Bank corporate governance and competition in banking industry: substitutes or complements?

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Abstract:

This paper investigates whether and how ownership concentration, as internal mechanism of corporate governance, and market competition, as external mechanism of corporate governance, interact to influence bank performance. In other words, we test whether ownership concentration and competition are complementary or substitutes. While the separate effect of ownership concentration and competition on bank performance is well established in the literature, the interaction effect of these internal and external mechanisms on bank performance has received a little attention. Using a unique hand-collected database covering commercial banks based in 16 Western European countries from 2004 to 2012, we find that banks with concentrated ownership exhibit less profitability when operating in less competitive markets. Our results indicate that in the banking industry, ownership concentration and market competition seem to be complementary disciplining mechanisms of corporate governance. Therefore, banks may benefit differently from ownership concentration, as disciplining mechanism to monitor managers and enhance performance, depending on the level of market competition. Regarding the independent effect of ownership concentration and market competition on bank performance, consistently with previous studies, we find that ownership concentration and market concentration impact positively bank performance.

Key Words: Bank performance, ownership structure, market competition, European banking

JEL Codes: G21, G28

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1. **Introduction:**

The separation of ownership and control generates conflicts of interests between shareholders and managers (Berle and Means, 1932; Jensen and Meckling, 1976). Consequently, several mechanisms of corporate governance have been introduced to better align interests of managers with those of shareholders. Among these mechanisms, ownership structure is an important component of corporate governance (Shleifer and Vishny, 1986) which may play an important role to monitor managers and improve performance. Particularly, the patterns of ownership structure such as the comparative power of shareholders and the identity of the owners may affect bank performance. In this line, the relationship between ownership structure and bank performance is well established in the literature however, empirical studies provide mixed results depending on the characteristics of ownership structure under investigation. In addition, market competition is another disciplining mechanism of corporate governance which has long been claimed as a powerful external mechanism of corporate governance to resolve agency problems between shareholders and managers and enhance performance (. e.g., Alchian, 1950; Stigler, 1958; Shleifer and Vishny, 1997). Furthermore, Allen and Gale (2000) pointed that standard governance mechanisms are less crucial for firms that operate in changing environments. One of the main rationales for this argument is that tougher competition increases threats of bankruptcy which consequently provide strong incentives for managers to exert efforts to increase firm value (Grossman and Hart, 1983). On the contrary, another strand of studies argue that market competition can not resolve the agency problem between shareholders and managers without the support of internal disciplining mechanisms (Shleifer and Vishny, 1997). Therefore, a number of empirical studies on non-financial firms examine the interaction effect of ownership structure and market competition on performance. To our knowledge, no empirical research exists addressing the question in banking industry. These conjectures cry out for further investigation.

Our study focuses on ownership concentration as an important dimension of ownership structure for controlling managers and market competition and we assess the interaction effect of ownership concentration and market competition on bank performance. in other words, we examine whether they are substitutes or complementary in the banking sector. On the one hand, market competition may force managers to act in accordance with shareholders 'interest and therefore may be considered as an alternative tool for ownership concentration. Therefore, competition would play an important role as a disciplinary device forcing managers of banks with poor corporate governance to reduce slack and enhance performance in competitive markets. On the other hand, when the effect of ownership on bank performance is greater for banks with concentrated ownership structure in competitive markets, ownership concentration and market competition may be complementary in this case.

To investigate whether ownership concentration and market competition reinforce each other or whether they are substitutes, our study builds on a large hand-collected data on ownership structure of 119 commercial banks established in 16 Western European countries over the 2004-2012 period and the Herfindahl index as a measure of marker competition. Considering the separated effect of ownership concentration and market competition, we find a significant and positive effect of both ownership concentration and market concnetration on bank performance. These results support the findings of previous studies (Bourke (1989) and Molyneux and Thornton (1992)). Turning to the joint effect of ownership concentration-as internal disciplining mechanism of corporate governance- and market competition –as external

disciplining mechanism- our preliminary estimations seem to indicate that market competition reinforce the effect of ownership concentration on bank performance. These findings indicate that banks may benefit differently from ownership concentration, as internal mechanism of corporate governance, depending on the competitiveness of the market. For deeper insights, we go further in our investigation and conduct other estimations by considering other factors that may influence our results (for instance, we use other proxies for bank performance and competition from the previous studies).

