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The effect of certain factors on FDI attraction A cross-country analysis

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Table of contents

Abstract	5
Introduction.....	6
Chapter 1: The meaning and the role of FDI	7
1.1 The globalization of business activities	7
1.2 Foreign Direct Investment: meaning and historical evolution.....	10
1.3 Classification of FDI.....	13
1.4 The factors that affect a country's capability to attract FDI	16
Chapter 2: Examining the most crucial factors that tend to influence inward FDI- A historical analysis.....	19
2.1 Market size and inward FDI	19
2.2 Economic stability and inward FDI	20
2.3 Labor cost and inward FDI	21
2.4 Trade openness and FDI inflows	22
2.5 Sample presentation and historical data on the variables examined.....	23
Chapter 3: Research Methodology.....	26
3.1 Formation of research questions	26
3.2 Empirical Results	30
3.2.1 Preliminary Analysis.....	30
3.2.2 Equation Estimations	39
3.3 Summary Results	50

Conclusions.....	53
References.....	56
Websites.....	62

Table of contents of figures, diagrams, tables and graphs

Figure 1.1: Cavusgil’s three stage globalization procedure.....	10
Diagram 1.1: Inward FDI in developing countries 1970-2004.....	12
Diagram 1.2: Inward FDI in developed countries 1970-2004.....	13
Diagram 1.3: Classification of FDI according to the directional principle.....	14
Diagram 1.4: Classification of FDI according to the target principle.....	15
Diagram 2.1: Inward FDI by country of low value of flows in million of Dollars 1990-2014.....	24
Diagram 2.2: Inward FDI by country of medium value of flows in million of Dollars 1990-2014.....	25
Diagram 2.3: Inward FDI by country of high value of flows in million of Dollars 1990-2014.....	25
Table 1: Correlations.....	31
Table 2: Variables.....	33
Graph 1.....	35
Graph 2.....	36
Graph 3.....	37
Graph 4.....	38
Table 3: Estimation of Equation (I).....	40

Table 4: Estimations of Equation (II)	44
Table 5: Estimations of Equation (III)	48
Table 6: Summary of Methodology & Findings.....	50

Abstract

In this Master Dissertation we examine the effects of (i) the direct taxes to GDP ratio, of (ii) the nominal unit labor cost, and of (iii) the business cycle fluctuations on the FDI net inflows, for the 19 Euro Area member states between 1999 and 2014. We estimated with Fixed and Random Effects three equations: one for the level of FDI net inflows, one for the first differences at current time and with one period lag, and one only with lagged differences – model (III). Business cycle was proxied with unemployment rate, and we additionally included a dummy for MOU regimes and one for the post and pre crisis periods. We have found that direct taxation triggers changes in FDI net inflow in the following year, but not for both fixed and random effects. Direct taxes are not associated with FDI net inflow at present time. We found no empirical evidence at all that unit labor cost affects FDI net inflows. Finally, for the business cycle, we found that it is negatively correlated with FDI net inflow at present time, indicating that recessions are associated with lower FDI inflows, but with one period lag, increases in unemployment positively affect FDI net inflows of the following period. We attempted a possible explanation for the counter intuitive results that may serve as a suggestion for future research.

Introduction

This master thesis aims at examining the effects of certain factors on the FDI net inflows. In order to provide a detailed analysis, this thesis includes two parts, a theoretical analysis and an empirical research.

The first two chapters refer to the theoretical analysis of FDI, providing the reader with information concerning its role and importance for economies, historical data and factors that tend to influence it. The next chapter presents the empirical research that took place in order to thoroughly examine the effect that certain factors (that literature suggests) have on inward FDI. At the end of the thesis, the results of the research are critically discussed.

Chapter 1: The meaning and the role of FDI

1.1 The globalization of business activities

During the last decades globalization has become a trend in the business world. In terms of trade, internationalization became necessary as the constant and growing competition between companies to attract clients accelerated the course of events. International business means cross-border transactions, a fact that firms should comprehend when they decide to conduct business out of their home country.

The decision to expand abroad and the increase in the number of multinational companies became a trend after the mid-20th century, as Technology and Informatics presented multiple new ways to produce, innovations to be applied and simply caused many products and services to come to life. Globalization thus became an everyday phenomenon in the business world, as companies that function in more than one country began to increase in number, for various reasons. This new tendency gave the chance to customers from abroad to come in touch with products and services that were not offered in their country, while at the same time the companies penetrating a new market could maximize their sales and profits (Guillén & García-Canal, 2009).

Entering a new market is a decision of strategic importance to a business. It is rather rational that a successful penetration into a foreign market strengthens the position of the company, boosts its reputation and of course supports its further progress and development within new markets (besides the domestic one) (Parker, 2005; McCann, 2011). Literature proposes multiple ways in which a company can enter a new market, from which the most common ones are:

- Exports: the company prefers to export its product to the chosen country in order not to risk making a high capital investment (Parker, 2005).

- Foreign Direct Investment (FDI): this type of penetration is generally preferred by large and experienced companies that can afford an investment of sizeable funds (Parker, 2005; Meyer & Tran, 2006).
- Acquisition: the company enters the new economy with the use of a local market company that already exists in this market, by acquiring either 100% of its share capital or a shorter percentage (Alix *et al.*, 1999; Meyer & Tran, 2006).
- Create a new unit (subsidiary): the company invests a large sum in the new market by creating a subsidiary company which belongs totally to it. The development of a subsidiary aims at providing the mother company with full control of the new unit, in order for the latter to have efficient and direct control of the local market (Ayal & Zif, 1979; Parker, 2005).
- Joint investments with foreign partners: this type of penetration refers to creating a strategic alliance designed to have two or more companies enter together the new market in order for them to share the risk and strengthen their presence there (Soosay *et al.*, 2008).

Each company will choose one or more of the ways described above in order to penetrate a new market, depending on the particular characteristics and conditions that hold in its case. Even if all these ways are rather famous in the global business environment, the most classic way of entry into new markets is by FDI as it expands and even renews the resources possessed and used by the company.

Based on the above methods to market penetration, literature has come up with the theory of the stages of globalization, which in fact describes the whole procedure from realizing that the domestic market is inadequate in contributing to the company's welfare to doing business universally. The stages of globalization according to this theory are (Daft *et al.*, 2008; De Bono *et al.*, 2008):

- Domestic stage:
 - ❖ The company is currently a domestic one, conducting its business activities within the country it is established. All facilities are located at the home country.

- ❖ The company realizes that the domestic market is limited and cannot provide with all necessary conditions for the company to prosper.
- International stage:
 - ❖ The company tries to expand business by exporting its goods abroad.
 - ❖ The home country is not the centre of the company's business interest any more.
- Multinational stage:
 - ❖ The company has expanded by functioning in more than one country.
 - ❖ Some of the facilities are now located in many countries abroad.
 - ❖ A respectable percentage of sales now comes from foreign countries.
- Global (or stateless) stage:
 - ❖ The company is a multinational, constantly seeing the opportunities all over the world to sell and acquire resources.
 - ❖ Due to the company's size, it is not possible to have a central management team, and thus management is dispersed.

Except for the above theory of the four stages, there are academics like Cavusgil (1984) who propose that the globalization procedure takes place within three (and not four) stages. Cavusgil claims that globalization (he in fact referred to exports as a way of business globalization) happens in three stages, that in fact the first one is the combination of stage one and two (domestic and international stages) of the theory mentioned above:

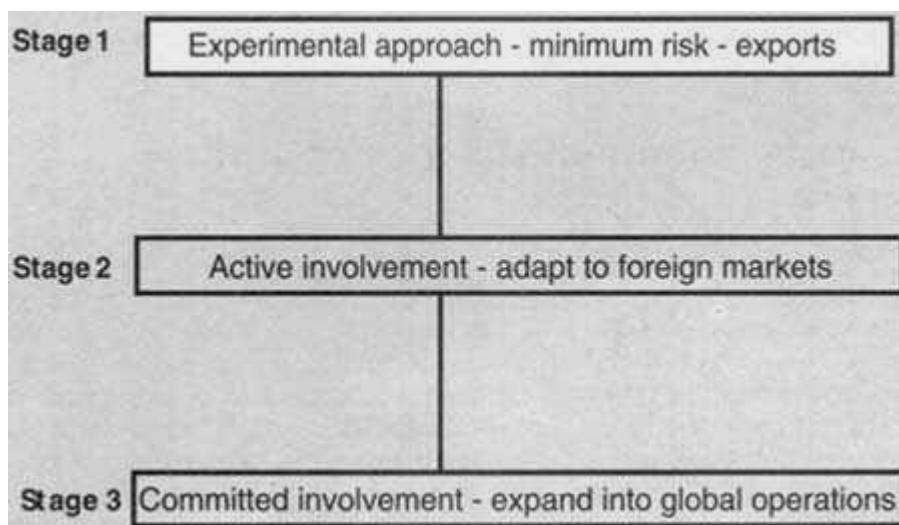


Figure 1.1: Cavusgil's three stage globalization procedure

Source: www.fao.org

1.2 Foreign Direct Investment: meaning and historical evolution

Foreign Direct Investment (FDI) is defined as international capital flows as a means of a company to create a new subsidiary or expand itself in another foreign market (Alam *et al.*, 2013). FDI do not refer to plain transfers of financial resources, as there is another term closely related to FDI's meaning; that of control. The Organization for Economic Cooperation and Development (OECD) states that the two concepts are closely related, as FDI refers to the acquisition of control of a minimum holding of 10% of the share capital of the new company (OECD, 2013).

FDI is undertaken mainly by multinational firms. As the latter are drawn to new markets by different reasons and with different goals, academics are much interested in examining the trends and geography of FDI. Literature and researches show that in recent years the latter have become a key factor of globalization and growth of the international economy (Markusen, 1995; Moran & Blomstrom, 2005; Hay, 2006). It is significant that in the mid-1980s, FDI growth rates exceeded the corresponding international trade ones, proving that they since constitute the primary mechanism of the new globalized economy (Dicken, 2003).

The period that followed the Industrial Revolution is characterized by a simplified economic structure. The industrially advanced countries were the core countries while the other non-industrialized ones constitute the periphery. The core countries consisted of developed economies, particularly the USA and countries of Western Europe, even Japan. These countries were the ones that generated the huge percentage of the international production. On the other hand the countries of the periphery included developing countries. The latter had a double role; they provided the core countries with raw materials and they also were the customers that bought the final products sold from the core countries.

Shortly before the outbreak of World War II, 90% of manufacturing output was produced by just 11 core countries. They sold 65% of their production in the periphery and absorbed 80% of these countries' raw materials. The production activities of enterprises were completed domestically and even within one single corporate unit. This situation is described by the term International Division of Labor (Dicken, 2003).

During this period, the majority of FDI was focused on developing countries, as in 1938, 65.7% of the world FDI capital was concentrated in such economies. Specifically, 30.8% were located in Latin America, 25% in Asia and just 7.4% in Western Europe. The primary focus of FDI at that time was the exploitation of natural resources by more than 50% (Dicken, 2003).

The International Division of Labor maintained this structure until the first postwar years. At that time the focus was shifted towards FDI orientation markets. Consequently there was a significant reorientation of FDI to developed countries. FDI were thus channeled to USA, Canada and the countries of Western Europe. Over the years the introduction of automation and technological innovations in the production process has made it possible to separate the whole production procedure into phases which could no longer be completed within a single corporate unit. Moreover, significant progress in the field of transport and communications has led gradually to liberation of the production factors' markets (Hummels & Stern, 1992).

These events encouraged many companies to decentralize certain stages of their production to countries of the periphery to take advantage of cheap labor and the multiple advantages offered. In the mid-1960s, FDI aimed at enhancing efficiency and reducing production costs internationally. By this way, production began to move to the developing economies, as traditional low-tech industries seek for cheap labor (Hummels & Stern, 1992).

This tendency went on for the next years and gradually caused radical changes in the international manufacturing activity. For the first time, industrial production is decentralized to the developing countries, and the old core ones are not the only ones

capable of producing. By the end of the 1960s, exports from developing to developed countries rose significantly, while during the 1970s they increased even more. Consequently, the old core and periphery production model no longer existed and thus the so-called New International Division of Labour (NIDL) was then created (Fröbel *et al.*, 1977).

