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► **To cite this version:**

Thierno Barry, Amine Tarazi, Paul Wachtel. Falling under the control of a different type of owner : risk-taking implications for Banks. 2016. <hal-01333492>

**HAL Id: hal-01333492**

**<https://hal-unilim.archives-ouvertes.fr/hal-01333492>**

Submitted on 17 Jun 2016

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## **Falling under the control of a different type of owner : risk-taking implications for Banks**

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**This draft: May 30, 2016**

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### **Abstract**

European banks have experienced significant changes in the type of entity that owns them (another bank, an individual or a family, a non-financial company, an institutional investor, a government, a foreign entity, a domestic entity...). In this paper, we look at the influence of ownership type changes on performance. Working with a panel of commercial banks from 17 European countries, we find that although banks that experience a change in ownership type do not exhibit lower or higher risk or profitability than other banks, their risk and profitability is significantly affected after the change takes place. The type of the acquirer plays a significant role in explaining the observed changes. When the acquirer is a non-financial company, the state or an institutional investor, the level of risk increases after the change while the level of profitability remains unchanged. Conversely, when the acquirer is a bank, we find that the level of risk-adjusted profitability decreases. Banks acquired by a different type of owner during the global financial crisis do not perform better or worse than they did before.

*JEL Classification:* G21, G28

*Keywords:* European banking, ownership change, type of ultimate owner, profitability, risk

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## 1. Introduction

The global financial crisis has led to the partial nationalization of banks in many developed countries, which reverses a pattern of consistent declines in government ownership of banks throughout the world since 1970. Although the impact of such ownership changes on bank performance has received a lot of attention (see Clark et al., 2005 for a literature review of the effects of bank privatization on bank performance such as Beck et al., 2005; Bonin et al., 2005; Haber, 2005; Nguyen and Williams, 2005), the consequences of the resulting changes in bank ownership structure on risk have yet to be adequately explored. A change in bank ownership can indeed take various forms. An initially private bank can be acquired and controlled by a government or by another private entity of a different type (another bank, an individual or a family, a non-financial company, an institutional investor, a foreign entity, a domestic entity). In this paper, we investigate whether the changes in the type of controlling shareholders differently affects bank profitability and risk.

The recent wave of consolidation and the rise of institutional investors in Europe has also affected the ownership structure of banks. While the main motivation for consolidation comes from the desire for growth, institutional ownership is mainly driven by value maximization concerns by possibly following hit and run strategies. Because of the different motivations underlying changes in bank ownership, it is important to distinguish the nature of the changes, which may generate differences in the level of bank risk taking. Furthermore, although controlling shareholders may have different risk preferences depending on their type, whether or not their desired level of risk can be achieved will also depend on their monitoring power and on internal governance mechanisms.

Family-controlled banks, for example, may be more averse to risk taking due to their goal of transferring the firm to the next generation (Anderson et al., 2003). This may also be due to their inability to diversify their wealth outside the bank. Nevertheless, they may end up taking more risk due to managerial and capital constraints.

Corporate-controlled banks are prone to participate in related lending, which could be both advantageous and risky. While insider lending may be a rational response to overcome asymmetric information issues, tunneling could also lead to inefficient capital allocation and higher risk. Moreover, an industrial group which owns a bank will act in the interest of the entire group, regardless of the possibly negative outcomes for the bank. Therefore, banks might pursue riskier strategies when they are controlled by a non-financial firm. It could also be argued that non-financial companies might not be sufficiently diversified to pursue high-

risk strategies in the banks they control. In addition, corporate owners often invest in firms for strategic reasons, for example, to delegate part of their activities or to take advantage of potential synergies and spillover effects between the owner and the controlled firm (Tribo et al., 2007). Thus, corporate-controlled banks may also have a preference for low risk.

The main goal of institutional investors is to optimize their financial gains, which they can achieve by holding a diversified investment portfolio (Thomsen and Pedersen, 2000; Aggarwal et al., 2010). Institutional investors might therefore have a strong preference for higher risk-taking by the banks they control as long as net present value is positive. Compared with family, corporate and bank owners, institutional investors usually have an arm's-length relationship with a firm. They are relatively less involved in the decision-making process and rather than spending time and resources to improve the performance of a company, they are more prone to play hit and run strategies (Ingley and Van der walt, 2004). As a result, their influence within a bank they control is likely to be lower compared to that of other controlling owners. However, institutional investors with significant voting power could also shape risk-taking at the bank's level. In terms of shareholder control and expertise in processing information and monitoring managers, such investors have a much stronger influence than atomistic individual investors.

There is no clear theoretical prediction on the risk preferences of banks controlled by other banks. When a bank owns another bank, the important risk-return relationship and strategies are expected to be handled by the parent company, and not at the subsidiary level. On the one hand, banks as shareholders might encourage relatively conservative risk-taking strategies for both safety-net reasons and reputation concerns. On the other hand, banks, especially when they are larger, tend to have diversified portfolios, which may increase their preference to take risk when controlling another bank. Consequently, in terms of their ability to achieve the desired level of risk, insider knowledge of business provides banks with a strong influence on the strategic choices and governance mechanisms to align management with their objectives.

Several studies have found that state ownership of banks leads to inefficiency and poor performance (e.g La Porta et al., 2002). One reason is that management in these state-owned banks sometimes comes under pressure to serve particular political interests. In cross country analyses, Caprio and Martinez-Peria (2000) find evidence that a greater extent of state ownership of banks is associated with a higher likelihood of banking crises in developing countries during the 1980-1995 period. Barth et al. (2004) find that state-owned banks have a higher ratio of nonperforming loans to total loans, but do not find a significant impact of state

ownership on banking crises, bank development and performance as measured by net interest margins and overhead costs. Using bank level data, Berger et al. (2005) and Iannotta et al. (2007) find that state-ownership of banks is associated with relatively high risk taking as measured by the ratio of non-performing loans to total loans, the standard deviation of banks' asset returns, and Z-scores.

Our paper complements the literature on the relationship between bank ownership structure and performance (risk/profitability) by further exploring the linkages between changes in bank ownership type and changes in terms of profitability and risk. We thus investigate banks whose type of ultimate owners have changed and examine how such changes have affected bank risk taking. We also look into how the type of the acquirer influences bank risk-taking and profitability. Rather than investigating ownership structure and ownership changes per se, we explore changes that lead to a different type of ultimate owner or controlling entity<sup>2</sup>. To our knowledge, this is the first paper that analyzes the implications of changes in ownership type on the risk-taking behavior of banks<sup>3</sup> which is an issue of major importance for bank stability.

Working with a panel of listed and non-listed commercial banks from 17 European countries over the 1998-2011 period, we find that banks that experience a change from one type of owner to another type do not on average differ significantly in terms of profitability and risk when compared to banks with stable ownership type. However, the risk and profitability of banks that experience a change in ownership type are significantly affected after a change takes place and the type of new owner plays a significant role in explaining the observed changes. We find that when the acquirer is a non-financial company, the state or an institutional investor, the level of risk increases after the change in the ultimate owner while the level of profitability remains unchanged. Conversely, when the acquirer is a bank, we find that the level of risk-adjusted profitability decreases. Banks acquired by a different type of owner during the global financial crisis do not perform better or worse than they did before.

The remainder of the paper is structured as follows. Section 2 presents the sample and the variables used in the study along with descriptive statistics. Section 3 discusses the method used while section 4 shows the results of our econometric investigation. Section 5 reports robustness checks and discusses further issues. We conclude in section 6.

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<sup>2</sup> We do not consider changes for which the owner's type remains the same (i.e. a family-owned bank is taken over by another family, a bank controlled by a non-financial firm is controlled by another non-financial firm...). Such changes are not expected to alter risk-taking behavior in our framework. Moreover, ownership changes where the owner type remains the same are not observed in our data.

<sup>3</sup> Taboada (2011) investigates the impact of changes in bank ownership structure on the allocation of capital by looking into privatization but not the other dimensions of ownership structure.

