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FINANCIAL SYSTEM HETEROGENEITY AND FDI FLOWS: EVIDENCE FROM OECD ECONOMIES

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ABSTRACT

Foreign direct investment (FDI) has grown dramatically as a major form of international capital transfer over the past decades. The unprecedented growth of cross-country FDI flows has been attributed to a rich set of economic, geographical and institutional factors. In this paper we examine the role of financial system heterogeneity as a potential detrimental factor to FDI flows across OECD economies. To do so, we use a panel dataset of the most recently updated bilateral FDI data at the country level according to OECD BMD4 definition and construct measures of financial distance using a broad set of financial indicators. The econometric approach consists of a gravity-style model, estimated according to the latest advancements in econometric techniques in order to avoid omitted variable bias. The results indicate that financial system similarityis associated with increased bilateral FDI flows, a conclusion that is robust across different estimation strategies and financial distance measures. This insightful policy implication for advanced economies is that the restructuring of the financial system and harmonization to best practices can contribute to economic recovery through the FDI channel as well. Finally, the results highlight the importance for the full implementation of the Banking Union and the Capital Markets Union in the EU.

Keywords: Foreign Direct Investment, Financial Development, Economic Growth, Advanced Economies

JEL Classification: O43, F21, F38, F65, G20

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1. Introduction

Foreign Direct Investment (henceforth FDI) has emerged as a pivotal force in the process of globalization throughout the past 35 years with the world FDI stock rising from less than USD 1 trillion to almost USD 25 trillion USD (UNCTAD, 2019). The global financial crisis had a sharp impact; however it was rather quickly reversed albeit with recent signs of a gradual slowdown (UNCTAD, 2019). Overall, the pace of growing FDI flows and FDI stock around the globe has been overwhelming along with a significant paradigm shift taking place in the process. The share of non-OECD economies in global capital inflows surpassed that of OECD economies for the first time in 2012. Regarding flows to emerging markets, China accounts for more than 30% according to the most recent data. The role of EU and the euro-area in the as a destination of FDI flows has been muted over the last decade, reflecting the increased importance of emerging economies and the deep impact of the 2008-09 financial crisis in the region. In an environment of strikingly low investment rates despite accommodative low policy rates, the attraction of FDI flows is a policy target for most economies. The presence of multinational firms can benefit domestic firms through backward or forward linkages (Javorcik, 2004). These channels, under the right conditions, can in turn be expected to make countries more competitive, productive and thus help stimulate their growth potential.

A vast theoretical and empirical literature has been developed in the quest to determine the factors that matter for FDI flows using both level and bilateral data. The aim of this paper is to capture the effect of heterogeneity in the financial system, in terms of development and depth, on bilateral FDI for OECD economies. Having identified the significant role of host country financial development for attracting FDI inflows (Dellis, 2018), we turn to gauge the importance of cross-country similarity in the functioning of the financial system for bilateral FDI flows. Alongthe lines of Fournier(2015) who address the effect of heterogeneity in product markets we construct measures of *financial distance* using an array of recently available financial variables and indicators to empirically test whether heterogeneity in the financial sector actually deters FDI flows among developed economies. Aizenman& Spiegel (2006) build a theoretical model according to which homogeneity in institutional performance enhances bilateral flows. Moreover, Habib &Zurawicki (2002) introduce the notion of "psychic distance", which encompasses differences in institutional and social outcomes as an impediment to FDI flows among economies. Harmonizingthe functioning of the financial system is at the epicenter of the ongoing transformation in the EU and Euro-area framework

reflected in the process of completing the Banking Union (BU) and the Capital Markets Union (CMU). According to the European Commission[1] (2018)

> "Suchfindings reiterate the need to pursue vigorously policies and structural reforms including those that take advantage of synergies and complementarities such as between a well-functioning Banking Union and Capital Markets Union which increases risk-sharing and a further opening to international trade".

Given the fact that FDI among advanced economies shows complementarities to international trade, it can be suggested that alleviating the fragmentation present in EU financial markets will also invigorate bilateral investment flows.

The remainder of this paper is organized as follows: section 2 briefly summarizes the basic theoretical models for the determinants of FDI and presents a review of the recent empirical literature on the topic. Section 3 describes the methodology followed in the empirical estimations and presents trends and stylized facts of the underlying data whereas section 4 features the econometric results from the analysis. The policy implications and the lessons drawn for the Greek economy are discussed in Section 5. The findings are summarized in the conclusion.

2. The quest of determining FDI determinants

2.1 Empirical literature review

The rich empirical literature on the determinants of FDI flows has included an ever increasing number of host and origin country variables that can potentially affect investment decisions (see Blonigen*et al.*, 2011; Eicher*et al*., 2011 for an overview of empirical studies on the topic). The set of variables included in empirical studies encompasses variables that capture macroeconomic, geographical and institutional attributes of host and origin countries following the relevant theoretical models[2] and the changing landscape of global trade and investment. In particular, studies that refer to bilateral FDI flows rely primarily on a variation of the "gravity" model which is commonly used in trade regressions following the pioneering work of Krugman (1991) in the field of New Economic Geography (NEG). According to this approach, the larger the size of the partners and the smaller the "distance" between them the larger are the expected FDI flows among them. Market size is usually approximated by the host and origin economy GDP whereas the distance term leaves room for a diverse set of variables. Apart from geographical distance, variables that capture cultural homogeneity such as common language, religion, former colonial ties and common legal systems are widely

[1]EC Quarterly Report (2018), vol. 3.
[2]For a description of the theoretical FDI models see Dellis (2018) and Bank of Greece (2018).

used and prove to be statistically significant (Bevan & Estrin, 2004; Benassy-Quere *et al*., 2005; Daude & Stein, 2007; Fournier, 2015; Chenaf-Nichet & Rougier, 2015; Anderson *et al*., 2016). The empirical results provide ample support for the importance of all measures of distance on the magnitude of bilateral FDI flows.The evolution of the globalized economy and increased interconnectedness among economies has contributed to the inclusion of even more variables at the bilateral level. The data point to an FDI enhancing role of participation in Free Trade Areas (FTAs) and Bilateral Investment Treaties (BITs) (Gast, 2005; Anderson *et al.*, 2016; Egger & Merlo, 2007; Neumayer & Spess, 2005; Berger *et al.*, 2010), however the effect is not robust across all specifications and depends largely on the nature of regional trade agreements (Berger *et al*, 2010). Furthermore, scholars have considered the effect of the common currency for the intra-Eurozone FDI flows to find that the introduction of the euro has increased flows from member and non-member states (Petroulas, 2007; de Sousa & Lockhart, 2006) whereas Anderson *et al*. (2016) find marginal positive effects of currency union participation for a sample comprising of developed and developing economies.

Strong support emerges from the empirical findings on the enhancing effect of size of the source and destination economy as measured by the respective GDP levels (Dellis*et al*., 2017; Ciriaci *et al.*, 2016; Canton & Solera, 2016; Benassy-Quere*et al.*, 2005) as well as on the deterring impact of exchange rate appreciation in the host country and exchange rate volatility (Gast, 2005; Fournier, 2015; Eicher *et al*., 2011; Golub *et al*., 2003). By contrast, GDP per capita and GDP growth for the host and origin economy are not unanimously associated with higher FDI flows as the two variables exhibit negative or insignificant coefficients in a number of studies (Wernick *et al.*, 2009; Sekkat & Verganzones-Varoudakis, 2007; Asiedu, 2002; Habib & Zurawicki, 2002. High levels of inflation discourage FDI flows according to Campos & Kinoshita (2008); however they do not appear to significantly affect MNC decisions in the work of Buse&Hefeker (2005). In their meta-analysis using Bayesian Model Averaging, Antonakakis & Todl(2010) find compelling evidence of the negative effect of inflation volatility (approximated by the standard deviation of inflation) on inward FDI flows. Numerous studies have investigated the role of host and origin taxation on the decision to invest abroad without reaching a consensus. Wei (2000) concludes that corruption has a more detrimental effect than taxation while Bellak *et al.* (2007) find that a high bilateral tax rate significantly deters FDI flows but can be compensated by sound infrastructure in the host economy. According to the Knowledge-Capital model, differences in factor endowments and skills are significant determinants of FDI flows. The seminal work of Carr*et al.* (2001) and Blonigen*et al.* (2003) builds on the theoretical assumption of the model and proposes the inclusion of differences in GDP and educational attainment as well their interaction in gravity models for FDI. A positive coefficient for the two former would support the notion of vertical

FDI increasing with factor dissimilarity. Neither measure proves significant in the work of Fournier (2015b) while Petroulas (2007) finds a positive effect of skill difference and the opposite for difference in (squared) GDP. In their thorough *meta-studies* both Blonigen *et al.* (2011) and Eicher *et al.* (2011) contradict in the inclusion probability of variables that measure skill differences in empirical studies of bilateral FDI.

