

The Impact of the Internal-Rating-Based Approach on Lending Growth and the Cost of Financial Intermediation

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Extended abstract

Since the global financial crisis erupted in the second half of 2007, the re-design of bank capital regulation has been put at the core of the policy debate on how to regulate the banking industry.

The new capital regulatory framework proposed in 2010 (Basel III) maintains key characteristics in common with the previous regulatory accord (Basel II). However, despite being still central for the architecture of capital regulation, little is known on the implications that the adoption of Basel II has produced on bank business policies. In particular, little attention has been dedicated to understand whether bank customers benefit from the use of the highly risky sensitive internal rating based (IRB) approach to measure credit risk introduced by Basel II (and confirmed by Basel III).

For a cross-country sample of large banks located in 44 high income countries, we examine whether the adoption of the IRB approach to measure credit risk impacts on the lending growth and the cost of financial intermediation. While we find that the use of the IRB approach has not affected the growth of credit, it has led to a significant increase in the cost of financial intermediation as measured by a bank net interest margin. This result is robust to numerous changes to the baseline specification and it is not driven by unobserved fluctuations in the demand for credit.

Furthermore, we find that the increase in the cost of financial intermediation due to the adoption of the IRB approach is greater for larger banks and is confined to bank-oriented countries where firms have less alternative funding sources respect to bank credit. Overall, our results do not seem to suggest that the increase in the cost of financial intermediation is related to cost inefficiencies generated by the adoption of a more sophisticated credit risk approach by banks. In contrast, they seem to imply that IRB adopters take advantage of their market position to pass through additional costs to their customers after the implementation of Basel II.

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1. Introduction

This paper examines whether the adoption of a highly risk-sensitive approach in computing capital requirements by banks affects lending growth and the cost of financial intermediation. Risk-based capital requirements have been a cornerstone of banking regulation since the late eighties when they were introduced with the purpose of safeguarding bank stability (Acharya et al., 2013; Demirgüç-Kunt et al., 2013; Jackson et al., 1999; Vallascas and Hagendorff, 2013).

Over recent years the design of the risk sensitivity of capital requirements has been characterized by significant revisions – culminating in the adoption of the Basel II Accord. While in response to the recent global financial crisis – and the related concerns over bank capital adequacy (Demirgüç-Kunt et al., 2013; Miles et al., 2012) – capital regulation has been further revised, the Basel II Accord still provides the building blocks of the most recent formulation of the capital requirements known as Basel III (Feess and Hege, 2012).

In general, the revisions of capital regulation attempt to achieve a much tighter nexus between the amount of capital banks are required to hold and their portfolio risk, with a significant increase in the differentiation of the risk weights within a given asset class – in particular loans (BIS, 2006; Borio, 2008; Mariathasan and Merrouche, 2014; Ruthenberg and Landskroner, 2008). Along these lines, the revisions introduce the possibility of banks opting for different approaches in quantifying credit risk and in particular offer the possibility to employ systems based on internal rating models that ensure the highest risk-sensitivity of capital requirement (Repullo and Suarez, 2004).

A number of theoretical models have highlighted potential differences in bank behavior following the adoption of the IRB approach (Repullo and Suarez, 2004; Ruthenberg and Landskroner, 2008), and several studies conducted pre the adoption of Basel II have speculated on its potential effects (Ayuso et al., 2004; Liebig et al., 2007). The empirical literature post-adoption is, however, surprisingly limited and mostly concerned on aspects related to the arbitrage opportunities in terms of bank capital arising from

Basel II and especially from the IRB approach. For instance, Vallascas and Hagendorff (2013) show that the risk-weighted assets (RWAs) computed under Basel II rules remain loosely correlated with a market measure of portfolio risk also for IRB adopters.

Other studies have more directly focused on the manipulations of risk weights by IRB banks (see Behn et al., 2016; Begley et al., 2016; and Mariathasan and Merrouche, 2014) as an attempt to gain flexibility in strategic and operational management. For instance, Behn et al. (2016) show that large banks assigned relatively low risk weights to loans under internal models in spite of being aware of the true risks when pricing them. Begley et al. (2016) show that low capitalized banks underreported risks in their trading book while Mariathasan and Merrouche (2014) provide evidence suggesting that banks, especially if low capitalized, have manipulated risk weights because of aiming at reducing the amount of RWAs. More recently Beltratti and Paladino (2016) demonstrate that, differently from banks complying with Basel I, there is no evidence of a relationship between a bank's cost of equity and risk weighted assets for IRB banks. They interpret this finding as indicating that banks – for which is more expensive to hold capital – engage more aggressively in reducing risk-weighted assets under the IRB approach.

None the existing studies has, however, directly focused on the implications of the IRB approach for bank customers in terms of lending volume and the cost of financial intermediation. This is particularly unfortunate given that an assessment of how different forms of risk-sensitivity of capital requirements influence bank behavior and affect bank customers appears important to the optimal design of capital regulation and to reduce the unattended consequences for the real economy. Furthermore, an understanding of the effects of the IRB approach has become even more pivotal since numerous countries have initiated the process of adopting Basel III (and the related revisions in the risk-sensitivity of capital requirements) since 2013 (BIS, 2013).

We base our analysis on a unique dataset of the adoption of Basel II covering the period from 1992 to 2012 and including 2,550 banks located in 44 high income countries that we complement with bank-

level information on the adoption of the Internal Rating Based (IRB) Approach for banks complying with Basel II. We construct our empirical tests around the effects of capital regulation on the substitution between asset classes and the cost of financial intermediation.

Our paper provides various contributions to the existing literature. Specifically, our initial results show that the adoption of the IRB approach has not produced incentives for banks to implement portfolio adjustments across asset classes with a consequent decline in lending growth. This conclusion is independent from the way we define bank lending, holds when we control for possible demand shocks and is confirmed across small and large banks. In general, the adoption of the IRB does not seem to have implications on lending dynamics during the observed period. Nonetheless, we find that IRB adopters significantly increase the cost of financial intermediation borne by their customers – as proxied by the Net Interest Margin (NIM). Furthermore, we show that the increase in the cost of financial intermediation due to the adoption of the IRB approach is greater for larger banks and is confined to bank-oriented countries where firms have less alternative funding sources respect to bank credit. Overall, our results do not seem to suggest that the increase in the cost of financial intermediation is related to cost inefficiencies generated by the adoption of a more sophisticated credit risk approach by banks. In contrast, they seem to imply that IRB adopters take advantage of their market position to pass through additional costs to their customers after the implementation of Basel II.

The remainder of the paper is organized as follows. Section 2 describes the sample of banks, how we have constructed the dataset on the adoption of Basel II at the country level, and the econometric model. Section 3 reports the results of the impact of the Basel II-IRB Approach on the growth of lending, while Section 4 examines the effects produced on the cost of financial intermediation. Section 5 reports some additional analyses. Finally, Section 6 presents conclusions.

2. Data and Methodology

2.1 *The sample of banks*

To construct our international sample of banks, we rely on bank-level data provided by BankScope – Bureau van Dijk. This database collects banks' financial statements in a standardized manner, thus favoring reliable cross-country studies (Nguyen, 2012; Saunders and Schumacher, 2000). To reduce the country-heterogeneity characterizing such database, we decide to focus our study only on banks located in high-income countries – as they are supposed to be the ones who more quickly adapt their financial environment to the international regulatory changes. Our dataset contains yearly data on banks' balance sheets and income statements for the period spanning from the year of adoption of Basel I (which varies country by country) to 2012. In this way, we are able to achieve a proper estimation of the effects related to the use of the IRB Approach – during Basel II – compared to first Basel Accord. Moreover, the observations under Basel I serve as a control group – which is essential for this kind of analysis (see Berger and Udell, 1994). Additionally, our dataset focuses on banks whose main activity is lending, thus to have an appropriate estimation about the possible impact that a change in risk based regulation (i.e., Basel II vs. Basel I) may have caused to the growth of credit and to the cost of financial intermediation. Specifically, we maintain in the sample only banks that are classified as commercial, cooperative, savings, and real estate & mortgage banks by BankScope. Furthermore, in order to avoid any duplicate issues related to banks that present both consolidated and unconsolidated statements, and to banks that are consolidated within the balance sheet of another bank, we keep only accounting information from the unconsolidated annual report as in Beck et al. (2013), De Mooij and Keen (2016), Fungáčová et al. (2014), Lepetit et al. (2014). This choice allows us to achieve a better assessment of the impact that the adoption of the more risk-sensitive IRB Approach has produced on the credit growth and the net interest margin of the banks, as unconsolidated statements do not reflect the activity of the whole banking group. Indeed, since the activity of a banking group can be supranational, it might then reflect

the influence of differences in capital regulations across countries. However, we include the consolidated statements when unconsolidated data are not available (Beck et al., 2013; Lepetit et al., 2014).

Furthermore, to avoid the risk of an excessive concentration of the sample on a limited number of countries, for each country we select only those banks that, based on a yearly ranking, are classified among the top 50 largest banking firms at least once throughout the sample and we exclude countries that do not reach a minimum number of observations of at least equal to 50 during the sample period. Additionally, we maintain in the sample only those banks that we were able to gather information on the specific type of Basel II-credit risk approach adopted.³ Finally, similarly to De Haas and Van Lelyveld (2014), we control for the effects of mergers and acquisitions by removing observations where the annual growth in total earning assets exceeds 75%.

