

# **Determinants of foreign direct investment in the business service industry**

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## **Abstract**

This paper has been devoted to the analysis of determinants of foreign direct investment into modern business services (BS). The aim was to investigate factors affecting location decisions of multinational corporations (MNC) using both macroeconomic and regional perspective. The latter proved to be an especially efficient approach. This is due to the fact that foreign companies operating in BS are highly unequally distributed across particular economies. In general, there are only few regions attracting bulk of operations in BS. The research method applied in the paper was negative binomial regression, which measures the outcome variable that is affected by various factors. The advantage of the conducted analysis in this paper was using macroeconomic, regional and firm-level data. The explanatory variables were divided into two groups: demand and supply. The main conclusion of the research concerns high significance of supply factors. In other words, foreign companies focus on locations offering large number of skilled workers at the reasonable price.

**JEL Classification: F21; F23**

Keywords: foreign direct investment, modern business services, regions, European Union

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## 1. Introduction

Services became crucial for most economies, not only the developed ones but also for many emerging ones. The fragmentation of business activities that first took place in manufacturing was essential in introducing less developed countries into the global economy. Nowadays, the focus shifts towards business services (BS), which constitute a distinctive group within the broad service sector. Thanks to the organizational and technology advances BS became internationally tradable and attracted vast amount of foreign investment. These all made business services a very important element of international economics analysis.

Especially when we focus on the knowledge-intensive business services (KIBS). They are defined as relying heavily on professional knowledge (Miles, et al. 1995). Examples of such services are: IT support, management consultancy or technical engineering (den Hertog 2000). KIBS firms are also more innovative than manufacturing ones, what results in the higher average innovation intensity (Kam and Singh 2004). The modern BS are prone to foreign direct investment (FDI), what is confirmed by the recent development in the flow of capital into this industry.

This paper is aimed at investigating recent flows of FDI into BS in European Union with the distinction between old (till 2004) and new member states (2004 extension). Such approach is justified by the rising importance of such operations in so called new Europe. The selection of these economies is justified by a significant increase in number and value of investment projects in the analysed sector in the last decade. The number of new investment projects in services by foreign MNCs is high and sufficient time has elapsed to assess the effects of the projects already completed. Additional measure of the significance of business services sector is the level of employment, which reached 150,000 jobs in Poland (2015), including 130,000 in enterprises with foreign capital. Approximate numbers of jobs in other countries in the region are as follows: Hungary – 50,000; Czech Republic – 40,000; Slovakia – 30,000. According to some estimates in the coming years, this level may rise to about 1 million throughout the region.

This paper aims at enriching literature regarding FDI in several ways. First, the novelty of the paper lies in using a unique dataset that contains observations precisely selected as belonging to the modern BS. The dataset is constructed using firm-level data what allowed for elimination of observations not meeting the criteria of activities described as modern BS. The next novelty lays in attitude towards FDI. The firm-level data allowed for selecting companies created as a result of FDI. Such approach helped avoiding transactions with no real operations or only using the round tripping. This is the case especially in services, which are sometimes

used in tax optimization strategies. Third, the factors influencing decision about FDI in BS were divided into two groups: supply and demand, and the analysis was conducted accordingly.

The research method applied in the paper is the negative binomial regression, which is the extension of the Poisson model. The research approach is designed to for the outcome data of the count nature. In our case the outcome variable is the number of foreign firms operating in the selected service industries, which is affected by the set of explanatory variables.

The remainder of the paper is organised as follows. Section 2 delivers a review of previous contributions in the field of determinants of BS; Section 3 contains data description; Section 4 delivers the outline of an econometric strategy; Section 5 contains results of the analysis; and Section 6 delivers concluding remarks.

## **2. Previous theoretical and empirical contributions**

Previous contributions focused greatly on BS in the broad meaning of this notion including for example, trade or transportation. Such services are very different from the modern BS, which are based on knowledge and high skills. These services are increasingly important for the competitiveness of firms and in effect also entire economies. Modern BS may be considered from expansion and consolidation point of view. When it comes to the expansion, BS such as research and development or consulting create unique knowledge giving the edge to companies. When it comes to the consolidation, modern BS help to reduce costs and increase efficiency of processes. It is also important to note that large firms (notably MNCs) have more capabilities to introduce organizational improvements.

