Are foreign banks better at measuring and managing risks? Evidence from European credit markets

Carlo Milani[1]

Abstract

Are foreign banks subjected to adverse selection in a highly integrated banking market? Recent evidence from the European Banking Authority (EBA) given after EU-wide stress testing suggests that they do not. I find that foreign banks seem to be better at managing credit risks, thanks to more sophisticated quantitative risk techniques, lower susceptibility to political pressures, better corporate governance and the possibility to export more stringent financial regulations. Moreover, I find that the advantages of banking integration are greater in banking markets in which the degree of competition is low and there are better institutional characteristics.

Keywords: foreign bank; risk management; lending technologies; European Banking Union; financial stability; international operations

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[1] BEM Research, 86/2A Viale Primo Maggio, 00047 Marino (Rome), Italy. Email: c.milani@bemresearch.it

1. Introduction

With the realization of the European Banking Union (EBU) in 2014, an important step towards a unique financial market and an effective monetary policy at the European level was taken. The EBU, composed of a single supervisory–regulatory framework, resolution mechanism and safety net on deposits, is the logical conclusion of the idea that integrated banking systems require integrated prudential oversight (Goyal et al., 2013). However, a more integrated European banking system is not necessarily synonymous with a more stable one. Gehrig (1998), considering the impact of integrating two separate monopoly banking markets, shows that integration may leave banking markets exposed to greater aggregate risk and a lower quality of credit allocation. Some problems could arise from the coordination process between euro area countries and non-euro area European Union (EU) countries, with an even more accentuated effect after the decision of the UK to leave the EU single market (the so-called Brexit). Moreover, the theoretical model shows, based on asymmetry of information and taking into account developing countries, that foreign banks tend to "cherry-pick" or "cream-skim" customers, leaving risky borrowers to domestic institutions (Berger and Udell, 1996; Berger et al., 2001; Detragiache et al., 2008; Sengupta, 2007; Stein, 2002).

More generally, Claessens and Van Horen (2012), reviewing the foreign banking performance studies and considering several measures of performance (profitability, profit and cost efficiency, loan quality, loan growth), find ambiguity in the literature. The authors identify 15 studies in which foreign banks perform better than domestic banks, while 9 studies report worse performance measures or no statistically significant difference. In another 11 studies, the evidence is ambiguous, with foreign banks performing better than domestic ones on some performance measures and worse or equally on others.

Although the vast literature, few studies focus on the effect of foreign banks' presence in the European countries (Berger et al., 2000; Havrylchyk and Jurzyk, 2011; Miller and Richards, 2002; Vander Vennet, 1996, 2002), and, to the best of my knowledge, no studies consider how greater integration among advanced banking markets affects financial stability. The object of this paper is to give an answer to the question, "Are foreign banks better at measuring and managing risks?," considering a post-crisis data set composed of banks operating in the recently integrated banking market of the EBU. I use data from the EBA consisting of 51 holding banks operating in Europe (37 from euro area countries). This high-quality data set allows me to distinguish how bank credit portfolios were allocated among European countries and business counterparties in 2015.

Another distinguishing characteristic of this study is the test of the following hypothesis, based on the theoretical model of Dell'Ariccia et al. (1999):

H0. Adverse selection hypothesis

> Banks would expand in a foreign market if the average remuneration rate for the new borrowers is high enough to cover the bank's investment. However, foreign banks could absorb higher risks because they cannot determine whether new applicants are good debtors or bad borrowers rejected by domestic banks. If domestic banks have the ability to measure and manage risk effectively, foreign banks are unavoidable subjected to adverse selection, then showing higher default rates.

Having evidence against the adverse selection hypothesis, I consider several possible mechanisms that may be responsible for the lower than average default rates of foreign banks: i) lending

technology; ii) related/connected-party transactions; iii) bank corporate governance; iv) bank regulation; v) the degree of competition in banking markets; and vi) legal and institutional characteristics. To the best of my knowledge, no studies consider all the factors that may affect the risk management abilities of both domestic and foreign banks.

The paper is organized as follows. In Section 2, I describe the data set and the empirical model. In Section 3, I comment on the empirical results, while in Section 4, I present further evidence to explain why hypothesis *H0* is rejected. Section 5 concludes and presents the policy implications of the empirical analysis.

2.   The data set and the empirical model

I analyse bank-level data using the data set collected by the EBA during the EU-wide stress testing in 2016 (see EBA (2016) for the complete list of banks). My sample is made up of 51 holding banks operating in Europe, 37 from euro area countries and 14 from Denmark, Hungary, Norway, Poland, Sweden and the UK (Table 1). The EBA sample covered around 70% of the total assets in each jurisdiction and across the EU. This data set allows me to test for potential problems in banking integration owing to the coordination process between euro area countries and non-euro area European Union (EU) countries.

I consider the bank's credit portfolio at the European country level. As shown in Table 1, the banks in my sample are, on average, active in 4.5 European credit markets (including their domestic country) through their branches or subsidiaries.[2] In this way I build a two-dimensional data set in which, on one side, there are the 51 banks examined by the EBA in the 2016 stress test and, on the other, there are all the European banking markets in which these banks operate. This data set allows me to test for the impact of foreign banks on the loan quality in European countries.

The data at the country level are from the World Bank database and Thomson-Reuters (sources and descriptive statistics of all the variables used in the empirical analysis are reported in Table 2).

I estimate the following model:[3]

$$\text{defrateTOT}_{i,c} = k + \gamma_1 \cdot \text{Dforeign}_{i,c} + \gamma_2 \cdot \text{irbTOT}_{i,c}$$

$$+\delta_1 \cdot \text{cet1}_i + \delta_2 \cdot \text{banksize}_i + \delta_3 \cdot \text{banksize}_i^2 + \delta_4 \cdot \text{cet1gov}_i + \delta_5 \cdot \text{markrisk}_i \qquad (1)$$

$$+\beta_1 \cdot \text{creditgdp}_c + \beta_2 \cdot \text{listed}_c + \beta_3 \cdot \text{bench}_c + \beta_4 \cdot \text{insolvcost}_c + \varepsilon_{i,c}$$

where the dependent variable, *defrateTOT*, is the ratio between the defaulted credit exposures and the sum of the defaulted[4] and non-defaulted overall credit exposures[5] (both the numerator and the

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[2] Only two banks in the sample are strictly domestic (the Polish PKO Bank Polski and the Hungarian OTP Bank).

[3] Multicollinearty is checked both through the variance inflation factor (VIF) diagnostic and the condition index. As rule of thumb for VIF (condition index) I consider a conservative level of 2.5 (15), while values greater than 5 (30) indicate high correlation and are cause for concern. Values between the two levels show evidence of moderately correlated variables.

[4] The default definition is based on Article 178 of the CRR: "A default shall be considered to have occurred with regard to a particular obligor when either or both of the following have taken place: (a) the institution considers that the obligor is unlikely to pay its credit obligations to the institution, the parent undertaking or any of its subsidiaries in full, without recourse by the institution to actions such as realising security; (b) the obligor is past due more than 90 days on any material credit obligation to the institution, the parent undertaking or any of its subsidiaries."

denominator are risk unweighted) for bank *i* operating in country *c*. I include three types of explanatory variables: i) bank-specific variables (lower case *i*; ● coefficients); ii) country-specific variables (lower case *c*; ⚲ coefficients) that refer to the country in which the bank operates; iii) bank- and country-specific variables (lower case *i* and *c*; ■ coefficients).

The EBA data set allows me to determine a precise distribution of bank credit portfolios among different countries, which overcomes the problem of the definition of a foreign bank. For example, Claessens et al. (2001) define a bank as foreign if at least 50% of its share is foreign-owned, while a lower ownership level could also allow foreign control.

The main goal of the empirical analysis is to test *H0*, which means to check whether or not foreign banks have a comparative disadvantage in selecting borrowers. For this reason, eq. (1) includes a dummy variable, *Dforeign*, that is equal to 1 if the headquarter of the *i*-th bank is not in the European country *c* and 0 in the case of domestic banks. A negative (positive) ■ may signal that foreign banks are more (less) efficient in the selection of borrowers.

