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The Impact of Foreign Banks' Activity on Retail Lending



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Abstract

Using data at the local market level, we investigate how the increasing presence of foreign banks in Italy affects the interest rate setting on loans and collateral pledged across Italian provinces, considering different borrowers (households and firms) and loan contracts (short-term and mortgage loans); these differences have received little attention in empirical analysis. We show that competition from foreign players is stronger for those market segments where standardized loan contracts are widespread and where asymmetric information is less important: a reduction in both the interest rates and the collateral pledged on mortgages to households is observed, whereas foreign bank activity has no impact on interest rates for business lending and brings about only a slight reduction in collateral posted by firms.

Keywords: Foreign Banks; Credit Market Competition.

JEL Codes: F23; G21; L10.

1 Introduction

The increased presence of foreign banks in many countries has heated the debate on the effect of the new entrants in the banking sectors of the host countries. Normally, a new player in a market should compete with the incumbents to the benefit of customers. However, lending activity has important informational problems and incumbent banks have a significant information advantage stemming from repeated interactions with borrowers over time. The ability of a new entrant to provide better conditions is then limited by the risk of attracting bad borrowers. This entry barrier is enhanced for banks coming in from abroad, whose headquarters may be both geographically remote and culturally distant. Therefore, foreign competitors are expected to focus on those market segments

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in which the knowledge of the borrower is less important and loan conditions are easily standardized (Sengupta, 2007). In contrast, domestic banks should maintain their market shares in those segments where substantial informational barriers exist and relationship lending is crucial (engaging the flight to captivity mechanism; Dell'Ariccia and Marquez, 2004). Accordingly, the impact of foreign competitors should differ depending on the relevance of information asymmetries, the degree of standardization of products and the importance of customer relationships.

Although most of the empirical literature finds positive effects for host markets following the entry of foreign banks, there have been only a few attempts to evaluate whether the improvement in credit conditions involves all the customers or whether it affects borrowers unevenly according to their different degrees of asymmetric information. This paper uses aggregated data at the local market level (identified by Italian provinces) in order to estimate to what extent informational barriers hamper the spread of these benefits. To this end, we disentangle the impact of foreign bank activity on households and businesses, taking into account the characteristics of the loan contracts according to different levels of opaqueness and for which the acquisition of information about the borrower type is dissimilar.

Italy is an interesting testing ground to analyse how information asymmetries hinder foreign competition, especially in relation to businesses since the Italian economy is particularly rich in small and medium enterprises, notably more opaque, that at the same time rely heavily on bank lending. Furthermore, following the profound changes undertaken by the Italian banking sector in the 1990s and the removal of all the entry barriers to foreign banks by the Second Banking Directive, the share of foreign banks in Italy in lending activity has risen. It was around 18% of total loans in 2011 (Bank of Italy, 2012), an increase from less than 3% in the mid-1990s. Foreign bank market shares are extremely diversified nationwide and they are significantly higher for households than for businesses.

To exploit this geographical and sector variability, we use a detailed dataset that reports information on lending activity to different counterparts (households and businesses) according to the location of these borrowers in Italian provinces in the period 1997-2006. We first estimate how foreign bank presence affects interest rates for different type of loans (mortgages and short-term credit lines) to households or businesses. Lending rates are measured in terms of differences either with the three-month interbank rate, which approximates the cost of the bank's internal funds, or with the funding rates. Then, we analyse the impact on the level of collateral pledged on different loan contracts by borrowers. For our purpose, we exploit spillover effects on domestic banks, since the dependent variables – interest rates and collateral – exclude foreign banks in the aggregation to limit the simultaneity issue.

To address the distinctive role actually played by foreign intermediaries, we control for the other characteristics of the local credit markets that can affect our dependent variables. The features considered are: the concentration of lending activity, the size of the market, the number of new branches opened by domestic banks in the same area, the credit risk, the degree of financial development, and two indices for the average liquidity and solvency of the banks operating in each province.

We perform various robustness checks by splitting the sample period and using weighted estimates. More importantly, it is not possible to rule out the existence of a reverse causation effect stemming from the dependents towards the foreign bank market shares. We address this potential endogeneity issue by using an instrumental variable estimator. Our results are robust to all these different specifications.

We show that foreign intermediaries exert a significant competitive pressure in credit markets. Their presence reduces the average lending rates charged by incumbents on mortgages to households. Most likely, the more aggressive credit policies followed by foreign intermediaries induce a reduction in the interest rates charged by domestic banks in order to maintain their positions. According to our results, a rise in the foreign banks' share from the 25th to the 75th percentile of the distribution implies a fall in interest rates by 13 basis points. This reduction is enhanced to 60 basis points when instrumental variable estimates are considered. We also detect a reduction in the collateral pledged by households, which decreases by around two percentage points on average and eight points in instrumental variable (IV) estimates. This outcome is consistent with the gradual introduction of high loan-to-value mortgages, essentially by foreign banks.

On the other hand, there is no evidence of a significant impact on lending rates applied to business loans: neither short-term rates, nor long-term rates are affected. In our view, this result is rooted in the crucial relevance of information asymmetries in business lending. Furthermore, services supplied and conditions applied to firms cannot easily be standardized.

Our findings are consistent with recent theoretical literature, which emphasizes that local banks tend to specialize in opaque market segments (a result of the flight to captivity mechanism in the face of outside competition; Dell'Ariccia and Marquez, 2004). The reduction in mortgage rates to households confirms that competitive pressure is more effective when products are standardized and information problems are less important (Lehner and Schnitzer, 2006; Sengupta, 2007). The evidence tends to reject the hypothesis that collateral is used to select low-risk customers (Sengupta, 2007).

This paper is organized as follows. Section 2 briefly reviews the theoretical and empirical literature on the determinants and effects of foreign bank entry. Section 3 describes the data used in the empirical analysis. In sections 4 and 5, we perform the econometric analysis by considering the impact of foreign bank presence on lending rates and collateral. Section 6 concludes.

2 Related Literature

In a perfect information setting, a new competitor entering the market should improve competition and decrease the market power of incumbents. Yet, the banking industry shows significant peculiarities. Since information problems between lenders and borrowers are pervasive, incumbents have significant advantages derived from repeated interactions over time with borrowers. New entrants have a limited ability to provide better conditions to customers as they face the risk of attracting bad borrowers (the winner's curse).

This classic entry barrier is further enhanced for banks coming in from abroad, whose headquarters may be both geographically remote and culturally distant.

In Sengupta (2007), the ability of the foreign entrant to attract good borrowers is conditioned by the need to offer lower lending rates on average to the pool of borrowers (the pooling equilibrium): thus, either the new entrant is more efficient in some respect, or the market will be dominated by incumbent banks, which have both information and cost advantages. The more opaque the borrowers, the higher the efficiency required to overcome the initial information disadvantage. Alternatively, the incoming bank can require collateral as a discriminating device against high-risk entrepreneurs (the separating equilibrium). The collateral is costly; it improves efficiency only in those countries with a well-functioning judicial system and adequate legal protection for creditors¹.