The diagram below shows the tendency described above, that during the 1970s and since then the developing countries attracted great worth of FDI:

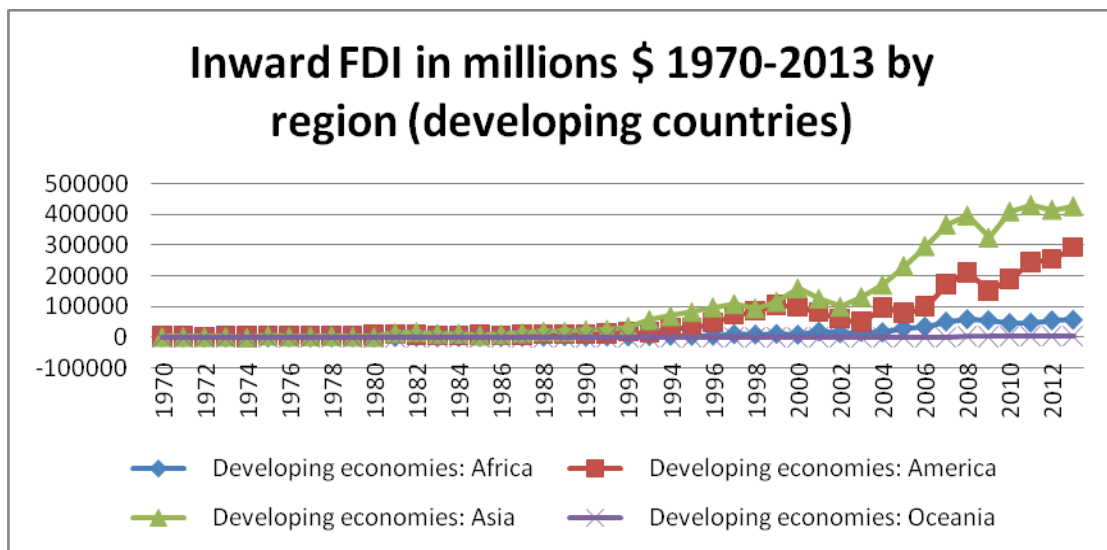


Diagram 1.1: Inward FDI in developing countries 1970-2004

Source: UNCTAD

The diagram below shows the course of inward FDI by region in the developed world during the period 1970-2013:

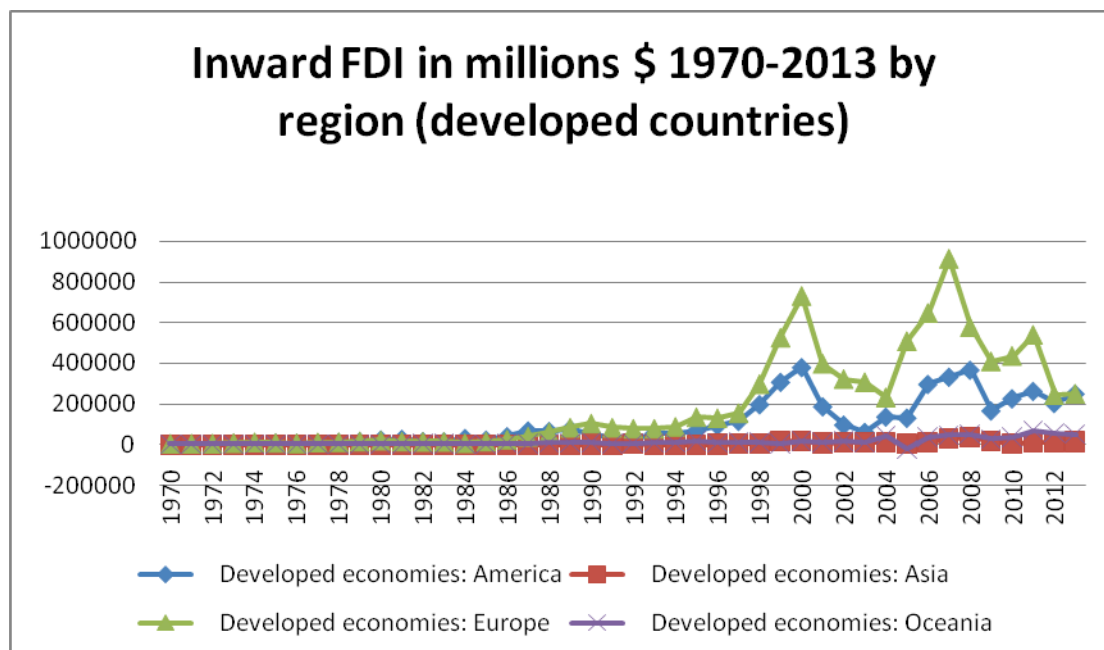


Diagram 1.2: Inward FDI in developed countries 1970-2004

Source: UNCTAD

It should be noted that in comparison to the inward FDI course for the developing countries presented above (Diagram 1.1), this measure has suffered various fluctuations during the last decade (after 2003). Since this period was characterized by financial recession and distress, factors that traditionally affect investments negatively, FDI would naturally be also affected. This fact actually takes place in the developed countries and not at the developing ones, which tend to have an increasing inward FDI course through all this period. This shows that the New International Division of Labour, that describes the production power of the developing countries and thus their attracting power for FDI, still holds.

1.3 Classification of FDI

Literature classifies FDI into groups basing on specific criteria- principles. The most common ones refer to FDI according to the direction, to target and to the motivation.

When it comes to direction, FDI is generally divided into inward and outward FDI (Parker, 2005). The first category describes the investment a foreign investor does in the domestic, local market. Inward FDI is the amount of capital that flows within an economy from a company or an investor that is not established nor lives respectively in the domestic country (Sekkat & Veganzones- Varoudakis, 2007). OECD defines inward FDI as an investment done by a non-local investor in the local market of the host country (OECD, 2008). Outward FDI describes the opposite state of events; a domestic company or investor invests in a foreign market, away from the home country. In this category, capital flows from the local economy to a foreign one, causing the first one to lose its value while the latter gains it (OECD, 2008).

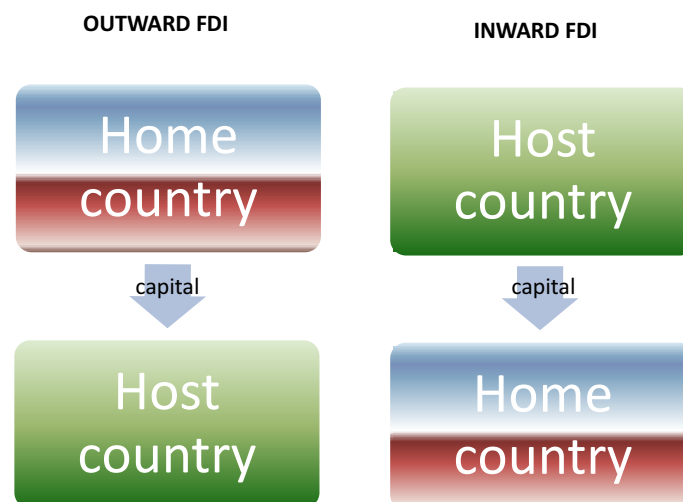


Diagram 1.3: Classification of FDI according to the directional principle

Both inward and outward FDI are measured by three indexes (Eurostat, 2014):

- FDI flows: refers to the new investments that took place within the fiscal year.
- FDI stocks: refers to the value of the investment that remains at the end of the fiscal year.

- FDI income: refers to the income gathered by the investor during the fiscal year.

When it comes to target, FDI is classified into three categories; vertical, horizontal and conglomerate ones. Vertical FDI refers to the expansion of the firm via acquiring either the company (companies) that belong to the former stage of the value chain (backward fragmentation) or the one (ones) of the next stage of the value chain (forward fragmentation). Horizontal FDI describes the company's decision to grow through acquisition of a company (companies) operating at the same stage of the production chain. This type of FDI aims to increasing the mother company's profit from economies of scale and also to increasing its market share. Finally, conglomerate FDI refers to both vertical and horizontal FDI that a company undertakes in order to both expand by acquiring its supplier or distributor and at the same time exploit another opportunity to expand by acquiring another company (rival) in the same stage of production chain (Gammeltoft, 2008).

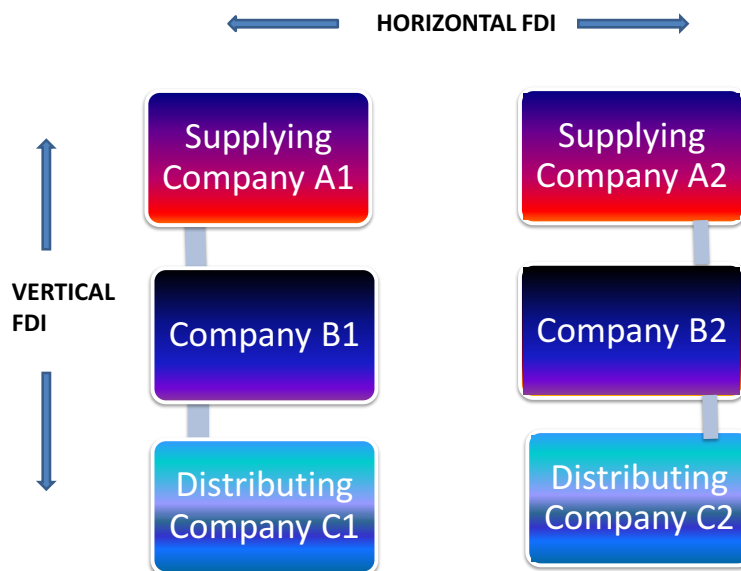


Diagram 1.4: Classification of FDI according to the target principle

When it comes to motivation, literature has long tried to determine and analyze the reasons that explain the attraction of FDI to one country more than others. Thus, multiple theories have been presented through time in order to identify what makes an economy attract (inward) FDI. The most well-known of these theories are going to be further analyzed below.

1.4 The factors that affect a country's capability to attract FDI

Dunning (1993) states that FDI enters an economy for three different reasons, all relevant to the motives that attract FDI in the first place:

- Market- seeking: according to the author, market- seeking FDI aims at starting production activity into a host market mainly to serve the local clients' needs by producing within their country's region. This way ensures to the mother company that it penetrates a new market by eliminating transaction/ transportation costs while at the same time it increases sales and probably profitability.
- Resource- seeking: this type of FDI aims at seriously reducing production expenses since either the necessary resources are limited within the firm's home country or they are rather expensive to provide the company with a decent profit margin. Thus, the company invests by FDI in a new market that ensures the resources needed in a lower price.
- Efficiency- seeking: by this type of FDI, the company seeks for opportunities to decentralize its activities based on economies of scale that appear for each activity in different markets around the world.

Besides Dunning's theory, other ones have also become quite popular. Academics, like Jordaan (2005) and Asiedu (2006), suggest that market size plays a significant role in attracting FDI. By market size studies usually refer to a country's GDP or GDP per capita, as these measures can reveal the market's tendency to grow through time. Both researchers mentioned above tend to agree upon the fact that a market that grows in size will fortunately grow in purchasing power, provoking the aggregate demand to increase and thus create the proper conditions for new firms to enter and succeed.

Another factor often mentioned in FDI studies refers to the degree of openness that characterizes the host country. This specific factor can be measured by the degree to which tariff and other barriers hinder a firm's penetration into the market and its capability to conduct its business there. Under this definition, a company would prefer to enter a market with a rather high degree of openness than one with significant, and often quite pricey, obstacles that are hard to overcome (Sekkat & Veganzones- Varoudakis, 2007; Nourzad, 2008).

Besides the factors presented above, general policy conditions are also an important factor for the host country. As suggested by the UNCTAD (2006), political instability within a country will negatively affect inward FDI. Since the latter is a long term investment for the mother company, it would avoid penetrating a market characterized by uncertainty and political instability, as these do not consist promising conditions for an investment to flourish. Thus, FDI usually fly towards countries characterized by stability, progress and evolution.

Moreover, Ke and Mengtao (2007) agree with all the above and conclude that a country tends to attract more FDI according to its local costs level, the number and market share of foreign invested companies and the market share of local ones. In addition, studies like the one by Bruce and Turnovsky (1999) claim that stability and welfare are strongly related to government budget surpluses, since when the economy prospers, the whole society does so as well.

Since the factors that tend to have an impact on the FDI that a country attracts are numerous, further analysis and discussion will be conducted in order to point out the most crucial factors that influence the course of FDI.

Chapter 2: Examining the most crucial factors that tend to influence inward FDI- A historical analysis

2.1 Market size and inward FDI

Academics tend to agree that the larger the market size, the larger the volume and value of inward FDI. In other words, FDI and market size are expected to have a positive relation. The reasons that justify the latter are mainly referred to the degree to which an economy is growing. Companies and investments tend to fly towards bigger markets, where the conditions that hold there are favorable for new firms to be established.