Among bank- and country-specific variables is also included *irbTOT*, equal to the share of the overall credit portfolio in the country *c* for which the bank *i* applies an internal-based (IRB), advanced or foundation, model. I include this variable to measure if the approach used to compute risk-weighted assets (RWAs) affect credit default rates. There is evidence showing that banks use the discretion of an IRB approach to reduce RWAs (Vallascas and Hagendorff, 2013; Mariathasan and Merrouche, 2014; Montes et al., 2017). Lower RWAs may create incentives to increase loans to higher risk borrowers without affecting regulatory capital. On the other hand, Barakova and Palvia (2014) find that risk weights generated by IRB US banks are more risk sensitive than those based on Basel I. Thus, the lower capital requirements observed for IRB banks may be explained, at least partially, by lower risk borrowers that are better selected thanks to the application of IRB models. As a consequence, the effect of *irbTOT* on default rates may be either positive or negative.

Among the bank-specific variables, I consider:

- The CET1 ratio (*cet1*), computed as CET1 capital over risk-weighted assets (RWAs) according to the Capital Requirements Regulation (CRR) under the Capital Requirements Directive (CRD). According to the banking capital regulation debate, banks with a lower capital ratio are likely to be more risk loving, mainly because managers may have the incentive to leverage the bank to spread profits on a narrower equity base (Tarullo, 2008). Actually, before the financial crisis, many banks adopted exactly this strategy (Haldane et al., 2010). Consequently, I expect the effect of *cet1* on the default rate to be negative.

- As an indicator of bank size, I consider the logarithm of the sum of i) total assets and ii) off-balance sheet items (e.g. guarantees) included in the leverage ratio according to the CRR and CRD (*banksize*). I allow for non-linearities by including the square of the variable (*banksize^2*). The relationship between the default rate and the size is unclear. Larger banks are more suited to risk diversification and achieving economies of scale. On the other hand, larger dimensions could involve too much complexity to be managed efficiently. Moreover, the attitude of the supervisory authority towards a bank may depend on its size for several

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[5] On the basis of the EBA definition, credit exposures include credit to central banks and central governments, institutions, corporations and retail and exposures in the form of equity, securitization and other non-credit obligation assets.

reasons: on the one hand, a large bank is more likely to be supervised by the market and the supervisory authority is more likely to be captured by a large bank, and therefore the supervisory activity by the authority could be less intense; on the other hand, a larger bank is riskier from a systemic risk perspective, thus potentially making supervision tougher.

- The share of market risks over risk-weighted assets (*marketrisk*). I consider this variable to capture the effect of the business mix.

Moreover, I control for the following country-specific variables:

- *creditgdp*, which is the difference between the levels of financial resources provided to the private sector, such as through loans, purchases of non-equity securities and trade credit and other accounts receivable, which establish a claim for repayment, as a percentage of GDP (credit intensity) in 2014 and in 2006. Lower credit intensity could signal countries that were affected by a credit bubble in the period before the 2007–2008 financial crisis. As a consequence, I expect the effect of *creditgdp* to be negative.

- *listed*, which is the number of listed companies per 1,000,000 people. This variable captures the financial depth of a country. Listed companies are able to find other sources of finance than banking loans; thus, I expect a positive effect from *listed*.

- *bench* is the average level of the interest rate on the benchmark government bond with 10 years of maturity in 2011. I consider 2011 because it is the year with the greatest tension on government bonds in the euro area, particularly in the so-called GIPSI countries (Greece, Ireland, Portugal, Spain and Italy). Higher benchmark interest rates imply higher interest rates on banking loans, thereby increasing the financial burden on households and corporations. Furthermore, higher benchmark interest rates are a signal of a country's financial vulnerability and low economic perspectives. Thus, *bench* should exert a positive impact on the default rate.

- *insolvcost* is the cost of the bankruptcy proceedings involving domestic entities (it is recorded as a percentage of the value of the debtor's estate). This variable is considered as a proxy for bankruptcy procedures' inefficiency. Bankruptcy procedures' inefficiency could affect, in particular, the process of taking possession of and liquidating collateral, which is recognized by theoretical studies as relevant in the context of asymmetric information about the unobservable risk characteristics of borrowers (Besanko and Thakor, 1987a, b; Bester, 1985; Dell'Ariccia and Marquez, 2006). As a consequence, the efficacy of collateral use is reduced (raised) with weak (strong) bankruptcy proceedings; thus, more (less) strategic defaults should be present. Moreover, countries with bankruptcy codes that reduce the cost of liquidating collateral should witness greater foreign bank lending (Sengupta, 2007).

Following Montes et al. (2017), I estimate equation (1) through ordinary least square (OLS) with robust standard errors clustered by bank to allow for arbitrary correlation of error terms across banking markets within a given bank.[6]

3. Results

The estimation results of eq. (1) are reported in Table 3. Considering the overall credit portfolio, I find that foreign banks appear to be more efficient in the selection of borrowers, as indicated by the

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[6] I use Stata13 for all the calculations.

negative and significant *Dforeign* coefficient (Model I). This result is in line with the studies that are based on developing country samples (Barajas et al., 2000; Berger et al., 2005; Crystal et al., 2002; Detragiache et al., 2008; Haber and Musacchio, 2013; Mian, 2006). Similar evidence is obtained by Demirguc-Kunt et al. (1998) with respect to a sample of developed and developing countries. They find that a greater foreign bank presence is associated with a lower probability of a systemic banking crisis in the host country.

Moreover, I find that the bank size variable has a U-reverted effect on the default rates.[7] The derivative of the default rate with respect to *banksize* is negative and significant for bank sizes bigger than the median value of the distribution, while it is positive but not significant for smaller bank dimensions (Figure 1). This result shows the potential presence of economies of scale in the underwriting procedures, due also to risk diversification.

To explore the potential effect of bank counterparties, I consider two different customer segments: i) corporate, which includes loans to firms with a total amount larger than €1 million; and ii) retail, which includes loans up to €1 million to small and medium firms (turnover or balance sheet up to €50 million) and to households (mortgages and other loans).

Taking into account credit to corporations, I find that the *Dforeign* coefficient is negative and significant (Model II), with a magnitude two times stronger than that for the overall portfolio. On the other hand, regarding credit to retail, I find a positive and mildly significant *Dforeign* coefficient (Model III). These results are in line with the empirical evidence of Mian (2006).

Owing to the heterogeneous characteristics among the considered countries, I also test whether a different result is obtained by dividing countries into more homogeneous groups. More specifically, I consider two different clusters: i) the European countries with a higher GDP per capita and better financial position, specifically Austria, Belgium, Finland, France, Germany, Luxembourg and the Netherlands, in the euro area, and Denmark, Norway, Sweden and the United Kingdom (core country group); ii) the remaining group, consisting of Italy, Spain and Ireland, among the euro area countries, and Hungary and Poland (peripheral country group).[8] For each group I create a dummy variable equal to 1 for banks that have their headquarters in the considered cluster and 0 otherwise. Following Claessens and van Horen (2012), I interact these three dummy variables with *Dforeign*.

Considering the overall credit portfolio, I find that the negative and significant effect of foreign banks' presence on the default rates appears only in the peripheral countries. While the *Dforeign* coefficient is negative but not significant, the derivative of the default rate with respect to *Dforeign* in the peripheral countries is negative and highly significant (Model IV). This result seems to be in

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[7] Among the other control variables, I find the expected signs. *cet1*, *marketrisk*, *creditgdp* and *listed* have a negative and significant impact on the default rate of the overall credit portfolio, while *bench* and *insolvcost* have a positive and significant effect. *irbTOT* shows a positive but not significant coefficient.

[8] The average (median) GDP per capita in 2014 is equal to €39.4 (€39.3) thousand in the core country group and €24.8 (€30.5) thousand in the peripheral one. The average (median) net international investment position and the average general government sector debt, both expressed as a percentage of GDP in 2014, are equal to 17.5% (2.2%) and 74.1% (74.9%), respectively, in the core country group and -74.2% (-73.8%) and 93.1% (99.3%) in the peripheral group. Furthermore, peripheral countries show more domestic-focused banks (they operate on average in 2.6 credit markets, including the domestic one, while banks in core countries are present in 5.3 markets).

line with Claessens et al. (2001), who find a positive effect on the banking system efficiency when foreign banks come from more developed countries.

When I take into account credit to corporations, I find that foreign banks are better able to select borrowers both in core and in peripheral European countries. However, in the latter group, the reduction in the default rate obtained by foreign banks is bigger than that in the core countries (Model V).

Finally, the effect of the presence of foreign banks on credit to retail disappears when the interaction between *Dforeign* and *Dperipheral* is considered (Model VI), which means that in weak countries foreign banks do not harm small firms and households (Clarke et al., 2001, 2005).

