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Has the crisis affected Spanish investment strategy abroad? A spatial panel data approach

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Abstract:

This paper investigates whether the Spanish investment strategy abroad has been affected by the Great Recession. Applying a panel Spatial Durbin Model for two sample periods, pre-crisis (1996-2007) and crisis (2008-2014), our findings indicate that Spanish FDI strategy has been indeed markedly altered by the global economic crisis. Complex-vertical FDI motives prevailed over the pre-crisis period whereas horizontal FDI did so over the crisis. These results are robust to the use of sectoral FDI data and alternative specifications of the spatial weight matrix.

Keywords: Foreign direct investment, spatial dependence, Spain

JEL codes: C23, F21, F23

1. INTRODUCTION

Over the last few decades, foreign direct investment (FDI) has registered growth rates well above those of global output and trade, fostering economic growth and development in recipient countries and, gradually, changing the landscape of the global economy. No wonder, then, that this rapid increase in FDI has deepened the interest in the study of the determinants and strategies of multinational enterprises' (MNEs) investments abroad.[1]

Indeed, one of the most important decisions made by MNEs when undertaking a foreign investment is the choice of their FDI strategy. Regarding this issue and based on models developed within a two-country framework - that is to say, assuming independence of FDI flows across host countries -, horizontal (market-seeking) and vertical (efficiency-seeking) have been the strategies traditionally set up by the FDI literature. However, recent theoretical contributions have incorporated the influence of third-country effects into models dealing with the analysis of FDI determinants, adding to the traditional horizontal and vertical FDI strategies other somewhat more complex strategies: the export-platform, which can be considered a variation of the horizontal FDI, and the complex-vertical as a variation of the vertical one (Baltagi et al., 2007).

[1] For a review on this issue, see Blonigen (2005), Faeth (2009), Assunção et al (2013) or Blonigen and Piger (2014).

But, why the need for third-country effects? This is due to the fact that, from a theoretical point of view, there are many reasons to suspect spatial dependence in FDI data. For instance, the 'new economic geography' literature (see e.g. Krugman, 1991; Fujita et al., 1999) indicates that agglomeration effects must be considered in the FDI attraction process since FDI in a country is expected to depend not only on its own characteristics but also on those of its neighbors.[2] Additionally, it must be reminded that the increasing participation in global value chains by different countries relies on the fragmentation of production around the globe, which heightens the interdependence between firms and supply chain partners located in different countries (Gereffi et al., 2005). As if these reasons were not enough to take into account the role of spatial dependence in FDI analysis, we can add another one coming from a methodological perspective: the parameter estimates and statistical inferences of most literature on FDI, which excludes third-country effects or spatial linkages, are questionable since this omission can lead to serious econometric problems in the estimation, such as biased, inconsistent or inefficient estimates, as well as inaccurate inferences (Anselin, 1988).

From an empirical perspective, however, the existence of spatial dependence has been only recently recognized in papers dealing with FDI determinants and MNEs' choice of FDI strategy (see, e.g., the pioneers Baltagi et al., 2007 and Blonigen et al., 2007). There is, in any case, need for further developments for at least two reasons. On the one hand, because the most popular method to tackle spatial dependence is based on spatial autoregressive models (SAR), which present an important limitation: they circumscribe spatial dependence to FDI but not to its determinants. On the other, because the majority of previous studies use the so-called point estimates for inferences and interpretation of the parameters of the spatial regression model, which, according to LeSage and Pace (2009), may give rise to wrong results. Instead, partial derivatives of the dependent variable concerning each independent variable should be employed.

[2] Several studies have shown the importance of agglomeration effects in FDI decisions (Gao, 1999; Raybaudi-Massilia, 2000; Ekholm and Forslid, 2001; Baldwin and Okubo, 2006; Egger et al., 2007; Hoffmann and Markusen, 2008 and Brakman et al., 2009).

We delve into these two aforementioned issues further in this work, for which we analyze Spanish direct investment abroad. This is an interesting case study not only because Spain has become a significant player in the world economy but also due to changes occurred during the recent economic crisis. Thanks to its integration into the European Union in 1986, Spanish FDI outflows registered notable increases since the second half of the nineties (Maté Rubio, 1996; Campa and Guillén, 1996; Gordo et al., 2008).[3] The outbreak of the economic crisis was, however, a turning point: from them on, and even though the lack of domestic demand forced Spanish firms to expand their business abroad (Eppinger et al., 2015), FDI outflows plummeted. Furthermore, the crisis pushed Spanish firms to be more selective in their international endeavors (Gil-Pareja et al., 2013). This, naturally, adds interest to our case study, as it allows us to infer whether changes in the economic cycle affected the FDI strategy.

Bearing all these considerations in mind, the main aim of this paper is to examine whether Spanish FDI determinants and, especially, the FDI strategy depend on the business cycle. More specifically, the main purpose is to analyze the impact of the Great Recession on the Spanish investment strategy abroad. For this reason, the sample period under investigation (going from 1996 to 2014) combines a sub-period of economic expansion (which we call "pre-crisis" (1996-2007)) with the aftermath of the economic downturn (what we call "crisis" (2008-2014)). To accomplish this aim, the paper uses a novel methodological approach. It contributes to the literature by estimating a panel spatial Durbin model (SDM), which considers spillovers arising not only from FDI but also from its potential determinants in neighboring host countries. Moreover, it computes the own- and cross-partial derivatives and reports scalar summary measures of the direct and indirect effects of the impact of a change in each of the FDI determinants, which is much more accurate than the typical point estimates (LeSage and Pace, 2009).

Although it is beyond the scope of this paper we also try, being aware that MNEs face a concurrent decision-making process, to establish a link (tentatively and in need of further research we have to admit) between the FDI strategies and two additional MNEs' decisions posited by the literature on

[3] Spanish MNEs took advantage of Europe's external openness to trade and investment, derived from the implementation of the European Monetary Union and the ongoing process of globalization. They started to internationalize and take advantage of the growth potential of certain markets and sectors. Consequently, outward FDI flows surpassed inward FDI flows, Spain becoming a net FDI exporter.

FDI entry mode research: the investment mode on one side, and on the other the ownership mode. In so doing, we have to keep in mind that under a horizontal FDI strategy (either pure or its export-platform variation) the MNE tends to locate the production in the destination country to save on the transport costs associated with exporting to a targeted market; the MNE will set up foreign facilities that mirror those in the home country. In contrast, under a vertical FDI strategy (either pure or its complex-vertical variation), the MNE tends to fragment the production process across different countries to exploit comparative advantages (Markusen and Maskus, 2002).[4] Accordingly, it seems plausible to believe that a horizontal FDI strategy implies, by and large, a higher level of integration within the host country than a vertical one. Whereas in the case of horizontal FDI, MNEs tend to be somewhat embedded in the host country by creating a local network with local firms, when vertical FDI is prevalent MNEs are less likely to do so (Chen et al., 2004).

As said, another important decision when it comes to investing abroad has to do with the investment mode. Here the MNE chooses between cross-border merger and acquisition (M&A) or greenfield investment. As Davies et al. (2015) state, M&A investment implies the acquisition of a local firm by a foreign MNE, so it involves a transfer of ownership arising from a desire to integrate, while in the case of greenfield investment the MNE builds new operational facilities from the ground up. Therefore, a priori, it seems more likely that M&A is the main investment mode when the predominant FDI strategy is horizontal (pure or export-platform), whereas greenfield investment is likely to prevail when a vertical (pure or complex-vertical) FDI strategy is widespread.

There must also be a connexion between strategies and the ownership mode. Regarding this point, the MNE has to choose between wholly owned subsidiaries or joint ventures. A wholly owned subsidiary arises when a firm entirely owns the facility in the foreign country, whereas joint ventures are characterized by sharing ownership, returns, and risks with local partners. Consequently, it seems the level of integration in the host country is higher for joint ventures than for wholly owned subsidiaries. Additionally, as Lankes and Venables (1996) indicated, the literature suggests that joint ventures are preferred when MNEs need information about the local market, while wholly owned subsidiaries are established when the MNE wants to control some aspects of the production process. Putting two and two together we might conclude that joint ventures are likely the prevalent

[4] This fragmentation of the value chain, when different functions are located in different countries, is coined in the management literature as 'global value chain' (Hernández and Pedersen, 2017).

ownership mode under a horizontal FDI strategy while under a vertical FDI strategy wholly owned subsidiaries seem to be more likely. The results obtained by some studies (see e.g. Duanmu, 2011) support it.

