Foreign direct investment and immigration inflows in Spain

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January 18, 2016

Abstract

In this paper, we investigate the extent to which the entry of new foreign firms into a host economy is influenced by location-related factors associated with the economy's business environment, specially its agglomeration economies and labor market composition. To analyze this dynamic as it occurs in Spain, we create an original database of information from 2005 to 2012 that represents 6 home-country groups, 50 provinces, and 22 sectors. Our results indicate that localization economies can partly explain the entry of new foreign firms, whereas human capital plays no role in that dynamic, which suggests that foreign investors are not principally attracted by high-skilled employees, since foreign vacancies are generally filled by medium-skilled workers. In sum, our findings emphasize Spain's particular problems with incentivizing long-term foreign direct investment in its local economies.

Keywords: Foreign direct investment, migration, localization economies, local labor market composition.

JEL classification: F15, F21, F61

*I am particularly grateful to R. Nicolini for her continuous encouragement, support, and advice. I also want to thank Y. Fawaz, G. Montes–Rojas, T. Hollstein, A. Larrea, J. Milgram, J.L. Roig–Sabaté, the participants to the Applied Lunch Seminar at UAB (Barcelona, 2015), the Doctoral Workshop of the Department of Applied Economics at the UAB (Barcelona, 2015), the XII Jornadas sobre Integración Económica (Valencia, 2015), and the Doctoral Day (Barcelona, 2015). The financial support from ECO2014-52506-R and 2014-SGR-327 is gratefully acknowledged. All errors are my own responsibility. Corresponding author: Department of Applied Economics, Universitat Autònoma de Barcelona, Edifici B, Campus de la UAB, 08193, Bellaterra (Cerdanyola el Vallès), Barcelona, Spain. E-mail: alicia.gomez@uab.cat.

1 Introduction

During the second half of the twentieth century, increasingly pervasive globalization induced remarkably stronger flows of foreign direct investment (FDI) in certain economies around the world. From 1970 to 1997, the worldwide nominal FDI grew by nearly 31 percent, whereas nominal gross domestic product (GDP) and international trade flows, measured by worldwide nominal import flows, increased by 7 percent and 12 percent, respectively (Brakman et al., 2011, p. 324).

Such features were particularly crucial for EU countries, where the removal of barriers to trade exchanges and capital mobility strongly affected trade patterns and volumes, as well as FDI flows, both in and out the European Union (Barrell and Pain, 1999; Lafourcade and Paluzie, 2011).[1]

The activity of foreign multinational enterprises (MNEs) is thought to pose advantages for a host economy, mostly in terms of economic performance, productivity, and job creation (Barba Navaretti, 2004; Barrell and Pain, 1999; Crozet et al., 2004).[2] Given these anticipated benefits, governments are often willing to implement costly public policies, including tax holidays and tax waivers, in order to attract foreign investors (Amiti and Javorcik, 2008; Blalock and Gertler, 2008; Haskel et al., 2002). However, if FDI is ultimately ineffective, then it produces no tangible effects in that economy (Konings, 2001). Indeed, an important critique versus FDI as a reliable tool for growth is often its volatility; MNEs are liable to temporary exploit location-specific advantages—above all, favorable fiscal treatment—yet suddenly leave to take advantage of ever better agreement elsewhere (Cebrián de Miguel et al., 2007). As a result, instead of implementing costly public policies, governments should implement specific measures to cultivate an attractive long-term environment for FDI, for example, skill-abundance composition in the local labor market, opportunities for technological partnerships, and selective consumer–provider collaborations.

To clarify the effectiveness of these measures, the chief goal of this study is to analyze the extent to which the entry of new foreign firms in Spain has been influenced by locational determinants and labor market composition. In a sense, we bridge two different strands of literature addressing FDI: one focusing on FDI determinants and the other on relationships within the in-

[1] In 1980, the EU-15 inward FDI represented 5.3 percent of the EU-15 GDP, yet represented 22.2 percent in 1999 (Ekholm and Midelfart-Knarvic, 2004, p. 146), an increase due primary to increased intra-EU FDI (Passerini, 2001).

[2] Per Markusen (2002, p. 5), MNEs are firms that engage in FDI—that is, invest abroad in order to establish a subsidiary or gain control over a foreign firm.

ternational movement of capital and people. In this context, Spain is an interesting case for two reasons. First, as a member of the European Union, Spain fully enjoys EU membership status and participated in the tremendous increase in FDI inflows. Second, the Spanish labor market is somewhat subject to notable structural problems, including higher unemployment and lower productivity,[3] features that clearly work against the attractiveness of Spain as host country. At the same time, Spain in the 2000s recorded remarkably increased inflows of immigrants, from mostly outside the European Union (de la Rica et al., 2014), a phenomenon that exacerbated more the natural imbalances of the local labor market.

The bulk of FDI entry in Spain has been associated with the country's accession to the European Economic Community (EEC) in 1986 (Barrios and Strobl, 2002).[4] During the second half of the 1980s, Spain offered location-advantages to MNEs—most of them related to cheaper-cost production options—and consequently the country became a major FDI receiver in Europe (Ferreiro et al., 1997). In fact, during 1986–1991, Spain received 8.8 percent of all EEC FDI inflows, or the fourth most behind the United Kingdom, France, and the Netherlands, as well as 18.9 percent of total intra-EEC FDI, which was second only to the United Kingdom.[5]

However, since the 1990s, Spain has suffered from two important external reallocation of companies, namely during 1992–1999 and 2000–2007 (Myro and Fernández-Otheo, 2008). The first wave involved the relocation of companies to more developed European countries in search of more sophisticated technology, which accordingly affected primarily high-tech industries such as manufactures of office machinery and computers, electrical machinery, and medical instruments.[6] By contrast, the second wave entailed the relocation of companies to Central and Eastern European Countries and emerging Asian countries, search of new location opportunities that could reduce production costs. In effect, Spain lost its principal advantages as a venue for FDI after EU enlargements in 2004 and 2007.

But nowadays what are the most important factors attracting FDI in Spain? In the line with the existing literature, in this study we provide a quantitative assessment of the importance of agglomeration economies, network forces, and labor market composition in attracting FDI. To implement our empirical strategy, we develop a novel database that merges information

[3]Of all EU-15 countries during 2004–2014, Spain and Greece had the greatest unemployment rates (Eurostat, 2015, Table 2). In particular, Spanish unemployment rate was 9.2 percent in 2005 and 24.8 percent in 2012.

[4]Along these lines, some evidence suggests that EEC membership had led a significant increases in FDI for both Spain and Portugal (Baldwin et al., 1996; Ekholm and Midelfart-Knarvic, 2008).

[5]Ferreiro et al. (1997) provide additional statistics.

[6]This relocation arguably stems from Spanish industrial characteristics. Midelfart-Kanarvic et al. (2000) point out the primary differences among industrial characteristics between "northern" and "southern" Europe, the latter of which—Spain concluded—is characterized by lower returns to scale, poorer technology, and less skilled labor.

from two sources of micro-level data: one for firms and the other for workers. To make both sources comparable, we organize available information by considering 6 home-country groups, 50 provinces, and 22 sectors during 2005–2012. Our approach's most novel feature is the study of the impact of locational determinants and labor market composition upon FDI entry by measuring the number of workplaces opened by foreign investors. As such, our measure of FDI is a real-type proxy, not a nominal one.

We develop a simple econometric analysis by using a fixed-effects (FE) estimator and by defining two econometric specifications. In the first, we aim to capture how specific determinants such as agglomeration economies and networks forces influence the opening of foreign workplaces, whereas in the second we focus on the influence of local labor market composition, defined by the skill and origin of newly hired workers. With the second specification, we also compare determinants that can explain the creation of new domestic workplaces, which we consider as our benchmark, and those that can explain the creation of new foreign workplaces. By these means, we seek to assess the differences and similarities, if any, between domestic and foreign companies in terms of their requirements for hiring employees.

Among our results, agglomeration economies (specifically, localization economies) are relevant to explaining the entry of foreign investors in Spain, as is nationality—that is, the presence of other investors for the same geographical area. This finding suggests that the number of new workplaces opened by investors from a specific home-country group positively depends on investments made one year prior by investors from the same home-country group, but negatively on investments made by foreign investors from other groups.

Unlike the empirical evidence found for other studies (Markusen, 2002; Brakman et al., 2011, chapter 8), our results determine that, in Spain, foreign firms do not demand high-skilled employees, since their employment vacancies are mostly filled by medium-skilled workers. This result poses a clear mismatch between the creation of new foreign vacancies in Spain and its labor market composition On the one hand, although MNEs require medium-skilled employees, the percentage of the Spanish working-age population with secondary education is far below the average reported by the Organisation of Economic and Co-operation Development (OECD).[7] On the other hand, even the percentage of the working-age population with higher (i.e., tertiary) education degrees is close to the OECD average—approximately 32 percent in 2012 (OECD, 2015a)—Spanish graduates face problems with finding positions that match their degrees (OECD, 2015b). Therefore, since a highly-qualified labor force is an important FDI de-

[7] In 2012, 22.28 percent of Spanish population aged 25-64 had secondary education, whereas the OECD average for similar educated people of the same age was 43.88 percent (OECD, 2015a).

terminant in the long-term, further effort is needed to make Spanish high-skilled workers more attractive to foreign investors.

The rest of the paper is organized as follows. Section 2 is a review of the relevant literature, after which Section 3 introduces our data and the descriptive statistics. Following an explanation of our econometric specifications in Section 4, Section 5 discusses our primary results. Lastly, Section 6 concludes our paper by presenting few implications for policy.

2 Literature Review

Referring to the literature addressing FDI determinants, a seminal contribution comes from Markusen (2002), who presents MNEs activity as part of international trade context and constructs an analytical framework to accommodate that view. In his work, Markusen integrates the ownership, internalization, and location framework (John Dunning, 1977; 1981) with firm- and country-specific characteristics for a model that relies on *knowledge capital*, a term encompassing a set of intangible elements such as human capital, patents, blueprints, trademarks, and reputation—to which he refers to investigate FDI determinants and patterns. Knowledge-based assets often have a joint-input or public-good property within the firm, and this characteristic facilitates the internalization of companies. In this context, MNEs tend to more intensively exploit knowledge capital than do domestic firms.

In general, FDI can be classified in two types: horizontal and vertical. Whereas horizontal FDI signifies a firm's replication of its production processes abroad in order to meet the demand of the new local market (i.e., market access target), vertical FDI suggests that the firm's production processes are geographically fragmented into several stages as a means to reduce production costs (i.e., comparative advantage target). Despite the frequent difficulty of precisely disentangle these two types of investment,[8] empirical evidence shows that most FDI is horizontal (Markusen, 2002, Markusen and Maskus, 2002).

