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Paladino, Giovanna; Rotondi, Zeno

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Stressing the European banks: An evaluation of the comprehensive assessment

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STRESSING THE EUROPEAN BANKS: AN EVALUATION OF THE COMPREHENSIVE ASSESSMENT

Giovanna Paladino and Zeno Rotondi

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Arcelli Centre for Monetary and Financial Studies
Department of Economics and Business
LUISS Guido Carli
Viale Romania 32, 00197, Rome -- Italy
http://casmef.luiss.edu

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Stressing the European Banks: an Evaluation of the Comprehensive Assessment [1]

Giovanna Paladino - IntesaSanpaolo; LUISS Guido Carli University

Zeno Rotondi - UniCredit; LUISS Guido Carli University

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Abstract:

We use the results of the ECB's Comprehensive Assessment to evaluate the importance of bank business model on risk assessment and the persuasive effectiveness of different supervisory styles on banks' recapitalization. Our analysis reveals inconsistencies in the information content provided by the various regulatory measures used for assessing bank stability. Moreover, opposite to the RWA density and CET1 ratio, the leverage ratio provides assessments on business models closer to a market-based measure of bank risk. We also find that the effectiveness of the supervisory action depends on the specific type of supervisory model. In particular, countries adopting the hybrid model are more severe and effective in persuading banks to recapitalize preventively. Differently, countries adopting the integrated and the sectorial model seem less prone or able to be effective in their requests.

Keywords: macroprudential regulation, stress test, systemic risk, risk-weighted assets

JEL Classification: G28, G21, G11, G01

1. Introduction

The comprehensive assessment (CA) of 2014 performed by the ECB made available for researchers more abundant and detailed information on a significant sample of European banks. In this paper we examine the outcomes of the CA focusing on two specific issues: the implications for bank business models and the role played by national supervisory architectures. These topics are strictly related. On one hand, banking supervisors are very interested in having sound banks with sustainable business models. On the other, differences in national supervision may imply different capacity in detecting the riskiness of banks business strategies.

[1] We thank Massimo Fiore, Pier Francesco Giacopelli and Matteo Namari for the availability of EDF data on non-listed banks and Tony Riti for excellent research assistance.

Firstly, we examine the risk assessment of alternative business models provided by the CA. The 2008-2009 financial crisis implied the largest materialization of bank risk since the Great Depression and it was preceded by structural changes in the banking industry which have made banks significantly more complex, larger, global and dependent on developments of financial markets. The most recent literature has shown that the variability across banks business models in the advent of the crisis can be related to the subsequent materialization of bank risk. In general, traditional retail banking is found to be less risky compared to nontraditional banking, although excessive loan growth may lead to greater risk taking and income diversification within a limited extent may increase stability. Demirgüç-Kunt and Huizinga (2010) find that banking business strategies that rely prominently on generating non-interest income or attracting non-deposit funding are very risky. Moreover, their empirical evidence on diversification benefits is weak and implies that there may limits to how far banks can steer away from the traditional model of interest income generation and deposit taking. Altunbas et al. (2011) show that business models related to significantly reduced bank risk are characterized by a strong deposit base and greater income diversification. Köhler (2012) finds that banks with high rates of loan growth are more risky, but if they increase their non-interest income share due to a better diversification of income sources they become more stable. The effect, however, decreases with bank size possibly because large banks are more active in volatile trading and off-balance sheet activities such as securitization that allow them to increase their leverage. Blundell-Wignall et al. (2013) find that business model features after controlling for macro factors have a huge impact on bank risk. Derivatives origination, prime broking, etc., carry vastly different risks to core deposit banking. Hryckiewicz and Kozłowski (2015) find that the riskiness of investment business model is difficult to detect and thus understated most likely because of a high level of off-balance sheet activities and derivatives not reported in the regulatory capital. Overall, with

respect to systemic risk, their results suggest that traditional banks are less risky than their nontraditional counterparts.

Following the discussion above, we examine the first research question (Question 1): *According to the CA have business models significant and heterogeneous impacts on bank risk?*

In particular, in our empirical analysis we examine the evaluations on the relative riskiness of bank business models implied by the stress test (ST) and the asset quality review (AQR). Moreover, we provide a comparative analysis of the findings on business models implied by the CA with those implied by a market-based measure of risk.

The stress test results are also a very important source of indirect information on the effect of specific jurisdictions and supervisory frameworks on banks' soundness. There are studies that assess the relationship between changes in bank regulatory model and banking system performance (Barth et al., (2012) among others). They usually find that despite the adoption of more stringent capital regulations and greater supervisors' discretionary power, most countries have not enhanced their economic performance (Masciandaro et al. 2013) and their financial stability. During normal times, instead, Harring and Camassi (2008) find that an integrated supervisor located outside the central bank might mitigate the conflict of interests and moral hazard problems. Čihák et al. (2013) explore the relation between financial soundness and differences in regulation and supervisory models and find that crisis countries were characterized by less stringent definitions of capital, less strict regulatory treatment of bad loans and loan losses and were less able to demand banks to adjust their equity to safer levels. Overall, the impact of financial supervisory architecture at macro level has attracted a lot of attention whereas, to our knowledge, its effect on individual bank soundness is a field still open to investigation. Barth et al. (2003) analyze the impact of supervisory architecture on banks' profits without finding clear-cut results. More recently, Gaganis and Pasiouras

(2013) study whether the central bank's involvement in financial supervision, the unification of financial authorities and the independence of the Central Bank affect banks' profit efficiency and find a negative relationship. Doumpos et al. (2015) analyse the impact of supervisory regimes during the crisis. They find that Central Bank independence and the power of the supervisory authorities have a positive impact on banks' soundness, especially for smaller banks whereas a unified supervisor mitigates the adverse effects of the crisis, especially for large banks. Similarly, Shehzad and De Haana (2015) observe that supervisory powers are unable to affect risk-taking behavior of systemically important banks.

Departing from the focus of the extant literature, our interest on regulatory architecture is related to the "moral suasion" ability of supervisors in asking costly adjustments to banks. Hence, the results of the stress test 2014 are a unique opportunity for assessing this point. As a matter of fact, after the crisis and the inadequate stress tests in 2009, 2010 and 2011, the European supervision went through a deep restructuring leading to the Banking Union. In 2014 -under the threat of a public disclosure endorsed by the credibility of the AQR exercise - the national supervisors might have played a new role in incentivizing banks to recapitalize proactively and to write down any dubious assets ahead of the deadline. We could assume, however, that differences in national supervisory models affected the promptness of banks' responses. Thus, we are left with the following research question (Question 2): *Have different national supervisory models been otherwise effective in persuading bankers to act preventively?*

The paper is organised as follows. Section 2 describes the sample and its statistical properties, Section 3 presents the econometric models employed to address our two research questions. In section 4 we comment the empirical results and finally conclusions are summed up in section 5.

