FDI on one of the following variables: a measure of firm efficiency (such as TFP), firm output, value-added, or labour productivity. The indirect effect of foreign firms is defined as the impact of foreign ownership on the performance of domestic firms. This effect may be measured as a dummy variable for foreign presence or as the percentage of foreign presence in a domestic firm. This leads to estimation of the following specification:

$$r_{ij} = \beta_0 + v_{ij} \qquad (.4)$$

where r_{ij} is the partial correlation coefficient, defined as $\frac{t}{\sqrt{(t^2+df)}}$ with "t" being the t-statistic of the effect under study, "df" being the degrees of freedom, for the "j^{th}" estimation in the "i^{th}" paper. β_0

[9] In such a case, the standard error can be omitted from the regression.

and v_{ij} are the average effect and the idiosyncratic (in this case, paper-estimate specific) errors, respectively. The partial correlation coefficient is chosen for two reasons: first, it allows direct comparison of studies with different dependent variables (e.g. TFP versus labour productivity); second, there is an important element of heterogeneity in specifications for firm-level databases, which makes it impossible to obtain an aggregate value that could easily be interpreted as an elasticity or semi-elasticity measure. In other words, limiting the reported estimates to a strictly comparable set of specifications would have excluded too many studies and as a result, the findings would have been based on a very small number of observations (not to mention the obvious selection issues).

5.2 Data Sample

Our final sample includes 46 papers released between 2000 and 2012, published in an academic journal, working papers or unpublished studies, providing 1643 point estimates. The period analysed ranges from 1973 to 2009. The countries analysed in the selected sample are Belgium, Bulgaria, the Czech Republic, Estonia, France, Greece, Hungary, Ireland, Italy, Lithuania, Poland, Portugal, Romania, Spain and the UK.[10] Most of the observations involve the UK, Ireland (among EU 15 Old Member States), Hungary, Poland and Romania (among New Member States). The studies are mainly organised in panel data.[11] The results are divided in Unconditional and Conditional estimates. In the former we keep the most rigorous RobuMeta methodology as specification but we do not control for any "moderator" variables. In other words we are unable to explain why there is heterogeneity in the results, even if we are fully accounting for such heterogeneity[12]. In the latter we insert a battery of FDI-Growth effect, specification and paper specific controls and we also test for the very encompassing regression containing country dummies (or alternatively the EU 15 vs. NMS dummy is included). In latter case we are exploring why we see heterogeneity and we can also posit the sources of such heterogeneity.

5.3 Econometric Results: Publication Bias

Several meta-regression and graphical methods have been envisaged in order to differentiate genuine empirical effect from publication bias (Stanley, 2005). The simplest and conventional method to detect publication bias is by inspection of a funnel graph diagram. The funnel graph is a scatter diagram presenting a measure of sample size or precision of the estimate on the vertical axis, and the measured effect size (in our MRA partial correlation coefficient, PCC) on the horizontal axis. The most common way to measure precision is the inverse of the standard error (1/*se*). Here, the precision variable on the vertical axis is computed as the inverse of the standard error of the PCC, $\frac{1}{se_{PCC}} = 1/\left[\frac{1}{(t^2+df)}\right]$. Asymmetry is the mark of publication bias: in the absence of such a bias, the estimates will vary randomly and symmetrically around the true effect. The diagram, then, should

[10] Three articles included in the MRA cover a group of countries instead a single nation, namely Central and Eastern Europe; the EU-15; Bulgaria, Poland, and Romania. They still perform a firm-level econometric investigation, however, and have therefore been included in the MRA.

[11] This statistical property is quite important in guaranteeing less biased estimates. Cross-section estimates would be upwardly biased and less suitable for a MRA.

[12] See RobuMeta help on STATA 12.

resemble an inverted funnel, wide at the bottom for small-sample studies, narrow at the top for bigger samples.

An additional graphical method is the Egger test that detects funnel plot asymmetry by determining whether the intercept significantly deviates from zero in a regression of the standardized effect estimates against their precision. The funnel and the Egger tests for detecting the presence of publication bias are represented in figure 1.

