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EURO AREA SIGNIFICANT BANKS: MAIN DIFFERENCES AND RECENT PERFORMANCE

by Emilia Bonaccorsi di Patti*, Roberto Felici*
and Federico M. Signoretti⁺

Abstract

Based on publicly available data we propose a simple taxonomy of the banks under the direct supervision of the ECB, taking into account their core business, size, and degree of internationalization. We compare the structures of the balance sheet and income statement of the eight different types of bank, and analyse their profitability between 2006 and 2013. The majority of banks are lending-oriented, exposed to their domestic market, with high credit risk exposure to nonfinancial firms and retail clients. The ratio of risk-weighted assets to total assets differs significantly across bank types, even controlling for the composition of credit risk exposures; this heterogeneity mostly reflects country-specific riskiness and the extent to which banks in each category use their internal models to determine capital requirements. Since 2010, the profitability of lending-oriented banks has declined more sharply than that of the other banks, reflecting both poorer macroeconomic conditions in countries where many of these banks are located, and a higher sensitivity of ROA to GDP growth.

JEL Classification: G21.

Keywords: euro area banks, significant banks, business model, bank profitability.

Contents

1. Introduction and main findings	5
2. Sample and data sources.....	7
3. Identification of clusters	9
4. Main characteristics of bank balance sheets by cluster	12
4.1. Composition of assets	12
4.2 Risk density and non-performing exposures	17
4.3. Funding	23
4.4. Capital and leverage ratios.....	24
5. Income and costs	26
6. Recent evolution of profitability	28
6.1. Panel regression	32
References	38
Tables	39
Appendix	46

* Bank of Italy, Financial Stability Directorate, ⁺ Bank of Italy, Economic Outlook and Monetary Policy Directorate.

1. Introduction and main findings¹

In November 2014 bank supervision in the euro area was transferred from the national competent authorities (NCAs) to the Single Supervisory Mechanism (SSM), comprising the ECB and the NCAs of the participating countries. Within the SSM, 123 banks in the euro area are currently supervised directly by the ECB (the “significant” banks).² The other banks are supervised by the NCAs in close cooperation with the ECB. Given that even the larger banks in the participating countries are heterogeneous, understanding the differences and similarities across the significant banks is even more important than in the past, as is the establishment of appropriate benchmarks when comparing banks’ performance.

This paper has three purposes. The first is to propose a simple and transparent approach for grouping the significant banks into clusters of institutions with a similar business model.³ The second is to compare banks by cluster, focusing on the structure of their assets, liabilities and income statements, and on the level and composition of credit risk exposure. We single out Italian significant banks, comparing their balance sheets and profitability to their respective peer groups. Our third and final purpose is to describe the evolution of bank profitability since the outbreak of the global financial crisis, and estimate an empirical model of banks’ return on assets (ROA) to assess the sensitivity of the profitability of different business models to macroeconomic conditions.

Our analysis is based on publicly available sources, specifically: (i) balance-sheet information from SNL Financial; (ii) detailed information on the composition of exposures and risks based on data released by the EBA and the ECB after the 2014 EU-wide stress testing exercise. We therefore focus on the 90 significant banks for which data are available. .

We identify 8 clusters. Two of them are “specialized” banks: (i) “Network Banks”, i.e., banks that typically provide services or act as the hub of a network of (usually) small cooperative banks, (ii) “Public and Development Banks”, i.e. intermediaries with a strong public interest goal. The other 6 clusters are based on a combination of core business (“Lending Banks” versus

¹ Our thanks to G. Chionsini for his clarifications on the EBA data, and to P. Bisio, G. Gobbi, and M. Piazza for their comments. Any error is our own. The opinions expressed do not necessarily reflect those of the Bank of Italy, the Eurosystem or their staff.

² As of the end of September 2015.

³ Throughout the paper, unless otherwise specified, we use the term “cluster” as a synonym of “group” or subset of banks although we do not employ a statistical clustering technique.

“Diversified Banks”), size and degree of internationalization.⁴ This approach has the advantage of being simple and transparent.

Our main findings are as follows:

- a. The majority of the significant banks have lending as their core business and are mostly oriented to their domestic market. Less than one sixth (15 banks) have a diversified balance sheet (i.e., a loan-to-asset ratio of less than 50 per cent), and only 9 have a share of non-domestic credit risk exposure that exceeds 50 per cent. For all but the network banks the incidence of deposits from customers on total funding is above one third; for the lending banks it is over one half.
- b. The distribution of business models is not uniform across countries. A higher proportion of banks is lending-oriented in Italy and Spain, while their allocation is more balanced across groups in France, Germany and the Netherlands.
- c. Considering credit risk exposure, its composition by type of counterpart is similar across lending and diversified banks. Exposure to corporates and small- and medium-sized enterprises accounts for around one third of the total, and other retail exposure for about another third. The specialized banks are more exposed to institutions and the public sector.
- d. There are substantial differences in credit risk density (RD), defined as risk-weighted exposure divided by unweighted exposure across clusters; in particular, RD is greater for small and medium lending banks. Such heterogeneity mostly reflects country-specific factors, including systematic differences in borrowers’ riskiness, and the extent to which IRB models are used by banks that have adopted different business models to evaluate risk weights (as IRB portfolios have systematically lower risk density).
- e. Income and cost structures differs across banks. Revenues and operating costs per unit of assets are higher than average for lending banks, especially the smallest ones.
- f. Considering the evolution of profits between 2006 and 2013, the ROA of lending banks exhibited a greater sensitivity to GDP growth than that of other intermediaries. Nevertheless, heterogeneity in the macroeconomic conditions faced by banks is the main driver of current differences in performance across bank types.

The paper is organized as follows. Section 2 describes the sources and data available as a starting point. Section 3 discusses the classification of banks into the different clusters. Sections 4 and 5 provide a comparison of, respectively, the balance sheet and income statement

⁴ In particular, the identified clusters are (cfr. Section 3): 1: Large-Lending-International (6 banks); 2: Large-Lending-Domestic (7 banks); 3: Large-Diversified (6 banks); 4: Medium-Lending (24 banks); 5: Small-Lending (24 banks); 6: Medium&Small-Diversified (9 banks).

structures of the clusters. Section 6 analyses the recent evolution of banks' profitability. Section 7 compares Italian banks with their peers. The final sections concludes.

2. Sample and data sources

The number of directly supervised entities, defined as *significant banks*) within the SSM, is 123 (as of end-September 2015). The list was compiled by combining a number of criteria, based on bank size, relative importance for a specific country or the EU economy as a whole, and their cross-border activities.⁵ Most of the entities are banking groups that include domestic and non-domestic subsidiaries.⁶ These are generally supervised as part of their parent group but some are considered significant banks in their own right from the perspective of smaller economies.

Box 1 shows the distribution of the significant entities by country of the established entity (vertical axis) and by country of its ultimate parent (horizontal axis). As expected, the four largest euro-area countries have the greatest number of established entities (Germany 21, Spain 15, Italy 14, France 10); banks in these four countries account for around three quarters of total SSM bank assets.

Twenty-eight entities are subsidiaries or branches of larger banking groups:⁷ 6 of these are subsidiaries of other euro-area groups; 22 are subsidiaries of banks headquartered outside the euro area. According to SNL, 40 entities are listed on stock exchanges; Italy has the largest number of listed banks (10), followed by Spain (6) and Greece (4). The full list of the significant banks is in Table A1 in the Appendix.

⁵ The criteria for determining whether banks are significant are set out in the SSM Regulation and the SSM Framework Regulation. To qualify as significant, banks must fulfil at least one of these criteria. The significance criteria are: size (the total value of their assets must exceed €30 billion), economic importance for the specific country or the EU economy as a whole, cross-border activities (the total value of their assets must exceed €5 billion and the ratio of cross-border assets/liabilities in more than one other participating Member State to total assets/liabilities must be more than 20 per cent), direct public financial assistance (it must have requested or received funding from the European Stability Mechanism or the European Financial Stability Facility). A supervised bank can also be considered significant if it is one of the three most significant banks established in a particular country.

⁶ A supervised entity refers to any of the following: (a) a credit institution established in a participating Member State; (b) a financial holding company established in a participating Member State; (c) a mixed financial holding company established in a participating Member State; (d) a branch established in a participating Member State by a credit institution established in a non-participating Member State.

⁷ As a special case, we consider *AXA Bank Europe* as a Belgium-based bank and not a foreign branch because its ultimate parent (the French insurance group AXA) is not a banking group, and *AXA Bank Europe* is the head office of the group's banking activities.

Box 1 – Significant banks by country

SSM established entity country of residence	SSM established entity ultimate parent country																			Total		
	DE	ES	IT	FR	AT	BE	NL	LU	CY	GR	IE	PT	FI	LV	MT	SI	SK	EE	LT		Extra-EA	
DE	20																			1	21	
ES		14																			1	15
IT			13																		1	14
FR				9																	1	10
AT					6																2	8
BE						6															1	7
NL							6														1	7
LU								2													3	5
CY									3												1	4
GR										4												4
IE											3										1	4
PT												4										4
FI													1								2	3
LV														1							2	3
MT															1						1	3
SI																						3
SK																						3
EE																						2
LT																						2
Total	21	14	15	9	8	6	6	2	3	4	3	4	1	2	1	2	0	0	0	22	123	

Analysing banks from different countries poses two main problems: data availability and comparability. Within the Eurosystem very little information on individual banks is shared outside the ECB and its use is restricted. The establishment of the SSM has not yet increased the availability of bank-level data for research.⁸ A recent ECB regulation introduced a common template for supervisory purposes with the collection of the data starting in December 2015.⁹ Nonetheless, outside the ECB such data will likely be available only to the NCAs for supervision and its use will be highly restricted even within such authorities. Currently, the only source of cross-country data on individual banks are commercial databases. We rely on SNL Financial, a source commonly used by International Financial Institutions or central banks in their official publications.¹⁰

⁸ On a restricted basis, the ECB provides national central banks with individual unconsolidated data for some assets and liabilities of a small number of Monetary and Financial Institutions (so called “individual BSI” data).

⁹ Regulation EU 2015/534 of the European Central Bank on reporting of supervisory financial information (ECB 2015/13), March 17, 2015.

¹⁰ See, for example, the ECB *Bank Structure Report* and the IMF *Global Financial Stability Report*.

We also draw on the information released by the ECB and the European Banking Authority (EBA) in connection with the publication of the results of the Comprehensive Assessment (CA). The EBA released the data employed in the 2014 stress test for a slightly smaller number of institutions than those involved in the CA. The EBA data are consolidated at the top tier level and are, therefore, not available for the significant banks that are subsidiaries of other banks (these entities are included in the CA data). The EBA data are very detailed on credit risk exposure and the composition of regulatory capital, as opposed to the data in SNL, which have a wider scope in terms of balance sheet and income statement items but do not provide much in the way of break-downs. The two sources are therefore complementary and paint a picture of the type of business banks do from different angles.¹¹

The ECB/EBA data are not directly comparable to those obtained from SNL due to different consolidation perimeters, as the former are based on a prudential scope of consolidation and the latter on accounting principles.¹² We compare the total assets provided by SNL with those from the EBA/ECB data to assess the magnitude of the discrepancy and find that for 85 per cent of the banks in the sample the difference is in the range of plus or minus 10 per cent,¹³ which suggests that it is reasonable to pool the sources.

3. Identification of clusters

In this section we discuss the approach followed for identifying clusters of similar banks. First, we exclude 11 entities for which there is no information in SNL.¹⁴ For the 112 banks with available data we report total assets and the share of loans to assets in 2013 in a scatter plot (Figure 1). The vertical line indicates the median of assets (approximately €60 billion) in log scale. The horizontal line is traced as a ratio of loans to customers (excluding loans to banks) of 50 per cent.¹⁵ There are 22 subsidiaries and branches of euro area and non-euro area banks (*Foreign Subs & Branches*), highlighted in yellow.¹⁶

¹¹ The ECB data describe end-2013 balance sheets and profitability, corresponding to the initial conditions of banks before the Asset Quality Review (AQR). The EBA data already account for the AQR results and were employed as initial figures in the stress tests.

¹² In the ECB/EBA data the perimeter of the banking group is defined by CRR/CRD IV; insurance activities are excluded both from the balance sheet and the revenues and costs side of the Profit and Loss account.

¹³ For four institutions the difference is more than 20 per cent.

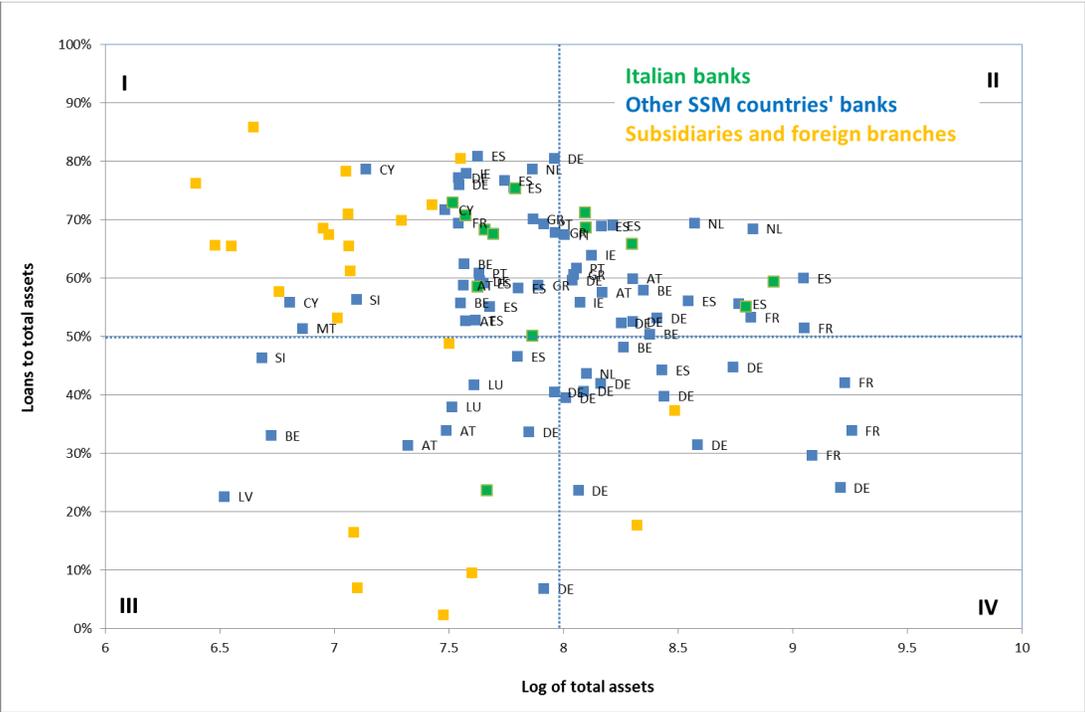
¹⁴ The following 6 banks were not found in SNL: Société de Financement Local (FR); Barclays Bank (IT), ABLV Bank (LT), AS SEB Banka (LT), Banesco (ES) and Deutsche Bank Malta (MT). The following 5 banks were excluded because the data to calculate their indicators, i.e. total assets and/or total loans, were not available in the SNL database: ING Groep N.V. C.R.H. (Caisse de Refinancement de l'Habitat) (FR) Novo Banco (PT), HASPA Finanzholding (DE) and Bank of New York Mellon (BE).