Several countries have exerted significant effort toward attracting FDI for the positive effects that foreign investors are thought to induce in host economies (Barrios and Strobl, 2002; Crozet et al., 2004). Most of these benefits are achieved via technological spillovers—namely, via technology transfer or labor training.[9] A generalized proposition is that knowledge spillovers generated by MNEs support efficiency and production gains for domestic firms (Blalock and

[8]For instance, Markusen and Maskus (2001) split average affiliate sales into sales designated to the local foreign market as a proxy of horizontal FDI and sales designated to exports as a proxy of vertical FDI.

[9]The other two important transmission channels are product market and factor market (see Barba Navaretti and Venables, 2004b).

Gertler, 2008; Haskel et al., 2002). However, empirical evidence remains inconclusive, for results are not robust against changes in methodology and datasets (Barba Navaretti, 2004; Barrios and Strobl, 2002; Kemeny, 2010). For instance, Griffith et al. (2003) and Haskel et al. (2002) find evidence of positive spillovers in the United Kingdom, Blalock and Gertler (2008) in Indonesia, and Javorcik (2004) in Lithuania, whereas Konings (2001) finds no evidence in Bulgaria, Poland, or Romania. Other studies point out that these positive externalities are effective only when domestic firms have the appropriate "absorptive capacity" (Barrios and Strobl, 2002; Kemeny, 2010) or belong to research and development intensive sectors (Sembenelli and Siotis, 2008). Interactions between foreign and domestic firms are also crucial for making these positive externalities effective for domestic firms (Barba Navaretti and Venables, 2004b; Javorcik, 2004).

Since empirical results concerning how FDI affects a host economy remain far from being conclusive, an important open question for public policy is whether host governments should endorse costly programs—for example, that subsidize the construction of infrastructure, offer tax holidays, and implement duty exemptions—in order to attract FDI (Amiti and Javorcik, 2008; Blalock and Gertler, 2008; Haskel et al., 2002). Given the lack of consensus in answering this question, case-by-case evaluation seems to be necessary.[10]

Following Ekholm and Midelfart-Knarvic (2004), we divide FDI determinants into three groups.[11] The first group includes industry- and firm-specific characteristics, including level of scale economies, costs and benefits of disintegrating stages of production, and firm productivity. Along these lines, it is worth mentioning the contribution of Helpman et al. (2004), who by modeling trade and FDI activity assess the way in which productivity, as a measure of firm heterogeneity, is a truly discriminating feature in explaining how FDI activity can serve foreign markets.

A second group of determinants focuses on characteristics at the country level, such as trade costs, tax differentials, production costs, factor endowments, and market size. Carr et al. (2001) exploit country-specific characteristics (namely, size, size differences, relative endowment differences, trade, and investment costs) and certain interactions among these variables in order to assess the magnitude of their effects upon FDI location decisions. Their results indicate that US outward investment is attracted by more skilled labor-abundant countries. Along the same lines in investigating the relationship between education and the location of multinational affiliates,

[10]For instance, Ireland has enacted deliberate, successful policy in order to attract FDI, from both the EU and other countries worldwide (Barry, 2004).

[11]See Blonigen (2005) and Ekholm and Midelfart-Knarvic (2004) for a review of literature discussing FDI determinants.

Shatz (2003) find that US multinational companies seek production locations in populations with high levels of education.

The third group includes other factors that bear important weight in the location of FDI, including regional integration and agglomeration economies. Clearly, reduced internal trade costs associated with regional integration can trigger FDI inflows (Barrell and Pain, 1999; Lafourcade and Paluzie, 2011). At the same time, proximity to other firms could play an important role in determining FDI location during the creation of agglomeration economies or external economies of scale (Basile, 2004; Brakman et al., 2011, chapter 8; Figueiredo et al., 2002; Head et al., 1995).

Yet, though domestic and foreign companies are subject to the same market conditions, their performance often differs sharply (Griffith et al., 2004; Markusen, 2002). Empirical evidence strongly suggests that MNEs perform better than national firms in terms of labor productivity because they are usually larger, invest more in research and development, have larger capital endowments, and hire more skilled labor (Barba Navaretti, 2004). Among these perspectives, by exploiting the principal firms location determinants for both domestic and foreign firms in Portugal, Figueiredo et al. (2002) find that foreign location choices depend heavily on agglomeration economies and proximity to major urban areas.[12]

Lastly, another important, more recent strand of empirical literature focuses on the relationship between FDI and migration flows. Most of these studies report a positive link between the international movement of capital and people. For instance, Bhattacharya and Groznik (2008) find that the size of a foreign group from a specific country living in the United States, is positively correlated with US investment in that country. Gao (2003) meanwhile finds that Chinese networks in other countries benefit inward FDI from these countries to China. Other papers by authors such as Buch et al. (2006) and Foad (2012) examine the regional distribution of immigrants and inward FDI stocks in Germany and the United States, respectively. Both authors detect a positive correlation between the stock of FDI and the size of the foreign group from the same country. The reason for this positive relationship relies on the network mechanism; for one, since immigrants create business and social networks that reduce the information barriers for their home-country enterprises, the movement of capital between their home and host countries is expected to flow more easily.[13] Empirical evidence suggests that any positive relationship

[12]Figueiredo et al. (2002) run two regressions—one for home investors, the other for foreign investors—and compare the estimated coefficients.

[13]The idea of the network effects was first exploited in studying the relationship between factors of production and trade flows (Combes et al., 2005; de la Mata and Llano, 2013; Gould, 1994; Head and Ries, 1998; Rauch, 2001). Among the earliest studies, Gould (1994) assesses how immigrants' ties with their home countries can foster

between FDI and migration is stronger as the level of education among immigrants increases (Foad, 2012; Javorcik et al., 2011; Kugler and Rapoport, 2007). This strand of literature is of particular import for Spain, which since the late 1990s until the beginning of the economic crisis in 2008 has experienced a higher rate of immigrant inflows than other European countries (de la Rica et al., 2014). This massive inflow could have affected the local features of Spanish labor market and, consequently, the inflows of FDI in the country as well. This effect could occur, at least according to Docquier et al. (2014), because immigrants in Spain on average tend to be more educated than natives.

3 Data

To investigate the determinants of FDI inflows in terms of locational factors and labor market composition, we create a novel database of information representing 2005–2012, a period that interestingly includes both a cycle of expansion (until 2007) and an economic recession (2008–2012).

3.1 Database Structure and Relevant Variables

Our database encompasses information from two data sources: Sistema de Análisis de Balances (SABI, source: Bureau van Dijk (BvD)) and Muestra Continua de Vidas Laborales (MCVL, source: Social-Security). The former provides information concerning firms activity, whereas the latter provides information about the Social Security records of workers.

Although micro data at the firm and worker levels are available, we cannot merge this information given the lack of a joint identifier. In response, we follow other studies (e.g., Buch et al., 2006) by semi-aggregating our raw data. The level of aggregation that allows us to merge available information is that of origin–province–sector. In particular, *origin* refers to one of the seven places from where investors or workers come: Spain and the six home-country groups of Asia–Pacific, Africa, EU-15, Latin America, North America, and rest of Europe.[14] Meanwhile, *province* refers to the host place, for which we consider 50 Spanish provinces.[15] Lastly, we apply an *ad hoc* classification by sector to render information in the SABI (NACE-93) comparable

bilateral trade between home and host countries—*immigrants' ties* meaning knowledge of home-country markets (e.g., cultural preferences and business opportunities) that contributes to reducing information asymmetries.

[14] "North America" includes Canada and the United States, whereas the "rest of Europe" includes all non-EU-15 European countries.

[15] The provinces correspond to the third level of the nomenclature of territorial units for statistics (NUTS 3) according to the Eurostat geographical classification of regions in Spain. Ceuta and Melilla have been excluded.

with the sector classification adopted by the MCVL (NACE-93 and NACE-2009). Our own classification identifies 22 sectors of production, as detailed in Table A.1.

Our first data source—the SABI—contains information at the firm level extracted from firms' balance sheets available as disclosed by Registro Mercantil.[16] To construct our key variables—that is, the proxy for FDI entry—we adopt the following selection criteria. First, we select firms established in Spain during 2005–2012 with at least two employees; all self-employment enterprises are excluded. Second, we distinguish domestic firms from foreign ones; to qualify as a foreign firm, a firm has to fulfill one of two conditions: have a parent company located abroad or account for a foreign stake holder with at least 10 percent of total capital.[17] If neither of these conditions is fulfilled, then the firm is considered to be domestic. After classifying new firms by country of origin, we identify the number of workplaces—namely, the headquarters and its delegations, if any—created by each firm. We identify new foreign workplaces, which accommodates our definition of FDI inflows, as well as new domestic workplaces.

One advantage of our FDI indicator is its being a real variable unaffected by values-related concerns. According to Markusen (2002), this approach allows MNEs to be considered as real production units in the economy. Following Foad (2012), who considers the number of foreign affiliates in the United States as a proxy for US inward FDI, we similarly focus on the number of workplaces associated with the opening of new establishments by foreign investors.[18]

Our second data source—the MCVL—contains individual, anonymous data extracted and compiled by Spanish Social Security office, which record information regarding individuals living in Spain, including their gender, age, civil status, country of birth, nationality, highest level of education achieved, and employment status.[19]

A person is included in the MCVL in a specific year if he or she fulfills two independent criteria. The first condition is to having a personal identifier number, that is, the *identificador de persona física* (IPF), which in Spain is the Documento Nacional de Identidad for natives and the Número de Identificación de Extranjeros for foreigners. The second condition is being part of the reference population group, which is defined as people with a relationship with the Social

[16]Though neither random nor stratified, this sample of more than a million Spanish firms has a size that makes it a reliable reference for economic studies at the national level (Duch et al., 2009).

[17]According to the OECD's and the International Monetary Fund (IMF)'s definition, FDI is any investment in which a foreign investor owns at least 10 percent of the ordinary shares of a company and that aims to establish a long-term relationship to influence the firm's management.

[18]We also have information about the number of employees at new firms, which could be used to purport FDI intensity—that is, the number of vacancies created by new foreign firms. The problem is that because the total number of employees at a company is reported by company headquarters, we do not know how these employees are distributed within the delegations, if any.

[19]Social Security office merges their information with the census extracted from the Instituto Nacional de Estadística (INE) and the Personal Income Tax extracted from the Spanish Tax Agency.

