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THE EFFECT OF REVENUE AND GEOGRAPHIC DIVERSIFICATION ON BANK PERFORMANCE

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ABSTRACT

This paper investigates the effect of revenue and geographic diversification on bank performance, also on a risk adjusted basis. Using an unbalanced panel dataset of 3,002 observations relative to Italian banks for the period 2006-2011, the core question is to analyse the effect of geographic and functional diversification across and within both interest and non-interest income and their effect on some principal performance measures. Furthermore in our study we analyse whether certain type of institutions are better able to reap the benefits of diversification analysing performance implications for different categories of banks and if the results have been affected by the financial crisis. The main results suggest that revenue and geographical diversification play a role in determining bank performance. The relative effects appear, however, to be different between mutual and not-mutual banks suggesting different business strategies for different banks. Moreover, in the after crisis period, banks that have been less penalized in terms of risk-adjusted profit are those characterised by a gretare focus on non interest income component and the ones more geographically diversified. These findings have strategic implications both for bank managers, regulators and supervisors for the consequences on banks' performance and stability.

JEL classification: G21

Keywords: Bank heterogeneity, Revenue diversification, Geographic diversification, Risk adjusted performance, Panel data

1. Introduction

The paper addresses the question of diversification in the banking sector. The importance of the topic is linked to the on-going debate as to what the scope of bank activities should be since also theoretical literature does not provide clear evidence.

The transformation of European banking systems in the last three decades has been intense and strictly related to the effects of deregulation and innovation on the competitive environment. The deregulation process has largely been based on the view that income diversification reduces the volatility of bank earnings and makes banks more resilient to financial distress. The evidence suggests however that the expected results often have not been successfully obtained becoming more evident after the financial crisis. The argument gains ground implying the banking industry be less diversified and refocused on lending activities (Vallascas et al., 2012).

Theoretically, the literature on bank diversification primary rests on the assumption that diversification may lead to cost savings or revenue improvements due to spreading of fixed costs, economies of scope from using the same information, customer cost economies (Berger et al, 1987). Moreover banks may also reduce their risks by engaging in both product and geographic diversification strategies (see Diamond, 1984 and Berger and DeYoung, 2001 respectively). Diversification implies also benefits in terms of reduced agency costs of managerial discretion by lowering cash-flow volatility (Stulz, 1990).

The aim of the present paper is, as in previous studies, rather than attempting to measure economies of scope and agency problems directly, investigate whether two types of diversification strategies, i.e. revenue and geographic diversification, may impact on bank performance. Moreover, the paper is aimed at filling the gap in the literature by assessing on the one hand the the risk/return implications of different types of product mixes and on the other by investigating the relative role of product and geographic diversification on bank performance for different size classes and in different time period.

To address these issues, we use consolidated and unconsolidated balance sheets of BHC and individual Italian banks submitted to the Bank of Italy and collected by the Italian Banking Association over the period 2006–2011. The starting date is 2006 since Italian banks report unconsolidated accounting data based on IFRS from that date. This dataset enables us to split commissions and fee activities into different components in order to introduce a more precise definition of bank functional diversification that enable us to disentangle between traditional and non traditional revenue bearing activities.

With respect to the previous work on bank diversification, our paper represents the first attempt to evaluate the role of different type of product mixes, moreover, we consider a large set of diversification and risk adjusted performance measures at the bank individual level using consolidated balance sheet when available and unconsolidated if not. This latter choice is of particular importance for several reasons pincipally linked to the fact that banks tend to reserve the making of non traditional innovative activities to non-banking subsidiaries whose contribution can be more precisely evaluated if consolidated financial statements are available.

Finally, in our empirical analysis we investigate whether certain type of institutions are better able to reap the benefits of diversification focusing on performance implications both for large and small banks which is a major issue regarding diversification. In this sense, the Italian banking system represents an ideal experimental setting since it is characterised by a homogenous group of banks - the mutual ones offering an alternative business model to traditional commercial banks. Mutual banks are typically small banks traditionally oriented to local lending.

We show that revenue and geographical diversification play a role in determining bank performance. The relative effects appear, however, to be different between mutual and not-mutual banks suggesting different business strategies for different banks and in relation to the explicit inclusion of the financial crisis structural break.

This result is shown to be robust for alternative measure of diversification, for different performance measure and also for alternative sub-sample used. Finally, they are robust also when controlling for

potential endogeneity problem between bank performance and diversification.

The paper is structured as follows. Section 2 reviews the theoretical and empirical literature on the nexus between different type of diversification and bank peformance. Section 3 presents the econometric methodology and the data used. Section 4 describes the results and discusses the robustness. Section 5 concludes.

2. Literature Review

In literature, diversification is analysed along two principal dimensions linked to income sources and geographical areas (Rossi et al., 2009). In the following section we briefly review the principal theoretical and empirical literature developed on the topic.

2.1. Theoretical literature

Theoretically, the literature on bank diversification analyses the benefits and costs associated to the strategy developed. Among the former are the results of the portfolio theory that postulate that as long as the revenue streams from different financial activities are less than perfectly correlated, income diversification should offer banks opportunities to grow their risk-adjusted profits. Thanks to economies of scope, diversification may lead to an increase in performance through cost savings or revenue improvements due to the joint production of a wide range of financial services (Teece, 1980 and 1982; Llewellyn, 1996; Klein and Saidenberg, 1997); moreover, diversified banks should realize revenue efficiencies when cross-selling various (fee-based) financial products alongside traditional lending-based services (Herring and Santomero, 1990). Given information asymmetry, banks gain valuable information on their clients by providing a service that might grant advantages in the provision of other services (Diamond, 1984 and 1991; Rajan, 1992; Saunders and Walter, 1994; Stein, 2002). Finally, for some agency theories diversification reduces the agency costs of managerial discretion by lowering cash-flow volatility (Stulz, 1990) or by creating internal capital markets (Stein, 1997; Gertner et al. 1994).

Alongside the positive effects, adverse implications on performance have been identified. Diversification can intensify agency problems between corporate insiders and small shareholders making it more difficult to design efficient managerial incentive contracts and more difficult to align the incentives of outsiders with insiders (Aron, 1988; Stulz, 1990; Rotemberg and Saloner, 1994). Increasing the size and scope of a bank's activities introduces the "cost of complexity", which at some point may dominate the benefits that can be achieved (Rajan et al., 2000). Moreover, diversified banks can use their advantage to operate with greater leverage, since several fee-based activities can be performed holding little or no regulatory capital, and to pursue riskier lending (Demsetz and Strahan, 1997; DeYoung and Roland, 2001). Diversified institutions can be characterized (DeYoung and Roland, 2001) by volatile earnings (i.e.: investment banking activities), lower switching costs for clients (i.e.: non-traditional banking services are based on transaction-based bank-client relationships) and higher operational leverage (given the heavy fixed investments in technology and human resources required) increasing in this way volatility of earnings and hampering risk adjusted performance measures.

As for geographical diversification in banking the literature develops along two lines. On one hand several theories suggest that geographic diversity will enhance efficiency, spread idiosyncratic risk, and reduce agency costs, boosting corporate valuations. Specifically, geographic diversity could enhance market valuations through economies of scale (Chandler, 1977; Gertner et al., 1994; Houston et al., 1997; and Berger et al., 1999) and by reducing exposure to idiosyncratic local shocks (Diamond, 1984). On the other hand, theories of corporate governance by Jensen (1986), Jensen and Meckling (1976) and Scharfstein and Stein (2000) suggest that if small shareholders find it difficult to monitor and govern geographically dispersed corporations then corporate insiders will have greater attitude to extract private benefits from geographically diversified firms with adverse effects on firm valuations. Specific to the topic of geographic diversification, when a bank enters into a new market can incur in higher risk given the adverse selection

problems to the extent that existing intermediaries abandon the riskiest and least profitable customers (Salas and Saurina, 2002).

Another variable that exert distinctive effects on firm value and it is related to geographic diversification is the distance (Deng and Elyasiani, 2008). As geographic diversification, distance can be associated with firm value enhancement or value loss. As a bank expands geographically, it reaches new profitable markets but the distance between its headquarters and branches increases, making it harder for senior managers to monitor the branch managers. This may heighten distance-related agency conflicts and harm firm value.

2.2. Empirical literature

Despite extensive research on the economic consequences of diversification, the empirical literature does not provide clear evidence on whether diversification generates net benefits or costs; this could be linked to the fact that it is extraordinarily difficult to unequivocally measure economies of scope or agency problems empirically. Given this, a more recent strand of empirical literature rather than attempting to measure economies of scope and agency problems directly, investigate whether the range of activities conducted by financial institutions influences their performance. This section summarizes the main empirical contributions on the consequences of diversification on bank performance and risk. The first part deals with revenue diversification, i.e. the profile of the diversification between interest and non-interest bearing activities, while the second one rests on the contributions that deal with the topic of geographic diversification.

2.2.1 Product diversification strategies in banking

The empirical analysis centred on the profile of the diversification between interest and non-interest bearing activities has largely concerned commercial banks in the United States, following the implementation of the Gramm Leach Bliley in 1999. With few exceptions[1], the results conclude that the costs of diversification outweigh the benefits (Stiroh 2004a,b; Stiroh and Rumble, 2006; Laeven and Levine, 2007; Goddard et al., 2008) and the result is valid both for financial holding companies and smaller institutions such as credit unions.

Fewer studies deal with European banks. Among them, Mercieca et al. (2007) explores the economic impact of diversification on average profitability by calculating the effect of an increase in the non-interest share on a sample of 755 small European banks for the period 1997–2003. The analysis evidences that an increase in non-interest activities has two main effects, which are a direct impact from shifting into non-interest activities and, an indirect effect arising from changes in diversification. Moreover, a negative net effect for average profitability and a corresponding positive effect on volatility are detected. The results are robust with respect to several controls, suggesting that over the investigated period the higher volatility of net-interest income outweighs diversification benefits. Lepetit et al. (2008) focusing on the relationship between bank risk and product diversification for a set of European banks belonging to 14 countries during the period 1996-2012 find that a shift into non-interest activities involves higher risk and this is particular true for smaller banks and driven by commission and fee activities.