According to Dell'Ariccia and Marquez (2004), when having to compete with more efficient new entrants, incumbents will try to exploit their superior information by specializing in those market segments where adverse selection problems are more severe (the flight to captivity mechanism). Incumbents will keep large market shares in segments with substantial entry barriers, thereby extracting higher profits from relationship lending. In contrast, new entrants may act more aggressively towards clients in cases where information problems are less relevant. Similarly, Lehner and Schnitzer (2006) expect increased competitive pressure by foreign banks, especially in those markets with low product differentiation.

The empirical evidence confirms that foreign banks have greater difficulties in establishing relationships with small and more opaque enterprises (Berger, Klapper and Udell, 2001) and are less supportive in the case of distress (Mian, 2006). A greater presence of foreign intermediaries in developing countries is associated with a lower credit supply and higher interest rates charged to smaller and more opaque firms, a result that does not hold for advanced economies (Detragiache, Tressel, and Gupta, 2006; Gormley, 2010). Multinational banks may amplify pro-cyclicality, switching their activity towards booming economies at the expense of those countries that are experiencing a downturn, although the internal capital market may alleviate negative liquidity shocks (De Haas and Van Lelyveld, 2003).

While the supply of loans to informationally opaque small businesses could be negatively affected, most of the empirical evidence emphasizes the improvements in the domestic credit markets following an increase in foreign bank presence. Giannetti and Ongena (2008, 2009) find that the entry of foreign banks in Eastern Europe has improved credit availability, especially for major companies. Also, financial constraints are mitigated by the presence of foreign intermediaries according to Clarke, Cull and Martinez Peria (2001). Foreign competitors tend to be more efficient and profitable than domestic banks; they usually have better screening techniques and skilled management, and they can exploit economies of scale or scope². These factors could partially offset the initial information disadvantage.

¹ In Claessens and Van Horen (2008), the institutional framework plays a crucial role in determining the likelihood of entry by foreign intermediaries, since a similar environment in the host and in the home country gives rise to a competitive advantage.

² Berger, DeYoung, Genay and Udell (2000), Lehner and Schnitzer (2006), Mahajan, Rangan and Zardkoohi (1996), among others.

Claessens, Demirgüç-Kunt and Huizinga (2001), using data on almost 8,000 banks from 80 countries, assess that foreign bank presence improves efficiency and reduces profit margins. Similar results are reported for countries in Central and Eastern Europe (Uiboupin, 2004). Limiting the entry of foreign intermediaries would increase interest margins (Levine, 2003) and the market power of incumbents (Claessens and Laeven, 2003). The effects on competition are also detected in the Italian case (Magri, Mori, and Rossi, 2005). Martinez Peria and Mody (2004) find that interest rate spreads are lower for foreign banks operating in Latin America, while their presence tends to reduce the operating costs of domestic banks.

3 Data Description and Stylized Facts

3.1 Data and Variables

To analyse to what extent and for what products foreign banks have an impact on domestic credit markets, we build a special data set, which draws on Bank Supervisory Reports. Each intermediary has to report detailed information on lending activity to different classes of borrower (households and firms) and by type of loan granted (mortgages and short-term credit lines). We use data collected according to the borrower residence principle³. The period is from 1997 to 2006. Data are disaggregated by province (103 provinces covering the whole Italian territory)⁴, type of borrower, and loan contract. In the dataset, to account for mergers and acquisitions among banks in the sample period, we build pro-forma consolidated data for the merged banks.

Our definition of a foreign bank considers only foreign branches and subsidiaries. A subsidiary is a separate legal entity, controlled by the majority of common stock in a foreign holding company, while a branch does not have separate autonomy. Foreign banks can also enter the market by acquiring a minority shareholding in domestic banks, but we do not investigate minority shareholdings⁵.

We measure the activity of foreign banks by considering their market share in each province and counterpart, according to the borrower location. This variable should give a more precise measure of foreign bank activity than other indicators, such as the number of foreign banks or branches in the market (Claessens, Demirgüç-Kunt and Huizinga, 2001). In fact, notwithstanding the limited number of provinces in which foreign banks have actually opened a branch, they grant loans to customers located all over the country. This is because foreign banks may perform retail activities remotely (without an on-site presence). Hence, by using market share we assess the activity of foreign banks nationwide, whereas other measures could understate the actual activity of these intermediaries in the different Italian provinces.

We merge information from Bank Supervisory Reports with data concerning interest rates on overdraft facilities (credit lines) and mortgages, calculated as the average charged

³ The Bank Supervisory Reports collect the amount of loans granted province by province.

⁴ In 2001, the number of Italian provinces increased to 107. In our analysis, to guarantee continuity in the time series, we maintain the previous geographical subdivision, which always covers the whole Italian economy.

⁵ On the presence of foreign banks also in the form of minority shareholdings, see Focarelli and Pozzolo (2001).

to borrowers located in each province. These data are derived from the Bank of Italy Loan Interest Rate Survey, which is the official source of data used to compile all the statistics on Italian interest rates, as well as to perform all studies on Italian lending rates (amongst others, Angelini and Cetorelli, 2003; Gambacorta, 2008). It includes information on interest rates charged on each loan reported to the Central Credit Register and granted by a sample of around 70 Italian banks, which are required to provide quarterly interest rates on any loan granted and also to provide information on the borrower location. This sample accounts for more than 70% of loans to the private sector and is highly representative of the universe of Italian banks in terms of bank size, category and location⁶. However, it is non-representative of foreign banks operating in Italy.

In fact, no foreign banks were included in the survey until 2004 and just very few from 2004 onwards⁷. Consequently, it was impossible to estimate directly whether these intermediaries were charging lower interest rates to their customers than domestic banks. Therefore, we analyse whether the presence of foreign banks induces incumbents to react to competitive pressure by decreasing their average lending rates. For homogeneity with the previous period and to reduce the simultaneity issue, we excluded foreign banks in the definition of the dependent variable after 2004.

In the empirical analysis, we measure the impact of foreign banks on interest rates charged on average to households or businesses in a certain province, or by the collateral posted on these loans. We use the spread with the three-month interbank rate, the latter being a proxy of the cost of internal funds for the bank. As a robustness check, we also use the differential with the average funding rates in the same area. This is commonly used to measure the mark-up and it is a proxy for bank market power (Levine, 2003; Martinez Peria and Mody, 2004). Deposit rates, however, are available only for sight deposits, a source of funding usually not correlated to medium and long-term lending (at the end of 2009, sight deposits amounted to about 70% of the overall deposits)⁸.

As a second dependent variable, we analyse the share of collateralized loans in relation to total loans. We use aggregated data on the collateral posted at the provincial level by households and firms derived from the Italian Credit Bureau. Again, to limit endogeneity problems, we excluded foreign banks in the definition of the dependent variable.

As control variables, we introduce information on local credit market structure. First, we consider the Herfindahl concentration index. Other structural indicators, such as the share of the three largest banks in the market or the ratio of the number of banks to the population, produced nearly identical results.