Finally, emphasis has been given to the institutional attributes mostly for the potential host economy since FDI is associated typically with long-term planning as opposed to portfolio flows. The sound institutional framework that fosters a business-friendly environment matters for FDI flows (Dellis*et al.*, 2017, Bank of Greece, 2018; Martinez *et al.*, 2012; Canton & Solera, 2016), while corruption is an obstacle (Wei, 2000; Barassi& Zhou, 2017). In the seminal work of Benassy-Quere*et al.* (2005) 73 out of 75 institutional factors prove to be statistically significant as determinants of bilateral FDI flows. Well-functioning product and labor markets in the host economy also appear to attract FDI flows (Fournier, 2015; Ciriaci *et al*., 2016; Leibrecht & Scharler., 2007) as do developed financial systems in both the host and origin economy (Campos & Kinoshita, 2008; di Giovanni, 2005; Schmitz, 2009). The consensus from empirical studies is that structural attributes of the host economy matter for decisions undertaken by MNCs, hence structural reform is a policy target if the economy wishes to attract FDI flows.

2.2 Financial distance and FDI flows

This paper focuses on the role of financial distance of financial system heterogeneity between host and origin economy. To our knowledge, the empirical literature has examined the role of origin country financial development as a significant push factor for FDI (di Giovanni, 2005; Razin *et al.*, 2008) and the importance of a sound financial system in the host country. The latter phenomenon is described by Campos & Kinoshita (2008) as the "Paradox of Finance" and has been identified as a significant determinant of FDI flows in a number of empirical papers (Bludell-Wignal & Roulet, 2017; Dellis, 2018; Desai *et al*., 2005). The notion of financial development has no concrete measure and is approximated through various financial variables (liquid liabilities, private sector credit, and stock market capitalization) and composite indicators available from the World Economic Forum and the International Monetary Fund[3]among other sources (see Appendix). Apart from the strength and depth of financial system in the origin and host economy, this paper argues that the harmonized function of financial system enhance FDI flows between countries. This

[3]For a thorough description of the financial variables used to capture financial development see Dellis (2018).

assumption is partly drawn from the empirical work on bilateral institutional distance (Habib & Zurawicki, 2002; Benassy-Quere *et al.*, 2007; Fournier, 2015) and partly from the recent discussions concerning the transformation of the financial sector in the EU.

Heterogeneity in product market liberalization is proven to be a substantial impediment to FDI between OECD in the study by Fournier (2015) pointing towards the importance of the similarity in economic structures as a potential catalyst of FDI flows. Insofar as the development of the financial system is an institutional pillar in modern economies this poses the question whether financial system heterogeneity is also a significant deterrent of FDI flows. Habib & Zurawicki (2002) introduce the notion that *psychic distance* adversely affects the decision of a company to invest in a foreign market. The term encompasses attributes of cultural and organizational heterogeneity that impede the MNC from learning from the host economy.Their study focuses on the corruption differential between host and origin economy (measured by the Corruption Perception Index) to find a robust negative effect on bilateral FDI flows. In their seminal work Benassy-Quere *et al.* (2007) find little support for the adverse impact of institutional heterogeneity on FDI flows. Nonetheless, the sample contains both developing and developed economies and there are much less source countries than destination countries. The authors describe the result as "puzzling" as they expect institutional similarity to attract FDI flows. Aleksynska and Havrylchyk (2013) conclude that FDI flows among economies in the same development group (North-North or South-South) are positive affected by similarities in institutional quality, whereas investment from emerging to developed economies aims to take advantage of the gap in institutional performance.

Having said that, the importance of the restructuring of the financial system in the EU and the need for a multilateral rules-based approached is underscored in the recent discussions over the future of the union and the common currency. The alarmingly low levels of private investment in the region are attributed, to a large extent, to credit constraints and the fragmentation of the financial system, especially in the stressed economies (ECB, 2018). The completion of the Banking Union and the Capital Markets Union aims to alleviate these constraints. According to ECB Vice President Victor Costancio "To be truly effective, CMU will require harmonization in a number of sensitive areas, including key legislation and policies related to financial products, such as investor protection and bankruptcy procedures[4]". The initiatives underway can help induce synergies and complementarities among member economies, thus making cross border investment less risky and increase the bilateral FDI flows and foster capital accumulation. The CMU in particular can address the pronounced divergence in the levels of venture capital and non-banking financing within the EU (see Section 3.2) and unlock investment projects within the Single Market. Finally,

[4]Eurofi Conference Malta, 4 April 2017.

harmonizing the financial systems is expected to increase international trade which is mostly considered a compliment to FDI for developed economies (Dellis, 2018).

3. Data and methodology

3.1 Descriptive statistics and trends

We include data for 36 OECD and emerging host economies from 2005 to 2016 using bilateral FDI inflows data from the OECD database. We rely on the OECD's database on *FDI Statistics according to Benchmark Definition 4th Edition* (BMD4)for our data on FDI. The updated dataset is based on data from Central Banks and Statistical Offices following the recommendations of the 6th edition of IMF's *Balance of Payments and International Investment Position Manual* (BPM6). The new database distinguishes between all units operating in a host economy and resident Special Purpose Entities (SPEs) in order to effectively gauge real multinational enterprise activity. Although a formal definition of SPEs remains elusive we can briefly identify them as legal entities controlled by a non-resident parent with little or no employment and production and marginal physical presence in the host economy (OECD, 2015). In the likely event that an affiliate in one host economy is merely used to pass capital[5]through before reaching the final recipient then the resulting data on FDI will be biased upwards. In addition, the new vintage of OECD data on FDI does not account for investment between *Fellow Enterprises*. Debt that passes through affiliates of the same parent company, which is identified through the implementation of the *Ultimate Controlling Parent*[6] definition, should not be included in the FDI flows more than once after the initial flow as it would cause double-counting. For all estimations the dependent variable is Inward FDI flows[7] measured in millions of US dollars. It should be noted that the OECD does not report bilateral data according to the BMD4 definition prior to 2013[8]; therefore we also use data according to the previous definition (BMD3). The full dataset consists of 1189 country pairs since we distinguish between host and origin economy and remove domestic investment. During the whole time period there are 472 zero observations recorded, that is no form of investment flows within a certain country pair and year. Amongst them, there are 67 country

[5]OECD (2015) also coins the terms *pass-through capital* and *capital in transit* to describe such entities.
[6]Ultimate controlling parent (UCP): the entity proceeding up the affiliate's ownership chain that is not controlled by another entity (that is, owned more than 50%).
[7]The variable captures net total FDI inward flows which include debt, equity and reinvestment of earnings.
[8]^8% of all the data points refer to flows from 2013 onwards. Prior to that year the vast majority of the data is constructed under the BMD3 definition. In a few instances, bilateral flows that were missing under BMD3 have been revised.

pairs that do not record any bilateral investment during the 2005-2016 period. Furthermore, as we are interested in net FDI inflows, we observe a significant share of negative values[9].

A look at the overall data reveals the rebound of global FDI inflows after the 2009-2010 financial crisis, however they have failed to reach the 2007 peak of 2 trillion USD. A similar picture is painted for the OECD economies with strong performances for 2015 and 2016, where inflows surpassed 1.2 trillion USD (OECD, 2019). Following the increased interconnectedness of the global economy in the 21st century and affected by the financial crisis, emerging economies exceeded 50% of global FDI inflows for the first time in 2012 (Bank of Greece, 2018). The latest OECD data mark a significant decrease of inflows for the OECD country group in 2018, a result mostly attributed to the US tax policy that led to a substantial repatriation of profits from US multinational corporations (MNCs)[10]. Broken down in terms of country and region pairs, the recent trends if FDI flows exhibit notable heterogeneity. It is evident duringthe sample time period there are only afew country pairs that are clear outliers that drive the large divergence between mean and median FDI flows among economies. In 2015 the mean bilateral FDI inflow stood at 1.1 billion USD compared to a value of 2.2 million for the median country pair of the distribution. Figure 1shows this divergence, which is more pronounced after 2010. This can also be seen when one examines the highest shares recorded in the sample, where there is a clear pattern regarding both time and geography. More specifically, the 5 highest observations are all recorded in 2015 and 2015 with USA being the host economy in all of them and with flows that go beyond 50 billion USD. Amongst them, inflows from Luxembourg in 2015 reached the highest value in the sample of 182 billion USD followed by Swiss FDI in the US from 2016 at 72 billion. Figure 2 clearly shows the concentration of extremely high observations as time in the sample progresses. It is important to underline the high degree of volatility in the yearly data, as there is substantial within year variation from the beginning until the end if the referred time span. The coefficient of variation is non-negligible ranging from 3.2 in 2006 to 10.2 in 2014. The last three years of the sample are the ones with the greatest variation among country groups.Distinguishing between pairs of economies some interesting stylized facts emerge. First, the key takeaways do not change with the use of mean or median values through the time sample. Nevertheless, mean values are skewed by outliers as discussed above and negative net flows. Flows from the UK to the US economy exhibit the highest median value with more than 40 billion USD, while the pair with the highest mean value is USA-Luxembourg[11] with 55 billion USD highly dependent on extreme values. The relationship

[9]OECD distinguishes between debt, equity and reinvested earnings.
[10]A large part of US outward FDI for the recent period took the form of profit reinvestment, therefore this shift resulted in a large gap in advanced economies' FDI inflows in 2018.
[11]All country pairs follow the pattern host-origin in the text.

remains strong if we focus on median flows where the aforementioned pair is in4th place. There are, indeed, some pronounced differences when comparing data for all units with data that account for SPEs as depicted in Figure 3.