In fact, the positive relation between those two measures is discussed in multiple researches over time. Davidson (1980) and Aristotelous & Fountas (1996) state that the most profound reason that market size tends to influence inward FDI lies with the fact that investors believe that larger markets have greater possibilities to increase sales, while at the same time the use of local resources can lower costs over time; in other words, larger markets are most probable to permit the development of economies of scale. This is in fact rational, since large markets are usually characterized by greater aggregate demand, causing companies to produce more to satisfy the ongoing tendency for demand (Kinoshita & Campos, 2003).

Market size is in fact one of the most famous variables examined in researches conducted before concerning the factors that influence inward FDI. Janicki & Wunnava (2004), Sahoo (2006) and Vijayakumar *et al.* (2010) use the Gross Domestic Product (GDP) in order to measure market size. Specifically, Janicki & Wunnava (2004) showed that there is a statistically significant positive relationship between inward FDI and GDP, where the latter is used for measuring market size. Sahoo (2006) showed that *GDP is the most significant factor positively affecting FDI inflow into the South Asian countries*. Vijayakumar *et al.* (2010) found a positive relation between GDP and inward FDI in the BRICKS countries, where market size (measured by GDP) is used as an independent variable.

2.2 Economic stability and inward FDI

It is rather rational that FDI tend to flow towards countries characterized by stability, both in political and economic conditions. Academics and analysts pay a great interest in the economy's holding conditions, since traditionally the development of unfavorable circumstances leads to uncertainty, which in turn will cause investors to leave the economy.

Balasubramanyam (2001) states that economic growth has a serious impact on inward FDI. The fact itself that an economy is characterized by stability leads to the rational conclusion that it is also characterized by a strong economy at the time being, and there is not a high risk of decreasing this stability. Thus, under this theory, economic growth reflects a high economic power for a country, which tends to attract foreign capital. Lucas (1990) claims that political risk is very possible to have a positive relation to the limitation of inward FDI. He states that when a country suffers political unrest, then political and country risk is probable to take place for all investments within this economy. Thus, in order to protect himself from high risk, the foreign investor will likely withdraw his capital and thus decrease the level of inward FDI. Kim (2010) tested Lucas' aspect and in fact her findings support the latter's theory; political instability influences inward FDI.

Academics use various tools to measure economic growth and stability. Levine and Zervos (1998) use GDP growth rate to show the progress an economy has in growing and prospering. Barro (1989) uses the growth rate of per capita real GDP in order to measure and examine economic growth of different countries, while King and Levine (1993) also use the same measure in order to represent economic growth. All these studies claim that when a country grows economically, it is expected to have a positive GDP growth rate.

In addition, there is a broad discussion on the way economic growth should be defined and measured. Academics agree that the term is rather wide and there are

multiple aspects that influence and even shape economic growth. The use of GDP as a measure of potential growth within an economy is not always proper, since it tends to obtain basic disadvantages as a measure of prosperity. In order to avoid this problem, some researchers prefer the use of other indicators for measuring economic growth, such as interest rates or inflation rate. Dotsey (1998) uses interest rate spreads as a measure of *predicting both economic activity and the probability of recessions*, while Vijayakumar *et al.* (2010) also propose this indicator for measuring economic growth.

2.3 Labor cost and inward FDI

It is a fact that FDI consists of various ways of entering an economy. Creating a subsidiary or expanding business activities in general is one of the most famous types of inward FDI, when the host country is attractive for the multinational company to invest in.

The decision of a company to penetrate a new market or depends on numerous reasons, merely concerning the nature of its activities, the economy's demand status and the abundance of resources necessary for the production procedure. The multinationals often seek new markets to invest in order for them to gain access to the resources available; the goal is to enter a market that its offers the necessary resources cheaper than either the company's home country or just other ones (the company receives its supplies from). Since nowadays firms tend to invest much in human resource, employing cheap workforce is quite important for the majority of them (Makino *et al.*, 2002).

Academics state that the cost of employment is wage and the lower the latter, the more attractive the economy becomes for new investors. When multinationals realize cheap labor exists within a country, they will likely try to penetrate the market. Thus, labor cost tends to have a severe impact on inward FDI. Bevan and Estrin (2004) state

use unit labor cost (ULC) in order to measure labor cost for the countries under examination and show its impact on inward FDI. Their findings show a negative relation between the variables. Dees (1998) also uses the unit labor cost for the Chinese economy to show that the country's increasing inward FDI has a negative relation to the economy's cheap labor force. Lankes and Venables (1996) use the wage rate as a means of measuring labor cost for economies into transition and showed the negative relation between the countries' attractiveness for foreign investments and high wage rates. Liu *et al.* (1997) also use the wage rate to explain the tendency of inward FDI to increase in the cheap-labor Chinese economy.

2.4 Trade openness and FDI inflows

The degree to which an economy attracts foreign FDI is also relevant to the degree of openness in trade transactions. Academics state that trade openness refers to the absence of tariffs and other obstacles that tend to hinder an economy's capability to conduct exports and imports easily and efficiently.

As it is quite clear, the higher the degree of openness in trade transactions, the more attractive the economy becomes for FDI. Multiple studies show that there does exist a positive relationship between these variables, as FDI are favored by more trade-open markets. Wheeler and Mody (1992) state that governments tend to adopt measures and regulations in order to attract more FDI, as nowadays the latter has become a competitive activity between economies. The need for capital is present as funds motivate investments and these in turn motivate employment, production and welfare. Thus, attracting FDI is absolutely necessary for all economies, developed and developing, in order to prosper and setting the right conditions in order to bring FDI within a country is a basic priority for modern countries.

Even though multiple studies are conducted concerning the impact trade openness has on inward FDI, measuring such a term is in fact complex, as discussed thoroughly in

multiple studies, like the one by Kandiero and Wadhawan (2003). Liargovas and Skandalis (2011) state that in order to measure the degree at which a country is open to trade transactions, measures related to trade should be used. The researchers suggest the use of ratios like either Exports to GDP, Imports to GDP or the sum of the latter as a method to efficiently quantify trade openness. Moreover, the last ratio is also suggested by Dollar and Kraay (2001) as an efficient way to show the degree of trade openness. Other studies have also used the ratios mentioned above for the same purpose. Ang (2008) conducted such a research concerning the factors that affect inward FDI in Malaysia and proved that trade openness (measured by the sum of exports and imports to GDP) have a positive affection on inward FDI. Vijayakumar *et al.* (2010) also used the sum of total trade to GDP and showed that there is a positive relation between the two variables. Except for the ratios mentioned above, other studies use different type of indicators to measure trade openness. The research conducted by Kandiero and Chitiga (2006) is such an example, in which the researchers proved (amongst others) the positive relationship of FDI and trade openness in African economies by measuring trade openness by trade taxes.

2.5 Sample presentation and historical data on the variables examined

This study examines the potential influence all factors presented above have on inward FDI. The countries under examination belong all in the European Union. As every country has various characteristics, European countries tend to differ significantly in the amount of inward FDI they tend to attract. Thus, there are countries that attract lower amount of FDI than others, while at the same time there are countries that tend to attract much higher amount of FDI than the others. Thus, it is considered to investigate the relationship of the factors presented above with inward FDI by categorizing the sample countries into three groups according to the amount of inward FDI that flew in the countries in the period 1990-2014 (UNCTAD, 2015):

- Countries that have low value of inward FDI: Greece, Cyprus, Slovenia, Estonia, Bulgaria,
- Countries that have medium value of inward FDI: Denmark, Finland, Hungary, Sweden, Norway,
- Countries that have high value of inward FDI: France, Spain, Germany, Netherlands, United Kingdom.

Moreover, the following diagrams depict the historic course of inward FDI in all three groups of countries under examination. With a few exceptions over time, it is shown that the countries of each group are characterized by the same level of inward FDI through the examined time period:

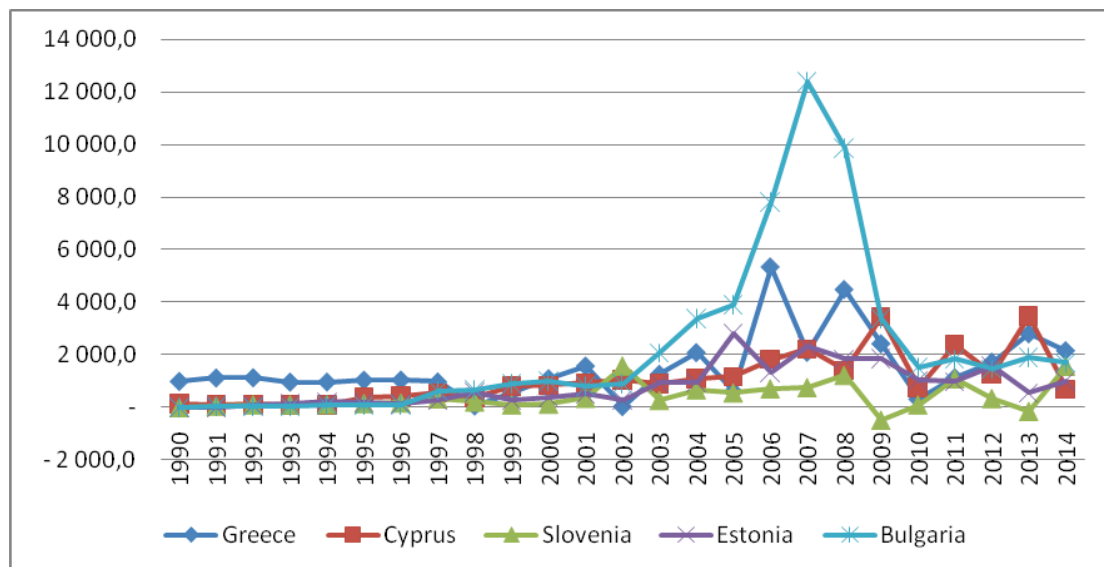


Diagram 2.1: Inward FDI by country of low value of flows in million of Dollars 1990-2014

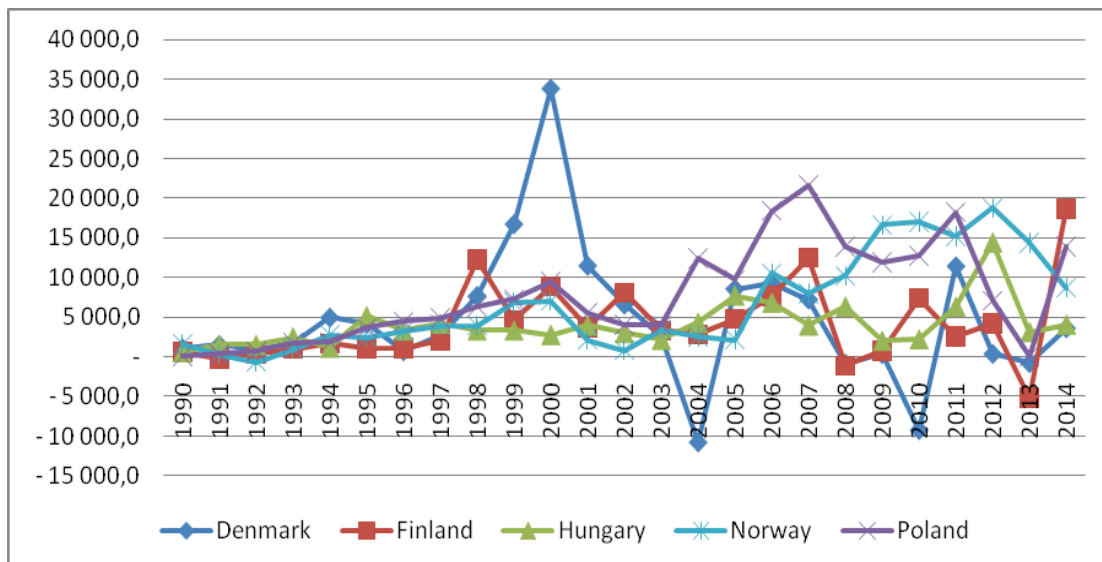


Diagram 2.2: Inward FDI by country of medium value of flows in million of Dollars 1990-2014