This paper complements the literature on the determinants of bank performance by further examine the interaction effect of ownership concentration and market competition - as disciplining mechanisms of corporate governance- on bank performance. Compared with non-financial firms, banks have some specificities which make bank governance more complex and lead to imperfect competition in banking market. Indeed, Caprio and Levine, (2002) argue that with greater opacity in this sector, it is difficult to shareholders and debtholders to monitor managers while it helps managers and large investors to exploit the private benefits of control, rather than maximize value. Furthermore, previous studies posit that information asymmetries generate imperfect competition in banking industry (Hannan (1991), Molyneux et al., (1994), De Bandt and Davis (2000), Bikker and Haaf (2002)). In addition, banking sector is heavily regulated which may alter standard governance practices. For instance, regulatory restrictions on the concentration of ownership in this sector interfere with the most direct tool to align the interests of managers and shareholders which is ownership concentration (Caprio and Levine, 2002). furthermore, the wave of consolidation in the banking sector led to changes in ownership structure and competition. Taking together, banking industry specificities may influence bank ownership structure and competition which may influence bank performance. Consequently, banks may benefit differently from these corporate governance mechanisms. Therefore, although it is important to assess the separate effect of governance mechanisms on bank performance, it is necessary to investigate their interactions. Focusing on ownership concentration, as a standard internal device, and market competition, as external device to monitor managers, our paper tries to shed new light on this question in the banking industry by analyzing how banks benefit from these disciplining mechanisms to improve bank performance.

The rest of the paper is structured as follows. Section 2 summarizes the most relevant studies akin to the objectives of this research. Section 3 is methodological and sets the research design with the description of the sample, variables and model specification to be tested. Section 4 presents the results obtained and we develop the robustness tests we run in section 5. We lay out the conclusion in the final section of this paper.

2. Literature review and hypotheses development:

Agency problems arise within a firm whenever managers have incentives to pursue their own interests at shareholders 'expense (Agrawal and Knoeber, 1996). According to the literature, there are several internal and external disciplining mechanisms to reduce these agency problems and so improve firm performance. An obvious mechanism to monitor managers is shareholdings concentration which affects firm value (Jensen and Meckling, 1976). In addition, market competition is considered as an alternative disciplining mechanism which contributes to alleviate the principal-agent problem and enhance performance (Holmstrom,

1982; Jensen, 1986; Shleifer and Vishny, 1997). This section reviews theoretical and empirical literature on the impact of ownership structure and competition on performance.

In a seminal study, Berle and Means (1932) pointed that separation of ownership and control (when a company is not run by the people who own it) generates conflicts of interests between managers (corporate insiders) and shareholders (outside investors). Jensen and Meckling (1976) referred to this as "agency theory". This theory argues that managers may pursue their own interests which may not be consistent with maximizing value of shareholders. In addition, when ownership structure is dispersed, managers may easily manipulate information and control the firm therefore, ownership concentration is the standard disciplining mechanism for controlling managers from deviating too far from the interests of shareholders and improve performance (La Porta et al., 1999).

Two frequent arguments emerge in the literature when investigating the impact of ownership concentration on firm performance. On the one hand, "monitoring argument" suggests that large shareholders may be more capable of monitoring and controlling the management and thereby perhaps contributing to a better performance (Shleifer and Vishny, 1997). Indeed, shareholders with large share of total equity have more incentives to control managers as they may be more affected by the decisions and actions of managers than shareholders with small share of total equity (minority shareholders) (Grossman and Hart, 1986; Huddart, 1993; Shleifer and Vishny, 1997; Dennis and Meconnell, 2003). According to Shleifer and Vishny, (1986, 1997), major owners use methods ranging from informal conversations with managers to formal proxy contests. In the same line, large shareholders will be more effective at exercising their voting rights than in an ownership structure dominated by small, comparatively uninformed investors (Caprio and Levine, 2002). Furthermore, controlling shareholders can more effectively negotiate managerial incentive contracts that avoid self-dealing and align investor and manager interests than a diffuse group of shareholders whose representatives- the board of directors- can be manipulated by management (Caprio and Levine, 2002). In this way, ownership concentration may address agency problem, reduce the costs associated with it and improve performance. On the other hand, ownership concentration raises a corporate governance problem between large and minority shareholders which corresponds to the second argument that can be derived from previous literature. It is referred to this argument as "expropriation of minority shareholders" by large shareholders (Claessens et al., 2000). This argument states that dominant shareholders exert their control owner to benefit themselves at the expense of minority shareholders. Large investors may pay themselves special dividends, exploit nosiness relationship with other firms they own that profit themselves at the expense of the corporation and in general, maximize the private benefits of control at the expense of minority shareholders (Dann and DeAngelo, 1983; Zingales, 1994; Caprio and Levine, 2002). From this perspective, ownership concentration provides more effective monitoring but it has its backwards. It may lead to poor firm performance because major owners may pursue their own interests which can be different from firm interests. There is substantial empirical literature with mixed results on whether and how ownership concentration affects performance of non-financial firms (see Agrawal and mandelker, 1990; Kaplen and Minton, 1994; Gorton and Schmidt, 2000; Leech and Leahy, 1991).

