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Does Foreign Direct Investment Crowd In or Crowd Out Domestic Investment? Evidence from the European Union

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ABSTRACT This paper investigates whether foreign direct investment crowds in or crowds out domestic investment in the European Union. We use the theoretical model developed by Agosin and Machado (2005) and apply the Arellano-Bond generalized method of moments (GMM) to capture macroeconomic externalities. Our data analysis covers 26 of the 27 EU countries (excluding Luxembourg) for the period 1990-2008. Our main conclusion is that FDI has no negative impact on domestic investment in the new EU member states over the longer run. By contrast, for the older EU14 member states we detect a significant crowding out effect of FDI on domestic investment.

JEL Classification: F21, F23, F36, F43

Keywords: Foreign direct investment, Domestic investment, European Union

1. Introduction

At the theoretical level foreign direct investment (FDI) can be explained by a variety of models. Similarly, the consequences of FDI can be examined using a variety of empirical methods. According to Rugman and Collinson (2006) multinational enterprises (MNEs) account for approximately 80% of FDI. In the literature it is generally agreed that the spread of business via FDI to other countries is beneficial for the supplier countries since FDI profits are either reinvested where appropriate to earn future higher returns or repatriated. However, the impact of FDI on the recipient economy is much more controversial. One reason is that the volume and type of FDI inflows strongly depends on how easily and productively the host country can absorb the flows. According to De Mello (1999), the ability to absorb is affected by a variety of factors such as the host country's trade regime, legislation, political stability, payment constraints and the size of the domestic market.

The European Union is an interesting case for examining the impact of FDI on domestic investment since it is a common market which seeks to guarantee the free movement of not only good goods and services but also of factors of production including capital and labour within the EU's 27 member states. Mišun and Tomšík (2002) note that FDI is generally considered to be one of the main contributors to the successful economic transformation and rapid economic growth in some of the Central and East European Countries (CEEC). A growing number of international companies use FDI to enter Eastern Europe by either acquiring local firms or setting up joint ventures. At the *prima facie* level FDI appear to have played an important role in promoting the economic development of some of the new EU member states.

While there is a large literature about FDI and its impact on economic growth and productivity of domestic firms, there are relatively few studies that concentrate on the issue of the impact of FDI on domestic investment. Most of the papers that have examined the impact of FDI are based on continents other than Europe. Some studies do include some of EU15, that is, pre May 2004 countries in their sample and others provide an analysis of the impact of FDI on some of the new EU12, that is, post May 2004 member countries separately. These studies include, Apergis *et al* (2006), Mileva (2008), Mišun and Tomšík (2002), Titarenko (2005), Javorcik (2004). However, to date no one has measured impact of FDI on domestic investment in all European Union member states.

In this paper, we utilize the investment model of Agosin and Mayer (2000) and empirical approach devised by Agosin and Machado (2005) to analyse the impact of FDI on the level of domestic investment in the EU. We do this by splitting the EU up into two groups the EU14 prior to May 2004 (excluding Luxembourg) and the EU12 made up of the new members that have joined post May 2004. The paper is structured as follows, section 2 reviews the existing theoretical and empirical

literature on the linkage between FDI and domestic investment. Section 3 describes the basic model used for the empirical estimations while section 4 covers the data and estimation methodology and discusses the empirical results. Finally, section 5 concludes.

2. Review of the theoretical and empirical literature

On the theoretical front the literature on the linkage between FDI and domestic investment is ambiguous. According to Blomström and Kokko (1998), FDI may stimulate domestic investment if local firms emulate the new machinery and technology introduced by foreign firms. Moreover, spillovers may take place when local firms hire workers trained by foreign affiliates to work with the new technologies in the long run. Workers employed by foreign firms may with encourage domestic companies to invest in new technology to both compete the foreign FDI sand also perhaps to encourage the foreign multinational to buy inputs and other goods/services from local firms. On the other hand, results obtained by Aitken and Harrison (1999) show little empirical support for the position that technology is transferred from multinationals to domestically owned firms in Venezuela. Domestic investment can also be crowded out because new technologies brought into the country through FDI may accelerate technological obsolescence of traditional technologies used in developing countries as argued by Kim and Seo (2003).

