

The impact of Foreign Direct Investments on productivity and salaries: Evidence from the EU and a case study from Greece

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Abstract

The role of Foreign Direct Investments (FDI) in enhancing economic growth is considered to be of great importance. The inflow of FDI in developing countries, such as Greece, has several implications. One of those, it is the wide spread perception that FDI assists to the increase of the wages and productivity in the domestic economies.

The aim of the paper is to explore the existence of a statistically significant relationship between FDI and the level of domestic wages in Greece. Apart from FDI, other explanatory variables are selected as well.

For this purpose, four concrete econometric models are employed and in most cases the results reveal that there is a negative relationship between FDI and domestic wages implying that an increase in the inflow of FDI is expected to have negative impact on wages in Greece.

The methodology steams from Aitken's et.al. (1996) and the original model has been properly modified.

Keywords: Foreign Direct Investment, productivity, international economics

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Introduction

Both economic theory and recent empirical evidence suggest that FDI has a beneficial impact on developing host countries. But recent work also points to some potential risks: it can be reversed through financial transactions; it can be excessive owing to adverse selection and fire sales; its benefits can be limited by leverage; and a high share of FDI in a country's total capital inflows may reflect its institutions' weakness rather than their strength.

Though the empirical relevance of some of these sources of risk remains to be demonstrated, the potential risks do appear to make a case for taking a nuanced view of the likely effects of foreign direct investments. Policy recommendations for developing countries should focus on improving the investment climate for all kinds of capital, domestic as well as foreign. In this context, a major issue related to the inflow of FDI is the effects that have on the domestic wages. Generally, it is considered that FDI helps in increasing the salaries of the workers.

In the next part of the paper, the impact of FDI on domestic companies and productivity is reviewed along with a literature review of empirical models concerning the same issue. Subsequently, the main

arguments justifying the absence of a relationship between FDI and productivity as implied by some research work performed.

Also, the paper deals with the recent developments regarding the relationship between FDI and wages in the European Union focusing on the case of Greece. A case study comprising of estimation of four alternative econometric models follows. Finally, the main conclusions and other implications are included in the last part.

The impact of FDI on the domestic businesses

FDI is both a channel for transporting goods and services worldwide, and a channel of transferring technology. The role of FDI as a channel of transferring technology is difficult to be proved empirically though that concrete evidence suggest that this claim can be substantiated. Such evidence include the fact that developing countries are trying by all means to convince the large multinational companies to invest in their markets, believing that this would create 'diffusion effect' for the domestic businesses. By the term 'diffusion effect', it is implied that someone receives benefits (or harm) from an investor's activity, without paying (or receiving) compensation to the latter. In other words, the diffusion effect comprises the net externalities resulting from FDI that the market could not quantify adequately.

Example of such externalities is the adoption of superior technology from domestic producers used by foreign investors. The potential channel of spill-over is primarily through demonstration (demonstration effects). Domestic companies are trying to adapt their production methods to those used by multinational companies. One way that this could be achieved is by imitation.

The second potential channel is through the workers mobility (labour turnover). The employees who have previously been trained by multinational enterprises may convey important information to domestic businesses in various ways. These include the development of links with managers of domestic firms and the set up of their own businesses. In order to limit the diffusion of technological knowledge, the multinational companies offer their employees higher wages relatively to domestic firms. Another channel of diffusion is the vertical linkage to domestic firms. The links developed among multinational and domestic companies lead to knowledge and technology transfer in developed countries. Thus, multinational companies can transfer their technology to domestic ones which are potential suppliers or even buyers of their products.

Empirical evidence for the impact of FDI on domestic productivity

The empirical studies of Blomstrom (1986), Blomstrom and Persson (1983), Caves (1974) and Globerman (1979) showed that regions with the higher level of foreign investment than others tend to have greater productivity. The fact that these studies employ data from many countries provides strong evidence that there is a positive relationship between FDI and domestic productivity. Caves (1974) and Globerman (1979) found a positive effect from the presence of foreign companies on domestic productivity using data from Australia and

Canada respectively. These results are in line with the results of Liu and Wang (2003) who studied the case of the China.

Blomstrom and Kokko (2003) argued that diffusion effects on the productivity of the host country arise when the domestic firms benefit from the multinational ones. The increasing competition among the domestic firms and the subsidiaries of large multinational companies drives the first ones to become more effective. The degree of foreign ownership is believed to affect significantly the 'diffusion results' in the domestic economy. A subsidiary company, whose administration is totally foreign, is more effective because the parent company has incentive to transfer technology, since there is no risk of easy diffusion to domestic firms.