The impact of ownership structure is even more complex in banking sector. More precisely, banks are distinct from other firms as they are heavily regulated, highly leveraged and more opaque than non-financial firms (Macey and O'Hara, 2003; John and Qian, 2003;

Levine, 2003). Among banks, many empirical studies investigate how ownership structure may affect bank performance, in term of profitability and risk. These studies provide varied results according to different characteristics of ownership structure under investigation. On the one hand, some studies find that ownership concentration does not affect bank profitability but they find that ownership concentration is positively related with risk taking resulting in a better asset quality and fewer insolvency risk (Iannotta et al., 2007; Shehzad et al., 2010). On the other hand, some studies document that banks with concentrated ownership tend to take more risk (Laeven and Levine, 2009; Erkens et al., 2012; Beltratti and Stulz, 2012). Using a panel of listed commercial banks, Haw et al. (2010) find that banks with concentrated control exhibit poorer performance, lower cost efficiencies and higher volatility and insolvency risk compared with widely held banks. Gropp and Kohler (2010) find that ownership concentration increases bank profitability measured by return on equity for a sample including banks from 25 OECD countries. A broad literature examines the relationship between bank performance and the nature of the controlling shareholders. In this regard, one line of research compared state-owned with privately-owned banks in term of performance (see among others, Iannotta et al., 2007; Berger at al., 2005; Micco et al., 2007) and find that state-owned banks are less profitable than privately-owned banks. focusing on institutional investors category, Elyasini and Jia (2008) find that the stability of institutional investors is positively related with bank holding companies' performance. Furthermore, Iannotta et al., 2007; Laeven 1999; Barry et al., 2011 find a positive relationship between risk taking measures and institutional ownership. Regarding family/individual category, Barry et al., 2011 find that this category adopts a conservative risk strategy as they hold less diversified portfolios.

Regarding market competition, it has long been claimed that market competition helps to enhance performance. Furthermore, previous studies consider that market competition turns out to be a powerful disciplining mechanism to resolve agency problems between shareholders and managers (. e.g., Alchian, 1950; Stigler, 1958; Shleifer and Vishny, 1997). For instance, Smith (1776) argues that "monopoly is a great enemy to good management". Furthermore, Allen and Gale (2000) pointed that standard governance mechanisms are less crucial for firms that operate in changing environments. One of the main rationales for this argument is that tougher competition increases threats of bankruptcy which consequently provide strong incentives for managers to exert efforts to increase firm value (Grossman and Hart, 1983). Holmstrom (1982), Nalebuff and Stiglitz (1983) further argue that an increase in competition can reduce agency problem by increasing the information available to principals for more accurate monitoring and evaluation of managers' relative performance. However, another strand of studies posit that competition can not resolve conflicts between shareholders and managers without the support of internal disciplining mechanisms. Hart (1983) finds that market competition is limited in terms of disciplining managers. Furthermore, Shleifer and Vishny (1997) state in their survey on corporate governance "we agree that product market competition is probably the most powerful force toward economic efficiency in the word, we are skeptical that it alone can solve the problem of corporate governance". In addition, Jensen and Meckling (1976) argue that managerial incentives to shirk exist equally in both competitive and noncompetitive markets therefore, the existence of competition will not eliminate the agency costs due to managerial control problems. Schmidt (1997) postulates that there is an inverted U-shape relationship between market competition and internal corporate governance, that is managerial incentives to maximize firm value increases when market competition intensifies initially, but when competition exceeds a certain level, managerial incentives

decreases. Though it is important to study the impact of different governance mechanisms on performance, it is necessary to study their mutual interactions. Therefore, a number of studies on non-financial firms examine the interaction effect of corporate governance and competition on firm performance. In other words, they raise the question on whether corporate governance and market competition reinforce each other – they are complementary- or they may be rather considered as substitutes. Market competition constrains managers to act in accordance with shareholders' interest and therefore it may act as an alternative mechanism to other corporate governance mechanisms. When these tools are complementary, the impact of competition would be greater in firms with efficient governance structure. If corporate governance are substitutes, this means that in firms with poor corporate governance, competition would play an important role as a disciplinary mechanism forcing managers to enhance performance and reduce slack. Regarding theoretical studies, Aghion and Howitt (1997); Aghion et al., (1999) developed a model in which competition appears to be a substitutes to what they name "good governance" proxied by financial pressures. Using a panel of british firms, Nickel et al., (1997) estimate the effect of market competition, shareholder control and debt level on productivity growth including interaction terms. They provide evidence that market competition can substitute for shareholder control. Grosfeld and Tressel (2001) investigate the interaction effect of competition and ownership concentration on performance in the case of non-financial firms listed on the Warsaw Stock Exchange. They find that market competition and good governance tend to reinforce each other than to be substitutes. In other words, they find that competition has no significant effect on performance for firms with poor governance while it affects positively performance in the case of firms with good governance. Januszewski et al., (1999) find weak evidence that competition has impact on performance of german firms with concentrated ownership structure. Furthermore, they find that ownership concentration has a negative impact on firm performance. Taken together, these findings suggest that competition can compensate for the negative influence of dominant owners. In the chinese context, Hu et al., (2004) examine the jointly effect of market competition and ownership concentration and find some substitutability between private ownership and competition. Using two large samples of non-financial firms from Germany and UK, Köke and Renneboog (2005) find that competition and shareholder control are complementary in Germany. In case of UK firms, they find that competition and shareholder control may be substitutes. In the European context, Ammann et al., (2013) find that corporate governance is significantly and positively related to firm value in non-competitive industries only. These findings confirm that competition acts as a substitute for governance. Cosset et al., (2016) examine the impact of corporate governance on firm value given the level of competition and country characteristics. They find that competition and governance seem to be complementary in explaining firm value in developing countries while they are substitutes in developed countries.