We control for the size of the local credit market, which also proxies the degree of financial development. This is computed as the sum of loans and deposits in relation to the population (Eckard, 1987; Kato and Honjo, 2006). A measure of the indebted-

⁶ To assure high quality of the interest rate statistics, the sample of banks reporting in the Italian Loan Interest Rate Survey has been selected following Regulation 63/2002 (ECB/2001/18) of the European Central Bank: this is stratified by size and geographical area and it allows a high level of representativeness for each product. In 2004, the sample was further enlarged to approximately 250 banks and the coverage to 80%.

⁷ In 2004, foreign intermediaries accounted only for 2.2% of mortgages to households reported on average in the survey; for businesses, the coverage was even lower, just 1.6% for long-term loans and 0.3% for short-term loans.

⁸ However, Kok Sørensen, and Lichtenberger (2007) use deposit rates as a proxy for the funding costs in explaining the dispersion in interest rates for mortgages across countries in the Euro area.

ness of households and businesses is also included in the empirical analysis in the form of mortgages per capita or total loans on value added, respectively. The share of small business lending in relation to total loans in the province is also considered to capture the dimensional structure of firms in local credit markets and thereby the relevance of relationship lending.

Increased competition may derive from the entry of domestic banks. Therefore, we consider the number of new branches opened in a certain year (per 10,000 inhabitants) by domestic banks in order to control for both the entry of banks from outside the area and the increasing rivalry among incumbents by means of new branches.

Credit risk is proxied by the ratio between non-performing loans and total loans; markets with a lower credit risk should attract more intermediaries and could be associated with a higher level of rivalry.

Finally, to control for the structural characteristics of the banks operating in each province we use two variables that summarize their average solvency and liquidity. These two variables are calculated as the weighted average of the solvency and liquidity of every bank operating in the province, where the weights correspond to the market share of the bank in lending to borrowers located in the same province.

Table A.1 (in the appendix) reports some descriptive statistics of the variables.

3.2 Stylized Facts

Figure 1 shows the entry of foreign intermediaries since the beginning of the 1980s. The total number of incoming banks has been increasing steadily over the last two decades⁹. Consistent with the increased activity in retail markets, the entrance by subsidiaries – acquired through M&A operations – has gained relevance since the 1990s¹⁰. At the end of 2007, there were 98 foreign banks in Italy – 74 branches and 24 subsidiaries – out of 806 banks operating in Italy.

Between 1995 and 2006, the market share of foreign intermediaries in Italy rose steadily. However, this trend has not been uniform nationwide. Figure 2 reports the main statistical indicators of the distribution of the market share of foreign banks across Italian provinces. The increase in market share is clearly higher for households than for businesses. The figure also shows the high variability of activity. For firms, the national average is always higher than the third quartile, pointing to very concentrated activity in certain areas.

⁹ A first wave of entries took place between 1977 and 1983, together with the integration of the world economy and the improvement of the Italian international trade position. In this period, the regulatory restrictions on Italian banks offered profit opportunities for foreign operators to be exploited in loco. A new wave of arrivals occurred with the launch of the European single market (Magri, Mori, and Rossi, 2005).

¹⁰ Sunk costs affect the decision whether and how to enter a foreign market (Bugamelli and Infante, 2003). The choice is associated with the activity that the bank wants to perform (Claeys and Hainz, 2006; Van Tassel and Vishwasrao, 2005). Entry by means of an acquisition gives the new entrant a network of branches. This choice is consistent with the aim to operate in the retail sector, where information asymmetries tend to favour banks with a widespread presence on the ground.

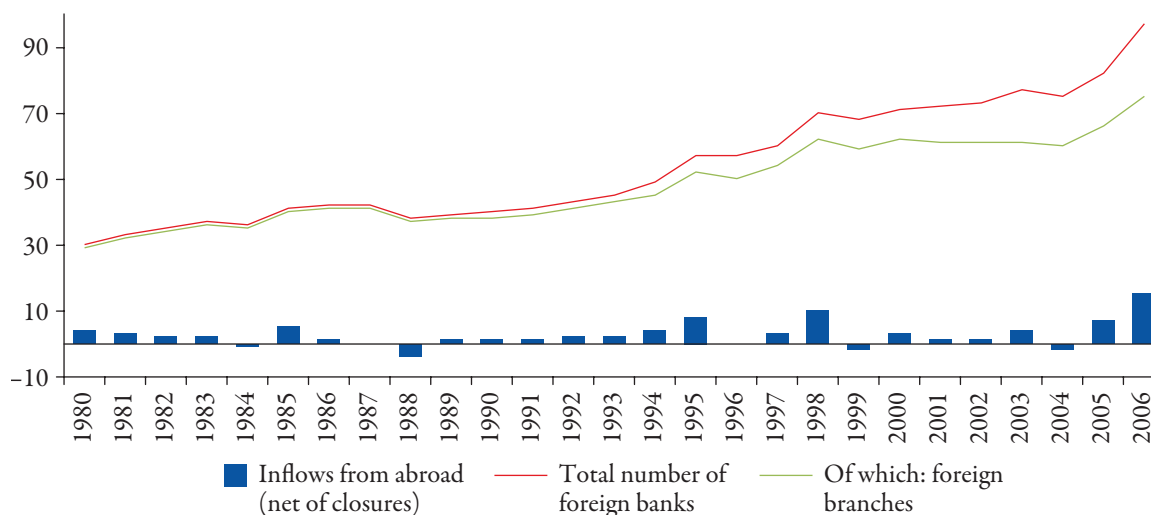


Figure 1: Foreign Banks in Italy (total number of foreign banks operating in Italy and net inflows, by year).

Source: Banks' Register. Data refer to both branches and subsidiaries of foreign banks.

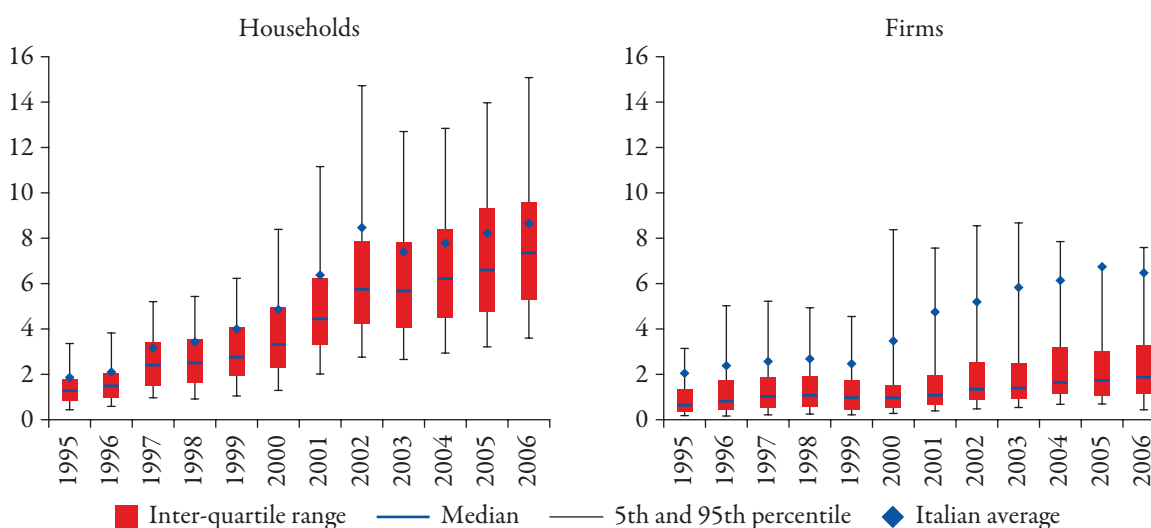


Figure 2: Distribution of the Market Share of Foreign Banks in The Italian Provinces.