## 2. Data, definition of variables and descriptive statistics

### 2.1 Data collection and sample definition

We take annual data from the Bankscope Fitch IBCA database, which provides information on financial statements and ownership structure for financial institutions. We identify 1791 commercial banks in 17 European countries, for which financial data is available over our 1998-2011 study period. To ensure comparability, other entities such as investment banks, savings banks, cooperative banks and other financial intermediaries (insurance companies, mortgage houses etc.) are excluded as their regulatory requirements differ from those of commercial banks (Perera et al., 2007).

Among the 1791 commercial banks, only 1237 have information on ownership. Out of these banks, 998 have an ultimate owner (controlled banks) while 239 are widely-held (non-controlled banks). Among the 998 controlled banks, 742 have the same type of owner (stable ownership type) while 256 banks have experienced changes in the type of their ultimate owner over the study period (see Table 1 for the distribution of banks by country and ownership type).

We also consider a subsample restricted to banks for which financial and ownership information is available for at least 7 consecutive years. This allows us to compute some of our risk measures which require information 3 years before and 3 years after the changes occurred. This subsample consists of 113 banks which experienced a change in their ownership type between 2002 and 2008 and 292 banks which did not experience any change over the same period.

[Insert Table 1]

### 2.2 Bank risk and performance measures

Table 2 provides detailed definitions of all the variables used in our study. We consider several measures of bank risk and performance based on accounting data that are commonly used in the research literature. We compute two standard measures of asset risk: the standard deviation of the return on assets (*SDROA*) and the standard deviation of the return on equity (*SDROE*) both based on a moving three-year window (for year  $t$  we consider year  $t$ , year  $t-1$  and year  $t-2$ ). Higher *SDROA* and *SDROE* indicate higher risk taking. We also consider three credit risk measures: the ratio of non-performing loans to net loans (*NPL*), the ratio of loan loss provisions to net loans (*LLP*) and the ratio of loan loss reserves to net loans

(*LLR*). To measure bank performance, we use both profitability and risk-adjusted profitability variables. We consider both the return on equity (*ROE*) and the return on assets (*ROA*) as profitability measures. Risk-adjusted profitability variables are defined as the ratio of *ROA* to *SDROA* denoted *AJROA* and the ratio of *ROE* to *SDROE* denoted *AJROE*. For our sample of banks with unchanged ownership type over the 2002-2010 period, to allow for computation of risk measures, we only consider banks that provide at least three consecutive years of data.

We also compute all our performance and risk variables by considering for each bank a three-year window before the ownership type change (i.e. t-1, t-2 and t-3 when the change in ownership occurred in t) and a three-year window after the ownership type change (i.e. t+1, t+2 and t+3). To allow comparability across time and countries, these values are normalized, i.e. divided, by their predicted values which are obtained by regressing each measure (risk and performance) on country and time dummies<sup>4</sup>. For example, the normalized standard deviation of the return on assets is obtained by dividing the standard deviation by its predicted value from the regression.<sup>5</sup>

The changes in performance and risk for all the variables (*D*<sub>•</sub>) are computed as the difference between their values on a window three years after the ownership change and a window three years before. For risk measures, we compute standard deviations based on observations in t+1, t+2 and t+3 and subtract the standard deviations computed on observations in t-3, t-2 and t-1. For profitability measures we subtract mean values based on observations in t-3, t-2 and t-1 from mean values computed with observations in t+1, t+2 and t+3

### 2.3 Ownership variables

Information on the ownership structure of banks is from Bankscope and individual bank websites. A shareholder is considered as the ultimate owner if the two following conditions are satisfied: 1) The shareholder holds the largest share with at least 25.01% of total shares, and 2) information about at least one other shareholder, who holds less than 25% of total shares is known. To identify banks whose ownership type changes, we create a dummy variable *Change* which takes the value of one if the bank experienced a change in the type of the ultimate owner between 2002 and 2010 and zero if no change occurs in the type of the ultimate owner. If the change occurs more than once over the study period, we consider

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<sup>4</sup> The predicted values of our risk and performance measure (*Y*) are the fitted values derived from equation:

$$Y = \alpha_0 + \delta_1 \text{Country} + \delta_2 \text{Year} + \varepsilon .$$

the additional change(s) (i.e the second or third change) only when the elapsed time between the changes is at least three years and when the owner controls the bank during at least two consecutive years. We also consider an alternative measure *Change\_After*, which takes the value of one after a change in the type of bank ultimate owner takes place over the 2002-2010 period and zero before or if no change occurs in the type of the ultimate owner. This is to investigate possible differences after the change takes place. We further consider a third measure, *Before\_Change*, which is a dummy that takes the value of one before a change in the type of bank ultimate owner takes place over the 2002-2010 period and zero after or is zero throughout if no change occurs in the type of the ultimate owner. Our aim here is to capture possible differences that could explain the change in ownership in the first place. Eventually, we consider a fourth measure *Change\_Year*, a dummy which takes the value of one the year when the change occurs for banks which experience a change and zero for banks whose ultimate owner type does not change over the study period. This variable allows us to track the exact timing of the observed changes.

In order to capture the changes in the type of the ultimate owner, we consider several categories of acquiring owners: banks, individual/family investors, non financial companies, states, institutional investors, foreign entities, domestic entities. For each category of acquiring owners  $X$ , our measure denoted  $Ch\_X$  is defined as a dummy variable, which takes the value one if  $X$  became the ultimate owner of a bank that was previously owned by another type of owner and zero if otherwise. For example if  $X$  is a bank then  $Ch\_Bank$  is defined as a dummy variable that equals one if a bank became the ultimate owner of a bank that was previously owned by either a family, a company, an institutional investor or a state, and zero otherwise.

## 2.4 Control variables

Several bank-specific control variables are considered. We account for size differences by considering the natural logarithm of total assets,  $LNTA$ . The relationship between bank size and risk is not clear-cut. Larger banks should have greater ability to diversify their asset portfolio and therefore be less risky. Nevertheless, because of the presence of too-big-to-fail policies, larger banks might have higher incentives than small banks to take more risk. Also, large banks appear to be more efficient than small banks, although studies on scale economies in the banking industry are inconclusive (Berger and Humphrey, 1997). Moreover, size appears to reduce funding costs (McAllister and McManus, 1993; Hughes and Mester, 1993). We also account for leverage differences (total equity to total assets ratio,  $EQUITY$ ). A well



capitalized bank will benefit from lower funding costs because its default risk is perceived as lower (Berger, 1995). Furthermore, the risk-shifting incentives induced by deposit insurance decreases with the level of capitalization (Brewer and Mondschean, 1994), and hence the equity to asset ratio is often used as a proxy for managerial risk preferences (Hughes and Mester, 1998). We also control for liquidity differences by using the ratio of liquid assets to total assets (*LIQUID*), diversification differences (net non interest income to total operating income, *NNII*) and managerial efficiency differences (ratio of total operating expenses to total operating income, *CIR*). We further control for possible country-specific effects by including country dummies (*COUNTRY*). Alternatively, we introduce variables to capture the strength of supervisory regime (*REG*) and degree of shareholder protection (*SP*). To account for possible disruptions due to the global financial crisis of 2007-2008, we also include a crisis dummy (*CRISIS*) that takes the value one if the change occurs in the 2007-2008 period and zero, if otherwise. To check the robustness of our estimations we also exclude from our sample the banks that were rescued during the 2007-2008 financial crisis.

[Insert Table 2]

## 2.5 Descriptive statistics

Table 3 presents the distribution of the type of bank ownership changes across all the years covered by our sample. We observe a strong heterogeneity among the different types of changes within each year, which enables us to analyze implications in terms of bank risk and profitability. We observe that the most frequent case is when a bank becomes the ultimate owner by replacing another type of entity (*Ch\_Bank*) and the least frequent cases are privatization (*Ch\_Privatization*), acquisition by a foreign ultimate owner of a bank previously owned by a domestic entity (*Ch\_Foreign*) and acquisition by a domestic ultimate owner of a bank previously owned by a foreign entity (*Ch\_Domestic*). Table 3 also shows that the number of ownership changes (first column) increases from 4 in 2004 to 74 in 2009 and falls to 34 in 2010.