Turning to the Italian situation, Acharya et al. (2006) analyse the relationship between industrial loan diversification and performance using data from 105 Italian banks over the period 1993-1999 concluding that diversification of bank assets is not guaranteed to produce superior performance and/or greater safety for banks. Chiorazzo et al. (2008) using annual data from 85 Italian banks over the period 1993–2003 find that income diversification increases risk-adjusted returns and that diversification gains diminish with bank size. Cotugno and Stefanelli (2012) using a panel dataset comprising 4038 observations relative to Italian banks for the period 2005-2010 find a positive relationship between product diversification and bank performance also in terms of risk adjusted measures. Vallascas et al. (2012) on a sample of 145 Italian banks during the period 2006-2008, using detailed data on the composition of bank income verifies that institutions that were diversified within narrow activity classes before the crisis experienced large declines

[1] See Stiroh (2009) for a recent review of the literature.

in performance during the financial crisis. By contrast, diversification across broad activity classes, such as lending and capital market activities, did not cause performance losses during the crisis.

2.2.2 Geographic diversification in banking

Also the empirical literature on geographic diversification is mainly focused on the US banking system and proliferates following the Riegle Neal Act of 1994. As regards the profile of geographic diversification and distance some prior research investigated:

i) the effects that the distance between the bank headquarters and its customers, mainly SMEs, may produce on the loan evaluation process (Stein, 2002; Shiers, 2002; Carling and Lundberg, 2005; Hauswald and Marquez, 2006, Felici and Pagnini, 2008; Alessandrini et al., 2009; Jiménez et al., 2009);

ii) to what extent the distance between affiliates and parent organizations may affect bank efficiency (Berger and DeYoung, 2001, Illueca et al., 2009, Bernini and Brighi, 2012a, b);

iii) whether geographic diversification affects directly or indirectly bank performance (Hirtle, 2007; Deng and Elyasiani, 2008, Cotugno and Stefanelli, 2012, Goetz et al. 2012).

Focusing on this latter strand of literature, Hirtle (2007) shows how the increase in size of the branch network engenders a downturn in bank performance. Deng and Elyasiani (2008) on a sample of 505 large publicly traded US BHCs over the 1994–2005 period, find that geographic diversification is associated with BHC value enhancement and risk reduction. When controlling for the distance between the headquarters and branches they find that an increased distance between a BHC and its branches is associated with firm value reduction and risk increase. The authors demonstrate that diversification attained in the same country is effective, since a diversified bank achieves on average a better performance than a bank concentrated in just a few geographic areas; as highlighted in literature, the benefits resulting from a geographical diversification are noticeable when significant economic differences are present in the areas where a bank is located. Goetz et al. (2012) examines the impact of the geographic diversification of bank holding company assets across the United States on their market valuations. They find that increases in geographic diversity due to interstate bank deregulation reduced BHC valuations consistently with the view that an exogenous increase in complexity allows corporate insiders to extract larger private rents with adverse implications on firm value.

As for Italy, a few papers have recently investigated the impact of geographical diversification in the banking sector. For a sample of Italian banks over the period 2005-2010 Cotugno and Stefanelli (2012) find that a positive relation between geographical diversification and bank performance. Focusing on cost efficiency and on a homogenous group of banks - the mutual ones - Bernini and Brighi (2012a) find that a greater degree of diversification at the local level determines an increase in the cost inefficiency. This result is apparently contradictory but it is related to the special role played by this type of banks at the local level. Mutual banks typically operate at the municipal level. In other words provincial geographical diversification does not appear to be enough to eliminate the local market risk (DeYoung et al., 2004; Emmons et al., 2004 and Yeager, 2004).

2.3. Model specification

The review of the literature provided above suggests the following hypotheses to be tested in the remainder of the paper:

H1 – diversification effects on performance between traditional and non-traditional revenue bearing activities and its principal components;
H2 – relationship between bank profitability and geographic diversification or similarly relationship between distance and bank profitability;
H3 – relative role of product and geographic diversification on bank performance;
H4 – how the crisis impact through diversification strategies on bank profitability and risk;
H5- how size affects diversification attitudes?

With respect to the previous work on bank diversification, our paper represents the first attempt to directly assess the risk/return implications of different types of product mixes; commissions and fee activities are in fact split into different components. Second, a large amount of additonal explanatory variables have been included in the model in order to avoid potential omitted variables bias. Moreover, in our empirical analysis we investigate whether certain type of institutions are better able to reap the benefits of diversification focusing on performance implications both for large and small banks which is a major issue regarding diversification. Finally, we consider a large set of diversification and risk adjusted performance measures at the bank individual level using consolidated balance sheet when available and unconsolidated if not. This latter choice is of particular importance for several reasons: on one hand banks tend to reserve the making of non traditional innovative activities to non-banking subsidiaries whose contribution can be more precisely evaluated if consolidated financial statements are available; furthermore, diversification benefits may exist for the institution as a whole and not for the single subsidiary. On the other hand, financial holding company represents the relevant unit of observation for regulators on extremly important topic such as the level of systemic risk (Stiroh and Rumble, 2006).

3. Methodology and data

This section presents the econometric methodology, the data used, along with the measure of banks' diversification and performance.

3.1. Measure of banks' revenue and geographic diversification

3.1.1 Revenue diversification

To determine the degree of bank diversification asset-based measure and/or income-based indicators can be used. Ideally, to measure the diversification of bank activities, detailed data on the degree to which each bank underwrites, operates mutual funds, insurance, etc. should be used. The dataset available do not provide information with this type of detailed information on the different type of activities engaged. So, several authors construct revenue based measure that suffers from larger measurement problems than the asset-based measure (Laeven and Levine, 2007). In fact, loans and in general more traditional activities can yield fee income; in this way the income-based measure could overestimate the degree to which some lending institutions engage in non-lending activities. For instance, DeYoung and Rice (2004) show that payment services linked to traditional banking activities are the largest source of non-interest income for U.S. banks.

To mitigate the overestimation problem, the ABI dataset offering details on consolidated and unconsolidated balance-sheet of all the Italian banks over the period 2006-2011 enable us to disaggregate fee income in relation to the type of activities developed.

In line with our research question, we construct several measures detailed in the remainder of the section.

The first type of diversification analysed is the one related to the **diversification across different sources of income**. Traditionally in literature (Stiroh, 2004a,b; Lepetit et al., 2008) one way to capture the degree of diversification of bank activities is to consider the net interest income generated by traditional activities and non-interest income produced by non-traditional ones. To this end, several authors have used an adjusted Herfindahl–Hirshman index (HHI) to account for diversification between major activities (among the others Acharya et al., 2006; Stiroh and Rumble, 2006; Mercieca et al., 2007; Elsas et al., 2010). As the HHI rises, the bank becomes more concentrated and less diversified. To have a direct measure of diversification (DIV) the sum of squared revenue shares have been substracted from unity so that DIV increases in the degree of revenue diversification. Moreover, following DeYoung and Roland (2001) and Elsas et al. (2010) that argue that the use of gross revenues is preferable to net revenues because allocating expenses (especially interest expenses) to different lines of bank business is somewhat arbitrary and may lead to biased diversity measures, we use gross meausures as in Vallascas et al. (2012). Analytically:

$$DIV\_REV = 1 - \left(\left(\frac{INT}{TOP} \right)^2 + \left(\frac{NON}{TOP} \right)^2 \right)$$

INT is gross interest revenue[2], NON captures non-interest income, and TOP is the sum of the two (TOP = INT+NON). By definition DIV_REV can take on values between zero (the bank is fully specialized in one business area) and 0.5 (the bank generates a fully balanced revenue mix from the two business areas).

The second set of indicators relate to the **diversification between different sources of non interest income**. Following the seminal work of DeYoung and Roland (2001), Stiroh (2004a,b), Mercieca et al. (2007) and Lepetit et al. (2008) to allow for deeper insights, we have first of all to distinguish the principal components of non-interest income.

Two principal components of non interest income have been identified: commission and fee revenue (COM) on one hand and the net results of financial operations (OPFIN) on the other.

Analitically:

$$DIV\_NON = 1 - \left(\left(\frac{COM}{NON} \right)^2 + \left(\frac{OPFIN}{NON} \right)^2 \right)$$

COM denotes gross commission revenue, OPFIN is the absolute value of net results from financial operations including results from trading, hedging and other activities[3]. NON is equal to the sum of COM and the absolute values of OPFIN. By definition DIV_NON can take on values between zero (the bank is fully specialized in one business area) and 0.5 (the bank generates a fully balanced revenue mix from the two business areas).

The third step is to verify the degree of **diversification between the commission revenues**. As in Vallascas et al. (2012) we identify gross revenue components. In particular, we divide commission revenue along four principal dimensions; the first three identify a productive diversification profile, the last one a distributive diversification strategy followed by the banks in the sample. The four categories are the following:

- Traditional Banking Commission (TBC) that comprise commission income from guaranties given, collection and payment services, services related to factoring, tax collection services, current accounts management and other services;
- Market and Trading Commission (MKT) fee and commission revenue from credit derivatives, trading operations in financial instruments and foreign exchange, custody and administration of securities, underwriting operations, servicing related to securitization, placement of securities, Multilateral Trading Facilities management, financial structure consultancy service;
- Asset management commission (AM) from portfolio management services, depositary bank services, investment consultancy service;
- Fee based revenues from the distribution of third party products and services (DIS).