The remainder of the paper is structured as follows. Section 2 provides a brief overview of the spatial FDI literature. Section 3 outlines the pattern of the geographical and sectoral distribution of Spanish FDI. Section 4 specifies the model and describes data used for the empirical analysis. Section 5 estimates the model and presents the results. Section 6 conducts a robustness check by employing sectoral FDI data and alternative specifications of the distance matrix. Finally, Section 7 offers the main conclusions and some policy implications.

2. FDI DETERMINANTS: A LITERATURE REVIEW OF SPATIAL MODELS

In this section, we briefly review the empirical literature on FDI determinants at the country level that takes into account spatial dependence (see Table 1 for a short reference focused on the treatment of spatial effects).[5] Two different approaches to model FDI spillovers and determine the predominant FDI strategy can be distinguished.[6] The less common one implies the inclusion in the model of spatial lags of the factors driving FDI to consider not only the impact of the host country characteristics on FDI but also those of its neighbors. This strategy is followed by Baltagi et al. (2007), who include spatially weighted explanatory variables (as well as spatial interactions in the error term) to examine the determinants of US outward FDI to 51 countries over the period 1989-1999; their findings show the importance of third-country effects. Similarly, Hall and Petroulas (2008) confirm the existence of spatial dependence in the determinants of FDI for 476 country-pairs during the period 1994-2004.

[5] Relevant papers on the choice of FDI locations have adopted a spatial analysis at the regional level (Coughlin and Segev, 2000; Ledyaeva, 2009; Kayam et al., 2013; Blanc-Brude et al., 2014; Casi and Resmini, 2014; Sharma et al., 2014; Villaverde and Maza, 2015).

[6] There is a third, recent and less investigated approach. It incorporates interdependencies across origin and destination countries in the analysis of FDI determinants. Leibrecht and Riedl (2014) and Alamá-Sabater et al. (2016a) include the possibility that FDI from every origin country to any destination country depends on the volume of FDI flowing from an origin country's neighbors to the same destination country, and the volume of FDI flowing from the same origin country to a particular destination country's neighbors. Needless to say, this approach is not applicable to our case study.

Likewise, Uttama and Peridy (2009) analyze US outward FDI to the main ASEAN countries over the period 1995-2007 and find that third-country determinants are relevant to explain FDI.

The other approach, followed by most empirical studies, consists of including the spatial lag of FDI to take account of spatial linkages in FDI across neighboring countries. That is the case of Blonigen et al. (2007). This paper, by estimating a gravity model extended to include the spatial lag of FDI -and a weighted average of the market potential of neighboring host countries-, analyzes US outward FDI to 35 host countries for the period 1983-1998. As we will see below, it develops a theoretical framework distinguishing different FDI strategies. As for the results, no matter the sub-samples used, the paper points to significant spatial interactions. On the other hand, Garretsen and Peeters (2009), analyzing Dutch outward FDI into 18 OECD host countries between 1984 and 2004, and Poelhekke and van der Ploeg (2009), using US affiliates' sales in 76 foreign countries during the period 1984-1998, conclude that third-country effects matter, although in this case they point to agglomeration in FDI. In the same vein, Martínez-Martín (2011) finds evidence of positive spatial linkages for Spanish outward FDI over the period 1993-2004, and so do Nwaogu and Ryan (2014) for US FDI into Africa, Latin America and the Caribbean over the period 1995-2007. On the contrary, Regelink and Elhorst (2015), by computing direct and indirect effects of FDI determinants, offer evidence of the existence of competition among European countries when attracting US FDI from 1999 to 2008. Alamá-Sabater et al. (2016b), focusing on bilateral FDI between the 27 EU member countries in 2007, also find positive spatial dependence across neighboring FDI host countries. More recently, Siddiqui and Iqbal (2018), employing partial derivatives in line with Regelink and Elhorst (2015), investigate US FDI in the MENA countries over the period 2002-2014. These authors find no effect of the spatially-lagged FDI (nor of the surrounding market potential).

This paper, as we will explain in Section 4, merges both approaches. It considers spillovers arising not only from FDI in neighboring countries but also those derived from their own characteristics. Besides, and as mentioned in the Introduction, we compute the average direct and indirect effects, in line with Regelink and Elhorst (2015) and Siddiqui and Iqbal (2018), to boost the reliability of the results.

3. DISTRIBUTION OF SPANISH OUTWARD DIRECT INVESTMENT

This section gives an insight into the geographical and sectoral distribution of Spanish direct investment outflows during the period under study (1996-2014), for which data are extracted from the Spanish Foreign Investment Registry (DataInvex).

First of all, Figure 1 displays the evolution of Spanish direct investment outflows. From its consideration, two main results emerge: first, that the series is very volatile and, second, that the financial crisis has severely affected the volume of Spanish direct investment abroad.

With regard to the geographical distribution, Table 2 shows how Spanish direct investment outflows evolved between 1996 and 2014. On average, it can be appreciated that more than half (51.5%) of them went to Europe, 45% to America (35.5% to Latin America) and the remaining 3.5% to Asia, Africa and Oceania (grouped into 'others'). Apart from this, four main characteristics can be highlighted. First, the golden age of Spanish direct investment in Latin America was in the second half of the nineties; second, Europe has been the main recipient of Spanish direct investment during most of the first decade of the new century; third, the US is consistently the main recipient of the Spanish direct investment in North America; and fourth, it seems that with the economic and financial crisis the percentage of FDI going to North America increased, on average, by 6 percentage points and the percentage of FDI going to Asia, Africa, and Oceania increased, on average, by 2.2 percentage points to the detriment of that going to Latin America.

Figure 2 provides additional insights into the FDI geographical distribution, both for the pre-crisis (a) and crisis (b) periods. During the pre-crisis period, the main European destinations were Portugal, France, United Kingdom, the Netherlands and Germany, while some countries such as Serbia, Macedonia and Montenegro did not receive any FDI from Spain. Regarding America, the top recipient countries were United States, Brazil, Argentina and Mexico. As for the crisis period, the most significant changes occurred in countries such as Ireland, Turkey, Libya, Saudi Arabia, India and China, which gained relevance with respect to the previous time span. Apart from this, an important feature that can be drawn from the figure is that there seems to exist spatial dependence in the distribution of Spanish direct investment abroad. So this is something to be considered later and, once tested, introduced in the model to explain the pattern of outward direct investment from Spain.

As for the sectoral distribution of Spanish direct investment abroad (reported in Table 3), it is important to highlight that industry and services concentrated, on average, 94.7% of the total, the latter being more than twice as much as the former. Besides, in the crisis period, services share increased by 4 percentage points, while industry lost importance. Needless to say that agriculture and construction represented a slight share of the Spanish direct investment abroad over the sample period.

4. DATA AND MODEL SPECIFICATION

The present section is devoted to studying the determinants of Spanish direct investment abroad. To do so, the sample consists of the top-50 host countries, which received, on average, 96.75% of total Spanish FDI outflows over the period 1996-2014 (see the countries considered in the Appendix). It has to be mentioned that the Chow test confirms, in line with Figure 1, the presence of a structural break with the outbreak of the crisis, which justifies the splitting of the period into pre-crisis (1996-2007) and crisis (2008-2014) sub-periods.[7]

Regarding the specification of the model, we draw on Blonigen et al. (2007) as, apart from identifying FDI determinants, we are also interested in unveiling FDI strategies. In Blonigen et al.'s model, FDI to country *i* in year t (FDI_{it}) is regressed on a group of traditional host-country determinants ($Host\ Determinants_{it}$), the surrounding market potential (proxied by a weighted average of the GDP of all other countries, $\sum_j W_{ij}\, GDP_{jt}$), and the spatial lag of the direct investment (a weighted average of the investment received by the remaining countries other than *i*, $\sum_j W_{ij}\, FDI_{jt}$). So, the model is as follows:

$$FDI_{it} = \beta\ Host\ Determinants_{it} + \theta \sum_j W_{ij}\, GDP_{jt} + \rho \sum_j W_{ij}\, FDI_{jt} + \varepsilon_{it} \qquad (1)$$

where W_{ij} denotes the spatial weight matrix, whose elements reflect the intensity of the interdependence between countries *i* and *j*. Then, Blonigen et al.'s model includes the spatial lag of

[7] To run this test, we used the FDI models of Equations (2) and (3) presented in this Section. The results, with no exception, confirm the existence of a structural break in 2008.

the dependent variable, as the investment decision in a host country may be influenced by the investment going to neighboring countries; that is, spatial spillovers, derived from direct investment, may arise. The inclusion of the surrounding-market potential is, on the other hand, instrumental in their model since, together with the spatial lag of the dependent variable, allows to determine the investment strategy.

