Geography as a determinant of FDI in the tourism and transport sector: The case of Greece

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Abstract: *Using data from a questionnaire survey which has been sent to more than 4,500 companies – domestic and subsidiaries of MNCs – of the main sectors of the Greek economy and focusing especially in the tourism and transport sector, we investigate the influence of natural geography of Greece, known as 'first nature' of geography, in attracting Foreign Direct Investments (FDIs) in the above sectors. This investigation is carried out in comparison with 'second nature' of geography – which refers to the proximity of economic agents – and other determinants, such as excessive bureaucracy, corruption, infrastructure and workforce. The results indicate that some factors related to the natural endowments of Greece are more important for both tourism and transport sector than for other sectors. They also indicate that the existence of natural endowments, such as proximity to sea and climate, is vital for the attraction of tourism FDIs, while geographic position of Greece seems to be the most important geographic factor in attracting FDI in the transport sector.*

Keywords: Foreign Direct Investment, 'first nature' of geography, tourism, transport, Greece

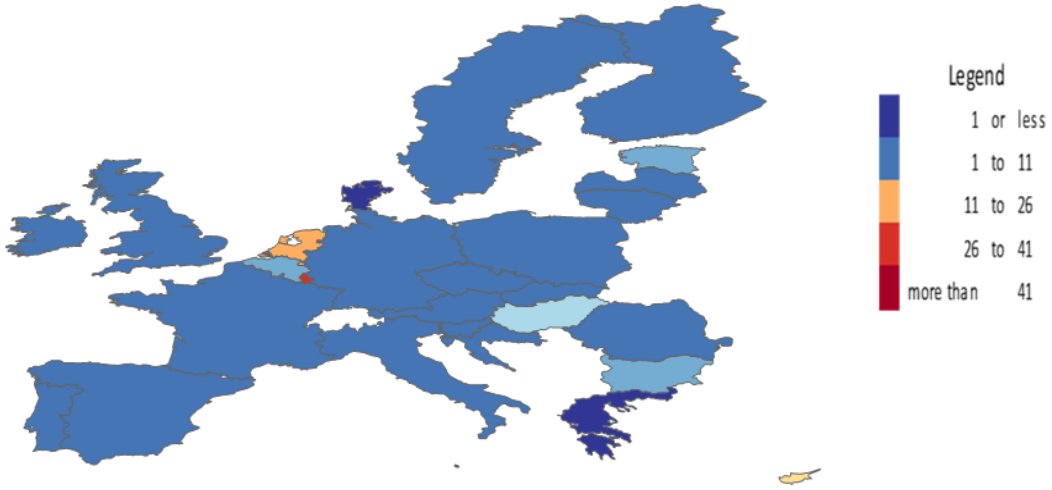
1. Introduction

Given the importance of Foreign Direct Investments (FDIs) in the economic development and growth of a host country, both at national and sub-national levels, for instance, through their positive effects on the balance of payments, their contribution to the increase of employment of skilled labor, and through the fact that foreign-invested firms are technologically superior, increasing the productivity spillover effects (Blomström & Kokko, 2002), FDIs constitute one of the main outlets for economic and social welfare of Greece as well as one of the main solutions in facing economic and social problems created by the prolonged 2008 economic and financial crisis, in the post-memorandum era.

Despite the boom in global FDI flows from about US$205 billion in 1990 to over US$1.7 trillion in 2015 (UNCTAD, 2016), Greece was not a major attraction in the years leading up to the 2008 global financial crisis, compared with other European countries. Only in 2006 and 2008 did Greece attract satisfactory FDI inflows. Specifically, in 2006 the Greek net inflows of FDI amounted to about US$5.4 billion and reached a peak in 2008, with its net inflows of FDI amounting to a little over US$5.7 billion (World Bank, 2019). From 2010, when the Greek crisis deepened, to 2015, there was a downward trend in FDI inflows. Since 2016, there has been a recovery of FDI, largely due to the privatization program implemented by the Greek government, at the request of the lenders. The lag between Greece and other countries of the E.U. is illustrated in Figure 1.

Tourism and transport are two sectors of great importance for their contribution to the GDP growth of the Greek economy. The tourism industry had a direct and indirect contribution of 16.3 per cent to Greece's GDP in 2013 (SETE, 2014) and 19.7 per cent in 2017 (WTTC, 2018). The direct contribution of the sector to the GDP of Greece in the last years – after 2011 – has exceeded 6 per cent and is steadily rising. The transport industry, due to the country's geographic position and because Greece is a maritime superpower with an important role in maritime transport in the Asia - Europe chain (Dalakis et al., 2014), is currently one of the main promotional sectors for the country's development. OECD statistics indicate that in 2017, the contribution of transport's sector Gross Value Added (GVA) as percentage of the GDP of Greece reaches a rate of 7 per cent and in absolute numbers amounted to 10,994.35 million Euros.

Figure 1. Net FDI inflows of E.U. countries as average percentage (%) of GDP 2002-2017



Source: Own elaboration using World Bank data.

What drives FDIs to some cities and regions and not to others? According to Dunning's eclectic paradigm, location advantages play an important role in a firm's decision to internationalize, referring not only to the natural and geographical endowments of the host country, but also to the quality of institutions, infrastructures and human resources. A key location advantage of Greece to attract FDIs is its natural endowments.

Using data from a questionnaire survey which has been sent to domestic companies and subsidiaries of MNCs of the main sectors of the Greek economy and focusing especially on the firms of the tourism and transport sectors, this paper tries to explore the impact of 'first nature' geographic factors (i.e. those related to the natural geography of the country) and 'second nature' geographic factors (i.e. those related to its economic geography) in FDI attraction in the Greek tourism and transport sector. In the existing studies, the determinants of FDI are mainly considered to factors that are not related to geography, such as the quality of institutions (Rodrik et al., 2004), trade openness (Kandiero & Chitiga, 2006), quality of transport and telecommunications infrastructure (Shah, 2014) and human resources and stable macroeconomic environment (Noorbakhsh et al., 2001). For this reason, not only will this paper examine the impact of geographical factors in FDI attraction in the case of Greece, but will also control for the influence of the above factors.

The remaining part of this paper is organized as follows. Section 2 reviews the 'first nature' and 'second nature' of geography factors and referring to the characteristics of Greece related to these factors. Section 3 presents the data and the variables of the empirical research as well as the descriptive statistics of the sample. It also presents the results of Principal Component and Factor Analysis. Section 4 presents and describes the results of two different regression models; and finally, conclusions are drawn in Section 5.

2. Theoretical background

2.1 Determinants related to 'first nature' of geography

The term 'first nature' of geography belongs to Krugman and refers to factors exogenous to the economy. It refers to the natural endowments of a region or a whole country that are independent of human activity. 'First nature' at national or subnational level may be one of the reasons for the big differences in the economic development and growth between regions in the same country. According to Rodrik et al. (2004), 'first nature' plays a key role in economic growth of a country, due to its consequences on agricultural productivity, and human and animal diseases. The role of 'first nature' in the economic development of a region or a country is largely related to a rich natural environment and it is interdependence with 'second nature' (Rodríguez-Pose, Tselios, Winkler & Farole, 2013).

Although there is a rich body of literature on FDI determinants, there are rather few studies on 'first nature' and how it affects FDI attraction. Most of these are focusing on the existence of natural resources in a region or a country (Asiedu, 2006; Asiedu & Lien, 2011; Shan, Lin, Li, & Zeng, 2018). We go a step further by examining a series of factors related to the natural geography of Greece. These factors are cited below, based on the existing literature about their impact on economic growth of a region and individual references on how these affect inward FDI flows.

