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COMPLEX OWNERSHIP STRUCTURES, BANKS' CAPITAL STRUCTURE AND PERFORMANCE

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To my dear father Ahcène ZEDEK

For his endless belief, support and love throughout my life.

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SUMMARY

GENERAL INTRODUCTION

Failures and weaknesses in corporate governance of banks, if widespread, can destabilize the financial system and even cripple the real economy. It is claimed that, to an important extent, the financial crisis of 2008 can be attributed to weak corporate governance arrangements (Kirkpatrick, 2009; Diamond and Rajan, 2009; BIS, 2010b). The Basel Committee on Banking Regulation and Supervision (BIS, 2010b) highlights that within this corporate governance framework, ownership structure plays a key role and that corporate governance challenges are posed where bank ownership structures are complex and lack transparency.

From the point of view of the academic literature, ownership structure is also regarded as a key internal governance mechanism. When ownership is diffuse, as is typical for instance in the U.S., agency problems stem from the conflicts of interests between outside shareholders and managers who own an insignificant amount of equity in the firm (Jensen and Meckling, 1976). In this case, the presence of controlling shareholders (i.e., those with large ownership stakes) helps to mitigate the conflicts of interests between managers and owners and therefore to reduce agency costs. This is because controlling shareholders have strong incentives to maximize their firms' value, are able to process information and to monitor managers, and have a substantial power to influence and put pressure on managers and even to fire them through, for instance, a takeover. This positive incentive view of ownership structure is referred to as the alignment hypothesis. However, when ownership is concentrated to a level at which an owner obtains effective control of the firm, as is the case for instance in Asia and Europe, the nature of the agency problem shifts away from manager-owner conflicts to conflicts between the controlling shareholder and minority shareholders. In this case, controlling shareholders may pursue their own interests and extract private benefits at the expense of minority shareholders and other stakeholders in the firm. This negative view of ownership structure is referred to as the entrenchment or the expropriation hypothesis.

Controlling shareholders can expropriate -often legally- by diverting funds for their personal use or by devoting funds to unprofitable projects that provide private benefits. For

instance, controlling shareholders can divert funds for private benefits by paying excessive salaries, and by selling assets to themselves or other corporations they control at favorable prices (Shleifer and Vishny, 1997). They can also extract private benefits by the preferential hiring of family members (Morck et al., 2000). In the specific case of banking firms, expropriation could also occur when controlling shareholders shape lending practices by encouraging the bank to make and extend loans to their related-firms at favorable conditions, rather than merit-based considerations (Caprio et al., 2007).

The entrenchment effect of ownership structures is further accentuated by pyramidal structures. A firm is said to be controlled via a pyramid if it has an ultimate owner, who controls it indirectly through at least another corporation that it does not wholly control. Each intermediate corporation in the firm's pyramid should hold at least an ownership stake greater than a pre-fixed control threshold of the control rights (i.e., a minimum percentage of shares that provides the owner a significant fraction of votes for effective control over the intermediate and the final corporations involved in the pyramid).

These control arrangements (pyramids) enable controlling owners to achieve control of a firm by committing low equity investment while maintaining tight control of the firm, creating a divergence between control rights (i.e., the right to vote and therefore to control) and cash-flow rights (i.e., the right to receive dividends). One consequence of the divergence between control and cash-flow rights, commonly referred to as excess control rights, is that concentrated control rights empower controlling owners to exercise full control over firms, while the disproportion in cash-flow rights (i.e., lower levels of cash-flow rights) fails to align their interests with those of minority shareholders. Actually, when control rights and cash-flow rights diverge a controlling owner could extract wealth from the firm without bearing a higher cost that may arise from such a behavior. For instance, Bebchuk et al. (2000) show how agency costs created by controlling shareholders with significant control rights in excess of cash-flow rights are larger than those associated with controlling shareholders who hold the majority of cash-flow rights in their companies.

Pyramids are the defining features of the ownership structures of both nonfinancial firms and banking firms outside the U.S. Nevertheless, the agency problems arising from such an ownership structure could be more severe in the banking sector than in nonfinancial firms for several reasons. First, compared to other firms, banks are inherently more opaque (Morgan, 2002) mainly because the quality of their loans is not easily observable and their assets are highly complex. Second, banks controlled through pyramids are generally connected to a business group (i.e., a mix of banks and firms) and may serve as capital suppliers for the group member firms. For instance, banks can lend to distressed related-firms merely to sustain them (Laeven, 2001; Unite and Sullivan, 2003; Williams and Nguyen, 2005). Third, because banks are subject to pervasive regulation, market discipline is weakened and therefore the effectiveness of traditional governance mechanisms should be reduced (Levine, 2004).

Although these banks' features, empirical research on the effects of ultimate ownership structure (i.e., excess control rights) on banks' behavior remain very scarce. The extant empirical literature documents the adverse impacts of such an ownership structure for industrial firms, including lower firm value and stock returns, weaker profitability, higher bond yield-spreads and lower ratings, and poorer earnings quality.[1] However, the only study that investigates the effect of excess control rights on banks' behavior is the one of Azofra and Santamaría (2011). The authors find that the divergence between the ultimate owner's control and cash-flow rights is negatively associated with Spanish banks' profitability.