The problem with Blonigen et al.'s model is that there are still spatial interdependencies that are overlooked. It seems likely that the decision to invest in a foreign market may depend on some other characteristics of neighboring countries, apart from the market potential. For this reason, once the variables acting as host determinants are selected on the basis of existing studies on the determinants of FDI (variables such as population (POP), trade costs (TC), human capital (HC) and regulatory quality (RQ), along with market potential (GDP)), we extend Blonigen et al.'s model by including also their spatial lags. Then, our model, namely the resulting SDM, is as follows:

$$FDI_{it} = \rho \sum_j W_{ij} FDI_{jt} + \beta_1 GDP_{it} + \theta_1 \sum_j W_{ij} GDP_{jt} + \beta_2 POP_{it} + \theta_2 \sum_j W_{ij} POP_{jt} + \beta_3 TC_{it} + \theta_3 \sum_j W_{ij} TC_{jt} + \beta_4 HC_{it} + \theta_4 \sum_j W_{ij} HC_{jt} + \beta_5 RQ_{it} + \theta_5 \sum_j W_{ij} RQ_{jt} + \mu_t + \mu_i + u_{it} \quad (2)$$

where the spatial weight matrix (W_{ij}) is defined here as the (row-normalized) inverse distance matrix and the dependent variable FDI denotes gross outflows of Spanish foreing direct investment (in logs), *i* refers to the host country, *j* to the remaining countries, and *t* denotes time. Time fixed effects (μ_t) are included to control for shocks affecting all or most of our set of countries. Besides, country fixed effects (μ_i) are included to account for time-invariant unobserved heterogeneity across countries. In any case, and as the influence of some variables could be absorbed by the inclusion of country fixed effects, we also specify an alternative model by including two potential time-invariant factors affecting FDI: the geographical distance of hosting countries with Spain ($DIST$), as well as a variable capturing cultural links, which is proxied by the share of a common language ($LANG$). Needless to say, when these two variables are included in the equation, country fixed effects are dropped from the model to avoid perfect multicollinearity. Thus, we also estimate the following SDM:

$$FDI_{it} = \rho \sum_j W_{ij} FDI_{jt} + \beta_1 GDP_{it} + \theta_1 \sum_j W_{ij} GDP_{jt} + \beta_2 POP_{it} + \theta_2 \sum_j W_{ij} POP_{jt} + \beta_3 TC_{it} + \theta_3 \sum_j W_{ij} TC_{jt} + \beta_4 HC_{it} + \theta_4 \sum_j W_{ij} HC_{jt} + \beta_5 RQ_{it} + \theta_5 \sum_j W_{ij} RQ_{jt} + \beta_6 DIST + \beta_7 LANG + \mu_t + u_{it} \quad (3)$$

At this point, it is mandatory to make some comments about the variables included in the model, whose metrics and data sources are reported in Table 4. These variables are:

(1) GDP_{it} as a proxy for market potential. Income of the host country is usually considered as a determinant for horizontal (market-seeking) FDI; the higher the income level of the host country, the more FDI is expected to go to that country.

(2) POP_{it}. Population is included to control for the known tendency for FDI to move towards wealthy countries (Blonigen et al., 2007). Holding GDP constant, an increase in a country's population reduces its per capita GDP, and so does FDI. Hence, a negative sign is expected.

(3) TC_{it}. Trade costs between Spain and potential host countries capture tariffs and other components such as currency barriers, informational costs and bureaucratic red tape.[8] With regard to the expected sign of the coefficient associated to this variable, it all depends on the motivation for investing. In the case of horizontal investment, which serves as a substitute for exports, higher trade costs to the host country would promote it. In contrast, vertical investment is considered as a complement to trade and thus increases if the trade costs are reduced. As for the export-platform investment, it could be discouraged if trade costs are high in the host country. Finally, in the case of complex-vertical investment, predictions on the expected sign of the *TC* coefficient are less clear-cut because they could depend on the stage of the chain of production of the host country (Fugazza and Trentini, 2014). Therefore, we do not expect a priori a specific sign in the relationship between *TC* and *FDI*.

(4) HC_{it}. Human capital is proxied by an index based on a Mincerian transformation of the average years of schooling, interpolated from Barro and Lee's (2013) 5-yearly data. This indicator estimates the human capital as a function of the average years of schooling *s*:

$$HC_{it} = e^{\emptyset(s_{it})} \quad (4)$$

[8] See Novy (2013) for the computation of this measure of bilateral trade costs. We consider it is a better proxy for trade costs than the one commonly used in the literature (inverse of the degree of trade openness).

where $\emptyset(s)$ are the Mincerian rates of return to education defined by Psacharopoulos (1994). Barro and Lee (2013) estimates for average years of schooling are more accurate than alternative measures (Barro and Lee, 2001; Cohen and Soto, 2007) basically due to the use of information on educational attainment from consistent census data and the consideration of differences in mortality rates by educational level. As Barro and Lee (2013, p. 186) indicate *"the assumption of uniform mortality can cause a downward bias in the estimation of the total educational stock"*. We use the average years of schooling for the population aged 15 and over. Although some studies use the schooling over 25 age population, excluding the 15-25 years-old might underrate the amount of human capital (Inklaar and Timmer, 2013). The expected sign of the human capital variable is, again, indeterminate. A positive sign is consistent with investment looking for skilled labor force in the destination country. However, if the investment is searching for cheap unskilled labor, a negative sign of the coefficient would be expected.

(5) RQ_{it}. Regulatory quality, as an essential dimension of the institutional quality, is included to account for the impact of regulatory risks on direct investment abroad. It captures perceptions of the ability of governments to formulate and implement sound policies and regulations that permit and promote private sector development. It is an index ranging from -2.5 (weak governance performance) to 2.5 (strong).[9] In general, direct investment tends to go to countries with good institutions since they guarantee property rights and minimize transaction costs, thus creating a favorable climate for investment. Accordingly, a positive sign is expected.

(6) $DIST$. Distance between countries, which proxy transport costs, has been proved to be a relevant determinant of bilateral FDI (e.g., Egger and Pfaffermayr, 2004; Blonigen et al., 2007; Hall and Petroulas, 2008). In our analysis, the distance between Spain and potential host countries is computed as the great circle distance between capital cities. A priori, distance discourages FDI. Therefore, if distance captures somehow the costs of investing abroad, we expect a negative sign.

[9] To see the variables used in the construction of RQ_{it} please refer to the Worldwide Governance Indicators.

(7) $LANG$, as a proxy for cultural proximity. We use a dummy variable taking a value of 1 if the official language of the host country is Spanish, and 0 otherwise. Strong cultural ties between home and host countries are likely to increase direct investment flows among them, so a positive sign is predicted.

Regarding the expected signs of the spatial lags of the dependent variables, we focus our attention on what Blonigen et al.'s paper says when it comes to defining FDI strategies. To be precise, the paper distinguishes four FDI strategies, depending on the expected signs of the coefficients of the spatial lag of FDI and the surrounding-market potential variable: horizontal, vertical, export-platform and complex-vertical FDI. Table 5 reports the expected signs.

Pure horizontal FDI is driven by market access and seeks to avoid trade costs in the host country. As the purpose of horizontal FDI is selling products in the host country, this type of FDI is not associated with either any spatial relationship between FDI into neighboring markets or the market potential of other countries.

