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# FINANCIAL STRUCTURE AND BANK RELATIONSHIPS OF ITALIAN MULTINATIONAL FIRMS

by Raffaello Bronzini\*, Alessio D'Ignazio<sup>o</sup> and Davide Revelli\*\*

## Abstract

This paper examines the financial structure and the bank relationships of Italian multinational firms. We show that multinationals are on average more leveraged than non-internationalized firms. Moreover, they have larger shares of both financial debt and bank debt out of total debt, maintain more bank relationships, are less dependent on the main bank for the firm, and benefit from lower interest rates. Lastly, multinationals take greater advantage of intra-group financing than non-internationalized firms. These results are robust to estimation methods that tackle the potential endogeneity of the choice to go international, such as matching and instrumental variable estimation.

**JEL Classification:** D22, F21, F23, G30, L25.

**Keywords:** multinational companies, foreign direct investment, financial structure, bank-firm relationships.

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## 1. Introduction<sup>1</sup>

According to the OECD, multinational enterprises (MNEs) and their affiliates produce about one third of global output and drive half of total world exports (OECD, 2018). Although internationalization is widespread worldwide, it does not involve evenly all the advanced countries. In Europe for example, the stock of outward foreign direct investments (FDI) ranges from 60% of GDP in the United Kingdom to about 45% in France, and 40% in Germany and Spain (Figure 1). Italy lags far behind, with about 25% of GDP, penalized by the preponderance of small companies, inherently less incline to internationalize than medium-large enterprises (Bugamelli and Lotti, 2018).

The worldwide increasing internationalization has stimulated wide-ranging firm-level studies that evaluate MNE's performance and examine their characteristics. Empirically, Mayer and Ottaviano (2007) and Altomonte et al. (2013), among others, show that MNEs are on average larger and more productive than domestic firms, and that the intensity of firm's internationalization is positively correlated to the innovation propensity of enterprises.<sup>2</sup> Their empirical findings give support to the theories on firm heterogeneity, which point out that only more productive firms engage in international markets, since investing abroad involves high sunk costs that only the most efficient companies can sustain (Melitz, 2003 and Helpman, 2006).

Until recently the empirical studies on multinationals are mainly confined to investigate firm features such as size, productivity, and propensity to innovate, rather than exploring the financial aspects associated with the choice to go international. These issues have been much less explored and to some extent are still open. For instance: are multinationals more or less leveraged than domestic firms? Are they more or less dependent on bank debts and on the main bank? Do they face lower financial costs? In this paper we try to give an answer to the questions above focusing on financial structure and bank relationships of Italian multinational firms.<sup>3</sup> The interest for these issues is twofold. Firstly, while some papers have explored MNEs' financial structure, mainly focusing on leverage, they have yielded opposite results. Several justifications are proposed, but mostly they refer to the misspecification of the empirical model (see, for instance, Lee and Kwok, 1988 and Park et al., 2013). Secondly, the characteristics of bank-

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<sup>2</sup> Recent surveys conducted by the Bank of Italy have also shown how, during the crisis, Italian multinationals have suffered less negative consequences in terms of turnover, employment and profits compared to other companies (Cristadoro and D'Aurizio, 2015).

<sup>3</sup> The empirical literature has more extensively studied to what extent access to credit can influence the internationalization of companies; see for example: Greenaway et al. (2007); Bellone et al. (2010); Minetti and Zhu (2010); Foley and Manova (2014); Manova et al. (2015).

MNE relationships turn out to be a prominent issue in order to grasp the potential effects on credit market of the increasing internationalization, however, such topic has been investigated by very few papers, which focused prominently on US firms (Li et al., 2011; Jang, 2017).

We contribute to the literature mainly in three respects. First and foremost, whereas the majority of the previous contributions has studied US firms, for the first time the focus is on Italian multinationals using very large micro-level datasets (from Cerved Group and the Bank of Italy) that collect information on the universe of limited companies that own foreign assets.<sup>4</sup> Focusing on the Italian case is relevant in order to verify whether the empirical evidence found for the US holds also for a structurally different country – one of the largest European economies, where firms are heavily dependent on bank debt.<sup>5</sup> If multinationals and domestic firms have different capital structure or banking relationships, stronger internationalization might impact on the shape of Italian corporate finance and banking market. Second, unlike almost all the previous contributions which are focused either on financial structure or banking relationships of MNEs, we study both, using a wider set of variables, some of them uninvestigated by the empirical literature, namely: firm leverage, financial debts, bank debts, number of financing banks, concentration of bank debt across banks, and interest rate.<sup>6</sup> This allows us to provide a wider and more complete picture of the multinational's corporate finance. Third, we provide some evidence on intra-group financial flows of MNEs, compared to those of domestic firms.

In this paper we define MNEs as the enterprises that engaged in foreign direct investment (Markusen, 1995 and 2002). Therefore, we consider multinational a firm that owns at least 10% of the shares (or other equity) of a foreign enterprise. Next, we compare MNEs with domestic firms, i.e. those that do not hold any assets in a foreign enterprise (firms whose foreign shares are below 10% are discarded). For robustness purposes we also adopt an alternative definition of MNEs, which is based on the ownership of more than 50% of the shares or voting power of the foreign enterprise.

Since firm internationalization, financial structure and bank relationships are determined jointly, in order to identify the effect of being multinational on various firm-level variables, we use OLS regressions together with empirical strategies robust to the endogeneity of internationalization decisions. In the first step, we compare MNEs with similar domestic firms by adopting propensity score matching methods.

<sup>4</sup> The universe of multinationals includes about 14,000 firms; more than 5,300 are in the sample used on the regressions. Some papers was based on panel data of several countries, but the samples of firms by countries were rather limited (see Kwok and Reeb, 2000 and Ramirez and Kwok, 2010). For a recent overview on the internationalization of Italian productive system, see Cristadoro and Federico (2015).

<sup>5</sup> Notice that the extension of the US outcomes to other economies should not be taken for granted, in that multinationals features are found to be heterogeneous across countries. Erel et al. (2020), for instance, show that US multinationals have more cash flows and less bank debts than domestic firms but these differences are not found over a sample of other advanced countries.

<sup>6</sup> In this respect our approach is more similar to that followed by Jang (2017) and to some extent Erel et al. (2020).



Furthermore, we employ an IV strategy using, as instrument, the outward foreign investment made by German firms, broken down by sector and year. In principle, this instrument should be correlated with the foreign investment made by Italian multinational firms, but uncorrelated with their financial characteristics and bank-firms relationships.

The results show that compared with domestic firms MNEs are more indebted, also with banks: they show higher leverage, a greater ratio of financial debt to total debt, and a greater share of bank loans on total indebtedness. In addition, we find that the bank debt of Italian MNEs is cheaper and less concentrated across banks: MNEs pay a lower interest rates than domestic firms, have relationships with a higher number of financing banks, and are less dependent on the main bank. Finally, MNEs engage in more financial transactions with foreign companies belonging to the same group. Notice that these results are, by and large, robust to the empirical strategy adopted and independent from the country in which the MNE invested.

The remainder of the paper is organized as follows. The second section discusses the literature review and theoretical predictions tested by the empirical model. Section three illustrates the dataset and provides a descriptive overview of the data. The fourth section describes the empirical setting, while the fifth and the sixth sections explore further topics and set out the main conclusions.

## **2. Literature review and theoretical hypotheses**

Our paper crosses three different streams of research. The first one focuses on financial structure of MNE, especially on debts and leverage of internationalized firms; a second one encompasses a few contributes that examine the relationship of MNEs with banks; a final one studies the intra-group capital markets.<sup>7</sup>

*Financial structure of MNEs.* Concerning the financial structure, in particular indebtedness, the economic theory suggests that MNEs should carry more debt than domestic companies because they are on average less risky. In particular, compared with non-internationalized companies, multinationals should have easier access to external financing because they are larger, have less volatile cash flow, display a more extensive diversification of their supply and sales markets, and enjoys greater proximity to foreign financial markets. However, the empirical evidence on the degree of indebtedness is mixed. Lee and Kwok (1988) and Burgman (1996), for instance, show that US MNEs are less indebted than non-internationalized enterprises. To explain this result it has been argued that MNEs of advanced countries

<sup>7</sup> Some research focused on related but different topics, such as the foreign affiliates of MNEs being better able to overcome financial constraints than local firms (see, for instance, Desai et al., 2008) and the advantages they have being able to borrow from their parent when local borrowing costs are higher (Desai et al., 2004).

are riskier because they tend to invest in emerging countries (Kwok and Reeb, 2000). In support of this argument, Ramirez and Kwok (2010) consider data on MNEs from 42 countries and show that leverage is negatively correlated with the riskiness of the geographical areas in which they invest; moreover, once they control for this variable, MNEs turn out to be more indebted than domestic firms.

On the other hand, some scholars have argued that multinational companies may take on less debt than domestic firms because they have more intangible assets (technological know-how, trademarks, patents, etc.) and better growth perspectives. Higher intangible assets make it more difficult to provide collaterals, whereas faster growth allows the company to raise internal resources: both these features should lead to a leverage compression. Accordingly, Park et al. (2013) show that US multinationals' level of debt is not different from that of domestic companies once we control for intangible assets and growth perspectives.