[Insert Figure 1 about here]

Even though the graph in figure 1 (panel *a*) slightly resembles a funnel, it does not present the symmetry crucial to exclude publication bias. Estimates of FDI effects seem to indicate a positive effect, the plot being over-weighted on the right hand side. Such direction is also confirmed by the Egger approach (panel *b*) showing the intercept deviating significantly from zero in a regression of the standardized effect estimates against their precision.

We also explore the publication bias more rigorously by implementing the FAT, the MST and the Card and Kruger test. Looking at the results of the FAT in Table 3, the statistically significant estimates of β_0 confirm the asymmetry of the funnel graph, since the reported effect is not independent of its standard error . The MST provides evidence of a genuine empirical effect of FDI on economic performance, since the β_1 estimate is statistically significant for the total sample, as well as for the Old and New EU members. The Card-Kruger publication bias test leads to the rejection of the null hypothesis $\beta_1 = 1$, but we can however report a positive relationship between t-ratios and degrees of freedom, signalling a mild publication bias.

[Insert Table 3 about here]

5.4 Econometric Results: Unconditional Partial Correlation Coefficients regressions

Examining the entire sample, the average partial correlation coefficient between economic performance (e.g. TFP productivity) and FDI is statistically significant and positive. On average, its magnitude is 0.024 (both for the Old EU 15 and the NMS): within the [-1,1] scale this translates in a mild effect (2.4% correlation). Therefore the correlation results between FDI and productivity for the EU-27 is positive and significant (though small in magnitude), whereas there is no apparent difference between Old and NMS. As a first approximation, EU-15 countries make a crucial contribution to the positive impact of FDI on productivity as well as NMS, which seems to play a very similar role. In the next section we uncover some interesting caveats to this "first approximation" conclusion.

[Insert Table 4 about here]

5.5 Econometric Results: Conditional Partial Correlation Coefficients regressions

We now turn to the conditional regressions. Table 5 present an encompassing set of control in column one: the type of FDI-Growth relationship, the econometric model, the paper characteristics as well as country dummies. The results are unfolded below.

There is a higher FDI-performance relation when using firm level data (vis-à-vis industry regional or plant). The OLS estimates (even if controlling for FE) overstates the FDI-performance relation with respect to more sophisticated econometric models. Studies including and higher number of observations (and therefore degrees of freedom) have less strong results. Finally, compared to UK, Belgium Estonia Italy and Portugal are exhibiting higher FDI-performance relationship. Column two does not include country FE any more but just a country group "Old EU" dummy and this is insignificant (as already confirmed in the unconditional estimates in section 5.4). When omitting countries dummies the results on moderator variables are only slightly modified and we can confidently state that the columns 2 to 9 are correctly specified.

Regarding publication "impact", we distinguish published from unpublished studies. One of the main criticisms of MRA is that because the quality of studies included in the dataset can vary considerably, strong methodological or empirical analyses are lumped together with studies that may have serious methodological or empirical limitations (the "garbage in, garbage out" criticism). It is argued that alternative selection schemes might be considered arbitrary and subjective. The inclusion in meta-databases of both published and unpublished studies is widely viewed as the best way to reduce the so-called "publication bias" (Ashenfelter et al, 1999). Our sample includes 35 published academic journal articles (providing 1212 point estimates) and 12 working papers or unpublished studies (providing 431 point estimates). Since the conventional wisdom is that published and very specific studies tend to include more accurate econometric analyses, we introduce a dummy "published paper" equal to one for published papers. Our results (Table 5) show that the peer-review process does not greatly affect the magnitude of the estimated effect, since the estimated coefficient of the dummy is not statistically significant.

[Insert Table 5 about here]

Finally the column 3 to 9 interact the Old EU 15 dummy with the relevant period of analysis (1995, 1996, 1997, 1998, 1999, 2000 or 2001 onwards): the stark result is that the NMS outperform the OLD EU-15 (interaction dummy for EU negative and significant) after 2001. This can be interpreted as an encouraging sign for NMS: on the one hand the overall effect is similar to Old EU, but this becomes even more important in the last decade. This has interesting convergence implications: in light of the last decade catching-up process NMS seem to have equipped themselves with a higher FDI impact potential and this might be the fruit of their continuous effort towards a more FDI-friendly environment (World Bank Group, 2010). However is too soon to draw any general conclusions on the improved absorptive capacity of these countries.