2. The sample

Our analysis includes 136 banks from 22 European countries[2] that were subjected to the stress test in 2014. The actual number of banks in the cross section depends on the availability of financial information obtained from the ECB and EBA data banks and Bankscope. The description of the variables used in this paper is presented in Table 1.

<Insert Table 1 around here>

2.1 Descriptive statistics

Table 2 contains the statistical characteristics of both bank and country-level regression variables. All bank variables have been winsorized at the 1% and 99% percentiles to reduce the influence of outliers and potential data errors. Variables are denominated in euro and are in million, unless computed as ratio or natural logs or indices.

<Insert Table 2 around here>

The variable *MORAL SUASION* - i.e. the persuasive influence of regulators on banks to raise capital before the announcement of the test's results- has been proxied by the ratio between the amount of equity capital raised during the period January- September 2014 and the value of the total assets in 2013. It is 0.4% on average. Cumulative raised capital reached EUR 49.856 bn in September 2014, about twice the value of the aggregate shortfall (EUR 24.617 bn) identified by the stress test. Only 48% of banks raising new capital showed a shortfall[3].

The mean capital ratio in 2013 (*CET1*) is equal to 14.5%, and the mean capital ratio post AQR (*CET1 AQR*) is slightly smaller at 13.9%. The ratio between tangible equity and total assets (*TEQTA*) is 5.1% and has a large standard deviation. This variable is mainly used here for controlling purposes.

[2] The sample comes from the list of banks that passed the 2014 stress test run by the ECB, plus extra euro area banks (located in UK, Denmark and Sweden) whose figures are found in the EBA data bank Data for Deutsche Bank Malta (CET1 ratio equal to 281%) and Co-operative Central Bank of Cyprus (negative CET1 ratio) have been discarded given apparent anomalies. The actual number of banks used in the estimates depends on the availability of the explicative variables.

[3] 22 out of the 25 banks with shortfalls raised new capital in advance. The 3 remaining being Dexia, Österreichische Volksbanken-AG and Permanent tsb plc.

As for the bank business model, 77% of banks feature a *RETAIL* strategy, 14% are characterized by a *WHOLESALE* model, and the remaining 9% have adopted an *INVESTMENT* business model. We can notice that 46% of banks changed their business model during the financial crisis and before the CA.

The non-performing exposure (*NPE*) and the covered ratio (*CR*) are respectively 7 and 42%, on average, while the mean value of the proxies of bank risk exposure, such as the risk density (*RWTA*) and the distance to default (*EDF* and *ZSCORE*) are respectively 45%, 0.9% and 4.51.

As for the banks' portfolio diversification, the share of domestic sovereign assets (*HOMEBIAS*) on average represents 62% of total sovereign exposure and decreases to 32% if the share is computed for sovereign exposures versus "GIIPS" [4] countries (*PERIPHERY*). Size, measured by the log of total assets in 2012, is on average equal to 11.2 which corresponds to EUR 236 bn.

The variable named *NATDISCR* represents the degree of national discretions in the adverse scenario and is the difference between the fully loaded CET1 ratio and the CET1 ratio in the transitional period under the adverse scenario in 2016, as in Barucci et al.(2014). This measure takes by construction negative values on average (-89bps), thus, the smaller the value (in negative term) the lower the national discretionary power.

3. Methodology

This section describes the empirical approach that we employ to address the research questions stated in section 1.

3.1 Model specifications

To examine Question 1, on the relative riskiness of alternative business models, we must first attribute a specific business model to each bank in our sample. Indeed, one of the key

[4] GIIPS stands for Greece, Ireland, Italy, Portugal, Spain.

methodological aspects in the empirical literature on risk taking in bank business models is the identification of distinct business strategies. In Ayadi and de Groen (2014) the procedure used to classify banks into distinct business models is driven by data through a cluster analysis[5]. They identify four models: large investment-oriented banks, wholesale banks with a heavy reliance on interbank funding and lending, retail-oriented banks distinguished between diversified and focused retail. The latter two models share several similarities but do differ in funding sources: while the diversified retail banks have a greater reliance on debt markets, focused retail banks rely primarily on customer deposits.

In our analysis we adopt the bank business models provided by Ayadi and de Groen (2014). Differently from them, we also consider the aggregation of focused retail and diversified retail business models into a single retail business model to control for the presence of potential measurement errors in the two retail business models which feature strong similarities.[6] We, firstly, estimate the following cross section specification:

$$BUSINESS\ MODEL_i^k =$$

$$\alpha_0 + \beta_1 \times NEW\ BUSINESS\ MODEL_i + \rho' \times EXPOSURE\ TO\ MARKET_i +$$

$$\gamma' \times SOVEREIGN\ EXPOSURE_i + \delta' \times QUALITY\ OF\ CREDIT\ ACTIVITIES_i + \mu' \times$$

$$OTHER\ BANK\ CONTROLS_i +$$

$$\varepsilon_i \qquad (1)$$

with *k* indicating the business and *i* indicating the bank.

[5] Their sample is comprised of 147 large European Economic Area (EEA) banking groups and subsidiaries of non-EEA banking groups. These banks together account for around 80% of the EU's banking assets The sample consists of the banks subject to at least one of the CEBS and EBA exercises conducted between 2010 and 2014, the credit institutions identified for the comprehensive assessment of the ECB, EU based banks identified by the FSB as global systemically important banks (GSIBs). The sample covers the years 2006 to 2013 and includes 1,126 bank-year observations

[6] In the cluster analysis the assignment of individual banks to a specific cluster, or model, depends crucially on the choice of instruments and procedures, such as the proximity metric, procedures for forming clusters and the stopping rules used. For instance in Roengpitya et al. (2014) the procedure used to classify banks into distinct business models shares many technical aspects with the procedure employed by Ayadi and de Groen (2014), but differs in terms of the judgmental elements and the data used. They identify three main business models which they label: trading, wholesale-funded and retail-funded.

This cross section is estimated only for descriptive purposes and does not examine causality links. We expect the investment business model to show a higher exposure to market risk and a lower exposure to credit risk if compared to the retail business model. Since the business mix of wholesale bank is intermediate with respect to the other two business models we do not have a specific a-priori on it.

In order to investigate the causal link between business model and risk, we use as dependent variable alternative regulatory measures of bank risk and estimate the following specification:

$$
\begin{aligned}
&REGULATORY\ RISK\ MEASURE_i^l \\
&\quad = \alpha_0 + \beta_1 \times BUSINESS\ MODEL_i^k \\
&\quad + \beta_2 \times BANK\ SPECIFIC\ RISK\ ATTRIBUTES_i + \gamma' \times BANK\ CONTROLS_i \\
&\quad + \delta' \times COUNTRY\ FIXED\ EFFECTS_j \\
&\quad + \varepsilon_i \qquad (2)
\end{aligned}
$$

with *l* indicating the regulatory risk measure in the CA, *k* the business model, *i* the bank and *j* the country.