This paper extends the above literature and investigates the effect of the interaction between competition and governance on performance in the banking industry. Specifically, we focus on ownership concentration as an internal mechanism of governance and assess whether ownership concentration and competition are substitutes or complementary in banking sector.

This study has until now presented some theoretical and empirical studies about the effect of the interaction between governance and competition for non-financial firms. This issue matters for banks as they have some specific characteristics compared with non-financial firms. On the one hand, in view of our main objective, we need to cast the major specificities of banking sector which make governance more complex in this sector. bank opacity intensifies

agency problem. Caprio and Levine (2002) argue that with greater information asymmetries between insiders and outside investors in this sector, it is difficult to shareholders and debtholders to monitor managers while it helps managers and large investors to exploit the private benefits of control, rather than maximize value. In addition, banks are heavily regulated which comes in different forms an alter the traditional mechanisms of governance. For instance, regulatory restrictions on the concentration of ownership interfere with the most direct device to align the interests of managers and shareholders: concentrated ownership (Caprio and Levine (2002)). Previous studies find that banking markets have a structure of imperfect competition (e.g. Hannan (1991), Molyneux et al., (1994), De Bandt and Davis (2000), Bikker and Haaf (2002)). On the other hand, theoretical literature suggests that information asymmetries in banking sector leads to imperfect competition. Taking together, these specific characteristics of the banking industry may influence ownership concentration and competition, as disciplinary mechanisms, and thereby, how they interact to influence bank performance.

building on existing theoretical and empirical studies discussed above, we test the following hypotheses:

- **H1:** *ownership concentration and competition are* **substitutes** *such as when competition is strong, the effect of ownership concentration on bank performance is weaker for banks in competitive markets.*

- **H2:** *ownership concentration and competition are* **complementary** *such as the positive link between ownership concentration and performance would be great in more competitive markets than otherwise.*

3. Research design:

In what follows, we will describe our sample, the set of dependent and independent variables and the estimation model.

3.1. sample selection:

Our sample covers the period 2004-2012 and comprises 119 commercial banks from 16 Western European countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Netherlands, Norway, Portugal, Sweden, Switzerland, Spain and United Kingdom. We use Bankscope BvD database to extract consolidated[1] bank accounting data and Word Bank database to collect macroeconomic data. We have restricted our sample to banks for which Bankscope BvD database provides information on ownership structure for the overall period. We identify 172 commercial banks for which we have the information on ownership structure on Bankscope BvD database for the period from 2004 to 2012. To build our ownership concentration variable, we define a control threshold of 25%. Consequently, we exclude 53 banks which are considered widely-held thus, the final sample includes 119 commercial banks. All variables are winsorized at levels 1% and 99% to mitigate the influence of outliers. **Table 1** reports the distribution of European commercial banks of our sample by country over the 2004-2012 period.

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[1] We use unconsolidated data to check the robustness of our results.

3.2 bank performance variables:

Following the literature, performance is measured usually using three measures: return on asset ratio (ROA) which reflects how effectively bank's management generate profits from the total asset, return on equity (ROE) which assesses the return on shareholder's equity. The last measure corresponds to the net interest margin (NIM) which reflects the generated profit from interest activities. In our study, we use the return on equity (ROE) as our main measure of bank performance and we use in the robustness tests return on asset (ROA) and the net interest margin (NIM) as alternative measures of bank performance.

3.3. Ownership and competition variables:

To measure the ownership dispersion/concentration of our sample, we define a control threshold in order to identify whether a considered bank has either concentrated or dispersed ownership structure. We collect information on direct ownership of each bank from Bankscope[2] and annual reports of banks of our sample. Following the previous studies (for instance, Barry et al. 2009, Shehzad et al., 2010), based on a control threshold[3] of 25% we consider that a bank has a concentrated ownership structure in case there is at least one owner with shareholdings above 25% of total equity otherwise, the bank is considered as widely-held. We define a concentration variable *(conc)* which captures for each bank in our sample the percentage of equity held by the controlling shareholder.