A subsidiary company whose administration is partly foreign, it is not highly probable to benefit from the transfer of technology since the parent company is likely to convey less effective production methods. Generally, it is considered that the higher the degree of foreign ownership is, the higher the incentive that the parent company has to transfer technology and information is.

The size of the foreign subsidiary plays a very important role in the impact of foreign direct investments on domestic productivity. The large multinational companies are prepared to meet their needs by own means and they do not easily develop links to the domestic businesses. Instead, the small foreign companies are willing to develop links to domestic firms as suppliers or vendors, resulting to a strong interaction between them, and hence larger 'diffusion effect'.

Blomstrom and Sjöholm (1999) argued that the impact of FDI on domestic firms depends on the degree of multinational ownership. In the case that the administration of the subsidiary of the multinational company is a minority, it develops stronger links with the domestic businesses making easier the transfer of technological knowledge and information to them. The administration of the form 'joint ventures' (partial ownership) of the large multinational companies eases the transfer of technological knowledge despite that this was not confirmed by Blomstrom and Sjöholm (1999) for the case of Indonesia.

Moreover, the size of domestic enterprises is an important factor in the adoption of more effective production methods by the multinational companies. The large domestic firms which are already competitive and have the maximum efficiency they can, do not increase their productivity due to the participation of foreign companies in the domestic economy. The small domestic firms, which lack technological knowledge, are more willing to accept the influence of foreign presence in their area of expertise so that ultimately will gain greater benefits from the participation of multinational companies in the domestic market. Another important conclusion is that the foreign direct investments mainly affect positively the industries with are characterized of low technological aspects.

The empirical studies of Aitken and Harrison (1999), Barry and Hannan (2001), Damijan et.al (2003), Djankov and Hoekman (2000) and Konings (2000) revealed negative impacts from the presence of foreign on the domestic firms. They used data from Venezuela, Ireland and eight countries of Central and Eastern Europe. They have found no statistically significant effect of multinational companies on domestic productivity.

Furthermore, two empirical studies investigating the relationship between foreign direct investments and domestic productivity in developing countries failed to reach concrete conclusions. Haddad and Harrison (1993) examining the case of Moroccan industry found that there is not any statistically significant relationship between foreign direct investments and domestic productivity.

Also, Aitken and Harrison (1999) using data from Venezuela did not find a positive relationship between the multinational companies and the productivity of domestic firms concluding that a negative relationship by industry and operation area of foreign firms exists.

Reasons for the absence of a relationship between FDI and productivity

There are two strands of explanations for the failure to find a statistically significant positive relationship between domestic productivity and foreign participation in the domestic market. The first explanation is that multinational companies having close cooperation with subsidiaries in the host country are leaving no room for diffusion of technology to domestic companies.

The second explanation is that the presence of foreign firms can only benefit specific groups. The empirical investigation of Kokko et al. (2001) confirmed this assumption by examining the case of Uruguay. This case showed a positive correlation between domestic productivity and the presence of multinationals operating in the country promoting import substitution, while no statistically significant relationship was found between domestic productivity and activity of multinationals that for export oriented companies.

Kokko et al. (2001) argued that the positive effects on productivity of host countries depend on their market orientation. If multinational firms relocate to an import-substitution country, then they are forced to compete to domestic firms. In their effort to become more effective, they transfer technology, which is channelled to domestic enterprises. Instead, when multinational companies install in an export-oriented country, then they play an important role in the international market rather than the domestic, resulting in decreased diffusion of information and knowledge to domestic firms.

Aitken and Harrison (1999) highlighted the negative effect of the presence of multinational companies in the domestic market due to competitive pressure. Multinational companies having technological superiority and achieving greater economies of scale, manage to reduce their costs, and hence their prices. In this way, they earn a greater market share than that of domestic firms. The latter are not able to compete successfully, ultimately reduce their production resulting to a reduction in the overall productivity of the domestic economy.

Barrios (2000) considering the case of Spain reached the following conclusion: between foreign direct investments and the productivity of regions with high costs for research and development, no statistically significant relationship was found. Blomstrom and Kokko (2003) concluded that the positive impact of foreign direct investments on domestic productivity depends on the sector and the host country and

that productivity increases as the effect of these factors on domestic businesses increase.