To construct measures of diversification within gross revenue we compute the measure DIV_COM

$$DIV\_COM = 1 - \left(\left(\frac{TBC}{COM} \right)^2 + \left(\frac{MKT}{COM} \right)^2 + \left(\frac{AM}{COM} \right)^2 + \left(\frac{DIS}{COM} \right)^2 \right)$$

[2] Gross interest revenues are computed as Interest and similar income - Interest and similar income on Financial assets held for trading - Interest and similar income on Hedging derivatives.

[3] Net results from financial operations include: a. net result from trading activities that principally comprise profits (losses) on trading and interest and similar income on financial assets held for trading; b. net result from hedging activities which includes fair value adjustments in hedge accounting and the net interest income from hedging derivatives; c. profits from sale of activities and repurchase of liabilities which is equal to the profits (losses) on disposal or purchase of loans, of financial assets available for sale and of financial liabilities and d. net results from financial assets and liabilities designated at fair value.

where COM = TBC + MKT + AM + DIS. By definition DIV_COM can take on values between zero (the bank is fully specialized in one business area) and 0.75 (the bank generates a fully balanced revenue mix from the four business areas).

3.1.2 Geographic diversification

To account for geographic diversification of a bank, we adopt a revisited index based on similar Herfindahl-Hirschman Index (HHI_GEO) proposed by Alessandrini et al. (2005 and 2009), Acharya et al. (2006), Coccorese (2008 and 2009) and Cotugno and Stefanelli (2012).

$$\mathrm{HHI}_{\mathrm{Geo\,i,t}} = \frac{\sum_{z_p=1}^{P_i}\left(\frac{\mathrm{Branches}_{t,iz_p}}{\mathrm{Branches}_{t,i}}\right)^2}{\mathrm{P}_{t,i}}$$

i=banks

j=provinces.

As underlined by Deng and Elyasiani (2008) to the extent that geographic diversification and distance go hand in hand, increased distance can confound the assessment of the geographic diversification effects. Therefore, it is important to account for branch distance when gauging the impact of geographic diversification on bank value and risk. To this end we introduce the following measure of distance previously introduced in the work of Bernini and Brighi (2012a,b). The variable (HQ-DISTANCE) measure the functional distance between bank branches and its headquarter (HQ) and is constructed for the i-bank at the municipal level as follows:

$$\mathrm{HQ-DISTANCE}_{\mathrm{it}} = \frac{\sum_{z_b=1}^{B_i}[\mathrm{Branches}_{\mathrm{itz_b}} \times \ln(1+\mathrm{D}_{\mathrm{itz_b}})]}{\sum_{z_b=1}^{B_i}\mathrm{Branches}_{\mathrm{tz_b}}}$$

where z_b=1,…,B_i are the municipalities where the i-bank has branches, with i:1,..,I. $D_{iz_b} = \sqrt{(X_{z_b} - X_{HQ_i})^2 + (Y_{z_b} - Y_{HQ_i})^2}$ is the Euclidean distance between the municipality zb where the branch is located and the municipality where the HQ of the i-bank is located (HQi). The HQ-DISTANCE is calculated in respect to municipalities where at least one branch is present.

For each bank holding company, the geographic diversification measures stem from an average computation. First of all, we have calculated the HHI_GEO and HQ-DISTANCE measures for all the individual banks belonging to the BHC. Then, we weight it for the contribution of the individual bank Total Asset to the formation of the group Total Asset.

3.2. Performance measures

Alternative proxies of bank performance are employed to investigate the relation between diversification and bank performance: the return on assets (ROA) defined as the ratio of net results from ordinary activities to total asset[4]. To adjust these measures for risk (volatility), following Stiroh (2004a,b) and

[4] As for mutual banks it is well known that for regulatory reasons they have different rules of provisions as capital reserve that implies that the degree of capitalization is structurally higher than that of other banks. To our purpose it is advisable to use ROA instead of ROE as a proxy of bank performance, also on a risk adjusted basis.

Chiorazzo et al. (2008) we compute the ratio between the annual return (ROA) and its standard deviation calculated over the entire sample period. Analytically:

$$\mathrm{SHROA}_{i,t} = \frac{\mathrm{ROA}_{i,t}}{\sigma \mathrm{ROA}_{i}}$$

where $\mathrm{SHROA}_{i,t}$ indicate risk-adjusted returns for the bank i in the year t.

Finally, as in Stiroh 2004a,b, we introduce a measure of insolvency risk computed in terms of the Z-score and calculated as follows:

$$\mathrm{Z-score}_{i,t} = \frac{\left(\mathrm{ROA}_{i,t} + \frac{\mathrm{E}_{i,t}}{\mathrm{TA}_{i,t}}\right)}{\sigma\left(\mathrm{ROA}_{i,t}\right)}$$

The Z-Score is a proxy for insolvency risk and is measured by how many standard deviations a firm is away from insolvency. A higher Z-Score indicates improved risk-adjusted performance; in other words, higher values of Z-score imply lower probabilities of failure.

3.3. Control variables

The banking sector all around the world has experienced major transformations in its environment, resulting in significant impacts on its performance. Thereby, both external and internal factors have been affecting the profitability of banks over time. The internal determinants include bank-specific variables. The external variables reflect environmental factors that are expected to affect the profitability of financial institutions. This section describes the control variables that we use in the econometric model distinguish between bank specific and external determinants.

Bank specific determinants

To capture the effects of bank size we use the continuous variable SIZE which is equal to the ln(assets) where assets is the year-end total asset. The continuous variable such as ln(assets) is normally expected to be a superior regressor than some arbitrary size dummies, except the case when there is a non-monotonic relationship between size and performance. To control for the potential nonlinear relationship between size and performance, as in Berger et al. (2010), we also include the squared term of ln(assets) – SIZE_SQ.

To measure the effect of efficiency on bank profitability, we introduce in the analysis the cost income ratio (COST_INCOME) computed as the ratio between personnel and other administrative expenses over intermediation margin.

As a proxy for bank capital we use the ratio equity over total asset – E_TA.

To proxy bank's credit quality we use the ratio of loan loss provisions over total loans (LLP).

To evaluate if loans are more profitable than other earning assets and in this way affects risk-adjusted returns we use the variable LOAN, which is the ratio between total loans and bank total asset (DeYoung and Rice, 2004; Stiroh, 2004a)

External determinants

In addition to the bank-specific variables described above, our analysis includes a set of macroeconomic characteristics.

The GDP_INDEX measures the GDP growth rate calculated in respect to the i-bank, weighting the indicator at the province level with the ratio of branches in the province in respect to the total amount of branches

of the i-bank. The procedure allows to take into account of the different impact that the macro-indicator has on the bank, in respect to the presence of that bank in that province.

$$\text{GDP\_INDEX}_{\text{i}} = \frac{\sum_{z_p} \frac{\text{Branches}_{iz_p}}{\text{Branches}_{\text{i}}} * (\text{GDP\_RATE})_i}{P_i}$$

where i refers to the bank and z_p to the province where the bank operates. Also in case of GDP_INDEX, the variable for bank holding companies has been computed in terms of weighted average of the individual bank score weighted for the contribution of the individual bank total asset to the formation of the group total asset.

Structural break dummy (BREAK). To account for the consequences from financial crisis we insert a dummy variable equals to zero for the years 2006, 2007 and 2008 and equals to one otherwise (2009, 2010 and 2011).

3.4. Empirical methodology

We use the econometric model shown in Eq. (a) to examine the link between diversification and the level and volatility of the banks' profitability. This regression uses Y = [ROA, SHROA, Z-Score] as dependent variables:

$$y_{i,t} = \alpha_{i,t} + \beta_1 \text{DIV\_REV}_{i,t} + \beta_2 \text{PRP\_NON}_{i,t} + \beta_3 \text{DIV\_NON}_{i,t} + \beta_4 \text{PRP\_COM}_{i,t} + \beta_5 \text{DIV\_COM}_{i,t} + \beta_6 \text{PRP\_MKT}_{i,t} + \beta_7 \text{PRP\_AM}_{i,t} + \beta_8 \text{PRP\_DIS}_{i,t} + \beta_9 \text{HHI\_GEO}_{i,t} + \beta_{10} \text{HQ - DISTANCE}_{i,t} + \sum_{s=11}^{17} \beta_s \lambda_{i,t} + \varepsilon_{i,t} \quad \text{(a)}$$

where *i* identifies the individual bank-observation belonging to the sample (*i = 1, 2, 3,..., 3002*); *t* expresses the time variable (*t = 2006,..., 2011*); βs are the parameters to be estimated, λ is a matrix of control variables. Both the constant and the error terms are also indicated in the model.

DIV_REV is revenue diversification, PRP_NON is the proportion of non-interest income in the sum of non-interest income and gross interest revenue. To differentiate within the non-interest income stream, DIV_NON is the non-interest diversification measure, PRP_COM is the proportion of fee and commissions in non interest income.

To differentiate within the gross commission revenue, DIV_COM is the gross commision diversification measure, PRP_MKT is the proportion of market and trading commission, PRP_AM is the proportion of asset management commission and PRP_DIS is the proportion of thrid party products and services distributive commission.

The other variables control for factors potentially affecting the level and volatility of profits.

As underlined in Chiorazzo et al. (2008) it is important to note that the regression coefficients on the individual component shares (PRP_) in the revenue shares measure the effect of a shift from the omitted category of the component share into an alternative since one component share has to be excluded to avoid perfect collinearity. For instance, in eq. (a), positive values of β_1 indicate that income diversification improved performance. β_2 denotes the effect on performance due to variations in the share of non interest income on the sum of non-interest income and gross interest revenue holding the effects of diversification (DIV) constant. Positive values of β_2 show that increases in noninterest income share are associated with higher returns; since the shares sum to one, the coefficient on the included shares (non interest income) shows the impact of a 0.01 change from the omitted share (gross interest revenue) to the included ones.