Export-platform FDI takes place when the MNE invests in a host country with the purpose of using this country as a base to export products to other countries. In this case, the FDI spatial lag is expected to be negative because setting up a plant is costly, so more FDI to a third country *j* implies less FDI to country *i*. However, the surrounding-market potential is expected to have a positive effect on FDI since the larger the surrounding markets to country *i*, the higher the FDI attraction of this country.

With pure vertical FDI, the MNE seeks the lowest cost destination. Therefore, FDI in a country is expected to be detrimental to FDI in neighboring countries. Besides, given that the affiliate's output in the host country is shipped back to the parent country, one would expect a non-significant effect of the surrounding-market potential on the host country's FDI.

Finally, in the case of complex-vertical FDI, the MNE fragments its production process by seeking out suppliers in different countries. A complementarity relationship among these suppliers is expected, thus a positive sign for the FDI spatial lag. In addition, if the market potential captures agglomeration effects, one would expect a positive sign in the surrounding-market potential.

5. MODEL ESTIMATION AND RESULTS

Prior to showing the results, there are two econometric issues in need of clarification; the potential presence of spatial dependence and, if so, which model better captures it. Then, we firstly tested for the presence of spatial dependence in the non-spatial versions of Equations (2) and (3); the Lagrange Multiplier (LM) tests revealed, for both periods, that there is spatial dependence, so a spatial approach is needed. Secondly, we estimated the two versions of the SDM (Equations 2 and 3) and, to ascertain whether these models could be simplified into SAR models or into Spatial Error Models (SEM), computed the corresponding Likelihood Ratio (LR) tests; the results, reported in Table 6, show that the null hypotheses can be rejected both in the pre-crisis and crisis periods. Consequently, we found support for our initial ideas: the existence of spatial dependence makes traditional models no longer appropriate, and it is necessary to combine spatial interdependencies in FDI with those in its determining factors.

Equations (2) and (3) are then estimated (by maximum likelihood because the inclusion of spatial lags causes OLS results to be inconsistent). First, we focus on the outcomes obtained for the pre-crisis period, which are shown in Table 7. Looking at the point estimates of the non-spatially lagged variables in Equation (2), only regulatory quality seems to be statistically significant. Nevertheless, in Equation (3), the results hint at the relevance of the market potential, trade costs and regulatory quality together with the geographical distance and cultural ties in the decision of Spanish firms to engage in investing abroad. Therefore, country fixed effects seem to be somehow capturing the effect of these variables (except regulatory quality) on FDI. If we focus on the coefficients associated to the spatially lagged variables in Equation (2), the direct investment to a particular host country appears to be influenced by the characteristics of its neighbors: namely, population, human capital and FDI. When country fixed effects are replaced by $DIST$ and $LANG$, surrounding market potential and trade costs turn out to be statistically significant, while population and human capital in nearby countries lose their significance.

However interesting, the point estimates obtained from Equations (2) and (3) are not accurate measures to capture the effect of each explanatory variable on FDI; thanks to the work of LeSage and Pace (2009), we know that they may lead to erroneous conclusions. Accordingly, point estimates are only a preliminary step to obtain direct and indirect effects of the different variables on FDI. Partial derivatives should be used as they provide a better interpretation of parameters in spatial regressions. This is so because, using the Leontief expansion $(I_n - \rho W)^{-1} = I_n + \rho W + \rho^2 W^2 + \cdots$,

feedback effects arise as a result of impacts passing through neighboring countries and back to the country where the changes originated from; therefore, there are global spillovers. So, we compute the average direct and indirect effect estimates (LeSage and Pace, 2009). The direct effect, defined by averaging the own-partial derivatives (the main-diagonal elements of the matrix of effect estimates),[10] measures the average impact on the FDI received in a specific country caused by one percent change in an explanatory variable of that country. The indirect or spatial spillover effect, computed by averaging the cumulative sum of the cross-partial derivatives (the off-diagonal elements), measures the cumulative average effect of the change in an explanatory variable of neighboring countries on the FDI received in a particular country.

Table 8 reports direct and indirect effects for the pre-crisis period. There exists a small difference in magnitude between the point estimates associated to the non-spatially lagged variables and the direct effects. It should be highlighted, however, that in the specification with two-way fixed effects (Equation 2), the point estimate of GDP was not statistically significant whereas the direct effect associated to this variable turns out to be significant, which unveils that, as previously mentioned, point estimates would be misleading. In contrast, there are large discrepancies between the point estimates associated to the spatially lagged variables and the corresponding indirect effects, which is in accordance with the literature.

As indicated in the previous section, particular attention should be given to the coefficient of the spatial lag of FDI and the indirect effect associated to GDP (the surrounding market potential). Namely, their signs allow us to determine the predominant FDI strategy of Spanish multinational firms. The positive and significant coefficient of the spatial lag of FDI supports geographical clustering of FDI for supply reasons before the crisis; FDI going to a country can be seen as a complement to that going to neighboring countries, which points to the presence of agglomeration economies in FDI.[11] Furthermore, the indirect effect associated to *GDP* results to be positive and statistically significant only in Equation (3); it loses its statistical significance when country fixed effects are included in the model. In any case, regardless of the significance of the indirect effect of

[10] The matrix of partial derivatives (effect estimates) of the expected value of FDI with respect to the *k*th explanatory variable takes the following form: $(I_n - \rho W)^{-1}[I\beta_k + W\theta_k]$.

[11] A discussion on the spillover effects and agglomeration economies arising in FDI can be found in Blomström and Kokko (1998).

GDP, Spanish MNEs seem to follow a complex-vertical FDI strategy. Namely, they set up their vertical chain of production by seeking out suppliers in neighboring countries. These results are in line with those drawn by Martínez-Martín (2011) for Spanish outward direct investment, but also with those by Garretsen and Peeters (2009) for Dutch outward FDI, and Nwaogu and Ryan (2014) for US outward FDI.

Apart from the identification of the strategy, some additional results are worth being mentioned. As expected, the direct effect of GDP always discloses a positive and significant relationship between the market potential of the host country and the investment flows received, which is in agreement with Blonigen et al. (2007), Garretsen and Peeters (2009) and Martínez-Martín (2011). We also find a negative and significant indirect effect for the host population in Equation (2), which is also in line with previous literature. As regards trade costs, when country fixed effects are excluded from the model (Equation 3), there are negative and significant direct effects as well as spillover effects on the attraction of FDI flows. This outcome seems to reveal that any host country would be more prone to receive Spanish direct investment if its trade costs with Spain are low and if it is surrounded by countries with low trade costs. Additionally, the direct effect of human capital is positive and statistically significant, which indicates that Spanish direct investment abroad has sought out skilled labor force in the destination country. As for the level of human capital in neighboring countries, it only positively influences the attractiveness of the recipient country in Equation (2), when country fixed effects are included. As regards the regulatory quality, it does seem to be a driving force for FDI; consistently with former literature, countries with a favorable environment for investment seem to receive more Spanish investment. There are no spillover effects though. Furthermore, as expected, distance discourages FDI, while cultural ties (sharing a common language) promotes it (Barrios and Benito-Ostolaza, 2010).

Turning our attention to the crisis period, Tables 9 and 10 display the results. We focus on direct and indirect effects since, as already noted, point estimates are not accurate. Relevant differences emerge in relation to the previous period. On the one hand, the spatial lag of FDI loses its explanatory power. It seems that Spanish investors do no longer agglomerate in host countries; in other words, the decision of Spanish firms to engage in FDI in a specific country is not influenced by the FDI going to other countries. On the other, the surrounding market potential does not seem to be a factor driving FDI anymore; as can be seen, the indirect effect of GDP is statistically non-significant. These results point to pure horizontal (or market-seeking) FDI. Thus, the strategy of

Spanish MNEs changed with the outbreak of the financial crisis: Spanish investors seem to perform horizontal, rather than complex-vertical direct investment.