Among the regulatory risk measures based on the CA we include the bank aggregate buffer/shortfall of CET1 capital ratio (*SF/BUF CAPITAL*) as measured by the ST exercise, the ratio of RWA on total assets (*RWATA*) and the leverage ratio as measured in the AQR. Finally, in order to perform a comparative analysis we consider also a market-based measure of risk: Merton's expected default frequency (*EDF*). In order to disentangle the impact on the regulatory risk measure related to the business model from that related to the idiosyncratic risk attributes of the bank we include in our specification the Z-score, as a proxy of bank specific risk attributes, together with fixed business model effects. Following the empirical literature reviewed in section 1, we expect business models to have significant and heterogeneous impacts on bank risk.

To tackle Question 2, which is related to the issue of moral suasion by national supervisory authorities, we focus on the impact on bank recapitalization of three different supervisory models and account for both national discretions and the bank's relative importance in the domestic economy (represented by credit risk exposure to SMEs and the share of sovereign domestic assets in the bank portfolio). We also control for other bank and country variables Hence, we constructed the dependent variable *MORAL SUASION (MS)*, as described in section 2, and employ the following cross section specification:

$$MS_i = \alpha_0 + \beta_1 \times HOMEBIAS_i + \beta_2 \times NATDISCR_i + \beta_3 \times SUPERVISION_i + \gamma' \times BANK\ CONTROLS_i + \delta' \times COUNTRY\ CONTROLS_j + \varepsilon_i \quad (3)$$

with *i* indicating the bank and *j* indicating the country.

3.2 Bank specific variables

We include a number of bank specific control variables. The effect of these variables on the dependent variables may be twofold. These variables, when used on the right end side either capture the specific bank impact on the related endogenous variable or, alternatively, can capture the differences in regulatory treatment, accounting standards or the banks' risk appetite.

As regarding the control variables used in the specification (1), EXPOSURE TO MARKET is a vector of variables comprising the share of risk exposure values on trading book over total risk exposures on securities (*TRADING BOOK*) and the ratio of level 3 instruments on total assets (*LEVEL 3*), which measure the degree of exposure to market risk. SOVEREIGN EXPOSURE is a vector of variables comprising the share of home country sovereign debt on

total sovereign debt (*HOMEBIAS*) and the share of sovereign debt of peripheral (GIIPS) Eurozone countries on total sovereign debt (*PERIPHERY*). QUALITY OF CREDIT ACTIVITIES is a vector of variables comprising the non‐performing exposures (*NPE*) and the coverage ratio of NPE (*CR*). Finally, OTHER BANK CONTROLS is a vector of variables including a dummy variable, *NEW BUSINESS MODEL*, which takes value 1 if the bank changed its business model during the financial crisis and before the CA, two size variables, the share of bank asset with respect to the domestic GDP *(SYS*) and the log of total asset (*LTOTAS 2012*), a dummy variable which takes value equal to 1 in case of a bank that has more than 50% of the risk weighted assets computed according to the internal rating model (*DIRB*) and *CET1 GOV* the capital instruments eligible as CET1 capital subscribed by government over total assets .

Among the bank specific control variables in specification (2) we have considered the ratio between tangible equity to tangible asset (*TEQTA*) and the natural log of total assets for the year 2012 (*LTOTAS 2012*). The choice of the lagged year compared to the CA reference year (2013) has been made to reduce endogeneity problems.

As for equation (3) we expect that the higher the *TEQTA* the lower the pressure on capital adequacy and the lower the likelihood of bank distress in the near future. We also control for bank size, using the log of total asset in year 2012. Ex ante we hold the expectation that large banks have higher contracting power, larger risk management departments and this could indeed enhance their ability to engage in capital arbitrage exercises.

The non-performing loans exposure (*NPE*) and the covered ratio (*CR*) have also been used as controls since we expect that there could be a compensatory effect, that is to say that high NPE should have a smaller effect on our dependent variables if it is accompanied by a high covered ratio. Moreover we introduce alternative risk measures - *RWATA* (risk density), *ZSCORE* (Altman's distance to default), EDF (Merton's expected default frequency) and

LEVEL 3 (the share of level 3 assets) - as controls (in eq. 3) since diverse supervisory capital requests in the transition period should reflect, in principle, the effective risk profile of the bank. As for *RWA SME* (the credit risk share for exposure to the SMEs), we use it as control in equation (3) to verify whether or not the importance of the interdependence between banks and SMEs (that is to say the degree of dependence of the real economy on the banking sector) could alter the regulators' persuasive effort. Along the same reasoning we use *HOMEBIAS*. Differently, *PERIPHERY* is used in our regression to check whether or not there could be worries regarding "GIIPS" exposure, due to contagion phenomena. *NATDISCR*, the set of options that allow the regulatory standards to be implemented differently by authorities in different jurisdictions, is expected to ease and facilitate banks in meeting the ECB requirements. Finally to address the size problem we use *SYS*,the share of bank assets with respect to the domestic GDP.

4.3 Country specific variables

The second group of control variables refers to country characteristics. We use the *HHI* index[7], a well-known measure of market concentration, to check whether the monopolistic power of banks can influence the stress test results. We also expect that *SINSF*, the strength of insolvency framework, may exert an influence on capital requests by easing the pressure as, in case of distress, a strong insolvency framework should protect banks'assets. *LOANGDP GAP* is introduced to control for the state of the cycle and the presence of bubbles. As for the sign, we do not hold expectations since expansionary phases of the cycle could be associated both with a more "generous" approach by the supervisor or - on the contrary - if the regulator sees it as a bubble, its approach could be more restrictive. We also test if being a bank located in a "core" country produces different outcomes, a result that might be related to specific features of the legal and administrative environment not directly introduced in the

[7] HHI is divided by 10000, so to limit its range between 0 and 1.

specifications As for the Supervisory power exerted by National Central Banks, we rely on the Oreski and Pavkovic (2015) classification. Accordingly six supervisory styles have been identified. They range from the sectorial model (*SUP SECT*), where there is a regulator/supervisor in charge of all functions for each main sector within the financial system, to the integrated model (*SUP INT*), where all the functions are integrated in one body[8], and to the hybrid model (*SUP HYB*) [9], which is a mix of other models[10] with different roles played by the National Central Bank. *SUP NEW* is a dummy taking the value of 1 if the supervisory model has changed since the 2011 crisis.

4. Main results

In this section we present the outcomes to our empirical analysis. Tables 3 to 5 report the set of regression results for models (1), (2), and (3).

To address research Question 1, at first we report in Table 3 a descriptive analysis of the business model risk exposure. As none of the banks with the investment model changed its business model prior to CA, the variable *BUSMOD NEW* is omitted from the estimation in column 1. Only for the retail business model, and its sub-model focused retail, the estimated coefficient for *BUSMOD NEW* is significant and positive. In fact, for this model the share of banks that changed their business model prior to the CA is very high[11]. For the wholesale business and the diversified retail models the coefficients are negative but significant only for the diversified retail business model. As discussed in Masciantonio and Tiseno (2013) the

[8] In this model there is one universal regulator and supervisor which conducts both prudential and business-to-conduct regulation and supervision of all financial service industry sectors. In our sample 10 out of 18 countries adopt this model, among which Germany and UK.

