FIRM AND LOCAL DETERMINANTS OF INWARD FDI. THE CASE OF ITALY

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Abstract

This study examines factors that might affect inward FDI (Foreign Direct Investments). More in detail, we study how and to what extent firm-level and local characteristics impact on the inward FDI in Italy, over the period 2006-2014. Using alterative definitions of foreign firms, we qualify firms receiving FDI in each year, as those firms that become foreign in year t (and was national in year t-1). We compare firms receiving FDI with national firms in each relevant year (2006-2014) in terms of their performance, using univariate kernel density estimations, and we estimate the probability that a firm receives FDI by applying Probit models. Looking at the firms characteristics that affect inward FDI, our evidence seems to suggest that foreign investors in Italy mainly pursue "lemon-picking" strategies by investing in more productive, even if less profitable, firms. The evidence on the role of the local factors seem to suggest that the aim of the foreign investors is to penetrate the Italian local market mostly through market-seeking FDI, rather than export-oriented FDI. Moreover, by distinguishing between firms receiving "financial" and "non-financial" FDI, according to the type of their global ultimate owners, we show how factors affecting inward FDI vary according to the type of investment.

Keywords: Foreign direct investment, Firm-level characteristics, Regional and provincial determinants, Italian firms

JEL classification: C21, D22, F21, F23

1 Introduction

The economic and financial crisis in the European Union reached its peak in terms of industrial output in 2009, when the production level fell on average by 14%. After two years of recovery with positive growth rates, again in 2012 the European Union displayed a negative industrial prospect. In 2014 the EU returned to a positive growth which continued in 2015 and 2016.[1] The crisis was particularly severe in Italy, where the GDP growth was lower than the Eurozone average GDP growth even before 2009. In some respect, the slow growth in Italy might be explained by its lower international integration compared with the other major OECD countries. This gap does not mainly depends on Italian trade (i.e. exports and imports), but is mainly due to a limited ability of Italy to attract foreign direct investment (inward FDI).[2] Thus, from a policy prospective, the analysis of the determinants of inward FDI might allow to select suitable policy tools to attract foreign investors and amplify the potential positive effects of FDI on the local economy.

A large body of the empirical literature has focused on macro-level characteristics in order to identify determinants of the attractiveness of foreign investments. According to this literature, the following set of characteristics, at the country-level, affect the inward FDI: GDP, population, market openness of host economy, relative factor prices, institutional development, geographical and cultural proximity, among others (see among the others, Kinoshita and Campos, 2003; Disdier and Mayer, 2004; Barrios et al., 2006; Yavan, 2010; Daniele and Marani, 2011). A recent wave of studies has started to analyze the determinants of inward FDI at a rather disaggregated level, in order to account for both regional and firm-level characteristics that might affect the location choices of foreign firms (e.g., Basile et al., 2008; Amendolagine et al., 2013; CieŚlik, 2013; Ablov, 2015).

In line with this recent strand of literature, we study how and to what extent firm-level and local characteristics impact on the inward FDI in Italy.

Our main contribution is the way in which we identify firms receiving FDI. Indeed, differently from other previous studies, that perform cross sectional analysis and/or assume constant firms ownership structure over the period of analysis (e.g., Gattai and Sali, 2018; Peri and Urban, 2006; Budd et al., 2005), we use several releases of the Historical ORBIS dataset in order to collect information on firms yearly ownership structure (covering the period 2005-2014). Thus, in each year, we can identify firms receiving FDI looking at the change in the amount and the source country of the foreign capital throughout the analysis period. To the best of our knowledge a similar approach has been followed only by few authors (see among the others, Temouri et al., 2008; Weche, 2018). Moreover, using data on firms direct shareholders and ultimate owners, we introduce a comparison across

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[1]This is documented in the industrial production (volume) index provided by Eurostat: Eurostat Figures.

[2]This is documented in the OECD trade and investment statistical country notes by OECD in 2017 .

three different definitions of firms receiving FDI. Our analysis shows that both firms and local characteristics affecting FDI do not change using alternative definitions of inward FDI. On the contrary, distinguish between firms receiving "financial" and "non-financial" FDI, according to the type of global ultimate owner, we verify that factors that affect inward FDI vary according to the type of investment.

The paper is organized as follow. We describe the data and define the variables of interest (Section 2). We next present some non-parametric evidence based on univariate kernel density estimations (Section 3). Section 4 illustrates our empirical strategy and discusses the empirical results. We provide some concluding comments in Section 5.

2 Data and variables of interest

The empirical analysis is based on a firm-level panel dataset for Italian firms built on the merger of AIDA (Analisi Informatizzata delle Aziende) and Historical ORBIS data.

The AIDA dataset includes detailed information on more than a million of Italian limited liability companies operating in both the manufacturing and service sectors, which have to report their balance sheet to the Italian Chambers of Commerce. The dataset includes firms financial and economic information, as well as a wide set of relevant indicators, including incorporation year and sector of activity, among others.

Firms included in the dataset correspond virtually to the universe of Italian limited liability firms independently of their size, thus AIDA represents the ideal set of data to study the dynamics of firms and industries.[3]

We integrate AIDA data with information on firms yearly ownership structure (covering the period 2005-2014) derived from Historical ORBIS. For each firm and year, the dataset enables to distinguish two types of owners: shareholders and ultimate owners. For each shareholder and ultimate owner we consider the following information: name (and/or the identification number), ownership share (the direct share for each shareholder and the total share for each ultimate owner), nationality (that allows to identify foreign owners) and type (i.e. bank, financial company, insurance company and corporate companies, among others).

In the remainder of this section we provide detailed information on the definition of foreign firms and firms receiving FDI, as well as details on the variables included in our analysis.

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[3]To comply with the law, limited liability firms have to report their financial statement, together with additional information, to the local Chamber of Commerce. Hence, as reported on the homepage of AIDA, at least in principle, the database includes all limited liability firms.