The objective of this dissertation is to fill this gap in the literature. It comprises three empirical essays, each one addresses one remaining important issue regarding the effect of the presence of controlling shareholders in pyramids on European banks' behavior and stability.

First, in the aftermath of the financial crisis of 2007-2008, the Basel Committee on Banking Regulation and Supervision (BIS, 2010a) has developed new rules not only to strengthen the existing capital requirements but also to improve the quality of regulatory

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[1] For more details on papers that focus on the adverse impacts of pyramidal ownership structures for nonfinancial firms, see, e.g., Claessens et al., 2002; Fan and Wong, 2002; Friedman et al., 2003; Lins, 2003; Haw et al., 2004; Boubakri and Ghouma, 2010; Jiang et al., 2011; and Bae et al., 2012.

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capital by excluding preferred shares from the new and narrower definition called Core Tier 1 capital.[2] From the point of view of control and ownership patterns, such a narrower definition of Tier 1 capital and increased requirements in terms of common equity (ordinary shares) raise the question on how banks will increase the capital ratio without shrinking loan activities and other assets. Unlike ordinary shares, preferred shares (and other types of hybrid instruments) generally carry only cash-flow rights and no control rights. In the past, banks could strengthen their Tier 1 capital -without diluting the shareholder's control rights- by issuing preferred shares and other types of hybrid capital, but this is no longer permitted under the Basel new standards. Such new capital adequacy rules might therefore entail high costs for those controlling shareholders who strongly value their controlling position and enjoy extraction of private benefits of control. The costs of implementing these new rules might exceed their advantages, and, as consequence, such shareholders could discourage banks to issue common equity and, rather, encourage them to shrink their assets including their loans.

From this perspective, **Chapter 1** investigates whether the presence of controlling shareholders with greater control rights than cash-flow rights affects the bank's decision on how to adjust and mainly on how to increase its capital ratio. Our aim is to shed light on whether controlling shareholders with greater control rights than cash-flow rights protect their controlling positions to be able to extract private benefits by discouraging banks to issue equity that might dilute their control power, and instead, encourage them to use other methods which are free from control dilution such as assets downsizing and loans contraction. For this purpose, we consider a partial adjustment model of capital structure to estimate a target Tier 1 capital ratio (either risk-based or not) and compute for each bank the capital ratio deviations from the target level (i.e., the capital ratio surplus and shortfall relative to the target ratio). We then look at the various methods (assets or capital) that banks rely on to fill a capital ratio shortfall (below the target) or surplus (above the target) in the absence and presence of excess control rights. We find that when control and cash-flow rights are equal, to increase capital

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[2] Tier 1 capital is composed of ordinary shares and disclosed reserved (e.g., retained earnings, share premium reserves). It also includes other capital instruments (for example, preferred shares, hybrid capital securities) which are no more be eligible under the Basel's new Accords (BIS, 2010a).

ratios banks issue equity without cutting lending. However, when control rights exceed cash-flow rights, instead of issuing equity, banks downsize by shrinking their lending.

Second, the Basel Committee on Banking Regulation and Supervision (BIS, 2010b) has claimed that failures of corporate governance have contributed to make the 2007-2008 financial crisis as severe as it was, and has called for better governance mechanisms within financial institutions. From the point of view of the academic literature, various studies have looked at the contribution of corporate governance to explain differences in banks' performance and resilience to the financial turmoil of 2007-2008. For instance, these studies have looked at manager compensation schemes, board structure, and ownership concentration. Nevertheless, how the presence of controlling shareholders in pyramids might have affected bank profitability but also risk-taking and default risk during the crisis remains an unexplored question. Indeed, banks controlled via pyramidal arrangements might endure higher losses during a crisis period. This is because controlling shareholders in pyramids could expropriate more -than they do in a sound period- to compensate for the losses arising from the decline in profits under extremely adverse market conditions. However, strong links in pyramids may also lead banks to suffer less during a crisis. Indeed, banks controlled through pyramidal arrangements are generally connected to other firms which are under a common ultimate controlling shareholder. If this ultimate controlling shareholder is likely to divert resources for his own during sound times, it might be optimal for him to sustain the bank during distress times (either by using his own funds or by redistributing resources among firms under his control) to maintain it in business. **Chapter 2** is therefore devoted to answer this question.

More precisely, in Chapter 2 we ask whether the effect of controlling shareholders with greater control rights than cash-flow rights in pyramids on banks' performance (profitability and risk) is different during normal times and distress times. We hence test the effect of excess control rights on profitability and risk before the crisis (2002-2006), during the acute financial crisis years (2007-2008) but also in the aftermath of the financial crisis (2009-2010). Our main objective is to test whether such an effect depends on the state of the economy and shed light on the extent to which banks controlled through pyramids are resilient to financial

shocks. The results show that excess control rights differently affect banks' performance in normal times and in distress times. Overall, we find excess control rights to be negatively linked with profitability and positively associated with risk before the crisis (2002-2006). However, during the acute financial crisis years (2007-2008) the results reveal a reversed effect: excess control rights improve profitability, reduce earnings volatility and no longer affect default risk. The results also show that such a reversed effect is short-lived since excess control rights are again negatively associated with profitability and positively with risk in the aftermath of the financial crisis (2009-2010).