¹⁵ A low ratio of loans to total assets is used to identify universal banks in ESRB (2014).

¹⁶ For 6 out of the 28 subsidiaries and branches there is no information in SNL.

We note that the remaining 90 entities are very diverse in terms of size and share of loans. Since such heterogeneity is likely to reflect different core businesses, we first check the institution type reported by SNL. Based on SNL and additional inquiries, we identify two types of bank with a specialized business: (i) *Network Banks* (9 entities), i.e. banks that typically act as the hub for a number of small local banks, usually mutualistic; (ii) *Public and Development Banks* (5 entities), i.e. banks that have a public interest purpose, like supporting investment in housing, infrastructure and agriculture¹⁷. The identification of network banks was based not only on qualitative information from inquiries made on the banks' websites but also on the shares of interbank assets and liabilities in their balance sheet.¹⁸

Figure 1 – Distribution by size and share of loans (1)



(1) Source: SNL. Data refer to 2013.

The other 76 entities are divided into clusters by combining 3 criteria: 1) size; 2) core business; 3) share of cross-border exposure. We consider three size classes in terms of 2013 total assets: (i) *Large* (above €200 billion); (ii) *Medium-sized* (€50-200 billion); (iii) *Small* (below €50 billion).

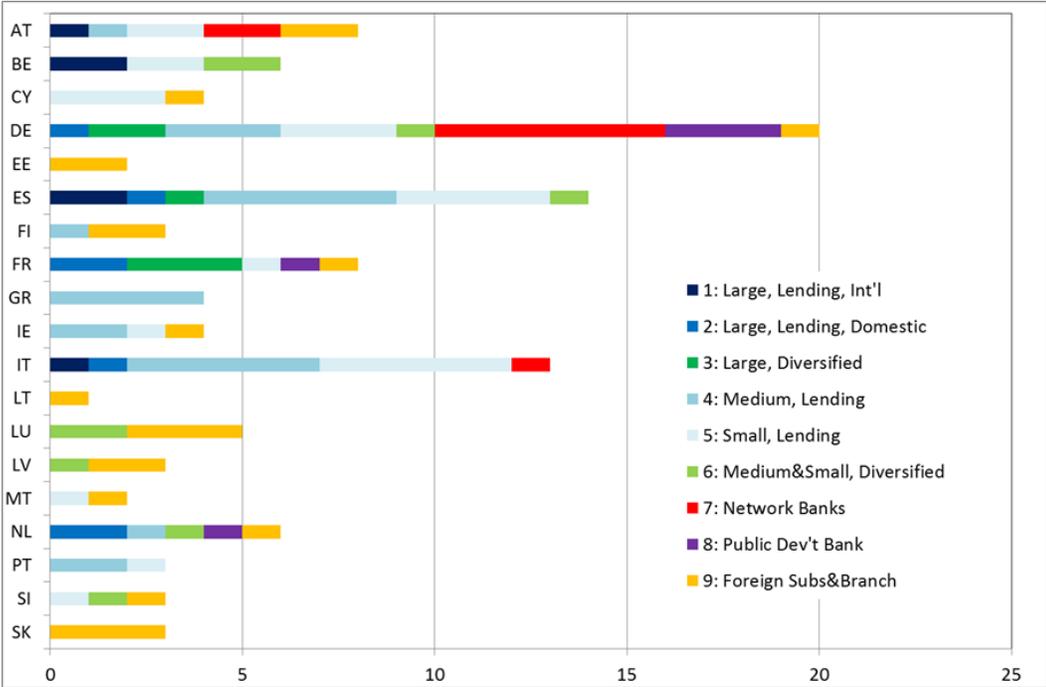
¹⁷ Being owned or controlled by local or central authorities is not a sufficient condition to be included in this cluster.

¹⁸ Two other institutions control regional banks that act as hubs for local networks but the top tier banks were not considered network banks.

Within each size class we divide institutions into *Lending* and *Diversified* banks depending on whether the ratio of loans to customers (excluding interbank loans) is above or below 50 per cent as of 2013, roughly the median of the distribution. The clusters change only marginally if we also require *Lending* banks to have also a ratio of customer deposits to total financial liabilities above the median (roughly 60 per cent). Therefore, we can conclude that the *Lending* banks engage primarily in commercial banking. To limit the number of clusters we focus on loans over total assets and therefore do not provide details of the types of lending, for example consumer versus corporate lending.¹⁹ There are too few medium-sized and small diversified banks to justify two separate clusters so we keep them together.

Some of the largest euro-area banking groups conduct a substantial proportion of their activities outside their domestic economy. Since it is difficult to assess ex ante the implications of internationalization for the balance sheet and income statement structure we divide the lending banks into two subsets of internationalized and domestic banks, based on their share of cross-border exposure. This is calculated based on the value of credit risk exposure in countries other than the home country, obtained from the EBA/ECB data, as of end-2013.

Figure 2 – Number of banks by cluster and country (1)



(1) Definitions based on 2013 SNL and EBA data.

¹⁹Lending banks could be split even into finer subsets, such as specialized lenders and diversified commercial banks, but this would require more granular information that is not available in SNL.

A bank is considered *International* if its non-domestic exposure is above 50 per cent of total exposure, *Domestic* if it is equal to or below 50 per cent. This threshold roughly corresponds to the 75th percentile of the distribution of the significant banks, and was chosen because the distribution is very skewed. There are 6 institutions above the threshold. Considering the medium-sized and small lending banks, there are 3 that are international, too few to have a separate cluster.²⁰

We group banks into the following 8 clusters: 1: *Large-Lending-International* (6); 2: *Large-Lending-Domestic* (7); 3: *Large-Diversified* (6); 4: *Medium-Lending* (24); 5: *Small-Lending* (24); 6: *Medium&Small-Diversified* (9); 7: *Network Banks* (9); 8: *Public&Development Banks* (5). The foreign branches and subsidiaries are in Cluster 9.

The distribution of institutions by cluster and country, shown in Figure 2, is related to the size of the economy, with most large banks (clusters 1, 2 and 3) located in the largest economies, particularly Germany and France. Smaller economies have smaller banks and, in many cases, these are subsidiaries of foreign entities. Spain and Italy have a large number of medium-sized and small lending banks, while network banks are concentrated in Germany and Austria with ICCREA Holding (IT) being the only exception.

4. Main characteristics of bank balance sheets by cluster

In this section and subsequent analysis we compare banks in clusters 1-8 in terms of the composition of their assets and liabilities. We exclude the subsidiaries and branches of foreign banks (cluster 9) because their balance sheets and income statements only represent part of the activity of the group to which they belong and are influenced by their relationships with the parent. Furthermore, the EBA data are not available for the subsidiaries.

4.1. Composition of assets

Figure 3 shows the composition of assets by cluster. By construction, lending banks have more than half of their assets invested in loans; the share is higher for the medium and small domestic banks, almost two thirds. The large lending banks are very similar regardless of their degree of international diversification (clusters 1 and 2), presumably because the internationalized banks operate mainly through local commercial banking subsidiaries.

²⁰ They were analysed separately in a previous version of this paper, and their international exposure is taken into account with a control variable in the robustness analysis of profitability shown below.

The medium-sized and small lending banks (clusters 4 and 5) have a very similar composition of assets, with a slightly higher share of loans, and lower shares of securities and interbank loans. Among the diversified banks, large intermediaries (cluster 3) have the largest share of assets invested in securities (around 50 per cent), while the share is almost a third for medium&small banks (cluster 7). The network and development&public banks (clusters 8 and 9) have around 30 per cent of assets invested in securities and, as expected, a very large proportion of interbank lending.

Broadly speaking, the data show that the incidence of traditional commercial banking activities decreases with bank size, within the same type of bank. International banks are no different from those that are focused on their domestic market in terms of asset composition, possibly because they tend to replicate the same business model abroad through subsidiaries.

Figure 3 – Composition of assets by cluster (1)



(1) Source: SNL. Data refer to 2013. Weighted averages by cluster.

We use the data released by the EBA and the ECB after the Comprehensive Assessment to gain a better understanding of the differences in the core business across clusters. The EBA data provide information on exposure to risk, in line with the Common Reporting (COREP) framework issued by the EBA for the Capital Requirements Directive reporting. The credit risk section covers all counterparties (e.g. sovereigns, institutions, financial and non-financial firms and households) and all positions exposed to risks stemming from the default of a counterparty

(loan portfolio positions, held to maturity securities positions and positions in the available for sale and designated at fair value through profit and loss)²¹ as defined according in the CRR/CRD IV.²²

The data report the breakdown of the portfolio into main classes of exposure, based on a mixed categorization that includes types of counterpart and types of instrument (e.g. equity). Exposure is also broken down between defaulted and non-defaulted; we compute shares using total exposure.

The EBA released values of exposure before and after applying risk weights. We refer to the first as un-weighted although some adjustments and conversion factors are applied to the original accounting figures, including off-balance sheet items. Portfolio shares are computed with the un-weighted values.

Geographical diversification

For each banking entity, the data include details by country of counterparts for a minimum of 95 per cent of total exposure (in terms of exposure value) or for the top 10 countries. Based on this information we construct the ratio of domestic exposure to total exposure to distinguish between *Domestic* and *International* banks in defining the clusters. A second indicator is a country concentration index, computed as the sum of the squared shares of the top ten exposures by country.²³ the index equals 1 if the bank's exposure is entirely domestic, and declines as exposure becomes more diversified across countries.²⁴

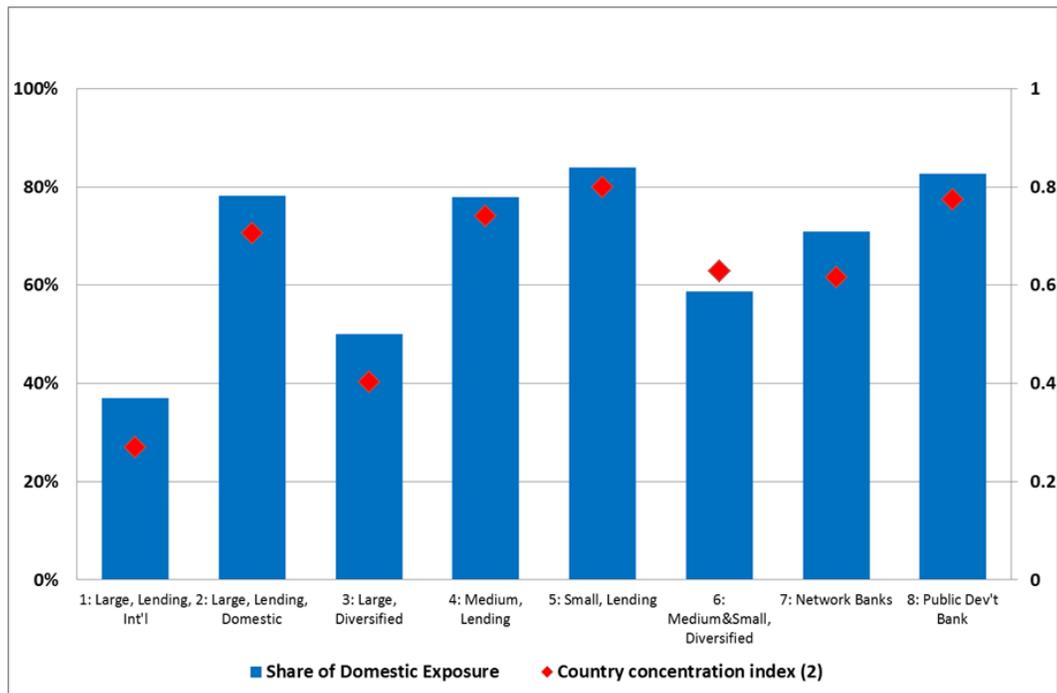
²¹ The stress test for credit risk assessed all assets in the banking book exposed to credit risk excluding counterparty credit risk, on and off-balance sheet positions, IRB and STA portfolios. See Table 1 (Overview of risk types and their treatment in the EU-wide stress test) in the Methodological Note EU-wide stress test 2014.

²² COREP covers credit risk, market risk, operational risk, own funds and capital adequacy ratios. The original exposure amount is the financial statement value, gross of value adjustments, of financial assets subject to credit risk capital requirements, pre-conversion factors (CCF) and pre-credit risk mitigation techniques and before any deduction of provisions. The EBA released the non-defaulted exposure after substitution effects and post conversion factors. This value of exposure is the starting point for the impairment calculation in the stress tests. See the Methodological Note on EU-wide stress test issued by the EBA on April 29, 2014.

²³ If there are more than ten countries we group all the exposures from the tenth country to subsequent ones together.

²⁴ The use of *credit risk* international exposure as a proxy of internationalization has some limitations. For example, we underestimate international diversification of banks with significant exposure to *market risk* arising from foreign markets.

Figure 4 - Geographical diversification, by cluster (1)



(1) Source: EBA/ECB. Data refer to 2013. Weighted averages by cluster. (2) Right-hand scale. Index equals 1 if the bank's exposure is entirely domestic.

Among large institutions, the average share of exposure to domestic counterparts is around 80 per cent for the Domestic banks and below 40 per cent for International banks (Figure 4). The share of foreign exposure of the large diversified banks is closer to the one of the internationalized lending banks, suggesting that banks achieve substantial cross-border diversification either through their investments in securities or through subsidiaries that engage in lending. Nonetheless, the implications in terms of flexibility in adjusting their portfolios is likely to differ between the two business models. Medium&small diversified banks are more domestically oriented than larger institutions with a similar business model, but have a significantly lower home bias than their lending peers. As expected, public&development banks have a strong domestic focus, similar to that of the medium and small lending banks.

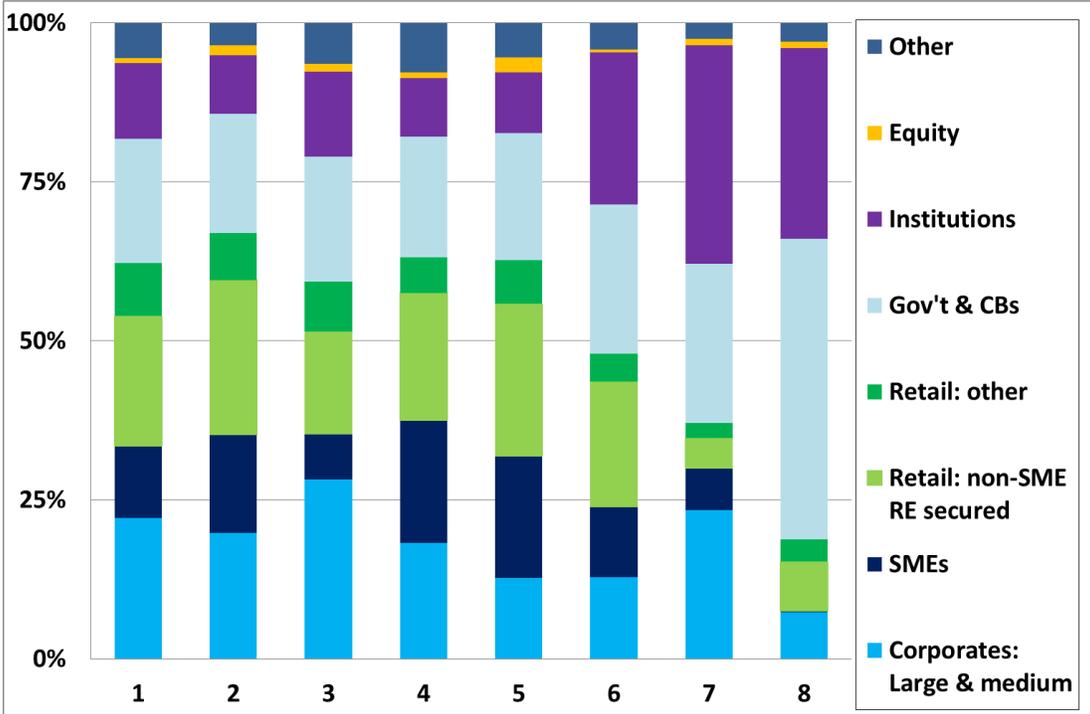
The distribution of the concentration index shows that when they do diversify, banks tend to do so across a limited number of countries, , with the exception of banks in cluster 1.