2.1 Foreign firms and firms receiving FDI

In the literature focusing on inward FDI at firm-level, different definitions have been considered for both foreign firms and inward FDI. Many studies, following the IMF (2009) definition, identify firms receiving FDI as those firms involving a single foreign investor directly owning at least 10% of shares in a company (see among the others, Altomonte and Pennings, 2009). Some other works have relaxed this definition considering inward FDI when the share of foreign capital is more than 10% for a company (see among the others, Ablov, 2015; CieŚlik, 2013), and in some other cases, the ultimate owner is accounted for in order to identify firms receiving FDI (see among the others, Basile et al., 2005).[4]

For the current analysis, using information on firms shareholders and ultimate owners, following the applied literature, we focus on three alternative definitions of foreign firms. Based on our first definition, to qualify as foreign, a firm should have at least 10% of its capital directly owned by a single foreign persons or company (i.e. a single foreign shareholder). All firms not meeting this criterion are defined as Italian owned (or national firms), including firms without ownership information. Using a second definition, we define as foreign those firms with at least 10% of their capital owned by foreign persons or companies (i.e. one or more foreign shareholders). Finally, using information on ultimate owners, we identify foreign firms as those with 25.01% or more of their capital owned, directly or indirectly, by a foreign entity (i.e. a global ultimate owner).[5]

According to these three alternative definitions of foreign firms, we qualify firms receiving FDI in each year, as those firms that become foreign in t (and were national in t-1).[6]

Table 1 reports the distribution of foreign firms and firms receiving FDI over the period of analysis, considering the three alternative definitions we adopt. Data show that, irrespective of the definition considered, both the number of foreign firms and the number of firms receiving FDI increase over time. This evidence might be, at least partially, explained by an increasing coverage of the ORBIS dataset over time. Focusing on the first definition of foreign firms and inward FDI (*Foreign_10* and *Fdi_10*, in box A), on average the share (stock) of foreign firms is about 2.18% of the total number of firms in the dataset, while, on average, the fraction of firms receiving FDI (flow) is around 0.08%. The number of foreign firms and firms receiving FDI slightly increase when we consider the second, less strict, definition of foreign ownership (*FOREIGN_10* and *FDI_10*, in box B). However, on average, the evidence is in line with that coming from the first definition. Indeed the share of foreign firms is about 2.19% (2.18% with the

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[4]Some authors combine the three definitions explained above in order to define firms receiving FDI (e.g., Günther et al., 2011).

[5]Alternatively, Historical ORBIS allows to consider the minimum 50.01% threshold in the direct or indirect share owned by a foreign entity in order to identify firms global ultimate owners.

[6]Given our definition of firms receiving FDI, the 2006 is the first year in which we can identify inward FDI.

Table 1: Foreign firms and firms receiving FDI according to our definitions.

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
BOX A: at least 10% of capital directly owned by a single foreign shareholder										
Foreign_10	13003	14186	15646	17221	18622	20988	22680	24504	25962	25575
(%)	1.92	1.92	1.94	1.97	1.98	2.07	2.24	2.47	2.65	2.69
Fdi_10	0	76	255	127	229	643	347	1659	1732	1926
(%)	-	0.0103	0.0316	0.0145	0.0243	0.0633	0.0343	0.1669	0.1771	0.2023
BOX B: at least 10% of capital directly owned by one o more foreign shareholders										
FOREIGN_10	13066	14252	15736	17311	18707	21074	22780	24624	26094	25714
(%)	1.93	1.93	1.95	1.98	1.99	2.07	2.25	2.48	2.67	2.70
FDI_10	0	84	275	133	232	644	354	1684	1744	1942
(%)	-	0.0114	0.0341	0.0152	0.0246	0.0634	0.0350	0.1694	0.1783	0.2040
BOX C: at least 25.01% of capital directly or indirectly owned by a global ultimate owner										
FOREIGN_GUO	10368	11247	12166	13221	14188	15445	16053	16346	16789	16513
(%)	1.53	1.52	1.51	1.51	1.51	1.52	1.59	1.64	1.72	1.73
FDI_GUO	0	21	24	39	51	126	40	231	694	998
(%)	-	0.0028	0.0030	0.0045	0.0054	0.0124	0.0040	0.0232	0.0710	0.1048
N. Firms	677285	739439	807206	875010	941551	1015777	1011522	993985	977998	952110

Note.Foreign_10, FOREIGN_10 and FOREIGN_GUO identify, in each year, the number of foreign firms according to the three alternative definitions of foreign firms. Fdi_10, FDI_10 and FDI_GUO represent, in each year, the number of firms receiving FDI (i.e. the number of that become foreign in each year).The numbers of firms receiving FDI in the table is lower than the numberS included in our analysis. In the analysis we only consider the domestic firm for the whole period 2005-2014 and the firms that, in the same period, have registered only one change in their ownership structure (from domestic to foreign).

first definition) of the total number of firms in the dataset, while, on average, the fraction of firms receiving FDI is around 0.08%. Based on this second definition, the slightly higher number of foreign firms and firms receiving FDI is mainly due to large companies (e.g. firms with on average more than 1,000 employees) that have more fragmented capital and are identified as nationally owned firms by using the first definition. Based on the third definition of foreign ownership (*FOREIGN_GUO* and *FDI_GUO*, in box C), data reveal a lower the share of foreign firms (1.58% vs slightly more than 2% based on the other two definitions) and a lower share of firms receiving FDI (0.02% vs around 0.08%). Using alternative definitions of foreign ownership allows us to verify whether firms characteristics and local factor differently affect firms probability of receive FDI according to the use of different qualifications for FDI.

In this work we can resort to balance sheet data information from 2005 to 2014 that we employ to study firms probability to receive FDI over the period 2006-2014. [7] To provide a comparison with other works, consider that figures for foreign firms based on

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[7]We use two AIDA historic disks available in December 2015 and December 2016, respectively. The resulting dataset covers the period between 2005 and 2014; however, given our definition of firms receiving FDI, the 2006 is the first year in which we can identify inward FDI.

the second definition are much in line with the statistics reported for Italy by Kalemli-Ozcan et al. (2015). Indeed, authors show that the share of with more than 10% foreign ownership increases over the period 2002-2011, moving from 0.77 in 2002 to 2.17 in 2011. Moreover, a comparison with the INFOCAMERE division has allowed us to verify that, the number of firms receiving FDI, identified in the dataset at our disposal (using the first and second definitions of foreign firms), is fully in line with the data collected at national level by INFOCAMERE.

2.2 Firm level variables and descriptive statistics

In this section we provide a brief illustration of the firm level variables employed in the empirical analysis as potential determinants of FDI, together with descriptive evidence to appreciate trend over time.