First, proximity to sea is a 'first nature' of geography factor. A concentration of large economic activities is observed in coastal areas, in areas with large harbors and navigable rivers that flow into seas or oceans. This happens because the companies established in these regions are gaining access to international trade by transferring their goods through the maritime channels when compared with regions that are far from the sea, especially isolated mountain areas whose potential commercial activities would be burdened by high transport costs.

Second, climatic conditions, latitude and geomorphology are key 'first nature' of geography factors. Bloom et al. (2003) stress the importance of climatic conditions and latitude in the attraction of business activities and the economic growth of a region or a country and conclude that the cold costal countries with a high percentage of rainfall throughout the year appear to have higher incomes than those with warmer climate, that are located far from the sea and experience longer periods of drought or seasonal rainfalls. Olsson (2005) points out the importance of latitude, meaning a country's distance from Ecuador and its topographical characteristics, while Krugman (1999) notes that countries located closer to Equator tend to be poorer than those located in temperate zones. Masters and McMillan (2001), however, introduce a novel geographic variable relating to the role that climate plays in economic growth: that of ground frost. They believe that ground frost not only plays an important role in the reduction of human morbidity and mortality but also the well-being of both animals and plants. They also believe that it contributes to the development of agriculture, among other things. The climatic conditions of a region are of great importance for the attraction of tourism activities and this is evident in cases such as beach tourism, where sunny weather is an imperative, or in the case of ski resorts and the development of winter tourism, where snow is a prerequisite. In this case, yet another geographic factor is added: that of geomorphology and the need of mountains for a region, which, apart from the role they play in the development of winter tourism, also indirectly contribute to the region's overall development, since they demarcate hydrographic basins and generate microclimates, while, at the same time, depending on their altitude and orientation, they contain the successive layers of vegetation (Nogué and Vicente, 2004:118).

Third, the most studies of the 'first nature' factors relating to the attraction of FDI is that of natural resources, such as Asiedu, 2006; Poelhekke and Van der Ploeg, 2010. Dunning in his eclectic paradigm created in an attempt to explain the reasons behind companies' tendency to become internationalized, places multinational companies in four different categories, depending on their motives for expansion to foreign markets. One of the four categories is that of expansion in search of resources. Therefore, an important motive of resource seeking FDI is the host country's natural resources. Research shows that countries with rich soil, but mainly subsoil, attract FDI that relies on raw material, while repel FDI that do not rely on them (Poelhekke & Van der Ploeg, 2010).

Fourth, a country's or region's geographic distance from other locations, which are rich or poor of natural endowments, could also be considered as a 'first nature' of geography factor, because the absolute and relative location of a country or region is decisive factor of human geography and economic activity (Hall & Petroulas, 2008). Proximity must be examined not only from the geographic perspective but also from administrative and economic one (Ghemawat, 2001). It is more likely to have positive spatial interaction effects between neighboring regions that possess similar geographical, economic, and cultural characteristics, rather than between two remote regions of the same country. Neighboring countries or regions are not only competitors in attracting investment but may also act complementary to each other on attracting them. This influence could be the result of the positive outcomes of diffusion. For instance, high FDI agglomeration in a region may lead to an increased investors' interest in a

neighboring region or country. The opposite is also possible, implying that, for instance, the increase in the average wage in a region, due to FDI flows, may redirect investors' interest towards a neighboring region, where the average wage is lower (Blanc-Brude et al., 2014:798). Within this framework, Blonigen et al. (2007), using U.S.A. FDI flows data in their research, concluded that spatial interdependence exists between neighboring countries. Generally, the geographic position of the host country must be taken into account as a factor for the attraction of foreign investment. This distance contributes to the decrease of administrative uncertainty, audit costs, information asymmetry and transportation costs, thus minimizing FDI's exposure to various types of business risks (Ali & Guo, 2005). In industries, it is quite likely that the greater the distance between the host and the home country, the better the chances are of relocation of the foreign companies' production units to the host country for production purposes (Kowalewski and Radlo, 2014). As far as the distance between the host and the home countries is concerned, Prasad et al. (2017), having as a starting point conclusions of Stein and Daude (2007) on the impact that different time zones between countries have, argue in their paper that the differences in time zones between the home country of the MNCs and the host country have a significant negative impact on bilateral trade relations between countries, but more so in the case of FDI.

Greece has several advantages stemming from its geographic position, which makes it a strategic link with emerging markets in the Balkans, the Black Sea and the Eastern Mediterranean regions. Besides, its position provides Greece sea access to the countries of Asia and consequently commercial communication with the very important and constantly rising Asian market. There is no region of Greece that is over 150 km from the sea; thanks to its rare geography, which is simultaneously the third most mountainous country in Europe. Therefore, its topography is characterized as mountainous with regions extending in the sea, consisting of island groups and individual large and small islands. Another natural endowment of the country is its temperate Mediterranean climate, with intense summer sunshine, moderate to hot summers and mild winters. In terms of energy natural resources, Greece is rich in both renewable energy sources and non-renewable natural resources, such as mineral wealth. Greece is also rich in cultural resources, since it is considered as a cradle of culture and has a large number of world cultural heritage sites.

2.2 Determinants related to 'second nature' of geography

'Second nature' of geography strives to explain concentration of population and economic activity which is independent on the region's natural endowments – meaning regardless of its geographical location. It refers to the proximity between economic agents.

Naudé (2009:2) mentions that 'second nature' includes the density of the population and the population location and composition, all important factors that can explain why regions with similar 'first nature' of geography may achieve different levels of development. According to what Naudé mentions, one can claim that the population size of a market, whether this refers to an entire country or a subdivision thereof, is a crucial 'second nature' geographical factor for FDI attraction. A great number of empirical works – for example those by Kravis and Lipsey (1982) and Artige and Nicolini (2006) – highlight market size as a powerful *ceteris paribus* factor that mostly attracts horizontal FDI. In this light, Jordaan (2004) claims that FDIs are located in countries with larger markets, which have a higher purchasing power, because companies in these markets can achieve greater return on their capital and therefore higher profits. This practice is further supported by Chakrabarti (2001:96) who claims that '*a large market is necessary for an efficient utilization of resources and exploitation of economies of scale'*.

New Economic Geography theory (Krugman 1991, 1999; Ottaviano & Puga, 1998) studies 'second nature' geography in depth, focusing mainly on the agglomeration of businesses or human economic activities in one place – the so-called economies of agglomeration – placing emphasis on the benefits obtained from the creation of the clustering effect. Krugman (1999) mentions 'centripetal forces', such as the impact of the size of the market and especially those markets that are rich with specialized workforce, as a driving force behind businesses agglomeration in a region. Similarly, Ottaviano and Puga (1998), who studied the issue of

spatial clustering and grouping of businesses in global economy, concluded that the combination of factors that favor agglomeration of economic activities includes the increase of internal economies of scale and the economic externalities that arise from the diffusion of technology and labor concentration. Roos (2005:606) claims that real agglomerations are caused by both 'first' and 'second nature' of geography, but he concludes that 'second nature' is more important than 'first nature'.

With regard to FDI, both Wu and Strange (2000) and Guimaraes et al. (2000) argue that the economies of agglomeration play a determining role in the decision making process of FDI. On this point, Halvorsen (2012) points out that FDI agglomeration has a positive effect on the size of FDI, when those investments have a common home country. In other words, economies of agglomeration can, to a great extent, determine foreign investors' decisions on the selection of a location.