Theoretical contributions on the determinants of inflows of FDI into BS are rather scarce. The approach to foreign investment in services is based on theoretical background built on manufacturing activities. Moreover, the approach generally focuses on services in broader term. As a result there are no explicit and widely accepted theoretical models regarding the modern BS. However, the very useful approach to BS in general was provided by (Markusen and Strand 2009). The advantage of the model is also comprehending the effects of service activities for production factors' markets in a host economy. Nevertheless, their approach has some shortcomings as the model fails to comprehend advanced organizational strategies of MNCs.

There is also little empirical evidence regarding determinants of location choices of FDI in modern BS. Moreover, the framework applied to study FDI in services is similar to that explaining FDI in manufacturing sector (Nefussi and Schwellnus 2010). However, some

assumptions regarding location choice of services might lead to different effects of distance (Navaretti and Vanables 2004). Additionally, the research approach frequently did not distinguish between types of services (Ramasamy and Yeung 2007).

Much richer is the empirical evidence regarding the factors influencing inflow of FDI into manufacturing e.g. (Head, Ries and Swenson 1999) or (Amiti and Smarzynska Javorcik 2005). Additional important element of investment in manufacturing were agglomeration effects. Especially reducing transportation costs leads to more agglomeration in industries with vertical links (Venables 1996). Agglomeration is even more evident in modern business sectors (see comment to figure 2 on page 7).

One of the approaches in empirical literature was to link investment in services with previous investment in manufacturing. The role of services was diminished only to support activities to more important production activities. Such approach does not treat business services as autonomous operations. Moreover, the role of services as intermediary to other business services was neglected. Many of the IT or accounting operations are delivered to financial or transportation firms. Frequently, those firms do not market their activities in the country of producing services. Such approach also does not take into consideration that services do not have to provide in the same location as manufacturing due to communication technologies. This was also against the theoretical framework of multinational corporations (Carr, Markusen and Maskus 1998), which assumes that services of knowledge-intensive activities can be supplied to additional production facilities at low cost and they can be separated geographically from the production.

Additional strand in empirical analysis focuses on employing data on the regional level instead of national one. European regions were analysed by (Castellani, Meliciani and Mirra 2013). They also focused on linkages between investment in manufacturing and business services. The period of analysis included period 2003-2008, therefore it did not include the period of large wage of investment projects in the new member states. However, the author of this paper argues that investment in services is attracted the same locations as manufacturing, but this is the result of high attractiveness for investors. Such regions are more attractive and have better supply of production factors than other parts of economies. Anyway, analysis on the regional level is considered as having strong advantages in explaining determinants of investment in BS and therefore will be used in this paper as the principal approach.

### 3. Data and variables

The econometric analysis in this paper was conducted using three sources of data. Data on the number of investment projects in modern BS was elaborated using Amadeus database by Bureau van Dijk. There were five NACE Rev. 2 activities selected: 6209 – *Other information technology and computer service activities*, 6910 – *Legal activities*, 6920 – *Accounting, bookkeeping and auditing activities, tax consultancy*, 721 – *Research and experimental development on natural sciences and engineering*, 722 – *Research and experimental development on social sciences and humanities*. Such approach helped to list companies that were purely engaged in business services. If the number of activities were expanded some holding companies or manufacturing firms organised under the umbrella of a service company would have been included. Such approach might devastate the results of the study.

Sadly, there are doubts that many earlier studies included broader categories pertaining not only to service firms and not only to FDI in BS. The list of companies for this study was elaborated using additional information, e.g. real activities of the companies. According to the best knowledge of the author such composition of the population gives the most precise image of the entities operating in the modern BS. The author tried to list the companies with their business functions. In this study, modern business services sector includes: business process outsourcing, shared service centres, information technology outsourcing and research and development centres.