[9] In our sample 5 out 8 remaining countries adopt this model, among which Italy and France. The sectorial model is adopted by Spain, Cyprus and Slovenia and the twin peaks by Belgium and the Netherlands.

[10] The remaining model is the 'twin-peaks' model, where there is one authority for prudential supervision and another responsible for market conduct and customer protection. Each of them extends its competence over all sectors of the financial system. Solutions are dubbed 'hybrid' when the model contains elements of more than one model in it. See Rossi (2015).

[11] Banks that have a new business are 52% in retail and 66% in focused retail. For the wholesale 33% of banks have a new business model while for the diversified retail 9% of banks have a new business strategy.

changed financial and regulatory landscape that followed the financial crisis has challenged business models based on balance sheet expansion and business line diversification. In our context the new business environment is captured by the new entrants in the focused retail business model, which featured previously higher income diversification. Thus our estimates support the idea that the proposed remedies to the global financial crisis are pushing for a return to a narrower model for banking activity. As regards market risk exposures, it is possible to observe that the investment model is, as expected, characterized by a relatively greater importance of trading activities and level 3 assets. The wholesale model has the lowest share of trading activities, as confirmed by the not significant coefficient for *TRADING BOOK*, but the share of level 3 assets is close to that of the investment model (on average 1.1% against 1.4%), with a significant and positive coefficient for *LEVEL 3*. The retail model, like its sub-models, features lower trading activities compared to the investment model, although higher than the wholesale model, with the lowest share of level 3 assets. As regards sovereign debt exposures, only the focused retail model shows a significant home bias and (*HOMEBIAS*) exposure to GIIPS (*PERIPHERY*) sovereign debt. The quality of credit activity is worse in the diversified retail business, with a significant negative coefficient for *CR* and to a lesser extent in the focused retail model, with a significant and positive coefficient for *NPE* but with a not significant coefficient for *CR*. Taken together the two business models in the retail business do not appear to have specific problems in the quality of credit activities compared to the wholesale and investment business models (average coverage ratio: 47% investment, 39% wholesale, 42% retail, 38% diversified retail, 43% focused retail). The last interesting finding regards a control variable, *CET1 GOV*, representing the share of capital instruments eligible as CET1 capital subscribed by government on total assets. We observe that the investment model has the highest share (on average 3.2%, while for the other business models it ranges from 0.2% to 0.6%). In order to investigate further our first research

question, we proceed to regress the regulatory measures of bank risk based on the CA on the identified business models. In table 4 are reported the findings of this analysis, with panels A, B and C referred to the regulatory measures of bank risk considered (*SF/BUF CAPITAL*, *RWATA* and *LEVERAGE RATIO*) and panel D referred to the market-based measure of risk (*EDF*).[12] In discussing our findings we will focus only on the estimated coefficients of the business model variables. We can observe that findings are mixed. According to *SF/BUF*, a measure of bank risk based on the CET1 ratio post-AQR and the ST exercise, the retail model and its focused retail sub-model are relatively more risky, while the other business models are neutral. For the *RWTA* post-AQR the retail model and its sub-models are relatively more risky, while the wholesale model is relatively less risky and the investment model is neutral. However, the sharpest differences are found for the *LEVERAGE RATIO* post-AQR where the wholesale model is relatively more risky, while the other business models are neutral. Thus our empirical analysis reveals, after controlling for business model heterogeneity, significant inconsistencies in the information content provided by regulatory indicators used for assessing bank stability. Moreover, given the extant empirical literature, it could be considered surprising that the investment model is systematically neutral in all regulatory measures of bank risk. However, as argued for instance in Barucci et al. (2014), two key elements not adequately analyzed in the CA are level 3 assets and off-balance sheet items. As regards the market measure of risk, it is important to stress that given the different sample size the comparative analysis with the previous set of results based on larger sample of banks should be taken with caution. Nevertheless, it is interesting to observe that the market measure of risk partially confirms the findings for case of *LEVERAGE RATIO*. In fact, now the wholesale business model is relatively more risky, while the retail model and its focused

[12] The sample size is reduced with respect to the ECB sample of banks due to the use of data from Bankscope (the computed Z-score, total assets and capital in 2012 in the present case) and to the limited availability of the EDF measure of bank risk. Nevertheless we have checked that our findings are robust for the whole sample of banks included in the ECB exercise (apart from the two outliers discussed in section 2 and the case of the EDF). These estimates are not reported but are available from the authors upon request.

retail sub-model are less risky, and the investment and diversified retail models are neutral. A similar finding on the CA, but without taking into account business models heterogeneity, has been found by Acharya and Steffen (2014a,b). In particular, their assessment of capital shortfalls based on market data and market equity (instead of book equity) in determining leverage differed widely from the CA outcomes. They argue that the divergence between their assessment and that of the ECB can be explained by the reliance on static risk-weights in the regulatory assessment. In fact, using the projected losses in the adverse scenario employed by the ECB and applying a different leverage ratio (non risk-weights based, i.e. simple) gives results much closer to them.

<Insert Table 3 around here>

<Insert Table 4 around here>

<Insert Table 5 around here>

Table 5 shows the empirical investigation carried out to answer the research Question 2. In column 1 we consider only the set of bank level characteristics. From column 2 to column 10 we add country variables, supervisory styles and we account for the interactions between *NATDISCR*, *DCORE* and *DIRB*. As for Supervision, from column 5 to 10 we alternate the specific supervisory model associated to the country, in particular *SUP INT* and *SUP HYB* and *SUP SECT*. In Column 3 we remove *PERIPHERY*, for parsimony, and include the measure of national discretions, the dummy representing the importance of internal rating models and the share of foreign bank assets in the domestic banking system. We proceed with interacting *NATDISCR* with *DCORE* and *DIRB*, respectively in specification 3 and 4, with the intention to replicate Barucci's et al. (2014) exercise and evaluate if national discretions were allowed mainly for banks located in CORE countries and whether national discretions were related to the attitude of the supervisor.