Special Purpose Entities account for the majority of US originated flows to Canada as well as most of MNE activity targeted to Switzerland. Inward FDI flows to Switzerland coming from enterprises based in the UK and the Netherlands are almost entirely attributed to SPEs. The Netherlands appear twice in the top ten recipients of FDI flows when looking at all units, however, they drop to 15th place (origin country Luxemburg) once we account for SPE presence. Moreover, Dutch outward FDI flows are mostly attributed to SPEs with a notable exception; the flows to the US economy where median flows are above 30 billion USD controlling for resident SPEs.

Fruitful facts emerge when looking at region pairs and not disaggregated country pairs through the years in the sample. By far the largest share of FDI flows takes place within the North America and Caribbean (NAC) region, where bilateral flows from US to Canada and show an impressive 21 billion USD value onan annual basis. Despite the fact that Latin America (LCN) is represented by just Mexico and Chile in our OECD sample, the flows from NAC to the region are the second highest in median terms with annual value of 7 billion USD. Europe and Central Asia (EAS) appears to be a more consistent investor in North America than the other way round. Nonetheless, it must be taken into consideration that the bilateral flows between countries in these two regions are quite volatile especially after 2010 (UNCTAD, 2018). Flows form USA and Canada have remained below the 1 billion threshold after 2012 with an abrupt surge in 2016 as a result of mega-deals between US and UK corporations. Bilateral relationships are quite stable during our sample period while intra-European flows picked up in 2014 and exceeded 500 million in 2015.

3.2 Measures of financial distance

There is no single metric of financial sector development. This implies that measures of *distance* in the efficiency and depth of financial systems across economies cannot be precisely defined. In this paper we take advantage of the most recent data on the functioning of the financial system for OECD economies and develop indices that aim to capture the differences among countries that are connected through bilateral FDI flows. Given the limitations on data coverage, financial indicators available from the World Economic Forum *Global Competitiveness Report* are primarily used to determine financial distance[12]. The first measure

[12]Definitions and measurement of the financial variables used in the paper are given in the Appendix table A2.

of bilateral distance introduced is calculated as the Euclidean Distance for five WEF variables[13] among origin and destination country[14]. As expected, higher values of the index imply greater dissimilarity in the development of the financial system between origin and host economy.

$$fin\_dist_{ijt} = \sqrt{\sum_{k=1}^{5}(fin_{ikt} - fin_{jkt})^2} \quad (1)$$

In addition, the common underlying component of these five indicators is extracted through factor analysis. We perform an oblique rotation in order to allow for correlation among the common factors of these five variables. The analysis yields one factor with an eigenvalue greater than unity, which explains 97.5% of total variation. Among the five variables the only one with significant uniqueness is *Bank Soundness* with a value of 54%. Once the factor score for the origin and host economy is calibrated, the distance metric is then calculated simply as:

$$fin\_dist_{ijt} = \left|Factor_{it} - Factor_{jt}\right| (2)$$

Similar to the first measure, higher values for this constructed variable denote greater heterogeneity between partner economies. Regarding the main distance indicator included in the empirical estimations (Equation (1)), the underlying variable is an indicator with a mean value of 2.16 with a minimum value of 0.18 and a maximum value of 7.36. Considering the mean distance for all the country pairs included in the sample, the data show a notable surge after 2010 which followed the gradual reduction of the 2007-2009 period. Nonetheless, there are signs of decline in the index which implies more homogenous financial systems after 2013. Overall, the data highlight the fragmentation in financial system depth among OECD economies following the financial crisis as measured by this composite index. Having said that, there are pronounced persistent differences among country pairs through the years. It comes as no surprise that the smallest values for the index are recorded, on average, for the Czechia-Slovakia and Finland-Norway country pairs. By contrast, one might not expect the fact that financial homogeneity between Turkey and Poland and Finland and New Zealand are among the top ten positions in the sample.Overall, financial distance is associated with geographical and cultural distance; therefore it is imperative to assess the impact on FDI flows within a gravity framework as described in Section 4.

In reference to the Greek economy, the data on financial distance reveal a mean value of 4.3 in the baseline heterogeneity indicator, more than two units above the sample average. In line with the sample the distance increases from 3.9 in 2014 to 4.9 in 2016. The most

[13]Financial Efficiency, Financial Markets Index, Bank Soundness, Venture Capital and Access to Loans.

[14]As a robustness check we calculate the Minkowski Distance using higher powers.

pronounced deviations are recorded in relation to New Zealand, USA and Norway which are among the top performers in the WEF indices of financial system development. What is striking is that Greece is a partner in nine out of ten country pairs that display the highest average distance. The Greek financial system has most in common with other peripheral countries of the Euro area, namely Italy, Portugal and Slovenia, which also fare worse than average in the aforementioned financial indicators.

As a further robustness exercise, bilateral distances are calculated for each of the financial indicators at hand as described by equation (1). Having said that, similarity indices are constructed for the continuous financial variables (liquid liabilities, stock market capitalization, private credit all as percentage of host country GDP) along the lines of Fournier *et al.* (2015) as:

$$sim_{ijt} = ln(1 - (\frac{fin_{it}}{fin_{it}+fin_{jt}})^2 - -(\frac{fin_{jt}}{fin_{it}+fin_{jt}})^2) \quad (3)$$

In this case, fin is one of the financial indicators described above and high values of the sim_{ijt} variable denote less heterogeneity between origin and host economy.

3.3Empirical methodology

The bilateral nature of the data at hand requires the estimation of a gravity type model with bilateral FDI flows (or stocks) as the dependent variable (Anderson & van Wincoop, 2003). This approach is very common when working with trade flows; however it has also gained significant traction in the FDI empirical literature (Gast, 2005; Desbordes & Wei, 2017; Fournier, 2015) and associates the intensity of FDI flows with the distance (geographical, social and economic) between two economies as well as their size usually approximated by GDP. Bergstrand & Egger (2007) provide the theoretical foundation for using the gravity model in the empirical measurement of FDI determinants.

The econometric specification is the *Poisson Pseudo Maximum Likelihood Estimation* (PPMLE) in spite of the dependent variable not being a count variable following Santos & Teneyro (2006). Despite the fact that the dependent variable is continuous and not in count form, the authors show that the first order conditions of the Poisson specification are identical to those of a weighted non-linear least squares estimator. Furthermore, this approach is suitable when there is a large proportion of zeros in the data and does not assume equi-dispersion to yield consistent estimators.Finally, other count data methods such as Negative Binomial and Zero Inflated models yield different results conditional on the scale of the

dependent variable used. The technique is employed by the most recent empirical gravity studies (Anderson *et al*., 2016; Desbordes and Wei, 2017;Chenaf-Nicet&Rougier, 2015).

The baseline specification is:

$$FDI_{ijt} = \exp(\sum_k \delta_k d_{ijk} + \beta_1 Y_{it} + \beta_2 Y_{jt} + \sum_k X_{itk} + \sum_k X_{jtk} + \beta_3 FTA_{ijt} + \gamma FIN_{DIST}{}_{ijt} + a_i + a_j + a_t + u_{ijt}) \quad (4)$$

The dependent variable is bilateral FDI flows or stocks from country j to country i at year t [15], d_{ijk} is a set of distance variables commonly used in the gravity literature (geographical distance, contiguity, common language, common religion), Y_{it} and Y_{jt} are logged GDP for the host and origin economy respectively, X is a vector of host and origin determinants including remoteness (the GDP weighted sum of bilateral distances), nominal and real exchange rates, trade openness and FTA is an indicator variable to account for a free trade agreement between the two economies. Following the theoretical and empirical literature on gravity models (Anderson & van Wincoop, 2003; Baldwin &Taglionni, 2006), we include host and origin country dummies as well as time dummies in order to avoid the omission of inward and outward multilateral resistance. We augment the baseline specification by including host country determinants that capture institutional quality and financial system development as well as dummy variables to account for participation in a currency union.

The coefficient of interest is γ,which measures the *ceteris paribus* effect of financial distance (FIN_DIST) on FDI flows. We approximate financial distance through a battery of indices, primarily through the (logged) absolute deviation between host and origin scores in financial indexes provided by the IMF and the WEF (see Dellis, 2018 for a description of the indicators). Moreover, we use factor analysis to identify the common underlying components from the aforementioned variables, taking into account the entirety of indicators as well as distinct categories (WEF and IMF indicators grouped separately) and then use the absolute deviation of the factor score as a measure of financial distance. In addition, we include the Euclidean Distance of all the underlying factors dictated by the factor analysis between the host and origin country for the whole set of variables and distinct sub-groups as well as an index of financial system heterogeneity.