According to Blomström and Kokko (1998) another important channel appears to be that competition becomes stiffer when multinational corporations enter the host market. This forces local firms to use their resources more efficiently or search for more modern technologies. Smarzynska (2004) argues that spillovers from FDI exist when the entry or presence of multinational enterprises increases the productivity of domestic firms in the host country and the multinationals do not fully internalise the value of these benefits. While Mileva (2008) argues that FDI may also be accompanied by increase capital inflows such as foreign loans and portfolio investment which helps reduce domestic interest rates and increase the availability of credit to finance new domestic investment. On the other hand, she recognises that multinational enterprises may raise productivity to such an extent that local competitors cannot compete and have to leave the market so curtailing domestic investment. This is particularly the case when MNEs instead of looking for the local suppliers import necessary inputs or enter sectors previously dominated by local state-owned firms which tend to be less efficient than privately owned companies. This latter argument finds empirical support from De Backer and Sleuwaegen (2003) who show that import competition and FDI discouraged entry and motivated exit of local firms across Belgian manufacturing industries during the period 1990 -1995.

Noorzoy (1979) argues that domestic investment may be substituted by foreign firms if the latter have superior technological or managerial expertise, or tax benefits provided by the host country. If MNEs start supplying goods that already exist in the local market, local companies may go under as they are unable to compete with MNEs that may also have the advantage of economies of scale. According to De Mello (1999) the impact of FDI to the recipient economy also depends on the extent of complementarity and substitution between domestic investment and FDI, MNEs can displace domestic producers or reduce their available investment opportunities so reducing domestic investment. The linkage effect in the host country is emphasised by Wang (2008) who argues that if MNEs bring new goods into the market then domestic investment will be enhanced because of the ecosystem that has to be created. On the other hand, the strength of domestic enterprises is important as local companies can be easily pushed out of the market together with potential investment from those companies due to entry of a multinational enterprise (MNE). This problem can be particularly acute if backward linkages are disrupted in domestic manufacturing through the substitution of imports for domestic goods resulting in lower sales.

Javorcik, (2004) argues that positive spillovers from FDI to domestic investment can also be realised through shared domestic and foreign ownership rather than fully owned foreign investments. The joint venture aspect of FDI means that foreign know how and technology can filter through to domestic firms in the host country improving their efficiency, profitability and with it domestic investment. At the empirical level, Aitken and Harrison (1999) find that domestic plants in sectors with more foreign ownership were significantly less productive than those in sectors with a smaller foreign equity. Their results suggest that recipient plants with less than 50 employees capture the productive advantages of foreign owners and become more productive and therefore tended to invest more. They also argue that FDI can raise domestic investment via the human capital channel. If FDI leads to the start up of new businesses in the host country, then employees after being trained and through the process of learning and doing can start their own business in the future. As such, the FDI will have a significant lagged effect positive effect on domestic investment. Similarly, De Backer and Sleuwaegen (2003) argue that FDI leads to higher productivity, because MNEs tend to hire the best individuals and therefore implement a wage structure very favourable for people endowed with higher levels of human capital and entrepreneurial ability. Working for MNEs improves their experience and skill set and the level of income of talented people in the host country which can result in higher domestic investment in the future. Indeed, the well paid job in foreign entity acts as an intermediate position to setting up their own enterprise in the future.

Of course, as argued by Agosin and Machado (2005) the magnitude of positive/negative spillovers from FDI on domestic investment will vary from country

to country, because of the differences in domestic policy, the types of FDI a country receives and the strength of local firms. According to Weeks (2001) study of Latin American countries, the structure of the economy and policies toward foreign investment predetermines whether the positive or the negative impact is dominant in different countries over the time. In particular, liberalization and the conduct of sound macroeconomic policies improve the likelihood of FDI crowding in domestic investment.

Bosworth and Collins (1999) measured the effect of FDI, foreign loans and portfolio flows on domestic investment using a panel data set covering 58 developing economies excluding European countries over a 17 years period. In their study FDI appears to have a positive impact on domestic investment and the results suggest a near one-for-one relationship between the two. A study by Agosin and Mayer (2000) finds mixed empirical results, the authors detect a positive effect of FDI in 15 out of 32 countries with a generally positive impact of FDI on domestic investment in Asia, a negative impact in Latin America and a negligible effect in Africa. As far as developing countries go Agosin and Machado (2005) assess the extent to which FDI in 36 developing countries from Africa, Asia and Latin America crowds in or crowds out domestic investment for the period 1971-2000. They find a clear crowding out effect in Latin America for the period 1971 – 2000 and also in Africa during the period 1991 – 2000 with complete long term crowding out in 9 out of 12 countries. Liu *et al.* (2001) do not find any significant relationship between FDI and domestic investment in China. While Ang (2009) finds that FDI has a positive effect on private domestic investment in Malaysia with a 1% increase in FDI inflows increases private domestic investment by 0.985%, keeping other explanatory variables fixed.