Finally, the academic literature has broadly addressed the implications of activity diversification on bank performance and has shown evidence for both economies and diseconomies of diversification. However, to date no study has tested whether the strength of ownership network to which banks belong in pyramids affects diversification performance. When related to activity diversification, pyramidal ownership structure could have two conflicting effects on bank performance. On the one hand, one could argue that ultimate controlling shareholders in pyramids encourage greater activity diversification to enable themselves to extract private benefits of control. In such a case, banks controlled via pyramidal arrangements should suffer higher diseconomies of diversification. On the other hand, the presence of multiple shareholders with prior experience in activities to which the bank expands (e.g., securities and insurance underwriting, and mutual funds activities) could play mitigating roles by delivering managerial expertise and valuable skills to the bank. If such mitigating roles are sufficiently important, banks controlled through pyramidal arrangements should benefit from economies of diversification. Hence, the net effect of greater activity diversification on bank performance is an empirical issue and depends on whether the negative effect of pyramidal ownership exceeds its positive effect and vice versa. **Chapter 3** is therefore devoted to test which effect prevails by empirically investigating whether the strength of banks' ownership network in pyramids mitigates diseconomies of diversification; or rather, whether such an ownership structure intensifies these diseconomies because of higher agency conflicts to which it is subject.

More precisely, in this chapter we construct an ownership indicator which measures how far the bank is from its largest ultimate owner. This measure is positively correlated with excess control rights and with the number of controlling shareholders involved in the bank's decision making (i.e., the extent of the bank's ownership depth). It therefore simultaneously captures the expropriation incentives of the bank's ultimate owner but also the bank's ownership depth. The results show that the presence of multiple controlling owners involved in the bank's decision making mitigates diseconomies of diversification, leading banks to enjoy higher profits and suffer lower costs and lower risk when they diversify their activities. We also find that the mitigating roles of ownership depth are only attributable to the presence of institutional owners and that such mitigating roles are greater for domestic than for foreign institutional owners.

CHAPTER 1

Excess control rights, bank capital structure adjustments and lending

ABSTRACT

We investigate whether excess control rights of ultimate owners in pyramids affect banks' capital ratio adjustments. When control and cash-flow rights are identical, to boost capital ratios banks issue equity without cutting lending. However, when control rights exceed cash-flow rights, instead of issuing equity, banks downsize by reducing lending. Such a finding is mostly prevalent in countries with weak shareholder protection or for family-controlled banks. Other factors also explain the extent to which such banks reduce lending. Our findings contribute to the capital structure adjustment literature and have critical policy implications for the implementation of Basel III and the debate on capital requirements and bank lending.

1.1. Introduction

Although banks are more leveraged than nonfinancial firms and are subject to capital regulation, both theoretical (e.g., Orgler and Taggart, 1983; Myers and Rajan, 1998; Diamond and Rajan, 2000; Allen et al., 2011) and empirical studies (e.g., Marcus, 1983; Flannery and Rangan, 2008) indicate that, like other firms, banks also have a target capital structure. Some studies also show that the determinants of banks' capital structure are similar to those documented for nonfinancial firms (e.g., Gropp and Heider, 2011). Moreover, minimum capital requirements might not be binding since banks set target capital ratios well above regulatory minima (Ayuso et al., 2004; Lindquist, 2004) and as a consequence, such regulations might not affect banks' capital adjustment (Berger et al., 2008). However, banks are also known to adjust to their target capital ratio faster than nonfinancial firms (Memmel and Raupach, 2010). Banks' assets are more liquid and they can more easily alter the size of their operations by expanding or shrinking assets to reach their target capital structure.

In this study, we question whether internal governance mechanisms and specifically excess control rights of ultimate owners in pyramids, affect the way banks adjust to the target capital structure. Excess control rights arise when controlling shareholders have greater control rights than cash-flow rights (e.g., La Porta et al., 1999). If, under certain conditions, controlling shareholders are more inclined to reap private benefits of control at the expense of minority shareholders, they will strongly value their controlling position. Such controlling shareholders might be reluctant to issue new equity which could dilute their private benefits of control or to supply the required equity themselves as this would increase the costs of extracting private benefits (La Porta et al., 2002). Aversion to losing these benefits, which we refer to as control dilution, depends on the extent of such benefits. Extraction of private benefits is known to be easier in pyramids where controlling shareholders can enhance their control and achieve greater divergence between control and cash-flow rights.[3] Such divergence provides the ability and incentives to extract private benefits of control. We hence expect dilution to be

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[3] For more details on the expropriation hypothesis within pyramids (extraction of private benefits of control) see, e.g., Bertrand et al., 2002; Claessens et al., 2002; Joh, 2003; Boubakri and Ghouma, 2010; Jiang et al., 2011; Lin et al., 2011b. For papers that specifically look at banks see, e.g., Azofra and Santamaría, 2011; Lin et al., 2011a.

stronger in banks controlled by a shareholder with excess control rights, and as a consequence, such banks might be reluctant to issue equity and are likely to first rely on internal resources to achieve target capital ratios. Furthermore, they could move to the target ratio by adjusting their size and/or by reshuffling their assets more promptly than other banks. Specifically, the adjustment process is likely to affect bank lending in varying ways depending on the presence or absence of excess control rights.