Due to the fact that there are many candidate variables that can be included as FDI determinants in the bilateral data framework, estimation results can be adversely affected by model uncertainty (Blonigen & Piger, 2011; Eicher *et al.*, 2011). To this end we estimate a parsimonious model that includes time-varying host and origin country fixed effects in

[15]Contrary to other methods the PPML estimator allows the use of level dependent variables without altering the results.

addition to the distance variables (d_{ijt}). In this case, host and origin country determinants X cannot be included in the specifications as they vary in the same dimension as the aforementioned fixed effects. According to Anderson *et* al. (2016), these time-varying fixed effects control for dynamic effects from the literature as well as absorb the multilateral resistance terms mentioned above. The model thus becomes:

$$FDI_{ijt} = \exp(\sum_k \delta_k d_{ijk} + \beta FTA_{ijt} + \gamma FIN_{DIST}{}_{ijt} + a_{it} + a_{jt} + a_t + u_{ijt}) \qquad (5)$$

To further test for the robustness of our results we include different measures of financial development distance as well as a varying set of bilateral and host-specific variables in Equations (4) and (5). More "traditional" log-linear specifications of the gravity model were also considered, however are not tabulated in the results and are available upon request.

4. Results

4.1 Baseline estimations

Descriptive results point to the positive impact of host and origin financial development on increased FDI flows. On top of that, substantial heterogeneity in key financial system indicators appear to impede bilateral FDI flows. Figure 5 highlights the negative correlation between FDI flows (in logarithmic form) and financial system heterogeneity as measured by the Euclidean distance of the four common factors (as calculated by factor analysis based on all financial variables in the sample) between host and origin economy. Turning to the econometric results, Table 2 presents the output for the regression as described in equation (5) using the financial distance indicator from equation (1). The two columns use FDI flows for all units and flows excluding Special Purpose Entities. The financial distance indicator in this case is the Euclidean distance for the five financial indicators taken by the WEF Global Competitiveness Indicators (GCI) namely *financial market efficiency, financial market development, access to loans, venture capital* and *bank soundness.* The parsimonious model yields the expected signs for the gravity variables and indicates a statistically significant negative effect of financial system heterogeneity on bilateral FDI flows irrespective of the presence of SPEs in the sample. Cluster standard errors at the country pair level are used for all purposes. The results are robust to the inclusion of measures of factor and size dissimilarity (based on the deviation in rates of tertiary education and GDP per capita), size similarity and common legal system among the partners. Table 3 presents the results from the same model once we incorporate the measure of financial distance heterogeneity described in equation (2). The resulting elasticity ranges from -0.15 to -0.28, thus verifying the hampering effect of financial system distance on bilateral FDI flows among OECD economies. The

standard gravity variables retain their size and significance corroborating the findings of the baseline model in Table 2.[16]

Finally, we consider measures of size and factor (dis)similarity following the literature (Gast, 2005; Martinez *et al.*, 2012; Petroulas, 2007; Fournier, 2015) in orderto incorporate the theoretical predictions of the *Knowledge Capital* model. The latter suggests that vertical FDI is spurred by differences in factor allocation. To this end we include the size similarity as defined by equation (3) using GDP for the host and origin economy and the difference in human capital following equation (2) with the ratio of the labor force with tertiary education as a proxy. Contrary to the predictions of the model, size similarity enhances bilateral investment (higher values indicate more similar economies). Notably, financial heterogeneity as measured by the Euclidean distance of the WEF financial indicators among host and origin economy maintains a negative significant effect, not far from the baseline estimations. The only difference is the negative coefficient of the same country dummy when data for non SPEs are used in Table 4. We further test the knowledge-capital model by including the interaction term between skill difference and size difference together with the squared difference in GDP within the country pair as do Blonigen *et al* (2003). The results are in line with the horizontal FDI model as absolute skill differences do not exert a significant effect on FDI flows. Moreover, difference in size appears to deter FDI contrary to the predictions of the model. The conclusions on financial distance do not change should we use factor dissimilarity as an additional control variable, while the indicator itself proves negative but not significant[17].

Overall our findings suggest that financial system heterogeneity is a significant deterrent of bilateral FDI flows among advanced economies in line with the conclusions drawn by Fournier (2015) and Benassy-Quere *et al* (2005) who address the issue of institutional heterogeneity. Both financial distance measured proposed above indicate a drop of 0.09 to 0.28 % in bilateral FDI flows due to a 1% surge in financial distance and point to the enhancing effect that the harmonization of financial systems across OECD economies could have on bilateral investment flows.

[16]The volatility of net FDI flows is also considered, hence 3 and 5 year Moving Averages of bilateral FDI flows are used as the dependent variable in equation (5). The results remain unchanged in their core and are available upon request from the author.
[17]Results not displayed but available upon request.

4.2 Robustness checks

4.2.1 High inflow-outflow correlation

A battery of robustness checks is carried out in order to test the validity of the estimations described in Table 5**.** Firstly, we address the conceptual issue of measurement of FDI flows as discussed in Blanchard & Acalin (2016). The authors posit that despite controlling for the presence of SPEs in the measurement of FDI flows, there is still a significant amount of *pass-through* capital in many cases. Such flows do not exert significant economic influence on the host economy and should, therefore, be approached with caution. Following the authors in the same vein as Dellis*et al.* (2017), we calculate the within country correlation coefficient between FDI inflows and outflows and exclude countries with high values from our estimation. As mentioned in Dellis (2018) this leads to the exclusion of Austria, Chile, Denmark, Hungary, Iceland and Israel[18]. The results reported in Table 5yield an almost identical coefficient (0.98) when all units are considered as in the baseline estimation for the index of financial distance, while all the control variables maintain their sign and significance. The elasticity of FDI flows with respect to bilateral financial distance when considering data for non SPEs ranges from -0.14 to -0.18, slightly smaller compared to the initial estimations, nonetheless significant at the 5% level. The outcome does not change should we use the difference in the *Financial Factor* as the relevant index of financial distance.Therefore, it cannot be claimed that the negative relationship between financial heterogeneity and FDI flows is driven by occurrences of pass-through capital in certain host economies.

4.2.2 Individual financial indices

We move on to use each financial variable in the sample separately by forming the respective financial distance variables as described in Section 3.2. Following the methodology of PPML estimation with time varying host and origin indicator variables we find support for the positive effect of financial sector proximity in the cases of the venture capital index, financial efficiency, overall financial development index and financial markets index (from the IMF) and financial efficiency (WEF). Moreover, for the continuous variables in the dataset we also rely on an index of similarity, calculated exactly as the size similarity index described in Equation (2) (Fournier, 2015). In this case, higher values of the index imply less financial distance between host and origin economy. Similarity indices for all four continuous variables, namely stock market capitalization, liquid liabilities, private credit and bank deposits[19] yield positive and significant coefficients for FDI flows for all units and non SPEs.

[18]The figure shows a unity coefficient for Finland and Slovakia, however there is only two data points available for these two countries.
[19]All measured as percentage of GDP.

The respective elasticities range from 0.65 to 1.88 as depicted in Table 6**.**The standard gravity variables by and large maintain their magnitude and significance across these specifications.

4.2.3 Minkowski distance

As described in Equation (1) the main index to measure the complex notion of financial distance is the Euclidean Distance between origin and host economy using the five financial variables from the World Economic Forum *Global Competitiveness Report*. In addition, the robustness of the PPMLE estimates is tested by calculating the *Minkowski Distance* (Lu *et al.*, 2015) which substitutes the square in the Euclidean Distance formula with higher powers as follows:

$$fin\_dist_{ijt} = \sqrt{\sum_{k=1}^{5}(fin_{ikt} - fin_{jkt})^{n}} \quad (6)$$

Table 7 reports the results of the baseline estimation for all units and excluding SPEs with a cubic exponent (n=3[20]). In accordance to the results from Table 2, the gravity variables broadly maintain their size and significance and the financial distance proves to be a significant deterrent of bilateral FDI flows. The respective elasticity is somewhat smaller in size ranging between -0.06 and -0.14. The picture does not alter when we use the 4th power (n=4) in the calculation of the Minkowski Distance measure.

4.2.4 Additional control variables

Our results are enhanced with estimations that control for additional host and origin country characteristics. Since these attributes vary with reporting country and over time it is not possible to include time-varying host and origin country dummies as in tables 1 through 6. The inward and outward multilateral resistance is approximated by time-fixed origin and host country indicator variables in all specifications (Baldwin &Taglioni, 2006). Table 8 presents results with a rather tight set of control variables as a further robustness test on the initial results. As emphasized in Blonigen&Piger (2011) and Eicher *et al.* (2011) there are more than 100 potential FDI determinants used in recent empirical research on the topic. The specifications presented in Table 7 include host and origin exchange rate in natural logarithms in a similar fashion to Gast (2005) and Fournier (2015)as well as remoteness of the host and origin economy calculated as the GDP weighted sum of the country's distance from its sample partners (Fournier, 2015; Demekas *et al*, 2005; de Sousa & Lockhart, 2006**).** This variable or similarly its mirror image market potential aims to capture third-country effects

[20]In this specification the absolute differences of the financial variables are used, something that is not necessary with the Euclidean Distance measure or the Minkowski Distance measure with n=4.