Source: Bank Supervisory Report. Data refer to branches and subsidiaries of foreign banks; takeovers of Italian banks taking place in 2006 are not included.

In the empirical analysis, this geographical and sector variability is used to measure the effect of foreign intermediaries on competitive conditions within local credit markets.

4 The Impact of Foreign Bank Activity on Interest Rates

4.1 Empirical Strategy

Our analysis focuses on establishing whether, to what extent, and for what products foreign banks affect interest rates charged on average to customers. Unfortunately, as al-

ready stated, we do not have direct data on lending rates charged by foreign intermediaries and therefore we cannot measure their credit policies directly. However, aggressive credit policies may force other banks to reduce their prices to retain customers. We focus on these spillover effects, testing whether competition from foreign players has an impact on average lending rates charged by incumbents in Italian provinces.

We expect that the effect on interest rates stemming from the presence of foreign banks varies according to the market segments in which these players compete: if foreign banks compete in the same lines of business as domestic banks, interest rates should be systematically reduced (Martinez Peria and Mody, 2004). On the other hand, greater competitive pressure could drive domestic banks towards opaque markets, where they have an information advantage and can charge higher interest rates. The result could be an increase in the average interest rate applied by incumbents due to a change in the composition of their customers (Dell'Ariccia and Marquez, 2004). In this latter case, even a reduction in the interest rate charged to a good borrower could be hardly detected in aggregated data and a foreign presence could result in higher interest rates charged on average in the province.

In the econometric analysis we run separate estimates for each type of borrower and loan contract. In the baseline specification, we use a fixed effects model, in which lending rates – as the difference in relation to either the yearly average of the three-month interbank rate (Euribor; eq. 1) or the funding rate (eq. 2) – are a function of foreign banks' market share in each province and market segment analysed, as well as other control variables, according to the following specifications:

$$(1) \quad \text{Interest rate on loans}_{k,p,t} - \text{Euribor}_t = \alpha + \beta \text{Foreign banks market shares}_{k,p,t-1} + \gamma \text{Controls}_{k,p,t-1} + d_t + u_p + \varepsilon_{p,t}$$

$$(2) \quad \text{Interest rate on loans}_{k,p,t} - \text{Interest rate on deposits}_{p,t} = \alpha + \beta \text{Foreign banks market shares}_{k,p,t-1} + \gamma \text{Controls}_{k,p,t-1} + d_t + u_p + \varepsilon_{p,t}$$

where the subscript k refers to the separated regressions related to mortgages to households, overdraft facilities and mortgages to firms, whereas the subscript p indicates the province. The d_t variable is a set of annual dummies and u_p is the unobserved heterogeneity at the provincial level. The data cover the period from 1997 to 2006.

We use the regressors presented in section 3. All the variables on the right-hand side are lagged by one period to limit endogeneity problems. As previously discussed, the dependent variable does not include foreign banks and this further reduces the simultaneity issue that could arise between the market share of foreign banks and interest rates. Time dummies take into account cyclical effects to which the banks usually react by changing their lending rates. Further time invariant differences among Italian geographical areas for which we do not control adequately are captured by using fixed effects at the provincial level.

However, we must account for the possibility that foreign bank market shares and interest rates (or collateral posted) are jointly determined by unobserved factors at the provincial level. These intermediaries could decide to operate mainly in those areas in which

the credit risk is lower and customer screening is less relevant in order to minimize their information disadvantage; consequently, lending rates are already lower in these areas¹¹.

We have addressed this issue, at least partially, through introducing fixed effects by province. However, we use also a two-stage estimation approach. In the first stage, we estimate the foreign bank market shares, our main variable of interest. The relation in the first stage is then:

$$(3) \quad \textit{Foreign bank market shares}_{k,p,t} = \alpha + \beta W_{p,t} + \gamma \textit{Controls}_{k,p,t-1} + d_t + u_p + \eta_{p,t}$$

with W representing the instrumental variables.

To find a suitable instrument, we draw on the classic literature on foreign bank activity. Historically, the decision to enter a foreign country has been driven by the internationalization of borrowers and therefore we use foreign direct investments as instruments. The economic intuition behind this choice is as follows. The growing interdependence of the world economy has transformed many banks into multinational corporations. This trend reflects two different needs: *i*) to retain credit relationships with customers originating from the bank's homeland and going abroad, and *ii*) to provide credit and financial services to those firms that enter the bank's homeland from abroad by opening up new plants¹². Empirical studies on the determinants of the entry and activity of foreign banks have largely confirmed the importance of economic integration among countries¹³.

Following this literature, we use two variables as instruments. These are: the yearly inflows of direct investments from abroad towards each province and the yearly outflows of direct investment from the province abroad¹⁴. They are defined as the percentage of GDP in the same area. To smooth erratic movements, these variables are computed as moving averages for the previous three years. Investments concerning the financial sector are excluded.

We have to rule out the possibility that these instruments, definitely correlated with the presence of foreign banks, are correlated with interest rates (or collaterals). While outward foreign direct investments could signal the existence of profit opportunities to foreign banks, and therefore affect the choice of whether or not to operate in a province, we think the correlation of these kinds of investments with omitted variables is less of an issue. As far as long-term loans to households are concerned, we think that foreign direct investments hardly affect mortgage rates and collateral pledged on these types of loans. For firms, to the best of our knowledge none of the vast empirical contributions on the setting of interest rates on loans to firms consider the degree of internationalization as a determinant of interest rates, as not even those that take into account balance sheet information at the firm level (Angelini and Cetorelli, 2003; D'Auria, Foglia and Marullo Reedtz, 1999). It might

¹¹ Such a critique should be particularly relevant for firms to whom lending by foreign banks is more concentrated in the northern areas. Nonetheless, this is exactly the case in which we did not find any significant results. In contrast, lending to households is decidedly widespread nationwide and we detect a significant effect of foreign intermediaries.

¹² Amongst others, see Aliber (1984), Grubel (1977), Kindleberger (1983) and Williams (1997).

¹³ See Brealey and Kaplanis (1996), Goldberg and Saunders (1981), Goldberg and Johnson (1990), Grosse and Goldberg (1991), Sagari (1992) and Yamori, (1998). An exception is Williams (1996). The «follow the customer» hypothesis holds for firm-level data in Ruhr and Ryan (2005) and more recently, Ferri and Pozzolo (2009) and De Bonis, Ferri and Rotondi (2010).