In all specifications the share of domestic sovereign assets (*HOMEBIAS*) enters with a negative and significant coefficient (at least at 5% level) indicating a negative association with the dependent variable as if there were a benign approach for banks highly exposed to the public sector.[13] Investigating further we find that this result is conditioned by the bank's size and holds mainly for small banks.[14] The national discretions coefficient is also negative and significant. Discretionary rules - as often put forward by practitioners, analysts and regulators - may have influenced the outcome of the stress test and possibly the persuasive power of the supervisor simply by altering the assessment of risk and muddling the comparison across banks and countries. In specification 3 we interact *NATDISCR* with the *DCORE*. We find that the overall negative effect of the national discretions does not depend on country specific elements, despite the fact that the t test shows that the national discretions are significantly greater for banks in core countries. *DCORE* is never significant neither alone nor in a variety of unreported interactive specifications[15]. Since regression 4 shows that national discretions helped to ease the moral suasion we interact *NATDISCR* with *DIRB* and we find a negative and significant coefficient. In our opinion, this is a signal that the ECB has only partially considered as banks taking advantage of both national discretions and IRB models as more risky. Finally, we address the issue of whether or not the type of supervisory model affects the persuasive power of the supervisor. We consider the impact of a change in the supervisory model during the crisis (*SUP NEW*), and find that the coefficient is always negative and significant (at least at 5% level). A possible interpretation relies on the fact that since the crisis, changes to the supervisory model correspond to the adoption of a stricter

[13] On the issue of how domestic Authorities may have put pressure on banks in order to enlarge their share of domestic bonds in their portfolios and on the consequences on banks risk see (Acharya and Steffen (2015) and Pagano et al (2013)).

[14] We interact *HOMEBIAS* with a dummy variable representing the bank's size and find that the negative coefficient is smaller for larger banks. We do not report the results in table 5 for symmetric purposes but they are available upon request to the authors.

[15] The t-test of the mean difference for the two subsamples (core non-core) rejects the null of equality of means at any level greater than 1.5%. The mean of national discretion for banks in core countries is -.0062493 that being a negative number implies that it is greater than for banks in non-core countries -.0156966.

approach and to new capital requests which were fulfilled well before the inception of the 2014 stress test. As noticed by Oreski and Pavkovic (2015), in fact, in this crisis many defects of financial regulatory models have emerged and this led to a greater focus on systemic risks and a shift away from the micro prudential to the macro prudential approach.

As for the direct impact of the supervisory style, we alternatively use three specific models, *SUP HYB*, *SUP INT* and *SUP SECT*, which have been selected as the most popular in the EU since 2011.

The result shows that the supervision style matters. *SUP HYB*, indeed, is mostly significant and positive, as shown in columns 5 and 6. Countries that adopt a hybrid model (such as Italy) may have exerted a stronger pressure on their domestic banks to recapitalize in advance. These findings are echoed in the Bank of Italy Governor's Concluding Remarks, clearly stating that "in 2014 the large increase in Italian banks' capital ratios, was achieved mainly with the capital increases carried out at our prompting in the first half of the year".[16]

Differently, countries adopting the integrated model seem less prone/able to be effective in their request. This is in line with the conclusions reached by Masciandaro et al. (2013) that central bank involvement in supervision (as in the integrated model) did not have any significant impact on bank resilience. As a matter of fact the sign of *SUP INT* is significant and negative at 1% level. Differently, the sectorial model appears to be neutral with respect to our research question. The cumulated economic impact of national discretions and the supervisory style[17] indicates an extra raise of new capital of 22bps in case of hybrid models, a reduction of 123 bps in case of integrated models, and a reduction of 28 bps, on average, for banks located in countries adopting a sectorial supervisory style.

Finally, we notice that pre-emptive capital-raising is unlikely to be feasible for weak banks, which may fail to convince investors to buy newly issued capital instruments, and may also be

[16] Page 15 of the "The Governor's Concluding Remarks" Ordinary Meeting of Shareholders, Bank of Italy Rome, 26 May 2015.

[17] Obtained on the base of the coefficients displayed in columns 5, 7, and 9.

unable to sell distressed assets at prices high enough to bridge their capital gap. Therefore we run additional regressions (not inserted in table 5 for brevity) introducing among the control variables the bank's ROE and alternative proxies of size (such as a dummy for large banks and a dummy for the *GSIFI*[18]) without detecting any statistical or additional insights into the explicative variables.

5. Conclusions

In the wake of the latest stress test, the availability of reliable data on a large sample of European banks has spurred researchers to "post validate" the ECB's exercise. The aim is twofold: to evaluate the coherence of the outcome across banks and countries and to assess the appropriateness of the requests at the individual bank level. As for our analysis, we focus on two research questions. First we tackle the issue of the business models relative riskiness, which is deemed very important in the new supervisory framework. We provide new empirical evidence on the importance of the variability across business models for risk assessment, although our findings on the relative riskiness of the specific business models are mixed as they depend on the chosen regulatory measure of risk**.** Our analysis reveals, after controlling for business model heterogeneity, inconsistencies in the information content provided by the various regulatory measures used for assessing bank stability. Interestingly, opposite to risk weighted assets density and CET1 ratio, the leverage ratio provides outcomes in terms of the relative riskiness of the specific business models closer to a market-based measure of bank risk. An exception is the case of the investment model which is systematically neutral across all regulatory measures of bank risk. This is a surprising result given the strong evidence in the literature that banking strategies that rely preponderantly on non-interest income or non-deposit funding are very risky. Indeed, two key elements not

[18] It assigns value 1 when the bank is on the list of the "globally systemically important financial institutions" defined by the Financial Stability Board; 0 otherwise.

adequately analyzed in the CA are level 3 assets and off-balance sheet items, which heavily feature the investment business model.

Second we investigate the persuasive power of different supervisory architectures and find that countries adopting the hybrid model were more severe and effective in persuading banks to act preventively. Differently, countries adopting the integrated and the sectorial model seem less prone/able to be effective in their request. Discretionary rules - often blamed by practitioners, analysts and regulators for modifying the picture- may have influenced the outcome of the stress test and possibly the persuasive power of the supervisor simply by altering the assessment of risk and muddling the comparison across banks and countries. Indeed national discretions were playing in favor of lower capital increase, especially for banks with more than 50% credit risk exposure evaluated by internal rating models and located in countries adopting an integrated supervisory architecture. In this paper, we find that the effectiveness of the supervisory action depends on the specific type of supervisory model and that the intrinsic risk of business strategies is not easy to detect and can be significantly underestimated. Consequently, it should be interesting to investigate how different supervisory styles interact with different business models in the correct assessment of banks' risk and we leave it for further research.

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Table 1. Variables definition and data sources