Types of credit risk exposure

Figure 5 reports the composition by type of counterpart based on the un-weighted exposures. The data suggest a number of remarks. First, large domestic and other lending banks (clusters 2, 4 and 5) are significantly more exposed towards SMEs and retail (non-SME) real-estate-

secured loans than large international or diversified banks (clusters 1, 3 and 6), at around 40 per cent of total credit risk exposure. Exposure to SMEs declines with size while the opposite holds for exposure to larger corporates, which is highest for large diversified banks.

Figure 5 – Composition of credit risk exposure (1)



(1) Source: EBA/ECB. Data refer to 2013. Weighted averages across type of exposure and cluster. Clusters are: 1: Large, Lending, Int'l; 2: Large, Lending, Domestic; 3: Large, Diversified; 4: Medium, Lending; 5: Small, Lending; 6: Medium&Small, Diversified; 7: Network Banks; 8: Public&Dev't Banks.

Second, the degree of exposure to governments and central banks is very similar across the first seven clusters (around 20 per cent); the development banks are instead heavily exposed to the public sector. The diversified and development banks have a higher share of exposure towards institutions than lending banks; exposure is highest for network banks in view of their role as interbank hub for the banks belonging to the network.

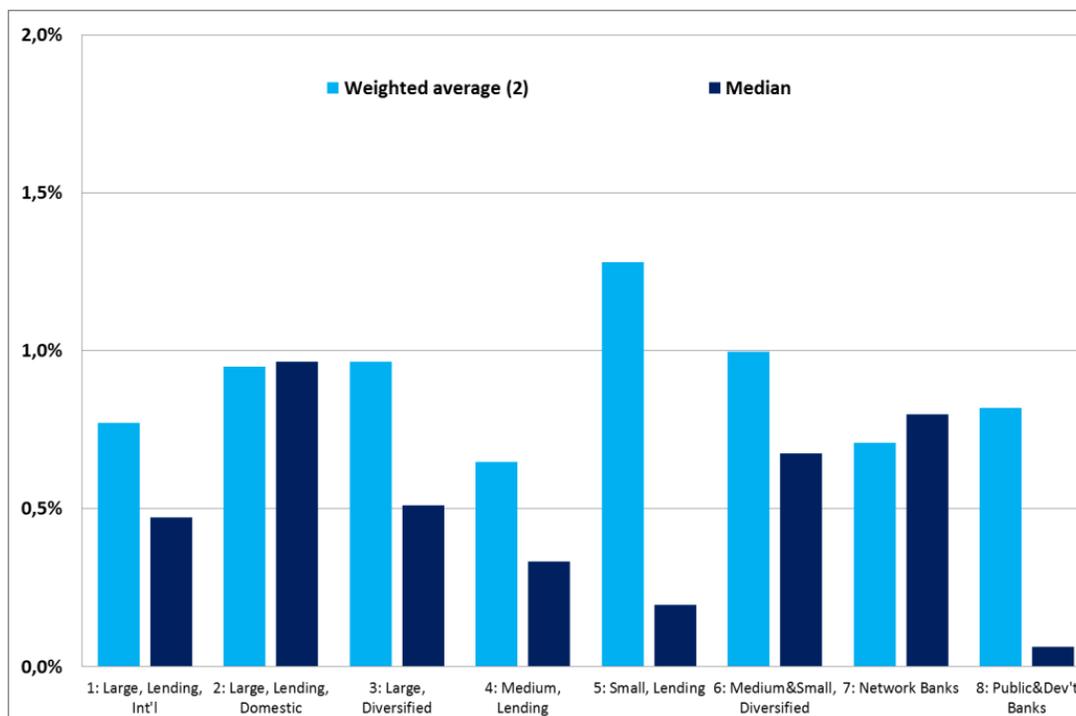
Level 3 assets

The ECB released data on the share of Level 3 assets in the banks’ portfolios.²⁵ Level 3 assets are investments whose fair value cannot be determined by using observable measures, such as market prices or models, but can only be calculated using estimates or risk-adjusted value ranges, typically based on management assumptions or expectations. These assets are typically

²⁵ The figure is based on data provided by banks that do not reflect the AQR.

very illiquid; examples include certain private equity investments, residential and commercial mortgage related assets, long-dated or complex derivatives.

Figure 6 - Level 3 assets as a share of total assets (1)



(1) Source: ECB/EBA. Data refer to 2013. (2) Weights equal to total assets.

Figure 6 reports this indicator by cluster; given the large heterogeneity within clusters, we also report the median value. On average, the reported amount of Level 3 assets is very low (0.9 per cent). The share tends to be somewhat higher for larger banks, but differences are limited to decimals of percentage points. Contrary to what we expected, we do not observe a higher share for the diversified (especially large) banks in cluster 3. When analysing dispersion across countries (not shown), we note that the (weighted) average of the share is higher in Portugal and Slovenia, at almost 4 per cent, reflecting the data of a small number of banking groups. The Network banks have a relatively high share of Level 3 assets.

4.2 Risk density and non-performing exposures

Risk density

The pre-stress test risk-weighted figures released by the EBA are used in the computation of the total risk-weighted assets for the purpose of assessing capital adequacy. The ratio of risk-

weighted assets to nominal exposure is a proxy of the credit risk profile of each bank, denoted as risk density (RD). At the aggregate level, we observe that large and medium-sized banks tend to have similar risk density, higher than that of small banks (Figure 7a). The specialized institutions have the lowest value of all clusters.

Differences in risk density across clusters, and across individual banks, are driven by a number of factors. The first is the composition of exposure by type because each one is weighted differently. To provide a sense of the range of weights, we show the risk density by type of exposure in Figure 7b. Equity exposure has the highest weight (over 200 per cent); large corporates, SMEs²⁶ and other retail exposures (not secured by real-estate) have a risk density of around 50 per cent; retail exposure secured by real estate (excluding SMEs), which includes household mortgages, and exposure towards institutions both have a RD of 25 per cent or less. Exposure to government and central banks has an average weight close to 0 per cent.

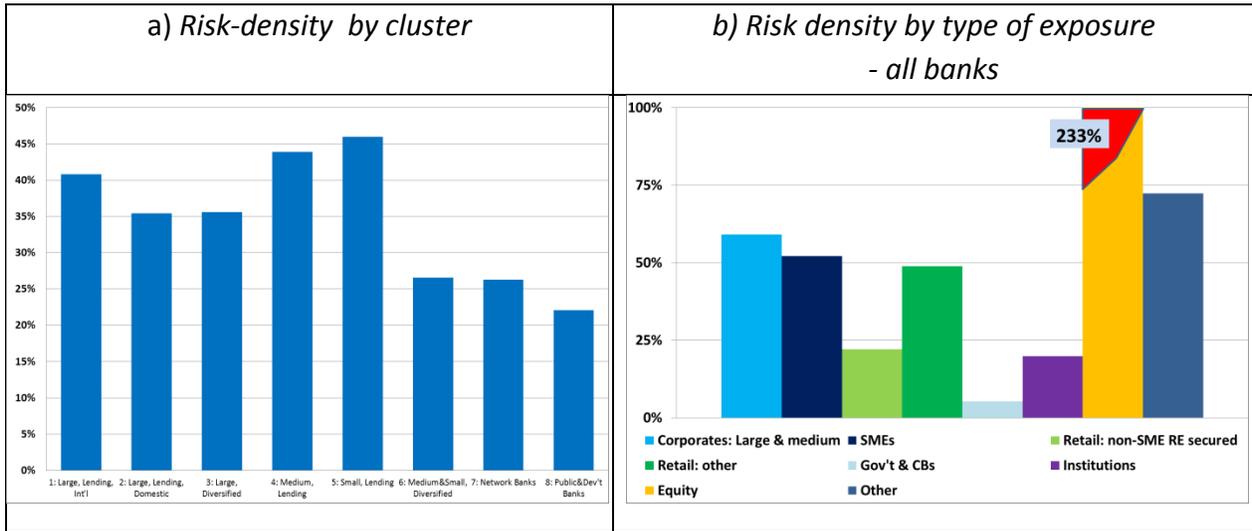
The second factor that could explain differences across banks is the method employed by each intermediary in computing the risk weights. Banks can choose between the Standardized Approach (SA), the Foundation-IRB approach or the Advanced IRB approach.²⁷ The evidence suggests that risk weights calculated under the IRB approaches tend to be lower than those employed under the SA (e.g. Vallascas and Hagendorff (2013)). In principle, this reflects the fact that IRB methods allow financial institutions to tailor riskiness to each individual position more effectively. *De facto*, some academic and policy sources underscore that IRB models may lead to the manipulation of risk weights, thus creating a bias versus lower risk density.²⁸ This debate is clearly beyond the scope of the present analysis. Here we only assess the contribution of the risk weight calculation method to the difference in RD across banks.

²⁶ We aggregate SME exposures that fall into retail and corporate exposures according to COREP.

²⁷ In the standardized approach, risk-weights are determined based on an external rating; in the Foundation IRB approach banks calculate a borrower's probability of default and then use the local regulator's prescribed values for the other parameters (such as exposure at default (EAD) and loss given default (LGD)) needed for calculating risk-weighted assets. In the Advanced IRB, banks are allowed to calculate internally— through models subject to validation from local regulators – all the parameters required for quantifying risk-weighted assets.

²⁸ Behn, Haselmann and Vig (2014) show this effect empirically for German banks using loan-level data; Becker and Opp (2014) find that giving insurance companies greater discretion in calculating their capital requirements led to much lower capital levels. The Basel Committee on Banking Supervision (2013) published an extensive study that showed a considerable impact of banks' modeling choices on risk weights, documenting that estimated risk parameters vary widely across banks, even for the same exposures. An EBA study (EBA (2013)) concludes that "The wide variability of modelling approaches appears to have led to divergent implementations and practices across banks, which makes comparisons across institutions difficult and may put institutions on an unlevel playing field, in particular as the implementation of the Internal Rating Based (IRB) Approach has led to different regulatory rules and supervisory practices. In addition, concerns have been raised about the internal models being used to reduce capital requirements by optimising parameters rather than ensuring precise risk measurements" (p. 8).

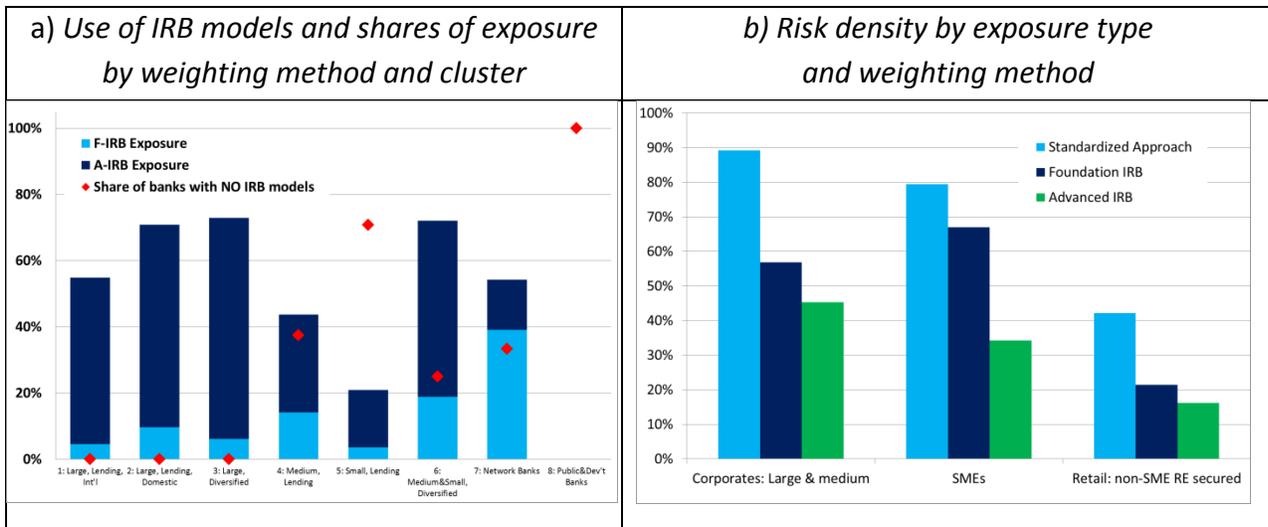
Figure 7: Risk density by cluster and type of exposure (1)



(1) Source: EBA/ECB. Data refer to 2013. Weighted averages across types of exposures and clusters.

The adoption of IRB methods varies significantly across clusters, as shown by Figure 8a. All large banks (clusters 1-3) use IRB models for some of their portfolios; among the Medium&Small diversified banks (cluster 6) two thirds use them, while the share is the lowest among the medium&small lending banks (clusters 4 and 5). No public&development institution uses IRB models.

Figure 8 – Use of IRB Models and Risk Density (1)



(1) Source: EBA/ECB. Data refer to 2013. Weighted averages across types of exposures and clusters. Clusters are: 1: Large, Lending, Int'l; 2: Large, Lending, Domestic; 3: Large, Diversified; 4: Medium, Lending; 5: Small, Lending; 6: Medium&Small, Diversified; 7: Network Banks; 8: Public&Dev't Banks.

In terms of share of portfolios, we note that when IRB models are adopted the Advanced version tends to dominate over the Foundation, with the exception of banks in cluster 7. Overall, the share of IRB portfolios is highest (more than 70 per cent of exposure) for the large diversified banks (cluster 3), followed by the large lending banks. IRB portfolios are about 60 per cent of exposure for the medium-sized and small diversified banks.

We compare the risk density of a subset of exposures evaluated using the different approaches to get a sense of the potential role in explaining cross-sectional variation across banks. Considering corporate, SMEs and the Retail non-SME secured portfolios we observe that the risk density of the A-IRB portfolios is the lowest, followed by that of the F-IRB portfolios. The Standardized Approach portfolios have the highest risk density, about twice that of the A-IRB (Figure 8b). It is interesting to note that the difference between the A-IRB and the F-IRB is larger for loans to SMEs, but this could be explained by the distribution across banks by riskiness of clients.