Security office in the year of reference, that is, if they are affiliated within any regimen or receive a contributive pension. The final sample is obtained by a simple random sampling method, in which people from the reference population group are selected if their IPF contains some specific digits, yet randomly selected digits.[20] The MCVL not only allows tracking an individual across time (as long as he or she maintains the same IPF and is part of the reference population), but furthermore includes new people registered by automatic devices, as detailed in Social-Security (2015).

To match worker and firm information, we focus on people who have entered the Spanish labor market—namely, new hirees. As before, we aggregate the information for each year at the levels of origin–province–sector, and use as our definition of immigration inflows the number of new foreign workers. We similarly compute new native workers.

In all, our final database contains information about new foreign workplaces and new foreign workers as a proxies for FDI and immigration inflow, respectively, during 2005–2012.[21]

3.2 Descriptive Statistics

In this subsection, we provide a descriptive analysis in order to examine the relationship between new workplaces and new hiring.

First, we focus on the average number of vacancies at new firms, which could indirectly be used as a proxy for the size of investment, and distinguish domestic from foreign firms. Figure 1 depicts the massive difference in the average size of these two groups of firms; new domestic firms, on average had 8 employees, whereas foreign firms, on average had 48. This result supports the stylized fact that MNEs are usually larger than domestic firms (Barba Navaretti and Venables, 2004a). If we compute the average firm size by sector, this difference continues to be larger. In the case of foreign firms, some sectors had more than 80 employees,[22] whereas among domestic firms, only the energy sector (code 800) had more than 20 employees.

Figure 2 describes new workplaces by investor origin. Panel A draws its trend over time, and due to high scale differences, we distinguish domestic values in the left-hand y-axis and foreign values on the right-hand y-axis. If we focus on new domestic workplaces, as represented with grey bars, we can observe a decreasing trend: from $228,905$ new workplaces in 2005 to only $63,783$ in 2012. This substantial drop is likely a consequence of the economic crisis. Concerning

[20] For instance, in 2006 the reference population group was 29.3 million people and the sample was 1.17 million people (i.e., approximately 4 percent).

[21] The final database contains additional variables, all explained in the Econometric Specifications section.

[22] These sectors are food, beverages, and tobacco (code 100), chemical, plastic, and petroleum refinery (code 400), metallurgy and mechanical equipment manufacture (code 500), and hotel (code 1100).

the origin of foreign investors, foreign workplaces are chiefly created with capital from the EU-15. But the home-country group is better presented in Panel B of Figure 2, where foreign workplaces for a specific year are normalized to 100. In this way, we depict the relative importance of each home-country group. In effect, the graph confirms the large relative importance of EU-15 as a foreign investor; excluding 2010, more than 50 percent of foreign workplaces were created with capital from the EU-15. Workplaces created with capital from North America represented around 17 percent of all foreign workplaces created, whereas investments from Asia-Pacific and Africa were insignificant.[23]

Figure 3 depicts new hirees by country of birth; Panel A describes the trend over time, whereas Panel B represents the relative distribution by regional cohorts. We observe that new native workers, as represented with grey bars, show a decreasing trend from 257,927 in 2005 to 185,063 in 2012, though such was not as strong as in domestic workplaces. As Panel B indicates, immigrants from Latin American countries represented nearly 50 percent of new foreign workers.[24] Other important groups were those of people from Africa and the rest of Europe, which on average represented 16.6 and 17.7 percent of new foreign-born workers, respectively.[25] The relative importance of the other home-country groups was quite constant over time, as the EU-15 represented 10.6 percent, Asia-Pacific 6.1 percent, and North America only 1 percent.

We describe composition by sector by referring to Figure 4 (Panel A for new workplaces and Panel B for new hirees). More than 67 percent of new domestic workplaces were created in only 5 sectors.[26] In the case of foreign workplaces, the concentration is even larger, only 2 sectors accounted for nearly 50 percent of new establishments.[27] Moreover, as Myro and Fernández-Otheo (2008) point out, the presence of foreign capital in some manufacturing activities (e.g., textiles, leather, wood, plastic, mechanical equipment, and electronic machinery) is expected to reduce over time. On the contrary, a starkly different sectoral pattern is depicted for new foreign-born workers. The construction sector (code 900) accounted for 23.5 percent of new hiring of

[23]Our results are consistent with the data provided by the United Nations Conference on Trade and Development (UNCTAD, 2014). In 2005, most inward FDI in Spain came from the EU-15 (76.3 percent) and North America (15.08 percent).

[24]de la Rica et al. (2014) point out that in 2008 more than 2 million immigrants entered Spain from Latin America, a number representing nearly 50 percent of the foreign-born working population. For this same year, we find that Latin American workers represented 49.4 percent of new foreign workers, which indicates that our database is consistent with that study.

[25]These results are consistent with other studies of immigration patterns in Spain. For instance, de la Rica et al. (2014) indicate that the most populous immigrant groups in 2011 were from Romania, Morocco, and Ecuador, which represented 12.4, 11.5, and 7 percent of the foreign-born population, respectively.

[26]These sectors are construction (code 900), wholesale, retail sale, and vehicle motor repair (code 1000), hotel (code 1100), administrative and support activity (code 1900), and other services (code 2200).

[27]These sectors are wholesale, retail sale, and vehicle motor repair (code 1000) and administrative and support activity (code 1900).

foreigners, but only 1.2 percent of new foreign workplaces. Along similar lines, the hotel sector (code 1100) accounted for 20 percent of new hiring of foreigners, but only 2.4 percent of new foreign workplaces. These results are consistent with those of González and Ortega (2011), who emphasize that immigrant employment in construction, hotel and restaurants, and domestic services rose noticeably in Spain during 1997–2007.

Another important feature of labor force composition is the level of education of newly hired workers. We distinguish three categories of educational attainment (i.e., low, medium, and high skilled) that correspond with primary, secondary, and tertiary education, respectively. Among the total of new hirees registered during the period of study (to be exact, $2,283,996$ new workers) 60.57 percent were low skilled, 28.24 medium skilled, and 11.19 percent high killed. However, according to data provided by the OECD (2015a), 28.51 percent of the working-age population had a college degree in 2005, a percentage that increased to 32.31 percent in 2012. In that sense, our data capture a clear mismatch between the jobs created and the level of education of Spain's working-age population.

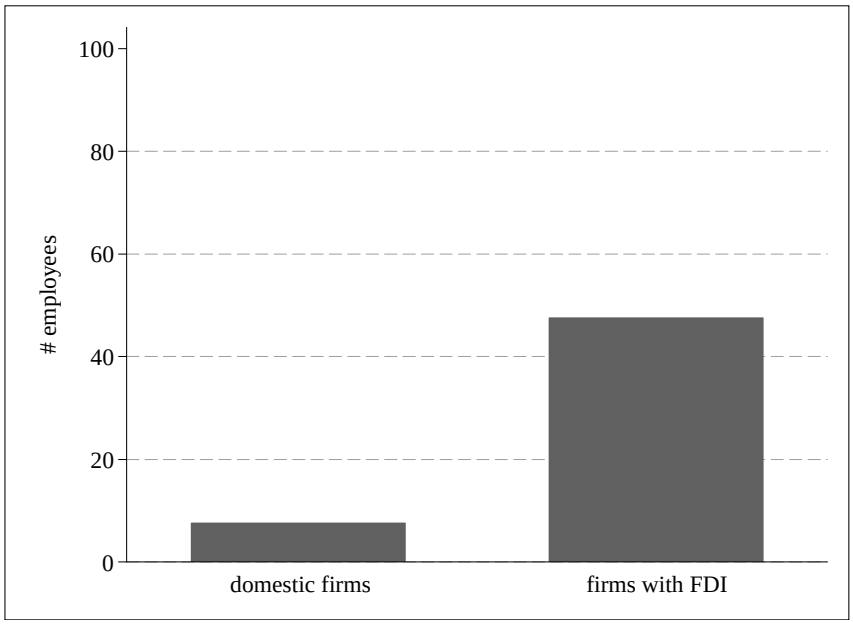
We lastly focus on the relationship between level of education attained and economic activity. Table 1 reports the relative importance of economic activities in each level of education, showing that most new workers with primary education were hired in the construction (25.5 percent), hotel (17.4 percent), and administration (16.4 percent) sectors. This group roughly coincides with the distribution of new foreign workers among sectors, thereby confirming a strong relation between immigrant and low-skilled labor.[28] Most new workers with secondary education were hired in the wholesale, retail sale, and motor vehicle repairs sector (23.1 percent) and the administration sector (23.5 percent). At the same time, nearly 40 percent of new workers with tertiary education were hired in services, specifically in education (19.1 percent) and health and leisure (20.2 percent).

Altogether, our evidence shows that FDI and immigration inflows in Spain follow different patterns. FDI inflows originate primarily from the EU-15 and North America and are concentrated in services. Meanwhile, immigrant inflows originate primarily from Latin America, Africa, and the rest of Europe and are concentrated in the construction, hotel, and administration sectors, all characterized by a preponderance of low-skilled jobs (see Table A.2).

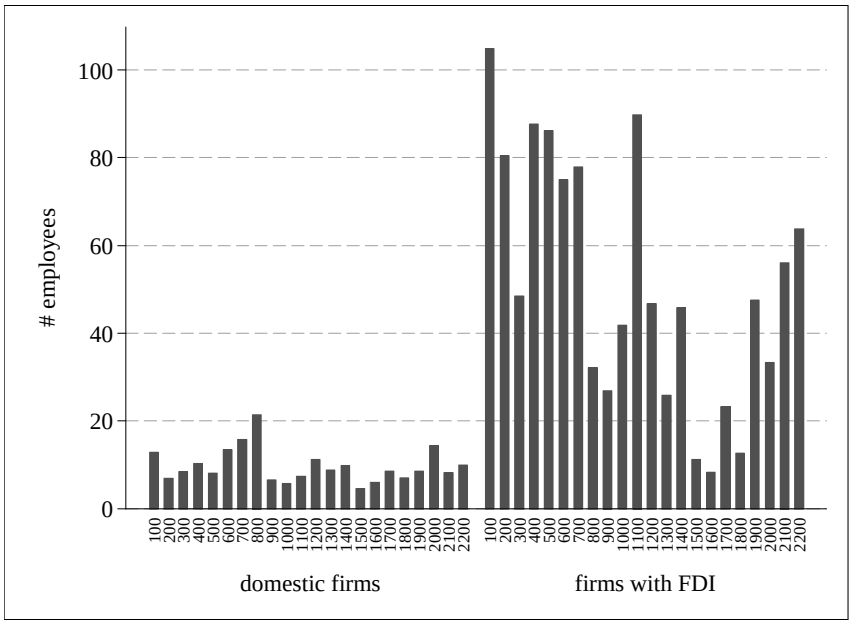
[28] New workers can be classified according to either country of birth or level of education attained, though both classifications cannot be applied at the same time.