Summarizing the outcomes of Table 3, foreign banks appear to have a better capacity to select quality borrowers, an evidence that is against the adverse selection hypothesis (*H0*). This effect is mainly driven by credit to corporations and is stronger in European countries with economic and financial gaps. This outcome signals that foreign banks are better able to select less opaque borrowers, as in the case of corporations, while for less transparent customers, as in the case of retail, they have a lower ability to select high-quality borrowers.

4.   Further evidence[9]

In this section, I report further evidence about the effect of foreign banks on loan quality that helps to interpret the reasons for the rejection of the adverse selection hypothesis (*H0*).

In the following sections, I present several possible mechanisms that may be responsible for the lower average default rates when foreign banks are involved: i) lending technology; ii) connected-party bias; iii) bank corporate governance; iv) bank regulation; v) the degree of competition in banking markets; and vi) legal and institutional characteristics.

4.1 Lending technology

As showed by Mian (2003), foreign banks have access to external liquidity from their parent banks, but, in return for that source of funding, the local branch of a foreign bank has little discretion to make lending decisions exclusively based on hard information. Thus, large multinational banks have

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[9] My main results are robust to several tests. With respect to the econometric approach, I estimate eq. (1) using different estimators. Among the OLS methods, I consider the random-effect and the fixed-effect estimators, with country-level random and fixed effects, respectively. Moreover, I estimate eq. (1) using the tobit and the random-effect tobit estimator, which applies a maximum likelihood estimation (MLE). The use of the tobit estimator could be justified by the fact that the dependent variable, the default rate on credit exposures, assumes values between 0 and 1 (only 9 observations over 221 are equal to 0). Furthermore, I consider the effect of the consideration of a different measure of bank capital in eq. (1). In particular, I substitute *cet1* alternatively with i) the fully loaded common equity tier 1 ratio, that is, the indicator that anticipates the effect of Basel III on capital, ii) the leverage ratio, that is, an index not affected by the risk-weighted asset measure and iii) the fully loaded leverage ratio. To account for the possible bias owing to the presence of outliers, I consider three different tests: i) I trim *defrateTOT* by excluding observations below the first percentile and above the ninety-ninth percentile; ii) I use the robust regression estimator; and iii) I use the quantile regression estimator evaluated at the median. Finally, I consider a dummy variable equal to 1 for the euro area countries and 0 otherwise, and I interact it with *Dforeign*.

a greater propensity to use very strict credit scoring methods that force local bank managers to rely on hard information (Cole et al., 2004).[10]

The wider availability of information and communication technologies (ICTs), and in particular of transactional lending technologies, is a factor that drastically improved the underwriting process, allowing banks to select borrowers with a higher probability of repayment (Agarwal and Hauswald, 2007; DeYoung et al., 2008; Milani, 2014, 2017; Albareto et al., 2016).

To determine whether these technologies could explain part of the advantage of foreign banks in the borrower selection, I include in eq. (1) a variable that expresses the share of the overall credit portfolio, in each country *c*, for which the advanced internal-based (A-IRB) model has been used (*irbaTOT*), and then I interact this variable with *Dforeign* (more sophisticated quantitative risk techniques may push banks to be more risk sensitive; see Barakova and Palvia, 2014).

I find that the *Dforeign* variable is negative but not significant (Table 4, Model I). However, considering the derivative of *defrateTOT* with respect to *Dforeign*, I find a negative and significant effect corresponding to the *irbaTOT* median value and the third quartile in the sample. This result signals that a more intense diffusion of A-IRB methods, proxy of transactional lending technologies, helps foreign banks in improving their selection and monitoring processes.

To confirm this interpretation, in Model II I consider the interaction of *Dforeign* and *irbaTOT* along with the dummy for the peripheral European countries (*Dperipheral*). I find that the marginal effect of *Dforeign* on *defrateTOT*, when only peripheral European countries are considered, is negative and highly significant for usage of the A-IRB model at the median value of the distribution and even stronger for the third quartile of *irbaTOT*.

Furthermore, in Models III and IV, I restrict the analysis to corporate and retail portfolios, respectively. I find that the derivative of *defrateCOR* with respect to *Dforeign* is negative, highly significant and with a magnitude that increases with the share of the corporate credit portfolio for which the A-IRB model is used (*irbaCOR*). Considering the retail credit portfolio, the derivative is not significant at the median value, or for higher values, of the retail credit portfolio share for which the A-IRB model is used (*irbaRET*). These outcomes show that transactional lending technologies are particularly useful for customers with a lower level of opacity, as in the case of corporations (Milani, 2014). However, transactional lending technologies could also be useful for retail customers (Mester, 1997; Milani, 2017), but only when their level of diffusion within the banking organization is high.

Overall, the evidence about transactional lending proxy shows that foreign banks avoid soft information loans not because of any limitations but rather because of the relatively poor quality of these loans (Mian, 2006). A higher level of investment in ICTs could then be justified by the willingness of multinational banks not to take too much risk and to avoid the loss of "franchise value" (Demsetz et al., 1996).

4.2 Related/connected-party transactions

Another potential factor that could influence the ability of foreign banks to select borrowers is their lower susceptibility to political pressures and lower tendency to lend to connected parties (see Conybeare, 1984, on the effect of political risk on banks' international lending). To test this effect, I

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[10] It should be remarked that foreign banks who enter in a market by purchasing local banks are not able to maintain a bank-borrower relationship since distant managers impose formal accountability to monitor local officers (Sapienza, 2002; Karceski et al., 2005; Degryse et al., 2005).

consider how the physical and cultural distance affects the underwriting process. The distance between borrower and lender might have an impact on the possibility to gather soft information as well as increasing the transaction costs. On the other hand, physical and cultural proximity might induce foreign banks to engage in excessive "related lending", that is, financing close associates/families on loose terms and conditions (Mian, 2003), a kind of moral hazard-driven risky lending. La Porta et al. (2003) find that Mexican banks make larger loans at a lower interest rate to more risky related companies. The problems of related lending also seem to be omnipresent in Eastern Europe.

To test the effect of distance on the default rate, when foreign banks are involved, I consider four different indicators, each interacted with *Dforeign*, as in Claessens and van Horen (2012):

   i.   The flight distance between European countries' capitals, expressed in logarithm of kilometres (*Lflight*). This variable measures the physical distance between European countries;

  ii.   The length of the borders between contiguous European countries, expressed in logarithm of kilometres (*Lborder*). Countries with longer borders should be considered closer in physical terms;

 iii.   A dummy variable equal to 1 if the home and host countries share the same official language and 0 otherwise (*Dlanguage*). Language is one of the main cultural barriers among European countries;

  iv.   A dummy variable equal to 1 if people in the home and host countries believe in the same religions and 0 otherwise (*Dreligion*).[11]

I find that the interaction with *Lflight* has a negative and significant effect on the default rate (Table 5, Model I). Foreign banks that have headquarters that are physically distant from the host country show a better capacity to select borrowers. It should be noticed that the derivative of the default rate with respect to *Dforeign* is negative and significant only for very distant countries, specifically those at the seventy-fifth percentile of the *Lflight* distribution.

In line with this result, I find that sharing longer borders implies higher default rates (Model II). In this case the derivative of the default rate with respect to *Dforeign* is negative and significant for shorter border lengths (average value of *Lborder*).

Both *Dlanguage* and *Dreligion* are not significant (Models III and IV). However, the derivative of *defrateTOT* with respect to *Dforeign* is negative but not significant for home and host countries that have different languages, while it is negative and significant when they share the same religion.

Summarizing, these outcomes seem to show that physical proximity reduces the capacity of foreign banks to select high-quality borrowers. Languages and religions appear to be cultural barriers that limit the selection and monitoring processes. Foreign banks, mainly when they are physically distant from the home country, appear to be less ready to lend on loose terms and conditions (Giannetti and Ongena, 2005). The distance between the "bank thinking head" and the credit officers does not allow

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[11] I consider the most followed religions, in terms of the percentage of the population, on the basis of the CIA World Factbook, which are: i) Catholicism in Austria, Belgium, Germany (also Protestant), Spain, France, Hungary (also Calvinist), Ireland, Italy, the Netherlands and Poland; ii) Lutheran in Denmark, Finland, Norway and Sweden; and iii) Anglican in the UK.

the intensive use of soft information; thus, foreign banks have to rely on hard information (Sapienza, 2002; Karceski et al., 2005; Degryse et al., 2005). I interpret this result as evidence in line with the expectations of Petersen and Rajan (2002), that is, that technological changes have reduced the importance of banking distance. The view of Hymer (1960/1976), who postulated that foreign banks encounter competitive disadvantages with respect to domestic institutions, appears to be overwhelmed.