In the literature focusing on MNEs' financial structure, a stream of research has been debating over the more appropriate empirical specifications to be used. In particular, Mittoo and Zhang (2008) argue that the OLS model should include a broader set of controls than that usually employed, theoretically to describe the levels of debt. Among them: the ratio of tangibles to total assets, which signals the ability of the firm to provide collateral, and the variability of cash flow, which is related to the risk of the enterprises. Using a larger set of control variables on Canadian firm data, they found that MNEs have higher leverage than domestic firms, as predicted by the theory. In their empirical specification Chkir and Cosset (2001) also control for the z-score (rating), a measure of company default risk, among the determinants of debt: they argue that, for US firms, greater risk is associated with lower levels of leverage. Finally, Reeb et al. (2001) include the ratio of current assets to current liabilities and EBITDA over interest expense, arguing that a better liquidity profile and a lower ratio of interest expense to EBITDA are associated with higher levels of debt. The authors find that, for US, the degree of firm internationalization is associated with a lower cost of debt financing and a better credit rating (for further evidences on internationalization and debt financing see also: Chen et al., 1997; Mansi and Reeb, 2002). According to the above arguments, we can posit and test the following hypothesis:

***H1: Multinationals firms have higher leverage and higher financial debt than non-MNEs.***

*Relationships with banks.* As regard bank debts and more in general banking relationships of multinationals, the theoretical and empirical literature is bare. In principle, MNEs should be less dependent on bank financing than local firms thanks to the liquidity raised from their foreign subsidiaries, as pointed out by Jang (2017) for US multinationals. Moreover, greater access to financial markets and stronger bargaining power favored by larger company size should be accompanied by better credit conditions, greater capability to maintain bank relationships and less bank debts of the internationalized

firms. As far as we know, only a few papers have empirically explored banking relationships of multinationals, focusing mainly on US. Li et al. (2011), using matching techniques (propensity-score) and IV estimates, show that the cost of bank credit for a sample of US companies is negatively affected by the degree of firm internationalization. Jang (2017), taking advantage of a propensity-score matching model, shows that US multinationals are more likely to borrow from international banks and to issue bonds on international markets than domestic firms. Moreover, she argued that during the 2007-2009 crisis MNEs' domestic investments were less affected by financial supply shocks thanks to international capital flows. Erel et al. (2020), adopting a descriptive approach (correlation), demonstrate that on average US MNEs have larger cash flows, lower leverage, lower bank debts and lower costs of debt than domestic firms. However, these outcomes do not hold for a pool of advanced countries, supporting the view that there are relevant cross-country heterogeneities in these results. As a results of the reasoning above, we can posit and test the following hypothesis on bank-MNEs relationships:

**H2:** *Multinationals firms have lower bank debts, higher number of financing banks, lower share of credit from the main bank out of the total, and pay smaller interest rate than domestic firms.*

We contribute to these two streams of literature focusing on non-US multinationals, testing H1 and H2 using a wider range of variables and a very large sample of firms, including also very small limited companies.<sup>8</sup>

*Internal capital markets.* Finally, our paper is also related to the literature on intra-group capital flows. Some have argued that, in case of credit constraints, companies that can access the internal (intra-group) capital market are more likely to survive (Santioni et al., 2017; Santioni and Supino, 2018). Moreover, in case of shocks, their investment rates are better insulated (Stein, 1997; Schiantarelli and Sembenelli, 2000) since within the same group cash-poor firms can benefit from financial transfer coming from cash-rich enterprises of the same group. On the other hand, further scholars have suggested the possibility that offsetting agency costs (e.g. among owners and managers) may generate an inefficient allocation of funds inside the same group (Lang and Stulz, 1994; Scharfstein and Stein, 2000). Our paper contributes to this literature by examining the size of international intra-group capital flows of MNEs, an issue remained unexplored.

### 3. Data and descriptive evidence

In this paper we take advantage of different datasets sourced from Cerved Group, which provides information on the foreign holdings of all Italian corporations and their balance sheet data, and from the

<sup>8</sup> In our paper we look at 5,300 Italian companies, whereas e.g. in the work of Erel et al. (2020) are included only about 240 Italian multinationals in the sample.

Bank of Italy (Central Credit Register, Taxia and Direct Reporting), which provides information on firm-bank relationships, the cost of bank credit, and firm foreign financial flows, respectively.<sup>9</sup> Data are available for the period 2008-2012.

Regardless of the degree of participation, at the end of 2012 almost 14,000 Italian companies held over 28,000 shareholdings in foreign companies, for a value of about €155 billion in total (Table 1).<sup>10</sup> The distribution of FDI by country in terms of value appears extremely concentrated, owing in part to the favorable taxation regimes in some European countries: almost 30% of foreign holdings is directed at one country (Netherlands), likely for its advantageous tax system; over 60% is directed at 5 countries (Netherlands, Luxembourg, United States, France, Germany).<sup>11</sup> On the other hand, the distribution in terms of the number of holdings appears much less concentrated: the first country (United States) represents just over 8% of the total; the top 5 countries (United States, France, Romania, Spain, China) less than 36%.

In our analysis, following the definition of foreign direct investment of the International Monetary Fund (IMF 2009), we define as “MNEs” those firms owning a degree of participation of at least 10% of the shares (or voting power) of a foreign enterprise. Among them, we focus on limited companies, which are more homogeneous in terms of size and whose balance sheet information (reported in the subsection Centrale dei bilanci archive of Cerved data set) is complete. In order to keep a sample of firms with a balance sheet structure as comparable as possible, we include industry and service MNEs only, thereby ending up with about 3,900 companies.<sup>12</sup> For each firm, we gathered information on size, productivity, profitability, financial structure, number of lending banks, total amount of bank credit (both granted and drawn), characteristics of loans, short-term interest rates and, for the subset of companies involved in the Direct Reporting survey (carried out by the Bank of Italy and involving about 1,000 companies), we also used information on trade debts and credits with foreign counterparts. In the paper the non-multinationals, i.e. domestic firms, are industry and service limited companies included in the dataset

<sup>9</sup> The Central Credit Register contains information on all bank-firm loans for amounts above € 30,000 (until 31 December 2008 the limit was € 75,000); the survey on interest rates, called Taxia, shows the cost conditions applied by a very large sample of banks to individual loans exceeding € 75,000; Direct Reporting is a survey covering more than 6,700 companies, used to gather information needed to compile the Balance of Payments statistics.

<sup>10</sup> This value reflects the historical cost of the investments; according to the balance of payments sample statistics, the market value of FDI at the end of 2012 was about €350 billion.

<sup>11</sup> In Netherlands – considered by the OECD to be a tax heaven in that its taxation system does not respect international standards – the value of the first seven investments is more than €1 billion each, while the first three amount to about €25 billion in total. According to the OECD classification the second country (Luxembourg) also has a very favorable taxation system. The role of taxation regimes will be examined in more depth later in section 6.

<sup>12</sup> In particular, we refer to the so-called “Cebil – Centrale dei bilanci” archive sample of companies (i.e. the “Cebil” firms), a subsample of the Cerved archive. We exclude financial, leasing, factoring, holding and real estate companies because their balance sheet structures are not comparable with those of the others. In any case, on average, over the 2008-2012 period, holdings account for less than 6 percent of the total number of companies and represent less than 8 percent of total foreign investments; their balance sheet assets account for just over 1 percent of the total; the turnover and the number of employees represent less than 1 percent of the total.

Cebil – Centrale dei bilanci that do not hold a direct shareholding in a foreign firm. They amount to about 19,000 enterprises. Notice that firms that hold shares of a foreign enterprise below 10% are excluded by the analysis.

The distribution of the investments by sector of activity of the MNEs shows the prevalence of manufacturing, in which almost 70% of the MNEs operate (Table 1); 16.5% of MNEs operate in the production of machinery, 12.2% in metallurgy and 10.8% in trade. The incidence of MNEs out of the total number of companies is largest in manufacturing, in particular in machinery, electronics, textiles-clothing, chemicals and pharmaceuticals and plastics (Figure 2).<sup>13</sup> The distribution of firms by economic activity is less concentrated in the case of non-MNEs, with the share of manufacturing amounting to 43%.

The main descriptive statistics for a wide set of balance sheet and bank-firm indicators of our sample are reported in Table A2. To some extent the Table confirms some well-known stylized facts about internationalized firms. With respect to non-internationalized enterprises, on average multinationals turn out to be larger (in terms of assets and employees), more productive (measured by added value per employee) and profitable (according to ROA and financial income over total assets). Next, multinationals have more financial and bank debts<sup>14</sup>, even though they show little less leverage.<sup>15</sup> Moreover, they are older but similar in terms of riskiness (rating). Looking at further aspects concerning bank relationships, internationalized firms have relationships with more banks, pay smaller interest rates, and for them the credit granted by their main bank is less important (as a share over total debt). Finally, the share of short term bank debt of multinationals is also smaller than that of domestic firms. Of course, the evidence shown are simple correlations. In the next section, we study in more depth the relationship between internationalization and firm capital structure using more robust causal models and focusing on the subset of financial variables only.

#### 4. Empirical setting

As a first step we estimate by OLS a simple econometric model pooling the observations available for the period 2008-2012. Later on, we will adopt empirical strategies more robust to endogeneity, such as matching methods and IV estimates.

Our first model is the following one estimated by ordinary least squares (OLS) on the sample of MNEs and non-MNEs described above:

<sup>13</sup> The indicator used to measure the relative importance of the MNE is built as follows:  $((\text{number of MNEs in the sector } i / \text{total number of MNEs}) - (\text{number of Cebil firms in the sector } i / \text{total number of Cebil firms})) * 100$ .

<sup>14</sup> Financial debts include bank loans, bonds and other debt instruments; commercial or fiscal debts are excluded.

<sup>15</sup> The leverage is given by the ratio of financial debt to the sum of financial debt and equity.

$$(1) \quad Y_{it} = \alpha + \beta INT_i + \sum_s \gamma_s SEC_s + \sum_a \gamma_a AREA_a + \sum_t \gamma_t YEAR_t + X'_{(i,2008)} \gamma_x + \varepsilon_{it}$$

where  $Y_{it}$  represents the financial firm-level variables of interest. In particular we focus on: leverage, the share of financial debt over total debt, the share of bank debt over total debt, the interest rate (paid by the firm for bank loans), the number of banks that finance the firm, and finally the share of credit granted to the firm by the main bank (for each firm the main bank is the one providing the largest amount of granted credit).  $INT_i$  is a dummy variable equal to 1 if a company holds at least 10% (or in the robustness exercise the 50%) of the shares or voting power in a foreign enterprise and 0 otherwise. Therefore, our coefficient of interest is  $\beta$ , which measures the conditional mean-differences of  $Y$  between MNEs and the domestic firms.