¹⁴ Both are calculated as the difference between investments and disinvestments.

be argued that internationalized firms are productive and competitive (Helpman, Melitz and Yeaple, 2004) and are therefore less risky. Accordingly, the link between internationalization and interest rates could run indirectly through credit risk, for which we control. The hypothesis of a residual correlation is rejected in our data by the usual diagnostic tests.

To assure the validity of these instruments, we perform the usual diagnostic tests. In the Hansen-Sargan test of over-identifying restrictions, the joint null hypothesis is that the instruments are valid instruments (i.e. uncorrelated with the error term) and that the excluded instruments are correctly dropped from the estimated equation in the second stage. Hence, a rejection of the hypothesis based on the Hansen-Sargan test suggests bad instruments or the wrong specification.

We also report the Kleibergen-Paap (2006) test for under-identification. This test controls whether the first stage equation is identified or not, i.e. that the instruments are significantly correlated with the endogenous regressors; thus, a rejection of the null hypothesis indicates that the model is identified. Estimators can perform poorly when instruments are weak. We control also for weak identification by using the Cragg-Donald Wald statistic (Cragg and Donald, 1993), as well as the robust Kleibergen-Paap Wald statistics. Stock and Yogo (2005) have compiled the critical values for the Cragg-Donald F statistic for several different estimators and a rejection of the null hypothesis suggests a proper instrument.

4.2 Results

Table 1 reports the results of the fixed effects estimates for mortgages to households. A greater presence of foreign banks reduces the average *spread* (Table 1, columns [1] and [3]). When the market share of foreign banks moves from the 25th to 75th percentile, the spread between the lending rate and the Euribor decreases by 13 basis points. The results are very similar when the dependent variable is defined in terms of the difference from deposit rates. The coefficients of foreign banks in the two sub-periods are very similar, and the impact of their presence is only slightly stronger between 2002 and 2006 (column [2]).

These results are consistent with the arrival of foreign banks specialized in housing finance. In the decade, the development of the Italian real estate market boosted household indebtedness. Competition in the mortgage market intensified: innovative contracts were introduced by foreign banks and the range of available products widened (Casolaro, Gambacorta and Guiso, 2005). The use of credit scoring techniques could have contributed to these developments (Albareto *et al.*, 2011); these techniques have turned mortgage contracts into a relatively standardized product, making the entry of foreign intermediaries easier.

Among the other regressors, the Herfindahl index is positively correlated with interest rates¹⁵. New branches boost competition and reduce interest rates on mortgages.

¹⁵ The expected sign of the Herfindahl index is ambiguous and it leads to different interpretations (see Berger, 1995, for a review). Empirical evidence for Italy is mixed: Focarelli and Panetta (2003) find that concentration is significant

Table 1: Interest rates applied on mortgages to households (within estimator with provincial fixed effects)

	Differential with respect to Euribor		Differential with respect to funding rate	
	[1]	[2]	[3]	[4]
Foreign banks' market shares _{<i>t-1</i>}	-4.9214*** (1.743)	-	-5.0469*** (1.741)	-
Foreign banks market shares _{<i>t-1</i>} 1997-2001	-	-4.4601* (2.526)	-	-3.9951 (2.523)
Foreign banks market shares _{<i>t-1</i>} 2002-2006	-	-4.8988*** (1.746)	-	-4.9954*** (1.744)
Herfindahl _{<i>t-1</i>}	1.3309* (0.693)	1.3478* (0.696)	1.3860** (0.692)	1.4245** (0.695)
Financial development _{<i>t-1</i>}	3.1265 (8.564)	2.9172 (8.608)	10.4897 (8.554)	10.0126 (8.597)
Log(Mortgages per capita _{<i>t-1</i>})	0.6216** (0.249)	0.6276** (0.250)	0.3917 (0.248)	0.4053 (0.250)
Bad loans _{<i>t-1</i>}	-0.4428 (0.706)	-0.4474 (0.707)	-0.0397 (0.705)	-0.0503 (0.706)
New branches _{<i>t-1</i>}	-0.1327** (0.064)	-0.1334** (0.065)	-0.1200* (0.064)	-0.1216* (0.064)
Average solvency _{<i>t-1</i>}	-0.0273 (0.025)	-0.0263 (0.025)	-0.0197 (0.025)	-0.0175 (0.025)
Average liquidity _{<i>t-1</i>}	-0.0332*** (0.012)	-0.0333*** (0.012)	-0.0291** (0.012)	-0.0293** (0.012)
Number of observations	1,030	1,030	1,030	1,030
R ² within	0.603	0.603	0.609	0.609

Note: All the estimates include annual dummies and a constant term. Standard errors in parenthesis. *** level of significance at 1%, ** level of significance between 1 and 5%, * level of significance between 5 and 10%.

Household indebtedness (mortgages per capita in the province) does not affect the spread between lending rates and the deposit rate, but it leads to an increase in the spread on the interbank rate (Table 1, columns [1] and [3]), in line with other empirical evidence (Kok Sørensen and Lichtenberger, 2007). The development of financial markets, the credit risk (bad loans on total loans) and the average solvency of the banks operating in the province do not have significant effects on interest rates. In contrast, a higher liquidity of the banks in the province reduces interest rates.

Table 2 reports the results as far as business lending is concerned. In our estimates, the activity of foreign banks does not exert any statistically significant effect on interest rates charged on loans toward firms (columns [1]-[8]).

Among the other regressors, a well-developed financial market reduces interest rates on short-term lending, while the coefficient is not significant for mortgages to firms. However, it is significant and positive when the spread is measured with respect to funding rates. Most likely, the same deposit rates are reduced by financial development; furthermore, they are not the best reference rate given the long-term maturity of mortgages. The estimated coefficient for the Herfindahl concentration index is not statistically different from zero, whilst the opening of new branches reduces interest rates on long-term loans. Furthermore, the greater the share of loans granted to small firms in the province, the higher the interest rates applied. This is due to their stronger

and reduces deposit rates, and it is significant for Fatica, Fiori and Piersante (2006). In contrast, it does not affect interest rates for Bofondi, Bonaccorsi, di Patti and Gobbi (2006).

Table 2: Interest rates applied to firms (within estimator with provincial fixed effects)