Figure 1: Average firm size (new firms, 2015–2012)

Panel A: By capital origin



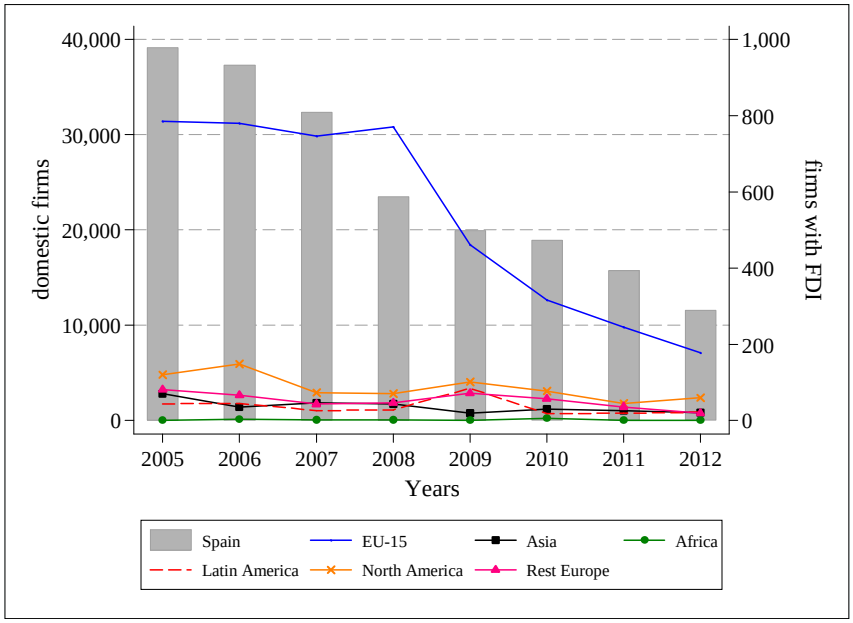
Panel B: By capital origin and sector



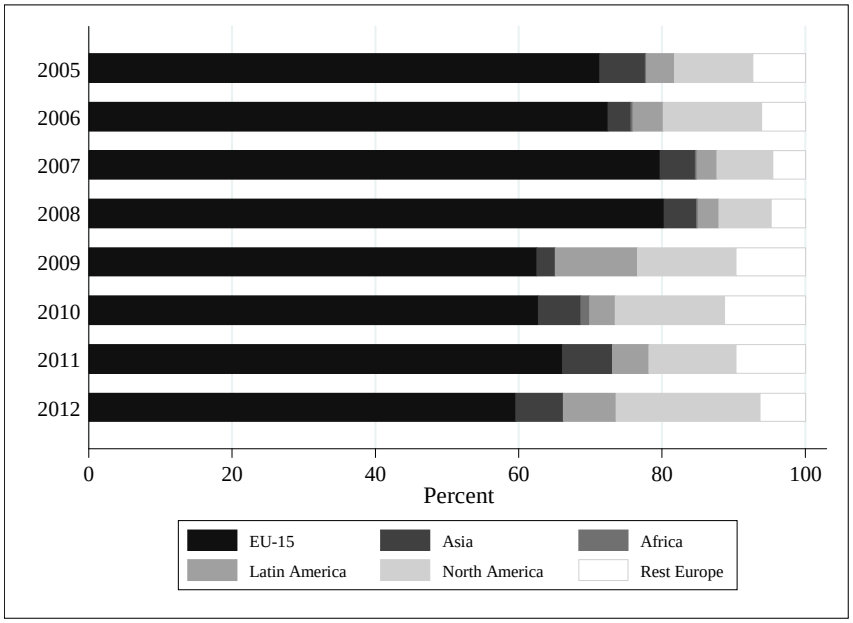
Source: Own elaboration based on data from SABI.

Figure 2: New workplaces

Panel A: Trend by origin



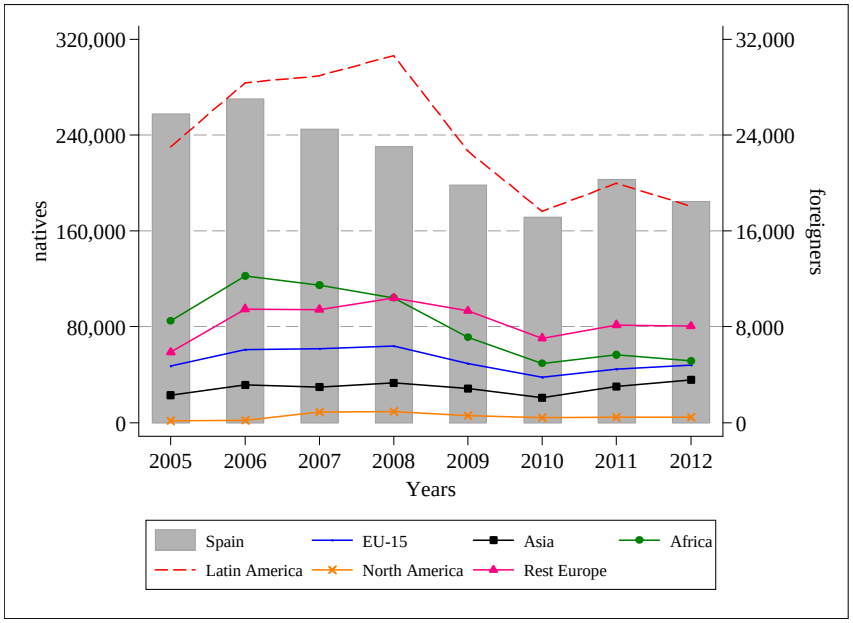
Panel B: Foreign workplaces: distribution by origin



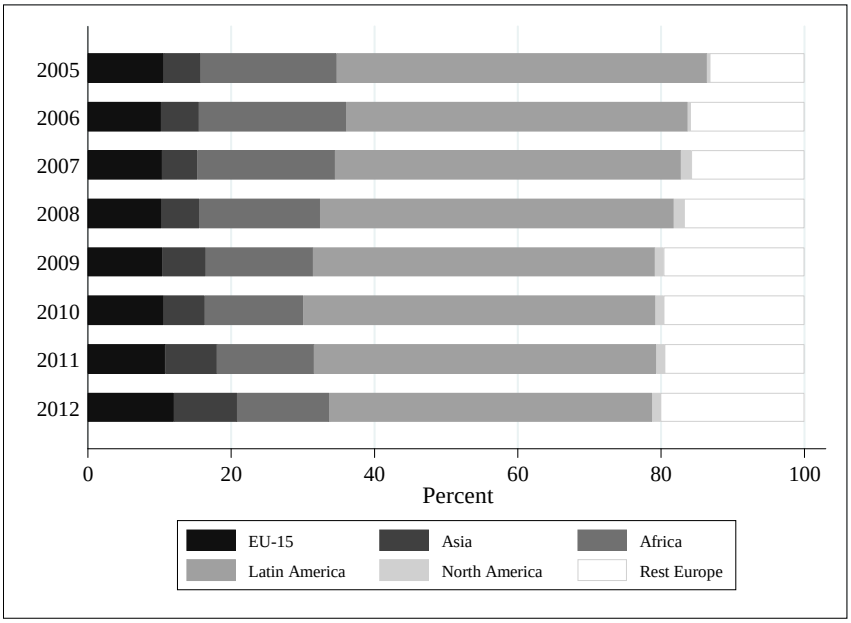
Source: Own elaboration based on data from SABI.

Figure 3: New hirees

Panel A: Trend by country of birth



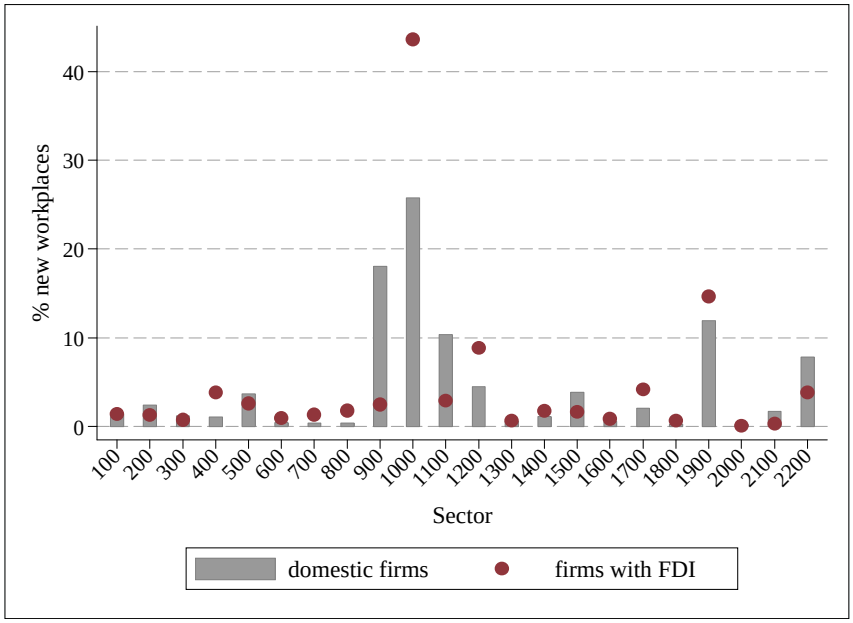
Panel B: Foreign hirees: distribution by country of birth



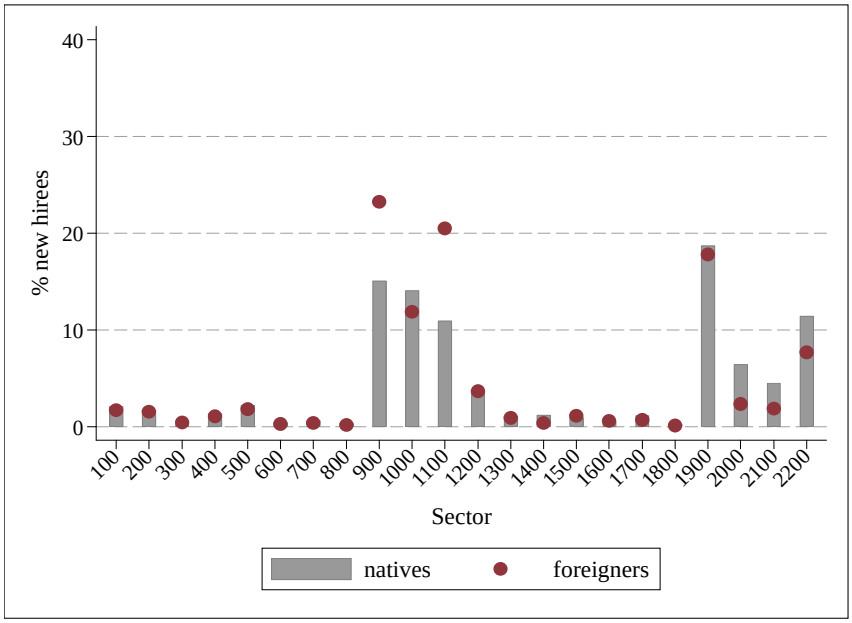
Source: Own elaboration based on data from MCVL.