6. Conclusions

The aim of this paper is to combine, explain and summarize a large number of results on the impact of FDI on economic performance in the Enlarged EU by using a meta-regression analysis approach. This paper discusses some of the more recent findings from the related empirical literature focusing on the Enlarged Europe FDI-growth relationship. Our results show three main findings:

1. the existence of a positive impact of FDI on productivity and ultimately on economic growth in the Enlarged Europe as a whole;
2. the existence of a limited size of this positive relationship, though;
3. the (relative) more important role of New Member States in the contribution towards this effect after 2001.

In view of ours and previous results in the literature, we can argue that policies promoting the inflows of FDI can be a tool for productivity and economic growth, this result being particularly evident for the new members of EU. From a policy perspective, this paper provides evidence that policy makers' agenda should discuss the removal of the still large (explicit and implicit) restrictions to which the access of foreign investors is subject (World Bank Group, 2010).

The European Union is thoroughly investigating the role of foreign investment in "reaping the benefits of globalisation" (European Commission, 2012) for policy purposes. At the same time the quality the available data for empirical estimation is increasing. This seems to be a favourable periods for a renovated effort in the research on FDI and economic growth and this is particularly important given the conditionality of the results (e.g. role of absorptive capacity) and the not always beneficial direction of such externalities (positive spill-overs versus stealing effect externalities). More country studies using high quality firm-level data might be extremely useful, but also a better synthesis of the existing literature is essential, too. This study falls in the latter approach and we believe this has potentially very important policy relevance.

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Table .1 Summary of firm-level studies on the effects of FDI on the performance of domestic firms