Once the composition of the portfolios by type of exposure and method of computation of risk weights are taken into account, the remaining difference in risk density is the result of two possible sources: i) differences in the “intrinsic” riskiness of the clients in each bank’s portfolio (country-specific or bank-specific), which affect both SA and IRB portfolios; ii) differences across banks in the implementation of the IRB models, given the underlying risk of the portfolio. The country-specific risk of exposures and the effect of the implementation of IRB models cannot be separated without additional information. Their cumulative effect can be captured by country fixed effects in a simple regression model.

We estimate the following regression, in which the risk density of the portfolio p of bank i is a function of the bank’s cluster X_i , the method of weighting exposures Z_p and the country of the bank W_i :²⁹

$$RD_{i,p}^e = \alpha + \beta X_i + \gamma Z_p + \delta W_i + \varepsilon_{i,p}$$

The regression is estimated separately for each type of exposure e (“bucket”). The coefficients of the various dummies are differences with respect to the baseline in the mean for the specific category – holding constant the other characteristics. The baseline RD is the Standardized Approach (SA) portfolio of German large domestic lending banks (cluster 2). The results are reported in Table 1 and can be summarized as follows.

²⁹ In particular, we consider the following exposure aggregations: Central Banks and Central Governments, Institutions, Large and Medium Corporates, SMEs, Retail, Secured on real estate, non-SMEs, Other Retail.

First, few of the coefficients of the cluster dummies are significant. Among the significant coefficients, the medium&small diversified banks (cluster 6) have on average a higher RD for corporate exposure, even controlling for country means. Second, the coefficients of the dummies for the method to calculate the RWA are statistically significant: holding constant country and bank type, the RD is between 20 and 40 percentage points lower for IRB portfolios than for SA portfolios for the corporate, SMEs and retail (non-SMEs) secured exposures; the difference is larger (between 50 and 70 points) for other retail exposures. Third, country dummies are significant in the regressions for institutions, corporates, and SMEs. The coefficients are generally positive indicating that German banks have a lower RD than the average bank in most countries. Country fixed effects are mostly insignificant for retail secured non-SMEs (mostly mortgage loans to households), excluding Greek and Irish banks, and for other retail exposures.

The values of the R-squared from the regressions suggest that the cluster, country and weighing method jointly account for between half and three-quarters of the overall variation in risk density across banks in the case of corporate, SMEs and retail exposures. Less than 20 per cent of the variance is explained by the regression variables in the case of exposure to central banks and governments, and to institutions, suggesting that most of this depends on the individual characteristics of the portfolios. We added bank fixed effects in the regression and find that the share of variance explained increases to 80-90 per cent (not reported).

Non-performing exposure

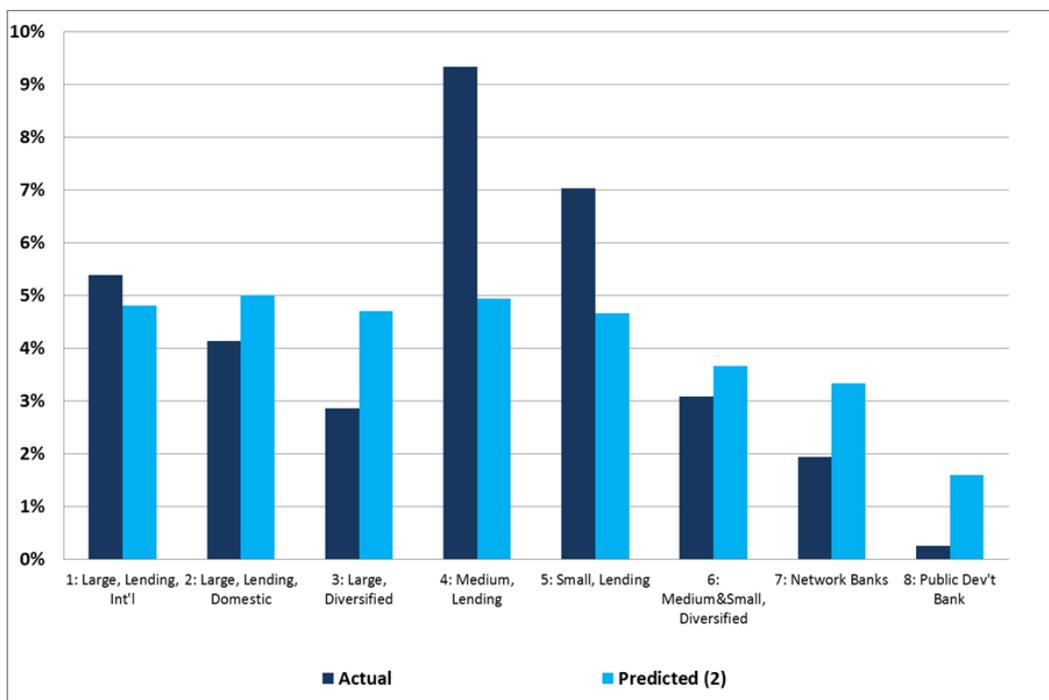
Figure 9 shows the ratio of non-performing exposure (NPE) to the total by cluster, based on the EBA data.³⁰ One caveat is that the definition of NPEs varies across countries, potentially affecting cross-bank comparison. The share of deteriorated assets is substantially higher for the medium-sized and small lending banks. Among the large banks, the greater geographical diversification of the international banks does not translate into lower NPEs.

As for the risk density, part of the aggregate difference between clusters could simply reflect the composition of exposures across types. The analysis of exposures showed that, particularly in some countries, lending banks are more exposed to riskier borrowers, e.g. corporates and SMEs. By contrast, network banks have a large degree of exposure to other financial institutions in their own country. The difference in the ratio of NPEs across clusters is also influenced by the distribution of banks across countries because the medium-sized and small

³⁰ The data disclosed by the EBA are the starting figures for the stress test. Accordingly, they take into account the AQR where it had a material impact.

lending banks are concentrated in countries that experienced weaker macroeconomic conditions.

Figure 9 – Non-performing exposure by cluster (1)



(1) Source: EBA/ECB. Data refer to 2013. Weighted averages by cluster. (2) Ratio calculated applying the average ratio of defaulted exposures to the exposures' composition by type of counterpart of each cluster.

We assess the contribution of local economic conditions to the level of the NPE ratio as follows. We compute the average NPE ratio for each type of exposure (buckets) using data on all the banks in our sample.³¹ Second, we calculate the predicted NPE ratio for each bank by multiplying the actual portfolio shares by the average NPE ratio for each type of exposure in the sample. The intuition is that we are assuming that each bank is exposed to the entire euro-area economy as the aggregate of the significant banks, with portfolio shares equal to its own observed ones.

Aggregating the predicted NPE ratios by cluster shows a reduction in heterogeneity in the NPE ratio (Figure 9). The NPE ratio of the small lending banks becomes 4.7 per cent instead of the observed 7 per cent; for medium-sized lending banks the figure would be 4.9 per cent instead of 9.6 per cent; for large lending internationalized banks NPE would be 4.8 per cent instead of the actual 5.4 per cent. Banks in the other categories would have a higher NPE ratio than the one observed.

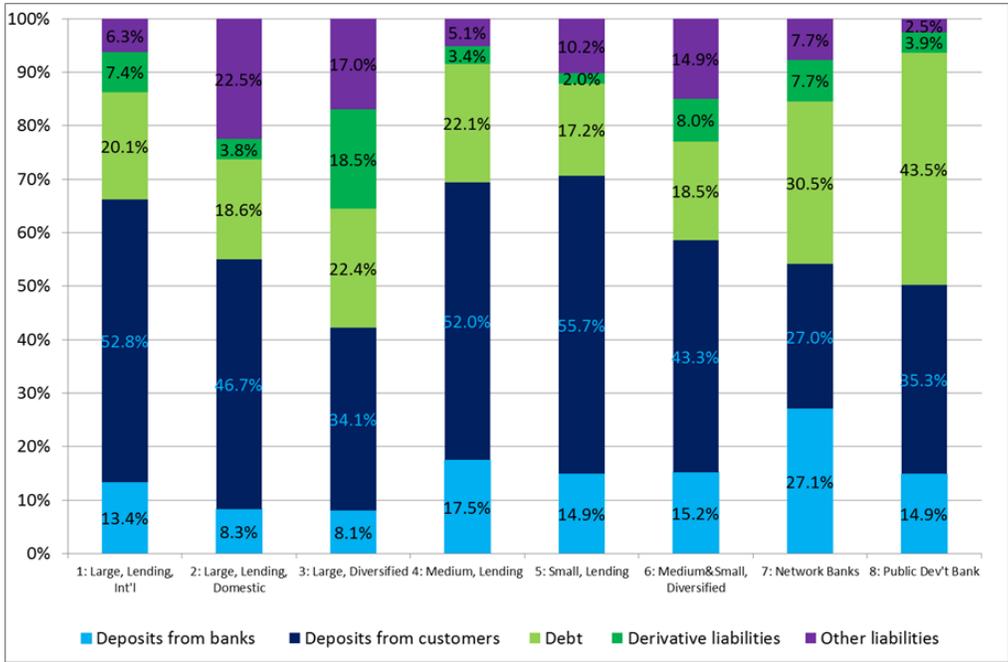
³¹ The buckets are: Central banks and central governments, Institutions, Corporates, Retail, Equity, Securitisation, Other non-credit obligation assets.

Essentially, the exercise shows that most of the variation in the NPE ratio across clusters is explained by the distribution of banks across countries with different exogenous conditions, not by the composition of the exposure across types of counterpart.

4.3. Funding

In this section we analyse the composition of funding sources using the data reported by SNL (Figure 10). The distribution of the share of customer deposits across the clusters, as expected, mirrors that of customer loans, with lending banks – especially the smaller ones – having a larger share of this type of funding.

Figure 10 – Composition of financial liabilities by cluster (1)



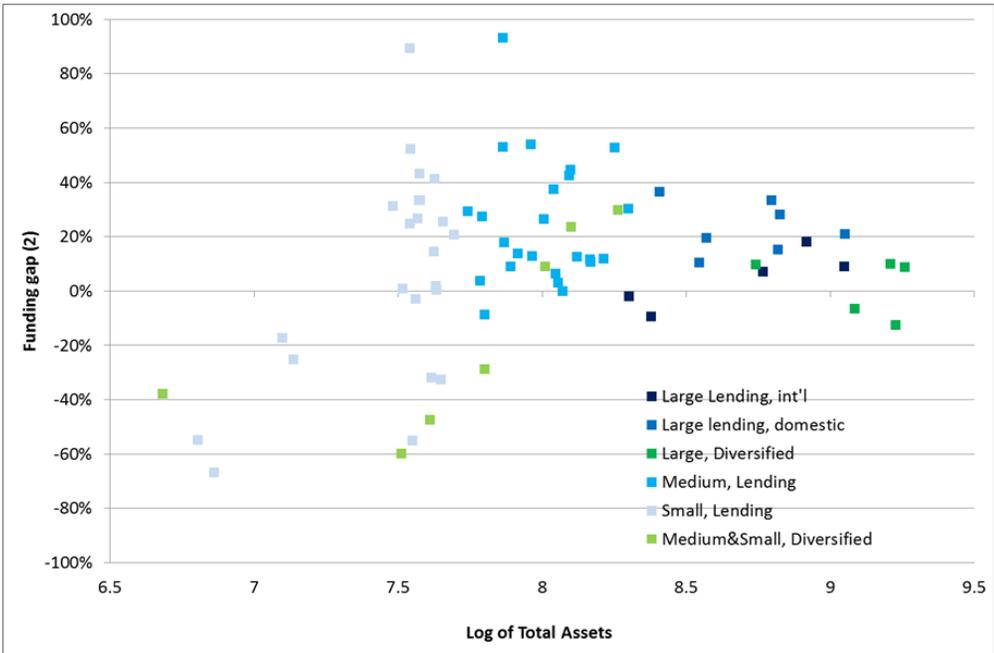
(1) Source: SNL. Data refer to 2013. Weighted averages by cluster.

We note that large diversified banks have the most diversified composition of liabilities, and the highest share of derivatives; the aggregate figure reflects the fact that some large banks have over 30 per cent of these instruments on the liability side of their balance sheets. Network banks are mostly funded with wholesale and market-based debt instruments. Medium-sized and small lending banks have around 15 per cent of interbank funding, which could reflect some country specificity. In particular, given that the figures refer to 2013, they might have been influenced by the exceptional monetary policy conditions.

In Figure 11 below we show a measure of the funding gap, defined as the share of loans that is not financed by deposits. The gap measures the dependency of lending from less stable funding

sources. Most of the banks have a positive gap. The scatter plot suggests that diversified banks have on average a lower gap than lending banks. It also shows that the gap increases to some extent with bank size because most medium-sized lending banks have a positive gap, while small banks tend to have a negative gap. Country-specific factors, including the business cycle, could play a role since Spanish banks tend to have a smaller funding gap than Italian and German banks of similar size.

Figure 11 – Funding gap of lending and diversified banks (1)



(1) Source: SNL. Data refer to 2013. (2) Funding gap is expressed in percentage and is calculated as follows: $(\text{Loans to customers} - \text{Deposits from customers}) / \text{Loans to customers}$.

Nevertheless, one should recall that this funding gap does not take into account that banks in some countries might place bonds with retail investors. This component should be added to retail deposits to compute the funding gap.

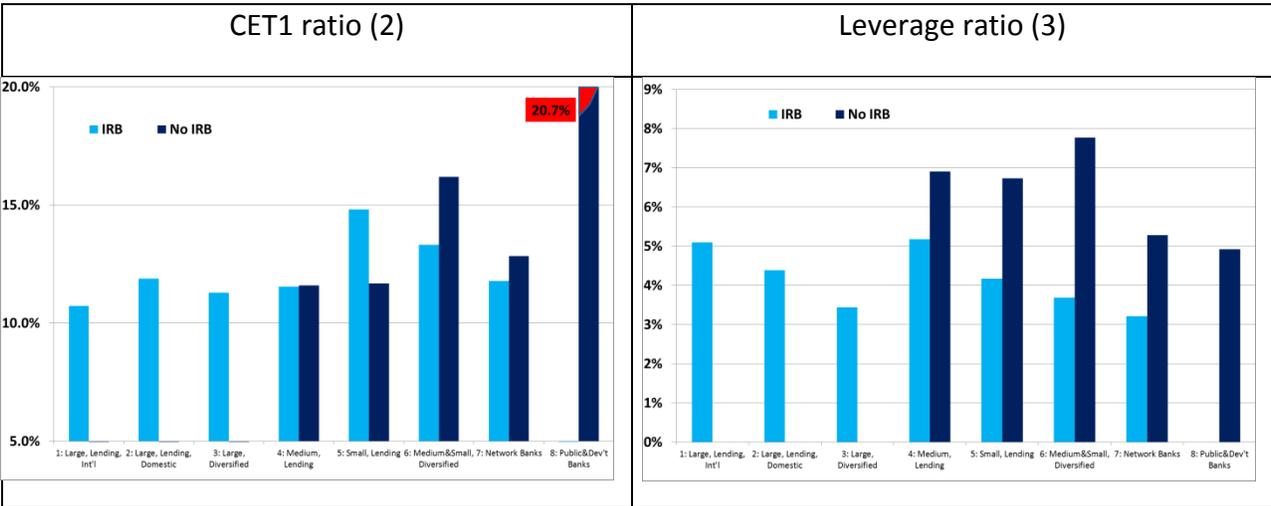
4.4. Capital and leverage ratios

The data released by the ECB and the EBA provide two different measures of end-2013 capital ratios: the Common Equity Tier 1 (CET1) ratio and the (inverse) Leverage Ratio. The Leverage Ratio, introduced by the Basel 3 framework, is a measure of capitalization based on un-

weighted assets and, as such, not influenced by valuation methods and risk.³² These ratios are both based on the information provided by banks before the Comprehensive Assessment.