Mileva (2008) presents evidence of small positive FDI spillovers on domestic investment over the long term in an EU group of transition countries with relatively well developed financial markets and stronger institutions, including countries included in our paper for the period 1995-2005. Ndikumana and Verick (2008) argue that a key economic development channel of FDI in sub-Saharan Africa is its effect on domestic investment. Their results suggest, first, that FDI crowds in domestic investment and, secondly, that private investment is a driver of FDI which implies that by improving the domestic business climate African countries can gain significantly from FDI.

Apergis *et al* (2006) use a panel data set of 30 different countries in four continents for the period 1992-2002 and find crowding-in effect on domestic investment in the cases of Asia and Africa (less developed) and crowding-out effects for America and Europe (more developed). They also provide evidence of two-way causal linkage between FDI and domestic investment. Their findings are partly consistent with that of Agosin, Mayer (2000), who detect similar results for Asia and

Latin America. Ghazali (2010), provides evidence that FDI supplements domestic investment and there is a bi-directional causality between FDI and domestic investment in Pakistan. On the other hand, using annual data for the period 1987-2001 in both developing and developed countries Calderón *et al* (2004) show that both greenfield FDI and mergers and acquisition FDI tend to precede domestic investment, but not the reverse. Faeth (2006) also finds that FDI directly increases domestic investment in Australia using quarterly data for the period 1985Q3 to 2002Q2.

In an analysis of firm entry and exit in Belgian manufacturing industries, De Backer and Sleuwaegen (2003) find that FDI and import competition positively affects exit and negatively affects entry of domestic enterprises. Their results show that an increase in FDI of 10% causes the entry rate of domestic firms to fall by 7% in the long term. Since entry into the market itself requires initial investments and staying in the market can lead to making an extra investment, their negative findings can be interpreted as a loss of potential domestic investment. According to Sauramo (2008), a crowding-out effect in developed countries can be attributed to evidence that outward FDI reduces domestic investment in Finland. The majority of the decline in the domestic investment rate in the corporate sector is explained by an increase of outward FDI flows since Finland has transformed its economy from a capital importing to a capital exporting one. Outward FDI directly reduces the financial resources that would otherwise be available for domestic investment. There is, of course, the possibility that other local firms operating in the country may use the investment opportunities that firms investing abroad ignore. These ideas are supported by Feldstein (1994) who estimating that outward FDI reduces domestic investment on a one for one basis 15 out of 18 OECD countries.

According to Cecchini and Lai-Tong (2008) increased productivity of domestic firms can cause an increase in domestic investment. International openness generates beneficial effects on total factor productivity through the higher level of human capital and also via the transfer of technology in the Mediterranean countries. However, greater openness means the better possibilities to export your production to the external market. Many MNEs export their products before they grow to a level that they start investing in foreign countries.

Mišun and Tomšík (2002) find that FDI increases domestic investment in export oriented countries by more than in domestic market oriented economies and they examine the effect of FDI on domestic investment in the Czech Republic, Hungary and Poland. They find mixed evidence of a crowding out effect in Poland (1990 – 2000) and a crowding in effect in Hungary the same period and also in the case of the Czech Republic for the time period 1993-2000. The structure of foreign investment was assumed to be a substantial reason for the uneven impact. Mainly export-oriented foreign direct investment stimulated additional domestic investment

in Hungary. By contrast, domestic market oriented foreign investment meant stiffer competition for domestic producers and reduced investment opportunities for domestic investors in Poland.

In sum, the existing empirical literature suggests that the impact of FDI on Domestic Investment is complex and differing results can be obtained. Nonetheless, there is some evidence that FDI has a generally a positive effect on domestic investment in less developed countries and also some evidence of a crowding-out effect in developed economies. Since at the theoretical level FDI can have both positive and negative effects on domestic investment then the debate can only be settlement by resort to empirical methods. Different studies use different mathematical and econometric methods covering different countries and sample periods. The results of the existing literature vary depending upon the choice of country/countries, the time period considered and the specific features of the empirical model.

3. A Model of the Linkage between Domestic Investment and FDI

For our examination of the European Union, we follow the model Agosin and Machado (2005) which improves upon the model developed by Agosin and Mayer (2000) where the impact of FDI is examined on total domestic investment rather than separated out into public and private domestic investment. Our empirical objective is to analyse the dynamic relationship between total investment, foreign direct investment and growth of real gross domestic product with the main focus being to examine how the behaviour of a foreign direct investment is related to the behaviour of domestic investment in the long run.