	Differential with respect to Euribor				Differential with respect to funding rate			
	Current account		Mortgages		Current account		Mortgages	
	[1]	[2]	[3]	[4]	[5]	[6]	[7]	[8]
Foreign banks' market shares _{t-1}	-1.2095 (2.364)	-	-2.8773 (3.672)	-4.5760 (5.568)	-1.7863 (2.605)	-	-2.4925 (3.766)	-
Foreign banks' market shares _{t-1} 1997-2001	-	-2.8565 (2.531)	-	-2.3984 (3.858)	-	-3.7327 (2.789)	-	-4.2880 (5.711)
Foreign banks' market shares _{t-1} 2002-2006	-	1.9906 (2.953)	-	-	-	1.9953 (3.254)	-	-1.9864 (3.957)
Share of loans to small firms _{t-1}	2.6248*** (0.858)	2.5295*** (0.858)	0.1273 (1.667)	0.1927 (1.675)	3.6898*** (0.945)	3.5772*** (0.945)	1.0788 (1.710)	1.1478 (1.718)
Herfindahl _{t-1}	-0.2855 (1.269)	-0.3937 (1.269)	-1.2498 (2.456)	-1.2038 (2.460)	-0.6349 (1.398)	-0.7627 (1.397)	-1.5392 (2.519)	-1.4905 (2.523)
Financial development _{t-1}	-40.572*** (9.711)	-42.810*** (9.777)	25.908 (19.256)	25.592 (19.282)	-31.848*** (10.701)	-34.493*** (10.770)	37.564* (19.750)	37.230* (19.776)
Log(Loans on value added _{t-2})	-0.5268*** (0.155)	-0.4959*** (0.156)	0.6773* (0.373)	0.6804* (0.374)	-0.4049** (0.171)	-0.3684** (0.171)	0.6885* (0.383)	0.6918* (0.383)
Bad loans _{t-1}	0.4755 (0.354)	0.4168 (0.355)	-0.2629 (0.684)	-0.2766 (0.685)	0.4504 (0.391)	0.3811 (0.392)	-0.3012 (0.702)	-0.3158 (0.703)
New branches _{t-1}	-0.0125 (0.064)	-0.0138 (0.064)	-0.264** (0.123)	-0.265** (0.123)	0.025 (0.070)	0.0235 (0.070)	-0.228* (0.126)	-0.229* (0.127)
Average solvency _{t-1}	-0.0594** (0.025)	-0.0639** (0.025)	-0.0283 (0.048)	-0.0300 (0.048)	-0.0634** (0.028)	-0.0687** (0.028)	-0.0353 (0.049)	-0.0370 (0.049)
Average liquidity _{t-1}	-0.0141 (0.013)	-0.0149 (0.013)	-0.0230 (0.024)	-0.0235 (0.024)	-0.0461*** (0.014)	-0.0471*** (0.014)	-0.0555** (0.025)	-0.056** (0.025)
Number of observations	919	919	919	919	919	919	919	919
R ² within	0.761	0.762	0.378	0.378	0.389	0.391	0.250	0.250

Note: All the estimates include annual dummies and a constant term. Standard errors in parenthesis. *** level of significance at 1%, ** level of significance between 1 and 5%, * level of significance between 5 and 10%.

opaqueness, which increases the difficulties in evaluating their creditworthiness. The credit risk variable has no significant impact either for the short or for the long term rate. The latter is affected by the degree of firms' indebtedness, a result that could capture part of the potential default risk, which is not well controlled by non-performing loans. The degree of firms' indebtedness in the province is negatively correlated with the short-term rate, most likely behaving as a proxy for the development of the local financial market. Finally, greater solvency tends to reduce interest rates on short-term loans, while liquidity is significant only when the spread is measured with respect to funding rates, possibly because it affects deposit rates.

As a robustness check, we also run weighted regressions on the previous specification (not reported but available upon request), where the weights are computed as the foreign bank market shares at the provincial level. The results, both in direction and in size, are confirmed.

Table 3: Interest rates – instrumental variable estimates

	Mortgages to households		Short-term loans to firm		Mortgages to firm	
	Diff. with Euribor [1]	Diff. with funding rate [2]	Diff. with Euribor [3]	Diff. with funding rate [4]	Diff. with Euribor [5]	Diff. with funding rate [6]
Foreign banks' market shares _{<i>t-1</i>}	-21.7436** (9.069)	-24.4110*** (9.459)	13.7129* (8.200)	8.6415 (8.602)	13.6665 (11.397)	9.1365 (11.769)
Share of loans to small firms _{<i>t-1</i>}	-	-	2.3358** (0.953)	3.4879*** (1.072)	-0.5133 (1.770)	0.6284 (1.859)
Herfindahl _{<i>t-1</i>}	1.8061** (0.869)	1.9330** (0.906)	-0.5283 (1.587)	-0.8045 (1.712)	-0.6942 (3.078)	-1.1486 (3.218)
Financial development _{<i>t-1</i>}	0.9660 (10.132)	8.0028 (10.695)	-41.2217*** (8.954)	-32.3021*** (8.722)	8.8570 (16.481)	25.5782 (17.045)
Mortgages per capita _{<i>t-1</i>} (<i>households</i>) or Loans on value added _{<i>t-1</i>} (<i>firms</i>) (logs)	0.1750 (0.377)	-0.1224 (0.386)	-0.5392*** (0.194)	-0.4136** (0.206)	0.9235*** (0.322)	0.8616** (0.347)
Bad loans _{<i>t-1</i>}	-0.5976 (0.730)	-0.2179 (0.730)	0.3705 (0.397)	0.3770 (0.464)	0.0453 (0.689)	-0.0846 (0.716)
New branches _{<i>t-1</i>}	-0.1607* (0.091)	-0.1522 (0.095)	-0.0009 (0.068)	0.0331 (0.071)	-0.2225** (0.112)	-0.1987* (0.120)
Average solvency _{<i>t-1</i>}	-0.0037 (0.034)	0.0075 (0.035)	-0.0536* (0.032)	-0.0594* (0.033)	-0.0235 (0.051)	-0.0319 (0.052)
Average liquidity _{<i>t-1</i>}	-0.0259 (0.019)	-0.0208 (0.019)	-0.0176 (0.017)	-0.0486*** (0.018)	-0.0189 (0.032)	-0.0525* (0.031)
Fixed effect by province	yes	yes	yes	yes	yes	yes
Fixed effect by year	yes	yes	yes	yes	yes	yes
R-sqr	0.562	0.555	0.749	0.362	0.376	0.241
Underidentification test (Kleibergen-Paap LM statistics)	15.777 (p-val = 0.0004)	15.777 (p-val = 0.0004)	13.213 (p-val = 0.0014)	13.213 (p-val = 0.0014)	17.711 (p-val = 0.0001)	17.711 (p-val = 0.0001)
Weak identification test (Cragg-Donald Wald F statistics)	14.080 (15% crit. val: 11.59)	14.080 (15% crit. val: 11.59)	32.548 (15% crit. val: 11.59)	32.548 (15% crit. val: 11.59)	19.490 (15% crit. Val: 11.59)	19.490 (15% crit. Val: 11.59)
Overidentification test of instruments Hansen J Statistic	0.158 (p-val = 0.6909)	1.559 (p-val = 0.2118)	2.648 (p-val = 0.1037)	3.666 (p-val = 0.0555)	0.003 (p-val = 0.9574)	0.002 (p-val = 0.9691)
First stage results						
Inward foreign direct investments/GDP _(average <i>t-1; t-2; t-3</i>)	0.0000115 (0.000017)	0.0000115 (0.000017)	-0.0000554* (0.000031)	-0.0000554* (0.000031)	0.0000463* (0.000025)	0.0000463* (0.000025)
Outward foreign direct investments/GDP _(average <i>t-1; t-2; t-3</i>)	0.000118*** (0.000029)	0.000118*** (0.000029)	0.0001629*** (0.000030)	0.0001629*** (0.000030)	0.0001329*** (0.000031)	0.0001329*** (0.000031)

Note: Robust standard errors in parenthesis. *** level of significance at 1%, ** level of significance between 1 and 5%, * level of significance between 5 and 10%.