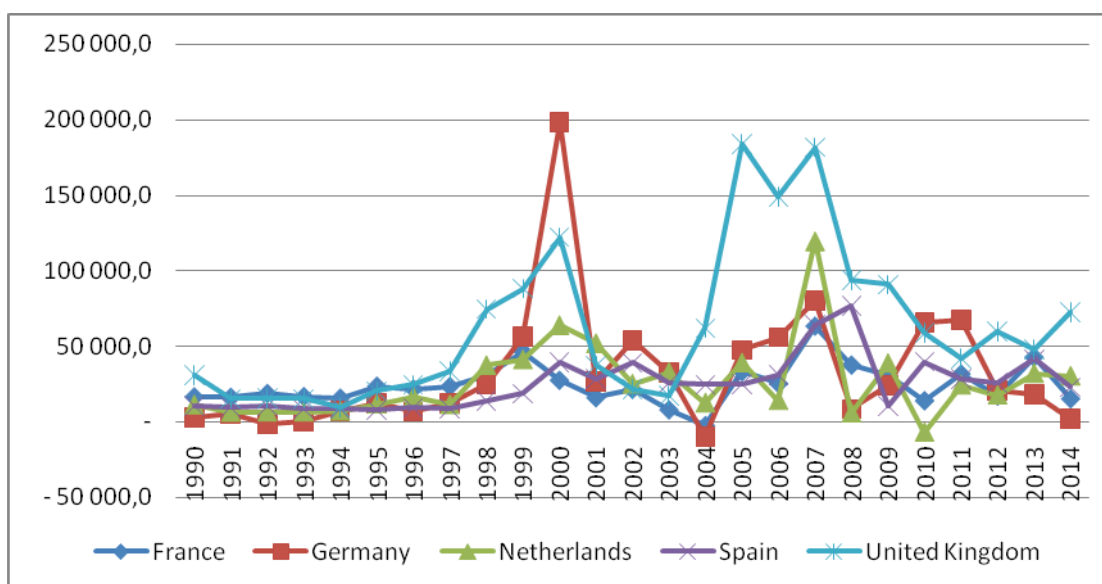


Diagram 2.3: Inward FDI by country of high value of flows in million of Dollars 1990-2014

Chapter 3: Research Methodology

3.1 Formation of research questions

In order to examine the three Hypotheses described above, we will estimate the following equation:

$$FDI_{it}^F = \alpha_0 + \rho FDI_{it-1}^F + \alpha_1 TAX_{it} + \alpha_2 ULC_{it} + \alpha_3 U_{it} + \alpha_4 TAX_{it-1} + \alpha_5 ULC_{it-1} + \alpha_6 U_{it-1} + \gamma_1 MOU_{it}^D + \gamma_2 CRISIS_t^D + u_i + e_{it}, \quad (I)$$

where i is the country index, t the year index, FDI_{it}^F is the FDI inflow (of country i at year t), TAX_{it} is the taxes on income, profits and capital gains to GDP ratio, ULC_{it} is the unit labor cost, U_{it} is the unemployment rate, MOU_{it}^D is a dummy variable taking value 1 if country i is under a Memorandum of Understanding (MOU) regime at time t , and $CRISIS_t^D$ is a dummy taking value one for years before 2008 ($t < 2008$), e_{it} is the regression error that is assumed to be white noise. Furthermore, as far as u_i is concerned, we will estimate the above model with both fixed and random effects for the purpose of robustness. The crisis dummy ($CRISIS_t^D$) was included in order to allow for alterations of the relationship (I) following the outbreak of the global financial crisis. Finally, the MOU_{it}^D dummy was included in order to allow for the effects of structural adjustments under MOU agreements of the FDI host country on the FDI inflows towards this country.

In order to draw safer conclusions we will, also, estimate equation (I) in first differences. That is:

$$\begin{aligned} \Delta FDI_{it}^F = & b_0 + \rho \Delta FDI_{it-1}^F + b_1 \Delta TAX_{it} + b_2 \Delta ULC_{it} + b_3 \Delta U_{it} + b_4 \Delta TAX_{it-1} \\ & + b_5 \Delta ULC_{it-1} + b_6 \Delta U_{it-1} + \gamma_1 MOU_{it}^D + \gamma_2 CRISIS_t^D + u_i + e_{it}, \end{aligned} \quad (II)$$

where $\Delta X_{it} \stackrel{\text{def}}{=} X_{it} - X_{it-1}$. Estimation results from (II) will assist us in investigate the exact effect of policy changes – namely, changes in income, profit and capital gain taxes and changes in unit labor costs – on changes in FDI inflows. Furthermore, we will estimate an equation with only lagged first differences to assess the exact dynamic effects of taxes, unit labor cost and unemployment on direct FDI inflows. In the framework of (III) causality effect is much clearer, as changes in one of the independent variables will affect the dependent one a period later. On the other hand, in (II) and (I) for the non-lagged cases we cannot tell whether there is a causal relationship or a covariance between the dependent variable and each of the independent ones.

$$\begin{aligned} \Delta FDI_{it}^F = & b_0 + \rho \Delta FDI_{it-1}^F + b_1 \Delta TAX_{it-1} + b_2 \Delta ULC_{it-1} + b_3 \Delta U_{it-1} + \gamma_1 MOU_{it}^D \\ & + \gamma_2 CRISIS_t^D + u_i + e_{it}, \end{aligned} \quad (III)$$

(II) and (III) will also be estimated using both fixed and random effects for purposes of robustness.

Based on equations (I), (II) and (III), we may restate the research hypotheses in a more technical manner.

H1: Negative impact of income, profits and capital gains taxation is implied rejecting the two Null hypotheses (H_0^1) $a_1, a_3 \geq 0$, versus the alternative (H_1^1) $a_1, a_3 < 0$.

H1: Negative impact of income, profits and capital gains taxation is implied rejecting the Null hypothesis $b_1, b_4 \geq 0$ in favor of the alternative $b_1, b_4 < 0$, for equation (II).

H1': Negative causal impact of income, profits and capital gains taxation is implied rejecting the Null hypothesis $b_1 \geq 0$ in favor of the alternative $b_1 < 0$, for equation (II).

H2: Negative impact of unit labor cost is implied by rejecting the two Null hypotheses (H_0^2) $\alpha_2, \alpha_4 \geq 0$ in favor of the alternative $\alpha_2, \alpha_4 < 0$.

H2': Negative impact of unit labor cost is implied by rejecting the Null hypotheses $b_2, b_5 \geq 0$ in favor of the alternative $b_2, b_5 < 0$.

H2'': Negative impact of unit labor cost is implied by rejecting the Null hypotheses $b_2 \geq 0$ in favor of the alternative $b_2 < 0$.

H3: Negative impact of unemployment rate is implied by rejecting the two Null hypotheses (H_0^2) $\alpha_3, \alpha_6 \geq 0$ in favor of the alternative $\alpha_3, \alpha_6 < 0$.

H3': Negative impact of unemployment is implied by rejecting the Null hypotheses $b_3, b_6 \geq 0$ in favor of the alternative $b_3, b_6 < 0$.

H3'': Negative impact of unemployment rate is implied by rejecting the Null hypotheses $b_3 \geq 0$ in favor of the alternative $b_3 < 0$.

As we are interested in examining the direction of the impact, negative or positive, we cannot check for H1 and H2 using linear restriction F tests. This is because these F tests conclude on rejecting the null that $\alpha_2 = \alpha_4 = 0$ (or $\alpha_1 = \alpha_3 = 0$) versus the alternative that at least one of the coefficients α_2 or $\alpha_4 \neq 0$ (or $\alpha_1 \neq 0$ or $\alpha_3 \neq 0$), which does not allow us to examine the sign of the coefficients. Therefore, we will reject or fail to reject each null of the research hypothesis, using the following t statistic for each coefficient, separately:

$$t_i = \frac{\hat{a}_i}{\hat{\sigma}_{a_i}}, i = 1, 2, 3, 4$$

where $t_i \sim z_{\alpha=0.05} = 1.96$, because our sample is large enough (asymptotic).

Let us now focus on u_i component of (I) and (II). In case of the Fixed Effects model scheme, u_i is not a random variable, it can be considered a constant, and, hence, $Var[u_i] = 0$. Therefore, for the fixed effects, the country specific regression constant is $\beta_{0,i} = \beta_0 + u_i$. Under the Random Effects (RE) scheme, u_i is a stochastic term, a country specific error term, and, hence, $Var[u_i] > 0$. Accordingly, for the RE estimation, there is no country specific constant, and the regression constant term, β_0 , is the same for all the economies. The fact that RE assumes that the constant term of the model is the same for all the countries is counterintuitive with respect to the economic theory. Assuming that FDI inflow is irrelevant to the specific country that hosts it is a very *hard* assumption to make. However, in order to gain robustness for our results we estimate all three models with both random and fixed effects.

The next section, presents the empirical findings following the estimation of (I), (II) and (III) with fixed and random effects (assuming u_i is not a random variable). Before these main results, we examine the correlations from the pool data between our three variables and how these three variables evolved throughout our sampling period for all the Eurozone countries.

3.2 Empirical Results

In this section, we will present the results of our empirical analysis. In the beginning we will graphically examine the evolution of our variables – FDI net inflow, direct taxes, nominal unit labour cost and macroeconomic fluctuations – and, afterwards, we will present and discuss the Fixed and Random Effects estimations of equations (I), (II) and (III).

3.2.1 Preliminary Analysis

In the first step of our analysis, we estimate the correlations among our dependent and the independent variables. This is crucial for two reasons. Primarily, because we need to exclude the possibility of correlations among the covariates of our estimations in the next steps; in order to exclude the possibility of multicollinearity issues. Secondly, since we have these data in our hands, the correlations among those variables reserve some preliminary attention, as well. This latter, in order to check for some first indications of dependencies and effects.

Table 1 reports the estimated correlations among our variables. These correlations are estimated for the entire panel sample as a pool. From what we observe there are no significant correlations among the FDI inflow as a share of GDP, the direct taxes to GDP ratio, the unit labor cost and the unemployment rate. Only unemployment rate shows some correlation with In other words, based on the pool data, there are no

indications of significant correlation among our variables, and, hence, we may exclude the possibility of facing problems due to multicollinearity.

Table 1: Correlations

	Foreign investment, inflows (<1 share of GDP)	direct net inflows (<1 share of GDP)	Direct Taxes (<1 share of GDP)	Nominal Labour Cost, 2010=1, per person	Unit Cost, 2010=1, per person	Unemployment Rate
Foreign investment, inflows (<1 share of GDP)	1					
Direct Taxes (<1 share of GDP)	0.1933		1			
Nominal Labour Cost, 2010=1, per person	0.1272		0.1126	1		
Unemployment Rate	-0.1971		-0.438	-0.0679		1

Another issue that we may face is the omitted variable bias, because our explanatory variables are few; there must exist other additional unobservable factors that affect FDI inflow, as well. However, as Hsiao (2014) suggests, the panel data analysis accounts for both omitted variable bias and endogeneity. In the case of the omitted variables, suppose that we have the following model:

$$y_{it} = c_0 + \mathbf{C}\mathbf{X}_{it} + \mathbf{\Gamma}\mathbf{Z}_{it} + e_{it} \quad (*)$$

where \mathbf{X}_{it} is the vector of the explanatory variables and \mathbf{Z}_{it} the vector with the omitted ones. If $\mathbf{Z}_{it} = \mathbf{Z}_i$, that is the omitted variables are time-invariant then by estimating equation (*) with fixed effects (within estimator), we eliminate the vector of the time-invariant omitted variables. Indeed:

$$y_{it} - \bar{y}_i = \mathbf{C}(\mathbf{X}_{it} - \bar{\mathbf{X}}_i) + \mathbf{\Gamma}(\mathbf{Z}_i - \bar{\mathbf{Z}}_i) + e_{it} - \bar{e}_i$$

where $\bar{v}_i = \sum_t \frac{v_{it}}{T}$, v being y_{it} or elements of \mathbf{X}_{it} or of \mathbf{Z}_i , where for $z_{it} = z_i$ from time-invariant \mathbf{Z}_{it} , $\bar{z}_i = \sum_t \frac{z_{it}}{T} = z_i$, which eliminates $(\mathbf{Z}_i - \bar{\mathbf{Z}}_i)$.

In case \mathbf{Z}_{it} is invariant for all the cross-sectional units and it is only time variant, i.e. $\mathbf{Z}_{it} = \mathbf{Z}_t$ for every t , or if \mathbf{Z}_{it} varies cross-sectionally and across time, then these omitted vector of variables would be part of the error. If omitted variables are added to the error, then the variance of the error would be inflated or biased and heteroscedastic. Indeed, for $u_{it} = \mathbf{\Gamma}\mathbf{Z}_{it} + e_{it}$ the error when \mathbf{Z}_{it} is omitted, then:

$$V[u_{it}] = \mathbb{E}[(\mathbf{\Gamma}\mathbf{Z}_{it} + e_{it})^2] = \mathbb{E}[(\mathbf{\Gamma}\mathbf{Z}_{it})^2] + \mathbb{E}[(e_{it})^2]$$

since $\mathbb{E}[e_{it}\mathbf{\Gamma}\mathbf{Z}_{it}] = 0$ in the absence of endogeneity in (*), and $\mathbb{E}[\mathbf{\Gamma}\mathbf{Z}_{it}] = 0$ because (*) has a constant term. As a result of the biased error variance, statistical inference values (t or F statistics) might, also, be biased. In order to deal with this

heteroscedasticity and bias, we will compute the inference statistics using the the Huber (1967) and White (1980, 1982) Heteroscedasticity Consistent Covariance matrix estimator which addresses the problem of heteroscedasticity and bias in the presence of omitted variables. This heteroscedasticity robust covariance matrix estimator also solves the issue of cross-sectional interdependences, which are likely to exist among nations (Hsiao, 2014). In addition, simultaneity may arise as a result of FDI affecting direct revenue and the business cycle, which would, also, bias the error variance. Once more, the estimated heteroscedasticity robust variance-covariance matrix will address this issue, as well.