To investigate the effect of control dilution, as captured by excess control rights, on banks' capital ratio adjustments we use a novel hand-collected data set on the ultimate ownership structure of 341 commercial banks based in 17 Western European countries (where the presence of excess control rights is more acute than in other Western countries such as the U.S.) between 2002 and 2010. We use a partial adjustment model to estimate a bank-specific and time-varying target capital ratio and to identify the bank's initial position relative to its target. More specifically, we investigate the various channels that banks rely on when they face a capital ratio shortfall (below the target) or surplus (above the target) to capture possible differences due to the presence of excess control rights. We look into how banks adjust their equity either externally (equity issues/repurchases) or internally (higher/lower earnings retention) and also into how they adjust their assets and particularly their lending. Indeed, in extreme cases banks could simply decrease their capital ratio by extending more loans (funded with new debt) or increase it by selling assets or reducing lending (leading to a lower amount of debt). But banks can also reallocate their assets to reach a different level of risk-weighted assets if they target a regulatory capital ratio such as the Tier1 capital ratio.[4]

We find that when control and cash-flow rights are equal, below-target banks increase their Tier 1 capital ratio by issuing new equity and by lowering risk-weighted assets (by substituting safer assets for riskier ones) but not by reducing their assets and specifically their

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[4] While the literature on firms' capital structure considers the leverage ratio (debt/equity) or identically the capital ratio (equity/total assets), in the case of banks some broader measure of regulatory capital is generally used. Tier 1 capital is the narrowest definition of regulatory capital in force during our period of study. It is composed of ordinary shares (which carry control rights) and disclosed reserved (e.g., retained earnings, share premium reserves). It also includes other capital instruments (e.g., preferred shares, hybrid capital securities) which will no more be eligible under the Basel III Accords (BIS, 2010a). We focus exclusively on the Tier 1 capital ratio and ignore the total regulatory capital ratio because unlike Tier 1, Tier 2 capital does not involve control rights and therefore the fear of control dilution might not be observed in changes in the total regulatory capital (Tier 1 + Tier 2).

loans. Above-target banks adjust both externally and internally (by repurchasing equity and lowering earnings retention) and expand their assets and specifically their lending. However, when control rights exceed cash-flow rights, while they do repurchase equity when facing a surplus, banks are reluctant to issue equity when they face a shortfall. In the latter case, banks not only draw on earnings to reach target capital ratios but also shrink their assets in general and their lending in particular. This finding is consistent with our prediction that controlling shareholders with excess control rights fear dilution that may arise from equity issuance. As a consequence, external recapitalization is limited and banks controlled by such shareholders rely on internal funds as well as downsizing.

We also take our investigation further and find that the impact of excess control rights is mainly effective for banks operating in countries with relatively weak shareholder protection or for family-owned banks. Instead of issuing equity to increase the capital ratio, such banks draw on earnings and reduce their assets (including their loans) consistent with the view that family ownership (Claessens et al., 2002; Villalonga and Amit, 2006) as well as weak shareholder protection (La Porta et al., 2002; Dyck and Zingales, 2004) increases the incentives of controlling shareholders to extract private benefits. Moreover, while banks never reduce their lending to move to the target capital ratio in the absence of excess control rights, those controlled by shareholders with such rights reduce their lending by even larger amounts when they are (1) undercapitalized, (2) relatively large, or (3) more focused on traditional intermediation activities. Such banks require closer regulatory attention regarding downsizing and potential credit crunch outcomes. Nevertheless, we also show that during the 2008 financial crisis such banks did issue equity (just like any other bank) to adjust to the target instead of cutting their assets and specifically their lending. This is consistent with the view that ultimate controlling owners who expect to divert higher resources in the future might provide significant support to their firms during a crisis (Friedman et al., 2003).

We make two main contributions to the capital structure adjustment and corporate governance literature. First, we build a bridge between the two strands of the literature by exploring the effect of control rights of the bank's ultimate owner in pyramids on capital structure adjustments. We investigate differences in the adjustment process towards the target

capital ratio and particularly whether banks are reluctant to issue equity and possibly limit their size and especially their lending in the presence of excess control rights. (Admati et al., 2011) argue that banks would only limit their lending if issuing equity is more costly because of frictions and governance problems. Consistently, in our work we show that banks do actually not refrain from lending except when control rights exceed cash-flow rights under very specific conditions. In the absence of excess control rights, banks do issue equity without cutting lending to increase their capital ratios. By linking ownership structure to bank lending, this study also contributes to the literature investigating the effect of foreign and domestic ownership on lending stability (e.g., Claessens and Van Horen (2013, 2014) show that foreign banks contributed to financial instability by strongly reducing their lending during the 2008 financial crisis).[5] We also add to the literature investigating asymmetries and/or cross-variations in the adjustment speed with which firms converge to the target capital structure (e.g., Byoun, 2008; Öztekin and Flannery, 2012, and more specifically Berger et al., 2008; Memmel and Raupach, 2010 for banks). Our study further contributes to the literature exploring the factors behind the reluctance of firms to recapitalize (e.g., Dittmar and Thakor (2007) who show that firms dislike raising equity if they expect disagreement on investment decisions with new investors). Second, unlike previous studies on pyramidal ownership structures (e.g., La Porta et al., 1999; Claessens et al., 2000; Faccio and Lang, 2002, and more specifically Caprio et al., 2007; Laeven and Levine, 2009 for banks) which mainly focus on the largest publicly traded corporations at a given point in time, we gather a broader and more detailed database on ultimate ownership structure including large and small banks, both publicly traded and privately owned for three different years of the sample period (2004, 2006 and 2010) to check for possible changes in the ultimate ownership structure, especially after the 2008 financial crisis.