We include a large set of control variables.  $YEAR_t$ ,  $SEC_i$  and  $AREA_i$  are dummies controlling for the year, the sector of economic activity and the location of the company, respectively.<sup>16</sup> The vector  $X'$  include a set of control variables that according to the previous literature can affect the debt and the financial structure of the firms (see among others: Chkir and Cosset, 2001; Reeb et al., 2001; Mansi and Reeb, 2002; Mittoo and Zhang, 2008). More specifically the control variables are the *Size* (measured by the average number of employees), the *Share of tangible assets out of total assets* (to measure the capability of firms to provide collaterals), *Profitability* (ROA), the *Standard deviation of the ratio of self-financing to turnover* (to measure the volatility of turn over), the *Z-score* (that proxies the risk of the firm and it is provided by Cerved), the *Ratio of financial costs to gross operating margin* (a measure of the debt burden), the *Assets/Liabilities ratio* (short-term assets to short-term liabilities, as a measure of the firm liquidity profile). Finally, in order to take into account the different composition of firm assets, which in the case of MNEs is usually characterized by a higher incidence of equity investments, we have added the ratio of *Financial assets to total assets* ( $COMP_i$ ). We estimate a pooled model over the period 2008-2012, clustering standard errors at the firm level. Moreover, to limit the influence of outliers, observations exceeding the 1st and 99th percentiles of each variable for each year are excluded. Finally, in order to reduce the endogeneity issues due to contemporary shocks or reverse causality, the set of controls are lagged and time invariant, i.e.

<sup>16</sup> In order to control the effects connected to the different economic activity carried out by companies, we used the ATECO 2007 classification published by Istat, which provides the following branches: agriculture, forestry and fishing, mining, food and beverages, textiles and clothing, wood and furniture, paper and printing, chemicals and pharmaceuticals, rubber and plastics, metallurgy, electronic products, machinery, means of transport, other manufacturing, electricity, gas, construction, trade, transport and storage, accommodation and catering, information and communication, real estate, professional activities, rental and travel activities, other services. To control for the effects related to the geographical location of the companies we have used the following macro areas: North West (Piedmont, Valle d'Aosta, Lombardy, Liguria), North East (Emilia-Romagna, Veneto, Trentino Alto-Adige, Friuli Venezia Giulia), Centre (Tuscany, Umbria, Marche, Lazio), South (Molise, Abruzzo, Campania, Puglia, Basilicata, Calabria, Sicily, Sardinia).

they refer to the first year available in the data set (2008). Because of this, the number of observations drops of about 14% for balance sheet indicators and 20% for bank-firm indicators.

*Results.* In the first panel of Table 2 we report the estimated values of parameter  $\beta$  for several models, each of them using a different dependent variable (leverage, financial debts/total debts, bank debts/total debts, interest rate, number of banks, and share of loans from the main bank). For each dependent variable, we present the results for the coefficient of INT in the first row, whereas in the second and third row those for the variable INT interacted either with the dummy variable *Service* (equal to one for the firms of the service sector) or the dummy variable *Small* (equal to one if the firm sales are smaller than the median value of sample). The aim of the models with interactions is to verify heterogeneous results for multinationals firms of the service sector with respect to industry (Lejpras, 2009) or smaller (with respect to the larger ones).

Focusing on the baseline results of the model without interactions (presented in the first columns for each variable), we show that MNEs are on average more indebted than non-multinational firms: they have higher leverage (about 3% higher than that of domestic firms), together with higher shares of financial debts out of total debt (around 11%) and bank debts over total debts (about 15%). These results are in line with the more recent literature based on empirical models that encompass a wide set of control variables such as Mittoo and Zhang (2008) and Ramirez and Kwok (2010), contrary to studies based on narrower models that found a negative relationship between multinationality and leverage for US internationalized enterprises (Lee and Kwok, 1988; Burgman, 1996; Erel et al., 2020).

As regards bank-firm relations, the results turn out to be consistent with theoretical predictions but for the share of bank debt out of total debt. The OLS estimates show that MNEs have credit relations with a greater number of banks (a little more than 1 bank, out of an average of 7.2 banks; about 15% higher); they benefit from more advantageous interest rates on short-term loans (0.3 percentage points lower); and finally receive a lower share of loans from the main bank (about 8% less). In other words, bank debts of internationalized firms are less concentrated across banks and cheaper than that of domestic firms (a result in line with Li, 2017). However, contrary to the theoretical expectations and part of the previous literature on US (Jang, 2017 and Erel et al., 2020), we find that Italian MNEs have more bank debts. In summary, MNEs Italian firms turn out to be not only overall more indebted than domestic firms in terms of leverage or financial debts, but also more indebted with banks.

In the second and third column of each variable we report the estimates of the models with interactions. As regards the sector of activity, for none variable we find statistically significant coefficients, i.e. we do not find any differences between industrial and service MNEs. As regards firm size we find that with respect to larger MNEs, smaller MNEs have less financial and bank debts, pay higher interest

rates, and finally have bank debts more concentrated across banks. Even though these results tend to confirm several theoretical a-priories, only the sign of the coefficients are confirmed by models that adopt more robust identification strategies but not the statistical significance (they are presented in the panels below the Table). Therefore they have to be taken with caution.

#### *4.1 Propensity score matching and instrumental variables models*

In the OLS model, although we use a wide set of lagged controls, the estimate of  $\beta$  could be biased due to the omission of relevant explanatory variables and reverse causality. In order to tackle such potential sources of endogeneity, we rely on matching methods and instrumental variables estimates.

The exercise based on propensity score matching allows us to tackle endogeneity by comparing MNEs with the most similar non-MNEs in terms of a number of characteristics, and regardless of the model's functional form. Greater homogeneity between the control group companies and the MNEs should reduce, if not eliminate, the sources of bias affecting our baseline estimates. In the exercise, we compare internationalized companies with a smaller control group than that previously used in the OLS model, represented by non-internationalized companies similar to multinationals in terms of size, sector, geographical area and share of financial assets over total assets. More specifically, the matching procedure is carried out in two steps. In the first one, in order to identify the control group of non-internationalized firms, we rely on a standard propensity score matching methodology using nearest neighbor matching and imposing common support (Rosenbaum and Rubin, 1983 and 1985). Non-MNEs are matched with MNEs of the same geographical area of settlement and the same economic activity of MNEs (in terms of the 2-digit ATECO code); we included in the propensity score function the number of employees and the share of financial assets over total assets (averages over the period 2008-2012). Nonetheless, the matching differences between the two samples are still significant in terms of firm size, therefore as a second step we exclude the largest MNEs (those with a number of employees above the 70th percentile) and the smallest non-internationalized firms (those with a number of employees below the 30th percentile). Thus, we end up with 2,662 MNEs and 1,412 matched non-internationalized companies of the control group.

The comparison between the two groups at the beginning of the period (in 2008) is shown in Table A3. After the matching there is a strong similarity between the two samples for all the available indicators and the mean differences are never statistically significant. The similarity is very high in terms of leverage, productivity (added value per employee), profitability (ROA and EBITDA/assets), size (in particular in terms of number of employees). Thus, we will estimate the equation (1) on the MNEs and the control group of non-MNE firms chosen by using the matching methodology.



The matching method is more robust than simple OLS regressions without matching, in that it selects firms that are more comparable and the results do not depend on the functional form. However, it is still a methodology that heavily depends on the selection on observables, similarly to the regressions with controls. For these reasons, we also estimate an instrumental variables (IV) model to further tackle the endogeneity of internationalization. We decided to instrument the dummy internationalization (INT) with the total foreign direct investments of German firms by sector and year, carried out in all countries except Italy (data are drawn from Eurostat). These investments are supposedly correlated with the internationalization of Italian companies, by sector and year, because the determinants of internationalization for Italy and Germany are, in principle, similar. At the same time, they should not be directly correlated with the dependent variables examined, conditional upon the various controls at the enterprise level. In other words, the hypothesis underlying the exclusion restriction is that there is no a direct link between the economic and financial indicators examined for Italian companies and the foreign direct investments of German firms, once the individual firm characteristics included in the equation are controlled for.<sup>17</sup>

Since the endogenous variable is binary, in order to devise the instrument we followed the so-called “procedure 18.1” suggested by Wooldridge (2002), which produces consistent estimators while increasing the efficiency of the estimates. In particular, Wooldridge suggests introducing a sort of “stage 0” by estimating a probit model in which the endogenous binary variable INT is explained by the exogenous variable (Germany’s FDI) and the other variables included in the equation (1). Subsequently, using the vector of estimated coefficients we determined the predicted probability of internationalization ( $\widehat{INT}$ ), which is used as an instrumental variable in a two-stage standard least squares model. More precisely, in “stage 0” the following model is estimated:

$$(2) \quad \Pr(INT_{it}) = \alpha + \beta GER\_FDI_{ts} + \Gamma X_{it} + \varepsilon_{it}$$

where  $GER\_FDI_{ts}$  are the FDI of Germany related to sector  $s$  in year  $t$  and  $X_{it}$  are the firm-level controls used in the equation (1).

The predicted probability of being internationalized, calculated using the estimated coefficients of model (2), is therefore used as an independent variable in the first-stage regression, while the effect of

<sup>17</sup> Foreign direct investment made by firms of other countries has been used as an instrumental variable of internationalization, among others, by Haskel et al. (2007) to study the effects of direct investment on business productivity.

internationalization on the balance sheet and bank variables is estimated in the second stage using the estimated values of INT from the first stage.

*Results.* For the matching and IV models the results are reported in the respective panels of Table 2 in more detail. Matching results fully confirm the OLS findings. The estimates of  $\beta$  have the same sign of the OLS estimates and are always statistically significant except for interest rate (with IV the estimates turn out to be significant though). Overall, the coefficients have smaller magnitudes, i.e. the differences between MNEs and non-MNEs are less pronounced, but still relevant in economic and statistical terms. On the other hands, in the model with interactions with sector and size dummy, the coefficients of interaction terms preserve the signs but are never statistical significant. As a results, we can conclude that there are no different behavior between manufacturing and service MNEs or among larger and smaller MNEs.