TABLE 1 HERE

The application of the selection criteria described above leads us to a final sample of 23,945 bank-year observations pertaining to 2,550 banks chartered in 44 countries. Table 1 provides the detail of the total observations and the number of banks by country.

2.2 The capital regulation database

We compile our database on the adoption of Basel I and Basel II at the country level by gathering information from various sources that we describe in detail in the Online Appendix. We employ the collected information on Basel I to define the beginning of our sample period (which varies country by country). Moreover, the information on Basel II is essential to define the date of adoption of the second Basel Accord.

³ It is worth noting here that, because of the language difficulties encountered when scrutinizing Russian banks' Annual Reports, and also in light of the fact that since the adoption of Basel II in 2010 (see BIS, 2016) many Russian banks still declared to compute capital requirements according to Basel I rules, we decided to drop from our sample those Russian banks for which we were not able to individually gather precise information on the approach used to compute the regulatory capital.

FIGURE 1 HERE

Figure 1 shows a geographical map of the distribution of our sample by year of adoption of Basel II. Early Basel II-adopters (within 2008) are highlighted with light shading and represent the majority of the countries in our sample (37 out of 44). Specifically, they include most of the Western nations (ranging from very early adopters like Japan, to the EU members which completed the upgrade to the new regulatory framework between 2007 and 2008) as well as some Middle East territories, such as Kuwait, Oman, Qatar, Bahrain, Saudi Arabia, and United Arab Emirates. Countries that adopted Basel II between 2009 and 2012 are highlighted in darker shading. This group includes a total of 4 countries, namely Israel (2009), Croatia and Russia (2010), and Uruguay (2012). Finally, late adopters are highlighted with the darkest shading and include the remaining 3 countries that, as of December 2012, had not implemented Basel II yet (i.e., Bahamas, Chile, and USA).⁴

Table 2 displays the sample distribution according to the capital adequacy regime. Approximately 79.5% of our sample, equivalent to a total number of 19,057 observations, corresponds to a period within Basel I – that is a reasonable control group with respect to the adoption of the IRB Approach. Furthermore, about 20.5% is made up of observations falling under the Basel II regime.

TABLE 2 HERE

Under Basel II banks can opt for different approaches to measure the capital requirements of the loan portfolio; the Internal Rating Based (IRB) approach links the regulatory risk weights directly to the borrower's probability of default, while the Standardized Approach (SA) maintains more similarities with the Basel I regime. To test how the more risk-sensitive IRB approach impacts on the growth of lending and on the banks' net interest margins, we inspect the annual reports of the sampled banks to identify whether a bank has chosen the IRB option.

⁴ Although US regulators have started the process of introducing Basel II regulation since 2007 and require the very largest banks to report both Basel I and Basel II calculations of capital requirements in parallel, as of December 2012 none of the US banks had received formal approval to shift to the Basel II regime. As a consequence, the reported information in the annual reports still refers to the Basel I Accord and its rules.

As highlighted in Table 2, our sample includes 1,477 bank-year observations of banks adopting the IRB approach and 3,411 bank-year observations of banks using SA. To the best of our knowledge, this is the most extensive dataset available with such detailed data on the two different Basel II methods. We, therefore, employ the additional information on the approach employed by Basel II banks to create a dummy that is the key part of our empirical analysis. More specifically, we construct an **IRB** dummy that is equal to one during the years in which banks opt for the IRB approach.

2.3 *Dependent variables*

In this section we describe the dependent variables that we employ to analyze the potential effects of the adoption of the Basel II-IRB approach on credit growth and the cost of financial intermediation. Key descriptive statistics for these dependent variables are reported in Panel B of Table 3.

2.3.1 *Credit growth*

A highly risk-sensitive capital regulation may lead banks to reduce their exposures to high capital absorbing assets, such as loans, in order to easily meet capital requirements (inter alia, Fratzscher et al., 2016). The occurrence of such event might then generate credit crunch phenomena at the expenses of borrowers (Behn et al., 2016). To analyze the impact that the adoption of the IRB approach may have on the dynamics of bank lending, we employ as our main dependent variables the growth rate of total bank loans.

We compute the growth rate in constant (or real) values, thus corrected for inflation through the national GDP deflator, and in local currencies in order to avoid our results being driven by fluctuations in exchange rates and not by actual bank business choices. More precisely, following Dinç (2005), we compute the growth in gross lending scaled by the gross value of earning assets from the previous year, i.e., $(Gross\ Loans(t) - Gross\ Loans(t-1))/Gross\ Earning\ Assets(t-1)$ to describe the evaluation of bank lending activity. We focus on gross loans instead of net loans because changes in the latter can be

influenced by a worsening in credit risk (De Haas and Van Lelyveld, 2014) rather than by changes in bank lending volumes.

In additional tests, we also assess the impact of capital regulation on the growth rate of corporate loans, computed via the increase of corporate loans in year t normalized by gross earning assets from the previous year, i.e., $(Corporate\ Loans(t) - Corporate\ Loans(t-1))/Gross\ Earning\ Assets(t-1)$. Although this variable is available only for a significantly smaller sample of banks (specifically, the sample size declines from 23,945 to 9,480 observations), it might help to understand the implication of the IRB approach on bank lending. Under the IRB approach the capital requirements vary with a borrower's default probability with loans to corporate borrowers representing the most risk-sensitive loan category⁵. It follows that under the IRB approach banks might effectively optimize the use of their capital base by acting on the portfolio of corporate loans rather than on other loans categories.

2.3.2 Cost of Financial Intermediation

The second set of tests focuses on the impact of the IRB approach on the cost of financial intermediation. We employ the bank net interest margin as a proxy for the cost of intermediation borne by the bank's customers. This is defined as the spread between banks' interest income and interest expense scaled by total earning assets, i.e., $(Interest\ Income - Interest\ Expense)/Total\ Earning\ Assets$. While the new regulatory waves that followed the first capital Accord are aimed at increasing the financial soundness of banks (BIS, 2006; Beltratti and Paladino, 2016), not much attention has been devoted to the possible effects that the adoption of a more sophisticated risk-based regulation might cause to borrowers beyond the volume of lending available.

Despite the lack of attention, there are two possible contrasting effects that the adoption of the IRB approach might have produced on the cost of financial intermediation. First, the IRB approach might have

⁵ For example (based on BIS, 2006), for the same PD (probability of default), corporate exposures require higher risk-weights than mortgages. The difference in terms of risk-weights between the two asset classes widens with decreased PDs. In fact, if we take PDs of 2.5%, 1.3%, 0.5%, we observe capital charges respectively amounting to 122.16%, 100.95%, 69.61% for the corporate exposure, and to 100.64%, 67%, 35.08% for the exposure in mortgages, highlighting a differential in risk-weights of about 21.52, 33.95 and 34.53 percentage points. This suggests that a significant capital saving can also emerge when banks reduce corporate lending to safe borrowers.

reduced capital requirements (see, for instance, Antão and Lacerda, 2011; Hamadi et al., 2016) with a consequent decrease in the cost of financial intermediation (related to a decline in a bank weighted average cost of capital). Second, the setup and implementation of an IRB system is expected to be costly for banks (Antão and Lacerda, 2011; Hakenes and Schnabel, 2011; Hamadi et al., 2016; Ruthenberg and Landskroner, 2008). Accordingly, banks might have taken advantage of their market position to transfer such cost to the borrowers via the intermediation function.

2.4 *Econometric approach and control variables*

We employ a similar econometric analysis as in Barajas et al. (2005), Guidara et al. (2013), and Wagster (1999). Essentially, we define the introduction of the Basel II-IRB approach as a regulatory change and study how lending growth and net interest margin are affected by such change.

To this end, we estimate panel models via the within estimator that allows us to control for unobserved bank heterogeneity caused by factors that remain constant across the sample period at the bank level. This estimator, by computing a separate intercept for each bank, strips out cross-sectional variation before estimating the slope coefficients. This approach is, therefore, well suited to capturing variations in lending growth and the cost of intermediation at the level of individual banks over time.

Moreover, all the models include country-per-year fixed effects (FE). This allows us to address concerns that our results may be driven by unobserved demand fluctuations (similarly to Bertay et al., 2015; Giannetti and Laeven, 2012). Standard errors have been corrected for heteroskedasticity and are clustered either at the bank-level or the country-level to remove any estimation bias resulting from within-group correlation in the sample. More formally, the general specification of our model is the following:

$$y_{it} = \alpha_i + \delta IRB_{i,k,t} + \beta X_{it-1} + \gamma Z_{k,t} + \varepsilon_{it} \quad (1)$$

where y_{it} is one of the dependent variables, described in the previous section, for bank i at time t ; α_i is the bank-specific intercept; $IRB_{i,k,t}$ is our dummy that allows us to evaluate the impact of the Internal-

Rating Based Approach (under Basel II) on lending growth and the cost of financial intermediation; X_{it-1} is a vector of lagged bank-control variables (these variables are lagged by one year to reduce simultaneity and endogeneity bias); $Z_{k,t}$ is a vector of country controls; ε_{it} is an idiosyncratic error.