Total investment is equal to domestic investment plus inward foreign investment.

$$I_t = I_{d,t} + I_{f,t} \quad (1)$$

We assume that total investment (I_t) is made up of domestic ($I_{d,t}$) and foreign investment ($I_{f,t}$) we assume that the latter depends on both contemporaneous FDI and its lagged values as set out in equation (2):

$$I_{f,t} = \Psi_0 F_t + \Psi_1 F_{t-1} + \Psi_2 F_{t-2} \quad (2)$$

FDI itself is considered to be an exogenous variable because it depends on conditions in the world economy, MNEs strategies and so on. The basic model for domestic investment ($I_{d,t}$) is the following:

$$I_{d,t} = \lambda(K^*_{d,t} - K_{d,t}) \quad (3)$$

where $K_{d,t}^*$ represents capital stock desired by domestic firms and $\lambda > 1$ and $K_{d,t}$ is the capital stock available to domestic firms at time t .

The rationale underlying equation (3) is that:

$$K_{d,t}^* = \varphi_0 + \varphi_1 G_t^e + \varphi_2 y_t \quad (4)$$

where $\varphi_1, \varphi_2 > 0$, G_t^e represents expected growth rate, y_t represents the difference between actual income (Y_t) and desired full employment income (Y_n) and φ_0 is the level of capital that is desired even if G_t^e and y_t are both equal to zero.

K is positively related to λ since when K_0 (actual capital) increases to K^* (desired capital), λ_0 (actual production) increases to λ^* (desired production), hence, actual production is positively related to actual capital since actual production will increase if actual capital increases.

$$K_{d,t} = (1-d) K_{d,t-1} + I_{d,t-1}, \quad (5)$$

where d is the annual rate of depreciation of the capital stock.

Combining equations (4), (5) and (6) we obtain:

$$I_{d,t} = \varphi'_0 + \varphi'_1 G_t^e + \varphi'_2 y_t + \lambda I_{d,t-1} + \lambda' I_{d,t-2} \quad (6)$$

where: $\varphi'_0 = \varphi_0 + \lambda^2 (1-d)^2 K_{d,t-2}$, $\varphi'_1 = \lambda \varphi_1$, $\varphi'_2 = \lambda \varphi_2$ and $\lambda' = \lambda^2 (1-d)$

$$\text{If } K_{d,t} = (1-d) K_{d,t-1} + I_{d,t-1}, \text{ then } K_{d,t-1} = (1-d) K_{d,t-2} + I_{d,t-2} \quad (7)$$

Finally, the model for domestic investment has to be converted into one for total investment with the foreign investment equation included. Replacing equations (6) and (2) into (1) and collecting terms yields:

$$I_t = \varphi'_0 + \varphi'_1 G_t^e + \varphi'_2 y_t + \lambda I_{d,t-1} + \lambda' I_{d,t-2} + \Psi_0 F_t + \Psi'_1 F_{t-1} + \Psi'_2 F_{t-1} + \lambda I_{d,t-1} + \lambda' I_{d,t-2} \quad (8)$$

where: $\Psi'_1 = \Psi_1 - \lambda$ and $\Psi'_2 = [\Psi_2 - \lambda^2 (1-d)]$

The final part is to specify a process for the expected growth rate for this purpose an adaptive expectations process is assumed:

$$G_t^e = \eta_1 G_{t-1} + \eta_2 G_{t-2} \quad (9)$$

The model is correctly specified only if foreign investment is not perfectly correlated with domestic investment. On a theoretical level both foreign and domestic investment equations are created using different components. While empirically, FDI has to be exogenous to the growth rate of GDP with 1 and 2 year lags since the latter are the variables that predetermine domestic investment. Hence, the estimated coefficients of $G_{i,t-1}$ and $G_{i,t-2}$ cannot be statistically significant in the following regression:

$$F_{i,t} = \delta' + \gamma'_1 G_{i,t-1} + \gamma'_2 G_{i,t-2} + \gamma'_3 F_{i,t-1} + \gamma'_4 F_{i,t-2} + u'_{i,t} \quad (10)$$

The benchmark model derived from equation (8) is given by:

$$I_{i,t} = \alpha + \beta_1 F_{i,t} + \beta_2 F_{i,t-1} + \beta_3 F_{i,t-2} + \beta_4 I_{i,t-1} + \beta_5 I_{i,t-2} + \beta_6 G_{i,t-1} + \beta_7 G_{i,t-2} + \eta_t + \varepsilon_{i,t} \quad (11)$$

Where α is a constant, I is the total investment/GDP ratio, F is the FDI/GDP ratio, G is the annual growth rate of GDP and the η_t are time dummies, ε is a serially uncorrelated random error. Gross fixed capital formation is used to measure total investment.