Figure 12 reports the average CET1 and leverage ratio by cluster, distinguishing between banks that use IRB models – for at least some of their exposure – and banks that do not.³³ Overall, the main source of variation in the CET1 ratio is the adoption of IRB weights. Considering IRB and non-IRB banks in clusters 4-6, IRB banks have considerably higher CET1 ratios within each cluster.

Figure 12 - Capital ratios by clusters and RWA calculation method (1)



(1) Source. ECB/EBA. Data refer to 2013. Weighted averages by clusters. Clusters are: 1: Large, Lending, International; 2: Large, Lending, Domestic; 3: Large, Diversified; 4: Medium, Lending; 5: Small, Lending; 6: Medium&Small, Diversified; 7: Network Banks; 8: Public&Development Banks. (2) Common equity tier1 capital over risk-weighted assets. – (3) Common equity tier1 capital over total exposure measured according to Article 429 of the CRR (“Leverage Exposure”).

The opposite holds if capitalization is measured by the leverage ratio: diversified banks tend to be less capitalized than the lending banks in the same size group; within each cluster, banks that do not use IRB models are significantly more capitalized than their IRB peers.

The inconsistency between the rankings produced by different capital ratios is also observed when banks are compared by country. Among the larger countries, banks in Italy and Spain have average CET1 ratios of 10.2 per cent and 10.6 per cent, respectively; French, German and Dutch institutions have ratios of, respectively, 11.4, 13.0 and 13.2 per cent. Capitalization

³² The leverage ratio is defined, according to Article 429 of the EU Capital Requirement Regulation (CRR) 575/2013, as the ratio of CET1 capital over the sum of the exposure values of all assets and off-balance sheet items not deducted from CET1 capital. The purpose of the leverage ratio is to have a simple instrument that offers a safeguard against the risks associated with the risk models underpinning risk weighted assets (e.g. that the model is flawed or that data is measured incorrectly).

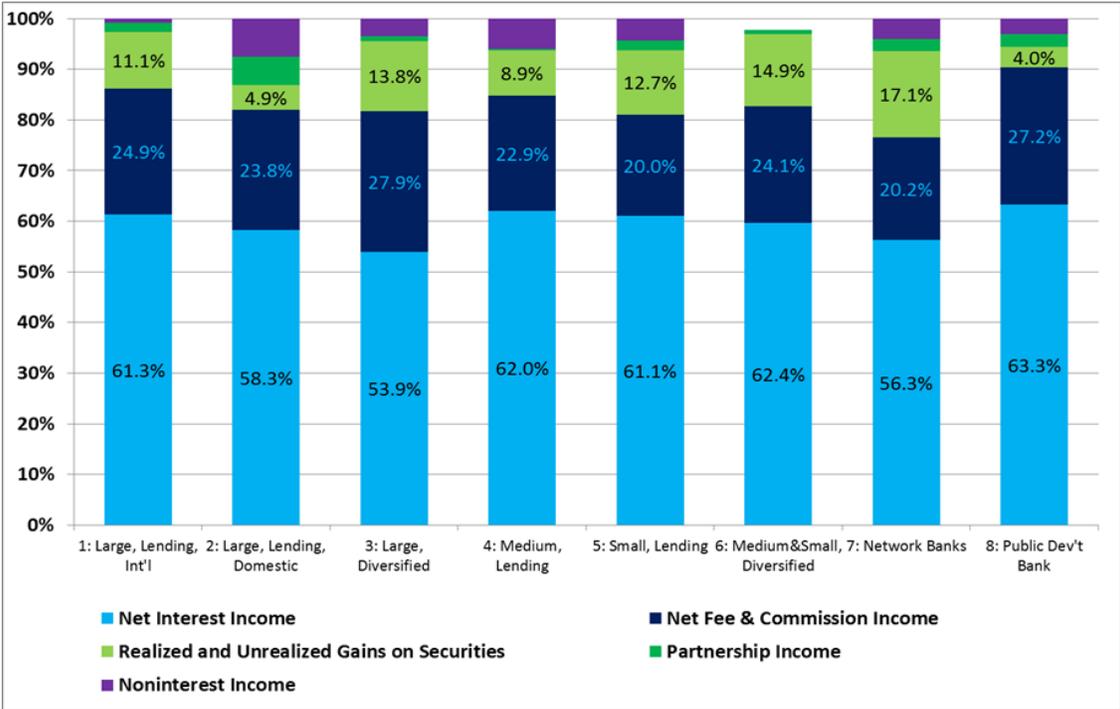
³³ In the Figure, bars are missing if there are no banks in that category.

measured by the leverage ratio is instead higher for Italian and Spanish banks (around 5.0 per cent) than for French (3.7), German (3.9) and Dutch (3.4) banks.

5. Income and costs

In this section we compare the structure of the 2013 income statement. Two caveats apply. First, the data refer to a single year and are therefore influenced by short-term developments in economic activity and financial markets, which will be analysed in greater detail in Section 6. Second, accounting practices are not uniform across jurisdictions. A recent report by ESMA (2013) examining accounting differences between the income statements of 39 major European banks found significant diversity in components included in interest income and interest expense, resulting in limited comparability of net interest margin and net trading income.³⁴ Therefore, some of the observed differences may reflect the joint distribution of banks across countries and clusters.

Figure 13 – Income sources (1)



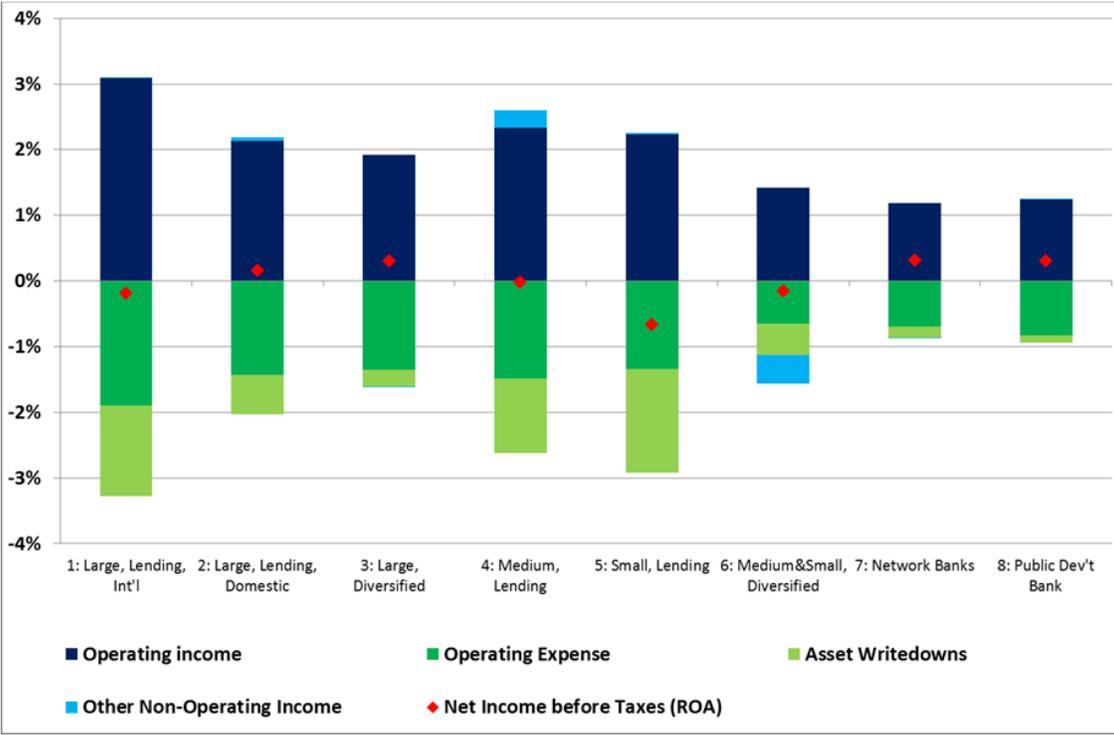
(1) Source: SNL. Data refer to 2013. Weighted averages by cluster.

³⁴ As a result of its review, ESMA concludes that there are “deviating structures of the income statement and different content of the line items, divergent disclosures in the notes in terms of content and detail and the lack of concise yet comprehensive accounting policy disclosures”. In particular, ESMA found “significant diversity in components included in interest income and interest expense and presentation of net gains or net losses by category defined by IAS 39 – Financial Instruments: Recognition and Measurement”.

In Figure 13 we show the sources of operating income for 2013. Among the large banks, the diversified ones have a lower share of revenues from interest than lending banks, and a higher contribution from gains on securities, as expected. The smaller diversified banks instead have the highest share of interest income. Network banks have a high share of partnership income, which could reflect their typical organizational structure based on the ownership of local institutions belonging to a network. Overall, the revenues of all banks reflect a traditional commercial banking model, even for the diversified ones, with the majority of revenues coming from interest income. A better understanding of the sources of revenues would require a more granular reporting since interest on securities could be reported in net interest income or in trading income.

Figure 14 shows a measure of profitability, Net Income before taxes scaled by total assets (ROA), and its main components. Regardless of size, lending banks tend to have higher operating income per unit of assets than diversified banks, but also higher operating costs.

Figure 14 – ROA and main Income statement items, by cluster (1)



(1) Source SNL. Data, as a percentage of end-of-year total assets, refer to 2013. Weighted averages by cluster.

Banks with the lowest costs per unit of assets are the network banks because they specialize in a wholesale activity, requiring a smaller contribution of labour and physical inputs. Again, the

difference across clusters is likely to hide cross-country heterogeneity, reflecting institutional differences, as well as varying efficiency levels across individual banks. We estimate a simple regression model of the operating cost-to-asset ratio on cluster dummies and country dummies, using figures from SNL for 2006-2013. According to the regression results (not reported) some of the cluster dummies are significant, but only when the country dummies are omitted. The country dummies have a greater explanatory power than the cluster dummies. On average, banks in most of the economies with currently weaker macroeconomic conditions have a higher incidence of costs, controlling for the clusters. In another regression we included proxies of the type of exposure that banks have on their asset side, to understand if the cost-to-asset ratio is related to the type of lending. One would expect that banks engaging more in traditional retail lending might have a larger branch network and more personnel per unit of assets. Indeed, the regression suggests that SME and corporate exposures are positively correlated with operating costs and the correlation is driven by the incidence of staff costs, but we cannot conclude that there is a causal relationship. The loan-to-asset ratio and bank size are instead not significant.

The ratio of impairments to total assets in 2013 is related to the banks' core business. Lending banks have higher asset write-downs than diversified banks of similar size; small banks have the highest level of impairments, consistent with their higher level of non-performing exposures, discussed above. Heterogeneity in reporting and definitions may matter but the main driver is likely to be the distribution of banks across countries with different cyclical conditions. As discussed below, there are more of these banks in countries with weaker GDP performance in recent years. Macroeconomic conditions will be analysed in greater detail in the following section.

6. Recent evolution of profitability

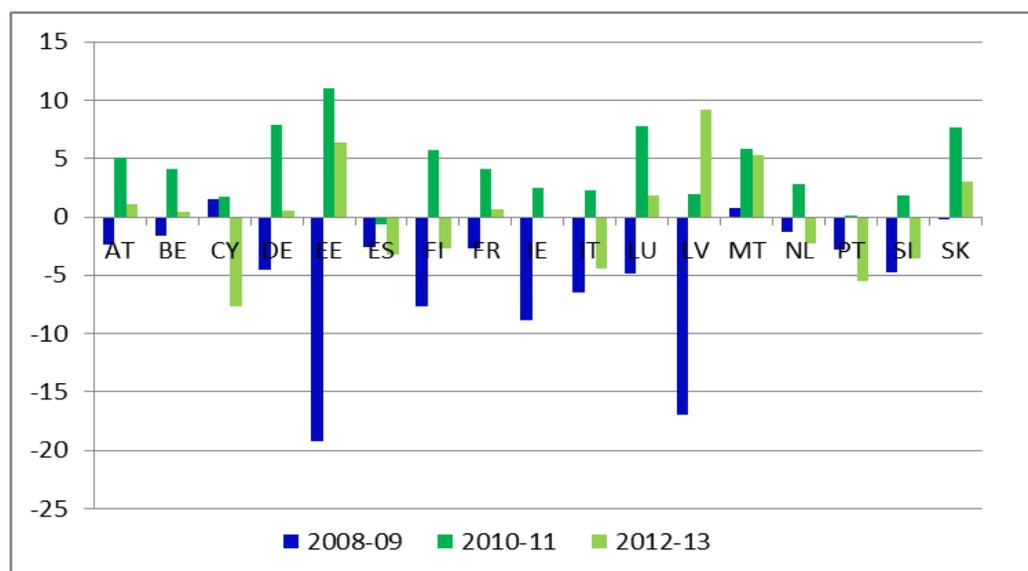
In this section we study the evolution of bank profitability between 2006 and 2013, in order to assess whether its main drivers differed across clusters.³⁵

As a measure of operating profits we use pre-tax return on assets (ROA), computed as net income before taxes divided by end-of-year total assets. One would expect the profitability of banks to be influenced by the cyclical economic conditions in the country where they are based and in countries towards which they are exposed. As shown in Figure 15, almost all countries experienced a recession in 2008-2009 and the extent of the subsequent recovery, in 2010-2011,

³⁵ The analysis is based on 89 banks rather than 90 since one institution has data for 2013 only.

was heterogeneous. Moreover, in 2012-2013 some countries fell back into a recessionary phase while others maintained positive growth rates.

Figure 15: Cumulative real GDP growth for euro area countries (1)



(1) Source: Eurostat. Real GDP growth over two-year periods.