Our study also contributes to the debate on the post-crisis bank regulatory framework and more specifically on the new standards for capital regulation. The Basel Committee on Banking Regulation and Supervision (BIS, 2010a) has implemented new rules not only to

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[5] Other studies investigate whether the implementation of risk-based capital requirements had an impact on bank lending and show that the severity of the 1990-1992 credit crunch in the U.S. can be explained by the introduction of more stringent capital rules (e.g., Berger and Udell, 1994; Brinkmann and Horvitz, 1995; Peek and Rosengren, 1995).

strengthen existing capital requirements but also to improve the quality of regulatory capital by excluding preferred shares, which in general do not carry control rights, from the new and narrower definition called Core Tier 1 capital. Both requirements might entail high costs for controlling shareholders with excess control rights. According to our findings, such shareholders will encourage banks to further reduce their size and notably their lending activities, especially if such banks are large, lending oriented or close to the minimum regulatory ratio. Our findings, however, show that in the absence of excess control rights, banks always boost capital ratios without cutting lending even when they face strong pressure from regulators. Hence, the fear that banks might severely reduce their lending and overall contribution to the real economy with the implementation of Basel III Accords might only be relevant for some banks but not others. Credit crunch phenomena are more likely to be driven by banks controlled by shareholders with excess control rights. Our work also addresses the concerns of the Basel Committee on Banking Regulation and Supervision (BIS, 2010b) highlighting the relevance of sound corporate governance in the banking industry and recommending the disclosure of banks' ownership.

The remainder of the chapter proceeds as follows. Section 1.2 describes the data, defines the ultimate ownership variables and provides some statistics. In Section 1.3, we discuss the approach we follow to conduct our empirical investigation. Section 1.4 provides estimation results and Section 1.5 shows robustness checks. Section 1.6 concludes the chapter and provides policy implications.

1.2. Data and ultimate ownership variables

We start by describing our sample and the procedure we follow to measure excess control rights. We then present the characteristics of the computed ownership variables.

1.2.1. Sample

Our study spans the 2002-2010 period and focuses on commercial banks established in 17 European countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland,

Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and, the United Kingdom. We retrieve bank-level accounting data from BvD Bankscope. We primarily use unconsolidated statements when available in Bankscope; otherwise we use consolidated statements. We nevertheless check the robustness of the results using unconsolidated data solely. To collect ownership data, we use both Bankscope and Amadeus as primary sources. We collect macroeconomic data from World Development Indicators (The World Bank) and Bloomberg and we use Thomson Reuters Advanced Analytics to identify mergers and acquisitions involving European commercial banks. For the time period and countries covered by our study, we identify 439 banks for which we have information on the variables of interest, especially the Tier 1 capital ratio. We restrict the sample to institutions actually involved in lending by requiring the bank to have a ratio of loans to total assets above 10%.[6] After eliminating extreme bank year observations for the main variables (1% lowest and highest values), we end up with a final sample of 2,204 annual observations corresponding to 341 commercial banks, 111 of which are listed. To gauge the representativeness of the sample we compare the aggregate total assets of the sample banks in a given country to the aggregate total assets of all the banks covered by Bankscope in the same country over the 2002-2010 period. On average, the final sample covers more than 78% of banks' total assets in the considered countries (see Table 1.1).

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[6] Bankscope defines as commercial banks institutions that are mainly active in a combination of retail, wholesale and private banking. This broad definition implies that some banks considered as commercial banks exhibit very low loans to total assets ratios. Since our aim is to analyze banks' lending behavior we need to further restrict our sample.

Table 1.1. Distribution of European commercial banks and representativeness of the final sample

This table shows the breakdown of the 341 European commercial banks by country and the representativeness of the final sample. To assess the sample's representativeness, we compute the ratio of aggregate total assets of the banks included in the final sample to aggregate total assets of all the banks provided in Bankscope from 2002 to 2010.

Country	Number of all banks	Number of listed banks	Total assets of the sample banks divided by total assets of all banks provided in Bankscope (%)
Austria	9	2	39.19
Belgium	8	0	97.56
Denmark	43	33	93.75
Finland	2	0	85.79
France	18	6	74.74
Germany	22	7	74.52
Greece	10	9	94.84
Ireland	11	5	94.14
Italy	99	18	81.49
Luxembourg	14	3	50.06
Netherlands	17	4	61.04
Norway	7	3	73.53
Portugal	9	2	81.39
Spain	16	9	87.24
Sweden	9	2	83.02
Switzerland	12	3	87.17
United Kingdom	35	5	71.44
Total/Mean	**341**	**111**	**78.28**