Additional inspection of the data revealed some worrisome facts. As a result all Irish firms had to be removed due to a strong evidence that some of them were not established for services' delivery but for the purpose of the tax optimization. The largest company in the Irish population reported revenue of over 12 billion euros employing only 54 people. In many cases the value of revenue was disproportionate to the size of operations. We can associate it with the tax optimization strategy named Double Irish<sup>2</sup>. Additional cleaning was of technical nature: British and Greek firms were removed due to lack of NUTS 2 designation. Also one firm from Cyprus was removed and four cases from Malta. The final population of countries encompassed 18 European Union member states, including 6 countries that joined in year 2004 (appendix 5).

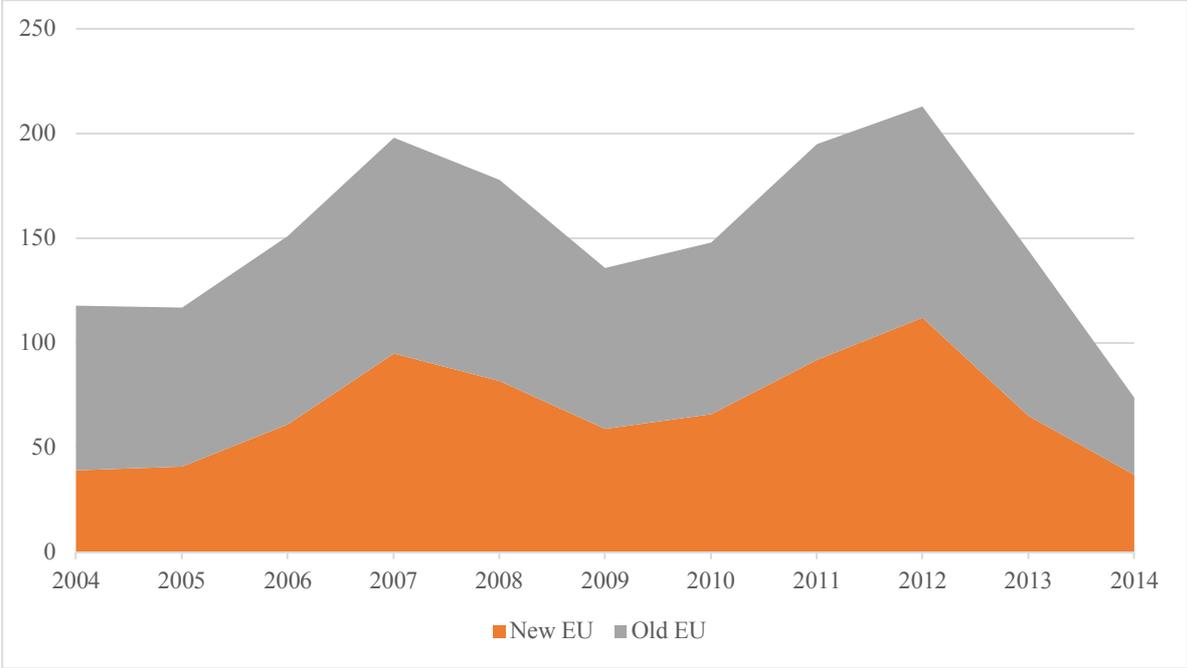
The source of data on the macro level was OECD.Stat and Eurostat provided data on regional level – NUTS 2. The period of analysis included years from 2004 till 2014. The motivation was analysing operations after enlarging the EU and thus increasing possibility of

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<sup>2</sup> Double Irish – tax avoidance strategy using two Irish companies, first one with tax residency in an offshore tax jurisdiction and second one with tax residency in Ireland

investment in services. Moreover, this was also the period of unprecedented growth of business services in EU, especially in the new member states (figure 1).