Agglomeration economies are divided into two types, which play an important role in location selection for FDIs: a) localization economies, which refer to the arising externalities caused by clustering of firms of the same sector or similar sectors in a specific location, mainly due to labor specialization, lower prices achieved on input supplies, the provision of specialized support services and knowledge diffusion, and b) urbanization economies, which stem from Jacobs's externalities and are characterized by the proximity of overall economic activity and great demand for goods and services in one place (Bronzini, 2007). Despite this classification, Bronzini (2007:975) argues that the ways in which the agglomeration externalities are combined and diffused are rather complex and in some geographical regions a combination of these types may occur.

Finally, the distance that exists between a market and its suppliers, which, even though it depends on the country's geographical position, is considered to be a 'second nature' geography factor, due to its connection to the economic definition of distance and the reduction in transportation costs. Research (Wu & Strange, 2000; Fletcher, Wynstra, Dittrich & Jaspers, 2005) has shown that a significant correlation between a market's distance from its suppliers and its economic growth exists.

In the case of Greece, agglomeration of economic activities around the metropolitan regions of Attica and Central Macedonia has been observed at both regional and local levels. In both regions, the size of the population is significant, since 35 per cent of the overall Greek population resides in Attica and 17 per cent resides in Central Macedonia. The majority of the country's foreign investment is located in these two regions (Petrakou, 2013) and taking into account the criterion of market size, it is safe to say that the attraction of more FDIs is still possible.

Kokkinou and Psycharis (2004), using data from 1996 to 2002, presented a much more balanced distribution and a smaller percentage of FDI agglomeration in the two metropolitan regions. However, in the researches that followed, the great percentage of FDI agglomeration, especially in Attica, was verified. The research conducted by Monastiriotis and Jordaan (2011), which was based on Bank of Greece data for the years 2000 to 2006, states that 87 per cent of FDI flows directed towards the Prefecture of Attica. Focusing on the employment percentage in foreign companies as part of the overall percentage of employment in the country, Monastiriotis and Jordaan (2011) found that FDI flows are, also, present in other areas of Greece – apart from the ones found in the two metropolitan regions mentioned above – such as the island of Lesvos, where FDI flows in the industrial sector can be found, and in the region of the Dodecanese, where someone mostly finds FDI flows that do not belong to the secondary sector of the economy.

Similarly, Petrakou's (2013) empirical research on the distribution of FDI in Greece in 2008 shows that the majority of FDI is concentrated mainly in Attica and secondarily in the wider area of Thessaloniki, especially with regard to the sector of financial activities. However, in Petrakou's research, manufacturing and other activities follow a more diverse dispersion, staying always close to large urban centers. Another interesting point of the research of Petrakou (2013) is that a large number of foreign investments in tourism are established around the island complex of the Dodecanese, mainly due to the geographic advantages of this region with regard to tourism. From these empirical findings, it is evident that in the case of Greece,

especially in the manufacturing sector, agglomeration economies are important for foreign investors' decisions on location selection.

3. Data and methodology

3.1 Data

Owing to the lack of sufficient data, especially those relating to the 'first nature' of geography factors in the case of Greece, the data of this paper came from a questionnaire survey. The questionnaire was created on the basis of the international literature about the determinants of FDI and the theoretical background about the 'first' and 'second nature' of geography factors. The questionnaires were sent to the recipients of the sample through the specialized application "eval & go", during the period February-November 2018. The contact details of the companies came from the Greek companies' database of ICAP Group, "www.findbiz.gr". The main population was the firms – both domestic and FDIs – of the tourism and the transport sector as well as of the remaining sectors, which are located in Greece (as detailed in Appendix A). In the tourism sector, a very large sample of 2,300 domestic and FDI firms were selected by simple random sampling. Only 80 of them are FDI, because there are only few FDIs in the tourism sector located in Greece. In the transport sector, the sample was the total population of the domestic firms and FDIs (964 firms) with the exception of a few very small domestic firms for which there were no contact details available. 42 out of 964 firms are FDIs. Apart from these companies and for comparison purposes, there were also selected companies from the secondary and the rest of the tertiary sector (1,300 firms). Specifically, the population of the ICAP database consists of more than 10,000 S.A. and Limited Liability companies – domestic and FDIs – from the main sectors of the Greek economy (Appendix B). The S.A.s and LLCs (or E.P.E. as they are called in Greece) of these industries are estimated at around 52.5 per cent of all S.A.s and LLCs in Greece, based on the ICAP record (2016). From the above population, about 1,300 companies were selected by simple random sampling. The chosen sample was based on the Saunders et al. (2009: 219) table with a statistical error of 3 per cent. No questionnaires were sent to companies of the primary sector, owing to the very small number of FDIs in this sector. According to this, the aggregate sample consisted of more than 4,500 companies and the response rate for the questionnaires is shown by category in Table 1.

Table 1: Number of companies of the sample and response rate (per sector)

SUBCATEGORY OF RESEARCH	NUMBER OF QUESTIONNAIRES SENT		NUMBER OF COMPANIES THAT RESPONDED		RESPONSE RATE	
	DOMESTIC	FDI	DOMESTIC	FDI	DOMESTIC	FDI
TOURISM	2220	80	415	19	18.69%	23.75%
TRANSPORT (including LOGISTICS)	922	42	177	15	19.20%	35.71%
OTHER SECTORS	1191	109	286	41	24.01%	37.61%

The sizes of the domestic and foreign direct investments in tourism and transport, based on employment, are shown in Figures 2 and 3. It is observed that most FDIs in the tourism sector (68.4 per cent) are companies employing more than 49 employees in contrast to the domestic companies, in which most of them (72.5 per cent) are very small and small companies, employing up to 49 employees. The same image repeats itself in FDIs of the transport sector. They are larger than domestic companies (Figure 3), since 53.4 per cent of the FDIs employ more than 49 employees, as opposed to 25.6 per cent of the domestic companies. The size of FDIs in both sectors stresses their importance for the employment in Greece.

Figure 2: Size composition (per cent) of domestic and FDIs tourism companies of the sample according to the number of employees