1.2.2. Building of control chains and ultimate ownership variables

To measure the ultimate owner's excess control rights, we first need to build indirect control chains to identify the ultimate controlling owners for each bank. Although excess control rights may arise from both indirect control chains and dual class shares, in-line with previous studies (Caprio et al., 2007) we only consider excess control rights stemming from indirect control chains. This is not only because of data unavailability (Bankscope and Amadeus only provide information on control rights) but also because the use of dual class shares is relatively scarce (Faccio and Lang, 2002; Azofra and Santamaría, 2011). We need to set a control threshold (minimum percentage of shares held) to identify each owner along the chains. Following previous studies (e.g., Caprio et al., 2007; Laeven and Levine, 2008; 2009), we use a threshold of 10% assuming that it provides a significant fraction of votes for effective control. To reflect ownership prior to the 2008 financial crisis, we construct the control chain for each bank for the years 2004 and 2006. Bankscope and Amadeus do not provide detailed information on shareholder types (e.g., firms, banks, institutional investors) before 2004. Prior studies (La Porta et al., 1999) argue that ownership is relatively stable over

time and therefore we do not construct the control chains for each year, which in any case would not be possible because data on ownership are only updated every 18 months. We also construct the control chains for the year 2010 to capture possible changes stemming from government intervention during the crisis.

We first identify the major shareholders (those holding at least 10% of the shares) of each bank by gathering data on direct ownership from Bankscope and complete it with information from annual reports disclosed on the banks' Web sites. We classify a bank as controlled if it has at least one shareholder with 10% or more of total outstanding shares. Otherwise, we consider the bank to be widely held. If some of the identified major shareholders are not controlled by another shareholder (which would be the case in family or state ownership) we consider these to be the ultimate controlling owners. If, however, some or all of the major shareholders identified at this first level of the control chain are themselves financial or nonfinancial corporations, we go deeper and build indirect control chains by identifying their owners, the owners of their owners until we reach ultimate shareholders.[7] Since Bankscope provides ownership information only for banks, we use the Amadeus database together with annual reports to collect ownership data on nonbanking firms that are major shareholders at the intermediate levels of indirect control chains.

We use these control chains to compute control rights, cash-flow rights and excess control rights by following the method initially proposed by La Porta et al. (1999). An ultimate owner can control a bank directly and/or indirectly. The aggregate control rights (Control Rights) and the aggregate cash-flow rights (Cash-flow Rights) of an ultimate owner are the sum of direct and indirect rights held in the bank. Direct rights (either control or cash-flow rights) refer to the percentage of shares directly held in the bank. Indirect control rights refer to the shares held by entities that the ultimate shareholder controls at least at the 10% level. Indirect cash-flow rights are calculated as the product of the percentages of shares held by the

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[7] Given a control threshold of 10%, the maximum number of controlling shareholders at each level of the bank's control chain is equal to ten. If n stands for the number of levels in the control chain, the maximum number of ultimate controlling owners for a control threshold of 10% is 10^n. In our sample, the number of intermediate levels necessary to trace the indirect control chain until the ultimate owner and the number of different ultimate controlling owners for a given bank, both reach a maximum of eight. Among the set of controlled banks in our sample, 223 are continuously classified as controlled by a single ultimate owner and 60 are continuously classified as controlled by multiple ultimate owners while 32 banks switch from one category to the other.

shareholders along the indirect control chain linking the ultimate controlling owner to the bank. We set aggregate control rights and aggregate cash-flow rights equal to zero if the bank is widely held (there is no controlling owner) or if the control chain is a cross-holding (a corporation holds a stake of at least 10% in the bank which in turn holds a stake of at least 10% in that corporation). When a bank is controlled by multiple ultimate owners we define the ultimate controlling shareholder as the owner with the greatest aggregate control rights.

We define excess control rights (Excess Control Rights) as the difference between aggregate control and cash-flow rights. We then classify the sampled banks into two groups: banks without excess control rights (Absence of Excess Control Rights) and banks with excess control rights (Presence of Excess Control Rights). A bank is classified as not having excess control rights if (1) it is controlled by an ultimate owner with equal control and cash-flow rights, (2) it is widely held or if (3) its control chain is a cross-holding (corresponding to five banks). A bank is classified with excess control rights if it is has an ultimate owner with greater control than cash-flow rights. The classification of banks can slightly change over time: 195 banks (out of 341) are continuously categorized as not having excess control rights and 113 with excess control rights while 33 banks switch from one category to the other.

For the regression analysis, we define a dummy variable, denoted d(Excess Control Rights), which is equal to one if the control rights are greater than the cash-flow rights, and zero otherwise. We use a binary variable which we consider to be more accurate than a continuous variable since it would give the same classification of banks (without or with excess control rights) regardless of the method used to compute indirect control rights (see, e.g., La Porta et al., 1999 and Claessens et al., 2000 for the two available methods).

Fig. 1.1 provides a simple example of a control chain to illustrate how we compute the ultimate ownership variables. The reported bank has three ultimate controlling owners (C4, C5 and C6). The largest one (with the greatest control rights) is C6. This ultimate controlling owner holds the bank directly and indirectly through two other intermediate corporations C1 and C3. Direct control and cash-flow rights of C6 are identical and equal to 40%. Her indirect control rights are equal to 30% (the percentage of shares held by C1) and indirect cash-flow

rights are equal to 0.6% (10% × 20% × 30%). Overall, aggregate control and cash-flow rights are equal to 70% (30% + 40%) and 40.6% (0.6% + 40%) respectively. The difference between both aggregate rights (Excess Control Rights) is equal to 29.4% (70% - 40.6%).