For example, the empirical analysis of Damijan et al. (2003) using data from the "transient economies": Bulgaria, Estonia, Czech Republic, Hungary, Poland, Romania, Slovakia and Slovenia did not manage to find a statistically significant relationship (either positive, or negative) between the activities of multinational enterprises and the domestic productivity. If the expenses of domestic enterprises for research and development are included in the estimation of the model, then different results are observed. Czech Republic and Poland present negative relationship between the presence of multinational enterprises and the domestic productivity. Positive relation was found only for Romania, while for the remaining countries no relationship was found.

The impact of FDI on domestic wages

The interaction between FDI and domestic wages is described by the following sentences which summarize the findings of a great number of econometric estimations:

- Regions with lower wages attract more FDI
- Usually, foreign firms pay higher wages, thereby increasing the income imbalance in host countries
- The foreign companies pay higher wages to skilled employees because their production processes demand mostly intensive technology and expertise, thus promoting the income imbalance between skilled and unskilled workers
- Foreign firms spread their production in different countries while domestic businesses usually focus on the market of their country of origin.
- FDI make significant contributions to the domestic stock of knowledge, introducing new capital goods, new technology, and improved production methods, having positive impact both the on short and long-term productivity of the host country.

Thus, the increase in domestic productivity is expected because FDI will affect the level of domestic wages. The question that arises is whether the presence of foreign multinationals affects the level of wages paid by domestic firms in the same industry. Aitken et.al (1996), Girma and Gorg (2002), Lipsey and Sjöholm (2001) argued that multinational firms often are willing to pay higher wages compared to competing domestic firms, and this is mainly due to the higher level of technology use.

FDI can be considered as a channel of transferring technology and information that will enable the host country to increase productivity, improve the stock of human capital, through investment in education. The entry of foreign multinationals in a country entails the adoption of technological knowledge from domestic companies only if the workforce is able to absorb this knowledge and become more productive. Generally, it is considered that the higher investments lead to higher productivity which is reflected in higher wages for labour in the host country.

Evidence about the relationship between FDI and wages in the European Union

In 2002, increases in real gross wages in 15 European Union countries were 1% (compared to 2001). In Greece, the increases were 3.1% and the country was first in the ranking of countries based on increases in real wages. During the period 1996-2002, increases in real wages were high (+2.8% to 3% per year) in four of the 15 member states of the European Union: Greece, Great Britain, Sweden and Portugal.

Labour productivity in the European Union in 2002 increased only by 0.7% and changes per country ranged between 0.5% and 2.5% with only two exceptions: Ireland and Greece, in which labour productivity increased by 4.5% and 4.1% respectively. Despite that in Greece the highest increases in real wages in 2002 (+3.1%) were observed, there was simultaneously a decrease (-1.1%) in unit labour costs in real terms through higher productivity. Substantial decline in real unit labour costs in 2002, appeared only in Ireland (-3.6%), Spain (-1.1%) and Greece (-1.1%), compared to a reduction -0.2 % across the European Union. The average monthly salary in 2002 was EUR 1348 in Greece and EUR 2147 on average in other European Union countries. The corresponding figure for Portugal was EUR 1197. The monthly labour costs were EUR 2642 in the Euro zone.

According to the above analysis, we conclude that the presence of foreign multinational companies is a great potential to increase of the salaries.

We can distinguish two different cases. The first is that when increasing the presence of foreign multinationals in the domestic economy there is an increase in demand for labour leading to pressure for higher wages in the entire domestic economy. In this case, there is higher productivity of foreign firms compared to that of domestic. But in the second case, assuming that foreign multinationals possess more technologically advanced production methods, and therefore higher productivity than domestic, result to two effects on wages of domestic economy. The first effect is that the increased demand for labour will push for wage increases.

The second effect comes from the difference in productivity between domestic and foreign firms. If domestic companies manage to absorb new technology and adopt more productive methods, then the wages paid by multinationals and domestic firms will increase. But if domestic firms fail to adopt new production methods because of their low-tech background, this will result in productivity gaps expressed as differences in wages paid by these companies to employees. In this case, the foreign multinationals pay higher wages than domestic firms.

Empirical investigation of the relationship between FDI and wages in Greece

In this section, the relationship between FDI inflows and domestic wages in Greece is explored for a 20-year period of time i.e. 1980-2000. Four alternative models are estimated in order to obtain a better insight of the links existing if any, among the selected explanatory variables and the labour cost.

All time series used have been tested and found stationary containing no unit roots. In addition to that, residual tests have been carried

out in order to ensure that the explanatory variables do not suffer from heteroscedasticity and serial correlation. Also, the time series employed are not linear combinations as the Ramsey Reset test has shown.