Table 2 shows some descriptive statistics in each year of the analysis (2005-2014). The average size, as measured by total revenues ($TotRev$), is on average about 2,300 thousands of Euro over the entire period considered, and slightly decreases over time, moving from more than 3,600 in 2005 to less than 2,000 in the last available year. Moreover, as expected, firms total revenues distribution is much asymmetric. In terms of labour productivity (LP), measured by the ratio between added value and the total number of employees, firms show, on average, slightly decreasing values over the period considered (the LP continuously decreases from about 66 to about 36 thousands of Euro per employee over time), but this could be explained by the greater coverage of sampled firms over time. Firms do not display a noteworthy trend over time in terms of return on sales (ROS), as measured by operative profits over sales (in percentage points). On average, firms profitability ranges between 4.40% and 2.14%. Firms financial stability is measured by the solvency ratio ($SolvRatio$), which is calculated by dividing total equity by total assets (in percentage points). The solvency ratio is stable over time: on average the share of assets that are internally financed is around 28% in all considered years, with the exception for the first year of the analysis period.[8]

We use firms age (Age), defined as the difference between the year of interest (2005-2014) and incorporation year plus 1 (Age is equal to one in the incorporation year), as proxy for firms experience. Firms are on average 13 years old in the AIDA sample.

Geographical dummies (North, Center, South) show that most firms (around 50%) are located in the North of Italy and around 25% are located in the Center and South of Italy, respectively.[9]

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[8]AIDA data only provide firms solvency ratio ranging between -50 and 100.

[9]Table 2 does not report statistics for geographical area dummy variables because evidence are strongly stable over the period considered. They are available upon request.

Table 2: Descriptive statistics.

Year	N. firms	TotRev	LP	ROS	SolvRatio	age
2005	645073	3648.057	66.32325	3.869518	21.59791	12.6526
		(112332)	(354.7412)	(9.534605)	(22.89282)	(12.44374)
2006	704761	2514.285	62.52234	4.406203	21.497	12.581
		(105485.2)	(321.8501)	(9.707382)	(22.959)	(12.4201)
2007	769569	2452	63.76042	4.02913	26.34633	12.46604
		(79979.65)	(421.8215)	(11.40902)	(28.6398)	(12.39154)
2008	833820	2381.277	16.96193	3.300231	28.08234	12.45664
		(84238.6)	(14879.21)	(11.85243)	(30.14128)	(12.36649)
2009	896747	2000.614	47.85436	2.478003	28.51573	12.52086
		(62396.81)	(318.6299)	(12.36155)	(30.136)	(12.34799)
2010	966609	1926.604	49.42993	2.665282	28.93474	12.54774
		(62676.74)	(211.7196)	(12.27848)	(30.52)	(12.371)
2011	960090	1960.392	42.27951	2.782548	28.95437	12.90685
		(71186.82)	(280.6054)	(12.31835)	(30.4439)	(12.50567)
2012	940792	1889.006	36.90253	2.149405	29.27232	13.35275
		(77323.37)	(161.9553)	(12.68323)	(30.51912)	(12.71223)
2013	923045	1829.814	37.62778	2.309153	29.48956	13.68437
		(74323.41)	(391.9673)	(12.59544)	(30.50347)	(12.93177)
2014	897809	1820.97	36.91592	2.675282	29.78861	13.97336
		(69329.77)	(185.3045)	(12.46865)	(30.41817)	(13.16976)

Note. For each year, we only consider companies with information for the relevant variables. For each variable and year we have a different number of observations. We account for national or subject to inward FDI (I Definition) firms, operating in the manufacturing or service sectors (we exclude firms operating in the following 2-digit ATECO 2007 sectors: 12 and 33). TotRev is total revenues in thousands of Euros, LP is labour productivity, ROS and SolvRatio are percentages and Age is the number of years.

2.3 Local level variables

In this section we provide a brief description of the local level variables employed in the empirical analysis as potential determinants of FDI.

Among local determinants of FDI we include different indicators measured at provincial, regional or at a more disaggregated level. Among variables measured at the provincial level, we account for market size measured as provincial GDP per capita (the logarithmic transformation, $ln(GDP\_per\_i,t-1)$). We use current Euro prices GDP (in thousands of Euro) taken from OECD divided by the total population provided by ISTAT. Trade openness reflects export per capita, that we measure as provincial total export, provided by ISTAT, divided by provincial population (in log, $ln(exp\_pro\_i,t-1)$). In order to capture inter-industry agglomeration forces in explaining inward FDI, we account for number of firms operating in each Italian province taken from INFOCAMERE ($ln(numb\_firms\_i,t-1)$). We also use bank of Italy data to measure the development of the financial system at the provincial level. In particular, we use $loans\_dep\_i,t-1$ measured as the ratio between bank loans and deposits expressed as a percentage.

Both the availability of labour forces and labour quality are expected to affect inward

FDI. We measure labour availability by accounting for rate of employment provided at the provincial level by ISTAT (*rate_emp_i,t-1*). However, our measure of labour quality are only available at regional level. In particular, we account for the availability of healthy and high educated workers by including in our analysis life expectancy provided by ISTAT, measured in years (the logaritmic transformation, *ln(life_exp_i,t-1)*), and the share of graduated over the population in each Italian region (*rate_grad_i,t-1*) by employing MIUR data. Moreover, we measure labour productivity at regional level as the ratio between value added (in thousands of Euro) and workers using ISTAT data (*ln(AV_emp_i,t-1)*).

We also use data provided by the General Direction for Statistics and Organisational Analysis (DG-Stat), established at the Italian Ministry of Justice, to account for institutional quality. In particular, we take in to account the average duration of civil proceedings at the court level (in log, *ln(length_proc_i,t-1)*). We build this measure as the sum between the number of pending cases at the beginning of a year plus the number of casproceedings pending at the beginning of the following year, divided by the sum of the number of cases filed and the number of cases disposed of during the year. Moreover, we multiply this measure by 365 days in order to express the average duration in terms of days.

3   Non-parametric evidence

Before proceeding with more standard econometric analysis we report evidence from univariate kernel density estimation, which allows us to graphically compare the performance of different groups of firms.