[Insert Table 3]

Table 4 shows the descriptive statistics of the bank risk and performance variables and in addition those of the bank-specific variables. In panel A, we present the descriptive statistics for the full sample available in Bankscope and for the subsample of non-controlled and

controlled banks while in panel B, we present statistics for banks with stable ownership type, with changing ownership type and the latter with reported ownership and financial data for 7 consecutive years. The general descriptive statistics reported in panel B show that banks whose owner's type did not change exhibit lower asset risk (*SDROA*, *SDROE*) but higher credit risk (*NPL*) and are more profitable (*ROA*, *ROE*) than banks whose ultimate owners changed from one type to another type. On the whole, we observe that banks whose ultimate owners did not change from one category to another were seemingly better able to manage their risk by achieving higher risk-adjusted profitability (*ADJROA*, *ADJROE*). We do not find, however, differences for banks with different business models (*LOANS*, *DEPOSIT*, *NNII*), leverage (*EQUITY*) and different managerial efficiency (*CIR*).

[Insert Table 4]

In Table 5, we examine the risk and profitability profiles for banks which experienced a change in the type of their ultimate owner and provide indicators computed after (Column A) and before (Column B) the ownership change. The table shows the indicators for the 113 banks that experienced changes in ownership type and subsamples based on the 10 types of changes for our variables of interest. The level of risk (*SDROA*, *SDROE*) is on average higher after the change occurs. However, the level of profitability (*ROA*) is lower after the ownership change. We also find significant differences in terms of risk-adjusted return (*ADJROA* and *ADJROE*) before and after the changes. On the whole, we observe that changes in the type of the ultimate owner are associated with higher levels of risk-taking without increasing the level of profitability or returns. The results are mainly driven by banks which are acquired by a non-financial firm (*Ch\_Company*) and to lesser extent by banks falling under the control of governments (*Ch\_State*) and institutional investors (*Ch\_Institut*). When we consider the risk and performance profiles of banks that experienced a change in the type of the ultimate owner, as in Table 5, but without normalizing the variables of interest, the results remain unchanged and are even stronger for the full sample.

[Insert Table 5]

In table 6, we report the descriptive statistics of the changes in bank risk/performance after and before the changes in the ultimate owner type. Table 6 reports that more than 50 percent of the European commercial banks that have experienced a change in the type of their

ultimate owner exhibit a higher level of risk after the change while their profitability and risk-adjusted profitability decreases. On average risk increases by 0.86 percent when using  $D\_SDROA$  and 0.30 when considering  $D\_SROE$  after the changes while  $D\_ROA$  drops by 1.36% and  $D\_ROE$  by 0.40% after the changes. The table also shows high heterogeneity in the risk/performance of such banks when looking at the standard deviations while the lowest performance quartile is -1.44 for  $D\_ROA$  and -0.77 for  $D\_ROE$  respectively. This suggests that although, on average, risk increases and profitability decreases after the changes in ultimate owner's type (three-year window), some banks appear to fare worse or are more affected than others. This cross variation in the change in risk allows to test whether changes in ownership characteristics affect bank risk taking behavior and performance strategies and if the nature of the acquiring owner matters in such a relationship.

[Insert Table 6]

### 3. Econometric Methodology

This paper examines how changes in the owner's type of European banks affect their risk taking behavior and performance. In this section, we present an econometric analysis that addresses three key questions:

1. Are there differences in terms of risk and profitability among banks which were acquired by a different type of owner over the 2002-2010 period and banks which were continuously owned by the same type of owner?
2. Are there differences in risk before and after the change in the type of the ultimate owner for banks that experienced a change in the type of owner?
3. Does the type of the acquiring owner (bank, individual/ family, non-financial company, institutional investor, foreign entity, domestic entity) matter in explaining changes in bank risk taking?

First, to test whether banks with a stable ownership type behave differently in terms of risk and performance than banks that experience a change in ownership type, we estimate the model given by equation (1):

$$Y_{it} = \delta_0 + \delta_1 Change_{it} + \sum \beta \cdot ControlVariables + \varepsilon_{it} \quad (1)$$

Where  $Y_{it}$  is either a performance or a risk measure computed on the basis of a three-year rolling window (for each year  $t$  we consider  $t$ ,  $t-1$  and  $t-2$ ). Performance is measured either by profitability ( $ROA$ ,  $ROE$ ) or risk-adjusted profitability ( $AJROA$ ,  $AJROE$ ). Risk is measured by either  $SDROA$ ,  $SDROE$ ,  $LLP$ ,  $NPL$  or  $LLR$ . The change variable ( $Change$ ) is a dummy that takes the value one if the type of the bank ultimate owner changes over the 2002-2010 period, and zero if otherwise. We also consider an alternative measure  $Change\_After$  which takes the value of one after a change in the type of the ultimate owner takes place over the 2002-2010 period and zero before or if no change occurs in the type of the ultimate owner. We further consider a third measure  $Before\_Change$ , a dummy which takes the value of one before a change in the type of bank ultimate owner takes place over the 2002-2010 period and zero after or if no change occurs in the type of the ultimate owner.  $ControlVariables$  is a vector of bank specific variables or country level variables as described in Table 2.

Second, we estimate equation (2) to analyze whether changes in ownership type lead to changes in the level of risk/performance.

$$D\_Z_{it} = \delta_0 + \delta_1 Change\_Year_{it} + \sum \beta . ControlVariables + \varepsilon_{it} \quad (2)$$

Where  $D\_Z_{it}$  is either the difference between the average level of profitability over the 3 years subsequent to the change ( $t+1$ ,  $t+2$ ,  $t+3$ ) and the average profitability 3 years before ( $t-1$ ,  $t-2$ ,  $t-3$ ) or the difference between risk and risk-adjusted profitability on a three-year window after and a three-year window before. In equation (2), the means and standard deviations are computed on the basis of  $t+1$ ,  $t+2$  and  $t+3$  (after) and  $t-1$ ,  $t-2$  and  $t-3$  (before). A positive value of  $\delta_1$  indicates higher risk/performance after a change in the type of the ultimate owner and in contrast, a negative value indicates lower risk/performance after a change in the type of the ultimate owner. We note that there is one measure of  $D\_Z$  for each bank  $i$  which experienced a change in ultimate owner type over our study period. For banks with the same type of ultimate owner throughout our study period, the calculation of the change in risk taking/performance is similar to  $D\_Z$  i.e the difference between the means (and standards deviations) of our profitability/ risk measure on a three-year window after (for year  $t$  we consider year  $t+1$ , year  $t+2$  and year  $t+3$ ) and on a three-year window before (for year  $t$  we consider year  $t-3$ , year  $t-2$  and year  $t-1$ ). For banks whose ownership type never changes, the dependent variable is annually introduced in the model based on the difference between the means (and standards deviations) of our profitability/ risk measure on a three-year window

after (for year  $t$  we consider year  $t+1$ , year  $t+2$  and year  $t+3$ ) and on a three-year window before (for year  $t$  we consider year  $t-3$ , year  $t-2$  and year  $t-1$ ). Consequently, our *Change\_Year* dummy takes the value of one the year when the change occurs for banks which experience a change and zero for banks whose ultimate owner type does not change over the study period.

Third, we also investigate whether the nature of the change in the ultimate owner's type influences banks' risk taking behavior and performance strategies differently according to the type of the acquiring ultimate owner. For this purpose, we use the model shown in equation (3):<sup>6</sup>

$$D_{-}Z_{it} = \delta_0 + \delta_1 Ch\_Bank + \delta_2 CH\_Family + \delta_3 CH\_Insitut + \delta_4 CH\_State + \delta_5 CH\_Company + \sum \beta . ControlVariables + \varepsilon_{it} \quad (3)$$

#### 4. Results

We use panel estimation techniques with random specific effects to estimate equation (1). The results are presented in Table 7. We do not find any significant difference between the two types of banks when considering performance, risk and risk-adjusted profitability measures throughout the sample period (*Change*). However, when considering the *Change\_After* variable we find that banks which experience a change in ownership type exhibit higher risk (*SDROA*) than other banks while their risk-adjusted profitability (*AJROA*) is lower (although at 10 % significance level only). Hence, banks whose ownership type changes appear to be riskier than other banks but only after the change takes place. Moreover, such a difference cannot be observed before the changes take place as indicated by the absence of any significance of the *Before\_Change* variable. Hence, changes in ownership type can apparently not be explained by differences in risk or by lower profitability and/or risk-adjusted profitability and hence by their ability or not to optimize their portfolio risk-return.