Fig. 1.1. Example of a control chain

Fig. 1 provides an example of a control chain of a bank. C refers to each corporation presented in each box. Arrows represent ownership stakes held by each corporation in the bank or in other corporations in the control chain. *Control Rights* and *Cash-flow Rights* respectively indicate aggregate control rights and aggregate cash-flow rights of the three identified ultimate controlling shareholders (C6, C4 and C5). Aggregate rights are the sum of direct and indirect rights. Direct rights refer to the percentage of shares directly held by the ultimate owner in the bank. Indirect control rights are computed on the basis of the standard method initially proposed by La Porta et al. (1999), that is indirect control rights of an ultimate controlling owner are equal to the percentage of shares held by the shareholder directly linked to the bank. Indirect cash-flow rights are computed as the product of the percentages of shares held by the shareholders along the indirect control chain. We define Excess Control Rights as the difference between control and cash-flow rights.

Control Rights (C6) = 30% + 40% = 70%
Cash-flow Rights (C6) = 30% × 20% × 10% + 40% = 40.6%
Excess Control Rights (C6) = 70% - 40.6% = 29.4%

Control Rights (C5) = 20%
Cash-flow Rights (C5) = 11% × 20% = 2.2%
Excess Control Rights (C5) = 20% - 2.2% = 17.8%

Control Rights (C4) = 20%
Cash-flow Rights (C4) = 17% × 20% = 3.4%
Excess Control Rights (C4) = 20% - 3.4% = 16.6%
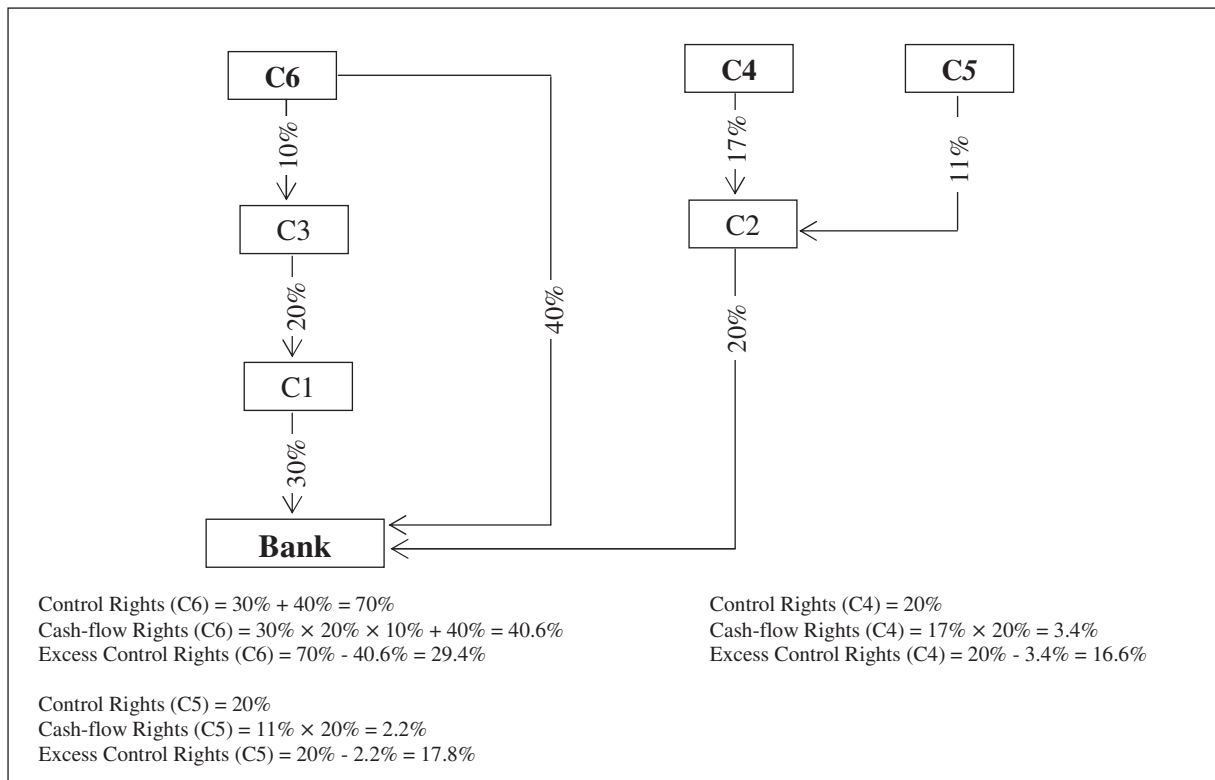
1.2.3. Ultimate ownership characteristics and financial profiles of the sample banks

Our data set indicates that 83% of the observations refer to banks controlled by at least one ultimate shareholder. Amongst banks that are controlled, 43% of the observations relate to an ultimate shareholder with excess control rights. This sample composition allows us to accurately conduct the empirical investigation.