In particular, we compare the empirical distributions of firms performance across two groups of firms over the period 2006-2014: national firms and firms receiving FDI, using the first definition of foreign firms (i.e. considering the 10% of direct share owned by a single foreign shareholder).[10] Throughout, we will refer to the firms of the first group as *national* and to the rest as *inward FDI* firms. We focus on (log of) total revenues, (log of) labour productivity, ROS and solvency ratio as measures of firms characteristics.

Graphically, we identify relevant differences between groups of firms in terms of total revenues, productivity and solvency ratio. As reported in Figures 1, 2 and 3, according to the empirical literature, our findings suggest that firms receiving FDI are bigger and more productive than national firms. Similarly, solvency ratio is slightly higher for firms receiving FDI and indicates a disproportionate financial structure of national firms, which are strongly dependent on external resources. Somewhat contrary to what one might expect, the univariate kernel density estimations do not suggest significant difference

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[10]In our analysis we only include firms that do not change their nationality in the period 2005-2014 and firms that change their nationality, from national to foreign, only once.

between the two groups of firms in terms of their age and profitability.[11]
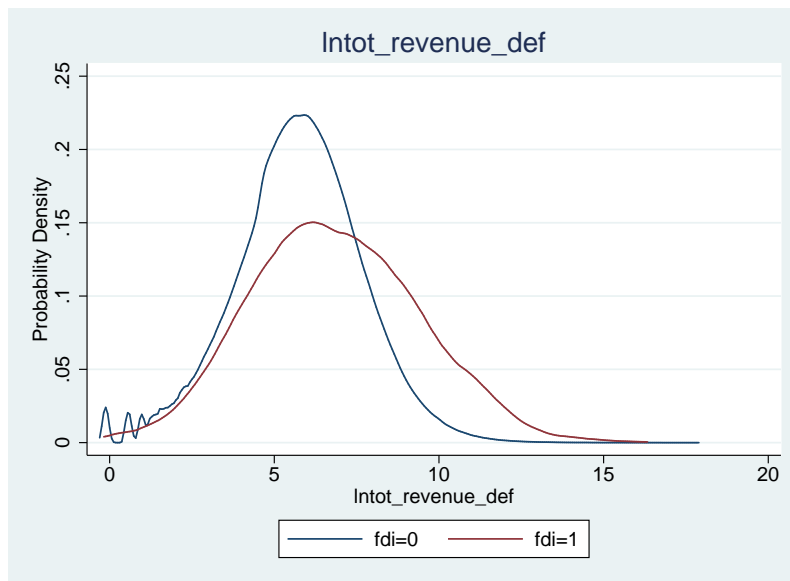

Figure 1: Empirical distribution of Total Revenues (in log), *national* vs *inward FDI* firms (2006-2014)
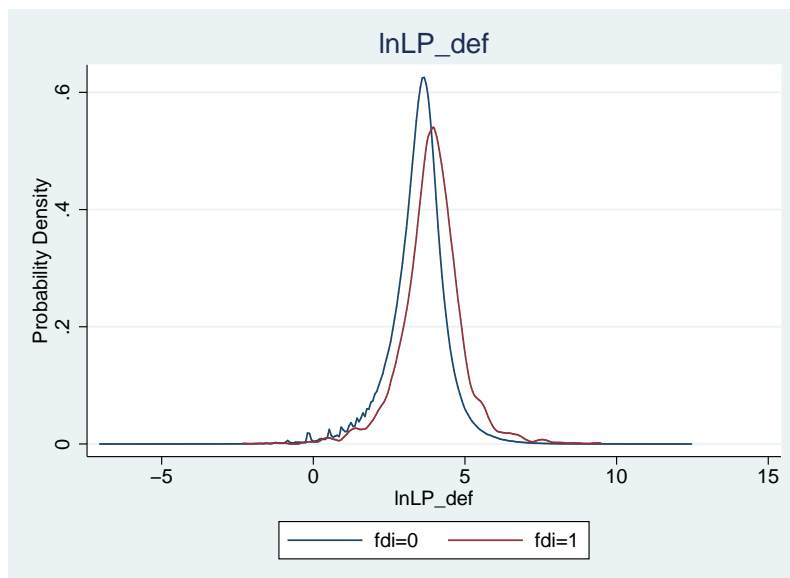

Figure 2: Empirical distribution of Labour Productivity (in log), *national* vs *inward FDI* firms (2006-2014)

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[11]In the interest of space, we do not show graphical comparison between the two groups of firms in terms of ROS and age. They are available upon request.
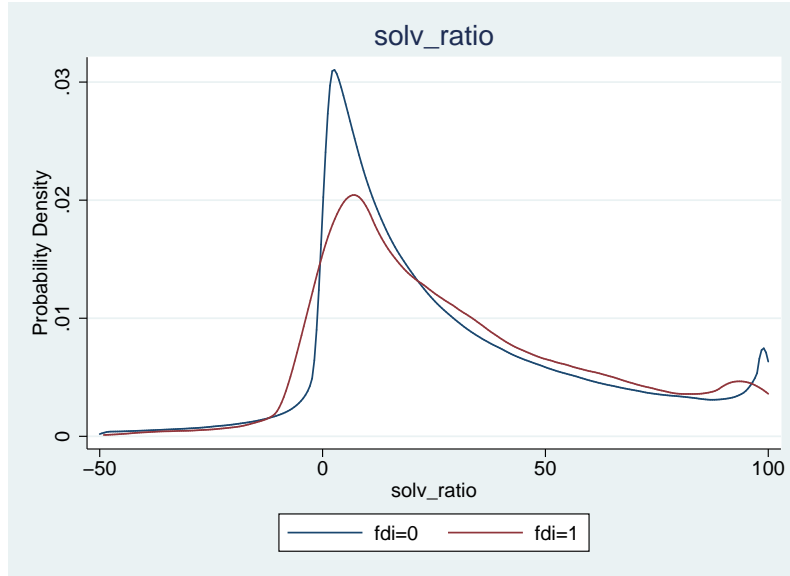
Figure 3: Empirical distribution of Solvency Ratio, *national* vs *inward FDI* firms (2006-2014)

4 Empirical analysis of firms probability of receiving FDI

In this section we investigate, the effects of firm and local level characteristics on firms probability of receiving FDI by applying parametric analysis and resorting to Probit models.