Panel C of Table 3 describes bank and country controls that enter in all specifications. The set of bank controls includes size, the equity to asset ratio, and deposits over total assets. Bank size is measured by the log transformation of bank total assets in constant thousands of US dollars at year 2012. As larger banks usually have a wider investment opportunity set, they should be less incline in expanding their lending activity. Furthermore, large banks are generally expected to show a lower net interest margin, as they operate with lower operating costs for a unit of production – that is scale efficiency (Demirgüç-Kunt et al., 2004).

The equity ratio is a measure of bank soundness and should increase the probability of banks in providing lending (Berger and Udell, 2004). Furthermore, better capitalized banks can achieve higher net-interest margin because of lower funding costs (Demirgüç-Kunt et al., 2004; López-Espinosa et al., 2011). An additional control is the ratio between deposits and total assets with higher values leading to relatively more stable lending (De Haas and Van Lelyveld, 2014), as well as to higher net interest margins (given the lower cost of funding).

The set of country controls described in Panel C consists of the real GDP growth rate, the natural logarithm of GDP, the Herfindahl-Hirschman Index of bank concentration, an index of financial freedom from the Heritage Foundation, a dummy that captures the banks utilizing the International Financial Reporting Standards (IFRS), and a dummy that identifies systemic banking crises. Given the procyclicality of bank credit (see, for instance, Berger and Udell, 2004; Bertay et al., 2015), we expect a positive effect of the real GDP growth rate on lending growth. Furthermore, since banks have larger investment opportunities during booms, borrowers' cost of financial intermediation (as measured via the net interest margin) should decrease in periods of greater economic growth (Poghosyan, 2012).

However, the literature does not converge on a unique assumption about the expected sign of this control on NIMs (Entrop et al., 2015) – for instance, a positive link between the cost of financial intermediation and the business cycle is found by Albertazzi and Gambacorta (2009).

The natural logarithm of GDP per capita, computed as in Dinç (2005), is a measure of economic development. We conjecture that the more a country is developed, the more banks should be inclined to expand their lending activity, and the lower the cost of financial intermediation for borrowers.

We control for banking market concentration (at the country level) measured by the Herfindahl-Hirschman Index of gross loans. A higher level of bank concentration should negatively affect the growth of lending (Boyd et al., 2006). Moreover, since in highly concentrated markets banks charge greater rates on loans and tend to pay lower rates on deposits (Berger and Hannan, 1989; Hannan, 1991), we would expect a consequent increase in net-interest margin (Demirgüç-Kunt et al., 2004).

The index of financial freedom should enter with positive signs in the models for the growth of credit, as banks chartered in countries that are more financially free might be more inclined to provide credit. In contrast, we cannot suggest an unambiguous sign of the financial freedom on NIMs. However, we would expect that the higher the financial freedom, the higher the bank competition, thus the lower the borrowers' cost of financial intermediation.

In order to rule out that our results are driven by the introduction of the IFRS – given that it was nearly concomitant to the adoption of the IRB approach – we include in our analysis a dummy that takes the value of one when banks switched to the new international accounting rules. Finally, we control for bank crises by constructing a dummy based on the dataset compiled by Laeven and Valencia (2012).

Panel D of Table 3 focuses on the ratio between profit before taxes over total assets (ROA) that is used as an additional determinant of lending growth. More profitable banks should have greater opportunities to raise capital by retaining earnings; therefore, they should be characterized by a greater

propensity to expand lending. For this reason, we expect a positive impact of bank profitability on the growth of credit as in Allen et al. (2015).

Finally, Panel E reports variables employed as additional determinants of bank interest-margins. Specifically, we control for the percentage of liquid assets over total assets. Liquid assets – which represent an opportunity cost for the bank – are given a lower remuneration than loans. Therefore a higher liquidity ratio should reduce the bank's interest margin (Demirgüç-Kunt et al., 2004; López-Espinosa et al., 2011).

Loan loss provisions over gross loans (LLP ratio) is used as a proxy for bank credit risk (Angbazo, 1997). Since higher risk should carry greater returns (essential to offset a greater risk of default), a higher LLP ratio should positively affect the cost of financial intermediation (see also López-Espinosa et al., 2011). Fee income – measured by the non-interest income share – is also employed as a determinant of the net interest margin. Indeed, higher values of this variable are expected to reduce interest margins (Entrop et al., 2015) via a decline in loan pricing (Demirgüç-Kunt et al., 2004). Overheads is the ratio between bank overheads and total assets and might proxy for the bank inefficiencies (Demirgüç-Kunt et al., 2004), that the banks may shift to customers via the intermediation function. The bank market share – which proxies for the bank market power – is computed as the ratio of loans of bank i at year t over the sum of loans (at the country-level) in year t . We would anticipate a positive effect of the bank market share on its net interest margin as banks are expected to use their market power to increase profitability (Ho and Saunders, 1981; Boyd and De Nicoló, 2005). Finally, inflation is expected to have a positive impact on the interest margins, following the findings by Demirgüç-Kunt et al. (2004), and Huybens and Smith (1999).

3. The IRB Approach and the growth of lending

Table 4 reports our benchmark specifications that focus on the impact of the IRB Approach on the growth rate of gross loans. More precisely, in Column 1 we report a baseline specification on the

impact of the IRB Approach on the growth rate of gross loans that includes as key controls for bank characteristics bank size, the equity ratio, the deposit ratio, the return on assets (all of them lagged by one year), and a dummy variable to account for the impact of the adoption of the IFRS. We then include in Column 2 some country characteristics; namely, the HHI of gross loans concentration in the domestic banking market, the real GDP growth rate, the natural logarithm of GDP per capita, an index of financial freedom and a dummy variable to account for the impact of banking crises. Both specifications in Column 1) and 2) include Bank FE and Country-Year FE; reported standard errors are clustered at the bank-level. From Column 3) we add to the specification Year FE, while in Column 4) standard errors are clustered at the country-level and not at the bank level.

TABLE 4 HERE

In all specifications the adoption of the IRB Approach does not seem to affect the growth rate of either gross or corporate loans. Furthermore, in unreported tests we find that the same conclusion holds when we employ alternative definitions of the dependent variable.⁶ In contrast, our analysis consistently suggests that the growth rate of loans is significantly affected by bank size (being smaller in larger banks) and by bank profitability (being larger in more profitable banks).

All in all, although the literature has pointed out that that the IRB approach might modify the lending behaviour, by raising the preference of banks for loans with lower capital requirements (Hakenes and Schnabel, 2011; Kroszner, 2007; Ruthenberg and Landskroner, 2008), we do not find that this potential shift in preference leads to any significant effect in terms of lending growth. In the Online Appendix we achieve a similar conclusion when we repeat the analysis for a sub-sample of banks for which we have information on the volume of corporate lending.

One of the limitations of the analysis discussed above is the fact that it does not take into account that the influence of the IRB approach on bank lending might depend on bank characteristics.

⁶ Namely, we find similar results if we employ – as dependent variable – the ratio between the growth rate of gross loans over lagged total assets as well as the ratio between the growth rate of gross loans over lagged total earning assets.

Specifically, investment opportunities and the portfolio composition of large banks might be significantly different from those of smaller institutions. Put it differently, large banks might have more opportunities to engage in forms of regulatory arbitrage that might reduce lending growth in favor of other business lines. From column 5) to column 8), we therefore repeat the analysis by adding – to each of the specifications employed initially – an interaction term between bank size and the IRB dummy. To reduce concerns over multicollinearity, we employ the demean approach in this analysis (see Vallascas and Hagendorff, 2013). In other words, we subtract the sample mean to bank size, before computing the interaction term. Under this new setting, the IRB coefficient expresses the impact of the IRB approach on lending growth for a bank of average size in our sample. The results from these additional tests still confirm the lack of any significant effect of the IRB approach on lending growth: both the IRB dummy and its interaction with size are not significant at customary levels.

In general, this section does not offer indications of any effect of the IRB approach on lending growth and this conclusion holds under different changes in our empirical design including change in the way we define the lending growth variable – in this regard, see also Columns 5-8 of Table A.1 in the Online Appendix.

4. The IRB Approach and the cost of financial intermediation

4.1 The IRB Approach and the cost of financial intermediation

In this section we focus on the effect that the implementation of the IRB Approach generates on the cost of financial intermediation borne by the bank customers by presenting the results of the model described in section 2.4 with the net interest margin as our dependent variable.

We report the estimation results in Table 5. As in the previous section, we start with a baseline specification, reported in column 1) that includes as key controls bank size, the equity ratio, the liquidity ratio, the fee income ratio, the deposit ratio (all of them lagged by one year), and a dummy variable to account for the impact of the adoption of the IFRS. We then extend the model in Column 2) with the

inclusion of the overheads ratio, the LLP ratio and the market share of loans (again, all lagged by one year). Next, in Column 3 we add some country-level controls such as the HHI of gross loans concentration, the real GDP growth rate, the natural logarithm of GDP per capita, the inflation rate and an index of financial freedom while in column 4) we add a dummy variable to account for the impact of banking crises. While all the specifications described above control for bank FE and for country-year FE, column 5) also adds year FE. Finally, in Column 6 standard errors are clustered at the country-level and not at the bank level.