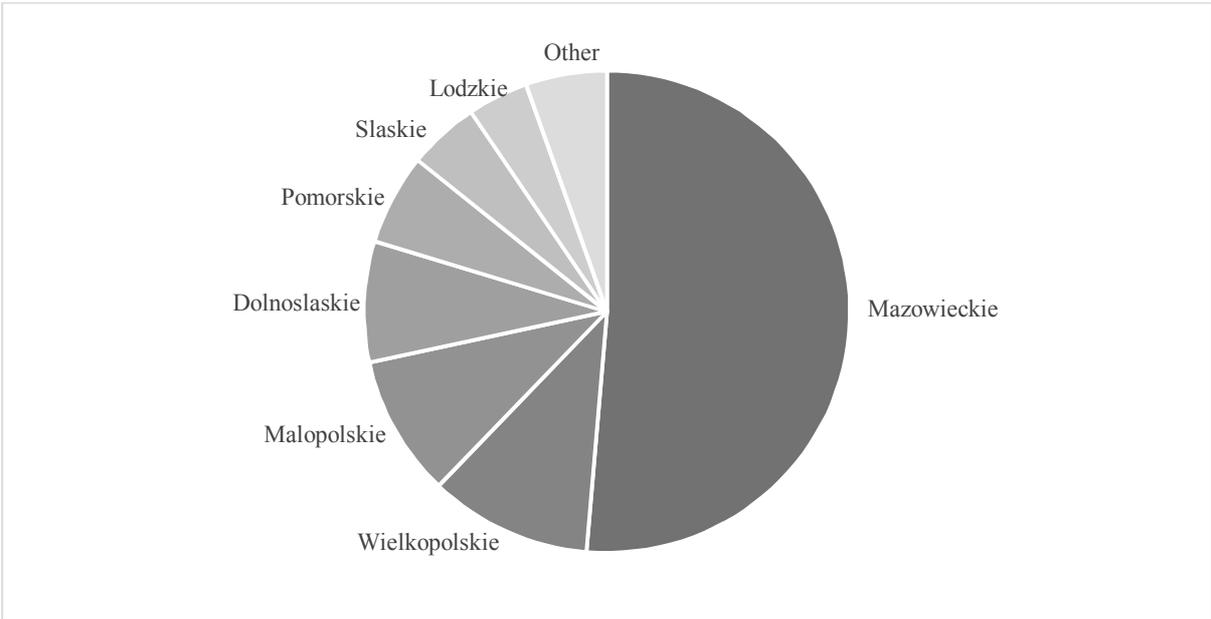
**Figure 1. Number of foreign companies operating in the business services industry**



Source: own elaboration based on Amadeus data

Regional approach to the analysis of FDI inflowing to the modern BS (figure 2). The main fact is unequal distribution of foreign-owned companies across country and significant agglomeration effects. In the case of Poland, out of 16 NUTS 2 regions, only 12 received any foreign investment, and 9 regions received more than 1. Extreme situation is observed in the case of Mazowieckie (Masovian) region, which took over 50% of all projects. This is the region with capital of the country. Similar pattern were observed in most of the analysed countries.

**Figure 2. Main locations of BS investment in Poland**



Source: own elaboration based on Amadeus data

The explanatory variables were divided into two groups: supply and demand factors. Moreover, the author wanted to provide robust results, therefore separate specification for data on regional and macroeconomic level was provided (table 1 and 2).

**Table 1. Description of dependent variables on regional level**

Variable	Description
Supply factors	
Number of students	Number of students in tertiary education by NUTS2 regions. Unit: thousand students. Source: Eurostat
Human capital	Population aged 30-34 with tertiary educational attainment by NUTS 2 regions. Unit: percentage. Source: Eurostat
Unemployment	Unemployment rate in the group 25+ by NUTS 2 regions. Unit: percentage. Source: Eurostat
Salaries	Compensation of employees divided by employment by NUTS 2 regions. Unit: thousand euro. Source: Eurostat
Demand factors	
Market size	Gross domestic product at current market prices by NUTS 2 regions. Unit: million euro. Source: Eurostat
Market attractiveness	Real growth rate of regional gross value added at basic prices by NUTS 2 regions. Unit: percentage change on previous year. Source: Eurostat

**Table 2. Description of dependent variables on country level**

Variable	Description
Supply factors	
Urbanization	Share of population living in urban areas. Unit: percentage. Source: OECD.Stat
University rate	Tertiary level enrolment rate. Unit: percentage. Source: OECD.Stat
Employment in services	Total employment in service sector. Unit: percentage. Source: OECD.Stat
Salaries	Annual salary in the economy. Unit: US dollar. Source: OECD.Stat
Demand factors	
Market size	Gross domestic product at current market prices. Unit: million US dollar. Source: OECD.Stat
Market attractiveness	Gross national income per capita. Unit: US dollar. Source: OECD.Stat
Trade openness	Trade openness: Unit: percentage. Source: OECD.Stat