Table 3 reports the instrumental variable estimations. Columns [1] and [2] refer to interest rates on mortgages to households and columns [3]-[5] to interest rates on different credit lines to enterprises. For the sake of simplicity, for the first stage we report only the two instruments. However, the various specifications include the usual controls. All the estimates and the reported tests are heteroscedasticity-robust. The diagnostic tests confirm that our instruments are appropriate in all the specifications considered.

In the first stage, foreign direct investments by firms appear to be very important in predicting the level of activity of foreign banks in a certain province. Sustaining Italian firms that decide to internationalize is a crucial source of business for foreign banks and an important reason to operate significantly in a certain area. Most likely, once they have entered a given province, foreign intermediaries expand their activity into new segments of business, such as mortgages. Consistent with the fact that we are analysing the retail

activity of these intermediaries, the arrival of firms from abroad is less important. It is likely that these foreign customers are supported, at least partially, by the headquarters in the homeland rather than by onsite branches.

Considering the instrumental variable estimates, our previous results are confirmed. Furthermore, the impact of foreign bank presence is significantly enhanced using IV estimates. Moving from the 25th to the 75th percentile of the distribution of foreign bank market shares computed for mortgages to households, the interest rate differential is reduced by 57 basis points (63 for the differential with the funding rate). In contrast, the impact is null with respect to the interest rates on short-term and mortgage lending to firms.

5 Collateral Pledged

5.1 Empirical Strategy

Foreign banks could use collateral requirements as a means of differentiating their lending policies. The collateral could be reduced to increase competition, or it could be increased as a device to screen good customers, to whom lower interest rates may be charged (Sengupta, 2007).

To verify these two opposite hypotheses, the share of collateralized loans on total loans is used as the dependent variable according to the following specification:

$$(4) \quad (\text{Collateralized loans} / \text{Total loans})_{k,p,t} = \alpha + \beta \text{Foreign banks market shares}_{k,p,t-1} + \gamma \text{Controls}_{k,p,t-1} + d_t + u_p + \varepsilon_{p,t}$$

We split real collateral from personal guarantees. As before, k is the type of loan contract and counterpart considered, p indicates the province; d_t is a set of annual dummies and u_p is the unobserved heterogeneity at the provincial level. The data cover the period from 1997 to 2006.

We also use instrumental variable estimates. In the first stage, we estimate the foreign bank market shares considering equation 3 reported in sub-section 4.1.

5.2 Results

Table 4 presents the results for the fixed effects model. In the estimates on short-term collateralized loans (not reported), we do not detect any effect for households or for firms. On the other hand, significant results emerge for medium and long-term collateralized loans (Table 4).

For households, an increase in the activity of foreign banks is associated with a reduction in real collateral pledged (column [2]). The impact is a decrease by nearly two percentage points by moving from the 25th to the 75th percentile. This effect is only partially balanced by the slight rise in personal guarantees (0.5 percentage points for

Table 4: Medium and long term collateral (within estimator with provincial fixed effects)

	Households			Firms		
	Personal	Real		Personal	Real	
	[1]	[2]	[3]	[4]	[5]	[6]
Foreign banks' market shares _{<i>t-1</i>}	0.1902*** (0.049)	-0.7049*** (0.137)	-	0.1969 (0.162)	-0.5701*** (0.182)	-
Foreign banks' market shares _{<i>t-1</i>} 1997-2001	-	-	-0.5420*** (0.200)	-	-	-0.4315 (0.274)
Foreign banks' market shares _{<i>t-1</i>} 2002-2006	-	-	-0.6959*** (0.138)	-	-	-0.6093*** (0.191)
Share of loans to small firms _{<i>t-1</i>}	-	-	-	0.0640 (0.073)	0.1416* (0.082)	0.1360* (0.082)
Herfindahl _{<i>t-1</i>}	-0.0294 (0.020)	0.0287 (0.057)	0.0323 (0.057)	-0.1232 (0.105)	-0.0787 (0.118)	-0.0805 (0.118)
Financial development _{<i>t-1</i>}	0.3925 (0.241)	0.4253 (0.678)	0.3522 (0.681)	1.7097** (0.839)	-2.6877*** (0.941)	-2.6598*** (0.942)
Mortgages per capita _{<i>t-1</i>} (logs)	-0.0103 (0.007)	-0.0312 (0.020)	-0.0292 (0.020)	-	-	-
Loans on value added _{<i>t-2</i>} (logs)	-	-	-	0.0131 (0.016)	-0.0184 (0.018)	-0.0187 (0.018)
Bad loans _{<i>t-1</i>}	0.0451** (0.020)	-0.0500 (0.056)	-0.0512 (0.056)	-0.0095 (0.029)	-0.0061 (0.033)	-0.0052 (0.033)
New branches _{<i>t-1</i>}	-0.0000 (0.002)	-0.0079 (0.005)	-0.0082 (0.005)	0.00626 (0.0054)	-0.0140** (0.006)	-0.0139** (0.006)
Average solvency _{<i>t-1</i>}	0.0013* (0.001)	0.0039** (0.002)	0.0042** (0.002)	0.0030 (0.002)	-0.0008 (0.002)	-0.0007 (0.002)
Average liquidity _{<i>t-1</i>}	-0.0004 (0.000)	-0.0002 (0.001)	-0.0002 (0.001)	0.0022** (0.0010)	0.0028** (0.001)	0.0028** (0.001)
Number of observations	1,030	1,030	1,030	919	919	919
R ² within	0.445	0.291	0.292	0.0901	0.195	0.195

Note: All the estimates include annual dummies and a constant term. Standard errors in parenthesis. *** level of significance at 1%, ** level of significance between 1 and 5%, * level of significance between 5 and 10%.

the corresponding impact). These results appear consistent with the increasing diffusion of high loan-to-value mortgages (where the share of real collateral is lower), commonly backed by personal guarantees.

This result also holds for firms: the larger the presence of foreign intermediaries, the lower the share of collateralized loans (columns [5] and [6]). The other variables confirm that the collateral is mainly used as a competitive variable rather than a screening device: the collateral posted is negatively correlated with the degree of financial development and the number of new branches opened; however, it increases along with the greater presence of smaller firms. In the two sub-periods analysed, the results are confirmed for households. As far as firms are concerned, the effect is concentrated only in the second sub-period. As before, we verify the robustness of the estimates by running weighted regressions. The main findings are confirmed (not reported).

When we use the IV model (Table 5), our main findings are confirmed in significance and enhanced in magnitude. The collateral on mortgages to households is now reduced by eight percentage points moving from the 25th to the 75th percentile of the distribution. In contrast, the impact is null with respect to collateral pledged on lending to firms.