We aggregate countries into two groups based on their cumulative GDP growth in 2008-2013: i) positive growth (Austria, Belgium, France, Germany, Luxembourg, Netherlands, Malta, Slovenia) and ii) negative growth (Cyprus, Finland, Greece, Ireland, Italy, Portugal and Spain). Within each cluster we compare banks in the two groups of countries.³⁶

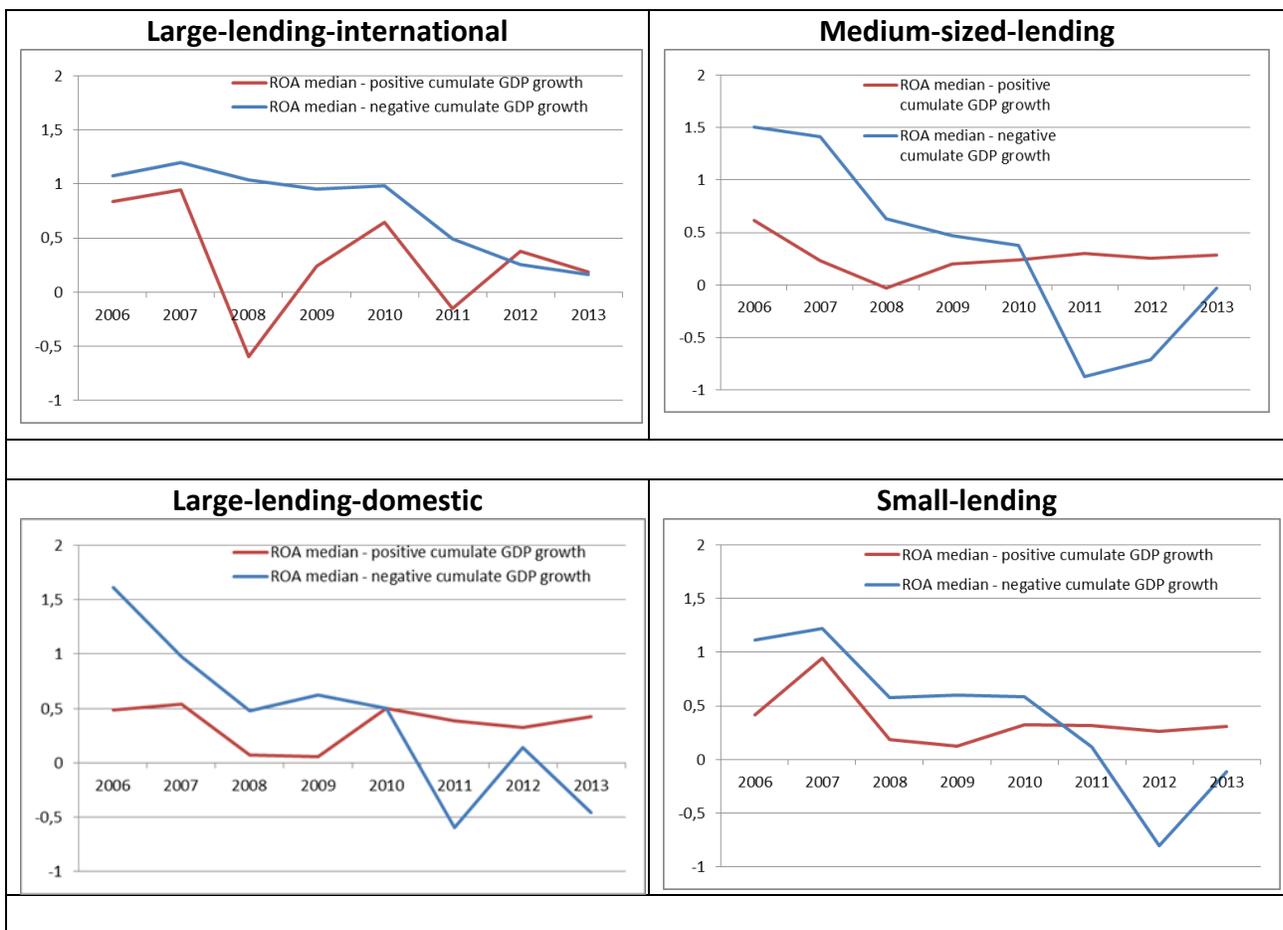
Figure 16 shows the median ROA for clusters 1 to 6 (i.e., excluding network and public&development banks, shown in Table 2), by type of country. The graphs suggests the following points. First, the ROA of all banks exhibits cyclical behaviour but for diversified banks it is less pronounced than for lending banks. Second, the profitability of lending banks differs significantly across the two types of country. All banks record a decline in 2008; after 2009 ROA recovers for banks in countries with cumulative positive growth and remains broadly flat in the following years, while in countries with negative growth it declines further in conjunction with the sovereign debt crisis and the second recession. It is interesting to note that in the weaker economies the drop in ROA in 2011-2012 was less pronounced for the large international banks compared with domestically oriented institutions; the profitability of these entities in 2013 is

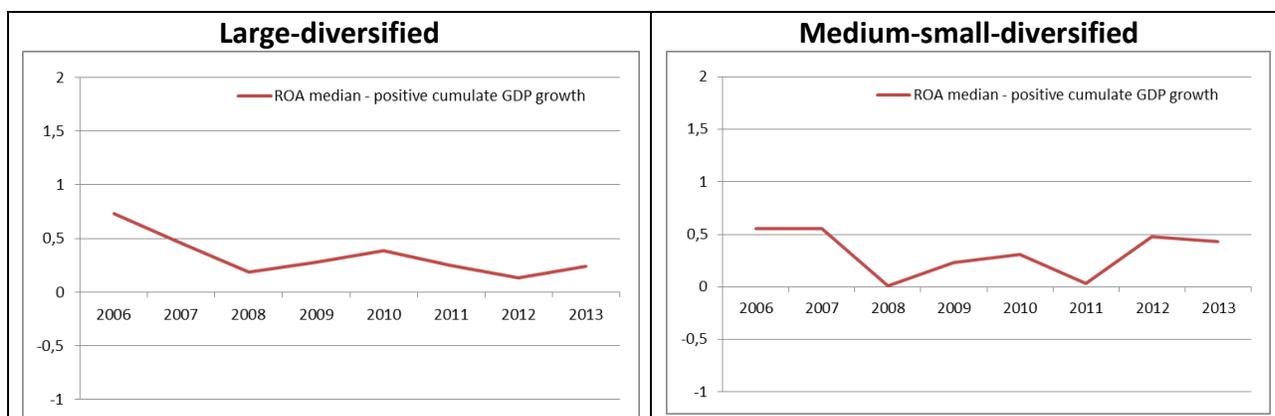
³⁶ For the sake of comparability, banks in countries that adopted the euro after 2008 are excluded; most of them would be dropped anyway because they are subsidiaries of foreign banks.

aligned with that of banks headquartered in the other euro area economies. One caveat is that the number of banks in this cluster is small so idiosyncratic factors might have played a role.

Table 2 shows the contribution of the main income statement items to overall ROA, by cluster and country macroeconomic performance. The main finding is that the sharper drop in ROA for banks in weaker economies reflects a decline in operating income, and an increase in impairments on loans since 2010. The same holds for the drop in ROA in 2008 for larger banks (lending international, and diversified) in countries with positive cumulative GDP growth, but the table shows that the shock to income was temporary while impairment remained higher in subsequent years too. The increase in impairments occurs not only on loans but also on other financial assets.

Figure 16 – Median ROA by cluster and country GDP cumulative growth (1)





(1) Source: SNL. ROA before taxes; data are winsorized for values of ROA < -5 per cent. Since there is only one large diversified and one medium-small diversified bank in countries with negative GDP growth for which data are available, the ROA is not plotted for these banks.

We estimate the ROA means of each cluster, conditioning for country GDP growth using a simple regression estimated on pooled cross-sections of two-year sub-periods of data.³⁷ The results, reported in Table 3, show that there are systematic differences in profitability across clusters in 2006-2007. In particular, lending banks are more profitable than diversified ones, and network and development banks have a similar, lower level of profitability. The differences across clusters subsequently attenuate. In 2010-2011 and 2012-2013 the coefficient of GDP growth becomes statistically and economically significant; a 1 percentage point drop in GDP growth is associated with a decline in ROA of around 30 basis points.

For robustness we estimate a similar regression using dummies for the bank characteristics that were used to construct the clusters, i.e. lending bank, large bank, internationalized bank. The results, shown in Table A2, confirm our previous findings that in 2006-2007 a significant share of the variation in profitability across banks is explained by their core business. All the lending banks, controlling for their size, were more profitable before the recession and keep doing better than other banks until 2009. After 2009, they are not significantly different from the non-lending banks. While internationalization was a source of shocks in the first phase of the crisis, it appears to have benefitted banks in the last four years of the sample. The effect of GDP growth increases both in terms of magnitude and significance in the latest period.

³⁷ Ideally, one should use the weighted average of GDP growth using the shares of credit risk exposure by country. The coefficient of GDP growth would be estimated more precisely but the qualitative results would not change since most banks are focused on their domestic economy.

6.1. Panel regression

In this section we estimate the impact of a wider set of macroeconomic variables on the profitability of the banks in our sample using the unbalanced panel. We employ a very simple regression model of pre-tax ROA. The explanatory variables are consistent with those employed by standard models in the literature,³⁸ showing that bank profitability is well predicted by a small number of macroeconomic variables. Given the very limited number of observations, we consider a parsimonious set of variables likely to influence the profitability of the banking industry: GDP growth, housing prices, equity prices, short-term and long-term euro interest rates, and spreads on government bonds.

After some specification search the following variables are included: country-level annual real growth of GDP, the yearly average of monthly returns of the Eurostoxx Index, the 3month Euribor interest rate, the country-level 10 year government bond spread with respect to the rate for the corresponding maturity Interest Rate Swap. The return on a country-level index of residential real estate prices is highly correlated with other variables and is not significant so it is not included in the main specification.

$$ROA_{it} = \alpha + \beta_1(GDP_Growth_{it}) + \beta_2(Euribor3month_t) + \beta_3(Govt_Spread_10year_{it}) + \beta_4 Stock_market_return_t + \beta_5 \log(Assets_{it}) + \varepsilon_{it}$$

Based on prior evidence (e.g. Albertazzi and Gambacorta (2009)) we expect a positive effect of GDP growth for all banks, larger for those engaging primarily in lending since net interest income (via lending activity) and loan loss provisions (via credit portfolio quality) are found to be more sensitive to macroeconomic conditions than other non-interest income.

The model is first estimated on all banks, and then for the subsets of lending banks and other banks (including the diversified banks and specialized institutions).³⁹ Finally, bank fixed effects are added to test for the robustness of the coefficients of the macroeconomic variables since they capture any bank-level differences, including country structural characteristics that do not change over time.

³⁸ There are two main strands of literature on bank profitability. One strand uses aggregate or individual bank data and relates profitability to bank balance sheet characteristics in addition to macroeconomic conditions (e.g. Albertazzi and Gambacorta (2009)). The second relates bank profitability to macroeconomic and financial variables only, letting banks adjust the composition of the balance sheet to exogenous conditions, for example the Federal Reserve CLASS model (see Hirtle et al. (2014)).

³⁹ This simple model is estimated using the unbalanced panel of banks observed between 2006-2013. Standard models of bank profitability use longer time series or panels so that they can have an autoregressive structure. In our data we have only 8 years of observations so we use a simpler specification pooling all the data and clustering standard errors at the country level.

As shown in Table 4, GDP growth has a positive and statistically significant effect in all of the regressions. The coefficient is larger for lending banks, suggesting that for this category of intermediaries ROA is more sensitive to changes in GDP growth: an increase of 1 percentage point in GDP growth is associated with a 0.07 point increase in ROA for lending banks, and of 0.04 for other institutions. The effects are economically significant given the sample means of 0.17 and 0.10 per cent, respectively. We test the hypothesis of different coefficients by adding interaction terms between bank type dummies and macroeconomic variables (not shown) and obtain very similar results but the coefficients of the interactions are not statistically significant by conventional standards.

As for the other variables, the coefficient on the short-term interest rate is positive and significant in the full sample, and for the lending banks, reflecting the effect of the level of interest rates on the interest margin. The effect of the 3-month Euribor on the ROA of the non-lending and specialized banks is virtually zero, although the interaction terms are not significant. All banks have been adversely affected by the spread in their government bond yield, much more than the diversified banks. It is important to note that the effect of the spread is conditional on GDP growth. This finding could reflect the fact that some lending banks, mostly located in countries that were involved in the sovereign debt crisis, benefited from high interest rates on their government bond investments. In addition, and as expected, bank profitability was positively influenced by the stock market average return, in a relatively uniform way across bank types. Finally, the last column shows that the coefficients of the macroeconomic determinants are robust to controlling for individual bank fixed effects.

These results suggest that the higher volatility in the profitability of lending banks, particularly during 2011-2012, reflects a combination of worse economic conditions in countries where these banks are more present, and a higher sensitivity of the ROA of lending banks to GDP growth.

7. Italian banks

We briefly compare Italian banks with the other significant banks belonging to the same clusters. There are 14 Italian banking groups under direct ECB supervision. One of them (Barclays Bank) is a branch of a non-euro area bank so it is excluded from the analysis. The Italian significant banks are: one large lending international bank (cluster 1; UniCredit Group); one large lending domestic bank (cluster 2; Intesa San Paolo); five medium-sized lending banks (cluster 4; Banca Monte dei Paschi, Banco Popolare, UBI Banca, Banca Popolare dell'Emilia Romagna, Mediobanca); five small lending banks (cluster 5; Banca Popolare di Sondrio, Banca

Popolare di Vicenza, Banca Carige, Banca Popolare di Milano, Veneto Banca); one network bank (cluster 7; Iccrea Holding). In this section we focus on the 12 lending banks.

Figure 17 compares some key balance-sheet indicators of Italian and non-Italian banks in a given cluster. For ease of representation, the values are scaled so that the average of non-Italian banks is 100 for each measure. If there is more than one bank in the cluster the figures show weighted averages for each cluster; the results are similar for medians or simple averages.

First, Italian banks have a significantly higher share of credit risk exposure to nonfinancial firms than other banks, both to large and medium-sized corporates and to SMEs. In particular, for Unicredit the share of exposure to SMEs (18 per cent) is 2.5 times the average of non-Italian banks in cluster 1. For Intesa and for the medium-sized and small Italian banks in clusters 4 and 5 the shares of exposure to SMEs (18 per cent, 27 and 26 per cent, respectively) and corporates (27, 20, 18 per cent) are between 1.5 and 2 times the average of their peers.

In term of international diversification, Unicredit has a share of domestic credit risk exposure of 40 per cent against an average of 26 per cent, so it is more domestically focused than its peers. Intesa is instead very similar to the other banks in the same cluster (77 per cent against 78 per cent for domestic credit risk exposure). Medium and small Italian banks hold less Level 3 assets whereas the two larger banks are similar to their peers in this respect.