#### 4. Econometric strategy

The econometric approach in this paper was based on count data, what stipulated using a form of Poisson regression. The basic form of Poisson probability function is given as follows:

$$P(n)=\exp(-\lambda)\lambda^n/n \quad (1)$$

where  $\lambda$  is the mean and the variance of the distribution and  $n$  is a count of the number of times an event occurs. In our case  $\lambda$  means the set of predictor variables  $x_i$  influencing the number of foreign controlled companies operating in the business service sector:

$$\lambda_i= \exp(\beta x_i) \quad (2)$$

Equidispersion can be presented by the following equation:

$$E(n) = \text{var}(n) \quad (3)$$

However, the observed data frequently display overdispersion (Greene 2008). Overdispersion (mean of the outcome variable was much lower than its variance) of data was revealed by summary statistics, therefore an extension to the general Poisson form had to be applied. The problem of overdispersion is solved by negative binomial regression models.

Following (Castellani, Meliciani and Mirra 2013) the functional form of the model used in the paper is given as follows:

$$\ln \lambda_i = \beta X_i + \varepsilon$$

Two step estimation procedure was applied in order to investigate the determinants of FDI in modern BS. First, we use only the regional data. The predictor variables describe supply and demand factors in the period of the analysis. In the second step we use panel data on the country level. The same key of division into supply and demand factors was applied here.

The dependent variable in both steps is the number of foreign controlled companies belonging to a particular NACE group that were established between 2004 and 2014. In the regional analysis the dependent variable is the number of companies in particular NUTS2 regions. In the country analysis the dependent variable is the number of foreign companies in particular countries.

## 5. Estimation results

The study revealed the strong influence of both supply and demand factors. Results of the econometric analysis indicate the power of the regional determinants of FDI into modern BS. Coefficients pertaining to both supply and demand factors were highly significant. The supply coefficients had values according to the underlying theory (column 1 in table 3). Hence, modern BS are very knowledge intensive and require vast resources of human capital. According to the results regions having larger number of students and larger share of highly educated population attracted larger number of foreign firms.

Not only the quality of production factors is important for potential investors, but also the price of the input. It is revealed by the significance of the coefficient for salaries. The higher the salaries in the region the lower number of investors in modern BS. Another important element in the analysis is the unemployment. Investors are looking for destinations with

abundance of human capital. This can be interpreted as a part of global quest for talents. However, in both old and new EU countries the number of available highly qualified workers is limited. The fact is that there is a strong competition between foreign investors to attract talented staff. Therefore the period of the first decade after the large expansion of EU in 2004 was crucial in the development of modern BS in new member states.

The variables of demand factors on the regional level were also highly important (column 2 in table 3). It means that investors are attracted to larger and more prosperous regions. These results can be associated with earlier evidence that size of the market and its growth are important factors because of the links between modern BS and other industries. However, the demand factors may be also associated with supply factors. Thus, larger and growing economies are attracting more and better skilled employees to all industries.

**Table 3. Results of Poisson regression using regional data**

Variable	(1)	(2)
Observations	120	93
Constant	2.2712 (.4617)	.3166 (.1330)
Supply		
Number of students	.0052 *** (.0015)	
Human capital	.0386 *** (.0136)	
Unemployment	-.0692 *** (.0324)	
Salaries	-.0656 *** (.0159)	
Demand		
GDP		.0061 *** (.0022)
GDP change		.4600 *** (.0757)

Notes: Standard error in parentheses, \*\*\* - significance at 0,01, \*\* - significance at 0,05, \* - significance at 0,1

The econometric evidence on the level of economies was less conclusive. The demand factors proved to be important also on this level (column 2 in table 4). However, the sign of coefficient for the size of the economy was not as expected. The fact is that many smaller economies like Slovakia, Estonia, Czech Republic or Luxemburg are attracting disproportionately large number of investment projects in BS. The second macroeconomic factor – GDP per capita – being a rough measure of the level of wealth in the economy – came as expected. Higher level of the measure increases the number of foreign companies in the economy. The fact is also that firms investing in particular EU economies take advantage of the common market. This may reduce the role of demand factors. However, the last variable – openness to trade – has also negative sign. This can be interpreted as necessity to locate BS in destinations that has certain level of trade restrictions. It is important to note that only EU economies were studied in this paper, however the business links through FDI in BS had global form. Therefore it was worth including the variable pertaining to trade openness.