Paper	*mean*	*p50*	*min*	*max*	*N*
Altomonte and Pennings (2009)	-0.0231	-0.0373	-0.0549	0.0705	19
Anon Higon and Vasilakos (2011)	0.0351	0.0293	-0.0736	0.1536	90
Barbosa and Eiriz (2009)	0.0058	0.0058	-0.0456	0.1087	60
Barrios and Strobl (2002)	0.0012	0.0132	-0.1527	0.0587	44
Barrios et al (2002)	0.0584	0.0382	-0.0417	0.3199	16
Barrios et al (2011)	-0.0043	0.0022	-0.4662	0.0567	73
Barry et al (2005)	-0.0219	-0.0272	-0.0467	0.0394	9
Bekes et al (2009)	0.0058	0.0056	-0.0004	0.0101	9
Belderbos (2011)	0.0702	0.0590	-0.0437	0.2407	8
Castellani and Zanfei (2010)	-0.0186	-0.0177	-0.0593	0.0175	18
Crespo et al (2009)	0.0042	0.0022	-0.0342	0.0365	16
Dimelis (2005)	0.0307	0.0330	-0.0466	0.0836	32
Djankov and Hoekman (1999)	0.0868	0.0868	0.0852	0.0884	2
Driffield (2004)	-0.0005	0.0004	-0.8835	0.7923	18
Driffield and Love (2005)	-0.0729	-0.0368	-0.3358	0.1336	12
Driffield et al (2009)	-0.0376	0.1732	-0.5926	0.2592	9
Flôres et al. (2007)	0.2930	0.2696	0.2334	0.3701	7
Girma and Görg (2007)	0.0171	0.0266	-0.0787	0.1125	36
Girma and Wakelin (2000)	-0.0015	-0.0001	-0.0446	0.0364	34
Girma and Wakelin (2007)	0.0121	0.0042	-0.0678	0.1639	90
Girma (2005)	0.0061	0.0111	-0.0166	0.0201	30
Girma, Görg and Pisu (2006)	0.0027	-0.0009	-0.0544	0.0734	62
Girma, Görg and Pisu (2008)	0.0118	0.0105	-0.1411	0.1756	142
Gorodnichenkou et al (2007)	0.0232	0.0203	-0.0015	0.0609	42
Görg et al (2009)	-0.0073	-0.0077	-0.0589	0.1019	128
Hagemeje and Kolasa (2011)	0.0140	0.0105	-0.0168	0.0575	72
Haller (2011)	0.0062	0.0086	-0.0270	0.0293	24
Halpern and Muraközy (2007)	0.0318	0.0011	-0.0233	0.1014	44
Jabbour and Mucchielli (2007)	0.0034	0.0008	-0.1374	0.1295	37
Javorcik and Spatareanu (2011)	0.0083	0.0070	-0.0081	0.0213	66
Javorcik (2004)	0.0337	0.0183	-0.0351	0.3221	80
Konings (2001)	0.0270	0.0082	-0.0257	0.1264	24
Lesher and Miroudot (2008)	-0.0036	-0.0032	-0.1390	0.0908	71
Liu et al (2000)	0.1920	0.1705	0.0651	0.3821	10
Marcin (2008)	0.0076	0.0062	0.0056	0.0190	15
Mariotti et al (2011)	0.0202	0.0130	0.0032	0.0756	7
McVicar (2002)	-0.0091	-0.0091	-0.0091	-0.0091	1
Monastiriotis and Alegria (2011)	0.0262	0.0099	-0.0202	0.1390	6
Nicolini and Resmini (2010)	-0.0112	0.0114	-0.3374	0.0263	24
Nicolini and Resmini (2011)	0.0794	0.0761	0.0104	0.1543	20
Proenca et al (2006)	0.0933	0.0616	0.0484	0.2017	4
Reganati and Sica (2010)	0.0302	0.0166	-0.0027	0.1191	6
Ruane and Ugur (2012)	0.0047	0.0038	-0.0003	0.0107	12
Stancik (2010)	0.0049	0.0080	-0.0379	0.0463	42
Vacek (2010)	0.0655	0.0492	-0.3445	0.2723	62
Vahter and Masso (2006)	0.0593	0.0637	0.0050	0.0816	10

Table .2 Summary of firm-level studies on the effects of FDI on the performance of domestic firms

Article	*Dependent variable*	*FDI Impact*	*Time spam*	*Industry coverage*	*Country*	*Data Source*
Altomonte and Pennings (2009)	TFP growth	Horizontal	1995-2001	Manufacturing and Services	Romania	Amadeus
Anon Higon and Vasilakos (2011)	TFP growth	Horizontal/Vertical	1997-2004	Manufacturing	UK	ARD-ABI dataset
Barbosa and Eiriz (2009)	Output growth	Backward/Horizontal	1994-1999	Manufacturing	Portugal	Bank of Portugal
Barrios and Strobl (2002)	TFP growth	Horizontal/Vertical	1990-1998	Manufacturing	Spain	ESEE
Barrios et al (2002)	Labour productivity	Horizontal	1992-1997	Manufacturing	Greece, Ireland, Spain	Irish Economy Expenditure survey (IEE)
Barrios et al (2011)	Output growth TFP growth	Backward/Forward/Horizontal	1983-1998	Manufacturing	Ireland	Irish Economy Expenditure Survey (IEE)
Barry et al (2005)	Output growth Labour productivity TFP growth	Vertical	1990-1999	Manufacturing	Ireland	Irish Economy Expenditure Survey (IEE)
Bekes et al (2009)	TFP growth	Backward/Forward/Horizontal	1992-2003	Manufacturing	Hungary	Hungarian Tax Authority APEH
Belderbos (2011)	TFP growth	Backward/Forward/Horizontal	2000-2007	Manufacturing	Belgium	Amadeus/Belfast database
Castellani and Zanfei (2010)	Output growth	Horizontal	1992-2003	Manufacturing	France, Italy, Spain	Amadeus
Crespo et al (2009)	Labour productivity	Backward/Forward/Horizontal	1996-2009	Manufacturing	Poland	Portuguese Ministry of Employment and S
Dimelis (2005)	Output growth	Horizontal	1992-1997	Manufacturing	Greece	Confederation of Greek Industries (ICAP)
Djankov and Hoekman (1999)	Growth in sales	Horizontal	1992-1996	Manufacturing	Czech Republic	Czech Statistical Office
Driffield (2004)	Gross value added (productivity growth)	Horizontal	1983-1997	Manufacturing	UK	UK Office of National Statistics
Driffield and Love (2005)	TFP growth	Horizontal	1984-1997	Manufacturing	UK	UK Office of National Statistics
Driffield et al (2009)	TFP growth	Horizontal	1987-1996	Manufacturing	UK	UK Office of National Statistics
Flôres et al. (2007)	TFP growth	Horizontal	1992-1995	Manufacturing	Portugal	Instituto Nacional de Estatìstica – INE
Girma and Görg (2007)	TFP growth	Horizontal	1980-1992	Electronics and mechanical and instrument engineering	UK	Annual Respondents Database (ARD), Office for National Statistics
Girma and Wakelin (2000)	Output growth	Horizontal/Vertical	1988-1996	Manufacturing	UK	OneSource database
Girma and Wakelin (2007)	TFP growth	Horizontal/Vertical	1980-1992	Manufacturing	UK	Annual Business Respondents Database
Girma (2005)	TFP growth	Horizontal	1989-1999	Manufacturing	UK	OneSource database
Girma, Görg and Pisu (2006)	Output growth TFP growth	Backward/Forward/Horizontal	1992-1999	Manufacturing	UK	OneSource database
Girma, Görg and Pisu (2008)	TFP growth	Backward/Forward/Horizontal	1992-1999	Manufacturing	UK	OneSource database