Acronym	Description	Source
PANEL A: bank-level variables		
MORAL SUASION	Ratio between the amount of equity capital raised during the period January and September 2014 and the value of the total asset in 2013 (TOTAL ASSETS)	Our computation on ECB Database
TEQTA 2012	Tangible Common Equity ratio in 2012 (Tangible Common Equity divided tangible assets)	Bankscope Database
CET1 AQR	Common equity tier 1 ratio post AQR in 2013 (CET1 capital divided RWA)	ECB and EBA Database
CET1	Common equity tier 1 ratio in 2013 (CET1 capital divided RWA)	ECB and EBA Database
CET1 GOV	Capital instruments eligible as CET1 capital subscribed by government on total assets (TOTAL ASSETS)	EBA Database
LEVERAGE RATIO	Leverage ratio post AQR in 2013 (common equity tier 1 divided total exposure measure according to Article 429 CRR)	ECB and EBA Database
DIRB	Dummy equal to 1 for banks with a credit risk exposure, not adjusted for risks, on IRB models (F-IRB and A-IRB) over 50% of total credit risk exposure; 0 otherwise	Our computation on ECB and EBA Database
SF/BUF CAPITAL	Aggregate shortfall (+) / buffer (-) of CET1 implied by the Comprehensive Assessment (shortfall/buffer divided RWA)	ECB and EBA Database
TRADING BOOK	Risk exposure values on trading book on total risk exposures on securities	ECB and EBA Database
TOTAL ASSETS	Total assets in 2013 based on prudential scope of consolidation (used is computed ratios)	ECB and EBA Database
LTOTAS 2012	Natural logarithm of the value of total asset in year 2012	Bankscope Database
LEVEL 3	Level 3 instruments on total assets (TOTAL ASSETS)	ECB Database
NPE	Non-performing exposures ratio	ECB Database
CR	Coverage ratio for non-performing exposure	ECB Database
RWA	Total risk exposure in 2013	ECB and EBA Database
RWATA	Total risk exposure (RWA) on total assets (TOTAL ASSETS)	ECB and EBA Database
EDF	Merton's Expected default frequency at the end of 2013, i.e. the probability that the firm will default within the specified time horizon (i.e. 1 year).	KMV Moody's
Z-SCORE	Z-score, computed as the sum of average bank return on asset with bank equity to assets ratio divided by the standard	Our computation on Bankscope

	deviation of return on assets over a four-year period; higher values indicate lower bank risk.	Database
RWA SME	Risk exposure (RWA) on credit risk on SMEs over total assets	ECB and EBA Database
HOMEBIAS	Net direct exposure on home country sovereign debt on total net direct exposure on sovereign debt	EBA Database
PERIPHERY	Net direct exposure on of peripheral Eurozone countries sovereign debt on total net direct exposure on sovereign debt	EBA Database
NATDISCR	Difference between the fully loaded CET1 ratio and CET1 ratio in the transitional period in the adverse scenario in 2016	BCE and EBA Dataset
BUSMOD NEW	Dummy which takes value 1 if the bank has changed its business model during the financial crisis and before the CA; 0 otherwise	Ayadi and de Groen (2014)
INVESTMENT	Dummy which takes value 1 if the bank has an investment business model in 2013; 0 otherwise	Ayadi and de Groen (2014)
RETAIL	Dummy which takes value 1 if the bank has a retail business model in 2013; 0 otherwise	Ayadi and de Groen (2014)
DIVERSIFIED RETAIL	Dummy which takes value 1 if the bank has a diversified retail business model in 2013; 0 otherwise	Ayadi and de Groen (2014)
FOCUSED RETAIL	Dummy which takes value 1 if the bank has a focused retail business model in 2013; 0 otherwise	Ayadi and de Groen (2014)
WHOLESALE	Dummy which takes value 1 if the bank has a wholesale business model in 2013; 0 otherwise	Ayadi and de Groen (2014)
SYS	Total assets over nominal GDP	Our computation on ECB and Eurostat Database
PANEL B: country-level variables		
HHI	Herfindahl–Hirschman Index (divided by 10.000)	ECB Database
SINSF	Strength of insolvency framework index: the index ranges from 0 to 16, with higher values indicating insolvency legislation that is better designed for rehabilitating viable firms and liquidating nonviable ones	World Bank Database
LOANGDP GAP	Domestic credit-to-GDP gap in 2013 (difference between the domestic credit-to-GDP ratio and its long-term trend)	ECB Database
SUP INT	Dummy equal to 1 for integrated model of prudential supervision in 2013; 0 otherwise	World Bank and Oreski and Pavkovic (2015)
SUP HYB	Dummy equal to 1 for hybrid model of prudential supervision in 2013; 0 otherwise	World Bank and Oreski and Pavkovic (2015)
SUP SECT	Dummy equal to 1 for sectorial model of prudential supervision in 2013; 0 otherwise	World Bank and Oreski and Pavkovic (2015)
DCORE	Dummy equal to 1 for banks located in Austria, Belgium, Germany, Finland, France, Luxembourg and the Netherlands (euro area core countries); 0 otherwise	Our computations
FOREIGN BANK ASSETS	Total assets of branches and subsidiaries of foreign credit institutions on total assets of total credit institutions in the country	ECB Database

Table 2 Descriptive statistics

VARIABLES	Obs	Mean	Std.Dev	Min	Max
MORAL SUASION	121	0.0038	0.0079	0	0.04
TEQTA 2012	129	0.0508	0.0524	-0.08	0.33
CET1 AQR 2013	136	0.1390	0.0841	0.04	0.73
CET1	136	0.1453	0.0847	0.05	0.76
CET1 GOV	136	0.0068	0.0333	0	0.35
DIRB	136	0.5000	0.5018	0	1
SF BUF	136	-0.0396	0.0718	-0.49	0.12
TRAD. BOOK SHARE	136	0.0383	0.1333	0	1
LTOTAS 2012	130	11.1835	1.6126	6.18	14.53
LEVEL 3	128	0.0079	0.0153	0	0.1
NPE	136	0.0705	0.0841	0	0.45
CR	128	0.4213	0.1775	0	1
RWTA	136	0.4504	0.1993	0	1
EDF	75	0.0095	0.0162	0	0.11
ZSCORE	122	4.1512	6.9971	-2.48	51.27
RWA SME	136	0.0200	0.0349	0	0.32
HOMEBIAS	136	0.6239	0.3512	0	1
PERIPHERY	136	0.3160	0.4042	0	1.05
NATDISCR	136	-0.0089	0.0189	-0.12	0.05
BUSMOD NEW	128	0.4609	0.5004	0	1
RETAIL	128	0.7656	0.4253	0	1
WHOLESALE	128	0.1406	0.3490	0	1
INVESTMENT	128	0.0938	0.2926	0	1
SYS	136	0.2814	0.3450	0.00	1.69
HHI	136	0.0864	0.0683	0.03	0.31
SINSF	136	11.9890	2.0839	6	15
LOANGDP GAP	136	-0.1666	0.1500	-0.47	0.03
SUP SECT	136	0.1594	0.3674	0	1
SUP INT	136	0.4485	0.4992	0	1
SUP HYB	136	0.3015	0.4606	0	1
DCORE	136	0.4853	0.5016	0	1
FOREIGN BANK ASSETS	136	0.2587	0.3015	0.03	0.96