TABLE 5 HERE

In all specifications, we find a significant increase in the cost of financial intermediation after the adoption of the IRB Approach. More precisely, the IRB dummy enters all specifications with a positive coefficient (significant at the 1% level in most cases). In terms of economic impact, the estimated coefficients imply that the introduction of a more sophisticated credit risk approach has led to 0.1 percentage point increase in the cost of financial intermediation. This does not appear a minor increase given that the average net interest margin in the sample is equal to 2.4%.⁷

In terms of controls our results tend to be in line with the existing literature. Specifically, the cost of financial intermediation is larger for highly capitalized banks (as in Demirgüç-Kunt et al., 2004), for banks carrying greater risk (similarly to Maudos and Fernandez de Guevara, 2004), as well as for those institutions with a larger overheads ratio (as posited by Demirgüç-Kunt et al., 2004) and a greater share of deposits. In contrast, larger banks (because of scale efficiency), banks with a higher share of liquid assets (which are remunerated at a lower rate) and fee income ratio, as well as banks located in highly developed countries, are able to reduce the cost of financial intermediation (Demirgüç-Kunt et al., 2004; Entrop et al., 2015; López-Espinosa et al., 2011).

⁷ As stated in Section 2.1, our analysis control for the effects of merger and acquisitions by removing observations where the annual growth in total earning assets exceeds 75% (as in De Haas and Van Lelyveld, 2014). However, one might raise concerns that our findings are driven by the choice of such threshold. In this regard, it is worth noting that our results hold even when utilizing different levels of the growth in total earning assets (40%, 50%, 90%, and 100%) to control for such effects.

Overall, taken together the results of this section and the previous findings on lending growth, our analysis suggests that IRB adopters have passed additional costs to their customers, thus increasing the cost of financial intermediation, after the implementation of Basel II.⁸

4.2 *The IRB Approach and the cost of financial intermediation – interaction with bank size*

We further investigate the impact of the IRB Approach on the cost of financial intermediation by adding an interaction term between our IRB dummy and bank size.⁹ In this way we are able to assess whether the effect of the more risk-sensitive regulation – compared to the previous capital regime (i.e., Basel I) – on the cost of financial intermediation changes with size. More precisely, by conducting this kind of test, we are able to assess whether the increased costs – observed upon the adoption of the IRB Approach – were indiscriminately applied by all the banks or if small/large banks behaved differently.

The results of such test are reported in Panel A of Table 6 where the model specifications in the various columns are similar to those of Table 5, except for the inclusion of an interaction term between bank size and our IRB dummy.

TABLE 6 HERE

Results show that both the bank size and the interaction term consistently play a significant role in affecting the cost of financial intermediation. Specifically, the positive coefficient of the interaction term is signaling that the cost of financial intermediation significantly increases with bank size. Indeed, if we look at Panel B of Table 6, we observe that the marginal effect of the IRB Approach on the net interest margin over bank size is significantly positive from the 75th percentile of bank size and its magnitude is about 0.1%. This highlights that the increase in the cost of financial intermediation due to the adoption of the IRB Approach is greater for those customers who turned to the largest financial institutions. Furthermore, our results underline that the observed increase in the cost of financial

⁸ Our results turn out to be robust if we exclude from our sample the observations related to those banks chartered in countries that – as of December 2012 – had not adopted Basel II yet (i.e., USA, Chile, Bahamas).

⁹ As for Section 3, we employ here the mean-centered value of bank size.

intermediation is not attributable to banks' inefficiencies (as they would have possibly emerged from smaller banks). Rather, they seem to be due to banks taking advantage of their position in the credit-market to shift additional costs to their customers. To corroborate this assertion, we thus perform additional tests to check for differences in bank behavior between bank- and market- based financial systems.

4.3 The IRB Approach and the cost of financial intermediation – bank-oriented vs market-oriented countries

In this section of the paper we repeat our analyses by splitting the sample into bank-oriented and market-oriented countries. By doing so, we can observe whether banks chartered in territories where they play a key role in the economy exploit their position thus behaving differently from those located in market-based economies. To this end, similarly to Beck and Levine (2002), we define bank (market) - oriented countries those territories where the ratio between the bank claims on private sector and the market capitalization of listed companies is above (below) the median value observed in our sample.

TABLE 7 HERE

Interestingly, results in Table 7 highlight that the adoption of the more risk-sensitive IRB Approach by banks located in bank-oriented territories has positively and significantly affected the cost of financial intermediation borne by borrowers (see Columns 1-5). This result does not hold in market-oriented countries where the adoption of the IRB method has not led to an increase in the cost of intermediation (see Columns 6-10). Unsurprisingly, this finding highlights that the banks located in the bank-based financial systems have been more prone to shift additional costs to their customers as a result of the costly setup and adoption of the IRB Approach.

TABLE 8 HERE

In Table 8 we repeat the previous analysis by adding the interaction term between bank size and our IRB dummy. Here we observe that the increase in the cost financial intermediation due to the adoption of the IRB Approach is greater for larger banks (the marginal effect is significantly positive from the

80th percentile of bank size) and is confined to bank-oriented countries where firms have less alternative funding sources respect to bank credit and banks can, therefore, exploit their position in the market to let their customers bear additional costs.

5. Additional Analyses

In this section we discuss a number of robustness tests (tables available upon request).

5.1 Random assignment test

One possible concern with our results is that they are driven by unobservable country characteristics and are then capturing spurious correlations. We conduct a falsification test to rule out this possibility by randomly shuffling the adoption dates of the IRB Approach across the sample. If our main results are driven by unobserved country characteristics, we should still find a significant association between our regulatory dummies and our various dependent variables. On the other hand, if the modifications in bank behavior we have found so far are linked to changes in bank capital regulation, then the reshuffling should remove any possible relation between the two. The results – that we do not report for the sake of brevity – confirm the latter hypothesis, that is, our results are not capturing potential spurious correlations.

5.2 Anticipation effect

Since banks usually know in advance the formal date of adoption of a new capital regulatory regime, they might anticipate changes in their behavior before the enforcement of these new rules. To control for this possibility, we repeat our analysis by including the year before the formal adoption of the new rules as part of the new regulatory regime. For instance, if a bank adopted the IRB Approach in 2008, we include also the 2007 as part of the IRB regime. Overall, this modification tends to broadly confirm our key conclusions.

6. Conclusions

Our study shows that the regulatory framework supporting Basel II–IRB Approach, and broadly confirmed under the recent Basel III Accord, does not amplify the risk of a generalized contraction in lending. This conclusion is independent from the way we define bank lending, holds when we control for possible demand shocks and is confirmed across small and large banks. In general, the adoption of the IRB does not seem to have implications on lending dynamics during the observed period.

In contrast, we find that IRB adopters significantly increase the cost of financial intermediation borne by their customers – as proxied by the Net Interest Margin. Furthermore, we show that the increase in the cost of financial intermediation due to the adoption of the IRB approach is greater for larger banks and is confined to bank-oriented countries where firms have less alternative funding sources respect to bank credit. Overall, our results do not seem to suggest that the increase in the cost of financial intermediation is related to cost inefficiencies generated by the adoption of a more sophisticated credit risk approach by banks. Rather, they seem to imply that IRB adopters take advantage of their market position to pass through additional costs to their customers after the implementation of Basel II.

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Figure 1: Basel II adoption – timeline



Legend:

- Light shading: Early adopters (before 2009)
- Intermediate shading: Late adopters (between 2009 and 2012)
- Darkest shading: Very late adopters (after 2012)

Table 1: Sample Distribution by Country

	Banks		Observations	
	Number	Percentage	Number	Percentage
AUSTRALIA	64	2.51	503	2.10
AUSTRIA	94	3.69	1,013	4.23
BAHAMAS	40	1.57	213	0.89
BAHRAIN	14	0.55	153	0.64
BELGIUM	85	3.33	804	3.36
CANADA	90	3.53	746	3.12
CHILE	37	1.45	354	1.48
CROATIA	49	1.92	421	1.76
CYPRUS	24	0.94	124	0.52
CZECH REPUBLIC	38	1.49	375	1.57
DENMARK	81	3.18	1,056	4.41
FINLAND	22	0.86	150	0.63
FRANCE	153	6.00	1,446	6.04
GERMANY	135	5.29	1,702	7.11
GREECE	30	1.18	292	1.22
HONG KONG	48	1.88	476	1.99
ICELAND	23	0.90	94	0.39
IRELAND	41	1.61	272	1.14
ISRAEL	19	0.75	230	0.96
ITALY	136	5.33	1,284	5.36
JAPAN	82	3.22	1,138	4.75
KUWAIT	8	0.31	128	0.53
LUXEMBOURG	106	4.16	900	3.76
MALTA	12	0.47	98	0.41
NETHERLANDS	76	2.98	544	2.27
NEW ZEALAND	19	0.75	128	0.53
NORWAY	76	2.98	829	3.46
OMAN	12	0.47	96	0.40
POLAND	70	2.75	619	2.59
PORTUGAL	46	1.80	436	1.82
QATAR	5	0.20	69	0.29
REPUBLIC OF KOREA	36	1.41	295	1.23
RUSSIAN FEDERATION	72	2.82	411	1.72
SAUDI ARABIA	11	0.43	189	0.79
SINGAPORE	24	0.94	196	0.82
SLOVAKIA	23	0.90	196	0.82
SLOVENIA	27	1.06	289	1.21
SPAIN	116	4.55	958	4.00
SWEDEN	66	2.59	614	2.56
SWITZERLAND	134	5.25	1,248	5.21
UNITED ARAB EMIRATES	20	0.78	311	1.30
UNITED KINGDOM	126	4.94	1,059	4.42
UNITED STATES OF AMERICA	112	4.39	1,199	5.01
URUGUAY	48	1.88	287	1.20
<i>Total</i>	2,550	100.00	23,945	100.00