4.3 Bank corporate governance

To consider the effect of bank corporate governance on the borrower selection, I include in eq. (1) two variables that capture some characteristics of the chief executive officers (CEOs) who were in power during 2015 for more than half a year:[12]

i) The age of the CEO (*CEOage*). Age is found by several scholars to be a factor that affects risk behaviour. For example, Vroom and Pahl (1971) find that older managers are more risk averse, and Wiersema and Bantel (1992) conclude that changes in corporate strategies are more probable when top management teams are younger. Thus, I expect a negative effect of *CEOage* on default rates;

ii) The number of years for which the CEO has been in office (*CEOyear*). Bank boards can learn quickly about CEOs' abilities and then remove CEOs with poor performance (Defond and Park, 1999). As a consequence, the expected effect on the default rates should be negative.

I find that the *CEOage* variable has no effect on the default rates, while *Dforeign* is still negative and significant (Table 6, Model I). However, including the interaction between *CEOage* and *Dforeign* as well, I find that the derivative of *defrateTOT* with respect to *Dforeign* is negative and significant only in correspondence to the third quartile of *CEOage* (Model II). This result could be interpreted as evidence that foreign banks that are led by an elderly manager are more risk averse.

CEOyear has a negative and significant effect on the default rates (Model III). CEOs who stay in power for a longer period of time seem to have better abilities and/or to be more risk adverse; thus, borrower selection processes are conducted more carefully. However, *Dforeign* is robust to the inclusion of this variable. Furthermore, in Model IV I include the interaction between *Dforeign* and *CEOyear*. I find that the derivative of *defrateTOT* with respect to *Dforeign* is negative and significant only when *CEOyear* is equal to or higher than the median value of the sample distribution. This outcome signals that foreign banks are better able to select borrowers only when the CEO has longer experience in the management of the bank. Foreign banks show a better ability to measure and manage risk thanks to higher manager performance.

4.4 Bank regulation

In this section I test the extent to which the different financial regulations among European countries affect borrowing selection. When rules are weak, foreign banks may have a comparative advantage over domestic institutions. In contrast, when the banking sector is well developed, domestic and foreign banks might be equally sophisticated (Claessens and Van Horen, 2012).

I consider two indicators from the World Bank surveys on bank regulation by Barth et al. (2001):[13]

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[12] Unfortunately, data on CEOs' compensation are scarcely available and do not allow me to check for the effect of this variable on default rates.

[13] Another interesting variable used in the literature about the effect of foreign banks on domestic markets is the limitations on foreign bank entry/ownership. However, my sample is only composed of banks operating in the EU, in which the same rules about foreign bank entry are applied.

- The overall financial conglomerates' restrictiveness in the country where the bank has its headquarter (*restricHOME*). This variable measures the extent to which banks may own and control non-financial firms, the extent to which non-financial firms may own and control banks and the extent to which non-bank financial firms may own and control banks.[14] Laeven (2001) shows that Russian banks grant larger loans to companies that own equity in the bank. Through *restricHOME* it is possible to determine whether a lower (higher) interconnection allowed between banks and non-financial firms in the bank home country increases (decreases) credit standards, mainly to corporations. In other words, with this variable is possible to test the extent to which the home country regulation deals with the related-lending problem. As a consequence, the interaction of *Dforeign* and *restricHOME* should have a negative effect on the default rates;

- The degree to which actions are taken to mitigate bank moral hazard in the country where the bank has its headquarter (*moralhazHOME*). This variable is measured taking into account whether banks receive funding from the government, whether there is a deposit guarantee scheme and/or coinsurance mechanism and how they are financed.[15] If the bank moral hazard behaviour is contrasted (favoured) by home country regulation, foreign banks should have a lower (higher) risk attitude. Thus, the interaction of *Dforeign* and *moralhazHOME* should have a negative effect on the default rates.

As expected, I find a negative and significant coefficient in both the interactions between *Dforeign* and *restricHOME* and *moralhazHOME* (Table 7, Models I and II, respectively).[16] Considering the derivative of the default rate with respect to *Dforeign*, I find that the effect is negative and significant. This result is evidence that banks with stronger home country bank regulation standards, in terms of financial conglomerates' restrictions and moral hazard contrasts, put more effort into their selection and monitoring procedures.

Moreover, I consider the difference between the two bank regulation indexes in the home and in the host country. In this way I measure the distance between European countries in dealing with financial conglomerates and moral hazard (*restricGAP* and *moralhazGAP*, respectively). The interaction with *Dforeign* is negative and significant both for *restricGAP* (Model III) and *moralhazGAP* (Model IV). In both cases the derivative of the default rate with respect to *Dforeign* evaluated at the point at which there is a large regulation gap between the home and the host country (ninetieth percentile of *moralhazGAP* and *restricGAP*) is negative and significant. Foreign banks seem to be able to export financial regulation skills from the home to the host country (Goldberg et al., 2000). On the other hand, domestic banks seem to be less scrupulous because of poor banking regulation that allows risky behaviour (Mian, 2006).

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[14] The index is based on answers to the following questions: 1) What are the conditions under which banks can engage in non-financial businesses except those businesses that are auxiliary to banking businesses (e.g. IT company, debt collection company, etc.)? 2) Can non-financial firms own voting shares in commercial banks? 3) Can non-bank financial firms (e.g. insurance companies, finance companies, etc.) own voting shares in commercial banks?

[15] The index is based on answers to the following questions: 1) Funding is provided by: a. government; b. banks; c. combination/other? 2) Do deposit insurance fees/premiums charged to banks vary based on some assessment of risk? 3) Is there formal coinsurance, that is, are ALL depositors explicitly insured for less than 100% of their deposits?

[16] I obtain similar outcomes when I consider the corporate default rate as the dependent variable.

These outcomes also seem to be in line with the branch of literature about banking consolidation (Berger et al., 1999), on the basis of which larger and more efficient banks acquire smaller and less efficient institutions. Through consolidation banks are able to spread their expertise and operating procedures as well as gaining the possibility to improve the risk–return trade-off due to diversification. In a similar way, foreign banks prefer to expand to countries where the banking system is on average less efficient (Focarelli and Pozzolo, 2000).

4.5 Degree of competition in banking markets

I test the effect of bank competition in the host country on the ability of foreign banks to select borrowers better using three different indicators, estimated by the World Bank at the country level on the basis of bank-by-bank data from Bankscope:

i.   The H-statistic or Panzar–Rosse statistic (Panzar and Rosse, 1982, 1987). This variable measures the elasticity of banks' revenues relative to their input prices based on 2014 bank data. It is equal to 1 under perfect competition, less than or equal to 0 under a monopoly and between 0 and 1 when the system operates under monopolistic competition;

ii.   The Boone indicator (Boone, 2001; Boone et al., 2005; Hay and Liu, 1997; Schaeck and Čihák, 2010). This indicator is calculated as the elasticity of profits to marginal costs based on 2013 bank data. The rationale behind the variable is that higher profits are achieved by more efficient banks. Hence, the more negative the Boone indicator, the higher the degree of competition;

iii. The Lerner index (Demirgüç-Kunt and Martínez Pería, 2010). This indicator measures the market power in the banking market as the difference between output prices and marginal costs (relative to prices) based on 2010 bank data. Higher values of the Lerner index indicate less bank competition.

As the first step, I include the *H-statistic*, *Boone* and *Lerner* variables for the host country in eq. (1) to check whether *Dforeign* is affected by the inclusion of a bank competition measure. I find that the effect of the presence of foreign banks on default rates remains negative and significant (Table 8, Models I, III and V). Among the bank competition indexes, only the Boone indicator is significant, with a positive coefficient (Model III). This outcome signals that higher degrees of competition imply the increase of default rates, evidence that seems to support the structure–performance hypothesis, which focuses on the negative effects of bank power, while it is inconsistent with the information-based hypothesis (see Beck et al., 2004). However, this result is not confirmed by the H-statistic and Lerner index.