The coefficients obtained with Eq. (a) are not to be interpreted in a causal sense as we estimate a reduced-form model. Thus, our coefficients show conditional correlations between the various measures of bank performance and the pursued diversification strategies.

A list of the variable used is presented in Table 1.

[Table 1 around here]

3.5. Data

Data are provided by the consolidated and unconsolidated balance sheets of BHC and individual Italian banks submitted to the Bank of Italy and collected by the Italian Banking Association over the period 2006–2011. The starting date is 2006 since Italian banks report unconsolidated accounting data based on IFRS from that date. We exclude banks with missing data on basic accounting variables, including assets, loans, deposits, equity, interest income, non-interest income, commission and trading revenues.

As in Chiorazzo et al. (2008) and Acharya et al. (2006) given the shortage of data we decide not to truncate the data.

The final dataset includes 3,002 bank-year observations. Differently from DeYoung and Roland (2001), Chiorazzo et al. (2008) and Vallascas et al. (2012), we analyze the relationship between diversification strategies and bank performance using consolidated accounting data when available and unconsolidated otherwise.

The coverage of our sample relative to the population of the whole Italian banking system is nearly 85 per cent, and it is quite stable over the analysed period.

In the analysis data on macro environmental variables, over the period 2006-2011, affecting banks performance are also used. Information on GDP at the provincial level are provided by ISTAT and by Istituto Tagliacarne. The number of branches (referred to each bank at the municipal level) are taken from the Bank of Italy.

4. Empirical Results

4.1. Descriptive statistics

Descriptive statistics of our sample are reported in Table 2. The average (mean) bank generated 79.4% of its revenues from lending (traditional) activities. Turning to the non interest income revenues the majority is represented by commission and fee income (80.4%), while the ratio of results from financial operation (OPFIN) contributes for nearly 20% to the formation of the non interest income. Turning to the type of fee and commission, the vast majority are credit related fees, the so-called traditional banking fee and commission, that contributes for more than two third to the formation of the aggregate.

[Table 2 around here]

As a preliminary investigation, this subsection examines bank characteristics and bank risk by dividing the whole sample into different groups. The first one rests on size distribution, i.e. large- and small-sized banks based on asset size. We distinguish between large and small banks following a classification frequently used in the literature[5]. Large banks are banks with total assets greater than 1 billion euro on average over the period 2006-2011 while small banks the ones with total average assets lower than 1 bln.

To evaluate the relevance of organisational structure we divide the sample between BHC and independent banks.

[5] Lepetit et al. (2008) and Carter and McNulty (2005).

Finally, to catch the effect of alternative business model we split the sample between mutual banks and others. Mutual banks are a homogenous group of banks offering an alternative business model to traditional commercial banks and are generally considered as relatively less profitable nonetheless characterised by low risk preferences (Iannotta et al., 2007).

Table 3 shows various bank characteristics and risk measures for each of the groups identified: size classes [Large *vs* Small banks], institutional category [Mutual *vs* Non mutual banks] and organisational structure [BHC *vs* Indipendent banks].

[Table 3 around here]

The final dataset that includes, as previously stated, 3,002 bank-year observations corresponds, in the final year to 410 small banks and 91 large; 59 BHC and 442 individual banks; 397 Mutual banks and 104 not mutual.

Large banks exhibit a high profitability with a high return on assets (ROA) also on a risk-adjusted basis (SHROA) compared to small banks. Moreover, small banks show a high ratio of equity to total assets (EQUITY) when compared to large ones. Third, most relevant to this study, non-interest income to operating income (PRP_NON) is higher for large banks than small banks. This implies that nonbanking activities, including fee, commission and trading income, are relatively important for large banks compared to small banks; moreover for small banks the tendency towards the prevalence of traditional banking commission is verified. This implies that large banks tend to intensify product diversification. De Young and Roland (2001) posit that a possible reason may be that non-interest income activity requires significant fixed costs. Fourth, regarding the risk measures, large banks have higher insolvency risk .

Concerning the institutional category, mutual banks are on average more profitable and less risky than non mutual banks and more involved into traditional activities, as verified by the higher ratio of interest income and traditional banking fee and commisisons. This result is also in line with highest ratio of loans to assets (LOAN).

BHC are on average less profitable and more risky than indipendent banks. This category is the one most involved into non-traditional activities, as confirmed by the higher ratio of non-interest income on total operating income. Moreover, these banks are associated with low ratios of loans to assets and are less dependent on traditional financial intermediation activities with less capital leverage (E_TA).

Turning to the relationship between bank risks and non-interest income activities, the banks with a higher share of non-interest activities display higher insolvency risk. In sum, these findings seem to be consistent with previous results from univariate mean tests by Lepetit et al. (2008) in that non-interest income is positively associated with bank risk and insolvency risk for European banks.

4.2. Multivariate Analysis

As for product diversification between interest and not-interest income (DIV_REV) the main results suggest that the diversification implies a negative effect on bank profitability measured both in terms of Return on Asset (ROA) and Risk Adjusted Return on Asset (SHROA). This result is in line with Goddard et al. (2008) investigating the impact of revenue diversification on financial performance for the period 1993–2004 finding a negative effect both on ROA and SHROA. This result would suggest that for a bank at least in terms of profitability is more convenient focusing on interest or non-interest business. As for the risk results suggest that greater diversification implies lower risk for banks. Focusing on interest or non-interest activities implies a lower risk control.

To better investigate the effects of income diversification on bank risk and profitability it could be useful to control for the effect of the share of non-interest component over the total revenue (PRP_NON). As the non-interest component increases the profitability increases. This is an important result since it suggests that for bank-profitability it is important to invest more in the non-interest component. For the full sample

this result is consistent with Stiroh and Rumble (2006) investigating the effect of income diversification on a sample of US financial holding companies over the period 1997-2002.

As for the risk-adjusted profitability results drastically change with respect to the crisis break. Before the crisis the non-interest income has a negative effect in terms of SHROA while after the crisis the effect is simply reversed. In the after crisis period the bank profitability is, in fact, strictly related to the non interest component being the interest margins substantially nil and the volumes drastically reduced. Considering the model with the break dummy we find that to invest more in the non-interest component implies less risk with greater risk-adjusted profitability. In other terms the traditional business strictly linked to the lending activity become riskier given the current economic crisis. The crisis sounds to hit bank performance via risk being the effects in terms of profitability (ROA) unchanged before and after the crisis. As for the pre-crisis period our results are in line with Stiroh (2004b), Stiroh and Rumble (2006) and Mercieca (2008).

The third step is to investigate if a further diversification among banking activities generating commissions or other financial fees among the non-interest component could be profitable for the bank (DIV_NON). In this respect the results for the full sample suggest that to better diversify among the non-interest operations does not produce any statistical significative effect both for profitability and risk except in the model 2 where an increasing diversification inside the non-interest income fees appear to negatively affect the risk-adjusted profitability being coherent with Stiroh (2004a). As DIV_NON measures also the net results from financial operations (OPFIN) this result also suggests that the net results of trading and hedging activities do not play any statistical significative role in determining bank risk and profitability.

As for the non-interest activities, the commission variable (PRP_COM) is negative and highly significant; shifting into this non-interest income activity lowers bank performance (or in other words engaging in risky trading activities raises bank performance) also on a risk adjusted basis coherenttly with Lepetit et al. (2008).

Further disentangle the commission component between the commission revenues i.e., traditional banking commissions (TBC), market and trading commission (MKT), asset management (AM) and distribution of third party products and services (DIS) is investigated. Evidence suggests that higher concentration among commission components negatively impact on bank risk and profitability. As expected greater diversification among different revenue components (DIV_COM) decreases bank risk and increases the risk-adjusted profitability. As for the single commision shares – PRP_MKT; PRP_AM and PRP_DIS – evidence suggests only the distribution channel (PRP_DIS) positively affect the bank return-on-asset. As for SHROA also market and asset management component play a positive role influencing the bank profitability dimension. In terms of risk the asset management activity significatively increase bank risk. As expected to invest in activities whose income is strictly linked to market volatility implies an increasing risk.

Having controlled for the revenue diversification dimension the aim of the paper is now to investigate how and in which measure structural variables like geographical diversification, distance and size could impact on bank risk and profitability.

The distance and the geographical diversification do not appear to play any relevant role in affecting both risk and profitability except for risk-adjusted profitability analysis (Table 5 - Model (5)). A greater geographical concentration implies a minor risk-adjusted profitability in the post-crisis period. This result is coherent with the literature on bank risk diversfication suggesting that banks geographically diversified could better absorb local systemic risk (Bhattacharya and Gale, 1987). As for distance results suggest that in the post-crisis period to operate distant from the head-quarter implies greater difficulties in terms of screening and monitoring and coherently with the literature on geographical distance (Alessandrini et al., 2009) the risk-adjusted profitability decreases. In this respect our results suggest that in the post-crisis period banks more geographically diversified have been less penalized in terms of risk-adjusted profit however to be distant from the head-quarter could exacerbate the screening evaluations strategy with negative effects on bank profitability.

Finally as for size results are in line with the literature (DeYoung et al., 2004) suggesting bank size has generally a positive impact on bank profitability. A direct relation between volumes and profitability hold for all the models and over the 2006-2011 investigated period. As for risk results are quite interesting

suggesting that as soon as we take into account the crisis break size becomes statistically significative, positively affecting the z-score index. In the post crisis smaller banks appear to be riskier being more exposed to local environmental shocks, strictly linked to traditional interest activities and less geographically diversified.