Concerning the rest of FDI drivers during the crisis, the direct effect linked to the GDP is positive and statistically significant, which provides evidence of Spanish investors looking for a large market in the host country. Notwithstanding, one has to notice that Spanish FDI seeks out a broader market in the host country than before the economic downturn (a 1% increase in the market potential of the host country enhances FDI to that country by 3.45% rather than 2.23%), probably due to the business cycle situation. As regards population, positive and significant spillovers emerge when country fixed effects are included, which tends to convey the idea that if neighboring countries to any host country *j* gain population, investment towards this country will increase; this reinforces the fact that FDI moves towards wealthy countries. Trade costs do not seem to affect Spanish investment during this period. Considering human capital, the results reveal a non-statistically significant direct effect, which might indicate that FDI during this period goes to low-technological branches. Moreover, there exists a negative and significant indirect effect upon FDI only when country fixed effects are included (Equation 2). Additionally, it seems that Spanish outward FDI is linked, during the recession period, to high regulatory quality in the host country. Finally, the negative (positive) effect of distance (sharing a language) is in line with the evidence found in the previous period.

Overall, our findings seem to indicate that during the pre-crisis period Spanish firms adopted complex integration strategies to set up their production processes abroad. However, this strategy seems to have changed over the crisis period. Spanish direct investment to any host country in this period is no longer a complement for that to another third country. Spanish markets were severely hit by the 2008 financial crisis and subsequent global recession, which significantly reduced Spanish firms' business opportunities. This, together with the fall in the Spanish internal demand, forced Spanish MNEs to search for foreign markets and engage in market-seeking (horizontal) FDI.

6. ROBUSTNESS CHECK

In this section, we provide a robustness analysis. Firstly, we run regressions for Spanish direct investment abroad just for the industry and service sectors, as they concentrate the bulk of FDI flows, to check whether the results using aggregate FDI are maintained. Secondly, we change the specification of the spatial weight matrix. As, according to the R squared, the model presented in

Equation (2) displays a higher goodness-of-fit, here and for the sake of simplicity, only this equation is estimated.

The results at sectoral level are displayed in Tables 11 and 12 in which we only show the point estimate for the spatial lag of FDI and the direct and indirect effects for the rest of explanatory variables. FDI in the pre-crisis period seems to exhibit a complex-vertical FDI strategy in both sectors; notwithstanding, the complementarity in FDI among neighboring countries is much stronger in services. Additionally, the effect of population is higher in services. Furthermore, the findings reveal that trade costs matter only for Spanish FDI in the service sector. Besides, only FDI in the industry sector looks for qualified labor force while a high level of human capital in neighboring host countries is a significant driver for FDI in both sectors. Finally, a strong regulatory quality in the host country seems to attract more Spanish investment in both sectors.

Concerning the crisis period, FDI appears to be market-seeking in industry and services, which is also in agreement with the aggregate results; in other words, the spatial lag of *FDI* and the indirect effect of *GDP* turn out to be non-significant. Moreover, the positive and significant direct effect of GDP supports the market-seeking motives of FDI. However, a strong regulatory quality only attracts FDI for the service sector.

Coming back to the aggregate analysis, and as in some cases the results may critically depend on the spatial weight matrix employed, the second robustness check consists of changing the weighting scheme. Specifically, we use the inverse square distance matrix (which imposes a higher penalty to distance than the inverse distance matrix) and the exponential distance matrix (in which the penalty to distance is even greater). Then, both matrices give more weight than before to the closest markets to the host country, so that the weight of countries belonging to a different continent is now almost negligible. The results of the estimation, reported in Tables 13 and 14, mainly reinforce previous findings, especially those regarding investment strategies. In the pre-crisis period, Spanish direct investment abroad seems to follow a complex-vertical pattern, although the strength of agglomeration economies in FDI when using the exponential distance matrix is a bit lower. Once again, the outbreak of the economic crisis has triggered a change in Spanish outward FDI strategy towards horizontal or market-seeking motives.

As for the FDI determinants, the results obtained in the pre-crisis period (Table 13) support the positive influence of the host market potential, human capital and regulatory quality. Besides, the spillovers on population, trade costs and human capital are robust to specification of the spatial weight matrix. Considering the crisis period (Table 14), the results reinforce the positive direct effect of market potential, the positive spillover effect of population and the negative spillover effect of human capital on FDI. Finally, strong regulatory quality in neighboring host countries seems to encourage FDI to a particular country.

7. CONCLUSIONS

Understanding the factors that determine FDI activity has attracted the interest of academics and policymakers over the last decades. This paper adds to the discussion by investigating the drivers behind Spanish direct investment abroad and unveiling its dominant strategy. Specifically, the main aim of the paper is to find out whether the FDI strategy has varied over the business cycle. To reach this goal, it estimates a panel spatial Durbin model, which offers key advantages over the conventional approach. Furthermore, partial derivatives are computed to obtain accurate results. Additionally, the paper develops the analysis at both aggregate and sectoral levels, this way avoiding the potential mask of heterogeneous patterns among sectors.

The empirical analysis points to relevant findings. There exist agglomeration economies concerning outward Spanish investments from 1996 until the crisis outbreak. Complex-vertical FDI motives prevail. Specifically, the results point out to a geographical clustering of Spanish direct investment abroad for supply reasons, which is in line with Martínez-Martín (2011). However, this strategy seems to have changed in the aftermath of the crisis, as demand factors gained importance; Spanish firms seem to have opted instead for primarily undertaking horizontal or market-seeking FDI. Thereby, direct investment in one host country did no longer seem to be influenced by the one going to neighboring countries.

This change of strategy, which is robust to the use of disaggregated data (analysis at sectoral level) and alternative specifications of the spatial weight matrix, can be understood by analyzing what happened with the fixed costs of outsourcing at a particular stage. If firms can sell abroad on a large scale, those fixed costs are worthwhile because firms are saving on their variable costs. However, after the outburst of the global economic crisis, the demand went down and firms sold on a smaller

scale. Therefore, those fixed costs were no longer offset and MNEs shifted towards more market-seeking FDI strategies.

Additional and tentative findings can be gleaned from our analysis if, as mentioned in the Introduction, we also pay attention to the literature on FDI entry modes. Specifically, to the MNEs' choice of the investment and ownership modes. Following the line of reasoning presented in the first section, the change in the strategy of Spanish MNEs from complex-vertical to horizontal FDI probably led MNEs to mostly perform M&As and joint ventures over the crisis period. There is also an additional reason supporting this cautious conclusion: the higher investment risk derived from the economic downturn. As Aizenman and Marion (2004) conclude, horizontal FDI is likely to predominate over vertical FDI in times of uncertainty, and it is obvious that M&A and joint ventures involve less risk than greenfield investment and wholly owned subsidiaries, respectively.

What have we learned from this? Mainly that Spanish MNEs reacted quickly to the change in demand and did not confine their direct investment strategy abroad (nor the investment and ownership modes, likely) to the dominant one in the years previous to the Great Recession. Thus, Spanish MNEs seem to be somewhat resilient to adverse shocks such as the fall in demand over the crisis period. But, what about other countries? Although we do not believe this feature is specific to the Spanish MNEs, we have to admit that drawing a general lesson about the influence of the business cycle on the MNEs' FDI strategy from a single case study turns out to be impossible. Needless to say, it would need a meta-analysis that integrates the results of as many case studies as possible. This paper could be the first in a series of case studies to corroborate, or qualify, our findings.

Finally, which policy implications can be drawn from this paper? Our results show that the strategy followed by Spanish direct investment abroad changed over the crisis from complex-vertical to horizontal FDI. But it is well-known that the positive effects of outward FDI on the Spanish economy are higher if FDI follows a complex-vertical rather than a horizontal strategy. Under complex-vertical FDI, MNEs set up their vertical chain of production process across multiple countries to benefit from their comparative advantages. Thus, their competitiveness could increase. Besides, productive activities in the new locations might require an increase of the activities developed in the home country. Therefore, complex-vertical FDI could promote employment and exports in Spain. On the contrary, in the case of horizontal FDI, foreign affiliates serve the local market in the host country

and substitute previous exports from the home country, which could reduce production and employment in Spain (Myro, 2014). Consequently, policy initiatives in times of recession in Spain should be focused on assisting MNEs through direct financial support to make the fixed costs of outsourcing, even with the decrease in demand, affordable. This type of policies could avoid the change in FDI strategy and therefore, benefit the whole Spanish economy.