[Insert Table 7]

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<sup>6</sup> There is some overlap between ownership type change and controlling country change (Foreign vs. Domestic). Therefore, in order to avoid singularity, we remove *Ch\_bank\_private*, *Ch\_privatization*, *Family\_Ch*, *Ch\_Domestic*, *Ch\_Foreign* in the estimates of equation (3). That is, we consider only 5 types of ownership changes instead of the 10 types described in Table 2.

We use the Ordinary Least Square (OLS) to estimate Equations (2) and (3) corrected for heteroskedasticity following White's methodology. The results are presented in Table 8. The regression findings show differences in bank risk-taking (asset risk) following the change in the ultimate owner's type. Our result indicates that while banks which experienced a change in the type of entity that controls them are more risky after the change than before ( $D\_SROA$  and  $D\_SROE$ ), they are not found to perform better after the change takes place. They are even performing more poorly than before as indicated by the negative sign of the coefficients of the change in ROA ( $D\_ROA$ ) and of the change in risk adjusted profitability ( $D\_AJROA$ ), respectively, (although at the 10% significance level only). Such results highlight that such banks engage in riskier activities are not eventually rewarded by higher profitability.

When considering equation (3), we find that the nature of the acquirer matters in explaining the changes in profitability and risk. When the acquirer is a non-financial company ( $Ch\_Company$ ) or an institutional investor ( $Ch\_Institut$ ), the level of risk increases while the level of profitability and risk-adjusted profitability remains unchanged. Moreover, when the acquirer is the state, the level of risk increases while the level of profitability measured by  $D\_ROA$  decreases (although at the 10% level only). We do not find any significant difference in terms of risk and profitability after a family acquires a bank. Moreover, when the acquirer is another bank, the results show that the level of risk-adjusted profitability decreases after the change in the type of the ultimate owner. These results are consistent with our hypothesis that a change in the type of the ultimate owner is associated with changes in risk-taking behavior and/or performance strategies depending on the nature of the acquiring owner.

[Insert Table 8]

## 5. Robustness check and further issues

In this section, we check the robustness of our regression results and examine further issues.<sup>7</sup> First, we focus on the subsample of 113 banks that allows us to isolate the banks which fell under the control of a different type of ultimate owner and for which the data is reported exhaustively for at least 7 years. When focusing on this subsample, the results regarding our variables of interest remain identical. We find that when the acquirer is a non-

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<sup>7</sup> Estimates for the robustness tests which are not shown here are available from the authors on request.

financial company, a state or an institutional investor the level of risk increases after the changes in the type of the ultimate owner.

Second, we run separate regressions introducing our ownership change variables one by one along with the control variables on the full sample. The results for our main variables of interest remain unchanged. In addition, we run separate regressions introducing our ownership change variables one by one along with the control variables on the subsample of 113 banks. The results regarding our main variables of interest still hold except when a bank is acquired/controlled by another bank. We find that, when the acquirer is another bank, the level of risk decreases while profitability increases (although at the 10% level only) after the change in the type of the ultimate owner. Such a result is consistent with the views that banks as acquirers are better in managing risk because of their comparative advantage in risk management compared with other acquirers.

Third, we further investigate whether the global financial crisis affects the relationship between changes in owner's type and risk. For this purpose, we interact our changes in ownership type variables with *CRISIS* in equations (2) and (3). Alternatively, we estimate equations (2) and (3) on a subsample limited to the years 2007 and 2008. Our results indicate that, during the crisis, banks which switch from one type of owner to another do not perform better or worse than they did before (see table 9). To check for robustness, we exclude from our estimations the banks that were rescued<sup>8</sup> during the global financial crisis of 2007-2008. The results regarding our variables of interest remain identical.

## 6. Conclusion

The objective of this paper was threefold: first, to analyze whether banks that are acquired by an entity of a different type than the one in place before acquisition (bank, individual/ family, non-financial company, institutional investor, foreign entity, domestic entity) behave differently, in terms of risk and performance, than banks whose owner's type remains identical ; second to examine whether the risk and performance of banks whose owner's type changes are different before and after the change ; and third to examine the role played by the type of the acquirer and the global financial crisis of 2007-2008 on the relationship between changes in owner type and changes in risk and performance.

Working with a panel of European commercial banks, we do not find significant differences in terms of risk and risk-adjusted profitability between banks with changing

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<sup>8</sup> Due to limited observations, we are not able to run the regressions on the rescued banks solely. The information on rescued banks comes from Petrovic and Tutsch (2009).

ownership type and those characterized by stable ownership type. However, after the change occurs, banks which experience a change in ownership type take more risk without increasing their profitability. This suggests that although such banks engage in riskier activities, they are not eventually rewarded with higher profits.

Analyzing whether the nature of the acquirer matters in explaining the changes in profitability and risk, we find that when the acquirer is a financial company, the state or an institutional investor, the level of risk increases but profitability is unaffected after the change takes place. Conversely, when the acquirer is another bank, we find that the level of risk-adjusted profitability decreases after the change in the type of ultimate owner. Our findings indicate that the type of the acquirer matters in explaining changes in profitability and risk.

Looking more closely at the changes that occurred during the global financial crisis (2007 and 2008) we find that banks that were acquired by a different type of owner do not perform better or worse than they did before.

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Table 1. Distribution of European commercial banks by country over the 1998-2011 period

Country	Full sample of commercial banks in BankScope	Our sample of commercial bank	Not-controlled banks	Controlled banks	Stable ownership type banks	Changing ownership type banks
Austria	91	70	18	52	30	22
Belgium	56	34	7	27	19	8
Denmark	68	17	6	11	8	3
Finland	12	7	2	5	4	1
France	241	192	40	152	116	36
Germany	249	183	42	141	97	44
Greece	20	16	4	12	8	4
Ireland	44	36	9	27	23	4
Italy	216	137	14	123	105	18
Luxembourg	125	96	16	80	58	22
Netherlands	55	44	11	33	16	17
Norway	24	10	1	9	7	2
Portugal	34	20	2	18	13	5
Spain	99	64	19	45	33	12
Sweden	27	13	2	11	10	1
Switzerland	218	136	25	111	88	23
United Kingdom	212	162	21	141	107	34
<b>TOTAL</b>	<b>1791</b>	<b>1237</b>	<b>239</b>	<b>998</b>	<b>742</b>	<b>256</b>