The key objective of our paper is to test the long term crowding-in or crowding-out effect of FDI on domestic investment. The relevant long run coefficient is:

$$\hat{\beta}_{LT} = \frac{\sum_{j=1}^3 \hat{\beta}_j}{1 - \sum_{j=4}^5 \hat{\beta}_j}$$

Our null hypothesis is that $\beta_{LT} = 1$. Using a non-linear post-estimation F-test we can obtain the value and significance of estimator of β_{LT} , there are three possibilities:

- (i) It is not possible to reject the null hypothesis that the estimator of β_{LT} is equal to 1. In other words, an increase in FDI by one percentage point of GDP increases total investment by one additional percentage point of GDP. This implies no crowding out effect on domestic investment.
- (ii) The null hypothesis is rejected and $\beta_{LT} > 1$. Meaning that an increase in FDI by one percentage point of GDP increases total investment by more than one additional percentage point of GDP. This case is considered as long-run crowding-in effect because total investment rises by more than foreign investment.

- (iii) The null hypothesis that $\beta_{LT} = 1$ is rejected and $\beta_{LT} < 1$. An increase in FDI by one percentage point of GDP increases total investment by less than one additional percentage point of GDP. Domestic investment is substituted by foreign investment and a long term crowding-out effect occurs.

4. Empirical analysis of the impact of FDI on domestic investment within the European Union.

For the purposes of our analysis we split the European Union up into two groups the EU14² who were members of the European Union prior to May 2004 and the EU12³ represented by the 12 countries who joined the EU in May 2004 or later. We excluded Luxembourg due to its skewed data on foreign direct investment, in addition its estimates on foreign direct investment using different calculation method than the rest of the sample⁴.

The model was run for EU14 and EU12 separately in order to compare the impact of FDI on domestic investment in old and new entrants to the EU post 2004. The data set is based on annual observations covering the period of 1990-2008. The time period was limited to 19 years due to the political situation in Eastern Europe over the earlier years. Many of new European Union members were under the political and economic control by former Soviet Union and data prior to 1990 and data is either incomplete or unreliable or both.

The one-step system generalised method of moments (GMM) developed by Arellano and Bond (1991) was used for estimation of the total investment function. When using GMM, the Sargan test is crucial to our empirical work because it shows whether instrumental variables (IV) are acceptable and valid, that is whether the instruments as a group are uncorrelated with the residuals. Rejection of the null hypothesis would indicate that the instruments are not valid therefore estimates are not reliable. The advantages of GMM over IV are clear: if heteroskedasticity is present, the GMM estimator is more efficient than the simple IV estimator, whereas if heteroskedasticity is not present, the GMM estimator is no worse asymptotically than the IV estimator, see Baum *et al* (2002)

Empirical results

Table 1 reports results obtained by using the Arellano – Bond GMM one step system procedure. There are two conditions that have to be satisfied in order to interpret the results obtained from regression reported in Table 1. The first is that the Sargan test cannot be rejected and the second is that AR(2) term has to indicate that the disturbances are serially uncorrelated, with both of these conditions satisfied the regression suggests that the model is well specified.

Table 1: Investment equations for both samples using panel data for 1990-2008

$$I_{i,t} = \alpha + \beta_1 F_{i,t} + \beta_2 F_{i,t-1} + \beta_3 F_{i,t-2} + \beta_4 I_{i,t-1} + \beta_5 I_{i,t-2} + \beta_6 G_{i,t-1} + \beta_7 G_{i,t-2} + \eta_t + \varepsilon_{i,t}$$

	EU-12	EU-14
F	0.10* (0.06)	-0.04 (0.11)
F(-1)	0.08 (0.23)	0.00 (0.97)
F(-2)	-0.07 (0.52)	0.03 (0.37)
I(-1)	0.75*** (0.00)	0.99*** (0.00)
I(-2)	0.07 (0.45)	-0.03 (0.71)
G(-1)	0.24*** (0.0)	0.17** (0.03)
G(-2)	-0.14*** (0.01)	0.01 (0.86)
F-test	2.26* (0.08)	12.4*** (0.00)
Sargan Chi-Sq	163.44 (0.17)	154.8 (0.53)
AR (1)	-2.67*** (0.01)	-3.31*** (0.00)
AR (2)	1.36 (0.17)	-1.09 (0.27)

Notes: Estimation by one step Generalised Method of Moments,
p-values in parantheses

* Significant at the 10 percent level, ** Significant at the 5 percent level. ***
Significant at the 1 percent level.