[Table 4, 5, 6 around here]

As size appears to play an important role both in the profitability determination and in the post-crisis risk analysis, it could be of interest to investigate how our main results, referred to the revenue and geographical diversification variables, we further investigated its effect splitting our sample among two sub-samples made by mutual and not-mutual banks. Mutual banks are typically small banks with total assets smaller than one billion; moreover for statutory reasons they are mainly dedicated to satisfy their member needs both on the lending and funding side at the local level. They can increase their territory of competence following the continuity principle[6]. In this respect to analyse the mutual vs. not-mutual samples is an interesting issue. Starting from the analysis of the revenue diversification strategy, i.e.: DIV_REV, we first find that as the diversification strategy between interest and non-interest strategy is implemented results appear to be different both with respect to the full sample and the non-mutual sample being or not statistical significative or differently with a reversed sign. In particular, this is evident in the post-crisis model – see model 2 in Table 7 – where a greater diversification implies a positive impact on the risk-adjusted profitability. For the mutual banks tipically concentrated in the lending activity to diversify its activity – particularly after the crisis – could be beneficial in terms of increased profitability. The evidence is in line with previous literature. Stiroh (2004a) in fact finds a similar result with reference to small US community banks. The result is also in line with European small banks evidence as shown in Mercieca et al. (2008). In this case our results suggest that for small banks like the mutual ones highly concentrated in traditional business to diversify between interest and non-interest income could be beneficial in terms of profitability even if it could imply more risk[7].

Once diversified its activity evidence suggests that as a mutual bank increases the non interest income activity, i.e.: PRP_NON the risk adjusted profitability decreases at least in the post-crisis period. Also in this case the result is reversed with respect to the full sample analysis. To increase the non-interest income does not appear to be profitable for small banks and this result sounds to be in line with Mercieca et al. (2008). Also in the case of risk-adjusted profitability and Z-score the results appear to be reversed in respect to the full sample suggesting that this category of banks are less risk exposed if continues to invest in the interest income segment instead of the non-interest one. Results are partially in line with Stiroh (2004a).

As for the diversification between non-interest income activities, DIV_NON evidence suggests mutual banks do not have benefits in terms of greater risk-adjusted profitability. The reason could be connected to the difficulties for this category of banks to efficient manage alternative strategies of business not directly linked to their business model. This result is further confirmed when we investigate the effect of an increased share of commision, PRP_COM that produce a negative impact. However a greater diversification among different revenue business areas, DIV_COM could be positive even if the not significative effects of market, asset management and distributions shares suggest that the positive effect in terms of profitability for this category of banks comes mainly from the traditional business commission (TBC). As underlied by Chiorazzo et al. (2008) these results seem to suggest that the diversification gain seem to be associated with fee and commision income in general and not with a specific business line.

[6] Mutual banks have been widely considered in empirical studies (Lang and Welzel, 1996; Goddard et al., 2008; Battaglia et al., 2010; Ayadi et al., 2010; Kontolaimou and Tsekouras, 2010) because it is a homogeneous group offering an alternative business model to traditional commercial banks.

[7] The effect on z-score is in fact negative. Results are available upon request to the authors.

Finally the analysis of structural factors like size, geographical diversification and distance suggest at least two interesting features: i) a larger size for mutual banks appear to be beneficial in terms of risk-adjusted profitability as the crisis break is considered. Larger size mutual banks could have the opportunity of greater capitalization to better manage the crisis. ii) as for the geographical diversification effect this category of banks does not appear to be significatively sensible because also in the case of geographical diversification their area of competence appear to be relatively local and they cannot have the opportunity to eliminate the local systemic risk; differently from other not-mutual banks for which geographical diversification positively affect the risk-adjusted profitability.

[Table 7 around here]

4.3. Robustness checks

In this section we investigate the likely impact of: - different measures of diversification; - different measures of bank performance; - different sample composition. In our opinion these are the principal reasons for the discrepancy among the results of the different studies reviewed and our contribution.

For a further investigation of the relationship between diversification and performance, first of all we introduce alternative measures of bank diversification. In our baseline specification we first introduce, as proxy of product diversification, the adjusted version of HHI to account for diversification between major classes of activities. In particular, we use DIV_REV as a proxy of diversification between gross interest revenues and non interest income; DIV_NON as a measure of diversification between different sources of non interest income i.e. commission and fee revenue on one hand and results from financial operations on the other; DIV_COM to assess the degree of diversification between the commission revenue Table 8 (columns 1 & 2). As a further check, in order to directly assess the risk/return implications of the individual components, we re-run the model including only the shares of the different revenue components (Table 8 columns 3 & 4). As can be seen in Table 8 our major empirical findings remain qualitatively unchanged. As for product diversification between interest and not-interest income the main results suggest that the diversification implies a negative effect on risk adjusted Return on Asset (SHROA). In terms of diversification between fee and commission income (DIV_COM), the result would suggest that for a bank increasing diversification inside the commission category appear to positively affect the risk-adjusted profitability. In evaluating the role played by the different income sources (Table 8 columns 3 & 4), the share of non-interest component over the total revenue (PRP_NON) has a negative effect in terms of SHROA but this results appears to be reversed by the financial crisis, as in the case of our baseline specification. The positive signs of the shares of non traditional banking fee and commision (Market, Asset Mangement and Distributive) implies that a shift towards less traditional fee and commission fosters risk adjusted performance. Also in this case, the financial crisis highlight the role of size and the role of geographic diversification. From the sign and the significance of the term, it seems that larger institutions have been better able to react to the financial crisis; in the after-crisis period as size increases risk decreases with a positive impact on the risk-adjusted profitability. In terms of geographic diversification, it becomes particularly important after the financial crisis when banks geographically diversified show a larger risk-adjusted profitability.

[Table 8 around here]

As a further control, another measure of bank performance have been employed: the risk adjusted return on equity (SHROE) computed as the ratio between annual return on equity (ROE), which is the ratio of net profits to equity, and its standard deviation calculated over the entire sample period. Table 8 (columns 5 & 6), report the results. Also in this case, our main empirical results remain unaffected by the change in the

measure of bank performance. The main results suggest that the diversification between interest and non interest income implies a negative effect on performance also on a risk adjusted basis.

As a further investigation, we rest on the sample composition since more than 85% of the sample banks are independent or in other words do not belong to a BHC organisation. To examine whether this sample concentration affect our results, we repeat our estimations for the sample of Italian BHCs, comprising 61 banks. Table 8 (columns 7 & 8) reports the results for the sub-sample of BHC for the risk adjusted performance measure (SHROA). As before, the measure of income diversification based on fee and commission components (DIV_COM) is positive and statistically significant. Thus, commission and fee income diversification obtained through a change in the bank product mix has a positive influence on risk adjusted performance. In the case of BHC, the diversification gains seem to be associated to "non traditional business line". Shifting form traditional banking commissions towards, market, asset management and distributive commission seem to improve the risk adjusted performance for BHC.

5. Conclusions

As for product diversification between interest and not-interest income the main results suggest that the diversification implies a negative effect on bank profitability measured also on a risk adjusted basis. This result is shown to be robust for alternative measure of diversification, for alternative performance measure and also for alternative sub-sample used.

As for revenue diversification, the result sounds to be reversed when the bank implements a more accurate diversification strategy among other financial services. Evidence suggests that higher concentration among commission components negatively impact on bank risk and profitability; as expected, greater diversification among different fee and commission components decreases bank risk and increases risk-adjusted profitability. As for the single commision shares evidence suggests only the distribution channel positively affect the bank return-on-asset. As for SHROA also market and asset management component play a positive role influencing the bank profitability dimension.

The distance and the geographical diversification do not appear to play any relevant role in affecting both risk and profitability except for risk-adjusted profitability analysis. In particular, we find that in the pre-crisis period as distance between headquarter and local branches increased then the risk-adjusted profitability increased but this effect is completely reversed if the bank size increases as well. This result suggest that as banks become larger and distant from its clientele the screening and monitoring of local clientele become more difficult increasing the risk of a wrong screening with negative effect in terms of risk-adjusted profitability.

The main results suggest that revenue and geographical diversification play a role in determining bank performance. The relative effects appear, however, to be different between mutual and not-mutual banks suggesting different business strategies for different banks. Starting from the analysis of the revenue diversification strategy we first find that in particular in the post-crisis model for small banks like the mutual ones highly concentrated in traditional business to diversify between interest and non-interest income could be beneficial in terms of profitability even if it could imply more risk. At the same time, increase the non-interest income does not appear to be profitable for small banks suggesting that this category of banks is less risk exposed if continues to invest in the interest income segment instead of the non-interest one. However a greater diversification among different commission business areas could be positive even if the not significative effects of the different component share seem to suggest that the diversification gain seem to be associated with fee and commision income in general and not with a specific business line. Finally, differently from other not-mutual banks for which geographical diversification positively affect the risk-adjusted profitability, geographical diversification do not affect mutual banks because also in the case of geographical diversification their area of competence appear to be relatively local.

Our analysis also provides an examination of the value of diversification during the recent financial crisis. The impact of the crisis is somewhat clear-cut. In the after crisis period the bank profitability is, in fact,

strictly related to the non-interest component being the interest margins substantially nil and the volumes drastically reduced. In the post-crisis period to invest more in the non-interest component implies greater risk-adjusted profitability. Moreover, our results suggest that in the post-crisis period banks more geographically diversified have been less penalized in terms of risk-adjusted profit however to be distant from the head-quarter could exacerbate the screening evaluations strategy with negative effects on bank profitability. As for risk results, size becomes statistically significative negatively affecting the z-score index in the post crisis era when smaller banks appear to be riskier being more exposed to local environmental shocks, strictly linked to traditional interest activities and less geographical diversified. For mutual banks a larger size appear to be beneficial in terms of risk-adjusted profitability as the crisis break is considered.