Regarding competition variable, we use the Herfindahl-Hirschman Index (HHI) whixh is a popular and commonly accepted approach in the literature (e.g. Claessens and Laeven, 2004) to proxy the level of competition. The Herfindahl index ranges from 0 to 1 and reflects the level of concentration in the industry. An increase in the HHI generally indicates an increase in market power, i.e. a decrease in competitiveness, while a decrease in the HHI indicates a decrease in market power, i.e. an increase in competitiveness. The Herfindahl index is defined as the sum of the square of the market shares of banks within the industry and it is calculated as follows:

$$HHI = \sum_{i=1}^{N} s_i^2$$

Where: s_i is the market share of bank i in the market and N is the total number of banks.

3.4. Control variables:

Following previous studies[4], we include in our regressions a number of control variables to control bank-level and country-level factors.

First, we include the *ratio of equity to asset (Equity)* as a proxy of bank capitalization. On the one hand, Berger (1995) argues that higher capital ratio is associated with lower risk. However, the conventional risk-return hypothesis posits that lower risk reduces return.

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[2] Information on ownership structure before 2004 is missing on Bankscope for almost banks in our sample, therefore, the starting point for our data is 2004.
[3] Previous studies consider that a threshold of 10 % is usually sufficient for shareholders to have an effective control of a firm (La Porta et al., 1999; Laeven and Levine, 2009).
[4] i.e. (Athanasoglou et al., (2008) ; Dietrich et al., (2011) ; Garcia Herrero et al., (2009)).

Therefore, we may expect a negative impact of capitalization on bank performance. On the other hand, banks with higher level of capital face lower costs of funding (Bourke, 1989; Berger, 1995; Iannotta et al., 2007) and further increases profitability. As a result, the net impact of capitalization on bank profitability is ambiguous in our study.

The second control variable we use is the *ratio of loan loss provisions over total loans (Asset_quality)*. We use this ratio as a proxy of asset quality. A higher ratio is associated with lower credit quality. Iannotta et al. (2007) argue that riskier loans should produce higher interest income leading to increased bank profitability. However, higher loan quality implies more resources spent on credit underwriting and loan monitoring and consequently, increasing costs (Mester, 1996) which leads to lower profitability. As a consequence, the relationship between loans loss provision to total loans ratio and profitability is unpredictable.

To account for the relationship between liquidity management and performance, we include in our model the *ratio of net loans to customer deposits and short term funding (Liquidity)*. This ratio shows the relationship between comparatively illiquid assets (i.e. loans) and comparatively stable funding sources (. i.e. deposits and other short term findings) (Kosmidou, 2008). Thus, lower net loans to customer deposits and short term funding ratio indicates that the bank is liquid. However, liquid assets are associated with lower revenues. Therefore, higher liquidity (lower net loans to deposits and short term funding ratio) leads to lower profitability. In other words, we expect a positive relationship between the loans to deposits and short term findings ratio and profitability.

Bank size(ln_assets) is an important determinant of bank profitability. However, its impact remains ambiguous. Bank size may have a positive impact on bank profitability because a large size may result in economies of scale which will increase operational efficiency and consequently, leads to higher profits (Short (1979), Smirlock (1985), Bikker and Hu (2002), Pasiouras et al. (2007)). However, larger banks become difficult to manage and thus, we may find a negative relationship between size and performance due to costs related to managing extremely large banks (Stiroh and Rumble (2006), Dietrich and Wanzenried (2011)). As a consequence, the expected effect of bank size on profitability is unclear. We include in our study the natural logarithm of total asset to account for bank size (Goddard et al., 2004; Athanasoglou et al., 2008; Dietrich and Wanzenried, 2011).

We also include the *ratio of cost to income (Efficiency)* as a proxy of operating efficiency. Previous studies show that efficiency enhances bank performance (Athanasoglou et al., 2008; Pasiouras and Kosmidou, 2007). Cost to income ratio shows the costs of running a bank, since an improved management of these costs will increase efficiency and therefore profits, we expect a negative relationship between cost to income ratio and bank profitability.

In addition to the bank-specific variables described above, our study includes *the annual growth rate of real gross domestic product (real_gdp)* to account for differences in the macroeconomic environment. According to the literature, economic growth has a positive impact on profitability (Demirguc-Kunt and Huizinga, 1999; Bikker and Hu, 2002; Athanasoglou et al., 2008). Accordingly, during cyclical upswings, investment and consumption increase which leads to a rise of lending demand and thus increase performance.