(Baltagi*et* al, 2007; Bloningen *et al.*, 2007). Within the economic and trade integration frameworks, MNCs can invest in a foreign economy with the purpose of exporting to a third country rather than the origin or the host economy as per the export-platform FDI model (Ekholm *et al.*, 2003). In addition, MNCs set up value chains across many economies in the process of *complex vertical FDI* (Baltagi *et al.*, 2007). In both of these cases the theoretical prediction is that host country remoteness should deter FDI flows. Finally, columns (5) and (6) add dummies for the participation of host and origin country in the Euro Area and the European Union. The effect of financial heterogeneity remains negative and significant in all specifications and the elasticity of bilateral FDI flows with respect to the measure of financial distance defined in equation (1) lies between -0.16 and -0.26. Interestingly, the negative effect of financial heterogeneity is more pronounced when the SPEs are excluded from the sample. Host and origin country remoteness proves to be negatively associated with the bilateral FDI flows in line with Fournier (2015), thus providing support to the notions of export-platform and complex vertical FDI, although one needs to keep in mind that the dataset comprises only from OECD economies.

5. Policy implications and the opportunities for Greece

The empirical results from Section 4 suggest that not only favorable financial conditions in the origin economy matter for the elevated FDI flows within advanced economies.Improving domestic financial conditions and harmonizing with regional best practices in the field can be associated with enhanced foreign capital which is necessary for the reboot of the European economy and fostering long-term growth.The ongoing discussions and reforms towards the Banking Union and the Capital Markets Union could, therefore contribute to the sharp decrease in the diversity in the development and functioning of financial systems across the continent. According to the European Commission (2018) the completion of the banking and Capital Markets Union will open up the possibilities for international trade. Insofar as trade and FDI are mostly considered as compliments in the context for the developed economies sample and taking into consideration our empirical results these procedures could boost bilateral investment as well. As noted below, the issue of non-performing loans is critical for some EU member countries. Apart from Greece which is an outlier with 43% of NPLs compared to total outstanding loans in 2018Q3, Portugal and Italy face substantial difficulties with 12% and 9% respectively with the EU average standing below 4%. Policies targeted towards the reduction of these ratios contribute to the convergence of financial sector performance and include the removal of obstacles to electronic auctions and promotion of out-of-court workouts. The decisive implementation of

such reforms can act as a pull factor for FDI flows on top of reinvigorating domestic investment in these economies.

The performance of the Greek economy in the field of FDI inflows has been modest albeit with strong signs of recovery after 2015. Over the course of the years, the Greek economy had failed to fulfil its potential as an investment destination and responded to regional FDI trends with a notable lag (Dellis, 2018). On the other hand, the severe financial crisis that manifested after 2009 had a significant adverse effect on the country's domestic financial conditions. With respect to the five financial indicators from WEF used in the analysis, Greece resides in the last place of the 2010-2016 average in all of them. The resulting high difference in our baseline heterogeneity indices shows the poor performance of the financial system on the one hand and the potential for convergence upon peer practices on the other. The IMF country report (2019) highlights the need for substantial progress in the reduction of non-performing loans (NPLs) and the governance of financial institutions.

As highlighted in Section 3.2, the average distance from partners when looking at factor distance for WEF and Euclidean distance of all WEF variables is among the highest in the sample. Having said that, the Greek economy attracts substantial FDI flows from partners despite their heterogeneous financial systems (see Figure 6). The relationship is not clear-cut, especially if we look at the 2000-2016 period as well. The "traditional" origin economies (see Dellis, 2018) are not uniform concerning the depth and performance of their financial systems. Physical distance and other factors seem to be the primary forces of FDI flows[21], nonetheless reducing financial distance could add to the increasing flows of the 2016-2017 period. According to the data, Greece was at the bottom of the table when looking at the financial indicators compiled by the World Economic Forum. This indicates that converging to best practices in terms of financial development can accommodate the increase of FDI flows as a byproduct. Looking at the individual attributes of the financial system and the results from Table 6 we can deduce that converging to the mean sample distance for the financial efficiency indicator (a drop by one point) increases FDI flows by no less than 20%. Reducing the distance in terms of venture capital ceteris paribus raises FDI inflows to Greece by 15% if the distance stands at sample average levels. It is evident that, given the empirical results from the gravity estimations and the poor performance of the Greek economy in the WEF indicators, there is room for improvement that could act as a catalyst for increased FDI flows. It has to be noted that the distance in terms of the continuous variables used as

[21]Luxembourg appears as the top investor in Greece for 2016, however this result should be approached with caution as the OECD does not provide with "clean" FDI data for Greece and SPEs account for a large proportion of Luxembourg outward FDI.

financial indicators (liquid liabilities, private credit, and stock market capitalizations) is in line with sample averages in sharp contrast to the five key WEF indicators discussed above.

6. Conclusion

This paper attempts to empirically gauge the impact of financial system heterogeneity on bilateral FDI flows for OECD economies. While the relevant literature has considered the effects of host and origin country financial development, little work to our knowledge has been devoted to the notion of *financial distance.* The underlying hypothesis is that a shift from the fragmented state of financial systems within the OECD towards homogeneity is a catalyst for increased FDI flows among advanced economies. We calculate different measures of financial system heterogeneity relying on a rich set of financial indicators that encompass both quantitative and qualitative information on the development and depth of the partners' financial system. Applying the most recent econometric techniques we estimate a gravity-style equation to explain bilateral FDI flows and find that heterogeneity in key attributes of the financial system between origin and host economy significantly deter FDI flows. The results are robust to alternative measures of financial distance and also controlling for possible pass-through capital that is embedded in reported FDI flows. The negative impact of financial heterogeneity is stable across various model specifications following the relevant empirical literature. This result provides fruitful policy implications for developed economies, namely the need for convergence to best practices in the financial system in order to increase bilateral investment in a time of need. Furthermore, peripheral countries of the Euro area (Greece, Portugal, and Spain) could also benefit in the field of FDI by restructuring their financial systems which were severely affected by the financial crisis of the current decade and converging to best practices in the field. The results also corroborate the view that institutional heterogeneity is detrimental to FDI flows as highlighted by Fournier (2015) and Benassy-Quere *et al.* (2007) and underscore the need for the continuation and ownership of structural reforms in economies recovering from the financial crisis.

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8. Tables and Figures

Table 1: Descriptive Statistics

	Mean	Median	St.Dev	min	max
FDI flows (All Units)	896.288	3.338	6351.147	-94851	182561
FDI flows (non SPEs)	690.86	3.32	5051.845	-94851	182561
Host Remoteness (log)	11.131	11.093	.761	7.754	12.597
Host Financial Efficiency	4.098	4.214	.688	2.238	5.282
Host Financial Market	4.498	4.589	.668	2.524	5.786
Host Bank Soundness	5.192	5.37	1.038	1.84	6.817
Host Venture Capital	3.176	3.201	.71	1.704	4.733
Host Loans Access	3.276	3.32	.911	1.57	5.744
Origin Remoteness (log)	11.082	10.854	.463	10.661	12.352
Origin Financial Efficiency	4.193	4.33	.709	2.238	5.814
Origin Financial Market	4.586	4.645	.699	2.524	6.169
Origin Bank Soundness	5.294	5.445	1.051	1.445	6.896
Origin Venture Capital	3.263	3.297	.75	1.704	5.278
Origin Loans Access	3.392	3.349	.945	1.57	5.744

Table 2: Gravity estimation – baseline model

VARIABLES	(1) FDI All Units	(2) FDI non SPEs	(3) FDI All Units	(4) FDI non SPEs
(log) Distance	-0.319***	-0.608***	-0.240***	-0.394***
	(0.000)	(0.000)	(0.004)	(0.000)
Common Language	0.384***	0.210	0.381***	0.233*
	(0.002)	(0.121)	(0.003)	(0.088)
Same Country in the past	0.544***	-0.320	0.594***	-0.160
	(0.001)	(0.224)	(0.001)	(0.548)
Common Religion	1.017***	0.695**	1.023***	0.741**
	(0.001)	(0.040)	(0.001)	(0.025)
Bilateral FTA dummy			0.239	0.834***
			(0.162)	(0.003)
Financial Distance	-0.098*	-0.199***	-0.096*	-0.198***
	(0.078)	(0.001)	(0.085)	(0.001)
Observations	2,224	2,146	2,224	2,146
R-squared	0.853	0.879	0.853	0.884
Year FE	Yes	Yes	Yes	Yes
Model	PPML	PPML	PPML	PPML
Pair-Cluster SE	Yes	Yes	Yes	Yes
Time-Varying Host Country FE	Yes	Yes	Yes	Yes
Time-Varying Origin Country FE	Yes	Yes	Yes	Yes
Size Similarity	No	No	No	No