As regards the IV estimates, we first notice that the instrument is rather powerful: the F-test of the first stage is quite large, 60 or higher depending on the model. Overall, almost all the OLS results are confirmed. The size of the coefficients are larger than those obtained by OLS estimates and always significant at the usual confidence levels except for leverage. In any case, MNEs turn out to be again more indebted than non-MNEs in terms of financial and bank debts. The other evidences are all confirmed for the baseline models, moreover the results of the interaction terms are never significant.

*Robustness.* A first robustness exercise exploits an alternative definition of MNEs. In particular, we refer to the concept of control and consider as MNEs only those firms that own more than 50% of the shares or voting power in the foreign enterprise (those owning lower shares are excluded from the sample). OLS, post-matching and IV estimates carried out using such alternative definition of MNEs are reported in Table 3. Baseline results are all confirmed in terms of statistical significance, and to a large extent in terms of the size of coefficients too.

Another check of robustness addresses the issue of Italian subsidiaries of foreign firms. Since some Italian firms included in the control group may be subsidiaries of foreign country MNEs, we estimated two additional sets of regressions. In the first one, we excluded from our sample all firms whose shares are detained by foreign firms, regardless of the share maintained. In the second one, we excluded only firms for which foreign MNEs own the majority of shares. Results on both balance-sheet indicators and bank-firm indicators are largely confirmed. The results are reported in Table 4.

## 5. Additional evidence

In this section we examine some further issues. First, we verify whether the results are heterogeneous across destination country of the foreign direct investment. Second, we investigate in more depth the financial relationships between the firms and their foreign counterparts other than shareholdings.

*Country heterogeneity.* First, we investigate whether our results are heterogeneous according to the characteristics of the destination countries of the international investment. For example, some MNEs may have invested relatively more in emerging countries to take advantage of smaller input costs, or in the more advanced countries to be near the potentially relevant markets. We estimated equation (1) for three different sub-samples of companies: those investing in emerging countries only (according to the classification of the International Monetary Fund); those investing in advanced countries only; and finally those investing in both types of countries. In all cases, the comparison group is represented by companies that do not hold investments abroad. The results obtained so far hold for all three categories of countries (Table 5). As shown in the third row of the table, in the case of firms investing in both types of countries, the previous results appear also to be strengthened.

Furthermore, in order to investigate the role of corporate income taxation in different countries, we grouped the destination countries of FDI into three categories based on the OECD classification: tax havens, i.e. countries that do not adopt shared international standards in their taxation systems (34 countries; among them: the Cayman Islands, the Netherlands, the Antilles, Monaco); countries that are not tax havens but that have potentially distortive taxation systems (8 countries; among them: Luxembourg, Belgium, Switzerland); the other countries. We therefore estimated the above models by excluding, firstly, the tax havens from the possible destinations of FDI; we then excluded the countries with potentially distortive characteristics; finally, we excluded both. The results obtained for balance sheet characteristics and bank-firm relationships are the same as with the previous benchmark models (results are not reported, but are available on request). In conclusion, the different destination countries and/or their different taxation regimes do not seem to influence substantially the MNEs characteristics that we analyzed.

*Intra-group finance.* Finally, for a subsample of MNEs we take advantage of additional information available on trade credits and trade debts with foreign firms. The aim is to verify whether the MNEs take advantage of the financial relationships with their foreign subsidiaries to manage their financial needs. Data are provided by the Direct Reporting (DR) survey carried out by the Bank of Italy. Given that the DR takes the form of a survey, this information was available for about 6% of the baseline sample and, therefore, the results should be approached with caution. For trade credits or debts between MNEs and foreign firms we are able to determine whether the relationships involve foreign companies that belong

to the same group as the MNE or not. We then merge this information with the datasets used so far and run the same regressions using, as the dependent variable, trade credits or debts.

The results of the estimates of the equation (1) in Table 6 show that, with respect to domestic firms, MNEs make greater use of trade credits and debts with foreign counterparts belonging to the same group than do non-MNEs, and have less trade debts with foreign companies that do not belong to the same group. Arguably, these results suggest that MNEs manage to obtain more favorable financial conditions from their within-group partners than from other firms. The aforementioned results are compatible with the hypothesis that MNEs take advantage of the centralized management of liquidity, playing a role both active (fund manager) and passive (borrower of funds) with foreign firms of the same group, with the aim of optimizing the group treasury.

## 6. Conclusions

This paper examines for the first time the features of the financial structure and the banking relationships of Italian multinational companies. The analysis shows that the MNEs, compared to companies that do not hold investments abroad, show between 3% and 5% higher degree of leverage. Next, they have from 11% to 25% higher share of financial debts out of total debts, and from 12% to 18% larger share of bank debts out of total debts. The ranges reflect the outcomes of different estimation methods. Multinational companies also make use of a larger number of domestic banks (between one and three more banks, out of an average of seven), receive a lower share of loans from the main bank (from 5% to 8%), and benefit from more advantageous cost conditions (between 0.1 and 1 percentage point). Finally, in line with expectations, the MNEs have more trade credits and debts with foreign firms belonging to the same group. These findings are confirmed both through the use of matching methods and instrumental variables, which make it possible to tackle the possible endogeneity of internationalization. Moreover, they do not change according to the type of country where the Italian MNEs had invested.

A couple of interesting outcomes from our analysis are worth stressing. First, according to the theoretical predictions, *ceteris paribus* Italian multinationals are able to sustain higher leverage, arguably because the diversification of their activities and markets reduces their level of risk. This results is in line with only a stream of more recent literature on leverage of multinationals (Ramirez and Kwok, 2010), and confirm the empirical findings that the degree of indebtedness of MNEs, with respect to domestic firms, is heterogeneous across countries (Erel et al., 2020).

Second, Italian MNEs have relationships with banks that are rather different from those of domestic firms: MNEs are clients of more banks, their bank credit is less concentrated in the main bank, and they

pay lower interest rates. Again these results are to some extent similar to previous findings on US enterprises (Li et al., 2011) and in line with theoretical hypotheses, except for bank debts that we find higher for MNEs than for domestic ones, whereas for US multinational firms Erel et al. (2020) found the opposite. Lastly, Italian multinationals have stronger financial relationships with foreign firms of the same group.

## References

- Altomonte C., Aquilante T., Békés G. and Ottaviano G. (2013), “Internationalization and innovation of firms: evidence and policy”. *Economic Policy*, 28(76), p. 663-700.
- Bellone F., Musso P., Nesta L. and Schiavo S. (2010), “Financial constraints and firm export behavior”. *The World Economy* 33(3), p. 347-373.
- Bugamelli M. and Lotti F. (2018), “Productivity growth in Italy: a tale of a slow-motion change”, Bank of Italy, *Occasional Papers*, No. 422.
- Burgman T. A. (1996), “An empirical examination of multinational corporate capital structure”. *Journal of International Business Studies*, 27(3), p. 553-570.
- Chen C. J. P., Cheng C. S. A., He J. and Kim J. (1997), “An investigation of the relationship between international activities and capital structure”. *Journal of International Business Studies*, Vol. 28, p. 563-577.
- Chkir I. E. and Cosset J. (2001), “Diversification strategy and capital structure of multinational corporations”. *Journal of Multinational Financial Management*, Vol. 11, p. 17-37.
- Cristadoro R. and D’Aurizio L. (2015), “Le caratteristiche principali dell’internazionalizzazione delle imprese italiane”. Bank of Italy, *Occasional Papers*, No. 261.
- Cristadoro R. and Federico S. (2015), “L’internazionalizzazione del sistema produttivo italiano”. Bank of Italy, *Occasional Papers*, No. 260.
- Desai, M. A., Foley C. F. and Forbes, K. J. (2008), “Financial Constraints and Growth: Multinational and Local Firm Responses to Currency Depreciations”, *The Review of Financial Studies* 21 (6), 2857-2888.
- Desai, M. A., Foley C. F. and Hines J. R. (2004), “A Multinational Perspective on Capital Structure Choice and Internal Capital Markets”. *The Journal of Finance* 59 (6), 2451-2487.
- Erel I., Jang Y., Weisbach M. (2020), “The Corporate Finance of Multinationals”, NBER, *Working Papers* No. 26762.
- Foley C.F. and Manova K. (2014), “International Trade, Multinational Activity, and Corporate Finance”. NBER, *Working Paper* No. 20634.
- Greenaway D., Guariglia A. and Kneller R. (2007), “Financial factors and exporting decisions”. *Journal of International Economics*, 73(2), p. 377-395.
- Haskel J., Pereira S., Slaughter M. (2007), “Does inward foreign direct investment boost the productivity of domestic firms?”. *Review of Economics and Statistics* 89(3), 482-496.
- Helpman E. (2006), “Trade, FDI and the Organization of Firms”. *Journal of Economic Literature*, XLIV(3), p. 589-630.