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Table 1 Variables names and definitions

Name	Definition
ROA	$\frac{\text{Net result from ordinary activity}}{\text{Total asset}}$
SHROA	$\frac{ROA_{i,t}}{\sigma ROA_i}$
Z_SCORE	$\frac{\left(ROA_{i,t} + \frac{E_{i,t}}{TA_{i,t}}\right)}{\sigma\left(ROA_{i,t}\right)}$
DIV_REV	$1-\left(\left(\frac{INT}{TOP}\right)^2+\left(\frac{NON}{TOP}\right)^2\right)$
PRP_NON	$\frac{NON}{TOP}$
DIV_NON	$1-\left(\left(\frac{COM}{NON}\right)^2+\left(\frac{OPFIN}{NON}\right)^2\right)$
PRP_COM	$\frac{COM}{NON}$
DIV_COM	$1-\left(\left(\frac{TBC}{COM}\right)^2+\left(\frac{MKT}{COM}\right)^2+\left(\frac{AM}{COM}\right)^2+\left(\frac{DIS}{COM}\right)^2\right)$
PRP_TBC	$\frac{TBC}{COM}$
PRP_MKT	$\frac{MKT}{COM}$
PRP_AM	$\frac{AM}{COM}$
PRP_DIS	$\frac{DIS}{COM}$
HHI_GEO	$\frac{\sum_{z_p=1}^{P_i}\left(\frac{Branches_{iz_p}}{Branches_i}\right)^2}{P_i}$
HQ-DISTANCE	$\frac{\sum_{z_b=1}^{B_i}[Branches_{itz_b}\times\ln(1+D_{itz_b})]}{\sum_{z_b=1}^{B_i}Branches_{tz_b}}$
SIZE	ln(TA)
SIZE_SQ	ln(TA)^2
COST_INCOME	Personnel and other administrative expenses over intermediation margin
E_TA	Equity over Total Asset
LLP	$\frac{\text{Loan Loss Provisions}_t}{\text{Net Loans}_t}$
LOAN	$\frac{\text{Loans}_t}{\text{Total Asset}_t}$
GDP_INDEX	$\frac{\sum_{z_p}\frac{Branches_{iz_p}}{Branches_i}*(GDP\_RATE)_i}{P_i}$
BREAK	Dummy variable equals to zero for the years 2006, 2007, 2008 and equals to one otherwise (2009, 2010 and 2011)

Table 2 Summary statistics for all banks, on average over the period 2006-2011

	obs	Mean	min	p25	p50	p75	max	sd
Performance Measure								
ROA	2994	0.007	-0.09	0.004	0.007	0.011	0.214	0.010
SHROA	2992	1.832	-4.13	0.782	1.707	2.838	9.609	1.584
Z-SCORE	2956	29.749	0.041	18.298	27.306	37.236	99.379	16.996
Revenue Diversification								
DIV_REV	3001	0.296	0.000	0.236	0.292	0.355	0.500	0.085
DIV_NON	2999	0.261	0.000	0.131	0.260	0.396	0.500	0.151
DIV_COM	2999	0.328	0.000	0.208	0.337	0.451	0.718	0.162
Shares of different sources of revenues								
PRP_INT	3002	0.794	0.000	0.763	0.821	0.862	1.000	0.125
PRP_NON	3002	0.206	0.000	0.138	0.179	0.237	1.000	0.125
PRP_COM	2999	0.804	0.018	0.723	0.845	0.928	1.000	0.165
PRP_OPFIN	2999	0.196	0.000	0.072	0.155	0.277	0.982	0.165
PRP_TBC	2999	0.766	0.000	0.699	0.796	0.884	1.000	0.178
PRP_MKT	2999	0.131	0.000	0.063	0.108	0.169	1.000	0.110
PRP_AM	2999	0.025	0.000	0.000	0.000	0.000	0.937	0.095
PRP_DIS	2999	0.078	0.000	0.019	0.053	0.109	0.965	0.093
Geographic Diversification								
HHI_GEO	2975	0.630	0.000	0.253	1.000	1.000	1.000	0.402
HQ-DISTANCE	2975	1.765	0.000	1.215	1.806	2.364	5.654	1.008
Control variables								
SIZE	3002	12.849	8.499	11.784	12.672	13.491	20.768	1.597
SIZE_SQ	3002	167.339	72.230	138.863	160.587	181.999	431.304	44.603
COST_INCOME	2880	0.702	0.145	0.630	0.703	0.774	1.000	0.115
E_TA	3001	0.123	0.015	0.090	0.113	0.144	0.984	0.059
LLP	2992	-0.006	-0.21	-0.007	-0.004	-0.002	0.016	0.008
LOAN	3001	0.665	0.000	0.592	0.704	0.774	0.990	0.159
GDP_INDEX	2492	0.016	-0.93	-0.009	0.012	0.024	9.172	0.299

Table 3 Descriptive statistics of bank characteristics, on average over the period 2006-2011

	TA [000]	ROA	SHROA	Z-SCORE	PRP_NON	PRP_COM	PRP_MKT	PRP_AM	PRP_DIS	C-I	E_TA	LOANS
Small banks [416]												
Mean	313,410	0.0070	1.802	30.663	0.190	0.809	0.123	0.013	0.072	0.716	0.129	0.661
Std	278,145	0.010	1.575	17.454	0.109	0.161	0.105	0.079	0.081	0.107	0.059	0.150
Large banks [94]												
Mean	29,586,004	0.0074	1.969	25.622	0.274	0.783	0.164	0.080	0.104	0.638	0.096	0.683
Std	117,452,273	0.008	1.616	14.039	0.162	0.177	0.123	0.132	0.128	0.126	0.049	0.194
BHC [61]												
Mean	45,183,305	0.0071	1.556	20.345	0.361	0.784	0.186	0.140	0.127	0.650	0.095	0.642
Std	144,870,842	0.018	1.527	12.711	0.223	0.189	0.170	0.195	0.179	0.131	0.072	0.225
Independent [449]												
Mean	451,492	0.0070	1.868	30.975	0.185	0.807	0.123	0.010	0.071	0.709	0.126	0.668
Std	593,111	0.008	1.588	17.102	0.086	0.161	0.097	0.056	0.072	0.111	0.056	0.148
Mutual [403]												
Mean	353,330	0.0072	1.880	31.107	0.178	0.811	0.116	0.004	0.072	0.714	0.124	0.676
Std	330,670	0.008	1.513	17.075	0.062	0.153	0.083	0.021	0.073	0.103	0.045	0.129
Not Mutual [107]												
Mean	26,416,756	0.0066	1.643	24.339	0.313	0.776	0.188	0.107	0.100	0.652	0.117	0.621
Std	111,624,129	0.016	1.825	15.554	0.216	0.201	0.168	0.185	0.145	0.144	0.095	0.240

Table 4 Revenue Diversification, Geographic diversification and performance
All banks in the sample. Dependent variable: ROA

	(1)	(2)	(3)	(4)	(5)
VARIABLES	ROA	ROA	ROA	ROA	ROA
Constant	-0.062	-0.055	-0.066	-0.078	-0.069
	(0.047)	(0.047)	(0.048)	(0.049)	(0.050)
DIV_REV	-0.041***	-0.042***	-0.045***	-0.046***	-0.047***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
PRP_NON	0.044***	0.042***	0.044***	0.045***	0.043***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.005)
DIV_NON		-0.002	-0.002	-0.002	-0.002
		(0.002)	(0.002)	(0.002)	(0.002)
PRP_COM		-0.004*	-0.005**	-0.004**	-0.005**
		(0.002)	(0.002)	(0.002)	(0.002)
DIV_COM			-0.006**	-0.006**	-0.006**
			(0.003)	(0.003)	(0.003)
PRP_MKT			0.003	0.003	0.003
			(0.003)	(0.003)	(0.003)
PRP_AM			-0.004	-0.005	-0.004
			(0.005)	(0.005)	(0.005)
PRP_DIS			0.016***	0.015***	0.016***
			(0.005)	(0.005)	(0.005)
HHI_GEO				-0.002	-0.002
				(0.001)	(0.001)
HQ-DISTANCE				-0.001	-0.001
				(0.001)	(0.001)
SIZE	0.014**	0.013*	0.015**	0.017**	0.016**
	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
SIZE_SQ	-0.000*	-0.000	-0.000*	-0.001**	-0.001**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
COST_INCOME	-0.048***	-0.047***	-0.047***	-0.047***	-0.047***
	(0.002)	(0.002)	(0.002)	(0.002)	(0.002)
CAPITAL_RATIO	0.112***	0.111***	0.114***	0.114***	0.114***
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
LLP	0.556***	0.552***	0.551***	0.551***	0.554***
	(0.025)	(0.025)	(0.025)	(0.025)	(0.025)
LOAN	-0.009***	-0.009***	-0.008***	-0.008***	-0.008***
	(0.003)	(0.003)	(0.003)	(0.003)	(0.003)
GDP_INDEX	-0.000	-0.000	-0.000	-0.000	0.000
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
BREAK					0.000
					(0.000)
Observations	2,372	2,372	2,372	2,372	2,372
R-squared	0.606	0.607	0.614	0.614	0.615
Adj. R-squared	0.499	0.500	0.507	0.507	0.507

***, **, * indicates statistical significance at the 1%, 5% and 10% respectively

This table reports the results of a panel data regression fixed effect. Regression coefficients are reported with standard error in parenthesis. The dependent variable is the measure of performance (ROA). DIV_REV measures revenue diversification between interest and non interest income. DIV_NON measures revenue diversification between fee and commission income on one hand and net results form financial operation on the other. DIV_COM measures revenue diversification within fee an commission income generating activities. PRP_NON and PRP_COM measure the share of non interest income in total operating revenue and the share of fee and commission in total non interest income. PRP_MKT, PRP_AM and PRP_DIS measure respectively, the share of market and trading commission, asset management commission and fee from the distribution of third party product in total fee and commission revenue. HHI_GEO measures geographic diversification. HQ-Distance measures the functional distance between bank branches and its headquarter. The following bank specific control are included in the regression: SIZE is the natural logarithm of Total Asset in thousands of euro, SIZE_SQ is the squared term of SIZE, COST_INCOME is the ratio between personnel and other administrative expenses over intermediation margin, CAPITAL_RATIO is the ratio of equity to total asset, LLP is the ratio of loan loss provisions to net loans, LOAN is the ratio of total loans to total asset. Two macroeconomic controls are included as follows; GDP_INDEX is the annual growth rate of GDP weighted for branches and provinces and BREAK a dummy variable equals to zero for the years 2006, 2007 and 2008 and equals to one otherwise (2009, 2010 and 2011).