Apart from biased or heteroscedastic errors, another, issue that may arise from the omitted vector \mathbf{Z}_{it} is endogeneity, i.e. $\mathbb{E}[\mathbf{u}_{it} \mathbf{C}\mathbf{X}_{it}] \neq \mathbf{0}$. In that case, statistical inference will be incorrect, as well. However, fixed effects estimation allows the correlation between the error and the covariates to be nonzero, which, in turn, permits us to proceed with our estimations. Allowing for endogeneity, is yet another reason why we should use fixed effects estimation, instead of random effects, but we need the latter only for robustness.

Table 2 summarizes, as a reminder, our variables, a short description and the data source.

Table 2: Variables

Variable	Description	Source
FDI_{it}^F	FDI net inflow (of country i at year t) as a share of GDP	World Development Indicators (WDI)

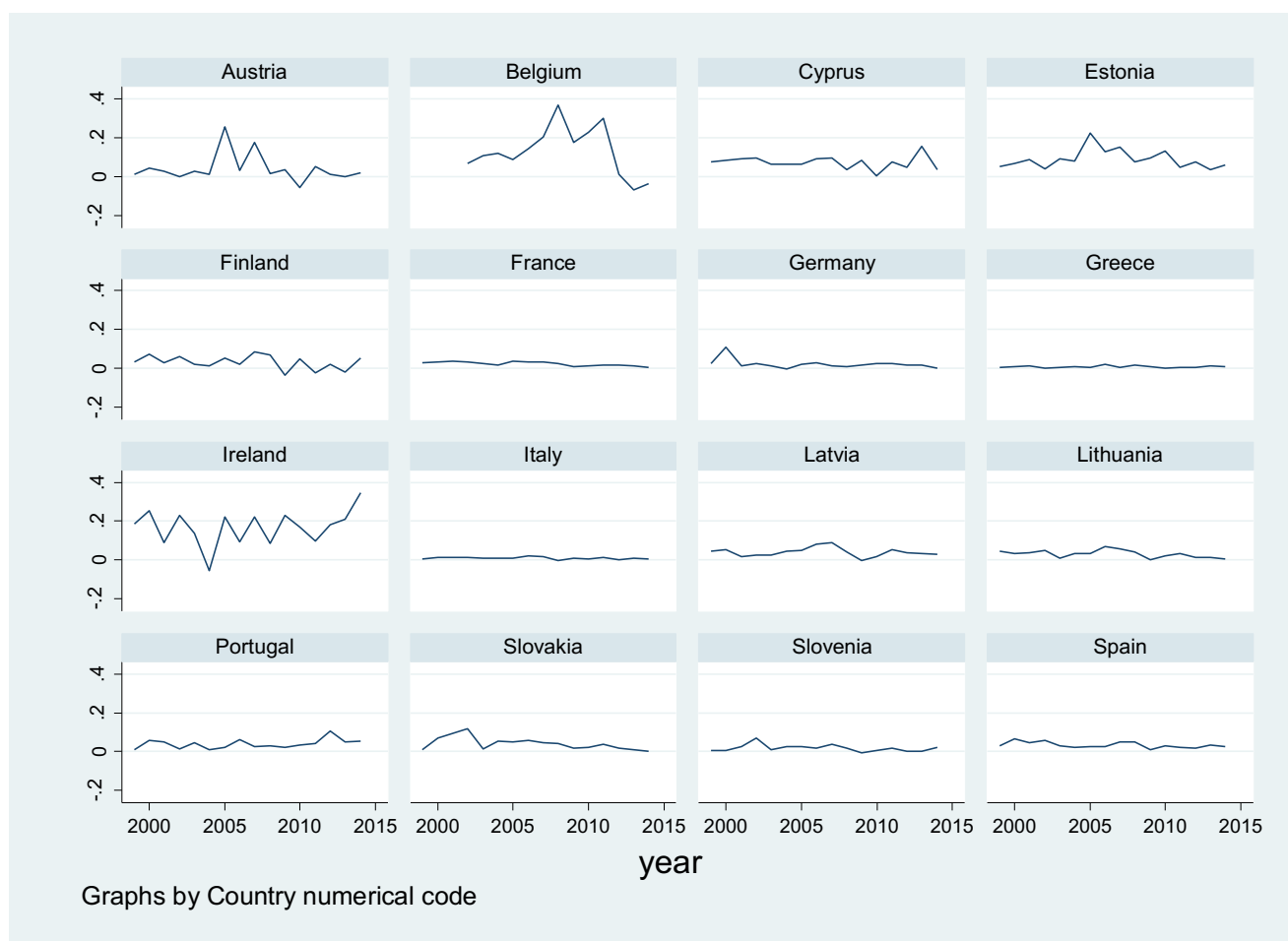
TAX_{it}	Tax on income, profits and capital gains to GDP ratio (of country i at year t)	WDI
ULC_{it}	Nominal unit labor cost on persons (of country i at year t), 2010=1	Eurostat, European Commission
U_{it}	Unemployment rate, as a share of economically active persons aged 15-64.	Eurostat, European Commission
MOU_{it}^D	Dummy variable taking value 1 if country i is under a Memorandum of Understanding (MOU) regime at time t	European Commission: Economic and Financial Affairs, “Financial assistance in EU Member States” ¹
$CRISIS_t^D$	$CRISIS_t^D$ is a dummy taking value 1 for years before 2008 ($t < 2008$)	-
country i	Austria, Belgium, Cyprus, Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, the Netherlands, Portugal, Slovakia, Slovenia, and Spain.	

¹ http://ec.europa.eu/economy_finance/assistance_eu_ms/

time t

1999-2014

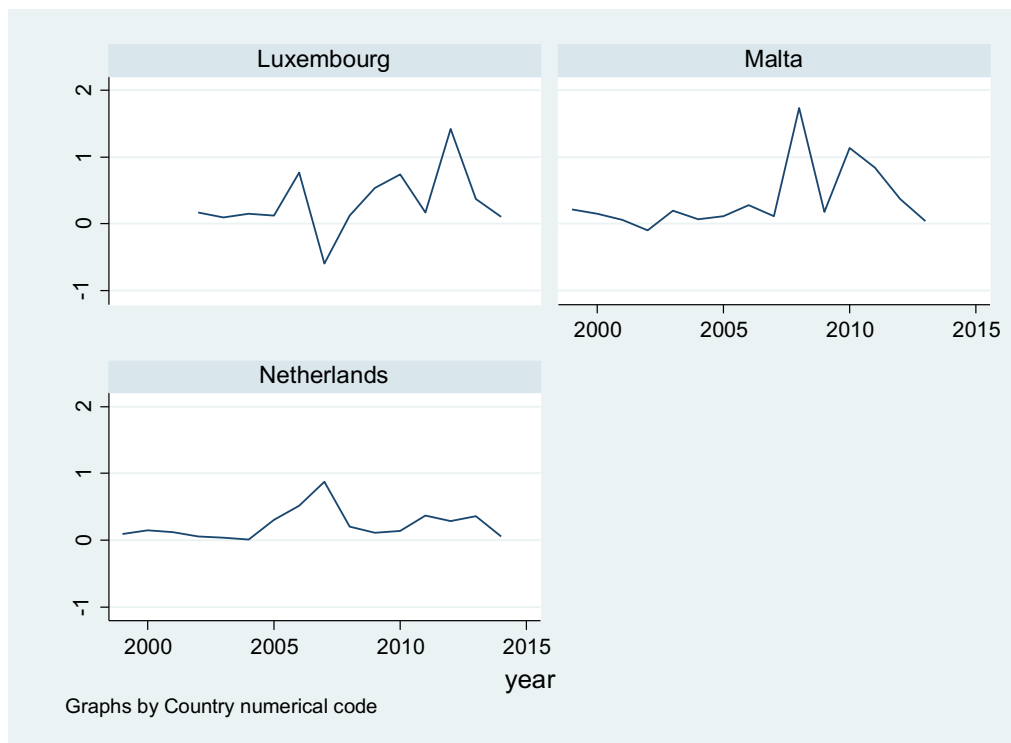
Graph 1



Graphs 1 and 2 show the evolution of FDI net inflow as a fraction of GDP, for each of the 19 Eurozone economies. We observe that, with the exception of Portugal, Malta and Luxemburg, the rest of the 18 Euro Area members experienced a decrease in net FDI inflow during the last quarter of the '00s decade, when the global financial crisis was beginning to develop. In addition, we observe that there are a few countries with significant variations in the FDI den inflow. Ireland, Austria, Belgium, Cyprus, Estonia, Finland, Luxemburg, Malta and the Netherlands have occasionally showed

considerably large FDI net inflows that were followed by large slumps. In some cases, as a matter of fact, FDI net inflows turned negative indicating strong, in some cases, disinvestment.

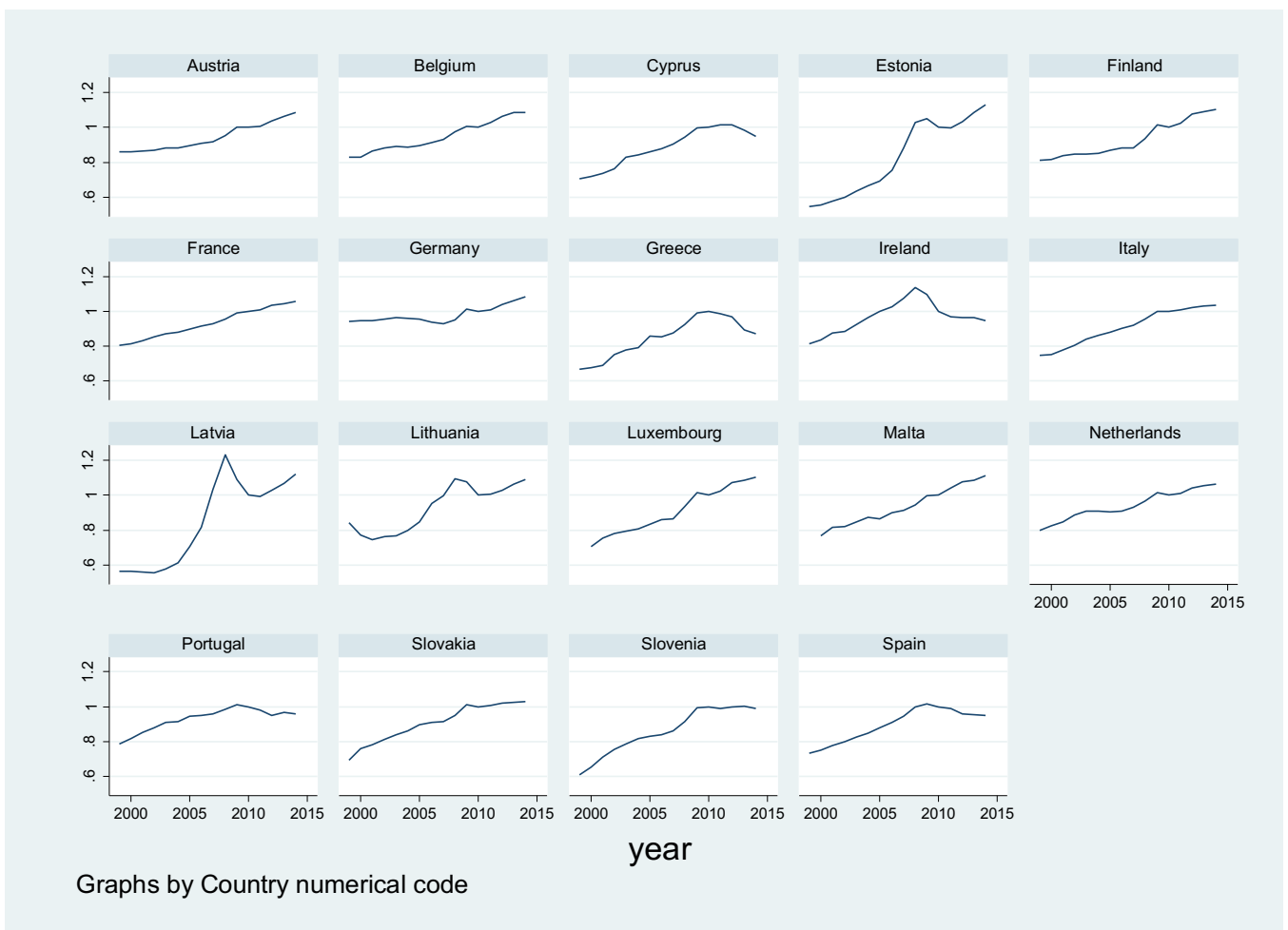
Graph 2



Graph 3 shows the evolution, through time, of nominal unit labor costs for each of the 19 Eurozone economies. We observe that for Cyprus, Greece, Ireland, Spain and Portugal the unit labor cost has been declining since late '00s. On the other hand, Estonia, Latvia and Slovenia experienced a strong growth of their unit labor cost during the '00s (approximately), and a slight decrease around the years of the global financial crisis. As a matter of fact, all of the 19 Eurozone countries experienced some decline or stagnation in unit labor cost during the crisis period of 2007-2009. Finally, the case of Germany is, also, interesting, since it is the only economy for which the unit labour growth showed persistent stagnation for almost a decade from 1999 to 2006 or 2007, but started growing strongly since 2010. Regardless the stabilization of German unit labor cost, this economy did not appear to attract more FDI as Graph 1

reports. In addition, the stagnating labor cost was enhancing Germany's competitiveness against the rest of the Euro area members for which the unit labor cost was growing during the same time. All in all, from this short graphical analysis we observe that cross-country differences in unit labor cost does not appear to be able to explain the cross-country differences in FDI net inflow.