Dependent variables

In our analysis, the dependent variable (the binary variable $fdi_{i,t}$) is equal to 1 if firm i receives an FDI in year t (where t varies between 2006 and 2014) and 0 otherwise.

As explained in Section 2.1, we qualify firms having FDI in t as those firms that were national until year *t-1* and became foreign in year *t*. Moreover, we alternatively account for firms receiving FDI (and estimate the probability that a firm receives FDI) using the three definitions of foreign firms (i.e. considering the 10% of direct share owned by a single foreign shareholder, the 10% of direct share owned by one or more foreign shareholders and the 25.01% or more of capital owned directly or indirectly by a global ultimate owner).[12]

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[12]In our analysis, we alternatively label our depended variables as follows: Fdi_10 (based on the first definition of foreign firms), FDI_10 (based on the second definition of foreign firms) and FDI_GUO(based on the last definition of foreign firms).

Independent variables

The explanatory variables consist of firms economic and financial variables and local characteristics. We include among firm level potential determinants of inward FDI firms size (proxied by the log transformation of total revenues), productivity (in log), profitability, financial stability and age. While among the local factor that might affect firms probability of receiving FDI we account for market dimension (proxied by the per-capita GDP), market openness (measured by the per-capita exports), market concentration (i.e. number of firms), financial development (proxy by the ratio between bank loans and deposits), employment availability (i.e employment rate) and demography indicator (i.e. life expectancy). Moreover, we include among regressors regional human capital and productivity, measured as the share of gradates over the total population and the ratio between added value and employees, respectively. In order to account for institutional development, we control for the length of court proceedings. To reduce the potential endogeneity of the independent variable, both at firm and local level, regressors are lagged one period with respect to the dependent variable. In each specification we control for time invariant sectoral effects through a set of 2-digit industry dummy variables. We control for three geographical area dummy variables which identify firms operating in the North, Centre or South of Italy, respectively: in this way we account for the omission of geographical specific time invariant characteristics which might bias our parameter estimates. We also include year dummies which allow us to account for the economic cycle and common macroeconomic factors.

Existing empirical evidence in terms of the effects firms characteristics on inward FDI unequivocally suggest that larger firms are more likely to receive FDI (see, e.g, Bhupatiraju, 2019; Ablov, 2015; Garavito et al., 2014; Karpaty and Poldahl, 2006). Thus, based on previous empirical findings and on our preliminary results, we expect to find a higher probability to receive inward FDI for larger firms. Many studies show how older firms are less attractive for foreign investors than newer ones (see, e.g, Bhupatiraju, 2019; Ablov, 2015); while, other few studies show that older domestic firms are more likely to become foreign owned, or that firms age negatively impacts on the foreign share of firms capital but does not have any significant effect on the probability to receive inward FDI (see, among the many others, Garavito et al., 2014; Karpaty and Poldahl, 2006). Thus, focusing on the role of firms age on attracting FDI, given the empirical literature, as well as our preliminary results, we do not have any expectation on our parametric results. Focusing on for the role of firms performance, measured in terms of productivity, previous empirical analysis identify the positive role of firms productivity in attracting inward FDI (see, among the many others, Ablov, 2015; Hilber and Voicu, 2010; Djankov and Hoekman, 2000). Thus, in line with previous empirical evidences and according to our preliminary results, we expect to find a positive relationship between

firms productivity and their probability to receive FDI. Moreover, to investigate the reasons that move foreigners to invest in Italy, we include profitability among measure of firms performance that can attract inward FDI. We expect to find positive coefficients of both firms productivity and profitability whether inward FDI in Italy are mainly cherry-picking. Thus, whether foreign investors prefer to invest in successful firms. On the contrary, we expect opposite signs in the coefficients of these two regressors whether FDI are mainly lemon-picking. Indeed, in the latter case, foreign firms are mainly attracted by lower performance firms, in the hope that they can be bought cheap and can be converted into successful firms at a future time (see, among others, De and Nagaraj, 2013; Matarazzo et al., 2018). Focusing on firms financial stability, some studies identify a negative impact of firms financial constraints on their attractiveness of FDI (see, e.g, Bhupatiraju, 2019). Thus, based on previous empirical findings and on our preliminary results, we expect to find a higher probability to receive inward FDI for firms facing higher solvency ratio.

At the macro-level market size, trade openness, labour market characteristics and human capital endowments are among the main destination location factors influencing inward FDI (see, among other recent surveys, Sahiti et al., 2018; Nielsen et al., 2017). In particular, generally market size is found to be positively related with FDI. However, the relationship between market size and inward FDI might differ according to the type of FDI (e.g.domestic market seeking and export oriented FDI). Indeed, larger market size attracts more domestic market seeking FDI, where the foreign investors are interested in serving domestic or regional markets. As suggested by Cohen et al. (2007), in this case a larger market allows foreign investors to achieve economies of scale and decrease production costs. On the contrary, as suggested by Kyereboah-Coleman and Agyire-Tettey (2008), market size is expected to not affect export oriented FDI (i.e. those foreign investors that access market for export related purposes). Moreover, few studies identify a negative relationship between market size and location of FDI (see, e.g, Alcantara and Mitsuhashi, 2012; Seetanah and Rojid, 2011).

Most of previous empirical studies identify a positive relationship between trade openness in the host country and inward FDI(see, among others, Boateng et al., 2015; Cohen et al., 2007); however, other studies do not identify any significant relationship (see, e.g, Sharma et al., 2012). Furthermore, as stated by Jadhav (2012) and Asiedu (2002) the impact of trade openness can be different for domestic market seeking and export oriented FDI. Indeed, more open economies might attract export oriented inward FDI because of lower trade protection implies lower transaction costs for exports; while, less open markets might attract domestic market seeking inward FDI.

Focusing on the characteristics of local labour markets, many studies focus on the role of labour costs and labour availability in the host country as potential determinants of inward FDI. Empirical results reveals that economies characterized by lower labour costs

attract more inward FDI and that higher availability of labour at local level positively impact on FDI inflow (see, among the many others, Stephan et al., 2011; Bellak et al., 2008; Chidlow et al., 2009). However, other studies reveal that the higher education level, labour productivity and availability of skilled and healthy workers as well as technological and managerial capabilities should attract foreign investors (see, e.g, Laura and Resmini, 2010; Bellak et al., 2008; Cassidy and Andreosso-OCallaghan, 2006; Globerman and Shapiro, 2002). We therefore expect that availability of healthy workers (i.e. high life expectancy), higher education (i.e. share of graduates), higher labour productivity and higher unemployment rate (i.e.lower employment rate) affect inward FDI in Italy positively.