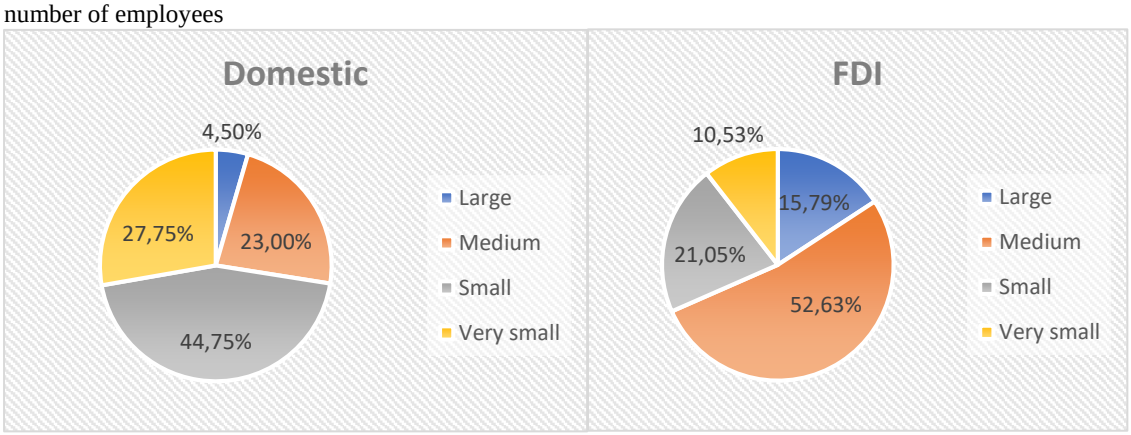
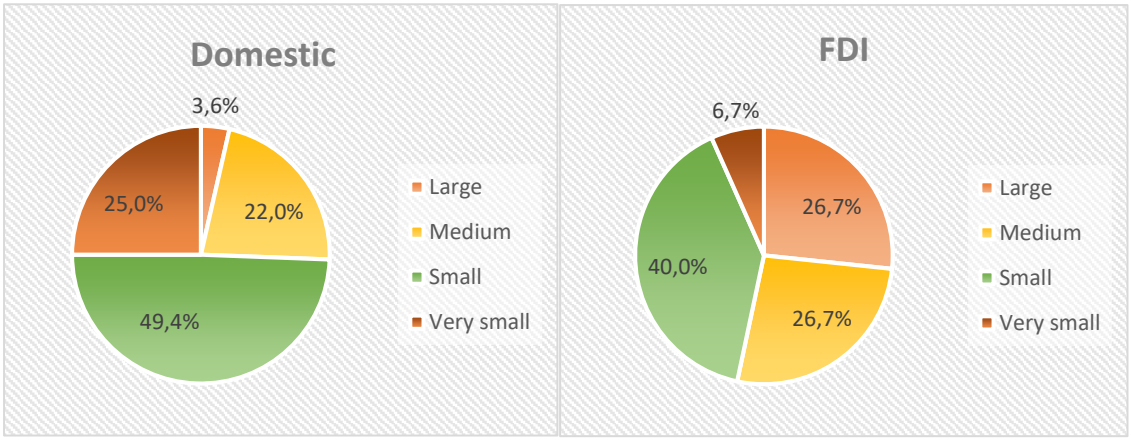


Figure 3: Size composition (per cent) of domestic and FDIs transport companies of the sample according to the number of employees



3.2 Variables and econometric specification

The main research question of this paper is: What is the effect of 'first' and 'second nature' of geography factors in attracting tourism- and transport-FDIs in Greece?

This main question can be decomposed into three sub-questions:

1) What is the effect of the 'first' and 'second nature' of geography factors in the tourism, transport and other sectors (domestic and FDIs)?

2) What is the effect of the 'first' and 'second nature' of geography factors in the tourism sector and to what extent this effect differs between FDIs and domestic companies?

3) What is the effect of the 'first' and 'second nature' of geography factors in the transport sector and to what extent this effect differs between FDIs and domestic companies?

To answer the above questions beyond descriptive statistics, we have used the same equation in two different econometric models - wherein the dependent variable (y_i) varies from case to case - adopting the following form:

$$y_i = \beta_0 + \beta_1 first\_nature_\iota + \beta_2 second\_nature_i + \beta_3 control\ variables_i + \varepsilon_\iota \quad (1)$$

where β_0 is the constant, $\beta_1, \beta_2, \beta_3$ are the coefficients of the above variables and ε_ι represents the regression residuals.

Extending equation 1, to answer the Sub-question 1, we obtain the following probability (multinomial logistic regression) model:

$$sectors_i = \begin{cases} ln\frac{\Pr(sector=tourism\ sector)}{\Pr(sector=other\ sectors)} \\ ln\frac{\Pr(sector=transport\ sector)}{\Pr(sector=other\ sectors)} \end{cases} =$$

$$= \beta_0 + \beta_1 Morph_\iota + \beta_2 Climate_\iota + \beta_3 Acc\_sea_\iota + \beta_4 Nat\_res_i + \beta_5 Cult\_res_i + \beta_6 Nat\_env_i + \beta_7 Country\_pos_i + \beta_8 Loc\_Gr_i + \beta_9 Dist\_suppl_i + \beta_{10} Dist\_cap_i + \beta_{11} Dist\_comp_i + \beta_{12} Market\_size_i + \beta_{13} Corrupt_i + \beta_{14} Bureaucr_i + \beta_{15} Tax\_pol_i + \beta_{16} Crisis_i + \beta_{17} Lab\_force_i + \beta_{18} Trade\_openn_i + \beta_{19} Infrast_i + \beta_{20} Age_i + \beta_{21} Firm\_size_i + \varepsilon_\iota \quad (2)$$

where the dependent variable is a categorical variable with the following categorization: (a) tourism sector, (b) transport sector and (c) other sectors, with reference category being the third category 'other sectors.'

For the part of the next two sub-questions (Sub-questions 2 and 3) concerning the comparison of the effect of geographic factors between domestic companies and FDIs, a similar extended equation will be used in a binary logistic regression model, which is as follows:

$$g(p(FDI_i)) = ln\frac{p(FDI)}{1-p(FDI)} = \beta_0 + \beta_1 Morph_\iota + \beta_2 Climate_\iota + \beta_3 Acc\_sea_i + \beta_4 Nat\_res_i + \beta_5 Cult\_res_i + \beta_6 Nat\_env_i + \beta_7 Country\_pos_i + \beta_8 Loc\_Gr_i + \beta_9 Dist\_suppl_i + \beta_{10} Dist\_cap_i + \beta_{11} Dist\_comp_i + \beta_{12} Market\_size_i + \beta_{13} Corrupt_i + \beta_{14} Bureaucr_i + \beta_{15} Tax\_pol_i + \beta_{16} Crisis_i + \beta_{17} Lab\_force_i + \beta_{18} Trade\_openn_i + \beta_{19} Infrast_i + \beta_{20} Age_i + \beta_{21} Firm\_size_i + \varepsilon_\iota \quad (3)$$

where the dependent variable is a dichotomous variable, which takes the value 0 when the firm that replied to the questionnaire is not an FDI and the value 1 when it is. The above model is used twice, once for the comparison between FDIs and domestic firms in the tourism sector (Sub-question 2) and the second time for the comparison between FDIs and domestic firms in the transport sector (Sub-question 3). In the first model the dependent variable is $FDI_{tourism}$ and in the second model it is $FDI_{transport}$.

The explanatory variables that are examined in both models are ordinal variables and are derived from the opinions of the respondents, measured on the 7-point Likert scale, except the variable '*market_size'*. The following variables are related to the natural geography of Greece (first nature): The $Morph_\iota$ variable reflects the importance of morphology for the selection of location of the company *i*; $Climate_\iota$ reflects the importance of the climatic conditions of the country for company *i*; Acc_sea_ι expresses the importance of access to the sea for the decision of a firm to settle in a certain region or more widely in a country; Nat_res_i expresses the importance of the country's natural resources, and $Cult\_res_i$ reflects the importance of the country's cultural resources for the company *i*. The Nat_env_i variable is used for the influence of the quality of location's natural environment of the company *i*. The $Country\_pos_i$ variable expresses the importance of the country's position on the world map for the company *i*. A classification of the last variable to the 'first' or 'second nature' of geography factors will be done after the factor analysis.

The variables that follow are related to 'second nature': To assess the importance of the market size at national level, a dummy variable is used, the $Market\_size_i$ variable, which takes the value 0 when the answer to the relevant question: "Did the small size of the Greek market have any influence on the firm's decision to invest in the country" is 'no' and the value 1 when the answer is 'yes'. The other 'second-nature' explanatory variables are: $Dist\_suppl_i$ that expresses the importance of distance from the markets from which the raw materials or final goods are supplied by the company *i* for the selection of its location; $Dist\_cap_i$ that reflects the importance of distance from the capital of Greece, attempting to evaluate the effect of agglomeration forces; since Greek literature shows that most of the economic activities are

located around Athens; and $Dist\_comp_i$ refers to the importance of distance of the company *i* from other similar (competing) companies, trying to measure in this way 'localization' effects.