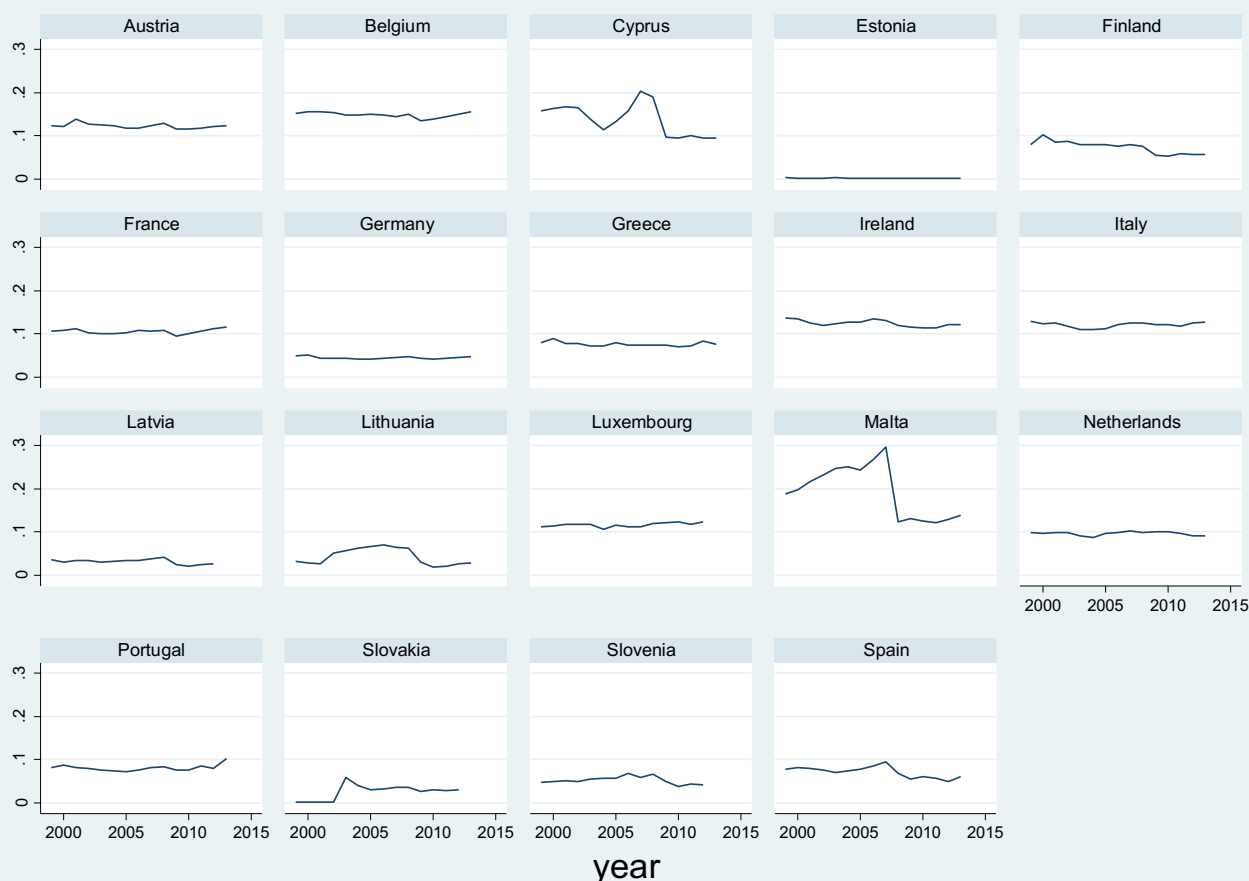
Graph 3



Graph 4 shows the evolution, through time, of the ratio of tax on income, profits and capital gains to GDP for each of the 19 Eurozone economies. We observe that Estonia, Germany, Latvia, Lithuania, Slovakia and Slovenia have the lowest taxation of income, profits and capital gains as compared to their GDP. However, these economies are not the ones with the highest FDI net inflows! In other words, from this short Graph analysis we observe that cross-country differences in ratio of tax on

income, profits and capital gains to GDP does not seem to be able to explain the cross-country differences in FDI net inflow.

Graph 4



Graphs by Country numerical code

The case of Malta deserves, finally, some attention. Malta significantly curtailed the taxation of income, profits and capital gains in late '00s, as we observe from the Graph 4. Following this strong decline in taxation, Graph 2 reports a vigorous growth in FDI inflow during this time, but this did not last long. That is to say that although cross-country differences in taxation (or unit labour cost) might not seem (for now) to explain their differences in FDI net inflows, it might explain its variations through time within each country. The Fixed Effects estimation of (I) and (II) in the following section, will shed more light to the relationship between FDI net inflows and taxation and labor cost.

3.2.2 Equation Estimations

Table 3 reports the results of the Fixed and Random Effects estimation of (I):

$$FDI_{it}^F = \alpha_0 + \rho FDI_{it-1}^F + \alpha_1 TAX_{it} + \alpha_2 ULC_{it} + \alpha_3 U_{it} + \alpha_4 TAX_{it-1} + \alpha_5 ULC_{it-1} + \alpha_6 U_{it-1} + \gamma_1 MOU_{it}^D + \gamma_2 CRISIS_t^D + u_i + e_{it}, \quad (I)$$

Surprisingly, we observe that $\rho = -0.0497 < 0$ and not statistically significant at 5% for the fixed effects estimation. In the random effects, the autocorrelation coefficient equals .258 and it is statistically significant. This means that changes in FDI net inflows are not particularly persistent, because ρ is low, in either estimation methods. Yet, only random effects show some autocorrelation, which is, still, very mild.

Next, for the analysis of direct taxes as a GDP ratio, our coefficient estimations are conflicting, being negative for the level variable and positive for the lagged variable. In addition, none is statistically significant at 5%, with the exception of , with the exception of α_3 in the fixed effects estimator. This finding hold for both random and fixed effects estimations. These estimation results imply that higher tax on income, profits and capital gains (as a share of GDP) at a given time positively affect FDI inflow the following year, but negatively this given year. Another way to see this conflicting sign is if we suppose that $\alpha_1 = -\alpha_3$, which is not that impossible since α_1 is less that one standard error away from $-\alpha_3$; again, this is true for both fixed and random effects. Under $\alpha_1 = -\alpha_3$ assumption, then $\alpha_1(\Delta TAX_{it})$ has a positive effect in FDI inflows. This, suggests that changes in direct taxes negatively affect FDI net inflows. We will return later to the dynamic effects of direct taxation to FDI net inflows. For the moment, we cannot conclude that Hypothesis 1 is supported by our

empirical findings in Table 3, because we cannot reject the null hypothesis $\alpha_1, \alpha_3 \geq 0$ at 5%.

As a result, nor the Fixed nor the Random Effects estimation of equation (I) provide support for our Research Hypothesis 1.

Table 3: Estimation of Equation (I)

$$FDI_{it}^F = \alpha_0 + \rho FDI_{it-1}^F + \alpha_1 TAX_{it} + \alpha_2 ULC_{it} + \alpha_3 U_{it} + \alpha_4 TAX_{it-1} + \alpha_5 ULC_{it-1} + \alpha_6 U_{it-1} + \gamma_1 MOU_{it}^D + \gamma_2 CRISIS_t^D + u_i + e_{it}$$

Estimation	Fixed Effects	Random Effects
VARIABLES	FDI Inflows to GDP	FDI Inflows to GDP
(FDI Inflows to GDP, t-1)	-0.0497 (0.107)	0.258** (0.108)
(Direct taxes to GDP)	-5.396* (2.812)	-4.401* (2.506)
(Unit Labour Cost)	0.258 (0.319)	-0.0386 (0.300)
(Unemployment)	-0.0181* (0.00889)	-0.0178** (0.00867)
(Direct taxes to GDP, t-1)	4.058**	5.061*

	(1.886)	(2.703)
(Unit Labour Cost, t-1)	-0.0948	0.0781
	(0.252)	(0.350)
(Unemployment, t-1)	0.0213*	0.0149*
	(0.0102)	(0.00890)
MOU_{it}^D	0.0328	0.0457*
	(0.0460)	(0.0276)
$CRISIS_t^D$	0.00326	-0.0318
	(0.0233)	(0.0485)
Constant	0.0302	0.0186
	(0.203)	(0.130)
Observations	252	252
Number of Countries	19	19
R-sq Overall	0.00610	0.266
R-sq Within	0.211	0.140
R-sq Between	0.392	0.664

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

As far as the analysis of unit labor cost is concerned, we observe that none of the coefficients (for the levels and the lagged variable) is statistically significant in any of the two estimation methods. The fact that none of the α_4 and α_2 is statistically significant makes us to fail to reject the two null hypotheses of H2 that the unit labor cost of the host country negatively affects the FDI inflow towards this country.

As a result, nor the Fixed nor the Random Effects estimation of (I) provide support for our Research Hypothesis 2.

Similarly to direct taxes as a share of GDP, the coefficients of unemployment rate – our proxy for macroeconomic business cycles – have opposite signs in levels than when lagged, and approximately the same in absolute values. This is true for both random and fixed effects. Also, none of the coefficients is statistically significant at 5%, with the exception of unemployment in level and in random effects. Again, if we assume $\alpha_3 = -\alpha_6$, (their absolute values are closer than one standard error) then we might say that ΔU_{it} negatively affects FDI inflow. In other words, an increase in unemployment negatively affect FDI net inflows, but this remains to be properly investigated when we will examine the estimations of (III). At this point, we cannot find evidence to substantiate research hypothesis 3.

As a result, nor the Fixed nor the Random Effects estimation of (I) provide support for our Research Hypothesis 3.

Moreover, nor γ_1 nor γ_2 are statistically significant at 5%, in any of the estimation methods. For the crisis dummy, this result implies that there was no shift – nor negative, nor positive – in the FDI net inflow following the outbreak of the global financial crisis. This is in accordance with our observations in Graphs 1 and 2, where we saw that FDI net inflow decreased only temporarily during the roughly the crisis period. For the MOU regime, that does not either shift the FDI net inflow nor negatively nor positively. Although, we might expect a positive response of

investment from foreigners to the painful structural reforms undertaken by certain Euro Area members (Cyprus, Ireland, Greece, Portugal and Spain), that does not appear to be the case whatsoever.

Finally, for the random effects $R^2(\textit{within}) = 14\%$ and $R^2(\textit{between}) = 66.4\%$, while for the fixed effects $R^2(\textit{within}) = 21.1\%$ and $R^2(\textit{between}) = 39.2\%$. These goodness of fit measures indicate that model (I) roughly explains 39.2-66.4% of the cross-national differences of FDI net inflow and only 14-21.1% of the variation of FDI net inflow across time for each nation separately. Random effects model appears to have more explanatory power.