As the second step, I also include the interaction of bank competition indicators with *Dforeign* (Models II, IV and VI). I find that the effect of the presence of foreign banks on the default rates remains negative and significant, while the interaction terms are not significant. Looking at the derivative of the default rate with respect to *Dforeign*, I find contrasting results between the H-statistic and the Boone indicator, on one side, and the Lerner index, on the other. Based on the first two indicators, in banking markets in which the competition is low, the effect of the presence of foreign banks on the default rates is negative and significant. This result could be interpreted as evidence that the entrance of foreign banks into market in which there is not perfect competition increases the competition and allows an improvement in the borrower selection. On the other hand, in a more competitive environment, customers are more demanding, and as a consequence banks

should offer high-quality products and invest more in innovation (Aghion and Howitt, 1998). Such an outcome signals that the benefits of banking integration are larger where there is not perfect competition in the banking market.

On the other hand, the Lerner index shows the opposite result. Only for a low level of the index, and then for a higher level of competition, is the derivative of the default rate with respect to *Dforeign* negative and significant. However, the Lerner index could be affected by some limitations. As remarked by Oliver et al. (2006), a bank's risk-taking approach could have an impact on the Lerner index estimation. Moreover, the average degree of market power may change due to the reallocation effect from inefficient to efficient firms (Boone, 2008). Taking into account that the period considered by the World Bank to estimate the Lerner index is 2010, a year that was particularly affected by the 2007–2008 international financial crisis, it is possible that the Lerner index considered is biased.

4.6 Legal and institutional characteristics

In this section I consider how the gap in the home and host country legal and institution characteristics could affect the ability of foreign banks to select high-quality borrowers. Following Claessens and Van Horen (2008) and Galindo et al. (2003), I take into account five different indicators from the Worldwide Governance Indicators (WGI) project, produced by Daniel Kaufmann (Natural Resource Governance Institute, NRGI, and Brookings Institution) and Aart Kraay (World Bank Development Research Group). For each index I consider the difference in the home and in the host country and I interact it with *Dforeign*. The indicators considered are the following:

  i.   Regulatory quality (*regqualGAP*). This variable captures perceptions of the ability of the government to formulate and implement sound policies and regulations that permit and promote private sector development;

 ii.   Political stability and the absence of violence/terrorism (*polstabGAP*). This index measures perceptions of the likelihood of political instability and/or politically motivated violence, including terrorism;

iii.   Voice and accountability (*voiceGAP*). This variable captures perceptions of the extent to which a country's citizens are able to participate in selecting their government as well as freedom of expression, freedom of association and free media;

 iv.   Government effectiveness (*goveffGAP*). This index captures perceptions of the quality of public services, the quality of the civil service and the degree of its independence from political pressures, the quality of policy formulation and implementation and the credibility of the government's commitment to such policies;

  v.   Rule of law (*ruleoflawGAP*). This indicator captures perceptions of the extent to which agents have confidence in and abide by the rules of society and in particular the quality of contract enforcement, property rights, the police and the courts as well as the likelihood of crime and violence.

Differences in degrees in the five legal and institutional indicators imply the development of specific skills by banks to deal with them (Galindo et al., 2003). A larger gap between home and host country governance indicators could limit the chances of foreign banks to adapt to more difficult political, social and regulatory background contexts. Learning how to deal with these harder background contexts is in fact costly. On the other hand, if the host country governance indicators are in a better

shape than the home country conditions, then foreign banks could have a competitive advantage due to the fact that they are used to dealing with harder background contexts, so their adaption costs could be lower. As a consequence, I expect that the interaction between *Dforeign* and governance indicator gaps will positively affect the default rates.

In Table 9 I find evidence that confirms this expectation. A larger gap in the political stability/absence of violence, voice and accountability, government effectiveness and rule of law gap indicators, interacted with *Dforeign*, has a positive and significant effect on the default rates (Models II-V). This result seems not to be in line with Galindo et al. (2003), who do not find evidence suggesting that it is easier to adapt upwards (to a better institutional/legal framework) than downwards (to a worse legal/institutional set-up). On the other hand, the interaction with the regulatory quality shows a positive but not significant coefficient.

The derivative of the default rate with respect to *Dforeign*, evaluated at the twenty-fifth and seventy-fifth percentiles of the governance gap indicators, confirms the previous interpretation. I find that, for a low level of the gaps, which means that the host country governance conditions are better than the home ones, the derivative is negative and highly significant (Models I-V). On the other hand, for a high level of the gaps, which means that the host governance conditions are worse than the home ones, the derivative is negative and mildly significant only for the regulatory quality indicators, while for the remaining indexes the derivatives are negative but not significant. This result could be interpreted as evidence that European countries have to reach a higher level of institutional maturity to exploit the advantages of banking integration.

This outcome seems to be in agreement with the empirical evidence of Fisher and Molyneux (1996), Grosse and Goldberg (1991) and Yamori (1998), who find that foreign banks prefer to invest in countries with a lower risk profile. Furthermore, my evidence appears to be in line with the Sengupta (2007) model, which shows that poorly functioning legal systems reduce the use of collateralizable assets, thus diminishing potential entrants' ability to sort borrowers.

5.   Conclusions

Although the literature on the effect of the presence of foreign banks in local banking markets is vast, little attention has been dedicated to the impact on developed countries and in particular on European ones. Using an EBA data set allows me to distinguish between bank credit activities among European countries, from the euro and non-euro areas, integrated with data from several other sources, this paper tries to close this gap. This paper aims to answer the following research question: do foreign banks perform better in the selection and monitoring process of borrowers than domestic banks? On the basis of adverse selection hypothesis – that is, foreign banks could absorb higher risks because they cannot determine whether applicants are new borrowers or borrowers who have been rejected by domestic banks (Dell'Ariccia et al., 1999) – the answer should be no.

However, I find robust evidence against the adverse selection hypothesis. In fact, foreign banks appear to have a better capacity to select quality borrowers. When foreign banks are involved in the European domestic credit markets, they show a significantly lower default rate. This effect is mainly driven by credit to corporations and is stronger in European countries with economic and financial gaps. This evidence signals that foreign banks are better able to select less opaque borrowers, as in the case of corporations, while for less transparent customers, as in the case of retail, they have a lower ability to select high-quality borrowers.

The paper shows several possible mechanisms that may be responsible for the lower than average default rates of foreign banks.

Foreign banks that apply transactional lending technologies appear to be in a better position to select quality borrowers. In line with this evidence, I find that a greater physical distance helps underwriting procedures, a signal that related/connected-party transactions play a large part in explaining the lower quality in European countries, mainly in the peripheral countries. Moreover, foreign banks show a better ability to measure and manage risk thanks to higher manager performance.

Foreign banks also seem to be able to export better practices in supervision, regulation and transparency rules. Legal and institutional characteristics could, however, limit the ability of foreign banks to select quality borrowers when the gap between the host and the home country is large. I also find evidence that the entrance of foreign banks into markets in which there is not perfect competition increases competition and allows an improvement in the borrower selection.

These results have important policy implications. First of all, a more integrated European banking market is able to increase financial stability and overcome the problem of coordination between the euro area countries and the non-euro area EU (on the importance of coordination in bank supervision and regulation, see Anginer and Demirguc-Kunt, 2014). Thus, the EBU should reduce bank fragility in Europe. Moreover, the EBU encourages further cross-border banking integration, from countries that do not share the euro or that are outside the EU as well, as in the case of Norway (Asmussen, 2013; Mersch, 2013). Thus, greater integration of UK banks should also be guaranteed after leaving the EU.

However, this paper shows that European countries have to reach a higher level of institutional maturity to exploit the advantages of banking integration (Bruno and Hauswald, 2014).

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Figures and Tables
Figure 1. Marginal effect of bank size on the credit default rate
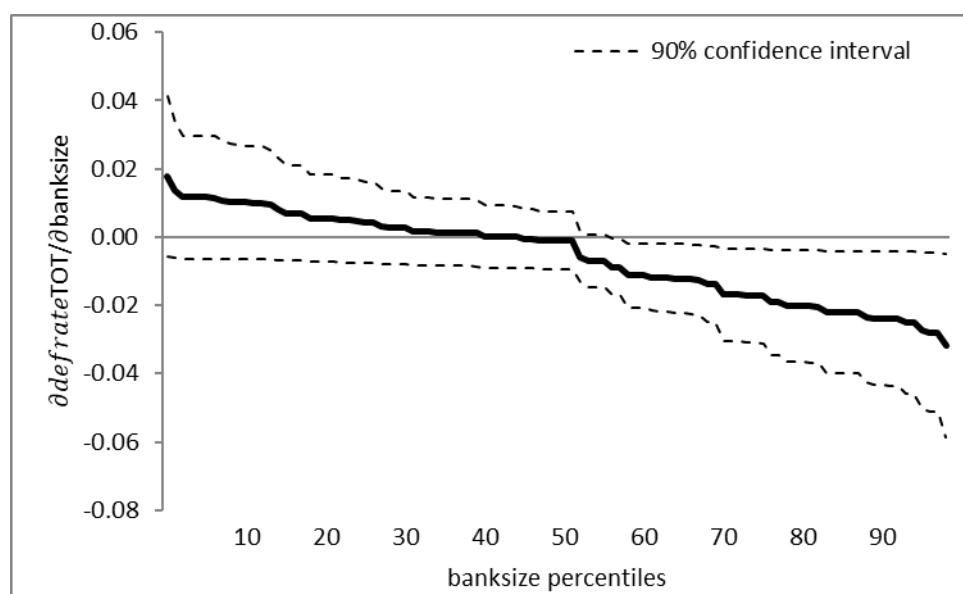
Note: Plot of the derivative of *defrateTOT* with respect to *banksize*, evaluated at the *banksize* percentiles, based on the estimate results of Table 3, Model I.