The data are drawn from the database of the General Secretariat of the National Statistical Service of Greece. As base year, the year 1995 has been selected.

Estimation of model using labour cost in terms of product units

The impact of FDI on domestic wages for the Greek economy is examined. Using data from 1980 to 2000 on FDI inflows in the country, the regression proposed by Aitken et al. (1996) is estimated.

$$\log(\text{Labour cost}) = c + a (\text{FDI}) + \log(\text{Capital Stock}) + \varepsilon \text{ (eq.1)}$$

The independent variables used are the inflows of foreign direct investments in the country (FDI), and the capital stock (Capital Stock) for the period 1980-2000. As dependent variable the cost of business for each employee expressed in product units (Labour cost) is considered. In order to eliminate the effects of inflation, deflated prices (base year 1995) are used. The results are presented in table 1.

Table 1: Estimation output of equation 1

Dependent Variable: LOG(LABOUR)				
Method: Least Squares				
Sample(adjusted): 1 20				
Included observations: 20 after adjusting endpoints				
Newey-West HAC Standard Errors & Covariance (lag truncation=2)				
LOG(LABOUR)=C(1)+C(2)*FDI+C(3)*LOG(CAPITAL)				
	Coefficient	Standard deviation	t-statistics	Probability
C	3.890671	1.005799	3.868240	0.0012
FDI	-0.000119	5.11E-05	-2.337507	0.0319
Capital stock	0.158884	0.211243	0.752139	0.4623
R-squared	0.312989	Mean dependent var		4.555233
Adjusted R-squared	0.232164	S.D. dependent var		0.093739
S.E. of regression	0.082140	Akaike info criterion		-2.023297
Sum squared resid	0.114699	Schwarz criterion		-1.873938
Log likelihood	23.23297	F-statistic		3.872438
Durbin-Watson stat	1.152406	Prob(F-statistic)		0.041133

The results in table 1 show a negative relationship between FDI and the level of domestic wages. The increasing inflow of FDI in Greece reduced the level of domestic wages. It is expected that an increase of 1 unit in FDI will lead to lower domestic wages by 0.000119.

On the contrary, a decrease in FDI by 1 unit will result in a reduction of wages by 0.000119. The coefficient of FDI for is statistically significant 5% significance level, so that FDI has a significant effect on domestic wages. The effect of capital stock on the domestic wages is not statistically significant.

Estimation of model using labour cost in terms of monetary units

Instead of labour cost per employee expressed in production units (labour cost), labour cost expressed in monetary units (wage cost) could be used alternatively. The following regression is estimated employing the same sample and independent variables:

$$\log(\text{Wage Cost}) = c + a(\text{FDI}) + b \log(\text{Capital Stock}) + \varepsilon \quad (\text{eq.2})$$

Table 2: Estimation output of equation 2

Dependent Variable: LOG(WAGE)				
Method: Least Squares				
Sample(adjusted): 1 20				
Included observations: 20 after adjusting endpoints				
Newey-West HAC Standard Errors & Covariance (lag truncation=2)				
LOG(WAGE)=C(1)+C(2)*FDI+C(3)*LOG(CAPITAL)				
	Coefficient	Standard deviation	t-statistics	Probability
C	4.462068	1.352883	3.298193	0.0042
FDI	-0.000113	7.01E-05	-1.609679	0.1259
Capital stock	0.039262	0.282470	0.138996	0.8911
R-squared	0.155568	Mean dependent var	4.577522	
AdjustedR-squared	0.056223	S.D. dependent var	0.105905	
S.E. of regression	0.102885	Akaike info criterion	-1.572933	
Sum squared resid	0.179950	Schwarz criterion	-1.423574	
Log likelihood	18.72933	F-statistic	1.565939	
Durbin-Watson stat	1.137015	Prob(F-statistic)	0.237574	

As shown in table 2, the coefficient of FDI, for 5% significance level is not statistically significant. So, FDI do not influence the level of domestic wages. The same conclusion applies to the cost of capital stock.

The fact that no statistically significant relationship between the domestic wages and foreign direct investments is found, could be due to that especially for Greece, FDI inflows are quite limited compared to other countries.