Along with the role of classical economic determinants described above, some analyses focus on impact of financial development at the local level in attracting inward FDI. The empirical literature suggest that efficient financial system (i.e. stock market development and/or bank credit availability) exerts a positive role in attracting foreign investors (see, e.g, Nkoa et al., 2018; Kinda, 2010; Deichmann et al., 2003).

In addition to these economic indicators, the empirical literature, focused on destination location characteristics as potential determinants of inward FDI, identifies institutional quality and agglomeration as sources of attractiveness for foreign investors.

In particular, the empirical literature shows that additional costs of doing business are expected to arise in economies characterized by low quality institutions. In general, these additional costs are related to high level of corruption and bureaucracy, political instability as well as to inefficient legal system. Consequently, low institutional quality decreases the attractiveness of a location to a foreign investor (see, among the many others, Daniele and Marani, 2011; Daude and Stein, 2007; Disdier and Mayer, 2004; Altomonte, 2000). Therefore, we expect to detect a negative and significant relationship between inward FDI in Italy and length of the processes, measured at the local level.

As a result of the trade-off between agglomeration and dispersion forces, the relationship between the number of firms operating in a specific location and the attractiveness of inward FDI in this location can be both positive and negative. On the one hand, knowledge and technological spillover as well as availability of high quality inputs are forces that can generate agglomeration effects and attract a higher numbers of foreign investors. On the other hand, the reduction of prices due to higher concentration of firms tend to discourage inward FDI. While a few studies identify a predominance of dispersion forces (see, e.g, Li and Park, 2006), most of the studies focused on the relationship between FDI location and firms spatial concentration show a positive role of both intra and inter-industry agglomeration economies on attracting foreign investors (see, among the many others, Castellani et al., 2016; Laura and Resmini, 2010; Basile et al., 2008; Barrios et al., 2006).

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Empirical models

Let us briefly outline the main characteristics of the econometric methods we apply. In particular, we resort to Probit models and we only consider national firms and firms that have changed nationality only once, from domestic to foreign ownership in the period of analysis.

In the Probit models, the firms probability to receive an FDI ($fdi_{i,t}$) depends upon the regressors $Xi,t\text{-}1$ through a linear combination of the latter, $Xi,t\text{-}1 \; \beta$. Thus, we estimate the following equation:

$$Prob(fdi_{i,t} = 1|X_{i,t-1}) = \Phi(X_{i,t-1}\beta) \tag{1}$$

where Φ (.) is the cumulative distribution function of a standard normal variable, with associated density $\phi(.)$. According to the three definitions of FDI, we alternatively label our depended variable ($fdi_{i,t}$) as follows: Fdi_10 (based on the first definition of foreign firms), FDI_10 (based on the second definition of foreign firms) and FDI_GUO(based on the last definition of foreign firms).

For each definition of FDI we estimate three specifications: in the first one we include only controls at firm level, in the second one we account only for local characteristics and in the last one we include both types of controls.

Results

Focusing on our empirical results, Tables 3, 4 and 5 show Probit estimated coefficients. Probit estimates for the two specifications, where we include either firms or local characteristics, are in line with estimates for the third specification where we account for both type of indicators. For this reason, we only comment our more extended specification (shown in the last column of each Table).

As shown in Tables 3, 4 and 5, we find that firms size and financial stability are positively related with their probability to receive FDI. Our results, as expected, are in line with previous empirical findings revealing that bigger firms facing higher solvency ratio have an advantage in terms of attracting foreign investors with respect to smaller and more financially constrained firms (see, e.g, Bhupatiraju, 2019; Ablov, 2015; Garavito et al., 2014; Karpaty and Poldahl, 2006).

In terms of performance, we find strongly significant effects of both productivity and profitability measures on firms FDI attractiveness. Our findings imply that higher productivity increases firms probability of receive FDI. This is in line with the relevant literature (see, e.g., Ablov, 2015; Hilber and Voicu, 2010; Djankov and Hoekman, 2000). On the contrary, we detect a negative relationship between firms profitability and inward FDI. Thus, as suggested by De and Nagaraj (2013) and Matarazzo et al. (2018), among others, our results on the role of firms performances might suggest that inward FDI in

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Table 3: Probit estimates, FDI first definition: Fdi_10

		(1) Fdi_10_i,t	(2) Fdi_10_i,t	(3) Fdi_10_i,t
Size	ln(TotRev_i,t-1)	0.166***		0.164***
Profitability	ROS_i,t-1	-0.00825***		-0.00777***
Productivity	ln(LP_i,t-1)	0.0691***		0.0615***
Solvency	SolvRatio_i,t-1	0.00168***		0.00168***
Age	ln(Age_i,t-1)	-0.132***		-0.131***
Market dimension	ln(GDP_per_i,t-1)		0.514***	0.473***
Market openness	ln(exp_per_i,t-1)		-0.0401***	-0.0398**
Market concentration	ln(numb_firms_i,t-1)		-0.00914	-0.0154
Financial development	loans_dep_i,t-1		-0.000177	-0.000216
Employment availability	rate_emp_i,t-1		-0.0105***	-0.00951**
Employment health	ln(life_exp_i,t-1)		5.408***	3.624**
Employment education	rate_grad_i,t-1		-404.2	1234.8
Employment productivity	ln(AV_emp_i,t-1)		-0.0254	-0.0806
Institutional development	ln(length_proc_i,t-1)		-0.0608***	-0.0900***
North		0.401***	0.313***	0.327***
Center		0.257***	0.157***	0.188***
Constant	const	-5.272***	-27.94***	-20.59***
N		2375968	6621508	2294755

Note. Estimated coefficients reported.
* p < 0.10, ** p < 0.05, *** p < 0.01.
Each specification includes a full set of 2-digit ATECO sector and year dummies.