Figure 4: New workplaces versus new hirees: relative importance by sector, 2005–2012

Panel A: New workplaces



Panel B: New hirees



Source: Own elaboration based on data from SABI (panel A) and MCVL (panel B).

Table 1: New hirees by level of education: relative importance by sector, 2005–2012

Code	Sector	Primary	Secondary	Tertiary	Total
100	Food, beverages, and tobacco	2.74	0.97	0.83	2.02
200	Textile, leather, and wood	2.34	0.74	0.44	1.68
300	Paper and publishing	0.52	0.68	0.76	0.59
400	Chemical, plastic and petroleum refinery	1.55	0.83	1.09	1.29
500	Metallurgy and mechanical equipment manufacture	2.95	0.81	1.17	2.15
600	Electrical machinery, computer systems and medical instrument manuf.	0.47	0.25	0.67	0.43
700	Automotive	0.85	0.15	0.63	0.63
800	Energy	0.33	0.18	0.48	0.31
900	Construction	25.50	3.58	5.19	17.05
1000	Wholesale, retail sale, and motor vehicle repairs	10.18	23.09	8.16	13.59
1100	Hotel	17.43	7.24	4.01	13.05
1200	Transport	4.19	3.23	2.18	3.69
1300	Telecommunications	0.30	2.68	0.97	1.05
1400	Financial activity	0.04	2.59	2.59	1.04
1500	Real estate activity	0.58	1.86	1.10	1.00
1600	Renting	0.57	0.72	0.40	0.59
1700	Information technology and computer services	0.24	1.67	4.07	1.07
1800	Research and development	0.03	0.16	1.42	0.22
1900	Administrative and support activity	16.44	23.50	16.62	18.45
2000	Public administration	5.22	5.25	7.93	5.53
2100	Education	0.86	4.67	19.06	3.97
2200	Services (e.g., Health, leisure, sports, and culture)	6.68	15.14	20.20	10.58
	Total	100	100	100	100

Note: The table reports, for each level of education, the relative importance of each sector.

4 Econometric Specifications

The core contribution of this study is the investigation of a group of FDI determinants is Spain. We focus our analysis on agglomeration economies, network forces, and labor market composition, defined by the skill and origin of newly hired workers.

To that end, we implement two different econometric specifications. The former follows the standard specification exploited in empirical studies of agglomeration and network effects, whereas the latter focuses on the role of labor force composition.

The first econometric specification is represented as follows:

$$
\begin{aligned}
workp_{opst} \quad = \quad & \alpha_1 + \alpha_2 workp_{opst-1} + \alpha_3 workp^{other}_{opst-1} + \alpha_4 workp^{domestic}_{pst-1} + \\
& + \alpha_5 hiring_{opst-1} + \alpha_6 hiring^{other}_{opst-1}\alpha + \alpha_7 hiring^{es}_{pst-1} + \\
& + \boldsymbol{\beta}\mathbf{V}_{opt-1} + \gamma\mathbf{X}_{pst-1} + \boldsymbol{\delta}\mathbf{Z}_{pt-1} + \mu_{ops} + \theta_t + \varepsilon_{opst} \ ,
\end{aligned} \tag{1}
$$

where $o = 1, ..., 6$ is the home-country group, $p = 1, ..., 50$ is the province, $s = 1, ..., 22$ is the sector, and $t = 2006, ..., 2012$ is the year.

The dependent variable is the number of new workplaces created by home-country group o in province p in sector s in year t. Its values are expected to constitute a linear function of a constant, a group of variables of interest, control variables ($\mathbf{V}_{opt-1}$, $\mathbf{X}_{pst-1}$ and $\mathbf{V}_{pt-1}$), fixed effects (μ_{ops}), year dummies (θ_t), and the error term (ε_{opst}). Following empirical studies (e.g., Alegría, 2006 and Basile, 2004), the explanatory variables are lagged one year because we assume that the act of investing and thereby creating new plants is carried out one year after making the decision to do so.[29]

In Equation (1) we introduce a few regressors to capture the impact of agglomeration economies and network forces on FDI inflows. Agglomeration economies merge when companies settle in certain locations, and this concentration triggers benefits in terms of production capacity via spillover effects. Agglomeration is usually represented by the number of companies or the proportion of workers belonging to the same industry that are located in a specific area, as is the case of the so-called localization economies or intra-industry externalities. In that respect, we follow Crozet et al. (2004) by implementing a measure of agglomeration that refers to the nationality of the investor. Our reason for doing so is to confirm whether firms tend to cluster with other firms of same home-country group ($workp_{opst-1}$) instead of other foreign groups ($workp^{other}_{opst-1}$) or domestic firms ($workp^{domestic}_{opst-1}$), if not both.[30] If so, then the coefficient α_2 is expected to be statistically significant and with a magnitude greater than both α_3 and α_4.

Another important group of regressors is that which represents network effects. According to the network effects mechanism, the presence of a sizeable group of immigrants from the same home country should reduce the information costs for home entrepreneurs regarding market considerations in the host economy. Consequently, an increase in capital flows between the two countries is expected. To capture this effect, we introduce new workers from the same home-

[29] According to Alegría (2006), a rational firm opening a plant in location p and in year t, makes its decision based on characteristics that location p had at $t-1$.

[30] For instance, Head et al. (1995) find that Japanese investments in the United States were significantly influenced by previous location decisions of other Japanese firms in the same industry.

country group hired in the same province and sector one year earlier ($hiring_{opst-1}$), new workers from other foreign groups ($hiring^{other}_{opst-1}$), and new native workers ($hiring^{es}_{pst-1}$). Again, if network effects are relevant, then the coefficient α_5 is expected to be statistically significant and greater than α_6 and α_7.

In addition to these proxies, other explanatory variables ($\mathbf{V}_{opt-1}$, $\mathbf{X}_{pst-1}$ and $\mathbf{V}_{pt-1}$) are included in order to control for specific characteristics of local markets that could attract foreign capital.[31] To this end, we select trade openness ($trade\ openness_{opt-1}$) as a proxy for competitiveness (Bloom and Van Reenen, 2007) computed as total trade flows (i.e., sum of exports and imports flows) over GDP.[32] Using the SABI data, we compute a measure of risk or business instability in the host economy as the number of firms (headquarters) that close down in a province–sector combination ($firms\ closing_{pst-1}$).

We also add control variables at the province level. From the INE database, we access GDP per capita and the percentage of the working-age population, that is, the population aged 15–64. GDP per capita is transformed into real values ($real\ GDPpc_{pt-1}$) using the Penn World Table (PWT) dataset (Feenstra et al., 2015).[33] For the working-age population, we distinguish natives ($working\text{-}age^{natives}_{pt-1}$) and foreigners ($working\text{-}age^{foreigners}_{pt-1}$).[34] We also include a measure of human capital ($human\ capital_{pt-1}$), represented by the average years of education of the working-age population, and capital stock ($capital\ stock_{pt-1}$).[35]

In addition to the first specification, we propose another to further analyze how labor market composition affects FDI inflows in Spain (Equation (2)). Although our dependent variable is again the number of new foreign workplaces, our new explanatory variables here refer to the composition of newly hired employees. We classify members in this group into skill-based categories in accordance to their highest level of education achieved (i.e., $hiring^{highedu}_{pst-1}$ for tertiary education, $hiring^{mededu}_{pst-1}$ for secondary education, and $hiring^{lowedu}_{pst-1}$ for primary education), as well as into the seven regional groups (Spain, EU-15, Latin America, Asia–Pacific, Africa, USA–Canada, and rest of Europe).

The most convenient way to create a proxy of quality of labor is combining the level of

[31] Table A.3 provides detailed definitions of all variables.

[32] Information concerning total trade flows is extracted from DataComex (MINECO) and available at the origin–province level. GDP at the province level is extracted from the INE database *Contabilidad Regional de España*.

[33] Specifically, we use the price level of GDP (variable *pl_gdpo*), where the reference is the United States in 2005.

[34] Since the INE includes all EU countries in a group, it is impossible to divide foreigners according to our classification.

[35] Information about human capital is extracted from the Fundación-Bancaja and Ivie database, whereas information regarding capital stock is extracted from the FBBVA and Ivie database.

education attained with the origin of the worker (for instance, new workers from the EU-15 with tertiary education). Nevertheless, we do not dispose that information.[36] To embed this feature while controlling for data limitations, we introduce several interaction terms into our econometric model. Specifically, we host an interaction among the three most representative regional groups of workers in Spain during the period 2005–2012—namely, natives workers and workers from the EU-15 and Latin America—with the three skill categories. The interactions control for the contingent features of the local recruiting process.[37]

Our second econometric specification is thus:

$$
\begin{aligned}
workp_{opst} \;=\; & \alpha_1 + \alpha_2 workp_{opst-1} + \alpha_3 workp^{other}_{opst-1} + \alpha_4 workp^{domestic}_{pst-1} + \alpha_h hiring^{highedu}_{pst-1} + \\
& + \alpha_m hiring^{mededu}_{pst-1} + \alpha_l hiring^{lowedu}_{pst-1} + \alpha_{es} hiring^{es}_{pst-1} + \alpha_{eu15} hiring^{eu15}_{pst-1} + \alpha_{lam} hiring^{lam}_{pst-1} + \\
& + \alpha_{h,es} hiring^{highedu}_{pst-1} hiring^{es}_{pst-1} + \alpha_{h,eu15} hiring^{highedu}_{pst-1} hiring^{eu15}_{pst-1} + \alpha_{h,lam} hiring^{highedu}_{pst-1} hiring^{lam}_{pst-1} + \\
& + \alpha_{m,es} hiring^{mededu}_{pst-1} hiring^{es}_{pst-1} + \alpha_{m,eu15} hiring^{mededu}_{pst-1} hiring^{eu15}_{pst-1} + \alpha_{m,lam} hiring^{mededu}_{pst-1} hiring^{lam}_{pst-1} + \\
& + \alpha_{l,es} hiring^{lowedu}_{pst-1} hiring^{es}_{pst-1} + \alpha_{l,eu15} hiring^{lowedu}_{pst-1} hiring^{eu15}_{pst-1} + \alpha_{l,lam} hiring^{lowedu}_{pst-1} hiring^{lam}_{pst-1} + \\
& + \boldsymbol{\beta} \mathbf{V}_{opt-1} + \gamma \mathbf{X}_{pst-1} + \boldsymbol{\delta} \mathbf{Z}_{pt-1} + \mu_{ops} + \theta_t + \varepsilon_{opst} \;,
\end{aligned}
\tag{2}
$$

where $o = 1, ..., 6$ is the home-country group, $p = 1, ..., 50$ is the province, $s = 1, ..., 22$ is the sector, and $t = 2006, ..., 2012$ is the year.