Table 5 Revenue Diversification, Geographic diversification and performance
All banks in the sample. Dependent variable: SHROA

VARIABLES	(1) SHROA	(2) SHROA	(3) SHROA	(4) SHROA	(5) SHROA
Constant	15.580***	17.180***	15.498***	15.839***	5.405
	(4.525)	(4.513)	(4.412)	(4.512)	(4.514)
DIV_REV	-1.133***	-1.329***	-0.771**	-0.753**	-0.074
	(0.343)	(0.343)	(0.343)	(0.350)	(0.347)
PRP_NON	-0.945**	-1.339***	-0.927**	-0.947**	0.959**
	(0.380)	(0.385)	(0.384)	(0.391)	(0.426)
DIV_NON		-0.399**	-0.262	-0.253	-0.119
		(0.189)	(0.186)	(0.187)	(0.182)
PRP_COM		-0.823***	-0.456**	-0.442**	0.001
		(0.195)	(0.195)	(0.196)	(0.195)
DIV_COM			1.670***	1.663***	1.604***
			(0.284)	(0.284)	(0.277)
PRP_MKT			0.876***	0.875***	0.715**
			(0.285)	(0.285)	(0.278)
PRP_AM			1.160**	1.136**	0.816*
			(0.486)	(0.486)	(0.475)
PRP_DIS			0.206	0.188	-0.112
			(0.426)	(0.426)	(0.416)
HHI_GEO				-0.186	-0.244*
				(0.139)	(0.135)
HQ-DISTANCE				-0.004	-0.015*
				(0.058)	(0.057)
SIZE	0.673	0.479	0.280	0.269	1.287*
	(0.679)	(0.676)	(0.660)	(0.674)	(0.665)
SIZE_SQ	-0.099***	-0.089***	-0.072***	-0.072***	-0.095***
	(0.026)	(0.026)	(0.025)	(0.026)	(0.025)
COST_INCOME	-7.028***	-6.894***	-6.862***	-6.874***	-6.338***
	(0.173)	(0.174)	(0.169)	(0.169)	(0.173)
CAPITAL_RATIO	1.907**	1.771*	1.608*	1.556*	1.615*
	(0.943)	(0.939)	(0.917)	(0.918)	(0.894)
LLP	60.124***	59.321***	58.471***	58.682***	54.931***
	(2.380)	(2.371)	(2.291)	(2.297)	(2.268)
LOAN	-0.092	0.074	0.113	0.087	0.262
	(0.269)	(0.269)	(0.261)	(0.262)	(0.256)
GDP_INDEX	-0.097***	-0.099***	-0.092***	-0.083**	-0.100***
	(0.036)	(0.035)	(0.034)	(0.035)	(0.034)
BREAK					-0.427***
					(0.042)
Observations	2,366	2,366	2,366	2,366	2,366
R-squared	0.767	0.770	0.787	0.787	0.798
Adj. R-squared	0.703	0.707	0.727	0.727	0.741

***, **, * indicates statistical significance at the 1%, 5% and 10% respectively

This table reports the results of a panel data regression fixed effect. Regression coefficients are reported with standard error in parenthesis. The dependent variable is the measure of risk adjusted performance (SHROA). DIV_REV measures revenue diversification between interest and non interest income. DIV_NON measures revenue diversification between fee and commission income on one hand and net results form financial operation on the other. DIV_COM measures revenue diversification within fee an commission income generating activities. PRP_NON and PRP_COM measure the share of non interest income in total operating revenue and the share of fee and commission in total non interest income. PRP_MKT, PRP_AM and PRP_DIS measure respectively, the share of market and trading commission, asset management commission and fee from the distribution of third party product in total fee and commission revenue. HHI_GEO measures geographic diversification. HQ-Distance measures the functional distance between bank branches and its headquarter. The following bank specific control are included in the regression: SIZE is the natural logarithm of Total Asset in thousands of euro, SIZE_SQ is the squared term of SIZE, COST_INCOME is the ratio between personnel and other administrative expenses over intermediation margin, CAPITAL_RATIO is the ratio of equity to total asset, LLP is the ratio of loan loss provisions to net loans, LOAN is the ratio of total loans to total asset. Two macroeconomic controls are included as follows; GDP_INDEX is the annual growth rate of GDP weighted for branches and provinces and BREAK a dummy variable equals to zero for the years 2006, 2007 and 2008 and equals to one otherwise (2009, 2010 and 2011).

Table 6 Revenue Diversification, Geographic diversification and performance
All banks in the sample. Dependent variable: Z-SCORE

	(1)	(2)	(3)	(4)	(5)
VARIABLES	Z-SCORE	Z-SCORE	Z-SCORE	Z-SCORE	Z-SCORE
Constant	57.049***	62.902***	41.043**	36.806**	16.641
	(18.528)	(18.540)	(18.246)	(18.712)	(19.219)
DIV_REV	2.446*	1.852	2.001	1.698	2.847**
	(1.379)	(1.385)	(1.392)	(1.421)	(1.440)
PRP_NON	-4.837***	-6.225***	-2.816*	-2.486	0.923*
	(1.532)	(1.565)	(1.570)	(1.601)	(1.783)
DIV_NON		-1.180	-0.514	-0.498	-0.253
		(0.776)	(0.768)	(0.769)	(0.768)
PRP_COM		-2.616***	-1.136	-1.122	-0.326
		(0.804)	(0.809)	(0.810)	(0.827)
DIV_COM			8.824***	8.795***	8.684***
			(1.153)	(1.154)	(1.149)
PRP_MKT			0.842	0.884	0.621
			(1.155)	(1.156)	(1.152)
PRP_AM			-7.511***	-7.624***	-8.225***
			(1.968)	(1.971)	(1.967)
PRP_DIS			-4.742***	-4.790***	-5.342***
			(1.730)	(1.732)	(1.728)
HHI_GEO				-0.241	-0.341
				(0.561)	(0.559)
HQ-DISTANCE				-0.266	-0.300
				(0.236)	(0.235)
SIZE	1.989	1.261	2.825	3.499	5.514**
	(2.766)	(2.762)	(2.711)	(2.779)	(2.807)
SIZE_SQ	-0.391***	-0.357***	-0.377***	-0.400***	-0.447***
	(0.105)	(0.105)	(0.103)	(0.105)	(0.105)
COST_INCOME	-6.803***	-6.363***	-5.971***	-5.961***	-5.016***
	(0.700)	(0.707)	(0.690)	(0.691)	(0.723)
CAPITAL_RATIO	133.022***	132.436***	135.491***	135.524***	135.855***
	(3.869)	(3.863)	(3.799)	(3.803)	(3.787)
LLP	41.669***	38.218***	31.172***	31.087***	24.095**
	(10.181)	(10.190)	(9.917)	(9.948)	(10.037)
LOAN	4.800***	5.329***	5.220***	5.230***	5.577***
	(1.092)	(1.096)	(1.069)	(1.072)	(1.070)
GDP_INDEX	-0.113	-0.119	-0.081	-0.080	-0.110
	(0.143)	(0.143)	(0.139)	(0.141)	(0.141)
BREAK					-0.755***
					(0.177)
Observations	2,339	2,339	2,339	2,339	2,339
R-squared	0.763	0.765	0.780	0.780	0.782
Adj. R-squared	0.698	0.701	0.718	0.718	0.721

***, **, * indicates statistical significance at the 1%, 5% and 10% respectively

This table reports the results of a panel data regression fixed effect. Regression coefficients are reported with standard error in parenthesis. The dependent variable is the measure of bank insolvency risk (Z-Score). DIV_REV measures revenue diversification between interest and non interest income. DIV_NON measures revenue diversification between fee and commission income on one hand and net results form financial operation on the other. DIV_COM measures revenue diversification within fee an commission income generating activities. PRP_NON and PRP_COM measure the share of non interest income in total operating revenue and the share of fee and commission in total non interest income. PRP_MKT, PRP_AM and PRP_DIS measure respectively, the share of market and trading commission, asset management commission and fee from the distribution of third party product in total fee and commission revenue. HHI_GEO measures geographic diversification. HQ-Distance measures the functional distance between bank branches and its headquarter. The following bank specific control are included in the regression: SIZE is the natural logarithm of Total Asset in thousands of euro, SIZE_SQ is the squared term of SIZE, COST_INCOME is the ratio between personnel and other administrative expenses over intermediation margin, CAPITAL_RATIO is the ratio of equity to total asset, LLP is the ratio of loan loss provisions to net loans, LOAN is the ratio of total loans to total asset. Two macroeconomic controls are included as follows; GDP_INDEX is the annual growth rate of GDP weighted for branches and provinces and BREAK a dummy variable equals to zero for the years 2006, 2007 and 2008 and equals to one otherwise (2009, 2010 and 2011).