Definition and summary statistics of the variables[5] used in our study are reported in **Table** *2*. We can highlight some facts regarding our sample: the banks in our sample exhibit an average ROE of 7.76%. In addition, on average, the capitalization *(Equity)* of banks in this study is 7.90%. For instance, the best-capitalized bank in our sample has a capital ratio of 39.54% while total equity for the least-capitalized bank in our sample represents 3.63% of its total assets. Regarding the proxy of the quality of assets *(asset_quality)*, the ratio of loans loss provisions to total loans is 3.25% on average. Furthermore, we notice that banks of our sample are characterized by a high level of ownership concentration *(conc)* with shareholders holding on average a share of 66.62% of total equity. Over the period 2004-2012, the average level of bank concentration *(HHI)* is 0.32 and ranges from 0.18 to 0.75 indicating that the degree of market concentration is quite different across the 16 countries of our sample.

3.5. Methodology and empirical results:

In this study, we test whether and how ownership concentration and market competition-as disciplinary mechanisms- interact to enhance performance in banking sector.

Berger et al., (2000) argue that bank profits show persistence over time reflecting the presence of impediments to product market competition which generate informational opacity and market power. Also, persistence may reflect sensitivity to regional/macroeconomic shocks. Therefore, we follow Athanasoglou et al., (2008) and Garcia Herrero et al., (2009) and we specify a dynamic model by including a lagged dependent variable among the control variables. We estimate the following model:

$$y_{it} = c + \partial\, y_{it-1} + \alpha_1 conc_{it} + \alpha_2 HHI_{it} + \sum_{j=1}^{J} \beta_j X_{it}^j + \varepsilon_{it} \qquad (1)$$

With: y_{it} and y_{it-1} are the profitability levels at time t and t-1 respectively measured by roe, with $i = 1,…, N$ and $t = 1,…T$, ∂ captures the speed of adjustment to equilibrium. A value of ∂ between 0 and 1 indicates that profits are persistent but they will eventually return to their normal level. A value close to 0 reflects a high speed of adjustment of profits (competitive industry) and a value close to 1 implies a slow speed of profits adjustment (less competitive industry) (Athanasoglou et al., (2008), c is a constant, $conc_{it}$ measures the proportion of total equity held by the controlling shareholder, HHI_{it} measures market concentration, an increase in the HHI_{it} generally indicates an increase in market power, i.e. a decrease in competitiveness, while a decrease in the HHI_{it} indicates a decrease in market power, i.e. an increase in competitiveness competition, X_{it}^j is a vector including the explanatory variables outlined above : *Equity, Asset_quality, Liquidity, ln_assets, Efficiency, real_gdp.* ε_{it} is the error term which is composed of two components : v_i : the unobserved bank specific effect and u_{it} the idiosyncratic error.

Regarding the dynamic nature of our model, we confront the following issues: conventional econometric techniques such as OLS will provide biased and inconsistent estimates since the lagged dependent variable (y_{it-1}) is correlated[6] with the bank-specific

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[5] Correlation matrix for the independent variables is reported in the **Table 3**.
[6] Nickell, (1981) called this issue the dynamic panel bias.

effect (v_i) (see for instance Blundell and Bond, 1998). Arellano and Bond (1991) and Blundell and Bond (1998) propose an alternative estimator that overcomes this problem: the general method of moments (GMM) estimator. There are two variants of GMM estimator: the first difference GMM estimator, which consists to first difference *equation (1)* in order to remove the bank-specific effects then use suitably lagged levels of the variables as instruments (Arellano and Bond, 1991). The system general method of moment estimator by Arellano and Bover (1995) and Blundell and Bond (1998) combines the set of first differenced equations with equations in levels to one greater system of equations where the lagged levels are used as instruments for equations in first difference and lagged first differences as instruments for the set of equations in level. Garcia Herrero et al., (2009) argue that the system GMM estimator controls for potential endogeneity, unobserved heterogeneity and the persistence of dependent variable. Furthermore, Using Monte Carlo simulations, Blundell and Bond (1998) find that first difference GMM estimator suffers from bias and imprecision in small samples with weak instruments. Therefore, we use the system GMM estimator to estimate *equation (1)* to test *H1* and *H2*.

Previous studies on bank performance (Athanasoglou et al., (2008), Garcia Herrero et al., (2009), Dietrich et al., (2011)) highlight potential endogeneity[7] problem for most of control variables. For instance, bank capitalization[8] and size may depend on bank profitability consequently, we use GMM instruments for the presumably endogenous regressors and we limit the number of instruments to three. For the consistency of the estimator, we test the validity of our instruments using the Hansen test and the Arellano and Bond test for the absence of second-order correlation (AR (2) test).

4. Results:

As explained before, there is no empirical studies on whether ownership concentration and competition as disciplinary mechanisms tend to reinforce each other or they are substitutes in the banking industry. In this paper, we examine the interaction effect of ownership concentration and competition on bank performance using a panel of European banks.