Table 3: Gravity estimation – alternative measure of financial heterogeneity

VARIABLES	(1) FDI All Units	(2) FDI non SPEs	(3) FDI All Units	(4) FDI non SPEs
(log) Distance	-0.315***	-0.601***	-0.243***	-0.381***
	(0.000)	(0.000)	(0.004)	(0.000)
Common Language	0.393***	0.230*	0.389***	0.258*
	(0.002)	(0.090)	(0.003)	(0.062)
Same Country in the past	0.548***	-0.297	0.593***	-0.138
	(0.001)	(0.263)	(0.001)	(0.608)
Common Religion	0.994***	0.669**	1.003***	0.717**
	(0.002)	(0.044)	(0.002)	(0.026)
Bilateral FTA dummy			0.219	0.864***
			(0.211)	(0.004)
Financial Distance	-0.145*	-0.275***	-0.135	-0.279***
	(0.077)	(0.001)	(0.101)	(0.001)
Observations	2,224	2,146	2,224	2,146
R-squared	0.853	0.881	0.853	0.886
Year FE	Yes	Yes	Yes	Yes
Model	PPML	PPML	PPML	PPML
Pair-Cluster SE	Yes	Yes	Yes	Yes
Time-Varying Host Country FE	Yes	Yes	Yes	Yes
Time-Varying Origin Country FE	Yes	Yes	Yes	Yes
Size Similarity	No	No	No	No

Table 4: Gravity estimation – size similarity

VARIABLES	(1) FDI All Units	(2) FDI non SPEs	(3) FDI All Units	(4) FDI non SPEs
(log) Distance	-0.318***	-0.607***	-0.258***	-0.442***
	(0.000)	(0.000)	(0.003)	(0.000)
Common Language	0.399***	0.218*	0.397***	0.233*
	(0.003)	(0.083)	(0.003)	(0.066)
Same Country in the past	0.405**	-0.605**	0.452**	-0.441*
	(0.018)	(0.019)	(0.011)	(0.096)
Common Religion	0.853***	0.456	0.868***	0.527
	(0.006)	(0.175)	(0.005)	(0.113)
Bilateral FTA dummy			0.179	0.651**
			(0.292)	(0.015)
Financial Distance	-0.125**	-0.256***	-0.122**	-0.249***
	(0.037)	(0.000)	(0.041)	(0.000)
Size Similarity	0.135*	0.255***	0.126*	0.221***
	(0.058)	(0.000)	(0.075)	(0.000)
Observations	2,224	2,146	2,224	2,146
R-squared	0.848	0.885	0.849	0.887
Year FE	Yes	Yes	Yes	Yes
Model	PPML	PPML	PPML	PPML
Pair-Cluster SE	Yes	Yes	Yes	Yes
Time-Varying Host Country FE	Yes	Yes	Yes	Yes
Time-Varying Origin Country FE	Yes	Yes	Yes	Yes
SizeSimilarity	Yes	Yes	Yes	Yes

Table 5: Gravity estimation excluding high inflow-outflow countries

	(1)	(2)	(3)	(4)
VARIABLES	FDI All Units	FDI non SPEs	FDI All Units	FDI non SPEs
(log) Distance	-0.319***	-0.574***	-0.252***	-0.371***
	(0.000)	(0.000)	(0.005)	(0.000)
Common Language	0.384***	0.169	0.358***	0.254*
	(0.002)	(0.227)	(0.008)	(0.088)
Same Country in the past	0.544***	-0.224	0.627***	-0.324
	(0.001)	(0.429)	(0.001)	(0.254)
Common Religion	1.017***	0.705**	0.918***	0.625*
	(0.001)	(0.044)	(0.008)	(0.072)
FinancialDistance	-0.098*	-0.140**	-0.064	-0.180***
	(0.078)	(0.041)	(0.296)	(0.007)
Bilateral FTA dummy			0.267	0.888***
			(0.129)	(0.009)
Observations	2,224	1,609	1,838	1,823
R-squared	0.853	0.899	0.857	0.889
Year FE	Yes	Yes	Yes	Yes
Model	PPML	PPML	PPML	PPML
Pair-Cluster SE	Yes	Yes	Yes	Yes
Time-Varying Host Country FE	Yes	Yes	Yes	Yes
Time-Varying Origin Country FE	Yes	Yes	Yes	Yes
Size Similarity	No	No	No	No

Table 6: Robustness with Individual Financial Indicators[22]

FinancialVariable	FDI All Units	FDI non SPEs
Access to loans (WEF)	-0.090	-0.208*
Venture Capital (WEF)	-0.250***	-0.342***
Financialmarket (WEF)	-0.202*	-0.363**
Financialefficiency (WEF)	-0.233**	-0.360***
Soundbanks (WEF)	-0.202***	-0.092
Financial Development Index (IMF)	-1.798***	0.051
Privatecredit %GDP	0.217	0.688*
StockMarketCapitalization %GDP	0.618**	0.690**
Bankdeposits %GDP	0.031	1.885**
Liquid Liabilities % GDP	0.253	0.954*

[22] All Results refer to PPMLE estimations following the baseline specification.

Table 7: Robustness with Minkowski Distance

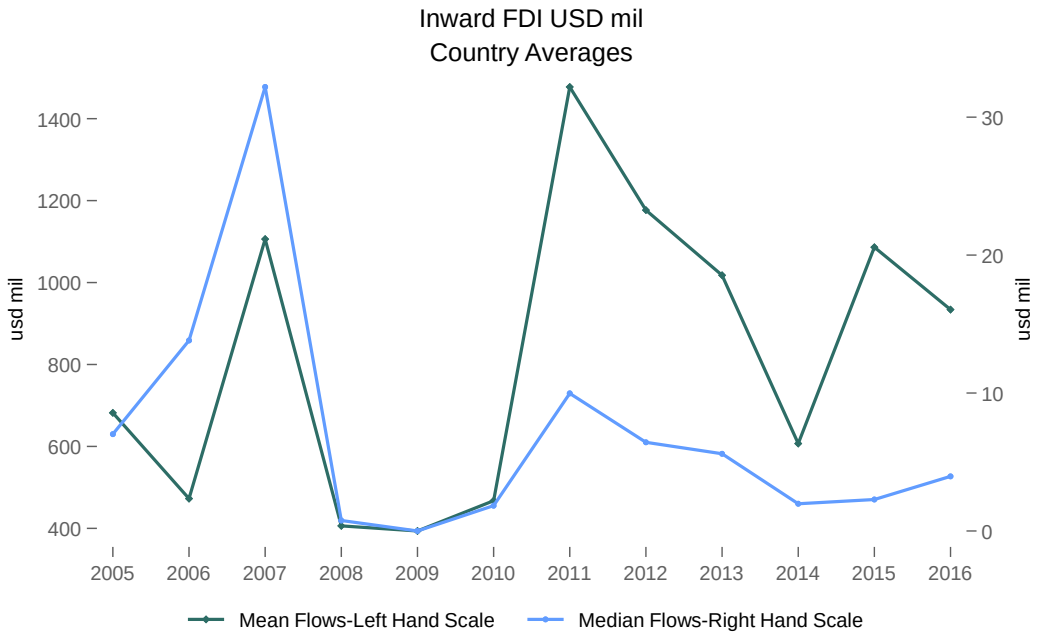
VARIABLES	(1) FDI All Units	(2) FDI non SPEs	(3) FDI All Units	(4) FDI non SPEs
(log) Distance	-0.318***	-0.610***	-0.239***	-0.400***
	(0.000)	(0.000)	(0.004)	(0.000)
Common Language	0.381***	0.200	0.379***	0.222
	(0.003)	(0.140)	(0.003)	(0.105)
Same Country in the past	0.546***	-0.308	0.595***	-0.151
	(0.001)	(0.238)	(0.001)	(0.569)
Common Religion	1.019***	0.684**	1.025***	0.731**
	(0.001)	(0.045)	(0.001)	(0.029)
Bilateral FTA dummy			0.236	0.815***
			(0.163)	(0.003)
Financial Distance	-0.060*	-0.134***	-0.059*	-0.131***
	(0.082)	(0.001)	(0.092)	(0.001)
Observations	2,224	2,146	2,224	2,146
R-squared	0.852	0.879	0.852	0.883
Year FE	Yes	Yes	Yes	Yes
Model	PPML	PPML	PPML	PPML
Pair-Cluster SE	Yes	Yes	Yes	Yes
Time-Varying Host Country FE	Yes	Yes	Yes	Yes
Time-Varying Origin Country FE	Yes	Yes	Yes	Yes
Size Similarity	No	No	No	No