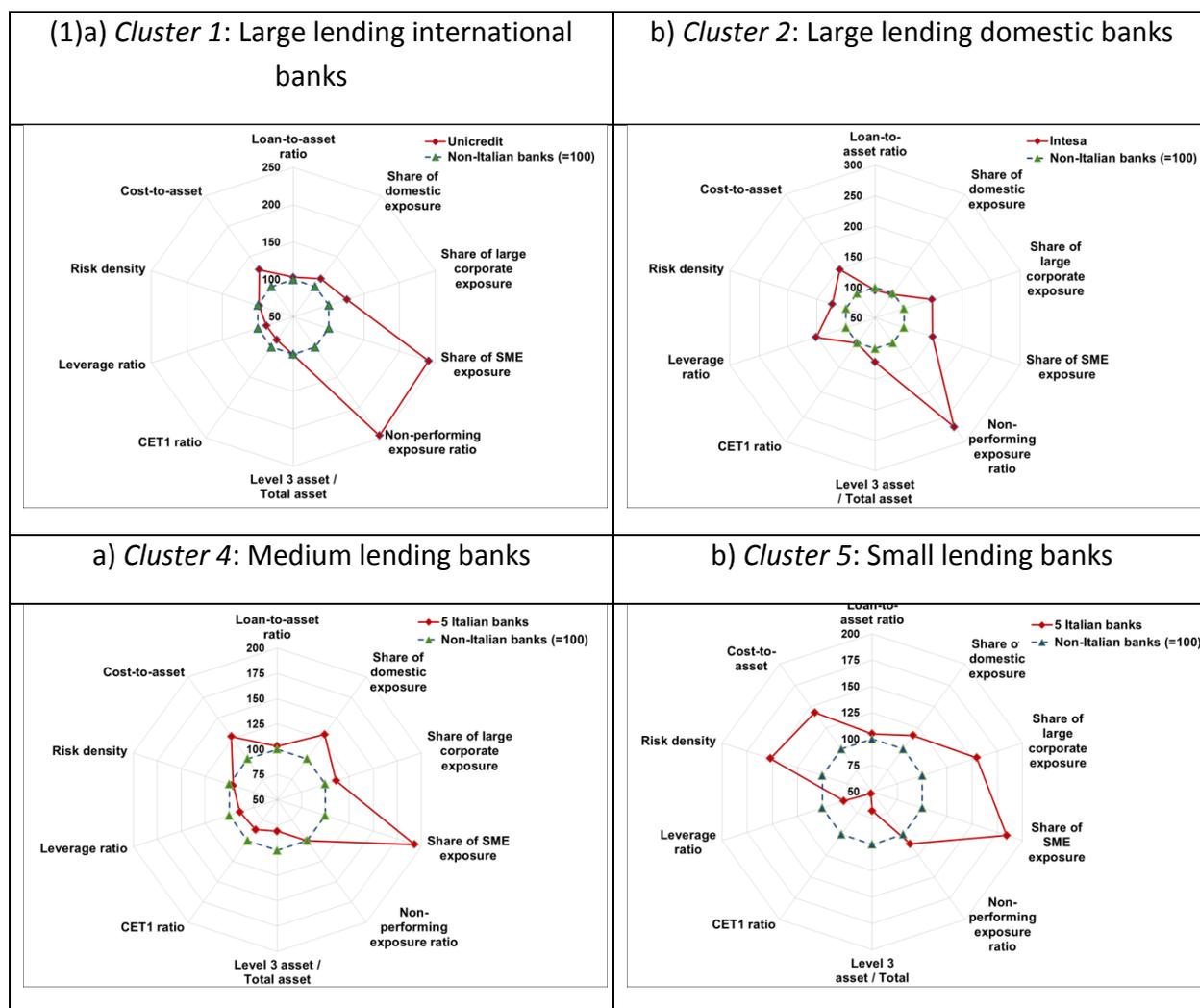
Despite the larger share of exposure in SMEs and corporates, the risk density of Italian banks is comparable to their non-Italian peers for clusters 1, 2 and 4; small lending banks (cluster 5), by contrast, have a risk density that is 1.3 times higher than banks in other countries.

The two large Italian banks have a much higher non-performing exposures (NPE) than their peers. Unicredit has an NPE ratio of 10.6 per cent, compared to 4.3 per cent for the average of cluster 1; the ratio for Intesa is 9.9 per cent, compared to 3.7 for cluster 2. By contrast, medium and small Italian banks have on average lower NPE ratios than their euro area counterparts in clusters 4 and 5.

At the end of 2013 the capital ratios of UniCredit (9.8 and 4.7 per cent, respectively, for the CET1 and leverage ratios) were slightly lower than the average of the other Cluster 1 banks. The CET1 ratio of Intesa (12.0 per cent) was very similar to that of the banks in cluster 2, while the leverage ratio was 6.2 per cent, against 4.1 per cent for non-Italian banks. For medium-sized and small banks the difference in terms of capital ratios with their peers is more pronounced: the average CET1 and leverage ratios were 10.3 per cent and 5.1 per cent for Italian banks in cluster 4, against 12.3 and 5.9 per cent for non-Italian banks. The figures were 7.5 and 4.9 per cent for small Italian banks, against 14.3 and 6.8 per cent for non-Italian banks in cluster 5.

Finally, Italian banks in all clusters have higher costs as a ratio to total assets (between 1.3 and 1.5 times than that of their non-Italian peers). These higher costs could be partly related to the much higher share of lending to small- and medium-sized companies, a type of lending that is typically not standardized, and requires more resources in terms of screening and monitoring.⁴⁰ The regression analysis of costs discussed in Section 5 shows that controlling for other bank characteristics, including country dummies, operating costs are positively correlated with SME exposure,. Data on the cost to income ratio for the Italian banking system are in line with those of other euro area large economies (see ECB (2014)).

Figure 17 –Main balance-sheet indicators for Italian banks (1)



(1) Source: ECB/EBA and SNL. Weighted averages across types of exposure and cluster. Indices of the composition of exposure refer to credit risk only.

⁴⁰ A large literature highlights that small business lending is information-intensive and requires also physical proximity to the firm (e.g. Petersen and Rajan (1994), Berger and Udell (1995)).

Each Italian group is benchmarked against the banks in the same cluster, considering the two-year periods employed above (Table 5). The two banks in clusters 1 and 2 are grouped together. Compared with banks in the same cluster, Italian institutions tend to have higher operating income scaled by assets in all periods; the gap was even wider before the recession, particularly for smaller banks. Italian banks also have higher operating costs in all periods. Smaller institutions have the highest ratio of operating costs to total assets, particularly before 2010. Since the outbreak of the crisis all banks have reduced the ratio of costs to assets substantially.

Regarding impairments, the largest banks have a higher cost of risk than their peers, even before the crisis. This may reflect the higher share of loans to nonfinancial firms, particularly SMEs, of Italian banks. The difference widens starting in 2010. The medium-sized and smaller institutions have a lower incidence of impairments than their peers but the difference is not statistically significant as a result of the high variance and small number of observations.

The differences reflect both structural and cyclical factors, given that Italy was hit by two recessions and belongs to the group of countries with negative cumulative GDP growth. In order to take into account differences in the business cycle across countries, we estimated cluster means conditional on a dummy equal to 1 for Italian banks, and GDP growth. The results, not shown, indicate that the mean ROA of Italian banks was higher than their peers before the recession. The positive gap however, declines and becomes insignificant after the sovereign debt crisis, confirming the conclusion that cyclical conditions explain most of the current difference in profitability across banks in the sample.

8. Conclusions

This paper describes the banks defined as *significant* by the Single Supervisory Mechanism and proposes a simple approach to cluster them according to core business and size; the degree of internationalization is also explored. Most significant banks focus on lending and have a funding structure that reflects the typical commercial banking model. Few are internationally diversified. The type of counterparts and the different recourse to internal models for evaluating credit risk go some way towards explaining differences in the risk density across banks but a large country-specific component remains relevant.

Finally, the data suggest that the main business of banks influenced the level of profitability before the global financial crisis, with lending banks being more profitable than diversified institutions. Since the 2008-2009 recession country-specific macroeconomic conditions played a greater role, with a weakening of profitability for all banks, especially for those in economies with worse cyclical conditions. Although our data point towards a greater cyclical sensitivity of

lending banks with respect to diversified ones, further analysis is required, including a full business cycle and, possibly, a larger number of banks.

References

- Albertazzi, U. and L. Gambacorta, 2009. Bank Profitability and the Business Cycle, *Journal of Financial Stability* 5 (4), 393-409.
- Basel Committee on Banking Supervision, 2013. Regulatory consistency assessment programme (RCAP) - Analysis of risk-weighted assets for credit risk in the banking book, July 2013.
- Behn, M., R. Haselmann and V. Vig, 2014. The Limits of Model-Based Regulation, August 28, 2014 mimeo.
- Becker, B. and Opp, C., 2014. Regulatory reform and risk-taking: replacing ratings, September 2014, mimeo, University of California Berkeley.
- Berger, A. N., and G. F. Udell, 1995, Small firms, commercial lines of credit, and collateral, *Journal of Business* 68, 351–382.
- European Banking Authority, 2013. Summary report on the comparability and pro-cyclicality of capital requirements under the Internal Ratings Based Approach in accordance with Article 502 of the Capital Requirements Regulation, 17 December 2013.
- European Banking Authority, 2014. Methodological note EU-wide Stress Test 2014, 29 April 2014.
- European Central Bank, 2014. Banking Structures Report, October 2014. Frankfurt am Main.
- European Securities Markets Authority, 2013. Review of Accounting Practices Comparability of IFRS Financial Statements of Financial Institutions in Europe, 18 November 2013 ESMA/2013/1664.
- European Systemic Risk Board, 2014. Reports of the Advisory Scientific Committee No. 4/June 2014, Is Europe Overbanked?
- Heitmüller, A., 2005. A Note on Decompositions in Fixed Effects Models in the Presence of Time-Invariant Characteristics, IZA DP No. 1886 December 2005.
- Hirtle, B., A. Kovner, J. Vickery, M. Bhanot, 2014. Assessing Financial Stability: The Capital and Loss Assessment under Stress Scenarios (CLASS) Model. Federal Reserve Bank of New York Staff Reports, No. 663 February 2014, Revised October 2014.
- Petersen, M., R. G. Rajan, 1994. The benefits of lending relationships, *Journal of Finance* 49, 3–37.
- Vallascas, F., J. Hagendorff, 2013. The Risk Sensitivity of Capital Requirements: Evidence from an International Sample of Large Banks, *Review of Finance*, 17: 1947–1988.

Tables

Table 1 – Drivers of differences in risk density (1)

Each column reports a pooled cross-section regression, where the dependent variable is the bank-level risk density for exposures to the corresponding counterparts. Explanatory variables are dummy variables for cluster, type of portfolio and country. The number of banks in each regression varies since banks with exposures in a single portfolio are automatically dropped. Standard errors are clustered at the bank level.

VARIABLES	(1) Central banks and Central Governments	(2) Institutions	(3) Medium& Large Corporates	(4) SMEs	(5) Retail, Secured on RE, non- SMEs	(6) Other Retail
Cluster 1: Large, Lending, Int'l	0.217	-11.72**	6.351	-7.760	-3.661	14.09***
Cluster 3: Large, Diversified	-3.102	-2.170	5.621	5.554	2.605	10.57***
Cluster 4: Medium, Lending	-13.40	-7.029	12.89	-7.889	-4.621	9.927**
Cluster 5: Small, Lending	-12.47	-2.740	8.522	-10.00**	-3.687	9.304*
Cluster 6: Medium&Small, Diversified	-13.66	-8.572	18.43	-4.492	-0.449	6.660
Cluster 7: Network Banks	-10.59	-5.030	1.398	-16.67**	-6.164	5.057
Cluster 8: Public&Dev't Bank	-19.25	-2.422	0.318	-5.828	-12.57	1.746
Portfolio: Foundation IRB	7.049	7.892**	-18.90***	-4.860	-24.40***	-69.51***
Portfolio: Advanced IRB	-6.876	2.568	-34.64***	-43.38***	-27.60***	-49.00***
Country: BE	6.798	12.76**	-2.082	4.024	3.928	-4.010
Country: ES	1.051	14.75***	23.37***	12.31**	-0.258	4.415
Country: FR	-4.813	6.824*	19.04***	3.508	-4.766	0.281
Country: GR	4.087	-2.571	27.20***	5.742	10.18***	-3.670
Country: IE	1.289	18.51	25.58***	20.26***	24.38***	15.24**
Country: IT	-2.240	25.59***	20.84***	15.38***	1.041	-2.527
Country: NL	29.47*	11.78*	36.63	9.090	-9.137	-0.0513
Country: OTH	-0.0661	11.91***	12.03*	15.52**	5.079	-1.770
Country: PT	4.779	31.07***	29.00***	19.69***	2.346	-1.443
Constant (= Cluster 2, SA Portfolio, GERMANY)	15.02 [10.02]	18.31*** [4.764]	63.64*** [9.256]	74.52*** [5.540]	46.24*** [3.607]	66.12*** [4.634]
Observations	124	138	151	152	125	127
R-squared	0.256	0.276	0.496	0.635	0.672	0.817
Adj. R2	0.128	0.166	0.427	0.586	0.617	0.787
N. of banks	89	89	89	83	83	83

***p<0.01, **p<0.05, * p<0.1

Table 2 - Main items in income statement by cluster and country GDP growth (medians) (1)

Years	2006-07	2008-09	2010-11	2012-13	2006-07	2008-09	2010-11	2012-13
	Large Lending International				Medium-sized Lending			
Cumulative GDP growth>0								
Operating Income	2.82	1.39	2.57	3.07	1.07	1.51	1.17	1.35
Operating Costs	1.49	1.52	1.45	1.63	0.61	0.58	0.64	0.90
Impairments	0.06	0.87	0.74	0.88	0.19	1.09	0.22	0.61
of which: on Loans	0.05	0.49	0.46	0.57	0.05	0.76	0.19	0.52
ROA before taxes	0.89	-0.18	0.12	0.28	0.47	0.09	0.27	0.27
Cumulative GDP growth<0								
Operating Income	3.08	3.31	3.33	3.29	3.41	3.05	2.68	2.35
Operating Costs	1.61	1.71	1.75	1.87	1.90	1.72	1.63	1.50
Impairments	0.35	0.83	0.98	1.25	0.29	0.90	1.03	1.40
of which: on Loans	0.33	0.72	0.78	1.00	0.25	0.66	0.68	1.04
ROA before taxes	1.14	0.99	0.56	0.21	1.49	0.55	0.20	-0.26
	Large Lending Domestic				Small Lending			
Cumulative GDP growth>0								
Operating Income	1.86	1.94	1.99	1.95	2.02	1.79	2.11	1.98
Operating Costs	1.21	1.28	1.35	1.32	1.02	1.01	1.24	1.23
Impairments	0.05	0.43	0.23	0.26	0.26	0.49	0.32	0.28
of which: on Loans	0.05	0.36	0.21	0.23	0.31	0.34	0.25	0.25
ROA before taxes	0.51	0.06	0.40	0.34	0.68	0.18	0.32	0.29
Cumulative GDP growth<0								
Operating Income	2.99	2.73	2.51	2.34	3.51	3.21	2.54	2.59
Operating Costs	1.82	1.64	1.46	1.50	2.03	1.83	1.66	1.52
Impairments	0.23	0.70	0.94	1.34	0.29	0.54	0.56	1.51
of which: on Loans	0.23	0.45	0.67	1.07	0.28	0.48	0.43	1.35
ROA before taxes	1.20	0.62	0.40	-0.15	1.16	0.58	0.19	-0.26
	Large Diversified				Medium-Small Diversified			
Cumulative GDP growth>0								
Operating Income	1.86	1.53	1.80	1.80	1.32	1.52	1.32	1.48
Operating Costs	1.18	1.10	1.20	1.28	0.74	0.79	0.89	1.10
Impairments	0.08	0.32	0.25	0.27	0.04	0.51	0.13	0.22
of which: on Loans	0.08	0.26	0.25	0.25	0.03	0.15	0.07	0.12
ROA before taxes	0.53	0.22	0.33	0.22	0.55	0.19	0.18	0.44
Cumulative GDP growth<0								
Operating Income			1.63	1.50			1.50	1.68
Operating Costs			1.10	1.15			1.11	2.60
Impairments			0.93	3.65			2.72	6.84
of which: on Loans			0.67	3.17			1.62	5.22
ROA before taxes			-0.71	-2.28			-2.59	-3.69
	Network Banks				Development Banks			

Cumulative GDP growth>0								
Operating Income	0.87	0.82	0.94	1.20	0.75	0.69	0.40	0.47
Operating Costs	0.46	0.56	0.57	0.70	0.48	0.43	0.14	0.14
Impairments	0.04	0.38	0.15	0.15	0.02	0.08	0.03	0.06
of which: on Loans	0.03	0.23	0.09	0.12	0.00	0.03	0.03	0.03
ROA before taxes	0.36	-0.33	0.12	0.25	0.25	0.23	0.25	0.29
Cumulative GDP growth<0								
Operating Income	1.97	2.31	2.22	1.29				
Operating Costs	1.35	1.44	1.33	0.70				
Impairments	0.17	0.51	0.52	0.38				
of which: on Loans	0.17	0.44	0.50	0.39				
ROA before taxes	0.45	0.35	0.35	0.20				

(1) SNL data for available bank-year observations. Medians of observations available in each period. Variables are scaled by end-of-period total assets. Data are winsorized for ROA values below -5 per cent. Missing data reflect the lack of observations/banks in that cluster and year

Table 3 - Means of ROA by cluster, accounting for GDP growth

Pooled cross-section regression of bank ROA before taxes on dummy variables for bank clusters. The number of banks is 89; regressions based on data available for the given years. Values of ROA<-5 per cent are winsorized. Robust standard errors clustered at the country level. GDP growth is the cumulate growth in each two-year period in the country of the bank's home country.