Table 2: Sample Distribution by Capital Requirements

		Number		Percentage	
Basel I		19,057	19,057	79.59	79.59
Basel II	Basel II – IRB	4,888	1,477	20.41	6.17
	Basel II – SA		3,411		14.24
<i>Total</i>		23,945	23,945	100.00	100.00

Table 3: Variable Definitions and Summary Statistics

		N	Mean	Median	St.dev	1 Pc	99 Pc
Panel A: Regulatory dummies							
IRB	A dummy variable equal to 1, for the banks involved, during the years of adoption of Basel II – Internal Rating-Based Approach. It takes values of zero before the adoption and if the country did not switch to Basel II.	23,945	0.062	0.000	0.241	0.000	1.000
Panel B: Dependent variables							
Δ Gross Loans/Gross Earn. Assets _{t-1}	Growth rate of gross loans over lagged gross earning assets (real LCU)	23,945	0.041	0.028	0.115	-0.297	0.424
Δ Corporate Lending/Gross Earn. Assets _{t-1}	Growth rate of corporate lending over lagged gross earning assets (real LCU)	9,480	0.025	0.009	0.100	-0.312	0.367
Net Interest Margin (NIM)	Interest income minus interest expense over interest-bearing assets	22,113	0.024	0.020	0.018	-0.002	0.098
Panel C: Control variables present in every model							
Equity Ratio	Equity over total assets	23,945	0.090	0.069	0.082	0.009	0.507
Size	Log transformation of bank total assets (real US \$)	23,945	15.484	15.541	2.094	10.815	20.315
Deposit Ratio	Customer deposits over total assets	23,945	0.535	0.589	0.262	0.002	0.931
Real GDP Growth Rate	Annual real growth rate of the domestic GDP	23,945	0.025	0.025	0.028	-0.057	0.096
Ln (GDP per capita)	Log transformation of domestic GDP per capita	23,888	10.366	10.491	0.624	8.487	11.554
Concentration	Herfindahl-Hirschman Index (HHI) of gross loans concentration	23,945	0.116	0.112	0.082	0.013	0.391
Financial Freedom	Index derived after scoring for the degree of government regulation of financial services, the degree of state intervention in banks and other financial firms, the level of financial market development, the government influence in the credit allocation process, and the degree of openness to foreign competition. The overall score ranges from 0 to 1 with higher values denoting higher financial freedom. (Source: Heritage Foundation).	23,945	0.679	0.700	0.160	0.300	0.900
IFRS	A dummy variable equal to 1 when a bank utilizes the International Financial Reporting Standards.	23,945	0.214	0.000	0.410	0.000	1.000
Banking Crises	A dummy variable equal to 1, for the countries involved, when a crisis occurs, according to the definition by Laeven and Valencia (2012).	23,945	0.170	0.000	0.376	0.000	1.000
Panel D: Additional control variables for the Lending Growth analysis							
ROA	Profit before taxes over total assets	23,945	0.009	0.007	0.014	-0.040	0.062
Panel E: Additional control variables for the Net Interest Margin analysis							
Liquidity Ratio	Liquid assets over total assets	23,423	0.222	0.161	0.200	0.002	0.883
Fee Income Ratio	Non-interest-operating income over total assets	23,079	0.015	0.009	0.023	-0.007	0.143
Overheads Ratio	Overheads over total assets	23,045	0.024	0.019	0.024	0.001	0.149
LLP Ratio	Loan loss provisions over gross loans	21,651	0.009	0.005	0.017	-0.020	0.096
Market Share	Market share of loans	23,945	0.027	0.005	0.057	0.000	0.324
Inflation	Annual percentage change in Consumer Price Index (CPI)	23,945	0.027	0.021	0.037	-0.013	0.158

Table 4: The Impact of IRB on Credit Growth

This Table shows regression results for the model presented in Section 2.4, concerning the impact of the IRB Approach on the growth of credit (Columns 1-4), and the impact of the IRB Approach on the growth of credit according to the bank size (Columns 5-8). The dependent variable is described in Section 2.3. **IRB** is a dummy that equals one if a bank complies with the Basel II-IRB capital standards in a given year. In Columns 1-4, Size is the log transformation of the of bank total assets (in real US \$); in Columns 5-8, Size is the mean-centered value of the log transformation of the of bank total assets (in real US \$); Equity Ratio is the ratio between equity and total assets; Deposit Ratio is the ratio between customer deposits and total assets; ROA is the ratio between profit before taxes and total assets; all bank characteristics are lagged by one year. IFRS is a dummy that equals one if a bank utilizes the International Financial Reporting Standards; Concentration is the Herfindahl-Hirschman Index of gross loans concentration; Real GDP Growth Rate is the annual real growth rate of the domestic GDP; Ln (GDP per capita) is the log transformation of domestic GDP per capita; Financial Freedom is an index measured at the country level by the Heritage Foundation with higher values denoting higher financial freedom; Banking Crises is a dummy that equals one if a country is hit by a banking crisis in a given year. All regressions include bank and country*year fixed effects; Columns (3)-(4) and (7)-(8) additionally include year fixed effects. Heteroskedasticity-robust standard errors, clustered at the bank level (Columns (1)-(3) and (5)-(7)) or at the country level (Columns (4) and (8)), are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

	Δ Gross Loans / Gross Earning Assets _{t-1}							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IRB	0.000	0.000	0.000	0.000	-0.004	-0.004	-0.004	-0.004
	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Size_{t-1}	-0.027***	-0.027***	-0.027***	-0.027***	-0.027***	-0.027***	-0.027***	-0.027***
	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)
IRB * Size_{t-1}					0.002	0.002	0.002	0.002
					(0.00)	(0.00)	(0.00)	(0.00)
Equity Ratio _{t-1}	0.058	0.059	0.059	0.059	0.057	0.059	0.059	0.059
	(0.04)	(0.04)	(0.04)	(0.05)	(0.04)	(0.04)	(0.04)	(0.05)
Deposit Ratio _{t-1}	0.006	0.007	0.007	0.007	0.006	0.007	0.007	0.007
	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)
ROA _{t-1}	0.662***	0.663***	0.663***	0.663***	0.663***	0.664***	0.664***	0.664***
	(0.12)	(0.12)	(0.12)	(0.15)	(0.12)	(0.12)	(0.12)	(0.15)
IFRS	0.010	0.010	0.010	0.010	0.010	0.010	0.010	0.010
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Concentration		-3.140*	-0.677	-0.677***		-3.139*	-0.677	-0.677***
		(1.75)	(2.95)	(0.10)		(1.75)	(2.95)	(0.10)
Real GDP Growth Rate		0.514	3.928	3.928***		0.514	3.928	3.928***
		(1.61)	(3.71)	(0.08)		(1.61)	(3.71)	(0.08)
Ln (GDP per capita)		0.235**	0.101	0.101***		0.235**	0.101	0.101***
		(0.11)	(0.33)	(0.01)		(0.11)	(0.33)	(0.01)
Financial Freedom		2.097*	0.263	0.263***		2.096*	0.264	0.264***
		(1.24)	(1.82)	(0.04)		(1.24)	(1.82)	(0.04)
Banking Crisis		-0.213*	0.205	0.205***		-0.212*	0.205	0.205***
		(0.11)	(0.28)	(0.01)		(0.11)	(0.28)	(0.01)
Constant	0.419***	-2.933*	-0.953	-0.953***	0.005	-3.343**	-1.350	-1.350***
	(0.07)	(1.68)	(2.08)	(0.13)	(0.01)	(1.68)	(2.11)	(0.05)
Observations	23,945	23,888	23,888	23,888	23,945	23,888	23,888	23,888
R-squared	0.39	0.39	0.39	0.39	0.39	0.39	0.39	0.39
Bank Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Country*Year Fixed Eff.	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	NO	NO	YES	YES	NO	NO	YES	YES
Error Cluster	Bank	Bank	Bank	Country	Bank	Bank	Bank	Country

Table 5: The Impact of IRB on Net Interest Margin (NIM)

This Table shows regression results for the model presented in Section 2.4, concerning the impact of the IRB Approach on the Net Interest Margin. The dependent variable is described in Section 2.3. **IRB** is a dummy that equals one if a bank complies with the Basel II–IRB capital standards in a given year. Size is the log transformation of bank total assets (in real US \$); Equity Ratio is the ratio between equity and total assets; Liquidity Ratio is the ratio between liquid assets and total assets; Fee Income Ratio is the ratio between non-interest-operating income and total assets; Deposit Ratio is the ratio between customer deposits and total assets; Overheads Ratio is the ratio between overheads and total assets; LLP Ratio is the ratio between loan loss provisions and gross loans; Market Share is the market share of loans; all bank characteristics are lagged by one year. IFRS is a dummy that equals one if a bank utilizes the International Financial Reporting Standards; Concentration is the Herfindahl-Hirschman Index of gross loans concentration; Real GDP Growth Rate is the annual real growth rate of the domestic GDP; Ln (GDP per capita) is the log transformation of domestic GDP per capita; Inflation is the annual percentage change in Consumer Price Index (CPI); Financial Freedom is an index measured at the country level by the Heritage Foundation with higher values denoting higher financial freedom; Banking Crises is a dummy that equals one if a country is hit by a banking crisis in a given year. All regressions include bank and country*year fixed effects; Columns (5)–(6) additionally include year fixed effects. Heteroskedasticity-robust standard errors, clustered at the bank level (Columns (1)–(5)) or at the country level (Column (6)), are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