Gorodnichenkou et al (2007)	Revenue Efficiency	Backward/Forward/Horizontal	2002-2005	Manufacturing	Central and Eastern Europe (CEE), Turkey	Business Environment and Enterprise Performance Surveys (BEEPS)
Görg et al (2009)	Output growth TFP growth	Horizontal	1992-2003	Manufacturing	Hungary	Amadeus
Hagemeje and Kolasa (2011)	TFP growth	Backward/Forward/Horizontal	1996-2005	Manufacturing	Poland	Poland Central Statistical Office
Haller (2011)	Labour productivity TFP growth	Horizontal	2001-2007	Manufacturing and Services	Ireland	Annual Services Inquiry (ASI)
Halpern and Muraközy (2007)	TFP growth	Backward/Horizontal	1996-2003	Manufacturing	Hungary	Hungarian Central Statistical Office
Jabbour and Mucchielli (2007)	TFP growth	Backward/Forward/Horizontal	1990-2000	Manufacturing	Spain	ESEE survey
Javorcik and Spatareanu (2011)	TFP growth	Backward/Horizontal	1998-2003	Manufacturing	Romania	Amadeus + Romanian Chamber of Commerce
Javorcik (2004)	TFP growth Output growth	Backward/Forward/Horizontal	1993-2000	Manufacturing	Lithuania	Lith. Statistical office
Konings (2001)	Output growth	Horizontal	1993-1997	Manufacturing	Bulgaria, Poland, Romania	Amadeus + Chamber of Commerce
Lesher and Miroudot (2008)	Operating revenue	Backward/Forward/Horizontal	1993-2006	Manufacturing and Services	EU15	Amadeus +OECD Input-Output Database
Liu et al (2000)	Labour productivity	Horizontal	1991-1995	Manufacturing	UK	Fame
Marcin (2008)	Output growth	Backward/Forward/Horizontal	1996-2003	Manufacturing	Poland	Poland Central Statistical Office
Mariotti et al (2011)	TFP growth	Backward/Forward/Horizontal	1999-2005	Manufacturing and Services	Italy	AIDA-Bureau
McVicar (2002)	TFP growth	Horizontal	1973-1992	Manufacturing	UK	OECD ANBERD data
Monastiriotis and Alegria (2011)	Output growth	Horizontal	2002-2005	Manufacturing	Bulgaria	Amadeus
Nicolini and Resmini (2010)	TFP growth	Horizontal/Vertical	1998-2003	Manufacturing	Bulgaria, Poland, Romania	Amadeus database
Nicolini and Resmini (2011)	TFP growth	Horizontal/Vertical	1998-2003	Manufacturing	Bulgaria, Poland, Romania	Amadeus
Proenca et al (2006)	Labour productivity	Horizontal	1996-1999	Manufacturing	Portugal	Dun and Bradstreet database
Reganati and Sica (2010)	Gross value added (productivity growth)	Horizontal/Vertical	1997-2002	Manufacturing	Italy	A.I.D.A and ISTAT
Ruane and Ugur (2012)	Labour productivity	Horizontal	1991-1998	Manufacturing	Ireland	Irish Central Statistics Office
Stancik (2010)	Growth in sales	Backward/Forward/Horizontal	1995-2005	Manufacturing	Czech Republic	ASPEKT database
Vacek (2010)	Output growth	Backward/Forward	1993-2004	Manufacturing and Services	Czech Republic	Czech Statistical Office
Vahter and Masso (2006)	TFP growth	Horizontal	1995-2006	Manufacturing and Services	Estonia	Balance of Payments of Bank of Estonia