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

Table 8: Robustness with Additional Control Variables

VARIABLES	(1) FDI All Units	(2) FDI non SPEs	(3) FDI All Units	(4) FDI non SPEs	(5) FDI All Units	(6) FDI non SPEs
(log) Distance	-0.293***	-0.543***	-0.202**	-0.332***	-0.203**	-0.203**
	(0.000)	(0.000)	(0.037)	(0.001)	(0.037)	(0.037)
Common Language	0.331**	0.142	0.335**	0.158	0.335**	0.335**
	(0.027)	(0.335)	(0.029)	(0.297)	(0.029)	(0.029)
Same Country in the past	0.314	-0.666*	0.352	-0.563	0.351	0.351
	(0.271)	(0.082)	(0.202)	(0.146)	(0.203)	(0.203)
Common Religion	0.631	0.496	0.622	0.505	0.621	0.621
	(0.109)	(0.182)	(0.117)	(0.161)	(0.118)	(0.118)
Origin Exchange Rate	-1.652*	-0.540	-1.706*	-0.448	-1.699*	-1.699*
	(0.063)	(0.521)	(0.052)	(0.591)	(0.065)	(0.065)
Host Exchange Rate	-2.739*	-2.571	-2.805*	-2.662	-2.803*	-2.803*
	(0.055)	(0.140)	(0.051)	(0.126)	(0.052)	(0.052)
Financial Distance	-0.160**	-0.259***	-0.159**	-0.253***	-0.158**	-0.158**
	(0.011)	(0.001)	(0.011)	(0.002)	(0.012)	(0.012)
Bilateral FTA dummy			0.256	0.788***	0.254	0.254
			(0.239)	(0.008)	(0.241)	(0.241)
Host in EA					-0.599*	-0.599*
					(0.069)	(0.069)
Host in EU					-4.685***	-4.685***
					(0.000)	(0.000)
Origin in EA					-2.157*	-2.157*
					(0.100)	(0.100)
Origin in EU					-3.502***	-3.502***
					(0.000)	(0.000)
Host Remoteness	-1.187***	5.019***	-1.337***	5.414***	-1.335***	-1.335***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Origin Remoteness	-2.502***	-2.913***	-2.707***	-3.897***	-2.707***	-2.707***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	56.331***	-7.587	59.601***	-2.489	59.569***	59.569***
	(0.000)	(0.372)	(0.000)	(0.761)	(0.000)	(0.000)
Observations	2,231	2,158	2,231	2,158	2,230	2,230
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Model	PPML	PPML	PPML	PPML	PPML	PPML
Pair-Cluster SE	Yes	Yes	Yes	Yes	Yes	Yes
HostCountry FE	Yes	Yes	Yes	Yes	Yes	Yes
OriginCountry FE	Yes	Yes	Yes	Yes	Yes	Yes
Dissimilarity	No	No	No	No	No	No

Figure 1: Mean and median FDI flows



Source: OECD

Figure 2: Maximum flows by year

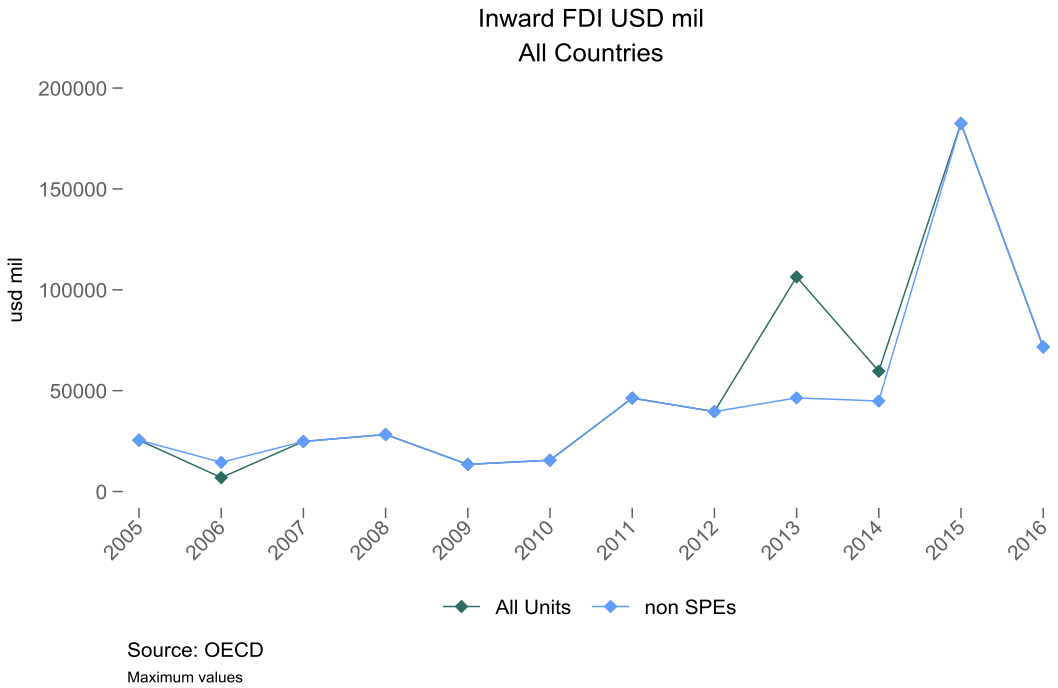


Figure 3: Top pairs in median FDI flows

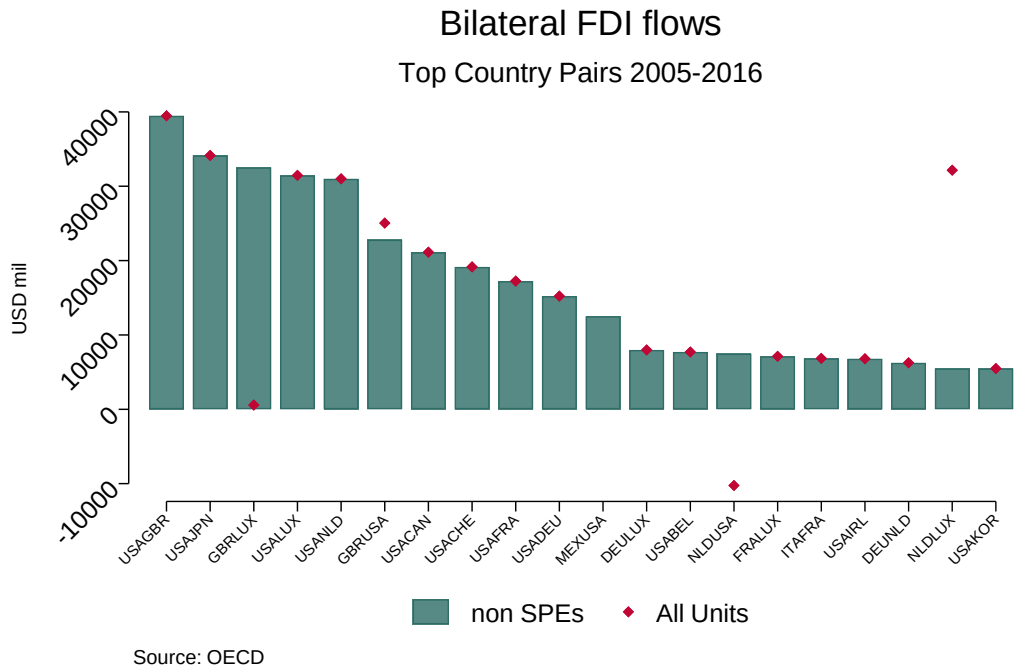
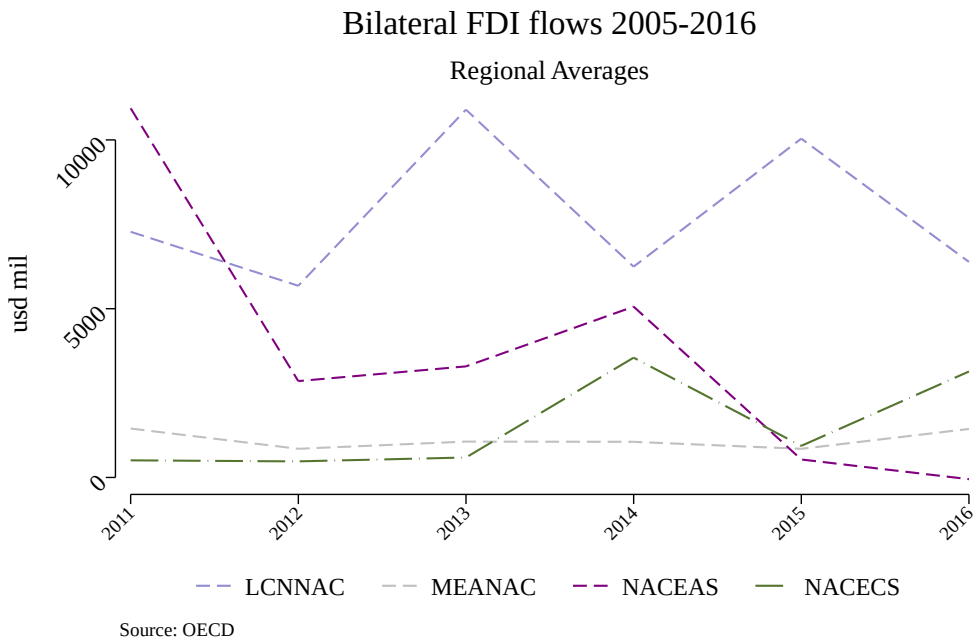
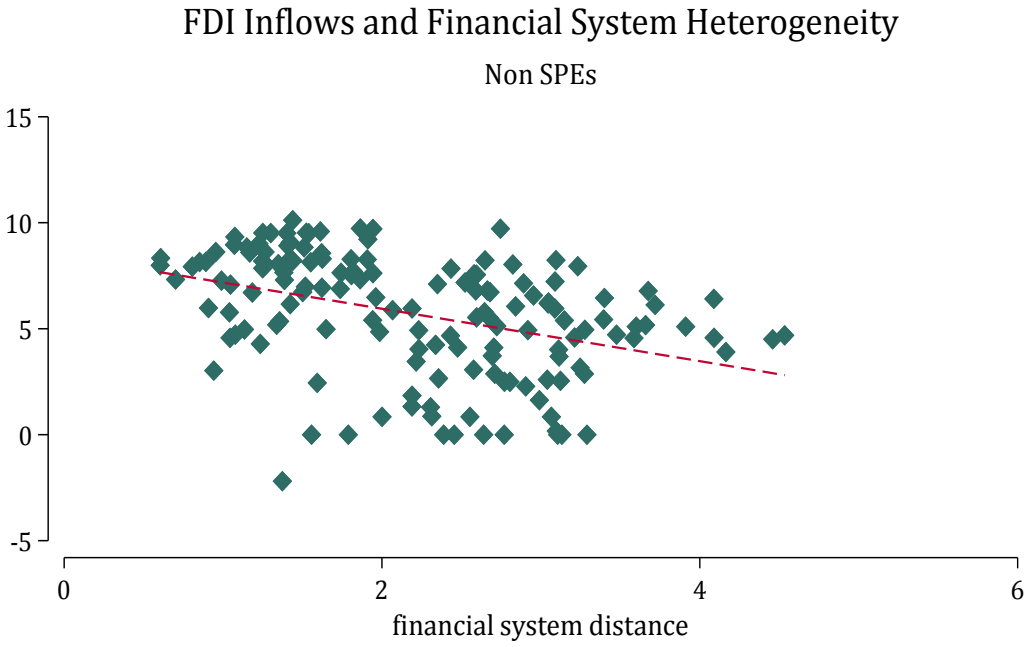