Table 5: Real collateral posted: Instrumental variable estimates

	Mortgages to households	Mortgages to firms
Foreign banks' market shares _{<i>t-1</i>}	-3.1346*** (0.976)	-0.4725 (0.926)
Share of loans to small firms _{<i>t-1</i>}	-	0.1379 (0.104)
Herfindahl _{<i>t-1</i>} (on mortgages to households or firms)	0.0237 (0.117)	-0.0711 (0.152)
Financial development _{<i>t-1</i>}	0.0646 (1.036)	-2.7885* (1.504)
Log(Mortgages per capita _{<i>t-1</i>})	-0.0979** (0.044)	-
Log(Loans on value added _{<i>t-2</i>})	-	-0.0171 (0.024)
Bad loans _{<i>t-1</i>}	-0.0592 (0.063)	-0.0043 (0.037)
New branches _{<i>t-1</i>}	-0.0116** (0.005)	-0.0137** (0.006)
Average solvency _{<i>t-1</i>}	0.0066** (0.003)	-0.0008 (0.003)
Average liquidity _{<i>t-1</i>}	0.0006 (0.001)	0.0028** (0.001)
Fixed effect by province	Yes	Yes
Fixed effect by year	Yes	Yes
R-sqr	0.0473	0.1944
Underidentification test (Kleibergen-Paap LM statistics)	18.310 (p-val = 0.0001)	17.852 (p-val = 0.0001)
Weak identification test (Cragg-Donald Wald F statistics)	15.705 (15% crit. val = 11.59)	19.455 (15% crit. val = 11.59)
Overidentification test of instruments Hansen J Statistic	0.006 (p-val = 0.9396)	2.334 (p-val = 0.1266)
First stage results		
Inward foreign direct investments/ GDP _(average <i>t-1; t-2; t-3</i>)	0.0000126 (0.0000173)	0.000046* (0.0000246)
Outward foreign direct investments/ GDP _(average <i>t-1; t-2; t-3</i>)	0.0001247*** (0.0000296)	0.0001318*** (0.0000303)

Note: Robust standard errors in parenthesis. *** level of significance at 1%, ** level of significance between 1 and 5%, * level of significance between 5 and 10%.

6 Conclusions

In this paper we measure the impact of foreign bank activity on retail credit markets. To capture the level of activity of foreign intermediaries, we use their market shares in the different geographical areas and with reference to the various lines of business. We study this variable in relation to interest rates charged and to the collateral pledged on different loan contracts and by different borrowers (households and firms).

In the estimates, we control for other factors that could affect our dependent variables, such as the degree of concentration of the market, the number of new branches opened by domestic banks, the credit risk, the development of financial markets, the degree of indebtedness of households and firms, and the average solvency and liquidity of banks operating in each province. IV estimates address the possible endogeneity problem related to the provinces in which foreign banks predominantly operate.

Our results show that foreign intermediaries exert a competitive pressure which is differentiated according to the type of borrower. A reduction in the interest rates charged on mortgage loans to households by domestic banks is induced by the presence of foreign play-

ers. This reduction is economically significant, around 13 basis points. This impact is even stronger – around 60 basis points – when the issue of possible endogeneity is controlled for. We also observe a reduction in real collateral pledged (2%; 7% in IV estimates); this finding is consistent with the diffusion of contracts whose loan-to-value is higher than in the past.

There is no evidence of a significant impact on interest rates applied to firms, although we observe a slight reduction in the share of collateralized loans associated with a greater presence of foreign intermediaries. However, this latter result is, at least, weak.

Consistent with banking theory, in our view the different effect we detect for households and businesses depends on the degree of standardization of the products (greater for mortgages to households) and on the relevance of asymmetric information (higher for credit to firms). An aspect that remains to be analysed is heterogeneity among firms since the conditions applied to business lending are hardly standardized. They depend on a firm's characteristics and the bargaining process between the bank and its customer. Most likely, in this field, competition from new entrants is complex and more time is needed for its effects to be observable.

7 Appendix

Table A.1: Descriptive statistics

	Average	Std. Dev.	50° perc.	25° perc.	75° perc.	Source
Interest rate differentials on:						
Mortgage rate to households and Euribor	1.880	0.953	1.727	1.227	2.409	Bank of Italy
Mortgages to households and funding rate	3.890	0.960	3.727	3.259	4.300	Bank of Italy
Overdraft facilities to firms and Euribor	5.970	1.482	3.801	3.286	4.456	Bank of Italy
Overdraft facilities to firms and funding rate	7.980	1.406	7.994	7.013	8.984	Bank of Italy
Mortgages to firms and Euribor	1.990	1.353	1.813	1.239	2.477	Bank of Italy
Mortgage rate to firms and funding rate	4.001	1.322	3.801	3.286	4.456	Bank of Italy
Collateralized loans (share of collateral on total loans)						
Mortgages to households	0.722	0.090	0.734	0.667	0.789	Bank of Italy
Mortgages to firms	0.584	0.098	0.600	0.535	0.650	Bank of Italy
Loans with personal guarantees (share on total loans)						
Mortgages to households	0.072	0.038	0.063	0.046	0.088	Bank of Italy
Mortgages to firms	0.183	0.063	0.174	0.144	0.207	Bank of Italy
Foreign banks' market share related to:						
Total loans to households	0.047	0.034	0.039	0.031	0.063	Bank of Italy
Mortgages to households	0.029	0.027	0.022	0.011	0.037	Bank of Italy
Short-term loans to households	0.090	0.067	0.071	0.035	0.132	Bank of Italy
Total loans to firms	0.020	0.025	0.012	0.007	0.023	Bank of Italy
Mortgages loans to firms	0.009	0.018	0.003	0.001	0.008	Bank of Italy
Short-term loans to firms	0.008	0.017	0.003	0.001	0.007	Bank of Italy
Control variables						
Herfindahl index on household loans	0.118	0.052	0.106	0.082	0.140	Bank of Italy
Herfindahl index on household mortgages	0.136	0.062	0.119	0.094	0.160	Bank of Italy
Herfindahl index on firm loans	0.105	0.040	0.095	0.077	0.122	Bank of Italy
Financial development (loans + deposits per capita)						
Loans to households per capita	2,804.4	1,474.4	2,406.1	1,664.8	3,784.4	Bank of Italy
Mortgages to households per capita	1,953.5	1,178.5	1,612.1	1,039.3	2,639.5	Bank of Italy
Short-term loans to households per capita	850.9	351.9	798.9	577.6	1,060.9	Bank of Italy and ISTAT
Loans to firms/Value Added	0.38	0.16	0.36	0.25	0.50	Bank of Italy and ISTAT
Mortgages/Value Added	0.13	0.05	0.12	0.09	0.16	Bank of Italy and ISTAT
Short-term loans to firms/ Value added	0.13	0.06	0.12	0.08	0.17	Bank of Italy and ISTAT
Share of loans to small firms	0.204	0.107	0.182	0.122	0.274	Bank of Italy
Bad loans on total loans (household)	0.087	0.074	0.062	0.036	0.106	Bank of Italy
Bad loans on total loans (firms)	0.134	0.131	0.081	0.043	0.183	Bank of Italy
New branches (per 10,000 inhabitants)	0.143	0.307	0.092	0.033	0.183	Bank of Italy and ISTAT
Average solvency	9.59	1.27	9.59	8.94	10.29	Bank of Italy
Average liquidity	15.43	3.36	15.43	13.22	17.56	Bank of Italy

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