Finally, Loc_Gr_i is a variable that shows the importance of the location of establishment of the company *i* in the Greek territory and is related to both 'first' and 'second nature'.

The remaining variables are control variables concerning other non-geographic factors, which have emerged from the literature review, that are important determinants of FDI. More specifically, the quality of institutions is investigated through two variables: a) the $Corrupt_i$ variable, which expresses the importance of corruption for firm *i* in the formation of the investment environment and b) the $Bureaucr_i$ variable, used for the measurement of the effect of excessive bureaucracy. The Tax_pol_i and $Crisis_i$ variables reflect the importance of the applied tax policy and economic crisis, respectively. Lab_force_i expresses the importance of skilled workforce and $Trade\_openn_i$ the importance of 'openness to trade' in the establishment of an investment in Greece; while $Infrast_i$ is used to express the importance of infrastructure. Finally, we check for the impact of the age of the firm *i* through the variable Age_i and the size of the firm *i* through a categorical variable, the $Firm\_size_i$, which is divided into the following categories: a) very small, b) small, c) medium and d) large, with reference category being the very small companies.

In order to control the reliability of all explanatory variables measured by the Likert scale that will be used in empirical analysis, the Cronbach's alpha Coefficient (Peterson & Kim, 2013), was taken into account. The Cronbach's alpha value was 0.802 > 0.700 and was considered to be quite satisfactory.

3.3 Factor analysis

Before the empirical analysis and to make a clearer classification of the explanatory variables – through the questionnaire replies – to 'first ' or 'second nature' variables, because some of them (i.e. Greece's position or location of establishment of a firm in the Greek territory) are related to both 'natures', there was a Principal Component Analysis. In PCA, in addition to the reduction of the large number of variables to a few main components, the correlation between the variables was examined. The results of PCA, after excluding outliers, are displayed in Table 2.

Table 2: Principal Component analysis using varimax method

	Components				
	1	2	3	4	5
Climate	0,846				
Morphology	0,826				
Cultural resources	0,817				
Natural resources	0,690				
Natural environment	0,674				
Access to sea	0,640				
Distance from capital		0,785			
Distance from suppliers		0,703			
Country position		0,658			
Distance from competitors		0,635			
Infrastructure			0,756		
Trade openness			0,739		
Labor force			0,661		
Bureaucracy				0,734	
Corruption				0,734	
Crisis				0,565	
Market size					0,878
Location in Greece					-0,417

Table 2 shows that the first component includes the variables related to the 'first nature' of Greece. The second one includes the variables related to its 'second nature'. This component includes the position of the country, which in theory relates to both ‘first’ and ‘second nature’ of geography, but in empirical analysis it should be treated as a 'second nature' geographic factor. The third component comprises three non-geographic determinants, referring to the structural characteristics of the country, which are important for its regional and national development. The latter are its skilled workforce, its infrastructure, and openness to trade. The fourth principal component includes institutional factors, while the fifth component consists of two variables, related to both first and second nature of geography. These variables are the size of the market and the location of establishment in the Greek territory.

After KMO test for sampling adequacy, whose result was 0.840 and indicated that sampling was adequate, and Bartlett's Test of Sphericity, whose p-value was equal to 0.000, the validity of factor analysis was confirmed. From the results of factor analysis, displayed in Table 3, some estimates can be made, but it is not possible to define clearly the impact of each component on the companies that are part of each sector.

The results clearly indicate that 'first nature' of geography has a significant positive impact only on the tourism sector, while 'second nature' and structural characteristics of the country have a positive impact on the transport sector. Finally, market size along with the location of establishment in Greece have a positive impact on the investors' decisions of the other sectors.

Table 3: Impact of principal components per sector

		‘First nature’	‘Second nature’	Other (structural) determinants	Institutional factors	Market size & location in Greece
		Mean	Mean	Mean	Mean	Mean
SECTOR	Other	-0.700	-0.031	-0.075	-0.040	0.266
	Tourism	0.668	-0.150	-0.012	0.090	-0.138
	Transport	-0.376	0.383	0.145	-0.136	-0.114

3.4 Descriptive statistics for tourism sector

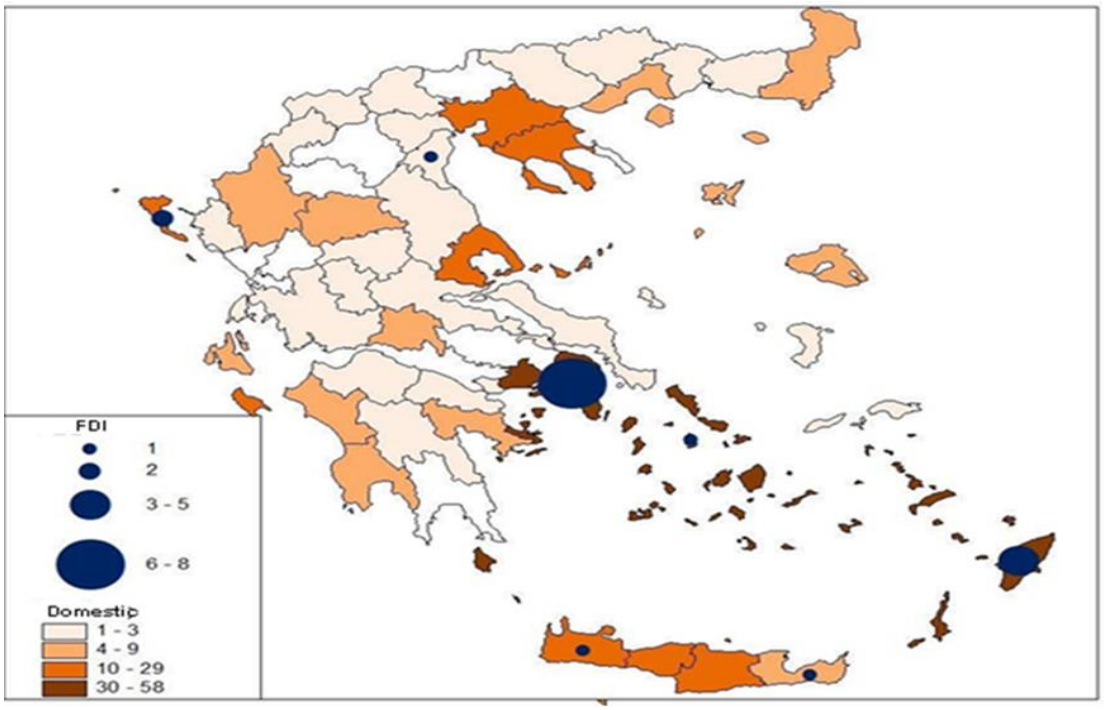
Observing the descriptive statistics of all tourism companies – domestic and FDIs – in Table 4, the importance of 'first-nature' factors is evident, as 5 out of 6 variables have been evaluated over 5.5 on the 7-point Likert scale. The only exception is ‘country's natural resources’, which have just surpassed the neutral point (4) in respondents’ assessment. The most important factor is the climate of Greece, with a mean of 6.075, low standard deviation and low Coefficient of Variation (23.71 per cent). Then, observing the means of the 'second nature' variables, it seems that none of them has any particular effect on the decisions of tourism companies for the location of their establishment. This is because the mean of all ‘second nature’ variables is around 4, which means a neutral effect on the 7-point Likert scale. Finally, from CV percentage, which is greater than 40 per cent in ‘second nature’ variables, a lack of homogeneity in the answers of the respondents arises. For the variables related to both 'first' and 'second nature', which are the impact of the size of the Greek market and the location in Greece; descriptive statistics indicate that market size has no effect on the companies of the tourism sector, while location in Greece has a significant positive impact on the companies of this sector and indeed shows a comparatively high degree of homogeneity in the responses of the sample (CV= 20.91 per cent). Non geographic variables seem to be very important for tourism companies, especially tax policy which has the highest mean and the lowest CV (14.05 per cent) among the seven control variables related to the macroeconomic environment and the institutions of the country.