Table 1. Sample by country

	Number of banks	Average number of credit markets (domestic + foreign)
Austria	2	5.0
Belgium	2	7.0
Germany	9	6.1
Denmark	3	4.0
Spain	6	2.3
Finland	1	5.0
France	6	5.0
UK	4	4.3
Hungary	1	1.0
Ireland	2	5.0
Italy	5	2.6
Netherlands	4	4.5
Norway	1	5.0
Poland	1	1.0
Sweden	4	5.8
Total	**51**	**4.5**

Source: Author's computation.

Table 2. Summary statistics

Variable	Source	Mean	St. Dev.	Min.	Max.	Obs.
banksize	EBA	12.800	0.902	10.400	14.600	228
bench	Thomson-Reuters	3.870	1.620	2.560	9.600	228
boone	World Bank	-0.014	0.061	-0.221	0.086	228
CEOage	Bloomberg and Thomson-Reuters	56.400	6.210	47.000	73.000	206
CEOyear	Bloomberg and Thomson-Reuters	6.290	4.810	1.300	24.700	206
cet1	EBA	0.155	0.059	0.105	0.428	228
creditgdp	World Bank	-6.380	20.400	-61.300	28.500	221
defrateCOR	EBA	0.057	0.097	0.000	0.656	227
defrateRET	EBA	0.082	0.180	0.000	1.000	218
defrateTOT	EBA	0.031	0.062	0.000	0.619	228
Dforeign	Author's elaboration	0.776	0.418	0.000	1.000	228
Dlanguage	CIA World Factbook	0.105	0.308	0.000	1.000	228
Dperipheral	Author's elaboration	0.171	0.377	0.000	1.000	228
Dreligion	CIA World Factbook	0.167	0.373	0.000	1.000	228
goveffGAP	World Bank	-0.096	0.451	-1.450	1.360	228
h-statistic	World Bank	0.651	0.131	0.386	0.871	220
insolvcost	World Bank	8.630	5.100	1.000	22.000	228
irbaCOR	EBA	0.527	0.421	0.000	1.000	227
irbaRET	EBA	0.643	0.408	0.000	1.000	218
irbaTOT	EBA	0.460	0.366	0.000	1.000	228
irbCOR	EBA	0.805	0.305	0.000	1.000	227
irbRET	EBA	0.643	0.408	0.000	1.000	218
irbTOT	EBA	0.670	0.308	0.000	1.000	228
lborder	CIA World Factbook	1.980	2.940	0.000	7.420	228
lerner	World Bank	0.197	0.100	0.070	0.400	228
lflight	Author's elaboration based on web resources	5.140	2.810	0.000	7.740	228
listed	World Bank	20.300	17.600	5.090	67.700	228
marketrisk	EBA	0.069	0.068	0.000	0.438	228
moralhazGAP	World Bank	-0.110	1.000	-2.000	2.000	200
moralhazHOME	World Bank	1.340	0.715	0.000	2.000	219
polstabGAP	World Bank	-0.073	0.371	-0.928	0.796	228
regqualGAP	World Bank	-0.061	0.471	-1.170	1.170	228
restricGAP	World Bank	0.040	1.040	-3.000	3.000	125
restricHOME	World Bank	5.670	1.190	4.000	10.000	187
ruleoflawGAP	World Bank	-0.111	0.559	-1.640	1.620	228
voiceGAP	World Bank	-0.065	0.234	-0.869	0.480	228

Table 3. Regression results. Main evidence on the effect of foreign banks on default rates

Model	I	II	III	IV	V	VI
Business sector (BS)	overall portfolio	corporates	retails	overall portfolio	corporates	retails
Dforeign	-0.016**	-0.032**	0.037*	-0.014	-0.027*	0.039
	[0.008]	[0.015]	[0.021]	[0.008]	[0.015]	[0.025]
Dforeign×Dperipheral	-	-	-	-0.016*	-0.026	-0.011
				[0.009]	[0.019]	[0.047]
cet1	-0.067**	-0.171***	-0.296	-0.082**	-0.198***	-0.305
	[0.029]	[0.057]	[0.376]	[0.033]	[0.069]	[0.409]
banksize	0.174	0.018	0.056	0.150	-0.019	0.041
	[0.104]	[0.193]	[0.447]	[0.097]	[0.173]	[0.423]
banksize^2	-0.007*	-0.257***	-0.001	-0.000**	0.000	0.000
	[0.004]	[0.063]	[0.000]	[0.000]	[0.000]	[0.001]
marketrisk	-0.137***	-0.001**	0.278*	-0.151***	-0.278***	0.267
	[0.036]	[0.000]	[0.149]	[0.037]	[0.062]	[0.175]
creditgdp	-0.000**	-0.001**	-0.001	-0.000**	-0.001**	-0.001
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
listed	-0.000**	0.000	0.000	-0.000**	0.000	0.000
	[0.000]	[0.000]	[0.001]	[0.000]	[0.000]	[0.001]
bench	0.010**	0.011**	0.009	0.010**	0.011**	0.009
	[0.004]	[0.005]	[0.008]	[0.004]	[0.005]	[0.009]
insolvcost	0.003**	0.005***	0.001	0.003**	0.005***	0.001
	[0.001]	[0.002]	[0.002]	[0.001]	[0.002]	[0.002]
irbBS	0.028	0.051**	-0.100	0.027	0.049*	-0.100
	[0.018]	[0.025]	[0.087]	[0.017]	[0.025]	[0.087]
constant	-1.078	0.018	-0.129	-0.921	0.263	-0.033
	[0.661]	[1.239]	[2.733]	[0.619]	[1.103]	[2.603]
$\frac{\partial defrateBS}{\partial Dforeign}\Big|_{Dperipheral=1}$	-	-	-	-0.029***	-0.053***	0.028
Adj R-squared	0.197	0.257	0.065	0.199	0.259	0.061
F statistic (p-value)	0.000	0.000	0.000	0.000	0.000	0.000
Obs	221	220	211	221	220	211

The table shows the impact of the presence of foreign banks on the credit default rates. All the regressions are estimated through OLS. The table reports the derivative of the default rate in the overall credit portfolio (Model IV) and for the corporate (Model V) and retail (Model VI) business segments with respect to *Dforeign* evaluated only for peripheral European countries (*Dperipheral*=1). The standard errors are clustered at the bank level and appear in parentheses. *, ** and *** indicate statistical significance of the parameters at the 10%, 5% and 1% significance levels, respectively.