	Net Interest Margin					
	(1)	(2)	(3)	(4)	(5)	(6)
IRB	0.001*** (0.00)	0.001*** (0.00)	0.001*** (0.00)	0.001*** (0.00)	0.001*** (0.00)	0.001** (0.00)
Size _{t-1}	-0.001* (0.00)	-0.001* (0.00)	-0.001* (0.00)	-0.001* (0.00)	-0.001* (0.00)	-0.001* (0.00)
Equity Ratio _{t-1}	0.037*** (0.01)	0.035*** (0.01)	0.035*** (0.01)	0.035*** (0.01)	0.035*** (0.01)	0.035*** (0.01)
Liquidity Ratio _{t-1}	-0.004*** (0.00)	-0.003** (0.00)	-0.003** (0.00)	-0.003** (0.00)	-0.003** (0.00)	-0.003* (0.00)
Fee Income Ratio _{t-1}	-0.022 (0.01)	-0.104*** (0.02)	-0.104*** (0.02)	-0.104*** (0.02)	-0.104*** (0.02)	-0.104*** (0.02)
Deposit Ratio _{t-1}	0.009*** (0.00)	0.007*** (0.00)	0.007*** (0.00)	0.007*** (0.00)	0.007*** (0.00)	0.007*** (0.00)
IFRS	0.002** (0.00)	0.002** (0.00)	0.002** (0.00)	0.002** (0.00)	0.002** (0.00)	0.002 (0.00)
Overheads Ratio _{t-1}		0.133*** (0.02)	0.132*** (0.02)	0.132*** (0.02)	0.132*** (0.02)	0.132*** (0.03)
LLP Ratio _{t-1}		0.034*** (0.01)	0.034*** (0.01)	0.034*** (0.01)	0.034*** (0.01)	0.034*** (0.01)
Market Share _{t-1}		0.002 (0.01)	0.002 (0.01)	0.002 (0.01)	0.002 (0.01)	0.002 (0.01)
Concentration			0.283 (0.21)	0.283 (0.21)	0.164 (0.33)	0.164*** (0.03)
Real GDP Growth Rate			0.059 (0.14)	0.059 (0.14)	-0.124 (0.42)	-0.124*** (0.03)
Ln (GDP per capita)			-0.040** (0.02)	-0.040** (0.02)	-0.027 (0.04)	-0.027*** (0.00)
Inflation			0.421 (0.35)	0.421 (0.35)		
Financial Freedom			-1.474 (0.91)	-0.922* (0.54)	-0.006 (0.19)	-0.006 (0.01)
Banking Crisis				0.166 (0.11)	-0.017 (0.03)	-0.017*** (0.00)
Constant	0.030*** (0.01)	0.028*** (0.01)	1.383** (0.59)	0.941*** (0.33)	0.306 (0.27)	0.306*** (0.01)
Observations	22,113	20,840	20,787	20,787	20,787	20,787
R-squared	0.85	0.86	0.86	0.86	0.86	0.86
Bank Fixed Effects	YES	YES	YES	YES	YES	YES
Country*Year Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effects	NO	NO	NO	NO	YES	YES
Error Cluster	Bank	Bank	Bank	Bank	Bank	Country

Table 6: The Impact of IRB on Net Interest Margin (NIM) with size interaction

This Table shows regression results for the model presented in Section 2.4, concerning the impact of the IRB Approach on the Net Interest Margin according to the bank size (see Panel A), and the marginal effects of the IRB Approach on NIM over bank size computed according to regression in Column (5) (see Panel B). The dependent variable is described in Section 2.3. **IRB** is a dummy that equals one if a bank complies with the Basel II–IRB capital standards in a given year. Size is the mean-centered value of the log transformation of bank total assets (in real US \$); Equity Ratio is the ratio between equity and total assets; Liquidity Ratio is the ratio between liquid assets and total assets; Fee Income Ratio is the ratio between non-interest-operating income and total assets; Deposit Ratio is the ratio between customer deposits and total assets; Overheads Ratio is the ratio between overheads and total assets; LLP Ratio is the ratio between loan loss provisions and gross loans; Market Share is the market share of loans; all bank characteristics are lagged by one year. IFRS is a dummy that equals one if a bank utilizes the International Financial Reporting Standards; Concentration is the Herfindahl-Hirschman Index of gross loans concentration; Real GDP Growth Rate is the annual real growth rate of the domestic GDP; Ln (GDP per capita) is the log transformation of domestic GDP per capita; Inflation is the annual percentage change in Consumer Price Index (CPI); Financial Freedom is an index measured at the country level by the Heritage Foundation with higher values denoting higher financial freedom; Banking Crises is a dummy that equals one if a country is hit by a banking crisis in a given year. All regressions include bank and country*year fixed effects; Columns (5)-(6) additionally include year fixed effects. Heteroskedasticity-robust standard errors, clustered at the bank level (Columns (1)-(5)) or at the country level (Column (6)), are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

	Net Interest Margin					
	(1)	(2)	(3)	(4)	(5)	(6)
IRB	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)
Size_{t-1}	-0.001* (0.00)	-0.001* (0.00)	-0.001* (0.00)	-0.001* (0.00)	-0.001* (0.00)	-0.001* (0.00)
IRB * Size_{t-1}	0.000*** (0.00)	0.000*** (0.00)	0.000*** (0.00)	0.000*** (0.00)	0.000*** (0.00)	0.000*** (0.00)
Equity Ratio _{t-1}	0.037*** (0.01)	0.035*** (0.01)	0.035*** (0.01)	0.035*** (0.01)	0.035*** (0.01)	0.035*** (0.01)
Liquidity Ratio _{t-1}	-0.004*** (0.00)	-0.003** (0.00)	-0.003** (0.00)	-0.003** (0.00)	-0.003** (0.00)	-0.003* (0.00)
Fee Income Ratio _{t-1}	-0.022 (0.01)	-0.104*** (0.02)	-0.104*** (0.02)	-0.104*** (0.02)	-0.104*** (0.02)	-0.104*** (0.02)
Deposit Ratio _{t-1}	0.009*** (0.00)	0.007*** (0.00)	0.007*** (0.00)	0.007*** (0.00)	0.007*** (0.00)	0.007*** (0.00)
IFRS	0.002** (0.00)	0.002** (0.00)	0.002** (0.00)	0.002** (0.00)	0.002** (0.00)	0.002 (0.00)
Overheads Ratio _{t-1}		0.132*** (0.02)	0.131*** (0.02)	0.131*** (0.02)	0.131*** (0.02)	0.131*** (0.03)
LLP Ratio _{t-1}		0.034*** (0.01)	0.034*** (0.01)	0.034*** (0.01)	0.034*** (0.01)	0.034*** (0.01)
Market Share _{t-1}		0.002 (0.01)	0.002 (0.01)	0.002 (0.01)	0.002 (0.01)	0.002 (0.01)
Concentration			0.283 (0.21)	0.283 (0.21)	0.164 (0.33)	0.164*** (0.03)
Real GDP Growth Rate			0.059 (0.14)	0.059 (0.14)	-0.124 (0.42)	-0.124*** (0.03)
Ln (GDP per capita)			-0.040** (0.02)	-0.040** (0.02)	-0.027 (0.04)	-0.027*** (0.00)
Inflation			0.420 (0.35)	0.420 (0.35)		
Financial Freedom			-1.472 (0.91)	-0.921* (0.54)	-0.005 (0.19)	-0.005 (0.01)
Banking Crisis				0.165 (0.11)	-0.017 (0.03)	-0.017*** (0.00)
Constant	0.017*** (0.00)	0.016*** (0.00)	1.366** (0.59)	0.924*** (0.33)	0.296 (0.27)	0.296*** (0.01)
Observations	22,113	20,840	20,787	20,787	20,787	20,787
R-squared	0.85	0.86	0.86	0.86	0.86	0.86
Bank Fixed Effects	YES	YES	YES	YES	YES	YES
Country * Year Fixed Effects	YES	YES	YES	YES	YES	YES
Year Fixed Effects	NO	NO	NO	NO	YES	YES
Error Cluster	Bank	Bank	Bank	Bank	Bank	Country

Panel B: Marginal effect of the IRB approach on NIM over bank size – based on regression in Column (5)						
Bank size percentile	$\partial Y / \partial \text{IRB} _{\text{SIZE}}$	Std. err	t	P > t	[95% conf. interval]	
25 th	-0.0004	0.0009	-0.41	0.681	-0.0022	0.0014
50 th	0.0003	0.0007	0.51	0.608	-0.0009	0.0016
75 th	0.0010**	0.0005	2.16	0.031	0.0001	0.0019

Table 7: The Impact of IRB on Net Interest Margin (NIM) – bank-oriented vs. market-oriented countries