Table 4: Descriptive statistics for tourism firms (domestic and FDIs)

	Obs.	Mean or percent	Std. Deviation	CV(%)	Min	Max
'First nature' of geography						
Acc_sea	388	5,874	1,70	28,97	1	7
Climate	387	6,075	1,44	23,71	1	7
Nat_res	380	4,258	1,98	46,61	1	7
Cult_res	386	5,624	1,61	28,69	1	7
Morph	385	5,462	1,76	32,20	1	7
Nat_env	386	5,762	1,26	21,88	1	7
'Second nature' of geography						
Dist_suppl	384	3,992	1,83	45,95	1	7
Dist_comp	383	4,245	1,83	43,10	1	7
Dist_cap	379	3,678	1,92	52,07	1	7
Country_pos	381	4,194	1,97	47,08	1	7
Market_size	378					
No	288	76,19				
Yes	90	23,81				
Loc_Gr	381	5,969	1,25	20,91	1	7
Other determinants						
Corrupt	362	5,972	1,34	22,43	1	7
Bureaucr	369	6,539	0,93	14,16	1	7
Crisis	365	5,712	1,47	25,67	1	7
Lab_force	361	5,737	1,26	22,01	1	7
Infrast	361	6,055	1,12	18,44	1	7
Tax_pol	367	6,556	0,92	14,05	3	7
Trade_openn	360	5,839	1,30	22,19	1	7
Age *(of the company)*	421	27,708	14,69	53,02	2	59
Firm_size:	434					
Very small	116	26,73				
Small	188	43,32				
Medium	107	24,65				
Large	23	5,30				

Figure 4 shows the dispersion of all tourism companies surveyed in the Greek territory. The larger share of both domestic companies and FDIs in this sector is established in the region of Attica, which apart from its proximity to the sea has an additional significant advantage: its wealth in cultural resources. In FDIs there is a concentration of a significant share of tourism FDIs in the island complex of Dodecanese, due to its natural advantages (i.e. sun and sea) and its qualitative tourism infrastructures. The prefectures of Corfu and Cyclades and the region of Crete also seem to attract foreign and domestic investors, which demonstrates that regions with natural endowments in combination with transport infrastructures – mainly airports – are able to attract FDIs and domestic investments in the tourism industry.

Figure 4: Tourism Domestic investments and FDIs dispersion in the Greek territory



3.5 Descriptive statistics for transport sector

From Table 5, which shows the results of descriptive statistics for the variables examined in the transport sector, there is evidence that except access to sea and to a lesser extent the natural environment of establishment, the remaining 'first nature' variables have no effect on the location of transport companies. On the contrary, there is evidence that 'second nature' factors are more important than those of 'first nature'. The most important geographic factor for the companies of the transport sector (including logistics) seems to be the location in the Greek territory, which has the highest mean value (5.43), the lowest standard deviation and CV among the other geographic factors.

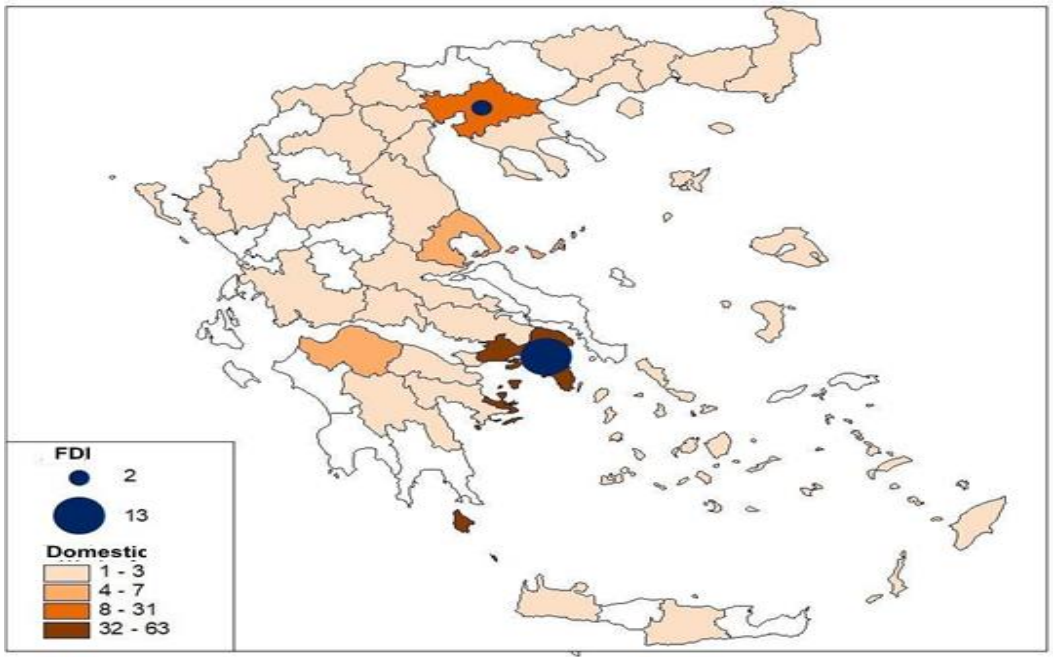
With regard to the other determinants being considered, the most important are tax policy and excessive bureaucracy, as evidenced by their mean values, their standard deviations and their CVs. Also, the other non-geographic determinants examined in this survey seem to be very important for transport managers and owners, since their mean values are greater than 5.5 on the 7-point Likert scale. Moreover, their standard deviations and CVs are low, which confirms their importance for the transport companies that took part in the survey.

In the transport sector as well as in the tourism sector, the approach of the determinants of the company's location will continue by illustrating their dispersion on the map of Greece, as it emerged from the answers of the participants in the survey, to give the reader a first image of the potential factors that can influence location choices of the transport and logistics companies. An important finding from Figure 5, for transport FDIs that participated in the survey, is that they are located exclusively in the two metropolitan regions of Greece, Attica and Thessaloniki, with the overwhelming majority being located in the first region. This shows that agglomeration forces determine the location of foreign investors. It is worth noting that in both these regions, there are large and organized ports. A significant number of domestic companies is located in Magnesia and Achaia, both of which have ports.