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TABLE 1

Papers on FDI determinants modeling spatial spillovers

Paper	*Spatial variables included in the model*	*Point estimates / Partial derivative effects*
Baltagi et al. (2007)	Bilateral size, similarity in size, relative physical capital endowments, relative skilled and unskilled labor endowments, interaction of relative physical capital endowments and bilateral size, interaction of relative endowments and distance	Point estimates
Hall and Petroulas (2008)	Market potential, similarity index, capital ratio, skill difference, trade costs	Point estimates
Uttama and Peridy (2009)	The variables included in Baltagi et al. (2007), and market potential	Point estimates
Blonigen et al. (2007)	FDI, market potential	Point estimates
Garretsen and Peeters (2009)	FDI, market potential	Point estimates
Poelhekke and van der Ploeg (2009)	FDI, market potential, investment potential	Point estimates
Martínez-Martín (2011)	FDI, market potential	Point estimates
Nwaogu and Ryan (2014)	FDI, market potential	Point estimates
Regelink and Elhorst (2015)	FDI, market potential	Point estimates and partial derivative effects
Alamá-Sabater et al. (2016b)	FDI	Point estimates
Siddiqui and Iqbal (2018)	FDI, market potential, infrastructure, governance	Point estimates and partial derivative effects

Source: Own elaboration

TABLE 2

Destination of Spanish FDI outflows (%), 1996-2014

Year	*Europe*	*Main recipient*	*North America*	*Main recipient*	*Latin America*	*Main recipient*	*Others*
1996	25.86	Portugal 10.46	10.07	US 10.04	62.80	Argentina 24.69	1.27
1997	28.35	Netherlands 12.72	5.39	US 5.38	65.51	Argentina 26.80	0.74
1998	28.73	Netherlands 7.04	9.13	US 9.12	60.49	Brazil 32.48	1.65
1999	21.05	Netherlands 7.17	2.06	US 1.32	75.61	Argentina 36.73	1.28
2000	32.22	Portugal 7.02	14.94	US 14.92	52.05	Brazil 28.57	0.79
2001	57.47	Netherlands 27.75	6.64	US 6.57	35.23	Mexico 8.08	0.67
2002	59.88	Germany 26.17	7.13	US 6.36	25.05	Brazil 8.67	7.95
2003	55.68	UK 18.57	3.77	US 3.47	31.03	Chile 9.91	9.51
2004	76.28	UK 37.66	4.11	US 2.69	18.85	Mexico 10.66	0.76
2005	73.19	France 18.78	7.51	US 6.40	16.49	Argentina 6.99	2.82
2006	81.54	UK 51.62	10.66	US 10.54	16.49	Brazil 2.26	1.88
2007	78.81	UK 30.48	10.22	US 10.12	8.90	Mexico 3.96	2.08
2008	50.69	UK 13.59	21.89	US 21.68	20.12	Mexico 9.92	7.30
2009	43.05	UK 15.55	28.42	US 27.21	24.69	Mexico 11.38	3.84
2010	64.48	Netherlands 27.19	10.11	US 9.47	18.42	Mexico 12.89	6.99
2011	57.09	Turkey 14.91	10.48	US 10.17	27.80	Brazil 15.59	4.64
2012	48.52	Netherlands 11.53	6.84	US 4.53	41.28	Chile 14.55	3.36
2013	55.13	Germany 17.13	3.78	US 3.29	37.72	Peru 20.07	3.36
2014	37.23	Ireland 15.92	11.71	US 10.91	46.63	Brazil 14.12	4.43
Period average	51.33	UK 17.21	9.73	US 9.32	35.50	Brazil 9.48	3.44
Pre-crisis average	51.59	UK 19.01	7.63	US 7.24	38.16	Brazil 10.06	2.62
Crisis average	50.89	UK 12.31	13.32	US 13.13	30.95	Brazil 7.90	4.85

Source: Spanish Foreign Investment Registry (DataInvex).

TABLE 3

Sectoral distribution of Spanish FDI outflows (%), 1996-2014

Year	*Agriculture*	*Industry*	*Construction*	*Services*
1996	0.59	23.34	2.68	73.40
1997	0.97	38.13	0.96	59.95
1998	0.32	29.92	4.05	65.71
1999	0.12	62.40	0.68	36.80
2000	0.13	19.28	0.54	80.05
2001	0.36	41.42	1.92	56.30
2002	0.25	31.98	4.10	63.67
2003	0.14	60.14	2.23	37.49
2004	0.14	18.31	1.49	80.05
2005	0.29	23.03	16.14	60.55
2006	0.22	16.10	8.19	75.49
2007	0.20	33.57	3.93	62.30
2008	0.31	38.45	5.41	55.84
2009	0.30	28.93	7.49	63.28
2010	0.24	15.06	6.94	77.77
2011	0.24	21.78	7.43	70.56
2012	0.27	26.83	7.73	65.17
2013	0.42	21.77	5.77	72.03
2014	0.47	27.98	7.45	64.09
Period average	0.32	30.44	5.01	64.24
Pre-crisis average	0.31	33.13	3.91	62.64
Crisis average	0.32	25.83	6.89	66.96

Source: Spanish Foreign Investment Registry (DataInvex).

TABLE 4
Variables, measures and data sources

Variable	*Measurement*	*Data source*
Dependent variable		
FDI_{it}	Ln(Gross outflows of Spanish FDI), expressed in thousands of euros of 2010	Spanish Foreign Investment Registry (DataInvex)
Independent variables		
Market potential (GDP_{it})	Ln(GDP), expressed in millions of dollars of 2010	World Development Indicators (World Bank)
Population (POP_{it})	Ln(Population)	World Development Indicators (World Bank)
Trade costs (TC_{it})	Ln(bilateral trade costs)	ESCAP-World Bank Trade Cost Database
Human capital (HC_{it})	Ln(Index based on a Mincerian transformation of the average years of schooling)	Barro and Lee (2013) and Psacharopoulos (1994)
Regulatory quality (RQ_{it})	Index ranging from -2.5 (weak) to 2.5 (strong governance performance)	Worldwide Governance Indicators (World Bank)
Distance ($DIST$)	Ln(Great circle distance between capital cities), in kilometers	Centre d'Etudes Prospective et d'Informations Internationales (CEPii)
Cultural proximity ($LANG$)	Dummy on common language	CEPii

Source: Own elaboration.

TABLE 5

FDI strategies and expected signs of the FDI spatial lag and surrounding-market potential coefficients

FDI strategies	*Sign of FDI spatial lag (ρ)*	*Sign of surrounding-market potential (θ)*
Pure horizontal	0	0
Export-platform	−	+
Pure vertical	−	0
Complex-vertical	+	0/+

Note: 0 denotes non-statistical significance. *Source*: Blonigen et al. (2007).

TABLE 6

LR tests for model selection

	Equation (2)		*Equation (3)*	
Tests	*Statistic*	*p-value*	*Statistic*	*p-value*
LR test for SAR				
Pre-crisis period	38.05	0.00	32.86	0.00
Crisis period	32.25	0.00	13.62	0.00
LR test for SEM				
Pre-crisis period	37.05	0.00	30.15	0.00
Crisis period	31.55	0.00	12.97	0.00

Source: Own elaboration.

TABLE 7

Point estimates. Spatial Durbin Model. Pre-crisis period (1996-2007)

Dependent variable: FDI_{it}	*Equation (2)*	*Equation (3)*
GDP_{it}	2.03 (1.35)	0.33* (0.19)
POP_{it}	-10.28 (7.34)	0.43 (0.30)
TC_{it}	0.97 (1.00)	-2.74*** (0.55)
HC_{it}	13.82 (3.86)	0.53 (1.20)
RQ_{it}	0.95* (0.54)	1.30*** (0.22)
$\sum_j W_{ij}\, GDP_{jt}$	9.10 (7.75)	3.59*** (1.30)
$\sum_j W_{ij}\, POP_{jt}$	-57.24*** (16.84)	0.05 (1.55)
$\sum_j W_{ij}\, TC_{jt}$	1.92 (7.12)	-17.08*** (3.66)
$\sum_j W_{ij}\, HC_{jt}$	83.61*** (19.78)	-1.60 (6.99)
$\sum_j W_{ij}\, RQ_{jt}$	-0.25 (2.36)	-3.80 (3.16)
$\sum_j W_{ij}\, FDI_{jt}$	0.30*** (0.11)	0.36*** (0.11)
$DIST$		-0.55** (0.25)
$LANG$		2.41*** (0.54)
Time fixed effects	yes	yes
Country fixed effects	yes	no
Observations	600	600
R squared	0.69	0.62

Notes: Standard errors in parentheses: *** Significant at 1%; ** Significant at 5%; * Significant at 10%.