Table .3 MR tests for publication bias and empirical significance

	Total Sample			*Old EU 15*			*New Member States*		
Variables	*FAT*[a]	*MST*[b]	*Card-Kruger*[b]	*FAT*[a]	*MST*[b]	*Card-Kruger*[b]	*FAT*[a]	*MST*[b]	*Card-Kruger*[b]
β_1 : 1/se (True)	0.003			0.003			0.001		
	(0.002)			(0.003)			(0.001)		
β_1 : Ln(n)		0.237***			0.322***			0.108*	
		(0.073)			(0.091)			(0.062)	
β_1 : Ln(Square Root DF)			0.474***			0.644***			0.215*
			(0.147)			(0.182)			(0.123)
β_0: Intercept	0.756**	-1.648**	-1.648	0.442	-2.391***	-2.391***	1.254**	-0.462	-0.462
	(0.351)	(0.650)	(0.65)	(0.440)	(0.817)	(0.817)	(0.592)	(0.538)	(0.538)
H_0: β_1=1			Rej***			Rej*			Rej***
Observations	1637	1041	1041	961	607	607	976	434	434
Cluster	46	45	45	28	27	27	18	18	18

Standard errors adjusted for studies/clusters are reported in parentheses; *** p<0.01, ** p<0.05, * p<0.1
[a] Dependent variable: t-ratio; [b] Dependent variable: ln|t-ratio|

Table .4 EU 27 EU 12 Unconditional RobuMeta-Analysis

RE Model	*Total Sample*	*Old EU 15*	*New Member States*
Coefficient	0.024***	0.024*	0.024***
SE	(0.008)	(0.012)	(0.007)
Observations	1,643	962	681
N. Cluster	46	28	18
Tau^2	0.00249	0.00265	0.000323