Table 4: Probit estimates, FDI second definition: FDI_10

		(1) FDI_10_i,t	(2) FDI_10_i,t	(3) FDI_10_i,t
Size	ln(TotRev_i,t-1)	0.166***		0.164***
Profitability	ROS_i,t-1	-0.00809***		-0.00761***
Productivity	ln(LP_i,t-1)	0.0700***		0.0626***
Solvency	SolvRatio_i,t-1	0.00164***		0.00163***
Age	ln(Age_i,t-1)	-0.133***		-0.131***
Market dimension	ln(GDP_per_i,t-1)		0.509***	0.470***
Market openness	ln(exp_per_i,t-1)		-0.0385***	-0.0404**
Market concentration	ln(numb_firms_i,t-1)		-0.00813	-0.0155
Financial development	loans_dep_i,t-1		-0.000153	-0.000188
Employment availability	rate_emp_i,t-1		-0.0108***	-0.00993**
Employment health	ln(life_exp_i,t-1)		5.413***	3.833***
Employment education	rate_grad_i,t-1		-599.6	269.7
Employment productivity	ln(AV_emp_i,t-1)		-0.0361	-0.113
Institutional development	ln(length_proc_i,t-1)		-0.0614***	-0.0919***
North		0.399***	0.319***	0.337***
Center		0.253***	0.161***	0.194***
Constant	const	-5.261***	-27.90***	-21.34***
N		2375462	6620533	2294289

Note. Estimated coefficients reported.
* p < 0.10, ** p < 0.05, *** p < 0.01.
Each specification includes a full set of 2-digit ATECO sector and year dummies.

Table 5: Probit estimates, FDI third definition: FDI_GUO

		(1) FDI_GUO_i,t	(2) FDI_GUO_i,t	(3) FDI_GUO_i,t
Size	ln(TotRev_i,t-1)	0.149***		0.148***
Profitability	ROS_i,t-1	-0.00401***		-0.00367**
Productivity	ln(LP_i,t-1)	0.0483***		0.0438**
Solvency	SolvRatio_i,t-1	0.00142***		0.00146***
Age	ln(Age_i,t-1)	-0.109***		-0.108***
Market dimension	ln(GDP_per_i,t-1)		0.455***	0.257*
Market openness	ln(exp_per_i,t-1)		-0.0187	-0.0450*
Market concentration	ln(numb_firms_i,t-1)		-0.00369	0.00196
Financial development	loans_dep_i,t-1		-0.00000788	-0.000416
Employment availability	rate_emp_i,t-1		-0.0110***	-0.00505
Employment health	ln(life_exp_i,t-1)		4.405***	7.300***
Employment education	rate_grad_i,t-1		2328.9	2187.6
Employment productivity	ln(AV_emp_i,t-1)		-0.205	-0.168
Institutional development	ln(length_proc_i,t-1)		-0.0854**	-0.0853*
North		0.391***	0.384***	0.358***
Center		0.310***	0.280***	0.278***
Constant	const	-5.648***	-23.25***	-36.72***
N		2394393	6634595	2312978

Note. Estimated coefficients reported.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.
Each specification includes a full set of 2-digit ATECO sector and year dummies.

Italy, over the period of analysis, are mainly lemon-picking investments. Thus foreign investors seems to be mainly interested in cheap investments by putting money in low-performance firms with potential for success at a future time. Moreover, similarly to Bhupatiraju (2019) and Ablov (2015), our analysis shows that firms FDI attractiveness reduces with their age.

Focusing on the role of local factors explaining inward FDI, in line with previous studies (see, e.g, Cohen et al., 2007), we identify a positive relationship between the local market size in which firms operate and their FDI attractiveness. Differently from many existing related studies, our results suggest that foreign investors prefer to invest in firms operating in local areas characterized by a lower degree of openness to foreign markets. As suggested by Jadhav (2012) and Asiedu (2002), this result, as well as the role of local market size in enhancing inward FDI, might be due to the prevalence of domestic market seeking FDI in Italy, over the period considered in our analysis.

Regarding local workforce, our results reveal that the higher the employment rate is, in the location where the firms operates, the lower is their probability to attract FDI. Thus, accordingly with previous empirical studies, this results suggest how a higher availability of labour force is a significant determinant of inward FDI at the local level (see, for similar results Stephan et al., 2011; Bellak et al., 2008; Chidlow et al., 2009). Moreover, in line with Globerman and Shapiro (2002) which stress the importance of control for the quality of life and for the availability of healthy workers, we find that the

availability of healthy workers at the local level (proxied by provincial life expectancy) is positively related with firms probability to receive FDI. However, differently from other studies, we do not detect any significant relationship between the quality of the labour force, measured in terms of education and productivity, and inward FDI. Similarly, our results do not detect any significant role of the financial system development and firms concentration at the local level in explaining firms capacity to attract FDI.

As regards the quality of institutions, in line with the empirical literature (see, among the many others, Daniele and Marani, 2011; Daude and Stein, 2007; Disdier and Mayer, 2004; Altomonte, 2000), our estimates show that higher length of civil proceedings (i.e. lower institutional quality) decreases the firms FDI attractiveness.

All these results are confirmed by alternately using the three definitions of FDI. The only exception concerns the occupancy rate, which turns to be non-significant when we use the global ultimate owners in order to define firms receiving FDI. Thus, we can assert that using different definitions of FDI does not substantially affect firms and local factors that impact on inward FDI.

4.1   Differences between "financial" and "non-financial" FDI

We have so far focused on factors affecting inward FDI, without taking into consideration any distinction between different types of investments. In this section we replicate our analysis making a distinction between "financial" and "non-financial" FDI.

Based on the third definition of FDI, where the global ultimate owner is considered in order to identify firms receiving FDI, we classify firms receiving "financial" and "non-financial" FDI according to the type of global ultimate owner. In particular, we define FDI as "financial" if the global ultimate owner falls into one of the following categories: bank, financial or insurance company, mutual and pension fund (nominee, trust or trustee), venture capital and hedge fund. Conversely, we identify "non-financial" FDI if the type of gobal ultimate owner does not fall within those listed above (i.e. if the GUO is a corporate company, one or more known individuals or families, unnamed private shareholders, among others).

In Table 6 we report Probit estimated coefficients. The dependent variable (the binary variable FDI_FIN_i,t), in box A, is equal to 1 if firm i receives a "financial" FDI in year t (where t varies between 2006 and 2014) and 0 otherwise. In box B, the dependent variable (the binary variable FDI_NOFIN_i,t) is equal to 1 if firm i receives a "non-financial" FDI in year t and 0 otherwise. In each box we report three specifications in which we control only for firm level characteristics (column 1), only for local factors (column 2) and for both types of indicators (column 3).