Dep. Var: ROA pre-tax	2006-07		2008-09		2010-11		2012-13	
Cluster:	Coef.	Signif.	Coef.	Signif.	Coef.	Signif.	Coef.	Signif.
Large Lending International	0.923	***	0.354		-0.124		0.270	
	0.166		0.416		0.450		0.306	
Large Lending Domestic	0.665	**	0.168		-0.212		0.448	***
	0.284		0.257		0.207		0.109	
Large Diversified	0.396	**	0.159		-0.429	*	-0.085	
	0.155		0.129		0.204		0.300	
Medium-sized Lending	1.083	***	0.436	**	-0.488	*	0.376	
	0.271		0.181		0.266		0.309	
Small Lending	0.802	**	0.420	**	-0.345		-0.386	
	0.270		0.161		0.201		0.264	
Medium-Small Diversified	0.424		0.160		-0.999	**	-0.507	
	0.237		0.147		0.455		0.680	
Network Banks	0.201		-0.244		-0.810	***	0.304	**
	0.270		0.180		0.211		0.114	
Development Banks	0.157		0.265	**	-0.550	**	0.278	*
	0.220		0.114		0.239		0.132	
GDP_growth	0.051		0.017		0.275	***	0.327	**
	0.044		0.025		0.063		0.132	
R-squared	0.838		0.238		0.277		0.243	
N. Obs.	137		144		171		180	

Table 4 - Regression of ROA on macroeconomic conditions (2006-2013)

Pooled cross-section regression of bank ROA before taxes on bank and country-level characteristics for years 2006-2013. The regressions are based on available observations for each bank. Values of ROA<-5 per cent and of spread10>10 are winsorized. The number of banks is 89. Gdp_growth is the annual real growth rate of the country's GDP. Euribor3m is the 3 month Euribor rate; Spread10 is the spread between each country's 10 year government bond yield and the IRS rate for the same maturity. Eurostoxx is the yearly average of the monthly return on the Eurostoxx Index. Logta is the log of total assets. Diversified banks are those with loan/TA<0.50; a bank can switch category over time if moves across the threshold. Other banks include the Network and the Development&Public Banks. In the fixed effects regression R sq. is adjusted. Standard errors clustered at the country level.

ROA pre-tax	All banks		Lending		Other		All - with Bank Fixed effects	
	Coef.	Sign.	Coef.	Sign.	Coef.	Sign.	Coef.	Sign.
Gdp_growth	0.056	**	0.064	**	0.035	*	0.063	***
	0.021		0.025		0.018		0.013	
Euribor3m	0.134	**	0.161	***	0.006		0.044	
	0.049		0.044		0.041		0.050	
Spread10	-0.228	***	-0.220	***	-0.604	*	-0.370	***
	0.053		0.051		0.263		0.078	
Eurostoxx	0.124	***	0.123	***	0.104	***	0.107	***
	0.025		0.031		0.019		0.029	
Logta	0.000		-0.003		0.001		0.420	**
	0.071		0.082		0.094		0.145	
Constant	0.083		0.208		0.116		-7.383	**
	1.315		1.482		1.795		2.701	
N. obs.	630		423		207		630	
R-squared	0.31		0.36		0.34		0.51	

Table 5 - Comparison between Italian banks and other banks (1)

The Table reports means for Italian banks and banks from other countries in the same cluster. The stars indicate statistical significance of the difference between the means of the two groups (**99 per cent, **95 per cent, *90 per cent). Given the small sample size the t-statistics are indicative. The data are pooled for two-year periods and the two Italian banks in cluster 1 and 2 are defined as Large. ROA data are winsorized at -5 per cent.

Bank type:		2006-07	2008-09	2010-11	2012-13
Operating Income					
Clusters 1&2	Italian	3.13 ***	2.87 **	2.72 **	2.87 ***
	Other	2.36	2.24	2.23	2.19
Cluster 4	Italian	3.66 **	3.10	2.88 **	2.72 ***
	Other	3.13	2.89	2.37	2.07
Cluster 5	Italian	3.76 ***	3.38 ***	2.72 **	2.88 **
	Other	2.78	2.35	2.29	2.24
Operating Expenses					
Clusters 1&2	Italian	1.90 ***	1.82 ***	1.81 ***	1.85 ***
	Other	1.31	1.38	1.29	1.33
Cluster 4	Italian	1.92	1.98 ***	1.85 ***	1.80 ***
	Other	1.59	1.44	1.31	1.34
Cluster 5	Italian	2.28 ***	2.21 ***	1.90 ***	1.75 ***
	Other	1.50	1.37	1.32	1.39
Impairments					
Clusters 1&2	Italian	0.26 **	0.72	1.27 *	1.58 *
	Other	0.17	0.66	0.59	0.68
Cluster 4	Italian	0.30	0.79	1.09	1.27
	Other	0.27	1.02	1.38	1.47
Cluster 5	Italian	0.34	0.53	0.58	1.80
	Other	0.29	0.61	0.83	2.42
Pre-Tax ROA					
Clusters 1&2	Italian	1.01	0.38	-0.39	-0.55
	Other	0.96	0.21	0.34	0.24
Cluster 4	Italian	1.47	0.38	-0.16	-0.33
	Other	1.30	0.43	-0.88	-0.53
Cluster 5	Italian	1.16	0.71 **	0.24	-0.60
	Other	1.00	0.38	-0.02	-1.09

(1) T-tests of differences between means. Based on all available banks in each period. One side statistical significance at ***99 per cent, **95 per cent, 90 per cent. Variables are scaled by end-of-period total assets.

Appendix

Table A1 – List of banks by cluster

Company Name	Country	Total asset (€bn)	Loan-to-asset ratio	Share of domestic exposure	Company Name	Country	Total asset (€bn)	Loan-to-asset ratio	Share of domestic exposure
Group 1: Large, Lending, International					Group 5: Small, Lending				
BBVA	ES	583	56%	49%	AXA Bk Europe	BE	37	62%	73%
Dexia	BE	223	58%	2%	Aareal Bk	DE	43	60%	30%
Erste Bank	AT	200	60%	43%	Argenta Bank	BE	35	56%	42%
KBC	BE	239	50%	51%	BAWAG	AT	36	59%	65%
Santander	ES	1,116	60%	29%	BMN	ES	48	55%	98%
UniCredit	IT	826	59%	40%	BP Sondrio	IT	33	73%	88%
Group 2: Large, Lending, Domestic					BP Vicenza	IT	45	68%	94%
A BN AMRO	NL	372	69%	78%	BPI	PT	43	61%	76%
BayernLB	DE	256	53%	74%	Banca Carige	IT	42	59%	96%
Crédit Mutuel Grp	FR	659	53%	86%	Bank of Cyprus	CY	30	72%	74%
Fundación La Caixa	ES	351	56%	99%	Bank of Valletta	MT	7	51%	84%
Groupe BPCE	FR	1,125	52%	76%	Bpifrance	FR	35	69%	100%
Intesa	IT	624	55%	77%	CCB	CY	14	79%	100%
Rabobank Grp	NL	669	69%	68%	CR Unidas	ES	42	81%	100%
Group 3: Large, Diversified					Hellenic Bank	CY	6	56%	77%
BFA	ES	269	44%	86%	Liberbank	ES	45	59%	100%
BNP Paribas	FR	1,811	34%	29%	Ljubljanska Banka	SI	12	56%	57%
Commerzbank	DE	550	45%	51%	Münchener Hypobk	DE	35	76%	71%
Crédit Agricole	FR	1,688	42%	73%	Permanent TSB Grp	IE	38	78%	84%
Deutsche Bank	DE	1,611	24%	37%	Popolare di Milano	IT	49	68%	96%
Société Générale	FR	1,214	30%	46%	Raiffeisen OÖ AG	AT	37	53%	71%
Group 4: Medium, Lending					Unicaja Banco	ES	41	53%	100%
AIB	IE	118	56%	72%	Veneto Banca	IT	37	71%	95%
Alpha Bank	GR	74	70%	83%	apobank	DE	35	77%	95%
BCP	PT	82	69%	70%	Group 6: Medium and Small, Diversified				
BPER	IT	62	75%	96%	ABL V Bk AS	LV	3	23%	37%
Banco Popolare	IT	125	69%	96%	BCEE	LU	41	42%	53%
Banco Popular	ES	147	69%	90%	Banque Degroof	BE	5	33%	.
Banco Sabadell	ES	164	69%	93%	Belfius	BE	183	48%	68%
Bank of Ireland	IE	132	64%	52%	CatalunyaBanc	ES	63	47%	100%
Bankinter	ES	55	77%	100%	Landesbank Berlin	DE	102	40%	70%
CGD	PT	114	62%	78%	Nova KBM	SI	5	46%	89%
Eurobank	GR	78	59%	64%	Precision Cap SA	LU	32	38%	43%
HSH Nordbank	DE	109	60%	79%	SNS Reaal	NL	126	44%	90%
Helaba	DE	178	52%	67%	Group 7: Network Banks				
Ibercaja Banco	ES	63	58%	99%	DZ Bank	DE	385	32%	62%
Kutxabank	ES	61	76%	99%	DekaBank	DE	116	24%	23%
Mediobanca	IT	73	50%	74%	HRE Holding	DE	122	41%	23%
Monte dei Paschi	IT	199	66%	99%	Iccrea Holding	IT	46	24%	100%
NBG	GR	111	61%	56%	LBBW	DE	275	40%	70%
NWB Bank	NL	73	79%	92%	NORDLB	DE	201	53%	67%
OP Financial	FI	101	68%	90%	Raiffeisen-Holding	AT	31	34%	82%
Piraeus Bank	GR	92	68%	91%	Volksbank	AT	21	31%	64%
RZB	AT	147	58%	22%	WGZ Bank	DE	91	41%	65%
UBI	IT	124	71%	97%	Group 8: Public and Development Bank				
VWFS AG	DE	91	80%	47%	BNG Bank	NL	131	70%	70%
Group 9: Non-euro area subsidiaries and branches					L-Bank	DE	71	34%	89%
Danske Bk	FI	27	73%	NA	La Banque Postale	FR	201	29%	95%
HSBC Bank Malta	MT	6	58%	NA	NRWBANK	DE	145	42%	77%
HSBC France	FR	209	18%	NA	Rentenbank	DE	82	7%	75%
Nordea Bk Finland	FI	305	37%	NA	Sberbank	AT	11	71%	NA
RBC Invr Svcs Bk	LU	13	7%	NA	Slovenska Sporitel	SK	12	61%	NA
RBS Holdings NV	NL	40	10%	NA	Swedbank	LV	4	66%	NA
RCB	CY	11	78%	NA	Swedbank AB	LT	20	70%	NA
SEB AG	DE	32	49%	NA	Swedbank AS	EE	9	69%	NA
SEB Pank AS	EE	4	86%	NA	Tatra banka	SK	9	67%	NA
SEB banka	LV	3	66%	NA	UBS (LU) SA	LU	12	17%	NA
SSBL	LU	30	2%	NA	Ulster Bk Ireland	IE	35	81%	NA
					UniCredit Banka SL	SI	2	76%	NA
					VTB Bk (Austria)	AT	10	53%	NA
					VÚB banka	SK	12	66%	NA

Table A2 - Conditional means of bank ROA by bank characteristics and GDP growth

Pooled cross-section regression of bank ROA before taxes on dummy variables for bank characteristics. The number of banks is 89; regressions based on data available for the given years. Values of ROA<-5 per cent are winsorized. LARGE=1 if assets>200 billion; LENDING=1 if loans to customers/assets>0.50; INTERNATL=1 if share of domestic assets<0.50 per cent; NETWORK=1 for network bank; DEVBK=1 for development banks or other special purpose public lending institutions. GDP_growth is the two-year cumulate of yearly real growth in GDP (Eurostat).

ROA pre-tax	2006-07		2008-09		2010-11		2012-13	
	Coef.	Signif.	Coef.	Signif.	Coef.	Signif.	Coef.	Signif.
LARGE	-0.072		-0.086		0.303		0.334	
	0.117		0.129		0.175		0.227	
LENDING	0.540	***	0.256	***	-0.107		-0.252	
	0.107		0.113		0.287		0.370	
INTERNATL	-0.265	*	-0.172		0.432	**	0.686	***
	0.147		0.165		0.180		0.192	
NETWORK	-0.196	**	-0.357	*	-0.30		0.374	
	0.089		0.186		0.243		0.324	
DEVBANK	-0.248	**	0.157		0.261		0.448	
	0.118		0.137		0.191		0.277	
CONSTANT	0.637	***	0.160		-0.188		-0.390	
	0.096		0.099		0.282		0.369	
R-squared	0.332		0.120		0.040		0.077	
N. Obs.	137		144		171		180	

ROA pre-tax	2006-07		2008-09		2010-11		2012-13	
	Coef.	Signif.	Coef.	Signif.	Coef.	Signif.	Coef.	Signif.
LARGE	-0.021		-0.086		0.283	*	0.292	
	0.121		0.132		0.166		0.196	
LENDING	0.554	***	0.259	**	0.407		0.259	
	0.100		0.116		0.272		0.379	
INTERNATL	-0.259	*	-0.178		-0.020		0.246	
	0.145		0.169		0.190		0.189	
NETWORK	-0.199	**	-0.347	*	-0.267		0.397	
	0.088		0.192		0.258		0.292	
DEVBANK	-0.242	*	0.162		0.049		0.381	
	0.125		0.133		0.195		0.227	
GDP_GROWTH	0.062	***	0.018		0.280	***	0.278	***
	0.021		0.018		0.065		0.079	
CONSTANT	0.385	***	0.191	*	-0.842	***	-0.383	
	0.123		0.110		0.312		0.322	
R-squared	0.365		0.128		0.266		0.177	
N. Obs.	137		144		171		180	