We are also interested in assessing potential differences in the weight of the selected determinants between domestic and foreign entrepreneurs. To that end, we replicate Equation (2) by considering two dependent variables: workplaces created by domestic entrepreneurs ($workp^{domestic}_{pst}$) and those created by foreign investors ($workp^{fdi}_{pst}$).[38] Referring to estimations of determinants for the creation of new domestic workplaces, we can gauge whether the business environment has a similar or different impact upon the creation of new foreign workplaces.

The longitudinal structure of our database allows us to control for unobservable time-invariant characteristics, as the home–province–sector level (μ_{ops}) in the case of foreign workplaces by origin-country group ($workp_{opst}$) and at the province–sector level (μ_{ps}) in the cases

[36] Taking into account all possible combinations (3 different skill levels, 50 provinces, and 22 sectors) would generate several zeros in our database.

[37] Modelling with interactions allows the marginal effect of one explanatory variable to depend upon the levels of other explanatory variables (Wooldridge, 2006).

[38] Total foreign workplaces are computed as follows: $workp^{fdi}_{pst} = \sum_{o=1}^{6} workp_{opst}$, where $o = 1, ..., 6$ is the home-country group.

of total foreign workplaces ($workp_{pst}^{fdi}$) and domestic workplaces ($workp_{pst}^{domestic}$). We control for unobservable characteristics using the FE or within-transformation estimator.[39]

5 Results

With Equation (1), we concentrate on the impact of agglomeration economies and network forces on FDI inflows. Table 2 reveals interesting results on this point (column 1 excludes control variables, whereas column 2 includes all control variables).[40]

We find that localization economies matter greatly for the location decisions of foreign investors. The coefficient of the variable $workp_{opst-1}$ is positive and statistically significant, meaning that the existence of available workplaces established during the previous period encourages other investors from the same home-country group to invest in the same location.[41] The existence of domestic workplaces established during the previous period also exerts a positive yet minor effect upon foreign investment. However, the presence of other foreign groups imposes a negative impact, possibly related to the effect of competition among firms (Disdier and Mayer, 2004). As such, we can confirm a tendency among foreign investors to cluster in those province–sector combinations where other companies from the same home-country group were established one year before.

Concerning network effects, our results seem at odds with outcomes found in other empirical studies. We conclude that the presence of new workers from a specific home-country group exerted a negative impact on FDI inflows from their home country to their host place. Yet, this result is unsurprising for our specific setting, since our descriptive analysis revealed that capital and labor inflows in Spain follow different patterns (see Figure 4). New foreign workers from other groups also have a negative impact on FDI inflows, whereas the number of newly hired native workers has a positive, yet minor impact.

Referring to the control variables, only two variables are positive and statistically significant: trade openness and the percentage of the native working-age population. Our interpretation is

[39] Our dependent variables take non-negative values, and in the case of new foreign vacancies by origin-country group, there are many of zeros (see Table A.4). We sought to overcome this dilemma by running a negative binomial (NB) FE estimator, but the model does not perform well statistically. Although the NB random effects estimator converges, it relies on the strong assumption that time-invariant unobservable characteristics are purely random—that is, uncorrelated with regressors. Accordingly, we prefer to use the panel FE or within-transformation estimator.

[40] To reduce the number of zeros, we exclude province–sector combinations, in which no foreign workplace was established during 2005–2012. Though $6,600$ groups are possible (i.e., $6 \cdot 50 \cdot 22 = 6,600$), following this procedure we work with only $2,838$ groups.

[41] Specifically, *ceteris paribus*, if the number of new workplaces from home-country group o established in province p and sector s at year $t-1$ increases by 10 units, then the new workplaces from home-country group o in this province–sector at year t increases by 3 units.

fairly straightforward. A dynamic commercial relationship between a given country and a given province encourages investors from that country to establish firms in that province. It could signify competitiveness, for the more a province is open to the external market, the larger the amount of FDI inflows. We observe that the percentage of the native working-age population positively affects the number of new foreign workplaces, meaning that foreign investors have incentives to locate in provinces with a larger availability of workers.[42] Although we identify this quantitative effect, we cannot isolate any effect related to the skill of the workers; the variable referring to human capital does not have any impact on the opening of foreign vacancies.

[42] *Ceteris paribus*, province with 10 percent more native working-age population have on average 0.3 more new foreign workplaces.

Table 2: Foreign workplaces by origin (1)

Estimator: Fixed effects		
Dependent variable: workp_{opst}		
	(1)	(2)
workp_{opst-1}	0.3353***	0.3280***
	(0.1241)	(0.1216)
$\text{workp}^{other}_{opst-1}$	-0.0186***	-0.0216***
	(0.0062)	(0.0074)
$\text{workp}^{domestic}_{pst-1}$	0.0040***	0.0028**
	(0.0015)	(0.0013)
hiring_{opst-1}	-0.0028***	-0.0028***
	(0.0005)	(0.0005)
$\text{hiring}^{other}_{opst-1}$	-0.0008**	-0.0009**
	(0.0004)	(0.0003)
$\text{hiring}^{es}_{pst-1}$	0.0008***	0.0008***
	(0.0002)	(0.0002)
Controls:		
$\text{trade openness}_{opt-1}$		2.9884***
		(0.8927)
$\text{firms closing}_{pst-1}$		-0.0058
		(0.0038)
real GDPpc_{pt-1}		-1.608e-05
		(0.0000)
$\%\ \text{working-age}^{natives}_{pt-1}$		0.0308*
		(0.0176)
$\%\ \text{working-age}^{foreigners}_{pt-1}$		0.0012
		(0.0149)
$\text{human capital}_{pt-1}$		-0.0731
		(0.0714)
$\text{capital stock}_{pt-1}$		-3.909e-12
		(0.0000)
constant	-0.2256*	-0.9650
	(0.1170)	(1.4411)
Fixed effects:		
origin-province-sector	Yes	Yes
year	Yes	Yes
Observations	19,836	19,836
Number groups	2,838	2,838
R-sq (overall)	0.6059	0.5066
sigma_u	1.1283	1.3237
sigma_e	1.1351	1.1317
rho	0.4970	.5777

Home-country group (o), province (p), sector (s), year (t).
Standard errors clustered by province–sector are in parenthesis.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

This last issue is better addressed in Equation (2), the results of which are summarized in Table 3, where column 1 refers to new hirees by skill attainment, column 2 to new hirees by country of birth, and column 3 to selected interaction effects. In these three columns, agglomeration economies pose a positive, significant effect upon FDI entry, thereby indicating that the results found in Table 2 are robust.

Concerning the level of education (column 1), we observe that the hiring of medium-skilled workers benefits FDI inflows, whereas the hiring of high- and low-skilled workers has a negative effect. These results counter those of other empirical studies, according to which most FDI is concentrated in skill- and technology-intensive industries. It seems that MNEs invest in Spain to perform standardized-type activities that require medium-skilled employees instead of high-skilled ones.

When we distinguish the labor force by regional cohorts (column 2), we find that immigrants from North America (i.e., the United States and Canada) generate a positive effect upon FDI inflows, whereas immigrants from the Asia–Pacific region generate a negative effect upon FDI inflows. This latter result is not entirely surprising, since official reports released by Spanish institutions, including Social Security office and the Agencia de Trabajadores Autónomos (ATA), show that a large amount of Asian immigrants in Spain—specifically Chinese ones—are self-employed.[43] These people usually set up their own business and remain disconnected from the international FDI movements.

The interaction terms (column 3) show that new workers from Spain and the EU-15 attract foreign capital in locations with large population of new medium-skilled employees, ($\widehat{\alpha}_{m,es} > 0$ and $\widehat{\alpha}_{m,eu15} > 0$), but not in locations with large populations of low-skilled employees ($\widehat{\alpha}_{l,eu15} < 0$). In the case of immigrants from Latin America, a reverse pattern is clear, since these workers attract foreign capital in locations with large populations of new low-skilled employees ($\widehat{\alpha}_{l,lam} > 0$).

Overall, these results point out that foreign capital in Spain targets a specific combination of level of education and country of birth. In particular, native workers and those from the EU-15 with a medium level of education and workers from Latin America with a low level of education positively affect FDI entry.

[43] At the end of 2004, the number of foreign self-employees in Spain was 85,409, of which 11,112 were Asian (Social-Security, 2004). At the end of 2012, these numbers increased to 85,409 in the case of foreign-born self-employees and to 29,920 in the case of Asian ones (Social-Security, 2012). These figures imply hat the growth rate of Asian self-employed individuals has been far more significant than that of all foreign-born self-employed people, at a rate of 169.26 percent against 64.63 percent. According to the ATA (2014), at the end of 2012, self-employed Chinese-born immigrants in Spain represented 18.47 percent of the total foreign-born self-employed.