Table 7 Revenue Diversification, Geographic diversification and performance Mutual and Non Mutual Banks - Dependent variable: SHROA

VARIABLES	MUTUAL SHROA	MUTUAL SHROA	NON MUTUAL SHROA	NON MUTUAL SHROA
Constant	8.806	-1.802	5.518	1.414
	(7.071)	(6.943)	(12.427)	(12.331)
DIV_REV	-1.624	3.016***	0.074	0.324
	(0.991)	(1.072)	(0.510)	(0.509)
PRP_NON	-0.583	-2.807**	-0.401	1.221*
	(1.171)	(1.158)	(0.508)	(0.720)
DIV_NON	-0.649***	-0.520**	0.039	0.022
	(0.227)	(0.220)	(0.400)	(0.394)
PRP_COM	-1.046***	-0.483**	0.305	0.479
	(0.244)	(0.244)	(0.376)	(0.375)
DIV_COM	2.276***	1.945***	1.266***	1.353***
	(0.449)	(0.437)	(0.475)	(0.469)
PRP_MKT	-0.209	-0.080	2.132***	1.867***
	(0.400)	(0.388)	(0.529)	(0.529)
PRP_AM	1.362	0.756	2.185***	1.704**
	(1.268)	(1.232)	(0.700)	(0.707)
PRP_DIS	-0.544	-0.444	1.211*	0.746
	(0.671)	(0.651)	(0.726)	(0.731)
HHI_GEO	-0.147	-0.139	-0.757**	-0.900***
	(0.157)	(0.152)	(0.328)	(0.327)
HQ-DISTANCE	0.035	-0.024	-0.092	-0.110
	(0.102)	(0.099)	(0.082)	(0.081)
SIZE	1.208	2.208**	1.991	2.253
	(1.125)	(1.096)	(1.634)	(1.614)
SIZE_SQ	-0.106**	-0.127***	-0.128**	-0.130**
	(0.045)	(0.044)	(0.054)	(0.054)
COST_INCOME	-6.497***	-5.871***	-7.536***	-7.308***
	(0.192)	(0.197)	(0.396)	(0.397)
CAPITAL_RATIO	3.747***	3.216**	-0.146	-0.180
	(1.291)	(1.254)	(1.520)	(1.500)
LLP	55.292***	52.884***	69.034***	60.797***
	(2.505)	(2.442)	(6.676)	(7.089)
LOAN	-0.003	0.092	0.202	0.354
	(0.315)	(0.306)	(0.531)	(0.526)
GDP_INDEX	-0.001	-0.050	-0.107**	-0.112**
	(0.057)	(0.055)	(0.048)	(0.048)
BREAK		-0.511***		-0.317***
		(0.052)		(0.101)
Observations	1,925	1,925	441	441
R-squared	0.801	0.813	0.755	0.762
Adj. R-squared	0.746	0.761	0.669	0.678

***, **, * indicates statistical significance at the 1%, 5% and 10% respectively

This table reports the results of a panel data regression fixed effect. Regression coefficients are reported with standard error in parenthesis. The dependent variable is the measure of risk adjusted performance (SHROA). Model 1 – 2 comprises Mutual banks in the sample. Models 3 & 4 only the category of non mutual banks. DIV_REV measures revenue diversification between interest and non interest income. DIV_NON measures revenue diversification between fee and commission income on one hand and net results form financial operation on the other. DIV_COM measures revenue diversification within fee an commission income generating activities. PRP_NON and PRP_COM measure the share of non interest income in total operating revenue and the share of fee and commission in total non interest income. PRP_MKT, PRP_AM and PRP_DIS measure respectively, the share of market and trading commission, asset management commission and fee from the distribution of third party product in total fee and commission revenue. HHI_GEO measures geographic diversification. HQ-Distance measures the functional distance between bank branches and its headquarter. The following bank specific control are included in the regression: SIZE is the natural logarithm of Total Asset in thousands of euro, SIZE_SQ is the squared term of SIZE, COST_INCOME is the ratio between personnel and other administrative expenses over intermediation margin, CAPITAL_RATIO is the ratio of equity to total asset, LLP is the ratio of loan loss provisions to net loans, LOAN is the ratio of total loans to total asset. Two macroeconomic controls are included as follows; GDP_INDEX is the annual growth rate of GDP weighted for branches and provinces and BREAK a dummy variable equals to zero for the years 2006, 2007 and 2008 and equals to one otherwise (2009, 2010 and 2011).

Table 8 Revenue Diversification, Geographic diversification and performance
Robustness chek

VARIABLES	(1) SHROA	(2) SHROA	(3) SHROA	(4) SHROA	(5) SHROE	(6) SHROE	(7) SHROA	(8) SHROA
Constant	14.374***	6.227	17.785***	6.408	17.805***	8.636	-17.257	-18.379
	(4.457)	(4.413)	(4.531)	(4.533)	(5.338)	(5.407)	(18.056)	(18.001)
DIV_REV	-1.337***	0.316			-1.662***	-1.061**	1.143	1.269*
	(0.213)	(0.264)			(0.414)	(0.416)	(0.733)	(0.735)
PRP_NON			-1.921***	0.645*	-1.334***	0.340	-0.308	0.900
			(0.248)	(0.342)	(0.463)	(0.510)	(0.628)	(1.000)
DIV_NON	0.106	-0.046			-0.204	-0.088	0.809	0.982
	(0.097)	(0.096)			(0.221)	(0.218)	(0.719)	(0.725)
PRP_COM			-0.297***	0.015	-0.824***	-0.435*	1.081	1.412**
			(0.101)	(0.102)	(0.231)	(0.234)	(0.661)	(0.692)
DIV_COM	2.254***	1.907***			1.428***	1.376***	1.509**	1.381*
	(0.189)	(0.187)			(0.336)	(0.331)	(0.716)	(0.718)
PRP_MKT			1.926***	1.723***	0.765**	0.625*	1.923**	1.967**
			(0.219)	(0.214)	(0.337)	(0.333)	(0.872)	(0.869)
PRP_AM			2.936***	2.330***	0.580	0.299	2.761***	2.611***
			(0.403)	(0.395)	(0.575)	(0.569)	(0.978)	(0.979)
PRP_DIS			1.864***	1.430***	0.071	-0.195	1.955**	1.781*
			(0.334)	(0.327)	(0.505)	(0.499)	(0.915)	(0.918)
HHI_GEO	-0.194	-0.239*	-0.216	-0.272**	-0.351**	-0.401**	1.246*	1.165*
	(0.139)	(0.135)	(0.140)	(0.136)	(0.164)	(0.162)	(0.665)	(0.665)
HQ-DISTANCE	-0.020	0.013	0.015	-0.019	-0.037	-0.047	0.063	0.066
	(0.057)	(0.056)	(0.058)	(0.056)	(0.069)	(0.068)	(0.093)	(0.092)
SIZE	0.459	1.201*	0.099	1.233*	-0.210	0.684	4.492*	4.385*
	(0.669)	(0.655)	(0.680)	(0.669)	(0.798)	(0.796)	(2.384)	(2.376)
SIZE_SQ	-0.081***	-0.094***	-0.070***	-0.095***	-0.038	-0.058*	-0.200**	-0.192**
	(0.025)	(0.025)	(0.026)	(0.025)	(0.030)	(0.030)	(0.078)	(0.078)
COST_INCOME	-6.904***	-6.383***	-7.016***	-6.360***	-6.741***	-6.275***	-7.216***	-7.045***
	(0.167)	(0.171)	(0.164)	(0.171)	(0.200)	(0.207)	(0.517)	(0.526)
CAPITAL_RATIO	1.839**	2.028**	0.929	1.089	-1.598	-1.541	-0.934	-0.988
	(0.910)	(0.886)	(0.924)	(0.897)	(1.086)	(1.070)	(1.823)	(1.817)
LLP	58.770***	54.968***	59.839***	55.651***	62.386***	59.084***	77.540***	69.889***
	(2.302)	(2.272)	(2.315)	(2.284)	(2.718)	(2.716)	(8.598)	(9.886)
LOAN	-0.033	0.279	0.189	0.368	-0.385	-0.227	1.067*	1.191*
	(0.260)	(0.255)	(0.264)	(0.257)	(0.310)	(0.306)	(0.638)	(0.641)
GDP_INDEX	-0.080**	-0.093***	-0.083**	-0.103***	0.012	-0.003	-0.126**	-0.128**
	(0.035)	(0.034)	(0.035)	(0.034)	(0.041)	(0.041)	(0.050)	(0.050)
BREAK		-0.382***		-0.441***		-0.374***		-0.230
		(0.038)		(0.042)		(0.051)		(0.148)
Observations	2,366	2,366	2,366	2,366	2,373	2,373	257	257
R-squared	0.784	0.796	0.782	0.794	0.709	0.718	0.757	0.760
Adj. R-squared	0.725	0.739	0.721	0.737	0.628	0.639	0.658	0.660

***, **, * indicates statistical significance at the 1%, 5% and 10% respectively

This table reports the results of a panel data regression fixed effect. Regression coefficients are reported with standard error in parenthesis. The dependent variable is the ROA risk adjusted (SHROA) in columns (1-4 and 7-8) and ROE risk adjusted in column (5 & 6). Model 1 – 6 comprises all the banks in the sample. Models 7 & 8 only BHC. DIV_REV measures revenue diversification between interest and non interest income. DIV_NON measures revenue diversification between fee and commission income on one hand and net results form financial operation on the other. DIV_COM measures revenue diversification within fee an commission income generating activities. PRP_NON and PRP_COM measure the share of non interest income in total operating revenue and the share of fee and commission in total non interest income. PRP_MKT, PRP_AM and PRP_DIS measure respectively, the share of market and trading commission, asset management commission and fee from the distribution of third party product in total fee and commission revenue. HHI_GEO measures geographic diversification. HQ-Distance measures the functional distance between bank branches and its headquarter. The following bank specific control are included in the regression: SIZE is the natural logarithm of Total Asset in thousands of euro, SIZE_SQ is the squared term of SIZE, COST_INCOME is the ratio between personnel and other administrative expenses over intermediation margin, CAPITAL_RATIO is the ratio of equity to total asset, LLP is the ratio of loan loss provisions to net loans, LOAN is the ratio of total loans to total asset. Two macroeconomic controls are included as follows; GDP_INDEX is the annual growth rate of GDP weighted for branches and provinces and BREAK a dummy variable equals to zero for the years 2006, 2007 and 2008 and equals to one otherwise (2009, 2010 and 2011).

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