Table 2. Variables definitions

Variables	Definition
<b>Dependent variables</b>	
<i>ROA</i>	Return on Average Assets
<i>ROE</i>	Return on Average Equity
<i>SDROA</i>	Standard deviation of return on assets' rolling window over 3 years (current year and 2 previous consecutive years)
<i>SDROE</i>	Standard deviation of return on assets' rolling window over 3 years (current year and 2 previous consecutive years)
<i>NPL</i>	The ratio of Nonperforming loans to Net Loans
<i>LLP</i>	The ratio of Loan Loss Provision to Net Loans
<i>LLR</i>	The ratio of Loan Loss Reserves to Net Loans
<i>AJROA</i>	<i>ROA/SDROA</i>
<i>AJROE</i>	<i>ROE/SDROE</i>
<i>D_ROA</i>	Changes in <i>ROA</i> which equal the difference between the average level of <i>ROA</i> over the 3 years after changes in the ultimate owner (t+1, t+2, t+3) and the average <i>ROA</i> 3 years before (t-3, t-2, t-1).
<i>D_ROE</i>	Changes in <i>ROE</i> which equal the difference between the average level of <i>ROE</i> 3 years after changes in the ultimate owner (t+1, t+2, t+3) and the average level of <i>ROE</i> 3 years before (t-3, t-2, t-1).
<i>D_SDROA</i>	Changes in <i>SDROA</i> which equal the difference between the <i>SDROA</i> 3 years after changes in the ultimate owner (t+1, t+2, t+3) and 3 years before (t-3, t-2, t-1).
<i>D_SDROE</i>	Changes in <i>SDROE</i> which equal the difference between the <i>SDROE</i> 3 years after changes in the ultimate owner (t+1, t+2, t+3) and 3 years before (t-3, t-2, t-1).
<i>D_AJROA</i>	Changes in <i>AJROA</i> which equal the difference between the <i>AJROA</i> 3 years after changes in the ultimate owner (t+1, t+2, t+3) and 3 years before (t-3, t-2, t-1).
<i>D_AJROE</i>	Changes in <i>AJROE</i> which equal the difference between the <i>AJROE</i> 3 years after changes in the ultimate owner (t+1, t+2, t+3) and 3 years before (t-3, t-2, t-1).
<b>Banks ownership variables</b>	
<i>Change</i>	A dummy variable that equals 1 if the type of bank ultimate owner changed at least once between 2002 & 2010, and zero otherwise.
<i>Before_change</i>	A dummy variable that equals 1 before a change in the type of bank ultimate owner over 2002-2010 period and zero otherwise.
<i>Change_After</i>	A dummy variable that equals 1 after a change in the type of bank ultimate owner over 2002-2010 period and zero otherwise.
<i>Change_Year</i>	A dummy variable that takes the value of 1 the year when the change occurs for banks which experience a change and zero for banks whose ultimate owner type does not change over the study period.
<i>Ch_Bank</i>	A dummy variable that equals 1 if bank became the ultimate owner of a bank that was previously owned by either family, non-financial company, institutional investor or state, and zero otherwise.
<i>Ch_bank_private</i>	A dummy variable that equals 1 if bank became the ultimate owner of a bank that was previously owned by another private shareholder (non state owned), and zero otherwise.
<i>Ch_Family</i>	A dummy variable that equals 1 if bank became the ultimate owner of a bank that was previously owned by either bank, non-financial company, institutional investor or state, and zero otherwise.
<i>Family_Ch</i>	A dummy variable that equals 1 if family owned bank is acquired by another type of owner, and zero otherwise.
<i>Ch_State</i>	A dummy variable that equals 1 if bank became the ultimate owner of a bank that was previously owned by either bank, non-financial company, institutional investor or family, and zero otherwise.
<i>Ch_Privatization</i>	A dummy variable that equals 1 if state owned bank is acquired by another type of owner, and zero otherwise.
<i>Ch_Company</i>	A dummy variable that equals 1 if non-financial company became the

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	ultimate owner of a bank that was previously owned by either bank, state, institutional investor or family , and zero otherwise
<i>Ch_Institut</i>	A dummy variable that equals 1 if bank became the ultimate owner of a bank that was previously owned by either bank, non-financial company, state or family , and zero otherwise
<i>Ch_Foreign</i>	A dummy variable that equals 1 if foreign investor(s) became the ultimate owner(s) of a bank that was previously domestic-owned , and zero otherwise
<i>Ch_Domestic</i>	A dummy variable that equals 1 if domestic-owned bank became the ultimate owner of a bank that was previously foreign-owned , and zero otherwise
<b>Bank-level variables</b>	
<i>LNTA</i>	Logarithm of total assets
<i>LIQUID</i>	Ratio of liquid asset to total assets
<i>EQUITY</i>	Ratio of equity to total assets
<i>CIR</i>	Cost to income ratio
<i>NNII</i>	Ratio non-interest income to total operating income
<b>Country-level and other variables</b>	
<i>CRISIS</i>	Dummy equal to one if the changes occur in 2007 and 2008 and Zero otherwise
<i>REG</i>	Index measuring the strength of supervisory regime. The yes/no responses to the following questions are coded as 1/0: (1) Does the supervisory agency have the right to meet with external auditors to discuss their report without the approval of the bank? (2) Are auditors required by law to communicate directly to the supervisory agency any presumed involvement of bank directors or senior managers in elicit activities, fraud, or insider abuse? (3) Can supervisors take legal action against external auditors for negligence? (4) Can the supervisory authority force a bank to change its internal organizational structure? (5) Are off-balance sheet items disclosed to supervisors? (6) Can the supervisory agency order the bank's directors or management to constitute provisions to cover actual or potential losses? (7) Can the supervisory agency suspend directors' decision to distribute: (a) Dividends? (b) Bonuses? (c) Management fees? (8) Can the supervisory agency legally declare-such that this declaration supersedes the rights of bank shareholders-that a bank is insolvent? (9) Does the Banking Law give authority to the supervisory agency to intervene that is, suspend some or all ownership rights-a problem bank? And (10) Regarding bank restructuring and reorganization, can the supervisory agency or any other government agency do the following: (a) Supersede shareholder rights? (b) Remove and replace management? (c) Remove and replace directors? A higher value indicates wider and stronger authority for bank supervisors. Source: Barth et al. (2006, 2009)
<i>SP</i>	SP is an index of anti-director rights for the country and is ranged from 0 for the country with the greatest shareholder right to 6 for the poorest right. The index is added one point when (a) the country allows shareholders to mail their proxy vote; (b) shareholders are not required to deposit their shares prior to the General Shareholders' Meeting; (c)cumulative voting or proportional representation of minorities on the board of directors is allowed; (d) an oppressed minorities mechanism is in place; (e) the minimum percentage of share capital that entitles a shareholder to call for an extraordinary shareholders' meeting is less than or equal to 10 percent (the sample median); or (f) when shareholders have preemptive rights that can only be waived by a shareholders meeting. Source: Djankov et al. (2008)

SOURCE: All variables are the authors' calculations from Banksourc data except where indicated.

Table 3. Distribution of changes in ownership type

YEAR	<i>Change</i>	<i>Ch_Bank</i>	<i>Ch_bank_private</i>	<i>Family_Ch</i>	<i>Ch_Family</i>	<i>Ch_Company</i>	<i>Ch_State</i>	<i>Ch_Institut</i>	<i>Ch_Privatization</i>	<i>Ch_Foreign</i>	<i>Ch_Domestic</i>
2001											
2002	15	2	2	0	4	2	2	3	0	4	0
2003	14	6	5	1	0	2	3	1	1	1	0
2004	4	1	1	1	1	1	4	1	0	0	1
2005	53	30	26	7	4	9	0	3	4	3	3
2006	62	25	22	10	8	23	1	3	6	5	3
2007	73	26	24	12	7	16	8	16	3	3	2
2008	36	5	5	4	3	8	11	4	1	3	3
2009	74	26	23	6	11	10	16	11	7	5	2
2010	34	9	5	3	2	13	8	2	5	0	1
Total	365	130	113	44	40	84	53	44	27	24	15

Variable definitions : *Change*= dummy variable that equal 1 if the type of bank ultimate owner changed at least once between 2002 & 2010, and zero otherwise ; *Ch\_Bank*: a bank became the ultimate owner of a bank that was previously owned by another type of entity (either family, company, institutional investor or state); *Ch\_bank\_private*: a bank became the ultimate owner of a bank that was previously owned by another private shareholder (non state owned); *Family\_Ch* : a family became the ultimate owner of a bank that was previously owned by another type of owner; *Ch\_Family*: a family-owned bank is acquired by another type of owner; *Ch\_Company*: non-financial company became the ultimate owner of a bank that was previously owned by another type of owner; *Ch\_State*: state became the ultimate owner of a bank that was previously owned by another type of owner; *Ch\_Institut*: institutional investor became the ultimate owner of a bank that was previously owned by another type of owner; *Ch\_Privatization*: state-owned bank is acquired by another type of owner.; *Ch\_Foreign*: foreign investor(s) became the ultimate owner(s) of a bank that was previously domestic-owned; *Ch\_Domestic*: domestic-owned bank became the ultimate owner of a bank that was previously foreign-owned.