- International Monetary Fund (2009), *Balance of Payments and International Investment Position Manual, Sixth Edition (BPM6)*.
- Jang, Y. (2017), “International Corporate Diversification and Financial Flexibility”. *The Review of Financial Studies* 30(12), 4133–4178.
- Kwok C. Y. and Reeb D. M. (2000), “Internationalization and firm risk: An upstream-downstream hypothesis”. *Journal of International Business Studies*, Vol. 31(4), p. 611-628.
- Lang L., Stulz R. (1994), “Tobin’s Q, corporate diversification and firm performance”. *Journal of Political Economy*, vol. 102, issue 6, 1248-80.
- Lee K. C. and Kwok C. Y. (1988), “Multinational Corporations vs. Domestic Corporations: International Environmental Factors and Determinants of Capital Structure”. *Journal of International Business Studies*, Vol. 19(2), p. 195-217.
- Lejpras A. (2009), “Determinants of internationalization: differences between service and manufacturing SMEs”. Deutsches Institut für Wirtschaftsforschung, Paper No. 886.
- Li S., Qiu J. and Wan C. (2011), “Corporate globalization and bank lending”. *Journal of International Business Studies*, Vol. 42(8), 1016-1042.
- Manova K., Wei S.J. and Zhang Z. (2015), “Firm Exports and Multinational Activity under Credit Constraints”. *Review of Economics and Statistics*, 97, p. 574-588.
- Mansi S. A. and Reeb D. M. (2002), “Corporate international activity and debt financing”. *Journal of International Business Studies*, Vol. 33, p. 129-147.
- Markusen J. (1995), “The Boundaries of Multinational Enterprises and the Theory of International Trade”. *Journal of Economic Perspectives*, 9, 169-189.
- Markusen J. (2002), “*Multinational Firms and the Theory of International Trade*”. MIT Press.
- Mayer T. and Ottaviano G. (2007), “The happy few: the internationalisation of European firms. New facts based on firm-level evidence”. Bruegel Blueprint Series, Volume III.
- Melitz M. (2003), “The Impact of Trade on Intra-Industry Reallocations and Aggregate Industry Productivity”. *Econometrica*, 71(6), p. 695-725.
- Minetti R. and Zhu S.C. (2011), “Credit Constraints and Firm Export: Microeconomic Evidence from Italy”. *Journal of International Economics*, 83(2), p. 109-125.
- Mittoo U. R. and Zhang Z. (2008), “The capital structure of multinational corporations”. *Journal of Corporate Finance*, Vol. 16, p. 706-720.
- OECD (2018), “*Multinational Enterprises in the Global Economy. Heavily Debated but Hardly Measured*”. Paris.
- Park S.H., Jungwon S., Yeung B. (2013), “Do multinational and domestic corporations differ in their leverage policies?”. *Journal of Corporate Finance*, 20, p. 115-139.

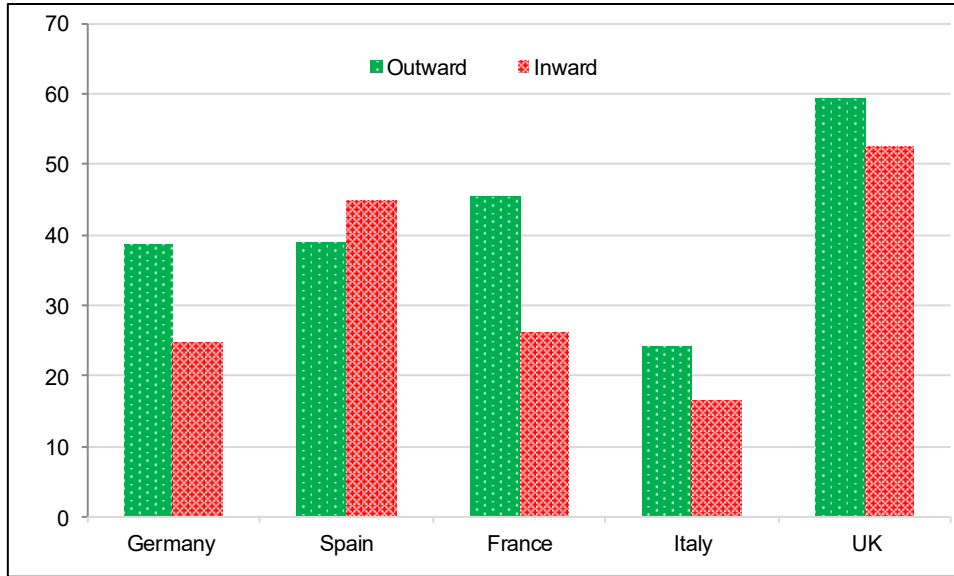
- Ramirez A. and Kwok C. Y., (2010), "Settling the debate on multinational capital structure using CEPR measure". *Journal of Multinational Financial Management*, Vol. 20, p. 251-271.
- Reeb D.M., Mansi S.A. and Allee J.M. (2001), "Firm internationalization and the cost of debt financing: evidence from non-provisional publicly traded debt". *Journal of Financial and Quantitative Analysis*, vol. 36, n. 3, p. 395-414.
- Rosenbaum P. and Rubin D. (1983), "The Central Role of Propensity Score in Observational Studies for Causal Effect". *Biometrika*, 70, 41-55.
- Rosenbaum P. and Rubin D. (1985), "Constructing a Control Group Using Multivariate Matched Sampling Methods that Incorporate the Propensity Score". *American Statistician*, 39, 33-38.
- Santioni R., Schiantarelli F., Strahan P. E. (2017), "Internal capital markets in times of crisis: the benefit of group affiliation in Italy". NBER, *Working Papers*, No. 23541.
- Santioni R. and Supino I. (2018), "Internal capital markets in Italian business groups: evidence from the financial crisis". Bank of Italy, *Occasional Papers*, No. 421.
- Scharfstein D. S., Stein J. C. (2000), "The dark side of internal capital markets: divisional rent-seeking and inefficient investment". *The Journal of Finance*, 55: 2537-2564.
- Schiantarelli F., Sembenelli A., (2000), "Form of ownership and financial constraints: panel data evidence from flow of funds and investment equations". *Empirica*, 25: 175-192
- Stein J. C. (1997), "Internal capital markets and the competition for corporate resources". *The Journal of Finance*, 52: 111-133.
- Wooldridge J. M. (2002), *Analysis of cross section and panel data*. Cambridge, Mass: MIT Press



## FIGURES AND TABLES

**Fig. 1**

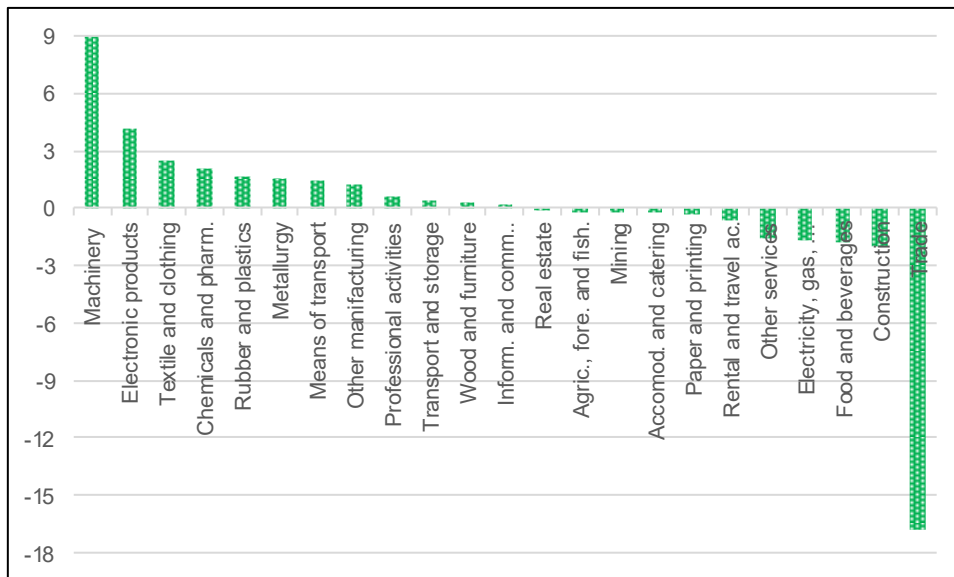
**Foreign Direct investments by country – Outward and Inward**  
*(stocks in percentage of GDP; year 2013)*



Source: Eurostat.

**Fig. 2**

**Distribution of Italian MNEs by economic activity: specialization index – year 2012**  
*Values above (below) 0 mean a higher (lower) degree of internationalization of sector*



Source: Cerved Group. Data are referred to Italy. The specialization index is calculated as:  $((\text{number of MNEs in the sector } i / \text{total number of MNEs}) - (\text{number of Cebil firms in the sector } i / \text{total number of Cebil firms})) * 100$ .

**Table 1. Distribution of shareholdings and firms – year 2012**

Panel a): value and number of shareholdings in foreign firms – first 15 countries (1)					
Value of shareholdings			Number of shareholdings		
Country	Millions of euro	Percentage	Country	Units	Percentage
Netherlands	46,138	29.7	USA	2,372	8.4
Luxembourg	15,581	10.0	France	2,199	7.8
USA	12,307	7.9	Romania	2,132	7.6
France	10,213	6.6	Spain	1,715	6.1
Germany	9,822	6.3	Cina	1,658	5.9
Belgium	8,749	5.6	Germany	1,507	5.4
United Kingdom	8,296	5.3	United Kingdom	1,240	4.4
Spain	6,349	4.1	Brazil	1,046	3.7
Brazil	3,492	2.3	Luxembourg	826	2.9
China	3,383	2.2	Poland	782	2.8
Switzerland	3,199	2.1	Switzerland	782	2.8
Ireland	2,897	1.9	India	645	2.3
Poland	2,456	1.6	Netherlands	548	2.0
Austria	2,109	1.4	Tunisia	515	1.8
Turkey	1,730	1.1	Czech Republic	483	1.7
...			...		
Total	155,148	100.0	Total	28,097	100.0

Panel b): firms distribution by economic activity (2)			
Economic activity	Not internationalized	All MNEs	MNEs with share >10%
Manufacturing	42.8	68.2	69.5
Construction	7.2	5.0	4.8
Services	45.0	24.1	23.1
Other activities	5.0	2.7	2.6
Total	100.0	100.0	100.0
Number of firms	18,820	5,309	3,944

Source: Cerved Group. – (1) Data are referred to all the Italian firms (about 14.000) that hold a participation in a foreign company. – (2) Data are referred only to the subsample of firms for which complete balance sheet information is available (reported in the subsection of the Cerved dataset known as “Centrale dei bilanci”) used in the regressions.