This Table shows regression results for the model presented in Section 2.4, concerning the impact of the IRB Approach on the Net Interest Margin in bank-oriented countries (Columns (1)-(5)) and market-oriented countries (Columns (6)-(10)). The dependent variable is described in Section 2.3. **IRB** is a dummy that equals one if a bank complies with the Basel II–IRB capital standards in a given year. Size is the log transformation of bank total assets (in real US \$); Equity Ratio is the ratio between equity and total assets; Liquidity Ratio is the ratio between liquid assets and total assets; Fee Income Ratio is the ratio between non-interest-operating income and total assets; Deposit Ratio is the ratio between customer deposits and total assets; Overheads Ratio is the ratio between overheads and total assets; LLP Ratio is the ratio between loan loss provisions and gross loans; Market Share is the market share of loans; all bank characteristics are lagged by one year. IFRS is a dummy that equals one if a bank utilizes the International Financial Reporting Standards; Concentration is the Herfindahl-Hirschman Index of gross loans concentration; Real GDP Growth Rate is the annual real growth rate of the domestic GDP; Ln (GDP per capita) is the log transformation of domestic GDP per capita; Inflation is the annual percentage change in Consumer Price Index (CPI); Financial Freedom is an index measured at the country level by the Heritage Foundation with higher values denoting higher financial freedom; Banking Crises is a dummy that equals one if a country is hit by a banking crisis in a given year. All regressions include bank and country*year fixed effects; Columns (4)-(5) and (9)-(10) additionally include year fixed effects. Heteroskedasticity-robust standard errors, clustered at the bank level (Columns (1)-(4) and (6)-(9)) or at the country level (Columns (5) and (10)), are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

	Bank-oriented countries					Market-oriented countries				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
IRB	0.001** (0.00)	0.001** (0.00)	0.001** (0.00)	0.001** (0.00)	0.001* (0.00)	0.001 (0.00)	0.001 (0.00)	0.001 (0.00)	0.001 (0.00)	0.001 (0.00)
Size _{t-1}	-0.001** (0.00)	-0.001** (0.00)	-0.001** (0.00)	-0.001** (0.00)	-0.001** (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)
Equity Ratio _{t-1}	0.029*** (0.01)	0.029*** (0.01)	0.029*** (0.01)	0.029*** (0.01)	0.029*** (0.01)	0.039*** (0.01)	0.039*** (0.01)	0.039*** (0.01)	0.039*** (0.01)	0.039*** (0.01)
Liquidity Ratio _{t-1}	-0.001 (0.00)	-0.001 (0.00)	-0.001 (0.00)	-0.001 (0.00)	-0.001 (0.00)	-0.005*** (0.00)	-0.005*** (0.00)	-0.005*** (0.00)	-0.005*** (0.00)	-0.005** (0.00)
Fee Income Ratio _{t-1}	-0.096*** (0.03)	-0.097*** (0.03)	-0.097*** (0.03)	-0.097*** (0.03)	-0.097*** (0.03)	-0.121*** (0.03)	-0.121*** (0.03)	-0.121*** (0.03)	-0.121*** (0.03)	-0.121*** (0.03)
Deposit Ratio _{t-1}	0.009*** (0.00)	0.009*** (0.00)	0.009*** (0.00)	0.009*** (0.00)	0.009*** (0.00)	0.006*** (0.00)	0.007*** (0.00)	0.007*** (0.00)	0.007*** (0.00)	0.007** (0.00)
Overheads Ratio _{t-1}	0.093*** (0.03)	0.092*** (0.03)	0.092*** (0.03)	0.092*** (0.03)	0.092* (0.05)	0.178*** (0.03)	0.177*** (0.03)	0.177*** (0.03)	0.177*** (0.03)	0.177*** (0.04)
LLP Ratio _{t-1}	0.022 (0.02)	0.022 (0.02)	0.022 (0.02)	0.022 (0.02)	0.022 (0.02)	0.047*** (0.02)	0.048*** (0.02)	0.048*** (0.02)	0.048*** (0.02)	0.048** (0.02)
Market Share _{t-1}	0.007 (0.01)	0.007 (0.01)	0.007 (0.01)	0.007 (0.01)	0.007 (0.01)	-0.001 (0.01)	-0.000 (0.01)	-0.000 (0.01)	-0.000 (0.01)	-0.000 (0.01)
IFRS	0.002** (0.00)	0.002** (0.00)	0.002** (0.00)	0.002** (0.00)	0.002 (0.00)	0.001 (0.00)	0.001 (0.00)	0.001 (0.00)	0.001 (0.00)	0.001 (0.00)
Concentration		0.235 (0.20)	0.235 (0.20)	0.234 (0.22)	0.234** (0.02)				0.280* (0.17)	0.280*** (0.01)
Real GDP Growth Rate		0.033 (0.15)	0.033 (0.15)				0.037 (0.05)	0.032 (0.12)	0.019 (0.04)	0.019*** (0.00)
Ln (GDP per capita)		-0.036** (0.02)	-0.036** (0.02)	-0.026 (0.02)	-0.026*** (0.00)		0.096*** (0.04)	0.021 (0.08)	0.035 (0.02)	0.035*** (0.00)
Inflation		0.363 (0.30)	0.363 (0.30)				0.176*** (0.07)	0.031 (0.04)		
Financial Freedom		-0.030 (0.02)	-0.026 (0.04)	0.026 (0.03)	0.026*** (0.01)		0.043 (0.04)	-0.031 (0.03)	-0.033*** (0.01)	-0.033*** (0.00)
Banking Crisis			-0.013 (0.01)	-0.014 (0.01)	-0.014*** (0.00)			-0.007 (0.14)	-0.028* (0.02)	-0.028*** (0.00)
Constant	0.034*** (0.01)	0.387** (0.15)	0.388** (0.18)	0.268 (0.29)	0.268*** (0.03)	0.014 (0.01)	-1.039** (0.41)	-0.189 (0.77)	-0.360 (0.26)	-0.360*** (0.03)
Observations	10,939	10,925	10,925	10,925	10,925	9,582	9,543	9,543	9,543	9,543
R-squared	0.88	0.88	0.88	0.88	0.88	0.89	0.89	0.89	0.89	0.89
Bank Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country * Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	NO	NO	NO	YES	YES	NO	NO	NO	YES	YES
Error Cluster	Bank	Bank	Bank	Bank	Country	Bank	Bank	Bank	Bank	Country

Table 8: The Impact of IRB on Net Interest Margin (NIM), with bank size interaction – bank-oriented vs. market-oriented countries

This Table shows regression results for the model presented in Section 2.4, concerning the impact of the IRB Approach on the Net Interest Margin in bank-oriented countries (Columns (1)-(5)) and market-oriented countries (Columns (6)-(10)). The dependent variable is described in Section 2.3. IRB is a dummy that equals one if a bank complies with the Basel II-IRB capital standards in a given year. Size is the mean-centered value of the log transformation of bank total assets (in real US \$); Equity Ratio is the ratio between equity and total assets; Liquidity Ratio is the ratio between liquid assets and total assets; Fee Income Ratio is the ratio between non-interest-operating income and total assets; Deposit Ratio is the ratio between customer deposits and total assets; Overheads Ratio is the ratio between overheads and total assets; LLP Ratio is the ratio between loan loss provisions and gross loans; Market Share is the market share of loans; all bank characteristics are lagged by one year. IFRS is a dummy that equals one if a bank utilizes the International Financial Reporting Standards; Concentration is the Herfindahl-Hirschman Index of gross loans concentration; Real GDP Growth Rate is the annual real growth rate of the domestic GDP; Ln (GDP per capita) is the log transformation of domestic GDP per capita; Inflation is the annual percentage change in Consumer Price Index (CPI); Financial Freedom is an index measured at the country level by the Heritage Foundation with higher values denoting higher financial freedom; Banking Crises is a dummy that equals one if a country is hit by a banking crisis in a given year. All regressions include bank and country*year fixed effects; Columns (4)-(5) and (9)-(10) additionally include year fixed effects. Heteroskedasticity-robust standard errors, clustered at the bank level (Columns (1)-(4) and (6)-(9)) or at the country level (Columns (5) and (10)), are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