Table 4. Descriptive statistics for European commercial banks, average over the 1998-2011 period

	LOANS	DEP	EQUITY	CIR	LLP	NPL	ROA	ROE	LIQUID	OBS	ASSETS	NII	NNII	SDROA	SDROE	AJROA	AJROE
Panel A . Full sample																	
Full sample of commercial banks available in Bankscope (1791 banks)																	
Mean	47,55	70,65	13,748	67,156	0,834	4,886	0,752	7,576	29,359	33,4264	22421,46	57,056	42,645	0,757	5,572	5,623	6,6324
STD	99,97	99,23	100	300	75	71,43	73,01	98,46	158,92	13117,6	2202423	296,05	282,47	55,2	82,71	441,9	3514,2
Our sample of commercial banks (1237)																	
Mean	46,73	71,34	12,49	64,66	0,85	4,47	0,90	8,65	30,72	32,55	24285,82	54,82	44,96	0,73	5,84	5,25	6,69
STD	30,11	22,36	15,32	28,98	4,36	6,35	3,14	14,83	28,03	137,59	113962,30	34,26	34,02	2,09	7,79	12,92	58,36
Controlled banks (998 banks)																	
Mean	47,39	70,89	12,15	63,74	0,88	4,25	0,89	8,79	30,65	32,71	27994,72	55,19	44,61	0,65	5,63	5,36	7,25
STD	30,17	22,41	14,96	28,64	4,20	6,25	3,00	14,64	28,04	146,19	125500,40	34,82	33,95	1,74	7,36	12,52	67,12
Not controlled banks (239 banks)																	
Mean	54,44	67,70	14,13	67,82	0,92	3,31	0,69	6,41	23,35	31,24	49892,31	59,25	40,75	0,76	5,16	6,44	7,49
STD	99,95	98,21	100,00	300,00	66,30	29,38	19,25	83,33	100,00	2060,53	2202423,00	296,05	177,68	22,14	71,35	169,74	548,07
Panel B. Stable and changing ownership type banks																	
Stable ownership type banks (742 banks)																	
Mean	47,63	70,82	12,67	62,61	0,74	4,28	0,99	9,15	31,47	35,02	23100,11	55,61	44,39	0,58	5,19	5,49	5,41
STD	99,94	97,75	100,00	270,71	60,94	65,31	60,26	98,46	100,00	5888,63	2150536,00	282,28	224,08	15,84	71,90	266,09	455,93
changing ownership type banks (256 banks)																	
Mean	46,06	69,82	12,00	69,06	0,85	3,25	0,66	7,43	29,93	24,85	29440,36	50,75	48,07	0,78	7,40	4,08	6,77
STD	28,85	22,77	12,43	33,77	4,02	3,93	2,56	18,95	26,57	85,35	123928,00	39,45	34,71	1,24	9,55	9,24	32,68
changing ownership type banks with 7 consecutive years (113 banks)																	
Mean	44,21	70,70	11,37	62,04	0,56	3,07	1,21	10,85	32,23	24,94	14675,24	55,90	44,10	0,61	5,28	4,48	12,59
STD	28,21	23,17	11,27	26,65	2,03	4,18	2,44	15,59	28,65	44,12	65742,77	31,44	31,44	0,94	7,30	4,85	51,98

Variable definitions (all variables are expressed in percentage except *ASSETS* which is in million of euros): *LOANS* = net loans/total assets; *DEP* = deposits/total assets; *EQUITY* = equity/total assets; *CIR* = total operating expenses/total operating income; *LLP* = loan loss provision/net loans; *NPL* = non performing loans/net loans; *ROA* = return on average assets; *ROE* = return on average equity; *LIQUID* = liquid assets/total assets; *OBS* = off balance sheet/ total assets; *TA* = total assets (millions Euros); *NII* = net interest income/ total operating income; *NNII* = net non interest income/total operating income; *SDROA* = standard deviation of the 3-year rolling windows *ROA*; *SDROE* = standard deviation of the of the 3-year rolling windows *ROE*; *AJROA* = *ROA/SDROA*; *AJROE* = *ROE/SDROE*.

Table 5. Risk and performance: three-year windows before (A) and after (B) the change

RISK	Change_Year		Ch_Bank		Ch_bank_private		Family_Ch		Ch_Family		Ch_Company		Ch_State		Ch_Institut		Ch_Privatization		Ch_Foreign		Ch_Domestic	
	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B	A	B
SDROA(a,b)	1,67	0,81	1,68	0,81	1,75	0,81	1,16	0,87	1,40	1,28	1,88	0,72	1,85	0,80	1,54	0,51	3,12	0,74	0,84	0,51	2,17	0,28
	1,87*		0,75		0,76		0,63		0,13		2,19**		1,81*		1,90*		1,33		1,39		3,06**	
SDROE(a,b)	1,13	0,82	0,80	0,82	0,82	0,79	1,34	1,09	0,88	1,11	1,51	0,66	1,46	0,86	1,49	0,83	0,97	0,88	1,79	1,08	1,40	0,41
	1,83*		-0,10		0,15		0,38		-0,40		2,07**		1,43		1,15		0,10		0,68		1,56	
ROA(a,b)	0,61	1,97	0,89	0,66	0,87	0,68	1,57	6,50	0,82	0,16	0,30	3,84	0,14	1,81	-	3,90	-0,66	0,29	-	1,00	0,29	-1,73
	-2,04**		0,52		0,41		-1,22		0,43		-1,76*		-1,63		-1,51		-0,85		-1,33		0,80	
ROE(a,b)	0,72	1,10	1,05	1,07	1,06	1,11	1,38	1,51	0,23	0,10	0,64	1,13	0,34	1,15	0,16	2,01	0,33	0,29	-	0,81	0,71	1,10
	-1,55		-0,04		-0,11		-0,19		0,18		-1,82*		-1,49		-1,14		0,11		-0,80		--0,55	
AJROA(a,b)	0,61	1,30	0,75	1,85	0,78	1,98	0,48	1,29	0,46	0,78	0,54	0,88	0,28	1,09	0,59	1,36	0,26	0,19	0,11	1,62	0,13	2,13
	-2,72***		-2,01**		-2,08**		-1,31		-0,89		-0,70		-1,92*		-1,45		0,47		-1,22		-2,27*	
AJROE(a,b)	1,06	1,36	1,71	1,94	1,79	2,05	1,15	2,51	0,62	0,67	0,95	1,44	0,22	0,52	0,33	1,08	0,53	0,39	0,71	0,47	0,32	1,53
	-0,61		-0,19		-0,20		-1,03		-0,13		-0,68		-0,91		-1,12		0,55		0,55		-0,99	

A : before the change in ownership type; B: after the change in ownership type.

Variable definitions : SDROA(a,b)= standard deviation of ROA 3 years after the change and 3 years before the change; SDROE(a,b) = standard deviation of ROE 3 years after the change and 3 years before the change ; ROA(a,b) = return on average assets; ROE(a,b) = return on average equity ; AJROA(a,b)= ROA(a,b)/SDROA(a,b); AJROE(a,b)= ROE(a,b)/SDROE(a,b); Change\_Year= dummy variable that takes the value of 1 the year when the change occurs for banks which experience a change and zero for banks whose ultimate owner type does not change over the study period.; Ch\_bank is a dummy variable that is equal to one if a bank acquired a bank that was previously owned by another type of shareholder and zero otherwise; Ch\_Bank: a bank became the ultimate owner of a bank that was previously owned by another type of entity (either family, company, institutional investor or state); Ch\_bank\_private: a bank became the ultimate owner of a bank that was previously owned by another private shareholder (non state owned; Family\_Ch : a family became the ultimate owner of a bank that was previously owned by another type of owner; Ch\_Family: a family-owned bank is acquired by another type of owner; Ch\_Company: non-financial company became the ultimate owner of a bank that was previously owned by another type of owner; Ch\_State: state became the ultimate owner of a bank that was previously owned by another type of owner; Ch\_Institut: institutional investor became the ultimate owner of a bank that was previously owned by another type of owner; Ch\_Privatization: state-owned bank is acquired by another type of owner.; Ch\_Foreign: foreign investor(s) became the ultimate owner(s) of a bank that was previously domestic-owned; Ch\_Domestic: domestic-owned bank became the ultimate owner of a bank that was previously foreign-owned.