TABLE 8

Effect estimates. Spatial Durbin Model. Pre-crisis period (1996-2007)

Dependent variable: FDI_{it}	*Equation (2)*		*Equation (3)*	
	Direct Effect	*Indirect Effect*	*Direct Effect*	*Indirect Effect*
GDP_{it}	2.23*	6.59	0.24***	5.69***
	(1.35)	(6.36)	(0.08)	(2.03)
POP_{it}	-9.55	-42.00***	0.44	0.41
	(6.82)	(13.10)	(0.33)	(2.56)
TC_{it}	0.97	0.94	-3.17***	-29.18***
	(0.93)	(5.55)	(0.56)	(9.01)
HC_{it}	12.64***	62.04***	0.56**	-1.86
	(3.75)	(14.82)	(0.26)	(11.92)
RQ_{it}	0.98*	-0.46	1.22***	-5.36
	(0.56)	(1.85)	(0.23)	(4.12)

Notes: Equation (2) includes two-way fixed-effects and Equation (3), time fixed effects. Standard errors in parentheses: *** Significant at 1%; ** Significant at 5%; * Significant at 10%.

TABLE 9

Point estimates. Spatial Durbin Model. Crisis period (2008-2014)

Dependent variable: FDI_{it}	*Equation (2)*	*Equation (3)*
GDP_{it}	3.01** (1.43)	0.88*** (0.26)
POP_{it}	-1.51 (7.45)	0.17 (0.25)
TC_{it}	-0.26 (0.49)	-0.37 (0.40)
HC_{it}	-9.00 (6.53)	-0.43 (1.62)
RQ_{it}	-1.05 (0.94)	0.68*** (0.23)
$\sum_j W_{ij}\, GDP_{jt}$	-15.43 (10.28)	2.53 (1.81)
$\sum_j W_{ij}\, POP_{jt}$	191.19*** (47.98)	-3.80 (2.71)
$\sum_j W_{ij}\, TC_{jt}$	-1.76 (3.51)	-1.49 (2.22)
$\sum_j W_{ij}\, HC_{jt}$	-163.49*** (57.30)	-3.85 (11.11)
$\sum_j W_{ij}\, RQ_{jt}$	17.93*** (5.84)	-5.39*** (1.69)
$\sum_j W_{ij}\, FDI_{jt}$	-0.33 (0.20)	0.12 (0.13)
$DIST$		-0.88** (0.36)
$LANG$		1.62* (0.77)
Time fixed effects	yes	yes
Country fixed effects	yes	no
Observations	350	350
R squared	0.56	0.50

Notes: Standard errors in parentheses: *** Significant at 1%; ** Significant at 5%; * Significant at 10%.

TABLE 10

Effect estimates. Spatial Durbin Model. Crisis period (2008-2014)

Dependent variable: FDI_{it}	*Equation (2)*		*Equation (3)*	
	Direct Effect	*Indirect Effect*	*Direct Effect*	*Indirect Effect*
GDP_{it}	3.45*	-11.49	0.88***	2.54
	(2.08)	(8.20)	(0.25)	(1.99)
POP_{it}	-4.15	149.99***	0.17	-3.88
	(7.39)	(40.22)	(0.26)	(2.98)
TC_{it}	-0.22	-1.43	-0.36	-1.66
	(0.46)	(2.62)	(0.37)	(2.54)
HC_{it}	-6.97	-124.78***	-1.15	-3.36
	(6.56)	(45.24)	(1.66)	(12.41)
RQ_{it}	-1.28	14.21***	0.67***	-5.70***
	(0.96)	(4.69)	(0.23)	(2.15)

Notes: Equation (2) includes two-way fixed-effects and Equation (3), time fixed effects. Standard errors in parentheses: *** Significant at 1%; ** Significant at 5%; * Significant at 10%.

TABLE 11

Sector-level FDI Regressions. Spatial Durbin Model. Pre-crisis period (1996-2007)

	Industry			*Services*		
	Point estimate	*Direct Effect*	*Indirect Effect*	*Point estimate*	*Direct Effect*	*Indirect Effect*
GDP_{it}		0.62	5.42		1.53	12.29
		(2.24)	(10.63)		(1.55)	(9.40)
POP_{it}		-1.15	-51.71**		-11.72***	-79.98***
		(6.19)	(21.90)		(4.27)	(20.02)
TC_{it}		-1.74	-6.99		1.82*	23.93***
		(1.56)	(9.44)		(1.10)	(8.35)
HC_{it}		11.04*	4.54*		4.92	70.67***
		(6.32)	(2.52)		(4.34)	(21.63)
RQ_{it}		1.72*	-1.79		1.37**	1.63
		(0.93)	(3.10)		(0.64)	(2.66)
$\sum_j W_{ij}\, FDI_{jt}$	0.27*			0.35**		
	(0.16)			(0.16)		
R squared	0.58			0.43		

Notes: Two-way fixed-effects are included. Standard errors in parentheses: *** Significant at 1%; ** Significant at 5%; * Significant at 10%.

TABLE 12

Sector-level FDI Regressions. Spatial Durbin Model. Crisis period (2008-2014)

	Industry			*Services*		
	Point estimate	*Direct Effect*	*Indirect Effect*	*Point estimate*	*Direct Effect*	*Indirect Effect*
GDP_{it}		4.15**	-15.55		3.83**	-27.91
		(1.88)	(18.09)		(1.66)	(19.93)
POP_{it}		-8.74	157.60***		4.96	129.94***
		(11.86)	(56.28)		(8.96)	(39.93)
TC_{it}		-0.87	-10.45		0.74	5.47
		(0.73)	(7.46)		(0.56)	(4.20)
HC_{it}		-22.18	-73.69		-5.25	-124.90
		(17.06)	(74.26)		(7.89)	(89.21)
RQ_{it}		-3.20**	2.13		0.67*	14.52***
		(1.53)	(7.81)		(0.37)	(5.06)
$\sum_j W_{ij}\, FDI_{jt}$	-0.23			-0.50		
	(0.19)			(0.38)		
R squared	0.54			0.49		

Notes: Two-way fixed-effects are included. Standard errors in parentheses: *** Significant at 1%; ** Significant at 5%; * Significant at 10%.

TABLE 13

Alternative spatial weight matrices. Spatial Durbin Model. Pre-crisis period (1996-2007)

	Inverse square distance matrix			*Exponential distance matrix*		
	Point estimate	*Direct Effect*	*Indirect Effect*	*Point estimate*	*Direct Effect*	*Indirect Effect*
GDP_{it}		2.17*	3.12		2.79**	2.52
		(1.20)	(3.43)		(1.39)	(2.02)
POP_{it}		-9.95	-21.47***		-9.61	-11.92*
		(7.65)	(6.52)		(6.86)	(6.24)
TC_{it}		0.78	-3.37*		0.73	-6.85**
		(0.93)	(1.87)		(0.94)	(2.75)
HC_{it}		11.29***	24.78***		10.07***	26.10***
		(3.72)	(6.49)		(3.76)	(9.44)
RQ_{it}		0.91*	0.00		0.83*	-0.00
		(0.50)	(0.94)		(0.48)	(0.86)
$\sum_j W_{ij}\, FDI_{jt}$	0.32***			0.25**		
	(0.14)			(0.11)		
R squared	0.65			0.62		

Notes: Two-way fixed-effects are included. Standard errors in parentheses: *** Significant at 1%; ** Significant at 5%; * Significant at 10%.