**Table 2. Baseline regression results with full set of controls – MNE with participation in foreign firms  $\geq 10\%$  – years 2008-12 (1) (2)**

	<i>Leverage</i>			<i>Fin debt/tot debt</i>			<i>Ban debt/tot debt</i>			<i>Interest rate</i>			<i>No. of banks</i>			<i>Share main bank</i>		
<b>panel a: OLS</b>																		
int	1.419***	1.798***	1.699***	4.552***	4.575***	5.285***	5.123***	5.135***	6.234***	-0.312***	-0.291***	-0.272***	1.132***	1.198***	1.166***	-3.203***	-3.228***	-3.464***
	(0.396)	(0.438)	(0.490)	(0.370)	(0.410)	(0.456)	(0.379)	(0.422)	(0.468)	(0.0289)	(0.0328)	(0.0350)	(0.0694)	(0.0801)	(0.0890)	(0.251)	(0.286)	(0.312)
int*service		-1.673*			-0.102			-0.0507			-0.0678			-0.178			0.105	
		(0.907)			(0.865)			(0.867)			(0.0642)			(0.153)			(0.583)	
int*small			-0.289			-1.743**			-2.415***			0.123**			-0.626***			1.401***
			(0.768)			(0.724)			(0.734)			(0.0562)			(0.125)			(0.492)
observations	80370	80370	80370	80370	80370	80370	80370	80370	80370	75012	75012	75012	76406	76406	76406	76406	76406	76406
<b>panel b: Post-matching estimates</b>																		
int	2.512***	2.511***	2.117**	4.302***	4.101***	4.149***	4.255***	4.186***	4.387***	-0.0918	-0.0822	-0.0235	0.578***	0.572***	0.620***	-2.026***	-1.591***	-2.236***
	(0.705)	(0.776)	(0.947)	(0.641)	(0.701)	(0.887)	(0.643)	(0.708)	(0.892)	(0.0578)	(0.0640)	(0.0769)	(0.133)	(0.150)	(0.192)	(0.505)	(0.553)	(0.709)
int*service		0.00549			0.916			0.318			0.0200			0.0558			-1.535	
		(1.734)			(1.624)			(1.602)			(0.140)			(0.315)			(1.294)	
int*small			0.802			0.283			-0.300			-0.0778			-0.243			0.693
			(1.368)			(1.246)			(1.253)			(0.110)			(0.254)			(0.992)
observations	14964	14964	14964	14964	14964	14964	14964	14964	14964	14113	14113	14113	14476	14476	14476	14476	14476	14476
<b>panel c: IV estimates</b>																		
int	2.929	1.941	3.753*	10.08***	9.843***	11.36***	6.009***	5.465**	7.745***	-0.985***	-0.973***	-0.560***	3.452***	3.488***	2.884***	-2.507*	-2.654*	-1.209
	(2.327)	(2.514)	(2.235)	(2.123)	(2.294)	(2.039)	(2.288)	(2.480)	(2.187)	(0.153)	(0.148)	(0.150)	(0.324)	(0.333)	(0.321)	(1.298)	(1.364)	(1.356)
int*service		-8.335*			-2.026			-4.592			-0.728***			0.733			-3.866	
		(4.561)			(4.040)			(4.091)			(0.271)			(0.625)			(2.426)	
int*small			-0.453			-2.303			-2.535			0.262			-0.396			-1.119
			(2.697)			(2.475)			(2.466)			(0.168)			(0.350)			(1.452)
observations	80370	80370	80370	80370	80370	80370	80370	80370	80370	75012	75012	75012	76406	76406	76406	76406	76406	76406
First stage F-statistic	64,16	65,05	83,67	64,16	65,05	83,67	64,16	65,05	83,67	71,96	96,34	103,23	71,96	96,34	103,23	71,96	96,34	103,23

Notes: (1) Data are referred to Italy. Int: dummy equal to 1 for those firms whose degree of participation in foreign companies is at least equal to 10 per cent; 0 for those that don't hold any participation in foreign companies (firms whose foreign shares are below 10% are discarded). Observations exceeding 1st and 99th percentile for each year and each variable are excluded. The first-stage F-statistic is based on bootstrapped standard errors. \*\*\* p<0.01; \*\* p<0.05; \* p<0.1. – (2) Year dummies, lagged size, lagged assets composition, sector of activity, geographic area, lagged tangible assets, lagged roa, lagged standard deviation of the ratio of self-financing to turnover, lagged rating, lagged ratio of financial costs to gross operating margin, lagged ratio of short-term assets to short-term liabilities.

**Table 3. Regression results with full set of controls – MNE with participation in foreign firms >=50% – years 2008-12 (1) (2)**

	<i>Leverage</i>			<i>Fin debt/tot debt</i>			<i>Ban debt/tot debt</i>			<i>Interest rate</i>			<i>No. of banks</i>			<i>Share main bank</i>		
<b>panel a: OLS</b>																		
int	1.477***	1.869***	1.741***	5.037***	5.173***	5.734***	5.414***	5.639***	6.517***	-0.319***	-0.314***	-0.272***	1.155***	1.228***	1.220***	-3.215***	-3.319***	-3.537***
	(0.429)	(0.471)	(0.522)	(0.403)	(0.444)	(0.490)	(0.415)	(0.461)	(0.505)	(0.0305)	(0.0343)	(0.0370)	(0.0738)	(0.0851)	(0.0962)	(0.265)	(0.299)	(0.340)
int*service		-1.819*			-0.627			-1.040			-0.0243			-0.191			0.388	
		(1.015)			(0.958)			(0.964)			(0.0683)			(0.166)			(0.630)	
int*small			-0.222			-1.692**			-2.465***		0.118*				-0.679***			1.618***
			(0.851)			(0.800)			(0.817)		(0.0604)				(0.135)			(0.537)
observations	77249	77249	77249	77249	77249	77249	77249	77249	77249	72171	72171	72171	73433	73433	73433	73433	73433	73433
<b>panel b: Post-matching estimates</b>																		
int	2.644***	2.612***	2.266**	4.834***	4.814***	4.617***	4.525***	4.714***	4.528***	-0.0811	-0.0835	0.0171	0.586***	0.589***	0.684***	-2.002***	-1.633***	-2.182***
	(0.753)	(0.820)	(1.000)	(0.680)	(0.742)	(0.929)	(0.687)	(0.754)	(0.940)	(0.0598)	(0.0659)	(0.0800)	(0.139)	(0.157)	(0.203)	(0.523)	(0.574)	(0.743)
int*service		0.148			0.0948			-0.875			0.0484			0.0474			-1.283	
		(1.855)			(1.718)			(1.704)			(0.146)			(0.330)			(1.339)	
int*small			0.776			0.418			-0.0245		-0.134				-0.320			0.740
			(1.439)			(1.315)			(1.329)		(0.115)				(0.266)			(1.035)
observations	12719	12719	12719	12719	12719	12719	12719	12719	12719	11991	11991	11991	12281	12281	12281	12281	12281	12281
<b>panel c: IV estimates</b>																		
int	2.609	1.744	3.515	10.61***	10.42***	11.85***	6.424***	5.875**	8.226***	-1.043***	-1.016***	-0.625***	3.540***	3.555***	2.945***	-2.957**	-3.011**	-1.818
	(2.468)	(2.651)	(2.315)	(2.256)	(2.426)	(2.120)	(2.438)	(2.626)	(2.278)	(0.154)	(0.147)	(0.150)	(0.334)	(0.340)	(0.328)	(1.347)	(1.407)	(1.432)
int*service		-9.403*			-2.045			-5.959			-0.836***			0.519			-3.644	
		(5.402)			(4.779)			(4.862)			(0.292)			(0.670)			(2.735)	
int*small			-0.736			-2.173			-2.658		0.243				-0.244			-0.705
			(3.398)			(3.088)			(3.085)		(0.196)				(0.409)			(1.699)
observations	77249	77249	77249	77249	77249	77249	77249	77249	77249	72171	72171	72171	73433	73433	73433	73433	73433	73433
First stage F-statistic	59,08	66,05	86,25	59,08	66,05	86,25	59,08	66,05	86,25	54,25	89,09	82,37	54,25	89,09	82,37	54,25	89,09	82,37

Notes: (1) Data are referred to Italy. Int: dummy equal to 1 for those firms whose degree of participation in foreign companies is at least equal to 50 per cent; 0 for those that don't hold any participation in foreign companies (firms whose foreign shares are below 50% are discarded). Observations exceeding 1st and 99th percentile for each year and each variable are excluded. The first-stage F-statistic is based on bootstrapped standard errors. \*\*\* p<0.01; \*\* p<0.05; \* p<0.1. – (2) Year dummies, lagged size, lagged assets composition, sector of activity, geographic area, lagged tangible assets, lagged roa, lagged standard deviation of the ratio of self-financing to turnover, lagged rating, lagged ratio of financial costs to gross operating margin, lagged ratio of short-term assets to short-term liabilities.