We regress our profitability measure (*ROE*) on a set of determinants from previous literature including proxies of ownership concentration and competition. **Table 4**[9] reports the empirical results using our main profitability measure *(ROE)*. Regarding the separate effect of ownership concentration and competition on bank profitability, we find that both of ownership concentration ($conc_{it}$) and competition (HHI_{it}) are associated with higher profitability. The coefficient associated to ownership concentration proxy ($conc_{it}$) is significant and positive. This result is consistent with the "monitoring argument" suggesting that large shareholders may be more capable of monitoring and controlling the management and thereby perhaps

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[7] We run Hausman test (endogeneity test) and consistently with previous studies, the test confirms that our bank-level variables are endogenous.

[8] Garcia Herrero et al., 2009 argue that more profitable banks may also be able to increase their equity more easily by retaining profits. Furthermore, they could also pay more for advertising campaigns and increase their size, which in turn may affect their profitability. However, the causality could also go in the opposite direction as more profitable banks may hire more personal which may reduce their operational efficiency.

[9] The Hansen test shows no evidence of over-identification restrictions indicating the validity of our instruments. Furthermore, the AR (1) test indicate the presence of first-order autocorrelation but it does not imply that our estimates are inconsistent. Following (Arellano and Bond, 1991), estimates are inconsistent when second-autocorrelation is present but the AB test AR (2) reject this case. Therefore, our estimates are valid.

contributing to a better performance (Shleifer and Vishny, 1997). Considering the impact of market concentration, approximated by the Hefindahl index (HHI_{it}) , we find a significant and positive effect on bank profitability. This result supports the findings of Bourke (1989) and Molyneux and Thornton (1992). The positive effect of market concentration on performance has been interpreted in different ways in the previous studies. On the one hand, the structure-conduct-performance (SCP) hypothesis, asserts that banks are able to extract monopolistic rents in concentrated markets by their ability to offer lower deposits rates and charge higher loan rates. On the other hand, the efficient-structure (ES) hypothesis, postulates that efficient banks increase in size and market share because of their ability to generate higher profits which usually leads to higher market concentration thus, the positive effect is explained by lower costs achieved through either superior management or production processes (Goldberg and Rai, 1996).

We now move to the obtained results when we examine the interaction effect of ownership concentration and competition. The coefficient associated to the interaction term ($conc_{it} * HHI_{it}$) is significant and negative this means that an increase in market concentration, i.e. a decrease in competitiveness, leads to a decrease in the effect of ownership concentration on bank profitability. In other words, our results seem to indicate that market competition seem to reinforce ownership concentration on bank profitability. Therefore, ownership concentration and competition seem to be complementary. These findings are consistent with our second hypothesis which states that *ownership concentration and competition are complementary such as the positive link between ownership concentration and performance would be great in more competitive markets than otherwise.* Our results seem to indicate that banks may benefit differently from ownership concentration, as a standard internal disciplining mechanism of corporate governance, depending on the level of competitiveness of the market.

Other results are worth noting from the control variables included. First, the coefficient of the lagged dependent variable is significant and positive indicating the persistence of profits for the banks in our panel. Second, the coefficient of the cost to income ratio *(Efficiency)* is significant and negative indicating that bank efficiency increases profitability. This result meets our expectation and supports the findings of (Athanasoglou et al., (2008), Dietrich et al., (2011). Finally, from the macroeconomic variable included *(real_gdp)*, the business cycle impacts positively bank profitability indicating that bank profits seem to be pro-cyclical (Athanasoglou et al., (2008), Albetazzi and Gambacorta, 2009).

5. Robustness tests:

We carry out several tests to check the robustness of our results.

- *Alternative measures of bank profitability:*

First, we use return on assets (roa) and net interest margin(nim) as alternative measures of bank profitability and alternative measures of competition.

- *Alternative control threshold level :*

Second, following Shehzad et al., (2010), we increase the control threshold and consider a control level of 50% instead of 25%.

- *Uncosolidated data :*

Third, we check the validity of our results using unconsolidated data instead of consolidated data.

- *Financial crisis:*

Finally, we test whether the global financial crisis affects our results. For this purpose, we run the regressions on sub-samples of pre-crisis, crisis and post-crisis periods.