TABLE 14

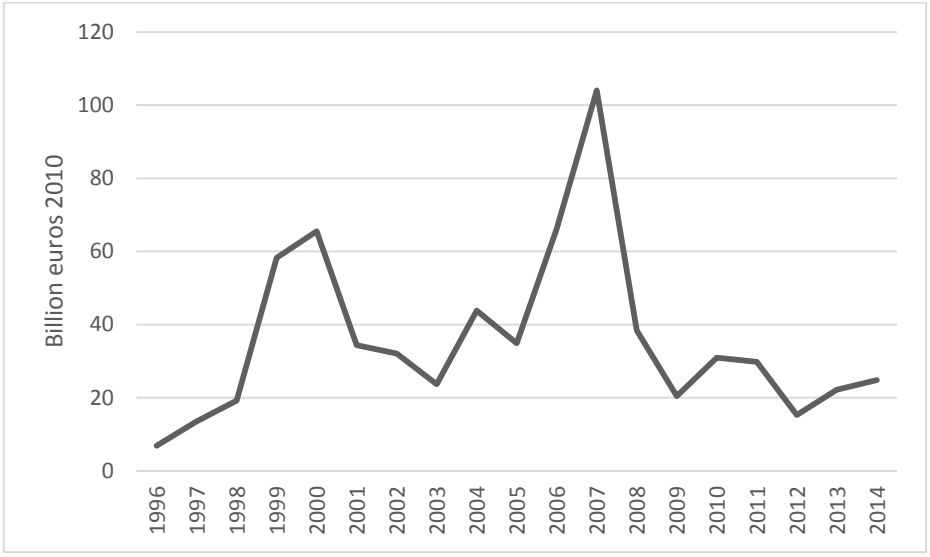
Alternative spatial weight matrices. Spatial Durbin Model. Crisis period (2008-2014)

	Inverse square distance matrix			*Exponential distance matrix*		
	Point estimate	*Direct Effect*	*Indirect Effect*	*Point estimate*	*Direct Effect*	*Indirect Effect*
GDP_{it}		4.51**	-8.94		4.07**	-5.52
		(2.05)	(6.87)		(2.06)	(3.47)
POP_{it}		-7.55	69.76***		-10.44	43.93***
		(7.31)	(17.46)		(7.59)	(14.83)
TC_{it}		-0.08	0.10		0.06	0.41
		(0.45)	(1.25)		(0.45)	(2.58)
HC_{it}		-7.65	-59.27**		-6.15	-55.89
		(6.44)	(21.60)		(6.50)	(21.34)
RQ_{it}		-1.24	4.74**		-0.70	4.89**
		(0.95)	(2.35)		(0.93)	(2.38)
$\sum_j W_{ij}\, FDI_{jt}$	-0.13			-0.12		
	(0.09)			(0.09)		
R squared	0.53			0.51		

Notes: Two-way fixed-effects are included. Standard errors in parentheses: *** Significant at 1%; ** Significant at 5%; * Significant at 10%.

FIGURE 1

Spanish FDI outflows, 1996-2014



Source: Spanish Foreign Investment Registry (DataInvex).

FIGURE 2a

Share of Spanish FDI outflows (Average pre-crisis 1996-2007)

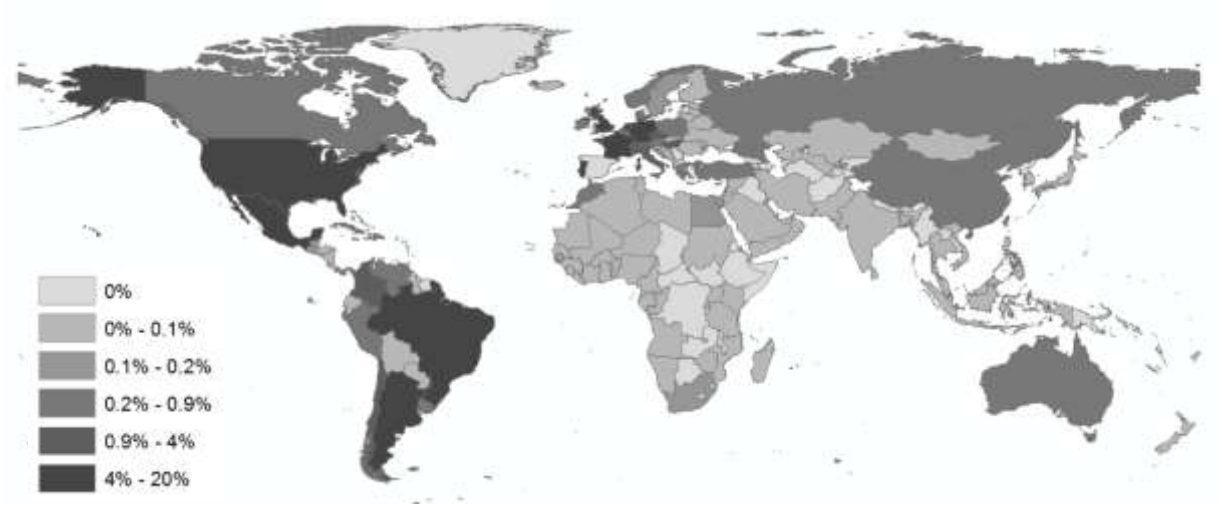
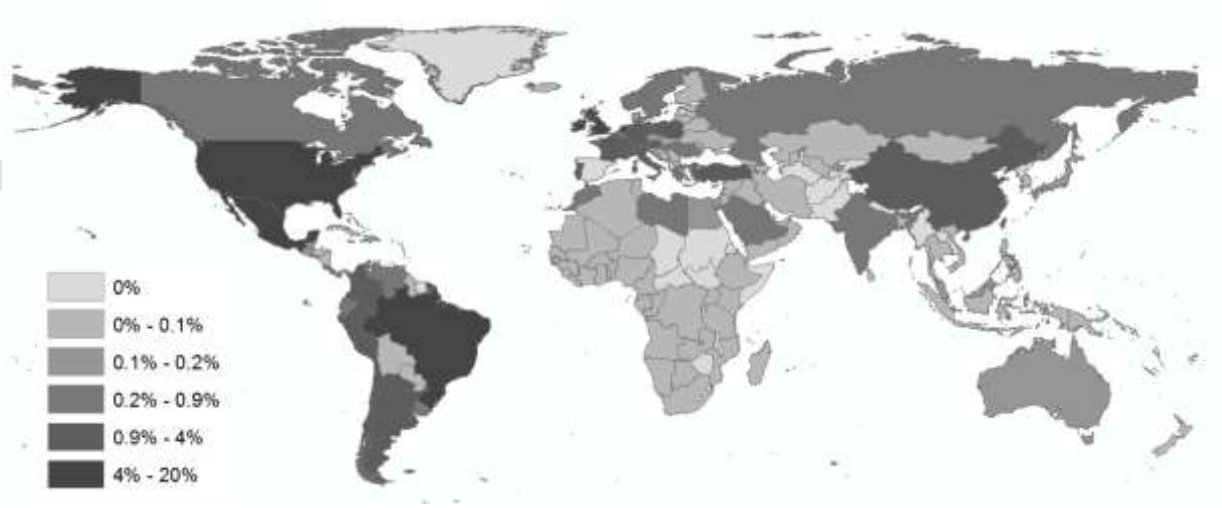


FIGURE 2b

Share of Spanish FDI outflows (Average crisis 2008-2014)



Source: Spanish Foreign Investment Registry (DataInvex).

APPENDIX

List of countries considered in the analysis

Algeria, Argentina, Australia, Austria, Belgium, Brazil, Canada, Chile, China, Colombia, Costa Rica, Cuba, Czech Republic, Denmark, Dominican Republic, Ecuador, Egypt, El Salvador, Finland, France, Germany, Greece, Guatemala, Hungary, India, Ireland, Italy, Japan, Luxembourg, Malaysia, Mexico, Morocco, Namibia, Netherlands, Norway, Panama, Peru, Poland, Portugal, Romania, Russia, South Africa, Sweden, Switzerland, Tunisia, Turkey, United Kingdom, United States, Uruguay, Venezuela.