**Table 4. Regression results: MNE balance sheet and financial indicators – years 2008-12 (1)**

	<i>Leverage</i>	<i>Fin debt/tot debt</i>	<i>Ban debt/tot debt</i>	<i>Interest rate</i>	<i>No. of banks</i>	<i>Share main bank</i>
Firms participated by foreign enterprises are excluded from the control group						
<b>panel a: OLS</b>						
int	1.145*** (0.421)	4.204*** (0.392)	4.287*** (0.401)	-0.305*** (0.0304)	1.087*** (0.0726)	-2.961*** (0.255)
controls (2)	yes	yes	yes	yes	yes	yes
observations	72876	72876	72876	68953	70461	70461
<b>panel b: Post-matching estimates</b>						
int	1.789** (0.731)	3.805*** (0.667)	3.387*** (0.670)	-0.0778 (0.0597)	0.500*** (0.138)	-1.569*** (0.506)
controls (2)	yes	yes	yes	yes	yes	yes
observations	13418	13418	13418	12666	12988	12988
<b>panel c: IV estimates</b>						
int	1.684 (2.441)	8.610*** (2.255)	4.309* (2.431)	-1.144*** (0.155)	3.538*** (0.355)	-2.715** (1.254)
controls (2)	yes	yes	yes	yes	yes	yes
observations	72876	72876	72876	68953	70461	70461
Firms controlled by foreign enterprises are excluded from the control group						
<b>panel a: OLS</b>						
int	1.389*** (0.412)	4.542*** (0.389)	4.853*** (0.396)	-0.263*** (0.0818)	1.869*** (0.350)	-2.865*** (1.050)
controls (2)	yes	yes	yes	yes	yes	yes
observations	76119	76119	76119	83331	84372	84372
<b>panel b: Post-matching estimates</b>						
int	1.885*** (0.720)	3.767*** (0.661)	3.487*** (0.666)	0.116 (0.118)	0.499** (0.227)	-0.347 (0.942)
controls (2)	yes	yes	yes	yes	yes	yes
observations	14218	14218	14218	15138	15477	15477
<b>panel c: IV estimates</b>						
int	3.714 (2.382)	8.946*** (2.205)	5.871** (2.351)	-1.339*** (0.237)	4.062*** (0.728)	-1.023 (3.561)
controls (2)	yes	yes	yes	yes	yes	yes
observations	76119	76119	76119	83331	84372	84372

Notes: (1) Data are referred to Italy. Int: dummy equal to 1 for those firms whose degree of participation in foreign companies is at least equal to 10 per cent; 0 for those that don't hold any participation in foreign companies (firms whose foreign shares are below 10% are discarded). Observations exceeding 1st and 99th percentile for each year and each variable are excluded. The first-stage F-statistic is based on bootstrapped standard errors. \*\*\* p<0.01; \*\* p<0.05; \* p<0.1. – (2) Year dummies, lagged size, lagged assets composition, sector of activity, geographic area, lagged tangible assets, lagged roa, lagged standard deviation of the ratio of self-financing to turnover, lagged rating, lagged ratio of financial costs to gross operating margin, lagged ratio of short-term assets to short-term liabilities.

**Table 5. Regression results: MNE balance sheet and financial indicators – years 2008-12 (1)**

	<i>Leverage</i>	<i>Fin debt/tot debt</i>	<i>Ban debt/tot debt</i>	<i>Interest rate</i>	<i>No. of banks</i>	<i>Share main bank</i>
<b>panel a: OLS</b>						
int*ad	-0.409 (0.569)	3.195*** (0.533)	3.483*** (0.543)	-0.272*** (0.0421)	0.825*** (0.101)	-2.599*** (0.365)
int*em	3.325*** (0.590)	4.139*** (0.561)	5.020*** (0.567)	-0.188*** (0.0454)	1.001*** (0.107)	-3.222*** (0.373)
int*adem	1.784*** (0.624)	6.988*** (0.603)	7.555*** (0.629)	-0.443*** (0.0499)	1.665*** (0.130)	-4.065*** (0.424)
controls (2)	yes	yes	yes	yes	yes	yes
observations	80370	80370	80370	69181	75888	75888
<b>panel b: Post-matching estimates</b>						
int*ad	0.819 (0.853)	2.887*** (0.803)	3.097*** (0.798)	-0.112* (0.0625)	0.278* (0.145)	-1.490*** (0.545)
int*em	4.703*** (0.889)	5.158*** (0.812)	4.913*** (0.815)	-0.0626 (0.0660)	0.480*** (0.149)	-1.729*** (0.542)
int*adem	2.045** (1.035)	5.246*** (0.973)	5.519*** (0.946)	-0.172** (0.0781)	0.630*** (0.188)	-1.731*** (0.660)
controls (2)	yes	yes	yes	yes	yes	yes
observations	14964	14964	14964	13174	14316	14316
<b>panel c: IV estimates</b>						
int*ad	0.0905 (0.665)	3.942*** (0.630)	3.910*** (0.643)	-0.268*** (0.0504)	0.716*** (0.128)	-2.227*** (0.460)
int*em	3.829*** (0.725)	4.635*** (0.673)	5.358*** (0.674)	-0.177*** (0.0534)	1.110*** (0.133)	-3.370*** (0.467)
int*adem	3.063*** (0.699)	8.511*** (0.680)	9.283*** (0.720)	-0.469*** (0.0544)	1.688*** (0.147)	-4.379*** (0.481)
controls (2)	yes	yes	yes	yes	yes	yes
observations	80370	80370	80370	69181	75888	75888

Notes: (1) Data are referred to Italy. Int: dummy equal to 1 for those firms whose degree of participation in foreign companies is at least equal to 10 per cent; 0 for those that don't hold any participation in foreign companies (firms whose foreign shares are below 10% are discarded). MNEs can invest in advanced countries (ad), emerging countries (em), both (adem). Observations exceeding 1st and 99th percentile for each year and each variable are excluded. The first-stage F-statistic is based on bootstrapped standard errors. \*\*\* p<0.01; \*\* p<0.05; \* p<0.1. – (2) Year dummies, lagged size, lagged assets composition, sector of activity, geographic area, lagged tangible assets, lagged roa, lagged standard deviation of the ratio of self-financing to turnover, lagged rating, lagged ratio of financial costs to gross operating margin, lagged ratio of short-term assets to short-term liabilities.

**Table 6. Regression results: MNEs financial relationships with foreign partners – years 2008-2012**

Dependent variable (Y)	Estimates in equation (1) of coefficient $\beta$ of MNE dummy: possession of shareholdings in foreign firms		
	(1)	(2)	(3)
Trade_cred infra-group	7.009*** (0.270)	6.060*** (0.290)	5.974*** (0.290)
Trade_cred non infra-group	0.371 (0.304)	0.342 (0.304)	0.371 (0.304)
Trade_debt infra-group	3.644*** (0.285)	2.619*** (0.298)	2.530*** (0.298)
Trade_debt non infra-group	-0.364 (0.265)	-0.899*** (0.277)	-0.905*** (0.277)
<i>Controls</i>	<i>Year</i>	<i>Year, size and sector</i>	<i>Year, size, sector and geographical area</i>
<i>Observations</i>	<i>5,748</i>	<i>5,748</i>	<i>5,748</i>

Data are referred to Italy. Observations exceeding 1st and 99th percentile for each year and each variable are excluded. \*\*\* p<0.01; \*\* p<0.05; \* p<0.1.

## APPENDIX

**Tab. A1**

### Description of the variables

Balance-sheet data		
Assets	Total assets	
Employees	Average number of employees for each year	(,000 euro)
Add_val/emp	Added value / employees	(percentages)
ROA (Return On Assets)	Earnings before interest and taxes / total assets	(percentages)
Fin_inc/assets	Financial incomes / total assets	(percentages)
Fin_debt/tot_debt	Financial debts / total debts	(percentages)
Ban_debt/tot_debt	Bank loans/ total debts	(percentages)
Leverage	Financial debts / (financial debts + equity)	(percentages)
Rating	Cerved Z-score: it can has values ranging from "1 – very safe" and "9 – very risky"	(score)
Age	Firm age	(years)
Central Credit Register (CR)		
Number of banks	Number of the banks lending money to the firm <i>i</i>	(units)
Cred_granted	Total credit granted to the firm <i>i</i>	(,000 euro)
Cred_drawn	Total credit drawn by the firm <i>i</i>	(,000 euro)
Drawn/granted	Credit drawn / credit granted	(percentages)
Interest rate	Average interest rate applied by banks to firm <i>i</i> on loans with shorter maturity	(percentages)
Share_main_bank	Credit granted to firm <i>i</i> by the main bank/total credit granted to firm <i>i</i>	(percentages)
Share_short_granted	Overdrafts and trade receivables granted / total loans granted	(percentages)
Direct Reporting (DR)		
Trade_cred infra-group	Trade credit with firms belonging to the same group	
Trade_cred non infra-group	Trade credit with firms not belonging to the same group	
Trade_debt infra-group	Trade debts with firms belonging to the same group	
Trade_debt non infra-group	Trade debts with firms not belonging to the same group	
Destination of foreign investments (according to the classification of the IMF)		
Ad	Firms with foreign investments in "advanced" countries	
Em	Firms with foreign investments in "emerging" countries	
Adem	Firms with foreign investments in both "emerging" and "advanced" countries	



Tab. A2

<b>Summary statistics – year 2008</b> (thousands of euro, percentages and units)						
	Mean		Median		Standard deviation	
	Not Internationalized	MNE	Not Internationalized	MNE	Not Internationalized	MNE
<b>Balance sheet indicators</b>						
Assets	26,118	52,058	13,380	26,644	42,974	72,172
Employees	85.7	154.9	45.0	87.5	142.4	193.6
Add_val/emp	75.6	76.8	61.4	65.8	59.8	50.4
ROA	4.7	5.2	4.2	4.5	6.4	6.7
Fin_inc/assets	0.4	0.6	0.1	0.3	0.7	0.9
Fin_debt/tot_debt	40.1	44.5	42.7	48.4	22.8	21.9
Ban_debt/tot_debt	33.9	37.9	35.5	40.8	23.0	22.5
Leverage	53.1	51.9	58.5	56.3	28.8	26.3
Rating	4.7	4.7	5.0	5.0	1.8	1.8
Age	24.8	26.2	23.0	25.0	14.4	14.4
Observations	<i>16,272 not internationalized; 3,590 MNE</i>					
<b>Bank-firm indicators</b>						
Number of banks	7.2	9.0	7.0	8.0	3.8	4.3
Interest rate	8.6	8.2	6.5	6.0	10.4	11.1
Share_main_bank_granted	39.4	34.4	34.8	30.5	18.8	16.0
Share_short_granted	63.8	58.6	65.1	58.6	23.6	21.0
Observations	<i>17,231 not internationalized; 3,553 MNE</i>					

Data are referred to Italy. Observations exceeding 1st and 99th percentile for each variable are excluded.