Table 4. Regression results. Technology availability effect

Model	I	II	III	IV
Business sector (BS)	overall portfolio	overall portfolio	corporates	retails
Dforeign	-0.010	-0.016*	-0.023	0.199*
	[0.015]	[0.008]	[0.022]	[0.102]
Dforeign×irbaBS	-0.017	-	-0.019	-0.207*
	[0.023]		[0.027]	[0.109]
Dforeign×Dperipheral×irbaBS	-	-0.018	-	-
		[0.014]		
banksize	0.177*	0.172	0.038	-0.131
	[0.104]	[0.104]	[0.192]	[0.347]
banksize^2	-0.007*	-0.007*	-0.002	0.004
	[0.004]	[0.004]	[0.007]	[0.014]
marketrisk	-0.145***	-0.141***	-0.261***	0.281*
	[0.044]	[0.037]	[0.066]	[0.141]
cet1	-0.064**	-0.073**	-0.166***	-0.318
	[0.029]	[0.030]	[0.055]	[0.379]
creditgdp	-0.000**	-0.000**	-0.001**	-0.001**
	[0.000]	[0.000]	[0.000]	[0.000]
listed	-0.000**	-0.000**	0.000	0.000
	[0.000]	[0.000]	[0.000]	[0.000]
bench	0.010**	0.010**	0.011**	0.007
	[0.004]	[0.004]	[0.005]	[0.009]
insolvcost	0.003**	0.003**	0.005***	0.002
	[0.001]	[0.001]	[0.002]	[0.002]
irbBS	0.035	0.027	0.057**	0.075**
	[0.025]	[0.017]	[0.027]	[0.035]
constant	-1.117	-1.066	-0.144	0.980
	[0.669]	[0.660]	[1.237]	[2.157]
$\frac{\partial defrateBS}{\partial Dforeign}\big|_{irbaBS\ median}$	-0.019***	-0.026***	-0.037**	0.017
$\frac{\partial defrateBS}{\partial Dforeign}\big|_{irbaBS\ 3rd\ quartile}$	-0.023***	-0.030***	-0.040**	-0.005
Adj R-squared	0.199	0.195	0.257	0.090
F statistic (p-value)	0.000	0.000	0.000	0.000
Obs	221	221	220	211

The table shows the impact of the presence of foreign banks on the credit default rates. All the regressions are estimated through OLS. The table reports the derivative of the default rate in the overall credit portfolio (Models I–II), and for the corporate (Model III) and retail (Model IV) business segments with respect to *Dforeign* evaluated at the median and the third quartile of the intensity use of the A-IRB model in each business segment considered. The standard errors are clustered at the bank level and appear in parentheses. *, ** and *** indicate statistical significance of the parameters at the 10%, 5% and 1% significance levels, respectively.

Table 5. Regression results. Related/connected-party transaction effect

Model	I	II	III	IV
Business sector (BS)	overall portfolio	overall portfolio	overall portfolio	overall portfolio
Dforeign	0.099**	-0.026***	-0.017*	-0.015
	[0.044]	[0.007]	[0.009]	[0.009]
Dforeign×Lflight	-0.017***	-	-	-
	[0.006]			
Dforeign×Lborder	-	0.004**	-	-
		[0.002]		
Dforeign×Dlanguage	-	-	0.005	-
			[0.015]	
Dforeign×Dreligion	-	-	-	-0.006
				[0.008]
cet1	-0.056**	-0.069**	-0.069**	-0.070**
	[0.027]	[0.027]	[0.029]	[0.028]
banksize	0.160	0.167	0.176*	0.173
	[0.101]	[0.102]	[0.103]	[0.104]
banksize^2	-0.006	-0.007*	-0.007*	-0.007*
	[0.004]	[0.004]	[0.004]	[0.004]
marketrisk	-0.127***	-0.128***	-0.135***	-0.137***
	[0.035]	[0.034]	[0.036]	[0.036]
creditgdp	-0.001**	-0.000**	-0.000**	-0.000**
	[0.000]	[0.000]	[0.000]	[0.000]
listed	0.000	0.000	-0.000**	-0.000**
	[0.000]	[0.000]	[0.000]	[0.000]
bench	0.009**	0.010**	0.010**	0.009**
	[0.004]	[0.004]	[0.004]	[0.005]
insolvcost	0.003**	0.003**	0.003**	0.003**
	[0.001]	[0.001]	[0.001]	[0.001]
irbBS	0.026	0.027	0.028	0.027
	[0.017]	[0.017]	[0.018]	[0.017]
constant	-0.995	-1.043	-1.091	-1.068
	[0.646]	[0.647]	[0.653]	[0.657]
$\frac{\partial defrateBS}{\partial Dforeign}\big|_{distance\ median}$	0.010	-0.018**	-0.012	-0.021***
$\frac{\partial defrateBS}{\partial Dforeign}\big|_{distance\ 3rd\ quartile}$	-0.022***	-0.002	-	-
Adj R-squared	0.209	0.220	0.194	0.194
F statistic (p-value)	0.000	0.000	0.000	0.000
Obs	221	221	221	221

The table shows the impact of the presence of foreign banks on the credit default rates. All the regressions are estimated through OLS. The table reports the derivative of the default rate in the overall credit portfolio with respect to *Dforeign* evaluated at the median and the third quartile of *Lflight* (Model I) and *Lborder* (Model II) and for countries that share the same language (*Dlanguage=1*) and religion (*Dreligion=1*) in Models III and IV, respectively. The standard errors are clustered at the bank level and appear in parentheses. *, ** and *** indicate statistical significance of the parameters at the 10%, 5% and 1% significance levels, respectively.

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Table 6. Regression results. Bank corporate governance effect

Model	I	II	III	IV
Business sector (BS)	overall portfolio	overall portfolio	overall portfolio	overall portfolio
Dforeign	-0.019**	0.064	-0.020**	-0.023
	[0.009]	[0.087]	[0.009]	[0.019]
CEOage	0.000	0.001	-	-
	[0.001]	[0.001]		
Dforeign×CEOage	-	-0.001	-	-
		[0.002]		
CEOyear	-	-	-0.001	-0.002*
			[0.001]	[0.001]
Dforeign×CEOyear	-	-	-	0.000
				[0.002]
cet1	-0.058	-0.054	-0.095**	-0.094**
	[0.035]	[0.037]	[0.043]	[0.043]
banksize	0.244*	0.257*	0.241*	0.231
	[0.130]	[0.135]	[0.127]	[0.148]
banksize^2	-0.010*	-0.010*	-0.010*	-0.009
	[0.005]	[0.005]	[0.005]	[0.006]
creditgdp	-0.000*	-0.000*	-0.000*	-0.000*
	[0.000]	[0.000]	[0.000]	[0.000]
listed	0.000	0.000	-0.000*	0.000
	[0.000]	[0.000]	[0.000]	[0.000]
bench	0.009*	0.009*	0.009*	0.009*
	[0.005]	[0.005]	[0.005]	[0.005]
insolvcost	0.002*	0.002*	0.003*	0.003*
	[0.001]	[0.001]	[0.001]	[0.001]
irbBS	0.023	0.022	0.020	0.020
	[0.018]	[0.018]	[0.018]	[0.018]
constant	-1.550*	-1.697*	-1.499*	-1.431
	[0.822]	[0.874]	[0.817]	[0.954]
$\frac{\partial defrateTOT}{\partial Dforeign}\big|_{CEO\ index\ 1st\ quartile}$	-	-0.012	-	-0.022
$\frac{\partial defrateTOT}{\partial Dforeign}\big|_{CEO\ index\ median}$	-	-0.014	-	-0.021*
$\frac{\partial defrateTOT}{\partial Dforeign}\big|_{CEO\ index\ 3rd\ quartile}$	-	-0.025**	-	-0.019**
Adj R-squared	0.144	0.143	0.155	0.151
F statistic (p-value)	0.001	0.001	0.001	0.001
Obs	199	199	199	199

The table shows the impact of the presence of foreign banks on the credit default rates. All the regressions are estimated through OLS. The table reports the derivative of the default rate in the overall credit portfolio with respect to *Dforeign* evaluated at the first quartile, median and third quartile of *CEOage* (Model II) and *CEOyear* (Model IV). The standard errors are clustered at the bank level and appear in parentheses. *, ** and *** indicate statistical significance of the parameters at the 10%, 5% and 1% significance levels, respectively.