Table 3. Business models risk exposures

Probit estimations

DEPENDENT VARIABLE	INVESTMENT		WHOLESALE		RETAIL		DIVERSIFIED RETAIL		FOCUSED RETAIL	
	1		2		3		4		5	
	Coef.	Robust z	Coef.	Robust z	Coef.	Robust z	Coef.	Robust z	Coef.	Robust z
BUSMOD NEW			-0.0819	-0.24	0.7056	2.69 ***	-1.5998	-4.21 ***	1.7453	4.17 ***
TRADING BOOK	2.1041	2.58 **	-37.5944	-2.63 ***	-0.3442	-0.59	-0.2489	-0.42	-0.0868	-0.10
LEVEL3	11.3004	2.20 **	15.0183	1.63 *	-17.2534	-1.88 *	-34.6841	-2.19 **	-3.3341	-0.26
HOMEBIAS	0.1243	0.13	-0.6879	-1.48	0.5114	1.37	-0.1806	-0.29	0.7441	1.82 *
PERIPHERY	-0.8100	-0.60	-0.9440	-1.48	1.1431	1.48	-0.3189	-0.46	1.4084	1.76 *
CR	0.4548	0.56	0.6678	1.53	-0.3810	-0.60	-1.1453	-1.69 *	1.2575	0.99
NPE	-17.3504	-1.85 *	-5.7631	-1.36	9.1785	1.58	-2.3732	-0.90	6.6317	3.52 ***
SYS	0.2895	0.43	-1.3325	-2.17 **	0.6987	1.35	-0.2332	-0.44	0.8416	2.00 **
LTOTAS 2012	0.3970	3.71 ***	0.2471	1.70 *	-0.3006	-2.76 ***	-0.1192	-0.82	-0.1823	-2.26 **
DIRB	-0.4998	-1.51	-0.8591	-1.78 *	0.8409	1.72 *	0.8387	1.46	0.2549	0.49
CET1 GOV	8.0297	2.80 ***	-6.3415	-2.33 **	-6.5978	-0.60	4.0503	0.85	-9.5698	-1.01
CONSTANT	-5.5287	-5.46 ***	-2.4044	-1.57	2.5573	2.23 **	1.4947	0.90	-0.5924	-0.63
Country clusters		YES		YES		YES		YES		YES
n. of banks		116		116		116		116		116
Wald chi2 (p values)		0.0000		0.0000		0.0000		0.0000		0.0000
VIF		1.41		1.41		1.41		1.41		1.41

Table 4. Risk and bank business models

Panel A: OLS estimations

DEPENDENT VARIABLE	SF/BUFFER CAPITAL		SF/BUFFER CAPITAL		SF/BUFFER CAPITAL		SF/BUFFER CAPITAL	
	1		2		3		4	
	Coef.	Robust t	Coef.	Robust t	Coef.	Robust t	Coef.	Robust t
INVESTMENT	0.00667	0.77						
WHOLESALE			-0.04108	-1.39				
RETAIL					0.02443	1.76 *		
DIVERSIFIED RETAIL							0.01342	0.45
FOCUSED RETAIL							0.02801	1.80 *
Z-SCORE	-0.00042	-0.37	-0.00069	-0.59	-0.00048	-0.38	-0.00043	-0.34
TEQTA_2012	-0.56765	-3.21 ***	-0.51879	-2.80 **	-0.53096	-2.92 ***	-0.50974	-2.70 **
LTOTAS_2012	0.00307	0.37	0.00193	0.24	0.00432	0.55	0.00435	0.55
CONSTANT	-0.01607	-0.16	0.01471	0.15	-0.04418	-0.45	-0.04783	-0.46
Country fixed effects		YES		YES		YES		YES
Country clusters		YES		YES		YES		YES
n.of banks		115		115		115		115
F(p values)		0.0000		0.0000		0.0000		0.0000
VIF		2.01		2.05		2.02		2.07

Panel B: Tobit estimations

DEPENDENT VARIABLE	RWA/TA		RWA/TA		RWA/TA		RWA/TA	
	1		2		3		4	
	Coef.	Robust t	Coef.	Robust t	Coef.	Robust t	Coef.	Robust t
INVESTMENT	-0.01161	-0.41						
WHOLESALE			-0.11028	-2.20 **				
RETAIL					0.08001	3.11 ***		
DIVERSIFIED RETAIL							0.08630	1.83 *
FOCUSED RETAIL							0.07797	2.76 ***
Z-SCORE	0.00016	0.10	-0.00066	-0.39	-0.00014	-0.09	-0.00017	-0.11
TEQTA_2012	1.71316	1.54	1.83604	1.73 *	1.82393	1.69 *	1.81182	1.70 *
LTOTAS_2012	-0.01373	-1.13	-0.01889	-1.37	-0.01202	-0.97	-0.01204	-0.97
CONSTANT	0.61343	3.88 ***	0.71998	3.83 ***	0.54850	3.35 ***	0.55058	3.34 ***
Country fixed effects		YES		YES		YES		YES
Country clusters		YES		YES		YES		YES
uncensored obs		115		115		115		115
n.of banks		115		115		115		115
F(p values)		0.0000		0.0000		0.0000		0.0000
sigma		0.1196 ***		0.1148 ***		0.1159 ***		0.1159 ***
standard error		0.0115		0.0101		0.0106		0.0105
VIF		2.01		2.05		2.02		2.07

Panel C: Tobit estimations

DEPENDENT VARIABLE	LEVERAGE RATIO		LEVERAGE RATIO		LEVERAGE RATIO		LEVERAGE RATIO	
	1		2		3		4	
	Coef.	Robust t	Coef.	Robust t	Coef.	Robust t	Coef.	Robust t
INVESTMENT	0.00806	1.27						
WHOLESALE			-0.00734	-1.74 *				
RETAIL					0.00100	0.28		
DIVERSIFIED RETAIL							0.00322	0.42
FOCUSED RETAIL							0.00029	0.08
Z-SCORE	0.00000	-0.01	-0.00002	-0.09	0.00002	0.10	0.00001	0.06
TEQTA_2012	0.52126	3.29 ***	0.53192	3.43 ***	0.52496	3.35 ***	0.52070	3.30 ***
LTOTAS_2012	-0.00178	-0.84	-0.00150	-0.82	-0.00118	-0.65	-0.00118	-0.66
CONSTANT	0.04629	1.94 *	0.04622	1.98 *	0.03883	1.77 *	0.03956	1.88
Country fixed effects		YES		YES		YES		YES
Country clusters		YES		YES		YES		YES
uncensored obs		115		115		115		115
n.of banks		115		115		115		115
F(p values)		0.0000		0.0000		0.0000		0.0000
sigma		0.0159 ***		0.0159 ***		0.0161 ***		0.0160 ***
standard error		0.0026		0.0027		0.0028		0.0028
VIF		2.01		2.05		2.02		2.07