	Bank-oriented countries					Market-oriented countries				
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
IRB	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	-0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)
Size_{t-1}	-0.001** (0.00)	-0.001** (0.00)	-0.001** (0.00)	-0.001** (0.00)	-0.001** (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)
IRB * Size_{t-1}	0.001** (0.00)	0.001** (0.00)	0.001** (0.00)	0.001** (0.00)	0.001** (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)	0.000 (0.00)
Equity Ratio _{t-1}	0.028*** (0.01)	0.028*** (0.01)	0.028*** (0.01)	0.028*** (0.01)	0.028*** (0.01)	0.039*** (0.01)	0.039*** (0.01)	0.039*** (0.01)	0.039*** (0.01)	0.039*** (0.01)
Liquidity Ratio _{t-1}	-0.001 (0.00)	-0.001 (0.00)	-0.001 (0.00)	-0.001 (0.00)	-0.001 (0.00)	-0.005*** (0.00)	-0.005*** (0.00)	-0.005*** (0.00)	-0.005*** (0.00)	-0.005*** (0.00)
Fee Income Ratio _{t-1}	-0.096*** (0.03)	-0.096*** (0.03)	-0.096*** (0.03)	-0.096*** (0.03)	-0.096*** (0.03)	-0.121*** (0.03)	-0.120*** (0.03)	-0.120*** (0.03)	-0.120*** (0.03)	-0.120*** (0.03)
Deposit Ratio _{t-1}	0.009*** (0.00)	0.009*** (0.00)	0.009*** (0.00)	0.009*** (0.00)	0.009*** (0.00)	0.007*** (0.00)	0.007*** (0.00)	0.007*** (0.00)	0.007*** (0.00)	0.007*** (0.00)
Overheads Ratio _{t-1}	0.091*** (0.03)	0.091*** (0.03)	0.091*** (0.03)	0.091*** (0.03)	0.091* (0.05)	0.177*** (0.03)	0.177*** (0.03)	0.177*** (0.03)	0.177*** (0.03)	0.177*** (0.04)
LLP Ratio _{t-1}	0.022 (0.02)	0.022 (0.02)	0.022 (0.02)	0.022 (0.02)	0.022 (0.02)	0.047*** (0.02)	0.048*** (0.02)	0.048*** (0.02)	0.048*** (0.02)	0.048*** (0.02)
Market Share _{t-1}	0.006 (0.01)	0.006 (0.01)	0.006 (0.01)	0.006 (0.01)	0.006 (0.01)	-0.001 (0.01)	-0.001 (0.01)	-0.001 (0.01)	-0.001 (0.01)	-0.001 (0.01)
IFRS	0.002** (0.00)	0.002** (0.00)	0.002** (0.00)	0.002** (0.00)	0.002 (0.00)	0.001 (0.00)	0.001 (0.00)	0.001 (0.00)	0.001 (0.00)	0.001 (0.00)
Concentration		0.235 (0.20)	0.235 (0.20)	0.230 (0.22)	0.230*** (0.02)				0.282* (0.17)	0.282*** (0.01)
Real GDP Growth Rate		0.033 (0.15)	0.033 (0.15)				0.037 (0.05)	0.032 (0.12)	0.020 (0.04)	0.020*** (0.00)
Ln (GDP per capita)		-0.036** (0.02)	-0.036** (0.02)	-0.026 (0.02)	-0.026*** (0.00)		0.096*** (0.04)	0.021 (0.08)	0.035 (0.02)	0.035*** (0.00)
Inflation		0.362 (0.30)	0.362 (0.30)				0.176*** (0.07)	0.031 (0.04)		
Financial Freedom		-0.030 (0.02)	-0.026 (0.04)	0.024 (0.03)	0.024*** (0.01)		0.042 (0.04)	-0.031 (0.05)	-0.033*** (0.01)	-0.033*** (0.00)
Banking Crisis			-0.013 (0.01)	-0.014 (0.01)	-0.014*** (0.00)			-0.008 (0.14)	-0.028* (0.02)	-0.028*** (0.00)
Constant	0.014*** (0.00)	0.367** (0.15)	0.364** (0.18)	0.250 (0.29)	0.250*** (0.04)	0.014*** (0.00)	-1.036** (0.41)	-0.190 (0.79)	-0.365 (0.26)	-0.365*** (0.02)
Observations	10,939	10,925	10,925	10,925	10,925	9,582	9,543	9,543	9,543	9,543
R-squared	0.88	0.88	0.88	0.88	0.88	0.89	0.89	0.89	0.89	0.89
Bank Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country * Year FE	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	NO	NO	NO	YES	YES	NO	NO	NO	YES	YES
Error Cluster	Bank	Bank	Bank	Bank	Country	Bank	Bank	Bank	Bank	Country

Online Appendix (not for publication)

A.1 – Regulatory Database

We collected data on the adoption of Basel I from Barajas et al. (2005) and Vallascas and Hagedorff (2013). We complemented these two data sources with data from the domestic regulatory authorities, policy reports and academic papers and from the notes to Annual Reports for the largest banking firms in our sample. As far as the adoption of Basel II is concerned, our main source of data has been the Financial Stability Institute (FSI) Survey on “Basel II, 2.5 and III implementation” released in June 2013 by the Bank of International Settlements. This survey, launched in 2012, is annually updated with data on the status of the adoption of Basel II, 2.5 and III, collected through a specific questionnaire that the FSI sends to jurisdictions that do not belong either to the Basel Committee on Banking Supervision (BCBS) and to the European Union. When unavailable from this survey, data have been manually gathered from Central Banks’ or local Monetary Authorities’ websites and from bank annual reports.

When data were available, we also hand-collected bank-level data regarding the specific Basel II approach adopted, from banks’ annual reports or specific risk reports (e.g., the Basel II–pillar III disclosure reports explicitly issued by major banks). Note, as well, that we had to pay particular attention to tracking banks’ evolutionary path within the adoption of Basel II, that is by controlling if banks originally adopting the Standard Approach (SA) then moved – after being authorized – to the more sophisticated Internal Rating Based (IRB) approach.

A.2 – Additional analyses

Table A.1: The Impact of IRB on Credit Growth to Corporate borrowers

This Table shows regression results for the model presented in Section 2.4, concerning the impact of the IRB Approach on the growth of credit to Corporate borrowers (Columns 1-4), and the impact of the IRB Approach on the growth of credit to Corporate borrowers according to the bank size (Columns 5-8). The dependent variable is described in Section 2.3. **IRB** is a dummy that equals one if a bank complies with the Basel II–IRB capital standards in a given year. In Columns 1-4, Size is the log transformation of the of bank total assets (in real US \$); in Columns 5-8, Size is the mean-centered value of the log transformation of the of bank total assets (in real US \$); Equity Ratio is the ratio between equity and total assets; Deposit Ratio is the ratio between customer deposits and total assets; ROA is the ratio between profit before taxes and total assets; all bank characteristics are lagged by one year. IFRS is a dummy that equals one if a bank utilizes the International Financial Reporting Standards; Concentration is the Herfindahl-Hirschman Index of gross loans concentration; Real GDP Growth Rate is the annual real growth rate of the domestic GDP; Ln (GDP per capita) is the log transformation of domestic GDP per capita; Financial Freedom is an index measured at the country level by the Heritage Foundation with higher values denoting higher financial freedom; Banking Crises is a dummy that equals one if a country is hit by a banking crisis in a given year. All regressions include bank and country*year fixed effects; Columns (3)-(4) and (7)-(8) additionally include year fixed effects. Heteroskedasticity-robust standard errors, clustered at the bank level (Columns (1)-(3) and (5)-(7)) or at the country level (Columns (4) and (8)), are reported in parentheses. *, **, and *** denote statistical significance at the 10%, 5%, and 1% level, respectively.

	Δ Corporate Loans / Gross Earn Assets _{t-1}							
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
IRB	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006	-0.006
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
Size_{t-1}	-0.015***	-0.015***	-0.015***	-0.015*	-0.015***	-0.015***	-0.015***	-0.015*
	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.01)
IRB * Size_{t-1}					-0.000	-0.000	-0.000	-0.000
					(0.00)	(0.00)	(0.00)	(0.00)
Equity Ratio _{t-1}	0.040	0.039	0.039	0.039	0.039	0.039	0.039	0.039
	(0.07)	(0.06)	(0.06)	(0.09)	(0.07)	(0.07)	(0.07)	(0.09)
Deposit Ratio _{t-1}	0.017	0.016	0.016	0.016	0.017	0.016	0.016	0.016
	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)	(0.02)
ROA _{t-1}	0.521***	0.509***	0.509***	0.509***	0.521***	0.509***	0.509***	0.509***
	(0.16)	(0.16)	(0.16)	(0.15)	(0.16)	(0.16)	(0.16)	(0.15)
IFRS	-0.043**	-0.043**	-0.043**	-0.043	-0.043**	-0.043**	-0.043**	-0.043
	(0.02)	(0.02)	(0.02)	(0.03)	(0.02)	(0.02)	(0.02)	(0.03)
Concentration		2.412***	1.449	1.449***		2.412***	1.449	1.449***
		(0.67)	(1.72)	(0.27)		(0.67)	(1.72)	(0.27)
Real GDP Growth Rate		1.729***	1.426	1.426***		1.729***	1.426	1.426***
		(0.58)	(2.64)	(0.30)		(0.58)	(2.64)	(0.30)
Ln (GDP per capita)		-0.031*	-0.088	-0.088***		-0.031*	-0.088	-0.088***
		(0.02)	(0.24)	(0.01)		(0.02)	(0.24)	(0.01)
Financial Freedom			1.156	1.156***			1.156	1.156***
			(1.24)	(0.17)			(1.24)	(0.17)
Banking Crisis		0.381**	0.248	0.248***		0.381**	0.248	0.248***
		(0.15)	(0.19)	(0.02)		(0.15)	(0.19)	(0.02)
Constant	0.219**	0.108	0.133	0.133	-0.000	-0.088	-0.101	-0.101
	(0.09)	(0.22)	(1.50)	(0.17)	(0.02)	(0.23)	(1.50)	(0.09)
Observations	9,480	9,456	9,456	9,456	9,480	9,456	9,456	9,456
R-squared	0.41	0.41	0.41	0.41	0.41	0.41	0.41	0.41
Bank Fixed Effects	YES	YES	YES	YES	YES	YES	YES	YES
Country*Year Fixed Eff.	YES	YES	YES	YES	YES	YES	YES	YES
Year Fixed Effects	NO	NO	YES	YES	NO	NO	YES	YES
Error Cluster	Bank	Bank	Bank	Country	Bank	Bank	Bank	Country