Table 8 reports the results of Both Fixed and Random Effects estimation of (II):

$$\begin{aligned} \Delta FDI_{it}^F = & b_0 + \rho \Delta FDI_{it-1}^F + b_1 \Delta TAX_{it} + b_2 \Delta ULC_{it} + b_3 \Delta U_{it} + b_4 \Delta TAX_{it-1} \\ & + b_5 \Delta ULC_{it-1} + b_6 \Delta U_{it-1} + \gamma_1 MOU_{it}^D + \gamma_2 CRISIS_t^D + u_i + e_{it}, \end{aligned} \quad \text{(II)}$$

For the autoregressive factor $\rho \Delta FDI_{it-1}^F$ we observe that it has a negative sign at both estimations, statistically significant at 5% at both estimations, and approximately the same value for Fixed and Random effects. In other words, positive changes in FDI net inflow tend to negatively affect the FDI net inflows of the following period. This could be explained if FDI net inflow positively affects GDP which means that in the following period the denominator of FDI_{it}^F grows more than the numerator, which, in turn, decreases the value of the FDI net inflow ratio. However, this fact needs more attention.

As far as the direct taxes ratio is concerned, changes in direct taxes as a share of GDP do not appear to correlate with changes in FDI net inflows at a present time; estimated coefficients are not statistically significant at 5%. However, with one period lag, they

positively affect changes in FDI net inflow. These results are robust to the estimation method; they are true for both random and fixed effects. This means that, positive changes in direct taxes negatively affect FDI net inflow as a share of GDP, which greatly contrasts our research hypothesis 1'. One possible explanation for this counterintuitive finding would, once more, be the denominator: a decrease in direct taxation affects GDP more than in affect FDI inflow, and since the former is the denominator and the latter the numerator, FDI net inflows to GDP ratio declines. Once more, one needs to properly examine this possible explanation before drawing any further conclusions.

Table 4: Estimations of Equation (II)

$$\Delta FDI_{it}^F = b_0 + \rho \Delta FDI_{it-1}^F + b_1 \Delta TAX_{it} + b_2 \Delta ULC_{it} + b_3 \Delta U_{it} + b_4 \Delta TAX_{it-1} + b_5 \Delta ULC_{it-1} + b_6 \Delta U_{it-1} + \gamma_1 MOU_{it}^D + \gamma_2 CRISIS_{it}^D + u_i + e_{it}$$

Estimation	Fixed Effects	Random Effects
VARIABLES	D(FDI Inflows to GDP)	D(FDI Inflows to GDP)
D(FDI Inflows to GDP, t-1)	-0.558*** (0.0783)	-0.556*** (0.0781)
D(Direct taxes to GDP)	-5.012* (2.505)	-4.897* (2.507)
D(Unit Labour Cost)	0.229 (0.404)	0.286 (0.424)
D(Unemployment)	-0.0167**	-0.0164**

	(0.00788)	(0.00754)
D(Direct taxes to GDP, t-1)	2.490***	2.579***
	(0.814)	(0.850)
D(Unit Labour Cost, t-1)	0.0622	0.0486
	(0.525)	(0.515)
D(Unemployment, t-1)	0.0181*	0.0192**
	(0.00885)	(0.00945)
mou	0.0543**	0.0383*
	(0.0205)	(0.0204)
crisis	0.0221	0.0190
	(0.0299)	(0.0308)
Constant	-0.0180	-0.0165
	(0.0111)	(0.0107)
Observations	232	232
Number of Countries	19	19
R-sq Overall	0.484	0.484
R-sq Within	0.493	0.493
R-sq Between	0.0126	0.00452

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

As a result, Research Hypothesis 1' is not supported by our empirical findings neither with the fixed effects nor with the random effects estimation.

Unit labor cost, on the other hand, appears to have no statistically significant effect on FDI in flow, in any of the estimation techniques. We might suppose that, for the Euro Area, the source of competitiveness is not the labor cost but the high quality of human capital. Therefore, foreigners chose to make investments in countries that have greater and of higher quality human capital, without its remuneration playing a particularly decisive role.

As a result, Research Hypothesis 2' is not supported by our empirical findings neither with the fixed effects nor with the random effects estimation.

For unemployment, we observe in Table 4, that during a present period it negatively affects FDI net inflow, for both estimation techniques, but, with one period lag, it positively affects FDI net inflow only in Random Effects. The lagged effect might indicate that GDP variations persist for a longer time than the developments of FDI net inflows. In other words, an increase in unemployment, as it indicates a reduction in GDP, is correlated with a decrease in GDP (the denominator) for the following period, as well, which negatively affects the ratio of FDI net inflows to GDP.

Therefore, Research Hypothesis 3' is only partially supported by our empirical findings: economic recession adversely affects FDI net inflow only in present time.

Furthermore, from Table 4 we observe no statistically significant impact of the crisis on the behavior of the dependent variable ΔFDI_{it}^F . In other words, the global financial crisis has not altered the behavior of ΔFDI_{it}^F . On the other hand, structural reforms attached to MOUs positively affect FDI net inflow, but only in the Fixed Effects estimation. Finally, $R^2(\textit{between})$ of model (II) is exceptionally low, for both fixed

and random effects, indicating that equation (II) offers no important information about the cross national variation of changes in FDI_{it}^F . On the other hand, $R^2(\text{within})$ is high for both fixed and random effects, indicating that model (II) explains almost 50% of the intertemporal variation of FDI net inflow to GDP ratio for each country independently.

Finally, Table 5 reports the estimation of equation (III):

$$\Delta FDI_{it}^F = b_0 + \rho \Delta FDI_{it-1}^F + b_1 \Delta TAX_{it-1} + b_2 \Delta ULC_{it-1} + b_3 \Delta U_{it-1} + \gamma_1 MOU_{it}^D + \gamma_2 CRISIS_t^D + u_i + e_{it}, \quad (III)$$

For the autoregressive factor we observe that it has a negative effect of FDI net inflows as a share of GDP. This result is statistically significant at 5% and robust to the estimation technique. Again, we may hypothesize that increases in FDI at present time cause a greater economic expansion in the following period, which, in turn, reduces the ratio of FDI net inflows as a share of GDP.

In Model (III), changes in direct taxes have a positive effect (statistically significant at 5%) on changes of FDI net inflows of the following period, but only in the random effects estimation. Which leads us to reject our research hypothesis 1''. Lagged difference of unit labor cost does not trigger any change in FDI net inflows, at level 5% of statistical significance, which provides no evidence to support research hypothesis 2''. Finally, the economic cycle – as proxied by unemployment rate – has a positive effect on the FDI net inflow of the following period which contrasts our research hypothesis 3''.

Once more, nor the MOU regime nor the global financial crisis of 2007-2008 seems to have shifted the FDI net inflows. Surprisingly, though, Fixed and Random effects estimation have almost equal coefficients of determination in both within and between – in other words, when we use first differences with only lagged variables, the two estimation techniques have almost identical explanatory power.

Table 5: Estimations of Equation (III)

$$\Delta FDI_{it}^F = b_0 + \rho \Delta FDI_{it-1}^F + b_1 \Delta TAX_{it-1} + b_2 \Delta ULC_{it-1} + b_3 \Delta U_{it-1} + \gamma_1 MOU_{it}^D + \gamma_2 CRISIS_t^D + u_i + e_{it}$$

Estimation	Fixed Effects	Random Effects
VARIABLES	D(FDI Inflows to GDP)	D(FDI Inflows to GDP)
D(FDI Inflows to GDP, t-1)	-0.612*** (0.0930)	-0.600*** (0.0849)
D(Direct taxes to GDP, t-1)	2.608* (1.344)	2.652** (1.316)
D(Unit Labour Cost, t-1)	-0.163 (0.380)	-0.114 (0.375)
D(Unemployment, t-1)	0.00715** (0.00309)	0.00785** (0.00332)
mou	-0.0180 (0.0213)	-0.0217 (0.0190)
crisis	0.0121 (0.0227)	0.0112 (0.0231)
Constant	0.00149	0.000988

	(0.0132)	(0.0140)
Observations	250	250
Number of Countries	19	19
R-sq Overall	0.421	0.421
R-sq Within	0.429	0.429
R-sq Between	0.631	0.632

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Overall, we may conclude that we have not found empirical evidence to support of H1 nor H2 nor H3. However, for the direct taxes we found that they positively affect FDI net inflow of the following period. This could be attributed to the fact that direct tax increases affect GDP more than they affect FDI net inflows, causing, eventually, a decrease in the overall ratio of FDI net inflows to GDP. This could also mean that there is a strong case of omitted variables² or that the relationship between direct tax and GDP is not linear or stable in the long-run. Moreover, Unit Labor Cost does not have any effect, at any reasonable significance level and in any estimation method to the FDI net inflows. Given that we are examining the Euro Area, with industrialized economies, perhaps the main driver of competitiveness which attracts investments is the quality of human capital instead of the unit labor cost. Finally, we found that unemployment is negatively correlated with FDI net inflows, indicating that recession obstructs FDI, but has a positive effect in FDI inflows as a share of GDP the following period. This latter indicates that FDI recovers more rapidly than FDI, following a recession.

² In this case, both fixed effects and the use of the lagged dependent variable are expected to increase their effect on time-invariant omitted variables.

3.3 Summary Results

Table 6 summarizes the findings of our empirical investigation.

Table 6: Summary of Methodology & Findings

Sample & Methodology		
19 Eurozone member countries, for a period from 1999 to 2014.		
Estimated three equations, (I),(II) and (III) (see Section “Research Methodology”) with both Fixed and Random Effects.		

Hypothesis	Intuition	Result
		Not fully substantiated.
H1: Direct taxes to GDP ratio of the host Euro Area countries negatively affects the FDI inflows.	This form of taxation decrease the net disposable income of the investor, and, hence, reduces its incentive to invest	We have only substantiated that an increase in taxation triggers a positive change in FDI net inflow in the following year, and not for both fixed and random effects.
H2: The unit labor cost of the host country negatively	Unit labor cost increases the wage cost of a service	Not substantiated.

affects the FDI inflow towards this country	or a good, decreasing the profit of the investor, and, subsequently reducing the incentive to invest.	We found no evidence to support this hypothesis whatsoever.
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Table 6 (continued) : Summary of Methodology & Findings

Hypothesis	Intuition	Result
		Partially Substantiated.
H3: For the Euro Area, the unemployment rate of the host country negatively affects the FDI inflow towards this country	In a shrinking economy, aggregate demand decreases, and, as a result, expected profitability of investments is reduced.	We found that at present time, increases in unemployment are correlated with decreases in FDI inflow. With one period lag, increases in unemployment positively affect FDI net inflows.

Secondary Findings

Model (III) has much greater explanatory power as measured by the coefficient of determination, for both within and between variation, and it is completely robust to the estimation technique (Fixed or Random Effects).

Model (II) has better explanatory power for the within variation (across time for each

country) of FDI net inflows.

Nor the Global Financial Crisis nor the structural reforms under MOU regimes have shifted the behavior of FDI net inflows at any direction.

Conclusions

Today's business environment is considered to be quite competitive, causing companies to seek new ways to expand their business and attract capital. One such method is Foreign Direct Investment (FDI), which causes great interest to both academics and economies in general universally. Concerning inward FDI, there are multiple theories referring to the factors that tend to influence a country's capability to attract FDI. In this Master Dissertation we aimed at examining the effects of (i) the direct taxes to GDP ratio, of (ii) the nominal unit labor cost and (iii) of the business cycle on the FDI net inflows, for the 19 Euro Area member states between 1999 and 2014. We estimated with Fixed and Random Effects three equations: one for the level of FDI net inflows – model (I) – one for the first differences at current time and with one period lag – model (II) – and one only with lagged differences – model (III). Business cycle was proxied with unemployment rate, and we additionally included a dummy for MOU regimes and one for the post and pre crisis periods.

We did not find robust empirical evidence to support our Hypothesis 1 as, surprisingly, higher direct taxes (as a share of GDP) at a given time positively (and statistically significantly) affect FDI inflow the following year. This might be attributed to the fact that increases in direct taxes affect, in absolute value, GDP more than FDI net inflows, causing a greater decrease in the denominator (GDP) than in the numerator (FDI inflow), increasing, eventually, the ratio of FDI inflows to GDP.

For the unit labor cost we failed to find any evidence that it negatively affects FDI net inflow, as our Hypothesis 2 was expecting. For all the equations (I), (II) and (III) we could not reject the null hypothesis that effect of unit labor cost of FDI net inflow is zero or positive. Labor cost plays a vital role in the cost function and in the variable cost of labor intensive production and services. In addition, production paradigm has greatly evolved over the last few decades, especially for the industrialized world. Labor and, more specifically, low-skill (and, hence, low productivity) labor intensive production has migrated towards low labor cost countries, such as China, India and

the rest of the developing world. At the same time, the production of goods and services that is either non labor intensive or require highly skilled labor, has remained mostly at the developed world. Therefore, the case of unit labor cost is somehow peculiar, and this might offer a speculation about why unit labor cost does not appear to affect FDI net inflows in the Euro Area.