Panel D: Tobit estimations

DEPENDENT VARIABLE	EDF		EDF		EDF		EDF	
	1		2		3		4	
	Coef.	Robust t	Coef.	Robust t	Coef.	Robust t	Coef.	Robust t
INVESTMENT	0.00020	0.06						
WHOLESALE			0.00937	5.02 ***				
RETAIL					-0.00466	-2.03 **		
DIVERSIFIED RETAIL							0.00232	0.45
FOCUSED RETAIL							-0.00659	-2.36 **
Z-SCORE	-0.00024	-2.07 **	-0.00019	-2.08 **	-0.00024	-2.38 **	-0.00028	-2.67 **
TEQTA_2012	-0.13767	-1.61	-0.10953	-1.43	-0.12218	-1.39	-0.18886	-1.75 *
LTOTAS_2012	-0.00293	-4.01 ***	-0.00220	-3.00 ***	-0.00308	-4.50 ***	-0.00357	-3.50 ***
CONSTANT	0.05180	4.60 ***	0.04140	3.41 ***	0.05727	5.60 ***	0.06919	3.96 ***
Country fixed effects		YES		YES		YES		YES
Country clusters		YES		YES		YES		YES
uncensored obs		70		70		70		70
n.of banks		70		70		70		70
F(p values)		0.0000		0.0000		0.0000		0.0000
sigma		0.0092 ***		0.0089 ***		0.0090 ***		0.0087 ***
standard error		0.0016		0.0016		0.0016		0.0014
VIF		2.90		2.92		2.90		3.13

Table 5. Moral Suasion (*MS*), Tobit Regressions

	1		2		3		4		5		6		7		8		9		10	
	Coef.	Robust t	Coef.	Robust t	Coef.	Robust t	Coef.	Robust t	Coef.	Robust t	Coef.	Robust t	Coef.	Robust t	Coef.	Robust t	Coef.	Robust t	Coef.	Robust t
Bank level variables																				
TEQTA 2012	-0.1172	-2.89 ***	-0.1265	-2.62 **	-0.1321	-2.99 ***	-0.1244	-2.87 ***	-0.1270	-2.84 ***	-0.1247	-2.97 ***	-0.1237	-2.95 ***	-0.1236	-3.17 ***	-0.1282	-2.64 ***	-0.1284	-3.01 ***
LTOTAS 2012	0.0006	0.69	0.0008	0.67	0.0006	0.52	0.0010	0.82	0.0005	0.48	0.0008	0.69	0.0006	0.46	0.0010	0.72	0.0006	0.50	0.0010	0.82
LEVEL 3	-0.1044	-0.87	-0.1186	-0.88	-0.1236	-1.07	-0.1350	-0.98	-0.1869	-2.10 **	-0.2064	-2.03 **	-0.1719	-1.76 *	-0.1889	-1.74 *	-0.1121	-0.94	-0.1453	-1.10
NPE	0.0542	3.04 ***	0.0572	3.18 ***	0.0436	2.13 **	0.0600	4.08 ***	0.0540	2.25 **	0.0571	2.70 ***	0.0582	2.47 **	0.0596	2.71 ***	0.0586	3.20 ***	0.0632	4.08 ***
CR	-0.0055	-0.49	-0.0049	-0.43	-0.0055	-0.52	-0.0042	-0.38	-0.0008	-0.10	0.0000	0.00	-0.0021	-0.24	-0.0009	-0.09	-0.0055	-0.57	-0.0029	-0.28
RWA_SME	0.1189	1.67 *	0.1286	1.56	0.1250	1.32	0.1207	1.50	0.0991	1.30	0.0874	1.29	0.1038	1.38	0.0907	1.31	0.1378	1.50	0.1175	1.47
Z SCORE	0.0003	1.20	0.0001	0.57	0.0001	0.59	0.0001	0.52	0.0002	0.88	0.0002	0.86	0.0003	1.59	0.0003	1.49	0.0001	0.60	0.0001	0.53
HOMEBIAS	-0.0105	-2.28 **	-0.0092	-1.97 **	-0.0118	-2.79 ***	-0.0088	-1.88 *	-0.0098	-2.69 ***	-0.0096	-2.30 **	-0.0116	-3.01 ***	-0.0116	-2.73 ***	-0.0087	-1.94 *	-0.0084	-1.75 *
PERIPHERY	0.0075	1.21																		
NATDISCR			-0.1556	-2.41 ***	-0.1715	-1.76 *	-0.0594	-0.93	-0.1364	-1.68 *	-0.0381	-0.39	-0.2493	-2.30 **	-0.1672	-1.30	-0.1491	-2.71 ***	-0.0321	-0.68
DIRB			-0.0020	-0.48			-0.0048	-1.14			-0.0038	-0.96			-0.0042	-1.00			-0.0050	-1.22
NATDISCR x DIRB							-0.1823	-2.71 ***			-0.1721	-2.73 ***			-0.1288	-1.84 *			-0.1936	-2.96 ***
Country level variables																				
HHI			-0.0168	-0.59	-0.0209	-0.74	-0.0172	-0.68	-0.0024	-0.10	-0.0024	-0.12	-0.0410	-1.33	-0.0379	-1.43	-0.0172	-0.57	-0.0165	-0.62
SINSF			0.0007	0.83	0.0006	0.62	0.0009	1.19	0.0014	1.43	0.0016	1.80 *	0.0026	2.22 **	0.0027	2.34 **	0.0006	0.61	0.0009	1.11
LOANGDP GAP			0.0379	3.85 ***	0.0420	4.10 ***	0.0365	3.88 ***	0.0261	2.41 **	0.0262	2.86 ***	0.0521	5.66 ***	0.0522	5.97 ***	0.0338	1.94 *	0.0311	1.98 **
SUP NEW			-0.0090	-3.11 ***	-0.0090	-2.13 **	-0.0080	-3.02 ***	-0.0121	-4.18 ***	-0.0110	-4.78 ***	-0.0146	-4.03 ***	-0.0136	-4.17 ***	-0.0088	-2.87 ***	-0.0078	-2.89 ***
FOREIGN BANKS ASSETS			0.0109	1.16	0.0097	0.90	0.0121	1.43	0.0129	1.56	0.0146	2.02 **	0.0243	2.74 ***	0.0255	3.02 ***	0.0094	0.90	0.0109	1.19
DCORE					-0.0052	-0.84														
NATDISCR x DCORE					0.0377	0.15														
SUP HYB									0.0104	3.65 ***	0.0100	4.11 ***								
SUP INT													-0.0153	-3.44 ***	-0.0142	-3.36 ***				
SUP SECT																	-0.0013	-0.22	-0.0032	-0.59
CONSTANT	-0.0057	-0.50	-0.0070	-0.36	0.0024	0.12	-0.0105	-0.59	-0.0200	-0.95	-0.0243	-1.19	-0.0205	-0.94	-0.0250	-1.14	-0.0042	-0.22	-0.0108	-0.61
Cluster in Country		YES		YES		YES		YES		YES		YES		YES		YES		YES		YES
uncensored obs		42		42		42		42		42		42		42		42		42		42
n.of banks		113		113		113		113		113		113		113		113		113		113
F(p values)		0.0028		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000		0.0000
sigma		0.0118 ***		0.0104 ***		0.0103 ***		0.0100 ***		0.0096 ***		0.0092 ***		0.0095 ***		0.0093 ***		0.0104 ***		0.0100 ***
standard error		0.0017		0.0016		0.0016		0.0015		0.0013		0.0012		0.0015		0.0014		0.0016		0.0015
VIF		1.42		1.76		1.93		1.88		1.76		1.89		1.85		1.98		1.81		2.08