Table 6. Descriptive statistics on the change in bank performance and risk for banks with a change in ownership type

stats	<i>D_SDROA</i>	<i>D_SDROE</i>	<i>D_ROA</i>	<i>D_ROE</i>	<i>D_AJROA</i>	<i>D_AJROE</i>
mean	0,86	0,30	-1,36	-0,40	-0,67	-0,30
p50	0,08	-0,01	-0,16	-0,18	-0,31	-0,09
p25	-0,08	-0,39	-1,44	-0,77	-1,17	-0,54
p75	0,81	0,79	0,57	0,36	0,24	0,30
sd	4,71	1,40	6,59	2,06	2,41	2,77
min	-9,44	-4,33	-57,05	-14,16	-13,48	-18,16
max	45,79	5,97	12,32	6,17	10,99	11,02
N	113	108	113	108	108	103

Variable definitions : *D\_SDROA*= difference between the standard deviation of ROA 3 years after the change and 3 years before the change; *D\_SDROE*= difference between the standard deviation of ROE 3 years after the change and 3 years before the change ; *D\_ROA* = difference between the return on average assets 3 years after the change and 3 years before the change; *D\_ROE* = difference between the return on average equity 3 years after the change and 3 years before the change; *D\_AJROA*= difference between AJROA 3 years after the change and 3 years before the change ; *D\_AJROE*= difference between AJROE 3 years after the change and 3 years before the change.

Table 7 Stable and changing ownership type and risk/performance, Equation (1)

	<i>ROA</i>	<i>ROE</i>	<i>SDROA</i>	<i>SDROE</i>	<i>AJROA</i>	<i>AJROE</i>	<i>NPL</i>	<i>LLP</i>	<i>LLR</i>
<i>Change</i>	-0.180 (-1.19)	-0.692 (-0.88)	0.116 (1.51)	0.364 (0.82)	-0.630 (-0.78)	8.349 (1.17)	0.0976 (0.13)	0.0853 (0.39)	1.907 (1.43)
<i>Before_change</i>	0.0409 (0.26)	0.224 (0.23)	-0.0234 (-0.24)	-0.326 (-0.48)	0.564 (0.62)	13.65 (0.93)	0.661 (1.26)	0.402 (0.87)	2.397* (1.75)
<i>Change_After</i>	-0.0917 (-0.56)	-0.872 (-0.82)	0.174** (2.47)	0.725 (1.08)	-1.561* (-1.76)	0.0176 (0.00)	-0.558 (-1.16)	-0.293 (-0.89)	-0.453 (-0.45)
<i>Controls</i>	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
N	2073	2066	1737	1724	1720	1706	779	1792	257

Variable definitions: *Change*= dummy variable that equal 1 if the type of bank ultimate owner changed at least once between 2002 & 2010, and zero otherwise ;*Before\_Change* = dummy variable that equal 1 before a change in the type of bank ultimate owner over 2002-2010 period and zero otherwise; *Change\_After* = dummy variable that equal 1 after a change in the type of bank ultimate owner over 2002-2010 period and zero otherwise; *ROA* = return on average assets; *ROE*= return on average equity; *SDROA*= standard deviation of the 3-year rolling windows *ROA*; *SDROE* = standard deviation of the of the 3-year rolling windows *ROE*; *AJROA*= *ROA*/*SDROA*; *AJROE*= *ROE*/*SDROE*; *LLP* = loan loss provision/net loans; *NPL*= non performing loans/net loans; *LLR*= loan loss reserve/net loans; *Controls* is a vector of bank specific variables or country level variables.



Table 8. The impact of changes of ownership type on risk/performance, Equations (2) and (3)

	(2)	(3)	(2)	(3)	(2)	(3)	(2)	(3)	(2)	(3)	(2)	(3)
	<i>D_SROA</i>	<i>D_SROA</i>	<i>D_SROE</i>	<i>D_SROE</i>	<i>D_ROA</i>	<i>D_ROA</i>	<i>D_ROE</i>	<i>D_ROE</i>	<i>D_AJROA</i>	<i>D_AJROA</i>	<i>D_AJROE</i>	<i>D_AJROE</i>
<i>Change_Year</i>	0.931*		0.479***		-1.401*		-0.000765		-0.581*		-0.0230	
	(1.72)		(2.95)		(-1.71)		(-0.00)		(-1.67)		(-0.06)	
<i>Ch_Bank</i>		1.112		0.0142		0.0522		0.223		-1.318**		0.267
		(0.77)		(0.08)		(0.08)		(0.42)		(-2.05)		(0.49)
<i>Ch_Family</i>		0.276		0.162		-0.346		0.561		-0.238		-0.0110
		(0.42)		(0.86)		(-0.39)		(0.87)		(-0.81)		(-0.02)
<i>Ch_Company</i>		0.822**		1.045***		-3.123		-0.302		-0.0253		-0.219
		(2.30)		(2.67)		(-1.30)		(-0.72)		(-0.04)		(-0.23)
<i>Ch_State</i>		1.074**		0.824*		-1.929*		0.148		-0.499		-0.154
		(2.14)		(1.66)		(-1.86)		(0.14)		(-0.97)		(-0.37)
<i>ch_invest</i>		1.475***		0.990*		-3.824		-1.155		-0.417		-0.836
		(2.71)		(1.94)		(-1.33)		(-0.56)		(-0.61)		(-1.01)
<i>LIQUID</i>	-0.00324	-0.00297	-0.000466	-0.0000934	0.000786	-0.000448	0.00353	1.00306	-0.000913	-0.000898	0.00206	0.00196
	(-1.07)	(-0.95)	(-0.23)	(-0.04)	(0.10)	(-0.06)	(0.85)	(0.75)	(-0.21)	(-0.20)	(0.69)	(0.66)
<i>NNII</i>	-0.0107	-0.0110	-0.00115	-0.00159	-0.00948	-0.00764	0.0170	0.0178	0.00842	0.00811	-0.00262	-0.00232
	(-1.59)	(-1.61)	(-0.42)	(-0.58)	(-0.51)	(-0.41)	(1.42)	(1.46)	(1.43)	(1.34)	(-0.40)	(-0.34)
<i>EQUITY</i>	0.0346**	0.0346**	0.00443	0.00435	-0.0339*	-0.0338*	-0.0307	0.0309	-0.00786	-0.00792	0.0149	0.0148
	(2.01)	(2.00)	(1.03)	(1.02)	(-1.91)	(-1.91)	(-1.64)	(-1.64)	(-1.08)	(-1.09)	(1.47)	(1.46)
<i>LNTA</i>	0.0899	0.0891	0.0714**	0.0745**	-0.334	-0.343	-0.589	-0.591	-0.0927	-0.0887	-0.00851	-0.0106
	(1.09)	(1.06)	(2.19)	(2.29)	(-1.31)	(-1.34)	(-1.56)	(-1.57)	(-1.30)	(-1.23)	(-0.06)	(-0.07)
<i>CIR</i>	0.00649	0.00658	-0.000310	-0.0000782	0.0204	0.0197	-0.00263	1.00290	0.00416	0.00426	0.00572*	0.00566
	(0.77)	(0.78)	(-0.10)	(-0.03)	(1.45)	(1.38)	(-0.55)	(-0.59)	(1.34)	(1.37)	(1.69)	(1.64)
<i>CRISIS</i>	-0.0219	-0.0235	-0.0525	-0.0571	-0.186	-0.172	0.588	0.592	0.0966	0.0952	-0.181	-0.181
	(-0.32)	(-0.33)	(-1.54)	(-1.64)	(-0.51)	(-0.46)	(1.26)	(1.25)	(0.58)	(0.56)	(-1.18)	(-1.17)
<i>SP</i>	-0.0125	-0.0147	-0.0417*	-0.0437**	0.0220	0.0257	0.0402	0.0401	-0.0272	-0.0253	0.00173	0.00177
	(-0.29)	(-0.34)	(-1.93)	(-2.00)	(0.47)	(0.54)	(0.86)	(0.86)	(-0.43)	(-0.40)	(0.04)	(0.04)
<i>REG</i>	-0.0447	-0.0506	-0.0396	-0.0624	-0.550	-0.465	-1.647**	1.622**	-0.739**	-0.757**	0.227	0.246
	(-0.20)	(-0.23)	(-0.39)	(-0.61)	(-0.80)	(-0.68)	(-2.25)	(-2.20)	(-2.50)	(-2.53)	(0.72)	(0.77)
<i>_cons</i>	-0.616	-0.580	0.183	0.208	2.951**	2.874**	0.589	0.574	0.186	0.162	0.145	0.152
	(-0.66)	(-0.61)	(0.45)	(0.51)	(2.12)	(2.05)	(0.71)	(0.69)	(0.18)	(0.16)	(0.17)	(0.17)
r2	0.0320	0.0330	0.0204	0.0305	0.0145	0.0175	0.0228	0.0230	0.0138	0.0153	0.00913	0.00972
N	944	944	927	927	944	944	927	927	928	928	910	910