The results show that in the short run FDI has a positive effect on total investment for the EU12 new members but a negative and significant effect for the EU14 older member states. The results also show that there is a strong impact on total investment from the previous period's investment and also from the previous period's growth rate.

Table 2 reports the results from the FDI equation (10) and reveal that there is not a problem of endogeneity between FDI and lagged growth for the period 1990-2008 and the residuals are well behaved. There is, however a significant lagged effect of FDI on current FDI for both the new and older EU members.

Table 2 FDI equations using panel data for 1990-2008 and for EU12 and EU14

$$F_{i,t} = \delta' + \gamma'_1 G_{i,t-1} + \gamma'_2 G_{i,t-2} + \gamma'_3 F_{i,t-1} + \gamma'_4 F_{i,t-2} + u'_{i,t}$$

	EU-12	EU-14
G(-1)	0.01 (0.88)	0.15 (0.27)
G(-2)	-0.08 (0.20)	0.17 (0.17)
F(-1)	0.61** (0.02)	0.71*** (0.01)
F(-2)	0.10 (0.77)	0.23 (0.46)
F-test	4.15**	13.76*** (0.00)
Sargan Chi-Sq	66.78 (0.29)	45.23 (0.94)
AR (1)	-2.14** (0.03)	-1.75* (0.08)
AR (2)	0.65 (0.51)	1.58 (0.11)

Notes: Estimation by one step Generalised Method of Moments,
p-values in parantheses

* Significant at the 10 percent level, ** Significant at the 5 percent level. *** Significant at the 1 percent level.

In Table 3 we present the results concerning the long run relationship FDI and domestic investment calculated from Table 1 using the formula for the long term beta.

Table 3: Long-term effect of FDI on domestic investment in European Union

Time Period 1990-2008	EU12	EU14
	0.61*	-0.26

Notes

Panel Data estimation

* Not significantly different from one

The results reported in table 3 show that we cannot reject the hypothesis that FDI has no impact on domestic investment for the European Union 12 new members in the long run. By contrast, for the EU14 older member states, there is evidence that FDI actually lowers total domestic investment in the long run suggesting more than a 100 per cent crowding out effect on domestic investment.

5. Conclusions

This study has investigated whether foreign direct investment crowds in or crowds out domestic investment in the case of the European Union. Particular attention was paid to comparing the EU14 and the EU12 for the period 1990-2008. Our results for the EU14 differ from the results obtained Agosin and Machado (2005) who find that because of large standard errors it is hard to reject the null hypothesis of no crowding out effect. By contrast, in our study of the European Union the standard errors of current and lagged FDI are relatively small and we argue there is a complete crowding out of domestic investment in the case of the older EU member states. However, in the case of the new member states there is no evidence of significant crowding out effect of FDI on domestic investment and we are unable to reject the hypothesis that total investment increases by the full amount of FDI in the long run.

The reported results in this paper suggest that short term impact of FDI was a significant boost to total investment for the EU12 and marginally negative for the EU14. The long term results are, much clearer, FDI has long-term, one-to-one, relationship with domestic investment in the EU12 and there is no evidence of crowding out effects of FDI in the case of the new EU member countries. By contrast, a crowding-out effect was captured for older EU14 member states, that is, FDI has negative spillovers on domestic enterprises leading to a complete crowding out of domestic investment opportunities in the EU14 member states.

Notes:

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- ². The EU-14 are Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Portugal, Spain, Sweden, United Kingdom.
- ³. The EU-12 are Bulgaria, Cyprus, Czech Republic, Estonia, Hungary, Latvia, Lithuania, Malta, Poland, Romania, Slovenia, Slovakia.
- ⁴. In the case of Luxembourg many purely financial transactions were included in foreign direct investment and made FDI/GDP to be larger than GFCF/GDP.

Data Appendix

The data on Foreign direct investment as a percentage of GDP, Gross fixed capital formation as a percentage of GDP, the GDP growth rate employed in this paper was collected from the World Bank World Development Indicators (2009). All series are in 2000 US dollars.

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