Table 5: Descriptive statistics for transport firms (domestic and FDIs)

Variables	Obs.	Mean or percent	Std. Deviation	CV (%)	Min	Max
'First nature' of geography						
Acc_sea	172	5,24	1,996	38,10	1	7
Climate	170	3,95	2,086	52,78	1	7
Nat_res	170	3,36	2,066	61,40	1	7
Cult_res	170	3,18	2,028	63,74	1	7
Morph	170	3,68	2,094	56,96	1	7
Nat_env	168	4,33	1,561	36,08	1	7
'Second nature' of geography						
Dist_suppl	168	4,45	1,987	44,64	1	7
Dist_comp	169	4,39	1,973	44,95	1	7
Dist_cap	169	4,27	2,046	47,95	1	7
Country_pos	170	4,48	2,143	47,82	1	7
Market_size	168					
No	127	75,60				
Yes	41	24,40				
Loc_Gr	169	5,43	1,546	28,48	1	7
Other determinants						
Corrupt	161	5,97	1,353	22,67	2	7
Bureaucr	163	6,45	0,963	14,94	2	7
Crisis	163	5,93	1,230	20,76	1	7
Lab_force	159	5,67	1,381	24,37	1	7
Infrast	160	6,11	1,153	18,87	1	7
Tax_pol	163	6,57	0,889	13,53	1	7
Trade_openn	160	5,94	1,386	23,34	1	7
Age *(of the company)*	179	28,83	17,544	60,85	3	59
Firm_size:	193					
Very small	45	23,30				
Small	95	49,20				
Medium	41	21,20				
Large	12	6,20				

Figure 5: Transport Domestic investments and FDIs dispersion in the Greek territory



4. Empirical results

To give a definite answer to the ***first sub-question***, about the differences in the effects of the geographic factors between the companies of the two sectors in which this investigation is dealt with and the companies of the other sectors of the Greek economy; multinomial logistic regression results are presented in Table 6.

Table 6: Multinomial logistic regression, comparing tourism and transport sector with the other sectors

	Dependent Variable is sectors					
	Tourism			***Transport***		
	(1)	*(2)*	*(3)*	*(4)*	*(5)*	*(6)*
First nature						
Acc_sea	0,161** (0,072)		0,236**(0,079)	0,387***(0,070)		0,379***(0,075)
Climate	0,357*** (0,087)		0,317***(0,093)	-0,124 (0,084)		-0,152* (0,088)
Nat_res	-0,362*** (0,082)		-0,303**(0,091)	-0,071 (0,085)		-0,086 (0,088)
Cult_res	0,500*** (0,075)		0,602***(0,088)	-0,036 (0,084)		0,008 (0,090)
Morph	0,197** (0,082)		0,332***(0,096)	0,171**(0,087)		0,195** (0,096)
Nat_env	0,351*** (0,086)		0,279** (0,095)	-0,072 (0,082)		-0,139 (0,086)
Second nature						
Dist_suppl		-0,110* (0,057)	-0,366***(0,087)		-0,003 (0,070)	-0,089 (0,080)
Dist_comp		0,222***(0,055)	0,026 (0,084)		0,182**(0,068)	0,154** (0,077)
Dist_cap		-0,218***(0,070)	-0,379***(0,082)		-0,090 (0,065)	-0,120 (0,075)
Country_pos		0,186***(0,052)	-0,004 (0,081)		0,185** (0,064)	0,101 (0,078)
Market_size			-0,589** (0,285)			-0,783** (0,281)
Loc_Gr			0,141 (0,099)			0,061 (0,096)
Other determinants						
Corrupt	0,028 (0,109)	-0,044 (0,072)		0,018 (0,112)	-0,048 (0,090)	
Bureaucr	-0,022 (0,168)			-0,181 (0,161)		
Crisis	-0,035 (0,091)	-0,018 (0,066)	0,034 (0,095)	0,178*(0,094)	0,134 (0,088)	0,172* (0,098)
Lab_force	0,154 (0,101)	-0,022 (0,090)	0,131 (0,109)	-0,055 (0,012)	-0,115 (0,094)	-0,057 (0,107)
Infrast	0,119 (0,116)	0,269** (0,090)	0,191 (0,127)	0,234* (0,126)	0,212*(0,112)	0,181 (0,130)
Tax_pol	-0,028 (0,149)			0,032 (0,164)		
Trade_openn	-0,144 (0,106)	-0,116 (0,077)	-0,130 (0,108)	-0,094 (0,108)	-0,060 (0,096)	-0,107 (0,108)
Age	-0,001 (0,002)	-0,001 (0,001)	-0,002 (0,002)	-0,001 (0,003)	-0,001 (0,002)	-0,001 (0,003)
Size						
Very small	Base	Base	Base	Base	Base	Base
Small	0,539* (0,285)	0,282 (0,213)	0,557* (0,308)	0,585**(0,290)	0,513*(0,272)	0,477 (0,303)
Medium	0,042 (0,335)	0,180 (0,258)	0,020 (0,367)	0,339 (0,347)	0,317 (0,330)	0,347 (0,358)
Large	-0,219 (0,177)	-0,406 (0,395)	-0,423 (0,560)	-0,074 (0,519)	-0,075 (0,493)	-0,292 (0,522)
Constant	-6,153*** (1,166)	-0,565 (0,663)	-5,786*** (1,057)	-2,700** (0,759)	-2,597**(0,856)	-3,033** (0,988)
Observations	703	710	692	703	710	692
-2 Log likelihood	1001,183	1402,426	899,069	1001,183	1402,426	899,069
Pseudo R-square	0,552	0,117	0,622	0,552	0,117	0,622
Chi Square (and df)	464,724(34)	76,912(26)	544,461(40)	464,724(34)	76,912(26)	544,461(40)

Notes: 1) *p<0.1 **p<0.05 ***p<0.01 2) Standard errors in the parentheses 3) Reference category is other sectors

Regressions 1-3, relating to the tourism sector, show the significant influence of almost all 'first nature' factors examined, except for the existence of natural resources. The low impact of natural resources on the tourism sector, when compared with others, is expected, because this sector does not depend on the existence of mineral wealth of the country or on the quality of its soil. All the other 'first nature' of geography factors, predominantly cultural resources, have a significant influence on tourism investors than those of the 'other sectors'. The explanation for the positive b coefficient on the 'cultural resources' variable is that it has no influence on the firms of the other sectors, especially those of the manufacturing sector. 'Second nature' factors do not have any positive effect on tourism investors' decision when compared with other sectors' investors, except proximity to other companies in the same sector (competitors). The size of the Greek market also has a negative impact (Regression 3) on investors of the tourism sector when compared with 'other sectors.' Location in Greece has no statistically significant effect on the firms of the specific sector.

Regressions 4-6 of Table 6 display the comparison between the transport sector and the other main sectors of the Greek economy. They show that only access to the sea and Greece's morphology have a positive differentiation from the other sectors. As for 'second nature' factors, proximity to the competitors and Greece's position on the world map have positive differentiation for transport firms. In this comparison, the size of the Greek market has significant negative differentiation for transport firms. Finally, non-geographic factors that emerge as the most important for this sector in relation to the other sectors are infrastructure and to a lesser extent the economic crisis.

Considering ***the second sub-question*** which relates to the impact of geographic factors on **tourism FDIs** when compared with domestic companies in the same sector, the results are presented in Table 7. This table shows the odds ratios (OR) of the explanatory variables, i.e. the log odds of each independent variable in the category under consideration – which is tourism FDIs – in relation to the reference category which is tourism domestic firms. When OR>1, the effect of the explanatory variable is more likely in tourism FDIs; when OR<1, the effect of the explanatory variable is more likely in tourism domestic firms and if OR=1, there is no difference between the two categories compared. In all regressions of table 7, both LR chi^2 and p-value show that the model is statistically significant. Pseudo R^2 reported in the table is McFadden's pseudo-R^2. The results show that there are not statistically significant differences in the effects of the geographic factors between FDIs and domestic firms in the tourism sector, with the exception of the location of establishment in Greece (*Loc Gr*). The latter is less important for foreign investors. As for the non-geographic factors, trade openness and economic crisis have a greater impact on FDIs than domestic firms of the tourism sector. Moreover, there are significant positive differentiation effects in the size of firms, especially in medium and large FDIs, with reference to the very small tourism firms.