The supply factors on the macro level were quite mixed (column 1 in table 4). First, only two out of four coefficients were statistically significant. Level of education in the economy proved to be important factor for the overall number of projects in the economy. The second significant coefficient – salaries – was not as expected. According to the study higher salaries are translated into larger number of projects. Anyway the value of the coefficient is very low. It can be interpreted that KIBS investment are directed into economies of higher level of human capital, but at the same time of higher salaries. This is not in line with the first part of the analysis, when lower salaries in regions were increasing the number of companies operating there.

**Table 4. Results of Poisson regression using panel data on economy level**

Variable	(1)	(2)
Observations	161	166
Number of groups	17	18
Constant	2.3735 (2.1621)	1.9508 (.4855)
<b>Supply</b>		
Urbanization	-.0181 (.0390)	
University rate	.0137 * (.0075)	
Employment in services	-.0099 (.0238)	
Salaries	.0001 ** (.0000)	
<b>Demand</b>		
GDP		-.0008 *** (.0003)
GDP change		.0001 *** (.0000)
Trade openness		-.0183 *** (.0074)

Notes: Standard error in parentheses, \*\*\* - significance at 0,01, \*\* - significance at 0,05, \* - significance at 0,1

The author believes that such two-level analysis of determinants is improving the understanding of location decisions in modern BS. The most important factors proved on both level was the level of education and abundance of highly qualified workers. The demand factors were quite inconclusive.

## 6. Conclusions

This paper has been devoted to the analysis of determinants of FDI into modern BS. The aim was to investigate factors affecting location decisions of MNC using both macroeconomic and

regional perspective. The latter proved to be an especially efficient approach. This is due to the fact that foreign companies operating in BS are very unequally distributed across particular economies. As a result, there are only few regions attracting bulk of operations in BS in each economy. The research approach using count data was limited only to regions that received at least one project over the period of 11 years. Thanks to such approach we could focus only on regions with some potential to attract investment in modern BS.

The main conclusion of the research is the high significance of supply factors. In other words, foreign companies focus on locations offering large number of skilled workers at the reasonable price. Therefore crucial in the analysis was to include new member states of EU. The regions of the new Europe were characterized by a large pool of highly qualified workers and lower salaries comparing to the old Europe. The special focus on the new EU countries was also justified by a large wave of investment that took place in decade started in 2004, which was also first decade after the large expansion of EU. Companies from old EU take advantage of lower cost and abundance of skills in new member states, while entities from outside EU have the same motivations but also focus on free movement of services across EU.

Further steps in the study of the determinants should focus on even more detailed data. One of the proposals is to include data on the regional NUTS3 level. Such approach may be justified by the fact that most of the projects are located not only in several NUTS2 regions but only in several cities across particular economies. Then additional determinants may be taken into consideration, such as office rent or quality of life that varies within particular cities. Therefore data on such detailed level may shed some more light on the issue of the determinants. Additional element in the analysis should focus more on firm-level data. As a result characteristics of particular investors should be taken into consideration.

Recommendations for governments interested in attracting this type of investment is focusing on increasing human capital in the economy. This is crucial for development of many economies, as it can be observed in investment policies aimed at attracting KIBS. More and more government agencies responsible for assisting foreign investors highlight modern BS as the desired and supported activities.

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Appendix 1. List of economies in the study

Country	New member state of European Union (2004 expansion)
Austria	No
Belgium	No
Czech Republic	Yes
Denmark	No
Estonia	Yes
Finland	No
France	No
Germany	No
Hungary	Yes
Italy	No
Luxemburg	No
Netherlands	No
Poland	Yes
Portugal	No
Slovakia	Yes
Slovenia	Yes
Spain	No
Sweden	No