Table 3: Foreign workplaces by origin (2)

Estimator: Fixed effects			
Dependent variable: workplace_{opst}			
	(1)	(2)	(3)
workp_{opst-1}	0.3106***	0.3200***	0.2966***
	(0.1173)	(0.1189)	(0.1110)
$\text{workp}^{other}_{opst-1}$	-0.0404***	-0.0310***	-0.0545***
	(0.0129)	(0.0116)	(0.0199)
$\text{workp}^{domestic}_{pst-1}$	0.0042***	0.0037**	0.0030***
	(0.0013)	(0.0014)	(0.0009)
$\text{hiring}^{highedu}_{pst-1}$	-0.0032***		0.0007
	(0.0009)		(0.0013)
$\text{hiring}^{mededu}_{pst-1}$	0.0032***		0.0006
	(0.0008)		(0.0007)
$\text{hiring}^{lowedu}_{pst-1}$	-0.0008***		0.0000
	(0.0003)		(0.0002)
$\text{hiring}^{es}_{pst-1}$		0.0006***	0.0002
		(0.0002)	(0.0003)
$\text{hiring}^{eu15}_{pst-1}$		0.0061	0.0056
		(0.0047)	(0.0036)
$\text{hiring}^{lam}_{pst-1}$		0.0011	0.0005
		(0.0017)	(0.0013)
$\text{hiring}^{aspa}_{pst-1}$		-0.0092**	
		(0.0040)	
$\text{hiring}^{af}_{pst-1}$		-0.0049	
		(0.0033)	
$\text{hiring}^{usacan}_{pst-1}$		0.0144*	
		(0.0078)	
$\text{hiring}^{reurope}_{pst-1}$		-0.0038	
		(0.0025)	
Controls:			
$\text{trade openness}_{opt-1}$	3.0075***	3.0166***	2.9721***
	(0.8962)	(0.9007)	(0.8860)
$\text{firms closing}_{pst-1}$	-0.0063*	-0.0063*	-0.0048
	(0.0036)	(0.0037)	(0.0030)
real GDPpc_{pt-1}	-1.769e-05	-1.188e-05	-2.683e-05*
	(0.0000)	(0.0000)	(0.0000)
$\text{working-age}^{natives}_{pt-1}$	0.0140	0.0314*	0.0221
	(0.0184)	(0.0166)	(0.0144)
Interactions:			
$\text{hiring}^{highedu}_{pst-1} \times \text{hiring}^{es}_{pst-1}$			-3.341e-07
			(0.0000)
$\text{hiring}^{highedu}_{pst-1} \times \text{hiring}^{eu15}_{pst-1}$			-3.022e-05
			(0.0000)
$\text{hiring}^{highedu}_{pst-1} \times \text{hiring}^{lam}_{pst-1}$			-2.863e-06
			(0.0000)
$\text{hiring}^{mededu}_{pst-1} \times \text{hiring}^{es}_{pst-1}$			3.583e-07*
			(0.0000)
$\text{hiring}^{mededu}_{pst-1} \times \text{hiring}^{eu15}_{pst-1}$			3.122e-05**
			(0.0000)

Table 3: Foreign workplaces by origin (2) (cont.)

Estimator: Fixed effects			
Dependent variable: workplace_{opst}			
	(1)	(2)	(3)
$\text{hiring}^{mededu}_{pst-1} \times \text{hiring}^{lam}_{pst-1}$			-1.241e-06
			(0.0000)
$\text{hiring}^{lowedu}_{pst-1} \times \text{hiring}^{es}_{pst-1}$			-1.339e-07
			(0.0000)
$\text{hiring}^{lowedu}_{pst-1} \times \text{hiring}^{eu15}_{pst-1}$			-1.083e-05***
			(0.0000)
$\text{hiring}^{lowedu}_{pst-1} \times \text{hiring}^{lam}_{pst-1}$			7.258e-07**
			(0.0000)
constant	-2.808e-01	-9.723e-01	-7.886e-01
	(1.3035)	(1.4703)	(1.3647)
Fixed effects:			
origin-province-sector	Yes	Yes	Yes
year	Yes	Yes	Yes
Observations	19,836	19,836	19,836
Number groups	2,838	2,838	2,838
R-sq (overall)	0.5245	0.4764	0.5869
sigma_u	1.2441	1.3638	1.1493
sigma_e	1.1210	1.1283	1.1079
rho	0.5519	0.5937	0.5183

Home-country group (o), province (p), sector (s), year (t).
Standard errors clustered by province–sector are in parenthesis.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$
Country of birth: Spain (es), EU-15 (eu15), Latin America (lam), Asia–Pacific (aspa), Africa (af), North America (usacan), rest of Europe (reurope).
Other controls: working-age (foreigners), human capital, and capital stock.

We lastly aim to analyze potential differences between domestic and foreign entrepreneurs. Results shown in columns 1–3 of Table 5 refer to domestic workplaces ($workp_{pst}^{domestic}$), whereas those in columns 4–6 refer to foreign workplaces ($workp_{pst}^{fdi}$).[44]

Among results regarding these differences, localization economies are clearly much more important for domestic entrepreneurs than foreign investors. Since we here do not consider investor origin, notable effects found in previous estimations do not appear, thereby stressing that localization economies that account for the nationality of investors are critical.

Considering how level of education affects new investment (Table 5, columns 1 and 4), locations that hire medium-skilled employees attract new entrepreneurs, both domestic and foreign, whereas locations that hire high-skilled employees produce the opposite effect, especially in the case of domestic entrepreneurs.[45] As before, we observe that foreign workplaces are not located in places where low-skilled employees are hired.

Respecting to the origin-country group of new workers (Table 5, columns 2 and 5), we detect some remarkable differences. Although domestic and foreign workplaces seem encouraged by the presence of native workers, this effect is stronger in the case of domestic entrepreneurs. Asian immigrants do not encourage the creation of new workplaces, whether domestic or foreign. As previously discussed, workers in this group are usually self-employed and establish their own businesses. By some contrast, African workers trigger the creation of domestic workplaces only, a result likely associated with the rapid expansion of the Spanish construction sector at the beginning of the 2000s. Workers arriving from North America positively affect the creation of foreign workplaces, but negatively affect domestic ones. These workers have specific professional qualifications, suggesting that their immigration flows are likely linked to established working opportunities within specific affiliates in Spain. Overall, foreign entrepreneurs seek an environment with more qualified workers than do domestic entrepreneurs, as generally confirmed by specifications that include the interaction terms (Table 5, columns 3 and 6).

Differences in targets between both groups of entrepreneurs take supported from other results as well. Trade openness is positive and statistically significant at 10 percent in the case of domestic workplaces, but not for foreign workplaces.[46] The number of firms that close down negatively affects the number of new domestic workplaces, but not foreign ones. Although

[44] In order to reduce the number of zeros, we exclude the province–sector combinations in which no domestic workplace was set up along the period 2005–2012. There are $1,100$ potential groups (i.e., $50 \cdot 22 = 1,100$), but after this procedure we work with 477 groups.

[45] The difference among coefficients is statistically different from zero.

[46] This coefficient is positive and statistically significant at 1 percent in Tables 2 and 3. The change in its significance stems from the aggregation of the six home-country groups.

the percentage of the native working-age population is important in the creation of workplaces for both types of entrepreneurs, the effect is stronger in the case of domestic entrepreneurs.[47] Furthermore, human capital negatively affects the number of new domestic workplaces. This and the previous result confirm the idea that foreign investors settle in place with a relatively high concentration of human capital.

Table 4: Domestic versus foreign workplaces

Estimator: Fixed effects						
Dependent variable:	*Domestic* workplace ($\text{workp}^{domestic}_{pst}$)			*Foreign* workplaces (workp^{fdi}_{pst})		
	(1)	(2)	(3)	(4)	(5)	(6)
$\text{workp}^{domestic}_{pst-1}$	0.7262***	0.6475***	0.6650***	0.0252***	0.0223***	0.0182***
	(0.0462)	(0.0419)	(0.0460)	(0.0080)	(0.0086)	(0.0056)
$\text{workp}^{fdi}_{pst-1}$	1.0810**	0.9750**	1.0895**	0.1087	0.1651*	0.0241
	(0.4618)	(0.4472)	(0.4485)	(0.0854)	(0.0928)	(0.0743)
$\text{hiring}^{highedu}_{pst-1}$	-0.0604*		-0.1318***	-0.0191***		0.0046
	(0.0359)		(0.0382)	(0.0056)		(0.0078)
$\text{hiring}^{mededu}_{pst-1}$	0.0209**		-0.0055	0.0191***		0.0033
	(0.0093)		(0.0167)	(0.0051)		(0.0041)
$\text{hiring}^{lowedu}_{pst-1}$	0.0074		-0.0102	-0.0046***		0.0002
	(0.0058)		(0.0128)	(0.0015)		(0.0013)
$\text{hiring}^{es}_{pst-1}$		0.0286***	0.0441***		0.0036***	0.0013
		(0.0056)	(0.0127)		(0.0010)	(0.0019)
$\text{hiring}^{eu15}_{pst-1}$		-0.0962	-0.0793		0.0362	0.0326
		(0.1828)	(0.2174)		(0.0284)	(0.0217)
$\text{hiring}^{lam}_{pst-1}$		-0.0187	-0.0976***		0.0064	0.0029
		(0.0216)	(0.0264)		(0.0100)	(0.0080)
$\text{hiring}^{aspa}_{pst-1}$		-0.3363**			-0.0550**	
		(0.1528)			(0.0239)	
$\text{hiring}^{af}_{pst-1}$		0.1060*			-0.0290	
		(0.0550)			(0.0200)	
$\text{hiring}^{usacan}_{pst-1}$		-1.7390***			0.0876*	
		(0.5549)			(0.0471)	
$\text{hiring}^{reurope}_{pst-1}$		-0.1635**			-0.0233	
		(0.0639)			(0.0152)	
Controls:						
$\text{trade openness}_{pt-1}$	2.6276	3.1861	3.9690*	0.0560	0.0825	-0.0983
	(2.3713)	(2.2397)	(2.2458)	(0.3781)	(0.4102)	(0.3584)
$\text{firms closing}_{pst-1}$	-0.1892***	-0.2167***	-0.2048***	-0.0376*	-0.0375*	-0.0285
	(0.0685)	(0.0704)	(0.0724)	(0.0219)	(0.0223)	(0.0180)
$\text{working-age}^{natives}_{pt-1}$	1.6971***	1.5895***	1.8112***	0.1272	0.2276**	0.1765**
	(0.5022)	(0.5087)	(0.5058)	(0.1070)	(0.0993)	(0.0833)
$\text{human capital}_{pt-1}$	-5.4912*	-4.9498*	-4.5150*	-0.5018	-0.1964	-0.2998
	(2.8893)	(2.8178)	(2.5519)	(0.3792)	(0.4651)	(0.3512)

[47] *Ceteris paribus*, if the native working-age population increases by 10 percent, then the number of new domestic workplaces increases by an average of 18 units, though this number drops to 1.8 in the case of foreign workplaces.

Table 4: Domestic versus foreign workplaces (cont.)