Taking into account the ***third sub-question*** which relates to the influence of the geographic factors on **transport FDIs** when compared with domestic companies in the same sector, the results are presented in Table 8. LR chi^2 and p-value in all regressions show that the model as a whole fits significantly better when compared with a model without predictors (Tselios & Tomaney, 2019). The results show that climate and natural environment (Regression 3) are more important factors for FDIs than for domestic firms. They also show that natural resources are less important for FDIs than for domestic firms. As for the 'second nature' factors, the position of Greece seems to be a very important factor for FDIs. Regression 4 also shows that proximity to the suppliers is more important for FDIs than for domestic firms. For the non-geographic factors, trade openness, infrastructure and skilled labor force are more important for FDIs than domestic firms. The variable *size* (*of the firms*) has been omitted from the regression table, because it was not statistically significant.

Table 7: Odds Ratio with robustness check, comparing tourism FDIs with domestic firms

	Dependent variable is: $FDI_{tourism}$			
Explanatory variables	(1)	(2)	(3)	(4)
'First nature' of geography				
Acc_sea	1.106	1.106		1.026
Climate	1.150	1.077		1.208
Nat_res	0.825	0.827		0.859
Cult_res	1.146	1.159		1.117
Morph	0.961	0.987		1.338
Nat_env	1.068	0.964		0.812
'Second nature' of geography				
Dist_suppl			0.891	1.028
Dist_comp			0.906	0.883
Country_pos			0.988	1.067
Dist_cap			1.265	1.403
Loc_Gr				0.471***
Market_size				0.483
Other determinants				
Corrupt		0.803	0.834	
Bureaucr		1.265	1.082	0.567*
Crisis		1.068	1.048	1.493*
Lab_force		1.313	1.270	1.232
Infrast		1.057	0.964	0.696
Tax_pol		0.639		
Trade_openn		1.879	1.594	3.363**
Size (of the firm):				
Very small	base	Base	Base	Base
Small	1.187	0.969	1.149	2.330
Medium	7.000**	5.303	6.464**	21.943*
Large	10.414**	7.888	7.473	64.513**
Constant	0.004	0.0003***	0.0004***	0.0001**
Observations	375	342	345	334
Prob>chi^2	0.006	0.000	0.000	0.000
LR chi^2	23.29	50.65	54.25	52.95
PseudoR^2	0.121	0.160	0.143	0.314
Log pseudolikelihood	-66.075	-56.782	-58.044	-42.009

*p<0.10 **p<0.05 ***p<0.01

Table 8: Odds Ratio with robustness check, comparing transport FDIs with domestic firms

	Dependent variable is: $FDI_{transport}$			
Explanatory variables	(1)	(2)	(3)	(4)
'First nature' of geography				
Acc_sea	0.716		0.5207	0.501
Climate	2.783**		2.236**	4.594***
Nat_res	0.473**		0.397***	0.161***
Cult_res	0.683		0.995	1.076
Morph	0.997		0.731	0.564
Nat_env	1.591		1.997***	3.797
'Second nature' of geography				
Dist_suppl		0.766	1.050	1.501**
Dist_comp		0.965	1.319	1.468
Country_pos		1.769**	3.554**	3.970**
Dist_cap		1.321	1.161	0.900
Loc_Gr		1.018	1.073	1.406
Other determinants				
Corrupt		0.905	0.9232	1.791
Bureaucr	0.426**	0.509*	0.205**	0.096**
Crisis	0.697	0.690	0.407	0.393*
Lab_force	1.417		1.952**	2.277**
Infrast	4.998***	3.394*	4.490***	5.031***
Tax_pol	0.210**			0.141**
Trade_openn	2.909**	1.386*	1.803*	8.410***
Age *(of the company)*	0.979			0.968
Constant	0.008	0.001*	2.28e-06**	1.39e-07**
Obs	140	151	147	137
Prob>chi^2	0.001	0.006	0.000	0.000
LR chi^2	33.25	24.90	43.890	45.18
PseudoR^2	0.412	0.279	0.479	0.613
Log pseudolikelihood	-24.087	-30.195	-21.671	-14.826

*p<0.10 **p<0.05 ***p<0.01

5. Conclusions

The importance of inward FDI in addressing the socioeconomic problems created by the prolonged economic crisis in Greece is widely considered to be very important. The tourism and transport sector are two of the most important sectors for the Greek economy and contribute – especially the first – significant share to its GDP. This paper examined, through the results of primary research, the impact of a series of 'first' and 'second nature' of geography factors on the possible attraction of FDI in the two sectors.

Research findings show that, especially in the tourism sector, the influence of geographic factors, such as the climate of Greece, the quality of natural environment, access to sea and country's geomorphology, have a significant positive influence on the investment of the tourism sector in relation to other economic sectors and show themselves capable of attracting FDI. In the transport sector, apart from the positive impact of the 'first nature' factor of access to sea and the smaller but statistically significant positive effect of morphology, there is evidence that the most important factors are those of 'second nature', such as the proximity to similar competitive firms and the geographic position of Greece, because of its proximity to

other important markets and its sea access to the very important and constantly emerging Asian market. However, these factors have not shown themselves as capable of attracting FDIs in transport, because here non-geographic factors play a significant role, particularly the quality of the country's infrastructure and its trade openness.

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APPENDIX A

Number of firms – **sampling frame** of the accommodation sector (I 55) and the transport & storage sector (H):

ACCOMMODATION (TOURISM) SECTOR		
NACE CODE	**Type of business**	**Number of firms**
55.10	Hotels and similar accommodation	2.993
55.20	Holiday and other short-stay accommodation	484
55.30	Camping grounds, recreational vehicle parks and trailer parks	62
	TOTAL NUMBER OF TOURISM FIRMS	**3.539**
TRANSPORT (TRANSPORTING AND STORAGE) SECTOR		
NACE CODE	**Type of business**	**Number of firms**
49.10	Passenger rail transport, interurban	2
49.31	Urban and suburban passenger land transport	52
49.39	Other passenger land transport n.e.c.	105
49.41	Freight transport by road	472
49.50	Transport via pipeline	2
50.10	Sea and coastal passenger water transport	52
50.20	Sea and coastal freight water transport	19
51.10	Passenger air transport	28
51.21	Freight air transport	13
52.10	Warehousing and storage	157
52.22	Service activities incidental to water transportation	34
52.23	Service activities incidental to air transportation	17
52.24	Cargo handling	35
	TOTAL NUMBER OF TRANSPORT FIRMS	**988**

Source: Own elaboration using data from "www.findbiz.gr" database (ICAP)

APPENDIX B

Sectors except tourism and transport, which constituted the category "Other sectors"

Economic Sector	**Sub-sector**
Tertiary	Retail sale of food, beverages and tobacco
Tertiary	Consultancy services
Tertiary	Retail sale of information and communication equipment
Tertiary	Information service activities
Tertiary	Development of building projects
Tertiary	Telecommunications and various other commercial activities
Secondary	Construction companies
Secondary	Energy production companies
Secondary	Manufacture of chemicals and chemical products
Secondary	Manufacture of medicines and cosmetics
Secondary	Manufacture of soap and detergents
Secondary	Manufacture of plastics products
Secondary	Manufacture of food, drinks and beverages
Secondary	Manufacture of wearing apparel and leather products
Secondary	Manufacture of fabricated metal products

Source: Own elaboration