Table 7. Regression results. Bank regulation effect

Model	I	II	III	IV
Business sector (BS)	overall portfolio	overall portfolio	overall portfolio	overall portfolio
Dforeign	0.060	0.014	-0.029***	-0.021**
	[0.040]	[0.023]	[0.009]	[0.008]
Dforeign×restricHOME	-0.015*	-	-	-
	[0.008]			
Dforeign×moralhazHOME	-	-0.025*	-	-
		[0.014]		
Dforeign×restricGAP	-	-	-0.007*	-
			[0.004]	
Dforeign×moralhazGAP	-	-	-	-0.016*
				[0.009]
cet1	-0.040	-0.054**	-0.084	-0.071**
	[0.027]	[0.025]	[0.132]	[0.027]
banksize	0.239*	0.210*	0.187	0.265*
	[0.126]	[0.117]	[0.129]	[0.140]
banksize^2	-0.010*	-0.008*	-0.007	-0.011*
	[0.005]	[0.005]	[0.005]	[0.005]
marketrisk	-0.138***	-0.141***	-0.079	-0.159***
	[0.048]	[0.038]	[0.109]	[0.046]
creditgdp	-0.001	-0.001**	-0.001	-0.001**
	[0.000]	[0.000]	[0.000]	[0.000]
listed	0.000	-0.001**	-0.001**	-0.001**
	[0.000]	[0.000]	[0.000]	[0.000]
bench	0.009*	0.009**	0.014***	0.010**
	[0.005]	[0.004]	[0.004]	[0.004]
insolvcost	0.004**	0.004**	0.003**	0.004**
	[0.002]	[0.002]	[0.001]	[0.002]
irbBS	0.034*	0.034*	0.026*	0.038*
	[0.019]	[0.020]	[0.015]	[0.022]
constant	-1.511*	-1.325*	-1.195	-1.677*
	[0.791]	[0.746]	[0.820]	[0.894]
$\dfrac{\partial defrateTOT}{\partial Dforeign}\Big|_{reg.index\ average}$	-0.025**	-0.020**	-0.029***	-0.020**
Adj R-squared	0.202	0.240	0.453	0.233
F statistic (p-value)	0.000	0.000	0.000	0.000
Obs	180	212	122	197

The table shows the impact of the presence of foreign banks on the credit default rates. All the regressions are estimated through OLS. The table reports the derivative of the default rate in the overall credit portfolio with respect to *Dforeign* evaluated at the average of *restricHOME* (Model I), *moralhazHOME* (Model II), *restricGAP* (Model III) and *moralhazGAP* (Model IV). The standard errors are clustered at the bank level and appear in parentheses. *, ** and *** indicate statistical significance of the parameters at the 10%, 5% and 1% significance levels, respectively.

Table 8. Regression results. Bank competition effect – overall portfolio

Model	I	II	III	IV	V	VI
Dforeign	-0.016**	-0.029*	-0.016*	-0.018*	-0.016*	-0.034*
	[0.008]	[0.017]	[0.008]	[0.009]	[0.008]	[0.017]
cet1	-0.085**	-0.085**	-0.074***	-0.058**	-0.061**	-0.064**
	[0.035]	[0.035]	[0.026]	[0.023]	[0.030]	[0.030]
banksize	0.147	0.147	0.178*	0.124	0.170*	0.162
	[0.105]	[0.106]	[0.102]	[0.112]	[0.101]	[0.100]
banksize^2	-0.006	-0.006	-0.007*	-0.005	-0.007*	-0.007
	[0.004]	[0.004]	[0.004]	[0.004]	[0.004]	[0.004]
marketrisk	-0.108***	-0.107***	-0.139***	-0.133***	-0.135***	-0.138***
	[0.037]	[0.037]	[0.037]	[0.039]	[0.034]	[0.034]
creditgdp	-0.000**	-0.000**	-0.000*	-0.000*	-0.001*	-0.001*
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
listed	0.000	0.000	-0.000**	-0.000**	-0.001	-0.001
	[0.000]	[0.000]	[0.000]	[0.000]	[0.001]	[0.001]
bench	0.007***	0.007***	0.010**	0.010**	0.007	0.007
	[0.002]	[0.002]	[0.004]	[0.004]	[0.007]	[0.007]
insolvcost	0.003**	0.003**	0.002*	0.002*	0.003*	0.003*
	[0.001]	[0.001]	[0.001]	[0.001]	[0.002]	[0.002]
irbBS	0.021	0.021	0.026	0.028*	0.028	0.028
	[0.018]	[0.018]	[0.017]	[0.017]	[0.018]	[0.018]
H-statistic	0.022	0.007	-	-	-	-
	[0.024]	[0.033]				
Dforeign×H-statistic	-	0.020	-	-	-	-
		[0.029]				
boone	-	-	0.095*	0.273**	-	-
			[0.052]	[0.110]		
Dforeign×boone	-	-	-	-0.224*	-	-
				[0.133]		
lerner	-	-	-	-	0.107	0.037
					[0.164]	[0.175]
Dforeign×lerner	-	-	-	-	-	0.089
						[0.064]
constant	-0.910	-0.903	-1.092*	-0.747	-1.063	-0.996
	[0.664]	[0.666]	[0.648]	[0.712]	[0.649]	[0.644]
$\frac{\partial defrateTOT}{\partial Dforeign}\Big\|_{comp.index\ 1st\ quartile}$	-	-0.017**	-	-0.011	-	-0.026**
$\frac{\partial defrateTOT}{\partial Dforeign}\Big\|_{comp.index\ median}$	-	-0.016*	-	-0.011*	-	-0.017*
$\frac{\partial defrateTOT}{\partial Dforeign}\Big\|_{comp.index\ 3rd\ quartile}$	-	-0.014	-	-0.022**	-	-0.010
Adj R-squared	0.135	0.131	0.199	0.203	0.198	0.198
F statistic (p-value)	0.000	0.000	0.000	0.000	0.000	0.000
Obs	213	213	221	221	221	221

All the regressions are estimated through OLS. The table reports the derivative of the default rate in the overall credit portfolio with respect to *Dforeign* evaluated at the first quartile, median and third quartile of the H-statistic (Model II), Boone indicator (Model IV) and Lerner index (Model VI).

Table 9. Regression results. Legal and institutional gap effect – overall portfolio

Model	I	II	III	IV	V
Dforeign	-0.015*	-0.011	-0.012	-0.013	-0.012
	[0.008]	[0.010]	[0.009]	[0.008]	[0.009]
Dforeign×regqualGAP	0.016	-	-	-	-
	[0.011]				
Dforeign×polstabGAP	-	0.039**	-	-	-
		[0.019]			
Dforeign×voiceGAP	-	-	0.049**	-	-
			[0.021]		
Dforeign×goveffGAP	-	-	-	0.026*	-
				[0.013]	
Dforeign×ruleoflawGAP	-	-	-	-	0.024**
					[0.012]
cet1	-0.042	-0.055	-0.039	-0.030	-0.030
	[0.038]	[0.034]	[0.032]	[0.035]	[0.035]
banksize	0.201*	0.206**	0.254**	0.199*	0.203*
	[0.103]	[0.099]	[0.117]	[0.109]	[0.111]
banksize^2	-0.008*	-0.009**	-0.010**	-0.008*	-0.008*
	[0.004]	[0.004]	[0.005]	[0.004]	[0.004]
cet1gov	-0.246***	-0.202**	-0.248***	-0.219***	-0.214***
	[0.084]	[0.079]	[0.074]	[0.080]	[0.072]
marketrisk	-0.121***	-0.137***	-0.122***	-0.119***	-0.118***
	[0.033]	[0.038]	[0.035]	[0.034]	[0.033]
creditgdp	-0.000*	-0.000**	-0.000**	-0.000*	-0.000*
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
listed	-0.000**	0.000	-0.000*	-0.000**	-0.000**
	[0.000]	[0.000]	[0.000]	[0.000]	[0.000]
bench	0.011**	0.009*	0.012**	0.012**	0.012***
	[0.005]	[0.004]	[0.004]	[0.005]	[0.005]
insolvcost	0.003**	0.004**	0.004**	0.004***	0.004***
	[0.001]	[0.002]	[0.001]	[0.001]	[0.001]
irbBS	0.030*	0.035*	0.033*	0.032*	0.033*
	[0.018]	[0.021]	[0.020]	[0.019]	[0.019]
constant	-1.265*	-1.257**	-1.600**	-1.266*	-1.292*
	[0.656]	[0.621]	[0.746]	[0.697]	[0.709]
$\frac{\partial defrateTOT}{\partial Dforeign}\big|_{legal\ index\ 1st\ quartile}$	-0.018**	-0.025***	-0.021***	-0.018**	-0.020**
$\frac{\partial defrateTOT}{\partial Dforeign}\big|_{legal\ index\ 3rd\ quartile}$	-0.014*	-0.006	-0.008	-0.011	-0.010
Adj R-squared	0.204	0.232	0.214	0.212	0.220
F statistic (p-value)	0.000	0.000	0.000	0.000	0.000
Obs	221	221	221	221	221

The table shows the impact of the presence of foreign banks on the credit default rates. All the regressions are estimated through OLS. The table reports the derivative of the default rate in the overall credit portfolio with respect to *Dforeign* evaluated at the first quartile and third quartile of the legal and institutional gap indicators considered. The standard errors are clustered at the bank level and appear in parentheses. *, ** and *** indicate statistical significance of the parameters at the 10%, 5% and 1% significance levels, respectively.

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