Figure 4: Regional Flows[23]



Source: OECD

Figure 5: Financial distance and bilateral FDI inflows

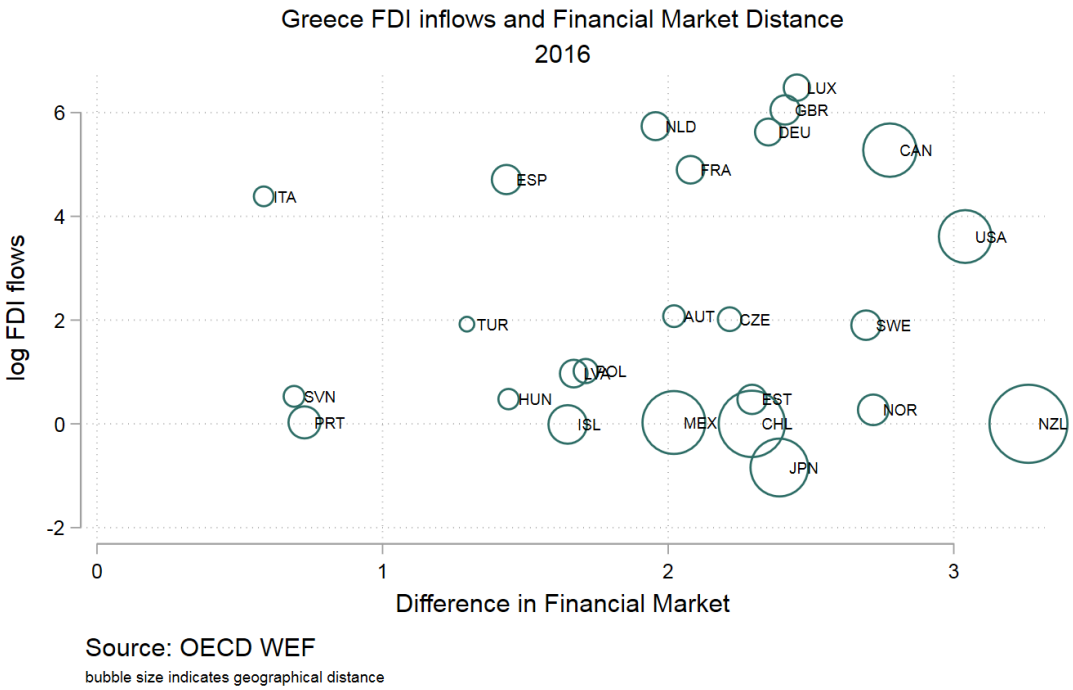


Source: OECD WEF WB and Author's calculations

higher values denote greater heterogeneity

[23]Top regional pair NACNAC not included.

Figure 6: Greece FDI inflows and financial heterogeneity



Appendix

Table A1: Original Host Country Set

Australia	Denmark	Italy	Portugal
Austria	Estonia	Japan	Slovakia
Belgium	Finland	Korea	Slovenia
Canada	France	Latvia	Spain
Chile	Germany	Luxembourg	Sweden
	Greece	Mexico	Switzerland
Czechia	Hungary	Netherlands	Turkey
	Iceland	NewZealand	UnitedKingdom
	Ireland	Norway	UnitedStates
	Israel	Poland	

Table A2: Financial Variables

Variable	Unit	Description	Source
Financial Development Index	0-1 (=more financial openness)	Aggregate Indicator	IMF[24]
Financial Institutions Index	0-1 (=more financial openness)	Aggregate Sub-Indicator	IMF
Financial Markets Index	0-1 (=more financial openness)	Aggregate Sub-Indicator	IMF
Financial Institutions Depth	0-1 (=more financial openness)	Private Sector Credit to GDP, Pension fund assets to GDP, Mutual fund assets to GDP, Insurance premiums (life + non-life) to GDP	IMF
Financial Institutions Access	0-1 (=more financial openness)	Bank branches per 100,000 adults and ATMs per 100,000 adults	IMF
Financial Institutions Efficiency	0-1 (=more financial openness)	Net interest margin, Lending-deposits spread, Non-interest income to total income, Overhead costs to total assets, Return on assets, Return on equity	IMF
Financial Markets Depth	0-1 (=more financial openness)	Stock Market Capitalization to GDP, Stocks traded to GDP, International debt securities of government to GDP,Total debt securities of financial corporation to GDP, Total debt securities of nonfinancial corporation to GDP	IMF
Financial Markets Access	0-1 (=more financial openness)	Based on the percentage of market capitalization outside of top 10 largest companies to proxy access to stock markets, Total number of issuers of debt	IMF
FinancialInstitutions Efficiency	0-1 (=more financial openness)	Stock market turnover ratio (value traded/stock market capitalization)	IMF
Chinn-ItoIndex	0-1(=less capital controls)	Composite Index examining existence of multiple Exchange Rates, restrictions on Current Account transactions, restrictions on Capital Account Transactions and requirement of the surrender of Export Proceeds[25]	Chinn & Ito[26]
Liquid liabilities	% GDP	Ratio of liquid liabilities to GDP	World Bank[27]
Deposit money bank assets	% of Deposit (Money & Central) Bank Assets	Ratio of deposit money bank claims on domestic nonfinancial real sector (as defined above) to the sum of deposit money bank and Central Bank claims on domestic nonfinancial real sector (as defined above)	World Bank
Private credit by Deposit Money Banks	% GDP	Claims on domestic real nonfinancial sector by deposit money banks as a share of GDP	World Bank
Stock Market Capitalization	% GDP	Value of listed shares to GDP	World Bank
Private Bond Market Capitalization	%GDP	Private domestic debt securities issued by financial institutions and corporations as a share of GDP	World Bank

[24]International Monetary Fund: *Financial Development Database.*
[25]Based on IMF: *Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER).*
[26]http://web.pdx.edu/~ito/Chinn-Ito_website.htm.
[27]Financial Structure and Development Dataset.

Bank concentration	%	Assets of three largest banks as a share of assets of all commercial banks.	World Bank
Bank deposits	%GDP	Demand, time and saving deposits in deposit money banks as a share of GDP	World Bank
Private credit by banks	%GDP	Private credit by deposit money banks to GD.	World Bank
Access to Credit	0-100 (=best)	Strength of credit reporting systems and effectiveness of collateral and bankruptcy laws in facilitating lending	World Bank[28]
Financial market	1-7 (=best)	Aggregate Indicator	WEF[29]
Financial efficiency	1-7 (=best)	Aggregate Sub-Indicator[30]	WEF
Sound banks	1-7 (=best)	In your country, how do you assess the soundness of banks?	WEF
Venture capital	1-7 (=best)	In your country, how easy is it for start-up entrepreneurs with Innovative but risky projects to obtain equity funding?	WEF
Access to loans	1-7 (=best)	In your country, how easy is it for businesses to obtain a bank loan?	WEF
Sound money	0-10(=best)	Money growth, Standard deviation of inflation, Inflation: most recent year, Freedom to own foreign currency bank accounts	Fraser Institute[31]

[28]Doing Business Report
[29]World Economic Forum: *Global Competitiveness Report 2017-2018.*
[30]Comprising of: Financial Services Meeting Business Needs, Affordability of Financial Services, Financing through Local Equity Market, Access to loans, Venture Capital Availability.
[31]*Economic Freedom Report*

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