Estimation of model using GDP ratios as explanatory variables

In an effort to find a statistically significant relationship between foreign direct investments and domestic wages the equation (2) is modified. Instead of the FDI variable, the logarithm of ratio FDI/GDP is used. Also, in the place of capital stock, the logarithm of ratio capital stock/GDP is used. Thus, the regression to estimate is the following:

$$\log(\text{Wage Cost}) = c + a \log(\text{FDI/GDP}) + \log(\text{Capital Stock} / \text{GDP}) + \varepsilon \quad (\text{eq.3})$$

Table 3: Estimation output of equation 3

Dependent Variable: LOG(WAGE)				
Method: Least Squares				
Sample(adjusted): 1 18				
Included observations: 18 after adjusting endpoints				
Newey-West HAC Standard Errors & Covariance (lag truncation=2)				
LOG(WAGE)=C(1)+C(2)*LOG(FDIG)+C(3)*LOG(CAPITALG)				
	Coefficient	Standard deviation	t-statistics	Probability
C	3.367368	0.613618	5.487726	0.0001
FDI/GDP	-0.450340	0.151174	-2.978960	0.0094
Capital stock /GDP	0.397300	0.205083	1.937263	0.0718
R-squared	0.394269	Mean dependent var		4.567601
Adjusted R-squared	0.313505	S.D. dependent var		0.106410
S.E. of regression	0.088166	Akaike info criterion		-1.868177
Sum squared resid	0.116599	Schwarz criterion		-1.719782
Log likelihood	19.81360	F-statistic		4.881740
Durbin-Watson stat	1.272275	Prob(F-statistic)		0.023286

According to the results in table 3, there is a statistically significant relationship between the level of domestic wages and the ratio of FDI inflows in the country to the respective GDP. This negative relationship may be due to low productivity of Greek enterprises in comparison to foreign.

This difference in productivity may lead to different levels of wages paid by domestic and multinational companies. Still, the relationship between wages and the domestic capital stock to GDP remains not statistically significant.

Estimation of model using trade as explanatory variable

The empirical investigation of the relationship between the labour cost with the FDI inflows and the degree of integration of the Greek economy expressed by the ratio of imports and exports to GDP is of particular importance. Considering as dependent variable the labour cost and independent variables the FDI inflows and a new variable (imports + exports)/GDP, the following regression is estimated:

$$\text{Labor Cost} = c + a \text{ FDI} + b (\text{imports} + \text{exports}) / \text{GDP} + \varepsilon \quad (\text{eq.4})$$

Table 4: Estimation output of equation 4

Dependent Variable: LABOUR				
Method: Least Squares				
Sample(adjusted): 1 20				
Included observations: 20 after adjusting endpoints				
Newey-West HAC Standard Errors & Covariance (lag truncation=2)				
LABOUR=C(1)+C(2)*FDI+C(3)*TRADE				
	Coefficient	Standard deviation	t-statistics	Probability
C	115.3398	17.93896	6.429570	0.0000
FDI	-0.013423	0.003059	-4.388030	0.0004
(imports + exports) / GDP	-0.369187	0.566617	-0.651564	0.5234
R-squared	0.293223	Mean dependent var		95.52400

Adjusted squared	R-	0.210072	S.D. dependent var	8.864612
S.E. of regression	of	7.878679	Akaike info criterion	7.103679
Sum squared resid		1055.251	Schwarz criterion	7.253038
Log likelihood		-68.03679	F-statistic	3.526417
Durbin-Watson stat		1.071564	Prob(F-statistic)	0.052348

From table 4, it can be concluded that FDI appear to have a statistically significant negative effect on wages of domestic firms. The variable (imports + exports) / GDP does not seem to affect significantly the level of domestic wages. In that case, the trade among Greece and other countries does not affect significantly the wages of domestic firms. In contrast, the FDI inflows in the country seem to affect significantly the level of domestic wages.

Conclusions

The research concerning the impact of FDI on domestic wages does not lead to clear conclusions. It is considered that FDI promote economic growth in the host countries but it is difficult to conclude if they tend to increase domestic wages. In many cases, the multinational companies offer higher wages compared to domestic achieving higher levels of productivity. This result could be attributed to low labour productivity. In the case of Greece, four alternative models were estimated in order to discover a statistically significant relationship between labour cost and FDI. The results revealed the existence of a negative relationship between FDI inflows and domestic salaries. Finally, host countries, including Greece, have to value the net externalities steaming from the presence of multinational companies relative to the profits they earn. On the first hand, foreign companies diffuse their knowledge and their technologically advanced production methods in the reception countries but on the other they tend to employ the most skilled employees. This could cause a major handicap for the domestic enterprises which try to be as competitive as the multinationals.

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