Variable definitions : *D\_SDROA*= difference between the standard deviation of ROA 3 years after the change and 3 years before the change; *D\_SDRROE*= difference between the standard deviation of ROE 3 years after the change and 3 years before the change ; *D\_ROA* = difference between the return on average assets 3 years after the change and 3 years before the change; *D\_ROEA* = difference between the return on average equity 3 years after the change and 3 years before the change; *D\_AJROA*= difference between AJROA 3 years after the change and 3 years before the change ; *D\_AJROE*= difference between AJROE 3 years after the change and 3 years before the change; *Change\_Year*= dummy variable that takes the value of 1 the year when the change occurs for banks which experience a change and zero for banks whose ultimate owner type does not change over the study period.; *Ch\_bank* is a dummy variable that is equal to one if a bank acquired a bank that was previously owned by another type of shareholder and zero otherwise; *Ch\_Family*: a family-owned bank is acquired by another type of owner; *Ch\_Company*: non-financial company became the ultimate owner of a bank that was previously owned by another type of owner; *Ch\_State*: state became the ultimate owner of a bank that was previously owned by another type of owner; *Ch\_Institutur*: institutional investor became the ultimate owner of a bank that was previously owned by another type of owner.

Table 9. The impact of changes of ownership type on risk/performance, Equations (2) and (3) during the global financial crisis period (2007-2008)

	(2)	(3)	(2)	(3)	(2)	(3)	(2)	(3)	(2)	(3)	(2)	(3)
	<i>D_SROA</i>	<i>D_SROA</i>	<i>D_SROE</i>	<i>D_SROE</i>	<i>D_ROA</i>	<i>D_ROA</i>	<i>D_ROE</i>	<i>D_ROE</i>	<i>D_AJROA</i>	<i>D_AJROA</i>	<i>D_AJROE</i>	<i>D_AJROE</i>
<i>Change_Year</i>	0.720*** (2.38)		0.427* (1.91)		-2.457 (-1.48)		0.444 (0.48)		-0.466 (-0.88)		-0.140 (-0.33)	
<i>Ch_Bank</i>		0.270 (0.85)		-0.138 (-0.49)		0.510 (0.56)		1.086 (1.34)		-1.595 (-1.08)		0.172 (0.27)
<i>Ch_Family</i>		-0.187 (-0.61)		-0.0635 (-0.18)		-1.143 (-0.40)		2.273 (1.40)		-0.347 (-0.54)		-0.956 (-0.95)
<i>Ch_Company</i>		0.00210 (0.01)		0.253 (0.93)		-5.681 (-1.16)		0.646 (0.77)		0.257 (0.45)		0.218 (0.35)
<i>Ch_State</i>		1.740** (2.46)		1.407** (2.04)		-2.620* (-1.80)		-0.563 (-0.26)		-1.004 (-1.31)		-0.436 (-0.71)
<i>ch_invest</i>		2.382*** (3.24)		1.356** (2.11)		-3.238 (-0.92)		-1.695 (-0.61)		-0.200 (-0.24)		-1.042 (-0.96)
<i>LIQUID</i>	-0.00254 (-0.51)	-0.00227 (-0.44)	0.00130 (0.39)	0.00163 (0.48)	0.00230 (0.12)	-0.00228 (-0.14)	0.0132 (0.96)	0.0120 (0.90)	0.00285 (0.44)	0.00368 (0.55)	-0.00123 (-0.20)	-0.000655 (-0.11)
<i>NNII</i>	-0.0214* (-1.71)	-0.0232* (-1.78)	-0.00954* (-1.96)	-0.0107** (-2.11)	-0.0253 (-0.57)	-0.0225 (-0.49)	0.0342 (1.35)	0.0380 (1.41)	0.00235 (0.41)	0.00159 (0.27)	-0.00791 (-0.52)	-0.00809 (-0.50)
<i>E_TA</i>	0.0303* (1.83)	0.0297* (1.79)	0.00568 (1.13)	0.00498 (1.00)	-0.0489 (-1.09)	-0.0461 (-1.04)	-0.0740 (-1.28)	-0.0728 (-1.26)	0.00347 (0.24)	0.00307 (0.21)	0.0167 (0.68)	0.0165 (0.67)
<i>LNTA</i>	0.169 (1.28)	0.170 (1.27)	0.0496 (1.06)	0.0498 (1.05)	-0.558 (-1.15)	-0.559 (-1.15)	-1.099 (-1.49)	-1.097 (-1.48)	-0.0355 (-0.29)	-0.0356 (-0.28)	0.0663 (0.23)	0.0625 (0.21)
<i>CIR</i>	-0.0000552 (-0.01)	-0.0000285 (-0.01)	-0.00162 (-0.42)	-0.00161 (-0.41)	0.0470 (1.43)	0.0463 (1.38)	-0.00437 (-0.43)	-0.00491 (-0.47)	0.00836* (1.91)	0.00866* (1.94)	0.00791 (1.12)	0.00825 (1.14)
<i>SP</i>	-0.0177 (-0.18)	-0.0109 (-0.11)	-0.0575 (-0.98)	-0.0571 (-0.94)	-0.147 (-0.18)	-0.105 (-0.13)	1.429 (1.30)	1.435 (1.29)	-0.271 (-1.06)	-0.276 (-1.05)	-0.576 (-1.64)	-0.589* (-1.65)
<i>REG</i>	0.0252 (0.66)	0.0161 (0.42)	-0.0195 (-0.61)	-0.0271 (-0.83)	0.0247 (0.30)	0.0381 (0.46)	0.0844 (0.79)	0.0912 (0.86)	-0.102 (-1.02)	-0.100 (-1.00)	-0.0839 (-1.13)	-0.0791 (-1.05)
<i>_cons</i>	-0.774 (-0.99)	-0.650 (-0.83)	0.492 (0.82)	0.609 (0.98)	3.191 (1.00)	2.888 (0.88)	-2.622 (-0.85)	-2.834 (-0.89)	1.469 (0.93)	1.479 (0.93)	2.975* (1.70)	3.002* (1.68)
<i>r2</i>	0.0672	0.0806	0.0350	0.0564	0.0193	0.0230	0.0298	0.0304	0.0167	0.0206	0.0211	0.0221
<i>N</i>	361	361	353	353	361	361	353	353	355	355	347	347

Variable definitions : *D\_SDROA*= difference between the standard deviation of ROA 3 years after the change and 3 years before the change; *D\_SDROE*= difference between the standard deviation of ROE 3 years after the change and 3 years before the change ; *D\_ROA* = difference between the return on average assets 3 years after the change and 3 years before the change; *D\_ROEA* = difference between the return on average equity 3 years after the change and 3 years before the change; *D\_AJROA*= difference between AJROA 3 years after the change and 3 years before the change ; *D\_AJROE*= difference between AJROE 3 years after the change and 3 years before the change.; *Change\_Year*= dummy variable that takes the value of 1 the year when the change occurs for banks which experience a change and zero for banks whose ultimate owner type does not change over the study period.; *Ch\_bank* is a dummy variable that is equal to one if a bank acquired a bank that was previously owned by another type of shareholder and zero otherwise; *Ch\_Family*: a family-owned bank is acquired by another type of owner; *Ch\_Company*: non-financial company became the ultimate owner of a bank that was previously owned by another type of owner; *Ch\_State*: state became the ultimate owner of a bank that was previously owned by another type of owner; *Ch\_Institut*: institutional investor became the ultimate owner of a bank that was previously owned by another type of owner.