For the business cycle, we found that it is negatively correlated with FDI net inflow at present time, indicating that recessions are associated with lower FDI inflows. On the other hand, with one period lag, increases in unemployment positively affect FDI net inflows of the following period. Once more, we might attribute this counter intuitive result to the fact that recession persists for longer than the drop in FDI inflow. As a result, the following year, GDP drops more than FDI, causing a positive change to the ratio of FDI to GDP.

Given that the Euro Area is part of the industrialized developed world, we may hypothesize that FDI towards the Eurozone countries concern mostly either human capital intensive or non-labor intensive goods and services. In other words, the cost function of the goods produced and the services offered at the Euro area is not largely affected by the labor cost, as their production function might not be labor intensive. Moreover, highly skilled labor is more productive and productivity is perhaps what foreign investors are after in the Euro Area, instead of the labor cost.

Finally, we saw that model (III) has much greater explanatory power as measured by the coefficient of determination, for both within and between variation, and it is completely robust to the estimation technique (Fixed or Random Effects); model (II) has better explanatory power for the within variation (across time for each country) of FDI net inflows. In addition, nor the Global Financial Crisis nor the structural reforms under MOU regimes have shifted the behavior of FDI net inflows at any direction.

To conclude, although we provided some initial ideas about the non-importance of unit labor costs in determining FDI net inflows towards a country, future research may focus on labor productivity and on compensation of high skilled and lower skilled labor separately. In addition, more attention, perhaps, needs to be paid in the

effects of the structural reforms in foreign investment, as well as in the effects of the crisis.

References

Alam, A., Zulfiqar, S., Shah, A., (2013), Determinants of foreign direct investment in OECD member countries, *Journal of Economic Studies*, 40(4), pp.515 – 527

Alix, Y., Slack, B., Comtois, C., (1999), Alliance or acquisition? Strategies for growth in the container shipping industry, the case of CP ships, *Journal of Transport Geography*, 7(3), pp. 203-208

Ang, J. B., (2008), Determinants of foreign direct investment in Malaysia, *Journal of policy modeling*, 30(1), pp. 185-189

Aristotelous, K., Fountas, S., (1996), An Empirical Analysis of Inward Foreign Direct Investment Flows in the EU with Emphasis on the Market Enlargement Hypothesis, *JCMS: Journal of Common Market Studies*, 34(4), pp. 571-583

Asiedu, E., (2006), Foreign direct investment in Africa: The role of natural resources, market size, government policy, institutions and political instability, *The World Economy*, 29(1), pp. 63-77

Ayal, I., Zif, J., (1979), Market expansion strategies in multinational marketing, *The Journal of Marketing*, pp. 84-94

Balasubramanyam, V. N., (2002), Foreign direct investment in developing countries: Determinants and impact, *New horizons for foreign direct investment*, 548, pp. 187

Barro, R. J., (1989), *Economic growth in a cross section of countries* (No. w3120), National Bureau of Economic Research

Bénassy-Quéré, A., Fontagné, L., Lahrière-Révil, A., (2005), How does FDI react to corporate taxation?, *International Tax and Public Finance*, 12(5), pp. 583–603.

Bevan, A. A., Estrin, S., (2004), The determinants of foreign direct investment into European transition economies. *Journal of comparative economics*, 32(4), pp. 775-787

Blonigen, B.A., Piger, J., (2014), Determinants of foreign direct investment, *Canadian Journal of Economics/Revue canadienne d'économique*, 47(3), pp. 775-812

Bruce, N., Turnovsky, S. J., (1999), Budget balance, welfare, and the growth rate:" Dynamic scoring" of the long-run government budget, *Journal of Money, Credit, and Banking*, pp. 162-186

Buettner, T., Ruf, M., (2007), Tax incentives and the location of FDI: Evidence from a panel of German multinationals, *International Tax and Public Finance*, 14(2), pp. 151-164

Campos, N. F., Kinoshita, Y., (2008), Foreign direct investment and structural reforms: Evidence from Eastern Europe and Latin America, *IMF Working Papers*, 1-38

Cavusgil, S. T., (1984), Differences among Exporting Firms based on Degree of Internationalisation, *Journal of Business Research*, 12(2), pp. 195-208

Cushman, D.O., (1987), The effects of real wages and labor productivity on foreign direct investment, *Southern Economic Journal*, 54(1), pp. 174-185

Daft, R., Kendrick, M., Vershinina, N., (2008), *Management: International Edition*, South-Western Cengage Learning Publications

Davidson, W. H., (1980), The location of foreign direct investment activity: Country characteristics and experience effects. *Journal of international business studies*, 11(2), pp. 9-22

De Bono, S., Van den Heijden, B., Joop, R., Jones, S., (2008), *Leadership, Change and Responsibility*, Meyer & Meyer Publications, UK

De Mello Jr, L. R., (1997), Foreign direct investment in developing countries and growth: A selective survey, *The Journal of Development Studies*, 34(1), pp. 1-34

Dees, S., (1998), Foreign direct investment in China: determinants and effects, *Economics of planning*, 31(2-3), pp. 175-194

Dicken, P., (2003) *Global shift: reshaping the global economic map in the 21st century* (fourth edition), London: Sage

Dollar, D., Kraay, A., (2001), *Trade, growth, and poverty*, World Bank, Development Research Group, Macroeconomics and Growth

Dotsey, M., (1998), The predictive content of the interest rate term spread for future economic growth, *FRB Richmond Economic Quarterly*, 84(3), pp. 31-51

Dunning, J., (1993), *Multinational enterprises and the global economy*, Addison-Wesley

Fröbel, F., Heinrichs, J., Kreye, O., (1977), The tendency towards a new international division of labor: the utilization of a world-wide labor force for manufacturing oriented to the world market, *Review (Fernand Braudel Center)*, pp. 73-88

Gammeltoft, P., (2008), Emerging multinationals: outward FDI from the BRICS countries, *International Journal of Technology and Globalisation*, 4(1), pp. 5-22

Garrett, G., Mitchell, D., (2001), Globalization, government spending and taxation in the OECD, *European Journal of Political Research*, 39(2), pp. 145–177

Guillén, M. F., García-Canal, E., (2009), The American model of the multinational firm and the “new” multinationals from emerging economies, *The Academy of Management Perspectives*, 23(2), pp. 23-35

Hagemann, M. R. P., (1999), *The structural budget balance: The IMF's methodology*, International Monetary Fund

Hay, C., (2006), What's Globalization Got to Do with It? Economic Interdependence and the Future of European Welfare States, *Government and Opposition*, 41(1), pp. 1-22

Herger, N., Kotsogiannis, C., McCorriston, S., (2015), Multiple taxes and alternative forms of FDI: Evidence from cross-border acquisitions, *International Tax and Public Finance*, 23(1), pp. 82–113

Hines, J., (1996), *Tax policy and the activities of multinational corporations*, National Bureau of Economic Research

Hsiao, C., (2014), *Analysis of Panel Data*, 3rd. Cambridge University Press

Hummels, D., Stern, R. M., (1992), *Evolving patterns of North American merchandise trade and foreign direct investment, 1960-1990* (No. 318), Institute of Public Policy Studies, University of Michigan

Janicki, H. P., Wunnava, P. V., (2004), Determinants of foreign direct investment: empirical evidence from EU accession candidates, *Applied Economics*, 36(5), pp. 505-509

Jordaan, J. A., (2005), Determinants of FDI-induced externalities: New empirical evidence for Mexican manufacturing industries, *World Development*, 33(12), pp. 2103-2118

Kandiero, T., Chitiga, M., (2006), Trade openness and Foreign Direct Investment in Africa: Economics, *South African Journal of Economic and Management Sciences*, 9(3), pp. 355

Kandiero, T., Wadhawan, S., (2003), Institutional quality, openness, and investment in Africa, *South African Journal of Economic and Management Sciences*, 6(2), pp. 346

Ke, L., Mengtao, C., (2007), The rational role of government in the process of attracting foreign direct investment in China, *Frontiers of Business Research in China*, 1(2), pp. 319-332

Kim, H., (2010), Political stability and foreign direct investment, *International Journal of Economics and Finance*, 2(3), pp. 59

King, R. G., Levine, R., (1993), Finance and growth: Schumpeter might be right, *The quarterly journal of economics*, pp. 717-737

Lankes, H.P., Venables, A.J., (1996), Foreign Direct Investment in Economic Transition: The Changing Pattern of Investments, *Economics of Transition*, 4, pp. 331-347

Levine, R., Zervos, S., (1998), Stock markets, banks, and economic growth, *American economic review*, pp. 537-558

Liargovas, P. G., Skandalis, K. S., (2012), Foreign direct investment and trade openness: The case of developing economies, *Social indicators research*, 106(2), pp. 323-331

Liu, X., Song, H., Wei, Y., Romilly, P., (1997), Country characteristics and foreign direct investment in China: A panel data analysis, *Weltwirtschaftliches Archiv*, 133(2), pp. 313-329

Loree, D.W., Guisinger, S.E., (1995), Policy and non-policy determinants of U.S. Equity foreign direct investment, *Journal of International Business Studies*, 26(2), pp. 281-299

Lucas, R., (1990), Why doesn't capital flow from rich to poor countries? *American Economic Review*, 80, pp.92-6

Makino, S., Lau, C. M., Yeh, R. S., (2002), Asset-exploitation versus asset-seeking: Implications for location choice of foreign direct investment from newly industrialized economies, *Journal of international business studies*, pp.403-421

Markusen, J.R., (1995), The Boundaries Of Multinational Enterprises And The Theory Of International Trade, *Journal of Economic Perspectives*, Volume 9, pp. 169- 189

McCann, P., (2011), International business and economic geography: knowledge, time and transactions costs, *Journal of Economic Geography*, 11(2), pp. 309

Meyer, K. E., Tran, Y. T. T., (2006), Market penetration and acquisition strategies for emerging economies, *Long Range Planning*, 39(2), pp. 177-197

Moran, G., Blomstrom, M., (2005), *Does Foreign Direct Investment Accelerate Economic Growth*, Institute for International Economics and Center for Global Development

Nourzad, F., (2008), Openness and the efficiency of FDI: a panel stochastic production frontier study, *International Advances in Economic Research*, 14(1), pp. 25-35

Parker, B., (2005), *Introduction to globalization and business: relationships and responsibilities*, Sage Publications

Sahoo, P., (2006), *Foreign direct investment in South Asia: Policy, trends, impact and determinants*, ADB Institute Discussion Paper No. 56

Sekkat, K., Veganzones-Varoudakis, M. A., (2007), Openness, investment climate, and FDI in developing countries, *Review of Development Economics*, 11(4), pp. 607-620

Soosay, C. A., Hyland, P. W., Ferrer, M., (2008), Supply chain collaboration: capabilities for continuous innovation, *Supply Chain Management: An International Journal*, 13(2), pp. 160-169

Vijayakumar, N., Perumal, S., Rao, K. C., (2010), Determinants of FDI in BRICS Countries: A panel analysis, *International Journal of Business Science and Applied Management*, 5(3), pp.1-13

Wheeler, D., Mody, A., (1992), International investment location decisions: The case of U.S. firms, *Journal of International Economics*, 33(1-2), pp. 57-76

Wooldridge, J., (2010), *Econometric Analysis of Cross Section and Panel Data*, 2nd. MIT Press

Websites

Eurostat, (2014), *Foreign direct investment statistics*, Eurostat Statistics Explained. Available at: http://ec.europa.eu/eurostat/statistics-explained/index.php/Foreign_direct_investment_statistics (Accessed: 03/10/2015)

OECD, (2008), *OECD Benchmark Definition of Foreign Direct Investment - 4th Edition*. Available at: <http://www.oecd.org/investment/fdibenchmarkdefinition.htm> (Accessed: 29/09/2015)

OECD *Factbook 2013*. Available at: <http://www.oecd-ilibrary.org/sites/factbook-2013-en/04/02/01/index.html?itemId=/content/chapter/factbook-2013-34-en> (Accessed: 29/07/2015)

OECD, (2016), *Euro area labour costs converging, but imbalances persist*. Available at: <http://www.oecd.org/employment/euroarealabourcosts.htm> (Accessed: 21 March 2016).

<http://www.fao.org/docrep/w5973e/w5973e02.htm> (Accessed at 27/09/2015)