Among firms level characteristics that affect "financial" and "non-financial" FDI, our results suggest that the only firms characteristics that differently impact of the two types

Table 6: Probit estimates, "financial" and "non-financial" FDI: FDI_FIN and FDI_NOFIN

| | | BOX A: "financial" FDI (FDI_FIN) | | |
		(1) FDI_FIN_i,t	(2) FDI_FIN_i,t	(3) FDI_FINO_i,t
Size	ln(TotRev_i,t-1)	0.157***		0.156***
Profitability	ROS_i,t-1	-0.00819**		-0.00767**
Productivity	ln(LP_i,t-1)	0.121***		0.110***
Solvency	SolvRatio_i,t-1	0.00187		0.00186
Age	ln(Age_i,t-1)	-0.0742*		-0.0718*
Market dimension	ln(GDP_per_i,t-1)		0.658**	0.553
Market openness	ln(exp_per_i,t-1)		0.0514	0.0495
Market concentration	ln(numb_firms_i,t-1)		0.0137	-0.0453
Financial development	loans_dep_i,t-1		0.00138***	0.000107
Employment availability	rate_emp_i,t-1		0.00567	-0.0146
Employment health	ln(life_exp_i,t-1)		-8.750**	0.672
Employment education	rate_grad_i,t-1		-4521.4	-5606.1
Employment productivity	ln(AV_emp_i,t-1)		-0.739	0.418
Institutional development	ln(length_proc_i,t-1)		-0.146*	-0.198*
North		0.157*	-0.237	-0.250
Center		0.147	-0.128	-0.111
Constant	const	-5.547***	34.77*	-10.01
N		1767594	6050869	1765282

| | | BOX B: "non-financial" FDI (FDI_NOFIN) | | |
		(1) FDI_NOFIN_i,t	(2) FDI_NOFIN_i,t	(3) FDI_NOFIN_i,t
Size	ln(TotRev_i,t-1)	0.143***		0.143***
Profitability	ROS_i,t-1	-0.00308**		-0.00278*
Productivity	ln(LP_i,t-1)	0.0347*		0.0315*
Solvency	SolvRatio_i,t-1	0.00126**		0.00130**
Age	ln(Age_i,t-1)	-0.111***		-0.110***
Market dimension	ln(GDP_per_i,t-1)		0.391***	0.204
Market openness	ln(exp_per_i,t-1)		-0.0291*	-0.0557**
Market concentration	ln(numb_firms_i,t-1)		-0.00282	0.00763
Financial development	loans_dep_i,t-1		-0.000317	-0.000464
Employment availability	rate_emp_i,t-1		-0.0130***	-0.00318
Employment health	ln(life_exp_i,t-1)		6.837***	8.083***
Employment education	rate_grad_i,t-1		3300.1	2647.6
Employment productivity	ln(AV_emp_i,t-1)		-0.0944	-0.242
Institutional development	ln(length_proc_i,t-1)		-0.0742*	-0.0693
North		0.416***	0.478***	0.425***
Center		0.321***	0.340***	0.315***
Constant	const	-5.534***	-34.15***	-39.90***
N		2392832	6630559	2311440

Note. Estimated coefficients reported.
* p < 0.10, ** p < 0.05, *** p < 0.01.
Each specification includes a full set of 2-digit ATECO sector and year dummies.

of FDI is the financial structure. Indeed, as we find in general for FDI in Section 4, firms size and productivity are positively related with both types of FDI, while profitability and age have a negative effect regardless of the type of investment (see columns 1 and 3

in Table 6, Boxes A and B). On the contrary, we find that higher firms financial stability is a factor of attractiveness of "non-financial" FDI, while it does not have any significant relationship with "financial" inward FDI.

Focusing on local factors affecting the two types of FDI, our estimates reveal that the institutional quality is the only local factor that is significantly related with "financial" FDI. In particular, we find that firm operating in regions characterized by higher quality institutions are more likely to receive "financial" FDI. Differently, market characteristics, measured as trade openness and availability of healthy workers, are significantly related only with "non-financial" FDI.

In concluding, despite we do not detect any difference in the relationship between firms and local factors affecting FDI, when we account for different definitions of FDI (see results reported in Section 4), the evidence, from the regression analysis shown in this Section, suggests that the impact of firm characteristics, as well as of local factors affecting FDI, differ according to the type of investment considered.

5 Conclusion

This work analyzes the impact of economic and financial performance of Italian limited liability firms on their attractiveness of FDI. Moreover, we account for the role of local factors, that characterize regions in which firms operate, in explaining inward FDI.

Our work contributes to the previous literature in several ways. We verify how using different inward FDI definitions at the firm level affect the identification of potential determinants of firms attractiveness of foreign investors; we enrich the existing empirical evidence on inward FDI providing evidence on differences in firms and local factors affecting FDI, according to the type of investment considered (i.e. "financial" and "non-financial" FDI).

We show that factors affecting firms probability to receive FDI as the definition of a foreign firm changes. Moreover, our analysis seems to suggest that inward FDI in Italy, over the period considered, are mainly "lemon-picking" and domestic market seeking FDI.

Interesting results emerge from the effects exerted by firms and local characteristics across different types of FDI. In particular, firms financial independence, as proxied by solvency ratio, exhibits a positive effect only on the firms probability to receive "non-financial" FDI, while it does not play any role in explaining firms attractiveness of "financial" FDI. Moreover, at local level, we find that characteristics related to local market performances affect the probability of receiving "non-financial" FDI, but do not impact on the attractiveness of "financial" FDI. On the contrary, institutional quality results to be the only local characteristic affecting inward "financial" FDI, while it is not significantly related with "non-financial" FDI.

Our empirical analysis faces a twofold limitation. Regarding the first limitation, although we include in our estimates year dummies which allow us to account for the economic cycle and common macroeconomic factors, we do not fully exploit the panel nature of our dataset. The second frailty of our work, common to the majority of the related applied works, is the impossibility to identify a clear causal relation between firms and local indicators and firms FDI attractiveness. This is, at least partly, mitigated by including lagged independent variables in each regression.

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