6. Conclusion:

There exist studies that investigate the interaction effect of ownership concentration and competition, as mechanisms of corporate governance, on bank performance. To date, no econometric study has examined whether and how ownership concentration and market competition interact and influence performance in the banking sector. Compared with non-financial firms, banking industry have some specificities which make agency problems more complex and generate imperfect competition which influence bank performance. Therefore, it is important to assess the effect of governance mechanisms on bank performance. However, looking only at the separate effect of corporate governance mechanisms on bank performance does not convey a clear picture. Allen and Gale (2000) pointed that standard governance mechanisms are less crucial for firms that operate in changing environments. consequently, it is also of interest to investigate their interactions to understand whether banks benefit equally from the corporate governance practices. Focusing on ownership concentration, as internal disciplining mechanism of corporate governance, and competition, as external mechanism, our study investigates whether ownership concentration and market competition reinforce each other or whether they are substitutes. Using a panel of commercial banks based in 16 Western European countries, this paper departs from an analysis of the separate effect of ownership concentration and market competition on bank performance. We find that ownership concentration affects positively bank performance. In addition, using market concentration as a proxy of competitiveness, we find some support to the SCP hypothesis which states that banks operating in less competitive (concentrated market structure) markets will earn higher profits. Our findings support the results from previous studies on these issues (Bourke (1989) and Molyneux and Thornton (1992)). Regarding the interaction effect of ownership concentration and competition on bank performance, we find that ownership concentration and market competition may be complementary in banking industry such that market competitiveness, as external disciplinary mechanism, reinforce ownership concentration, as internal mechanism, to monitor managers and improve bank performance. Our findings seem to indicate that banks may benefit differently from ownership concentration depending on the level of competitiveness of the market they operate in. We investigate these issues in a deeper level.

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Table 1: Distribution of European commercial banks by country over the 2004-2012 period

Country	Number of banks
Austria	11
Belgium	5
Denmark	8
Finland	3
France	4
Germany	11
Greece	4
Ireland	5
Italy	18
Netherlands	13
Norway	6
Portugal	6
Spain	11
Sweden	3
Switzerland	4
United Kingdom	7
Total	*119*

Table 2: Descriptive statistics of the dependent and independent variables

Variable	Description	Mean	Std.Dev	Min	Max	Obs
ROE	Return on average equity ratio	7.76	6.44	-0.04	29.5	606
Equity	Equity to asset ratio	7.907	4.75	3.63	39.54	626
Asset_quality	loan loss provisions over total loans ratio	3.25	2.65	0	10	613
Liquidity	Net loans to customer deposits and short term funding ratio	116.32	64.66	6.37	376.80	608
Efficiency	Cost to income ratio	64.31	21.95	5.56	201.69	609
Size	Natural logarithm of total asset	16.38	1.98	11.21	20.72	623
Conc	Percentage of equity held by shareholder	66.62	24.50	26	100	626
HHI	Herfindahl index is defined as the sum of the square of the market shares of banks within the industry	0.32	0.11	0.18	0.75	619
Conc*HHI	Interaction between the level of ownership concentration and Herfindahl index	26.41	14.37	5.32	75.62	619
Gdp_growth	Annual growth rate of real GDP	0.74	2.61	-5.6	5.7	609

Table 3: Cross-correlation matrix of independent variables

	Equity	Asset_quality	Liquidity	Efficiency	Size	Conc	HHI	Conc*HHI	Gdp_growth
Equity	1								
Asset_quality	0.0632	1							
Liquidity	-0.192***	0.116**	1						
Efficiency	-0.0661	-0.0245	-0.0896*	1					
Size	-0.495***	0.0300	0.230***	-0.124**	1				
Conc	-0.103*	-0.154***	0.00134	-0.0903*	0.158***	1			
HHI	-0.0627	-0.252***	0.0783	-0.0988*	0.0539	0.261***	1		
Conc*HHI	-0.138***	-0.260***	0.0528	-0.0539	0.157***	0.518***	0.854***	1	
Gdp_growth	-0.0398	-0.111**	-0.0462	-0.0465	0.0509	0.118**	0.210***	0.180***	1

*With ***, ** and * indicate significance at the 1%, 5% and 10% respectively.*

Table 4: Regression results

Dependent variables:	*y*
y_{it-1}	0.468***
	(4.23)
Equity	-0.495
	(-1.40)
Asset_quality	-0.084
	(-0.20)
Liquidity	0.008
	(0.45)
Efficiency	-0.133***
	(-2.70)
Size	-0.440
	(-0.66)
gdp_growth	0.334***
	(3.31)
conc	**0.102***
	(1.77)
HHI	**23.53***
	(2.09)
Conc * HII	**-0.258***
	(-2.69)
Constant	14.53
	(1.23)
Number of Observations	451
Hansen Test (*p-value*)	0.23
AB test AR(1) (*p-value*)	0.00
AB test AR(2) (*p-value*)	0.23

the dependent variable (*y*) is the return on equity *(ROE)*. For the notation of the variables see *Table 2* . the full sample includes 451 observations from 119 commercial banks established in 16 Western European countries for the period 2004 to 2012. Coefficients that are significantly different from zero at the *1%, 5%* and *10% are market with ***, ** and * respectively.* Robust standard errors are reported in brackets. Hansen test for over-identification restrictions in GMM estimation. AB test *AR (1) and AR (2)* refer to the Arellano-Bond test that the average autocovariance in residuals of *order 1* and *order 2* is 0 (H0: no autocorrelation).