**Tab. A3**

**Matching: balancing properties**

Variable	Not internationalized		MNE		Mean Differences		t-test	Pr( T  >  t )
	Mean	std.err.	Mean	std.err.	mean	std.err.		
Employees	67.051	1.320	67.770	0.797	-0.719	1.457	-0.494	0.622
Assets	26,077	1,430	27,724	641	-1,646	1,365	-1.206	0.228
Add_val/emp	80.814	7.729	82.934	2.381	-2.121	6.512	-0.326	0.745
ROA	4.589	0.329	4.816	0.226	-0.226	0.392	-0.577	0.564
EBITDA/Assets	7.853	0.295	7.583	0.214	0.270	0.363	0.744	0.457
Leverage	49.665	1.912	48.616	4.145	1.049	5.828	0.180	0.857
<i>Observations</i>	<i>1,412</i>		<i>2,662</i>					

Data are referred to Italy. Difference in mean between control group firms and MNEs. The matching procedure is based on: size, economic activity, geographical area and relevance of financial assets on total assets. Data are referred to 2008. Outliers have not been excluded. MNE at 10%.

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- NERI S. and A. NOTARPIETRO, *Collateral constraints, the zero lower bound, and the debt–deflation mechanism*, Economics Letters, v. 174, pp. 144-148, **WP 1040 (November 2015)**.
- PANCRAZI R. and M. PIETRUNTI, *Natural expectations and home equity extraction*, Journal of Housing Economics, v. 46, 4, **WP 984 (November 2014)**.
- PEREDA FERNANDEZ S., *Teachers and cheaters. Just an anagram?*, Journal of Human Capital, v. 13, 4, pp. 635-669, **WP 1047 (January 2016)**.
- RIGGI M., *Capital destruction, jobless recoveries, and the discipline device role of unemployment*, Macroeconomic Dynamics, v. 23, 2, pp. 590-624, **WP 871 (July 2012)**.

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- ALESSANDRI P. and M. BOTTERO, *Bank lending in uncertain times*, R European Economic Review, V. 128, **WP 1109 (April 2017)**.
- ANTUNES A. and V. ERCOLANI, *Public debt expansions and the dynamics of the household borrowing constraint*, Review of Economic Dynamics, v. 37, pp. 1-32, **WP 1268 (March 2020)**.
- ARDUINI T., E. PATACCHINI and E. RAINONE, *Treatment effects with heterogeneous externalities*, Journal of Business & Economic Statistics, , v. 38, 4, pp. 826-838, **WP 974 (October 2014)**.
- BOTTERO M., F. MEZZANOTTI and S. LENZU, *Sovereign debt exposure and the Bank Lending Channel: impact on credit supply and the real economy*, Journal of International Economics, v. 126, article 103328, **WP 1032 (October 2015)**.
- BRIPI F., D. LOSCHIAVO and D. REVELLI, *Services trade and credit frictions: evidence with matched bank – firm data*, The World Economy, v. 43, 5, pp. 1216-1252, **WP 1110 (April 2017)**.
- BRONZINI R., G. CARAMELLINO and S. MAGRI, *Venture capitalists at work: a Diff-in-Diff approach at late-stages of the screening process*, Journal of Business Venturing, v. 35, 3, **WP 1131 (September 2017)**.
- BRONZINI R., S. MOCETTI and M. MONGARDINI, *The economic effects of big events: evidence from the Great Jubilee 2000 in Rome*, Journal of Regional Science, v. 60, 4, pp. 801-822, **WP 1208 (February 2019)**.
- COIBION O., Y. GORODNICHENKO and T. ROPELE, *Inflation expectations and firms' decisions: new causal evidence*, Quarterly Journal of Economics, v. 135, 1, pp. 165-219, **WP 1219 (April 2019)**.
- CORSELLO F. and V. NISPI LANDI, *Labor market and financial shocks: a time-varying analysis*, Journal of Money, Credit and Banking, v. 52, 4, pp. 777-801, **WP 1179 (June 2018)**.
- COVA P. and F. NATOLI, *The risk-taking channel of international financial flows*, Journal of International Money and Finance, v. 102, **WP 1152 (December 2017)**.
- D'ALESSIO G., *Measurement errors in survey data and the estimation of poverty and inequality indices*, Statistica Applicata - Italian Journal of Applied Statistics, v. 32, 3, **WP 1116 (June 2017)**.
- DEL PRETE S. and S. FEDERICO, *Do links between banks matter for bilateral trade? Evidence from financial crises*, Review of World Economic, v. 156, 4, pp. 859 - 885, **WP 1217 (April 2019)**.
- D'IGNAZIO A. and C. MENON, *The causal effect of credit Guarantees for SMEs: evidence from Italy*, The Scandinavian Journal of Economics, v. 122, 1, pp. 191-218, **WP 900 (February 2013)**.
- ERCOLANI V. and F. NATOLI, *Forecasting US recessions: the role of economic uncertainty*, Economics Letters, v. 193, **WP 1299 (October 2020)**.
- MAKINEN T., L. SARNO and G. ZINNA, *Risky bank guarantees*, Journal of Financial Economics, v. 136, 2, pp. 490-522, **WP 1232 (July 2019)**.
- MODENA F., E. RETTORE and G. M. TANZI, *The effect of grants on university dropout rates: evidence from the Italian case*, Journal of Human Capital, v. 14, 3, pp. 343-370, **WP 1193 (September 2018)**.
- NISPI LANDI V., *Capital controls spillovers*, Journal of International Money and Finance, v. 109, **WP 1184 (July 2018)**.
- PERICOLI M., *On risk factors of the stock–bond correlation*, International Finance, v. 23, 3, pp. 392-416, **WP 1198 (November 2018)**.

- RAINONE E., *The network nature of OTC interest rates*, Journal of Financial Markets, v.47, article 100525, **WP 1022 (July 2015)**.
- RAINONE E. and F. VACIRCA, *Estimating the money market microstructure with negative and zero interest rates*, Quantitative Finance, v. 20, 2, pp. 207-234, **WP 1059 (March 2016)**.
- RIZZICA L., *Raising aspirations and higher education. Evidence from the UK's widening participation policy*, Journal of Labor Economics, v. 38, 1, pp. 183-214, **WP 1188 (September 2018)**.
- SANTIONI, R., F. SCHIANTARELLI and P. STRAHAN, *Internal capital markets in times of crisis: the benefit of group affiliation*, Review of Finance, v. 24, 4, pp. 773-811, **WP 1146 (October 2017)**.
- SCHIANTARELLI F., M. STACCHINI and P. STRAHAN, *Bank Quality, judicial efficiency and loan repayment delays in Italy*, Journal of Finance, v. 75, 4, pp. 2139-2178, **WP 1072 (July 2016)**.

*FORTHCOMING*

- ACCETTURO A., A. LAMORGESE, S. MOCETTI and D. PELLEGRINO, *Housing Price elasticity and growth: evidence from Italian cities*, Journal of Economic Geography, **WP 1267 (March 2020)**.
- ALBANESE G., E. CIANI and G. DE BLASIO, *Anything new in town? The local effects of urban regeneration policies in Italy*, Regional Science and Urban Economics, **WP 1214 (April 2019)**.
- ALBANESE G., G. DE BLASIO and A. LOCATELLI, *Does EU regional policy promote local TFP growth? Evidence from the Italian Mezzogiorno*, Papers in Regional Science, **WP 1253 (December 2019)**.
- ANZUINI A. and L. ROSSI, *Fiscal policy in the US: a new measure of uncertainty and its effects on the American economy*, Empirical Economics, **WP 1197 (November 2018)**.
- BOLOGNA P., A. MIGLIETTA and A. SEGURA, *Contagion in the CoCos market? A case study of two stress events*, International Journal of Central Banking, **WP 1201 (November 2018)**.
- COVA P., P. PAGANO, A. NOTARPIETRO and M. PISANI, *Secular stagnation, R&D, public investment and monetary policy: a global-model perspective*, Macroeconomic Dynamics, **WP 1156 (December 2017)**.
- DE PHILIPPIS M., *Multitask agents and incentives: the case of teaching and research for university professors*, Economic Journal, **WP 1156 (December 2015)**.
- DEL PRETE S. and M. L. STEFANI, *Women as "Gold Dust": gender diversity in top boards and the performance of Italian banks*, Economic Notes, Monte dei Paschi di Siena, **WP 1014 (June 2015)**.
- FIDORA M., C. GIORDANO and M. SCHMITZ, *Real exchange rate misalignments in the Euro Area*, Open Economies Review, **WP 1042 (January 2018)**.
- HERTWECK M., V. LEWIS and S. VILLA, *Going the extra mile: effort by workers and job-seekers*, Journal of Money, Credit and Banking, **WP 1277 (June 2020)**.
- LI F., A. MERCATANTI, T. MAKINEN and A. SILVESTRINI, *A regression discontinuity design for ordinal running variables: evaluating central bank purchases of corporate bonds*, Annals of Applied Statistics, **WP 1213 (March 2019)**.
- LOSCHIAVO D., *Household debt and income inequality: evidence from Italian survey data*, Review of Income and Wealth, **WP 1095 (January 2017)**.
- METELLI L. and F. NATOLI, *The international transmission of US tax shocks: a proxy-SVAR approach*, IMF Economic Review, **WP 1223 (June 2019)**.
- MOCETTI S., G. ROMA and E. RUBOLINO, *Knocking on parents' doors: regulation and intergenerational mobility*, Journal of Human Resources, **WP 1182 (July 2018)**.
- NISPI LANDI V. and A. SCHIAVONE, *The effectiveness of capital controls*, Open Economies Review, **WP 1200 (November 2018)**.
- PEREDA FERNANDEZ S., *Copula-based random effects models for clustered data*, Journal of Business & Economic Statistics, **WP 1092 (January 2017)**.
- PERICOLI M. and M. TABOGA, *Nearly exact Bayesian estimation of non-linear no-arbitrage term-structure models*, Journal of Financial Econometrics, **WP 1189 (September 2018)**.