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

Table .5 EU 27 EU 12 Conditional RobuMeta-Analysis

	1	2	3	4	5	6	7	8	9
	Country Ds	*EU 15 D*	*EU 15 D*1995*	*EU 15 D*1996*	*EU 15 D*1997*	*EU 15 D*1998*	*EU 15 D*1999*	*EU 15 D*2000*	*EU 15 D*2001*
Vertical FDI	0.006	0.008	0.007	0.007	0.007	0.008	0.008	0.007	0.004
	'(0.013)	(0.01)	(0.01)	(0.01)	(0.01)	(0.011)	(0.011)	(0.01)	(0.01)
Firm Level Data	0.057*	0.021	0.018	0.018	0.021	0.021	0.021	0.019	0.023
	(0.032)	(0.025)	(0.024)	(0.024)	(0.025)	(0.025)	(0.025)	(0.026)	(0.027)
Manufacturing	0.017	0.008	0.011	0.011	0.008	0.007	0.007	0.008	-0.005
	(0.019)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.023)	(0.022)
Non TFP as dependent	0.001	0.006	0.009	0.009	0.008	0.006	0.006	0.003	0.005
	(0.022)	(0.014)	(0.014)	(0.014)	(0.014)	(0.016)	(0.016)	(0.015)	(0.013)
Interacted FDI	0.005	-0.011	-0.012	-0.012	-0.012	-0.011	-0.011	-0.011	-0.014
	(0.018)	(0.01)	(0.01)	(0.01)	(0.01)	(0.011)	(0.011)	(0.01)	(0.011)
Not OLS estimator	-0.044**	-0.044**	-0.048**	-0.048**	-0.046**	-0.044**	-0.044**	-0.044**	-0.045**
	(0.019)	(0.02)	(0.02)	(0.02)	(0.02)	(0.021)	(0.021)	(0.02)	(0.02)
Data Length in Years	-0.003	-0.006**	-0.005	-0.005	-0.006*	-0.006**	-0.006**	-0.007**	-0.007**
	(0.005)	(0.002)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
1995-2000 end Year	-0.073	-0.080**	-0.082**	-0.082**	-0.080**	-0.080**	-0.080**	-0.081**	-0.076**
	(0.049)	(0.036)	(0.036)	(0.036)	(0.036)	(0.037)	(0.037)	(0.036)	(0.035)
2000-2005 end Year	-0.073	-0.075**	-0.091***	-0.091***	-0.082**	-0.075**	-0.075**	-0.074**	-0.071**
	(0.047)	(0.034)	(0.032)	(0.032)	(0.032)	(0.034)	(0.034)	(0.033)	(0.034)
after 2005 end Year	-0.083	-0.046	-0.065*	-0.065*	-0.054	-0.045	-0.045	-0.018	-0.015
	(0.051)	(0.037)	(0.037)	(0.037)	(0.034)	(0.033)	(0.033)	(0.024)	(0.028)
Published Paper	0.000	0.001	0.003	0.003	0.003	0	0	-0.004	0.001
	(0.016)	(0.014)	(0.013)	(0.013)	(0.014)	(0.017)	(0.017)	(0.015)	(0.013)
Log Square Root DF	-0.027**	-0.020**	-0.021**	-0.021**	-0.020**	-0.019**	-0.019**	-0.020**	-0.021**
	(0.011)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.008)
EU 15 Dummy		-0.004	-0.022	-0.022	-0.011	-0.003	-0.003	-0.001	0
		(0.012)	(0.016)	(0.016)	(0.016)	(0.012)	(0.012)	(0.012)	(0.012)
EU 15 Dummy*1995			0.037						
			(0.024)						
EU 15 Dummy*1996				0.037					
				(0.024)					
EU 15 Dummy*1997					0.016				
					(0.026)				

EU 15 Dummy*1998						-0.002			
						(0.04)			
EU 15 Dummy*1999							-0.002		
							(0.04)		
EU 15 Dummy*2000								-0.048	
								(0.049)	
EU 15 Dummy*2001									-0.098***
									(0.028)
Constant	0.129	0.206***	0.215***	0.215***	0.209***	0.206**	0.206**	0.218***	0.223***
	(0.102)	(0.072)	(0.074)	(0.074)	(0.073)	(0.076)	(0.076)	(0.078)	(0.076)
Country Dummies	Yes***	No	No	No	No	No	No	No	No
Observations	1,643	1,643	1,643	1,643	1,643	1,643	1,643	1,643	1,643
N. Cluster	46	46	46	46	46	46	46	46	46
Tau^2	0.572	0.115	0.136	0.136	0.136	0.148	0.148	0.131	0.115

Standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1

The Omitted categories are UK (1st column), Horizontal FDI, Not firm Level Data, Not Manufacturing data, TFP as dependent variable, pure effect of FDI (i.e. not interacted), OLS (and panel FE) estimator, database stopping before 1995 (end year), unpublished paper, NMS (for the EU 15 dummy in columns 2 to 9).

Figure 1: Funnel graph of individual estimates