Estimator: Fixed effects						
Dependent variable:	*Domestic* workplace ($\text{workp}_{pst}^{domestic}$)			*Foreign* workplaces (workp_{pst}^{fdi})		
	(1)	(2)	(3)	(4)	(5)	(6)
Interactions:						
$\text{hiring}_{pst-1}^{highedu} \times \text{hiring}_{pst-1}^{es}$			-7.902e-06			-2.015e-06
			(0.0000)			(0.0000)
$\text{hiring}_{pst-1}^{highedu} \times \text{hiring}_{pst-1}^{eu15}$			1.137e-03			-1.824e-04
			(0.0012)			(0.0002)
$\text{hiring}_{pst-1}^{highedu} \times \text{hiring}_{pst-1}^{lam}$			-5.448e-05			-1.715e-05
			(0.0001)			(0.0000)
$\text{hiring}_{pst-1}^{mededu} \times \text{hiring}_{pst-1}^{es}$			2.903e-07			2.150e-06*
			(0.0000)			(0.0000)
$\text{hiring}_{pst-1}^{mededu} \times \text{hiring}_{pst-1}^{eu15}$			2.574e-05			1.879e-04**
			(0.0005)			(0.0001)
$\text{hiring}_{pst-1}^{mededu} \times \text{hiring}_{pst-1}^{lam}$			-8.439e-06			-7.466e-06
			(0.0000)			(0.0000)
$\text{hiring}_{pst-1}^{lowedu} \times \text{hiring}_{pst-1}^{es}$			3.580e-06			-8.001e-07
			(0.0000)			(0.0000)
$\text{hiring}_{pst-1}^{lowedu} \times \text{hiring}_{pst-1}^{eu15}$			-2.877e-04			-6.496e-05***
			(0.0002)			(0.0000)
$\text{hiring}_{pst-1}^{lowedu} \times \text{hiring}_{pst-1}^{lam}$			2.702e-05***			4.323e-06*
			(0.0000)			(0.0000)
constant	-80.6345*	-81.3748*	-140.3253***	-1.3486	-5.7805	-4.2572
	(47.4535)	(45.7610)	(48.8466)	(7.7692)	(8.6680)	(8.1876)
Fixed effects:						
province-sector	Yes	Yes	Yes	Yes	Yes	Yes
year	Yes	Yes	Yes	Yes	Yes	Yes
Observations	3,331	3,331	3,331	3,331	3,331	3,331
Number groups	477	477	477	477	477	477
R-sq (overall)	0.9645	0.9387	0.9454	0.4867	0.2523	0.6605
sigma_u	9.8010	19.3504	19.1509	4.6725	5.7887	3.5431
sigma_e	16.2833	15.6348	15.6339	2.6304	2.7402	2.4212
rho	0.2659	0.6050	0.6001	0.7594	0.8169	0.6817

Home-country group (o), province (p), sector (s), year (t).

Standard errors clustered by province–sector are in parenthesis.

* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Country of birth: Spain (es), EU-15 (eu15), Latin America (lam), Asia–Pacific (aspa), Africa (af), North America (usacan), and rest of Europe (reurope).

Other controls: real GDPpc, working-age (foreigners), and capital stock.

6 Conclusion

In this paper, we emphasize the importance of the influence of agglomeration economies, network forces, and labor market composition upon the intensity of foreign workplaces creation in Spain during 2005–2012. To complete our analysis, we elaborate a novel database by aggregating and merging information from two different data sources: the SABI, which contains information about firms, and the MCVL, which contains information about workers.

We find that localization economies are relevant to explaining the entry of new foreign firms, whereas human capital does not play any important role. Accordingly, though unlike other empirical studies, we find that a population of high-skilled workers does not affect the specific setting—namely, foreign firms in Spain do not seek highly qualified employees, and their vacancies are filled by medium-skilled workers. This result indirectly confirms that foreign investors do not privilege quality in the local production environment, but instead pursue better opportunity-costs when investing in Spain.

Our results also generally reveal Spain's problem with incentivizing FDI. On the one hand, MNEs seek medium-skilled-type employees, whereas Spanish workers' education falls below the OECD average of secondary education. In this sense, if one aimed to fulfill current MNEs demand in terms of labor, it would be rather convenient to foster vocational education programs. On the other hand, if Spanish authorities aimed to favor the long-term interest of foreign investors in the domestic economy, it would be advisable to adopt the incentive scheme already consolidated in other countries that relies on making high-skilled local workers a key determinant for attracting FDI.

One weakness of this research is the exploitation of aggregated data. Aggregating information entails the loss of important individual features at the firm and worker levels. A valuable extension would thus be to exploit an employer–employee database that allows us to complete a micro-level analysis and control for firm and worker characteristics. Doing so would yield more precise results concerning the effects of local labor force composition on the intensity of FDI inflows.

Finally, according to our database, foreign investors from the EU-15 represent 60–80 percent of new foreign workplaces in Spain. In that case, it would be interesting to provide a tailored investigation referring to the MNEs with headquarters in EU-15 countries, with the aim to further deepen the understanding of the connection between the determinants of FDI entry in Spain with the evolution of the European integration process.

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A Appendix

Table A.1: Classification of economic activity

Code	Description	CNAE-93 Rev 1					CNAE 2009									
100	Food, beverages, and tobacco	15	16				10	11	12							
200	Textiles, leather, and wood	17	18	19	20	36	13	14	15	16	31	32				
300	Paper and publishing	21	22				17	18	58							
400	Chemical, plastic, and petroleum refinery	23	24	25	26		19	20	21	22	23					
500	Metallurgy and mechanical equipment manufacture	27	28	29			24	25	28							
600	Electrical machinery, computer systems, and medical instrument manufacture	30	31	32	33		26	27								
700	Automotive	34	35				29	30								
800	Energy	40	41				35	36	37	38	39					
900	Construction	45					41	42	43							
1000	Wholesale, retail sale, and vehicle motor repairs	50	51	52			45	46	47							
1100	Hotel	55					55	56								
1200	Transport	60	61	62	63		49	50	51	52						
1300	Telecommunications	64					53	61								
1400	Financial activity	65	66	67			64	65	66							
1500	Real estate activity	70					68									
1600	Renting	71					77									
1700	Information technology and computer services	72					62	63	33							
1800	Research and development	73					72									
1900	Administrative and support activity	74					69	70	71	74	78	82				
2000	Public administration	75					84									
2100	Education	80					85									
2200	Services (e.g., Health, leisure, sports, and culture)	85	90	91	92	93	86	87	88	90	91	92	93	94	95	96

Notes: Codes from 100 to 800 refer to industry, code 900 to constrauction, and codes from 1000 to 2300 to services. The primary sector is excluded.

Table A.2: New hirees by sector: relative importance by level of education, 2005–2012

Code	Sector	Primary	Secondary	Tertiary	Total
100	Food, beverages, and tobacco	81.88	13.50	4.62	100
200	Textile, leather, and wood	84.61	12.44	2.94	100
300	Paper and publishing	53.03	32.58	14.39	100
400	Chemical, plastic and petroleum refinery	72.49	18.07	9.44	100
500	Metallurgy and mechanical equipment manufacture	83.27	10.64	6.09	100
600	Electrical machinery, computer systems and medical instrument manuf.	66.14	16.37	17.49	100
700	Automotive	81.90	6.87	11.23	100
800	Energy	65.61	16.84	17.55	100
900	Construction	90.67	5.92	3.41	100
1000	Wholesale, retail sale, and motor vehicle repairs	45.38	47.89	6.73	100
1100	Hotel	80.93	15.63	3.44	100
1200	Transport	68.69	24.69	6.62	100
1300	Telecommunications	17.46	72.12	10.42	100
1400	Financial activity	2.04	70.09	27.87	100
1500	Real estate activity	35.26	52.35	12.38	100
1600	Renting	58.21	34.19	7.60	100
1700	Information technology and computer services	13.69	43.83	42.48	100
1800	Research and development	8.40	20.64	70.96	100
1900	Administrative and support activity	54.00	35.90	10.10	100
2000	Public administration	57.17	26.77	16.06	100
2100	Education	13.07	33.17	53.76	100
2200	Services (e.g., Health, leisure, sports, and culture)	38.27	40.33	21.40	100

Note: The table reports, for each sector, the relative importance of each level of education.

Table A.3: Data definition and sources

Variable	Definition	Source
New workplaces	Number of new workplaces. This variable varies by home country, province, and sector.	SABI (BvD)
FDI inflows	Workplaces created by new firms that fulfill at least one of the following conditions: (i) have a parent company located aborad and/or (ii) account for a foreign stake holder with at least 10 percent of total capital. This variable varies by home country, province, and sector.	SABI (BvD)
New hirees	People entering in the Spanish job market. This variable varies by home country, province, and sector.	MCVL (Social Security)
Immigrant inflows	New workers born in a foreign country. This variable varies by home country, province, and sector.	MCVL (Social Security)
GDP / GDP per capita	The INEbase contains information about the GDP in current euros (*Contabilidad Regional de España*). Using the price index (*pl_gdpo*) provided by the PWT, nominal values are converted into real ones. We compute the GDP per capita using information about population, which is also available at the INEbase (*Cifras de Población*). This variable varies by province.	INE; PWT (Feenstra et al., 2015)
Trade openness	DataComex provides information about trade flows (exports and imports) by province. For each province, total trade flows is aggregated according to the six home-country groups. Using the GDP, we calculate an index of trade openness as trade flows over GDP. This variable varies by home country and province.	DataComex (MINECO); INE
Risk	Number of firms that close down. This variable varies by province and sector.	SABI (BvD)
Working age	Data about population are extracted from the INE database *Cifras de Población*. We calculate the working age population as people aged between 15 and 64. We distinguish between natives and foreigners. This variable varies by province.	INE
Human capital	Average years of education of the working-age population. This variable varies by province.	Fundación Bancaja and Ivie
Capital stock	Net capital stock. Using the price index (*pl_gdpo*) provided by the PWT, nominal values are converted into real ones. This variable varies by province.	FBBVA and Ivie; PWT (Feenstra et al., 2015)

Table A.4: Distribution of new workplaces, 2005–2012 (percentage values)

		0	1	2	3	4	5	6	7	>8
Foreign (by origin)[1]	$workp_{opst}$	91.66	4.03	1.73	0.88	0.43	0.31	0.19	0.15	0.62
Foreign (total)[2]	$workp_{pst}^{fdi}$	65.60	13.78	7.45	3.21	1.80	1.92	0.99	1.11	4.14
Domestic[2]	$workp_{pst}^{domestic}$	6.48	6.39	4.71	5.13	4.38	3.30	2.91	2.85	63.85

Notes:

[1]The table reports the percentage of home–province–sector with 0, 1, 2, ... new workplaces.

[2]The table reports the percentage of province–sector with 0, 1, 2, ... new workplaces.