We report in Table 1.2 (Panels 1 and 2) information on ultimate ownership characteristics for the subsamples of banks without and with excess control rights. For banks without excess control rights, control and cash-flow rights both amount to about 51%, on average. Amongst

these banks, those that are controlled by an ultimate owner exhibit, on average, a higher percentage (69% which is not reported in Table 1.2). In such a case, an ultimate controlling shareholder is more inclined towards profit maximization (Azofra and Santamaría, 2011). In the presence of excess control rights, the largest ultimate controlling shareholder holds on average more than 80% of the control rights and only around 36% of the cash-flow rights. As cash-flow rights are more than two times lower than control rights, the ultimate controlling shareholder would be more inclined to extract private benefits and, in turn, to protect her control rights rather than her cash-flow rights. Furthermore, the type of ultimate owner is generally different in the presence or the absence of excess control rights (Panel 2 of Table 1.2). Banks more frequently control other banks without excess control rights (almost 42% against only 17% of the observations in the presence of excess control rights). This is consistent with the view that banks, when they are controlling shareholders, are less likely to engage in expropriation as the resulting benefits are distributed among multiple owners and also because regulation, when stringently enforced, makes expropriation more costly (Villalonga and Amit, 2006; Haw et al., 2010). Not surprisingly, individuals/families and states are predominant in banks with excess control rights (respectively 30% and 22% against only 15% and 3% of the observations in the absence of excess control rights).[8] The divergence between both rights could enable ultimate controlling owners, and especially families, to expropriate minority shareholders and divert a larger fraction of resources (Claessens et al., 2002). Institutional investors and industrial companies are also more present as ultimate controlling shareholders with excess control rights. Foundations are quite evenly distributed between the two subsamples of banks without and with excess control rights, with a much weaker presence as controlling shareholders in both cases.

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[8] We follow La Porta et al. (1999) by categorizing a bank as family-controlled if the controlling shareholder is a person. We therefore include inside this category manager-controlled banks (six banks, four of which are banks with excess control rights). Compared to previous studies (Faccio and Lang, 2002; Caprio et al., 2007), the proportion of state ownership in the full sample is higher (10.03%). This is because we consider not only large and publicly traded banks but also small and privately owned banks and because of the outcome of the 2008 financial crisis with massive government intervention either by capital injections and/or by nationalizations. Just like prior studies, before the crisis (2002-2006) state ownership represents only 4.72% of the observations in the sample of 341 banks.

Table 1.2. Ownership structure of European commercial banks

This table reports ownership characteristics for the subsamples of banks without and with excess control rights, on average, for the years 2004, 2006 and 2010 using a control threshold of 10%. We classify a bank as without excess control rights (*Absence of Excess Control Rights*) if (1) it is controlled by an ultimate owner with equal control and cash-flow rights, (2) it is widely held, or (3) if its control chain is a cross-holding. We classify a bank as with excess control rights (*Presence of Excess Control Rights*) if it is controlled by an ultimate owner with greater control than cash-flow rights. *Panel 1* provides summary statistics (expressed in percentages) on the control rights, the cash-flow rights and the excess control rights. *Control Rights* and *Cash-flow Rights* refer respectively to the largest ultimate controlling owner's aggregate control rights and aggregate cash-flow rights if the bank is controlled. Both variables are set equal to zero if the bank is widely held or if the control chain is a cross-holding. We define *Excess Control Rights* as the difference between aggregate control and cash-flow rights. *Panel 2* reports information on ultimate ownership type. We differentiate banks according to the type of their largest ultimate controlling owner: a bank (*Bank*); an individual, a family or a manager (*Family*); a state or a public authority (*State*); a financial company, an insurance company, a mutual or a pension fund (*Institutional*); an industrial firm (*Industry*); a foundation or a research institute (*Foundation*). *Widely Held* and *Cross Holding* refer to banks that are respectively widely held and those for which the control chain is a cross-holding.

	Absence of Excess Control Rights (1,416 observations)			Presence of Excess Control Rights (788 observations)		
Panel 1: Summary statistics on ultimate ownership variables						
	Control Rights	Cash-flow Rights	Excess Control Rights	Control Rights	Cash-flow Rights	Excess Control Rights
Mean	50.71	50.71	0.00	80.22	36.34	43.89
Median	50.01	50.01	0.00	98.00	26.17	43.25
Standard deviation	40.69	40.69	0.00	26.62	29.25	30.40
Minimum	0.00	0.00	0.00	10.00	0.09	0.001
Maximum	100.00	100.00	0.00	100.00	99.74	99.41
Panel 2: Information on ultimate ownership type						
	Percentage of observations	Number of observations	Number of banks	Percentage of observations	Number of observations	Number of banks
Bank	41.88	593	114	17.13	135	25
Family	14.76	209	45	30.08	237	54
State	3.39	48	10	21.95	173	44
Institutional	7.63	108	25	16.12	127	25
Industry	2.47	35	7	9.14	72	14
Foundation	3.81	54	12	5.58	44	15
Widely Held	23.73	336	61	-	-	-
Cross Holding	2.33	33	5	-	-	-

Table 1.3 compares key financial characteristics for the subsamples of banks with and without excess control rights. Banks with excess control rights are more lending-oriented (higher loans to total assets ratios). In-line with the expropriation hypothesis of pyramidal ownership structure, they have poorer loan quality (a higher proportion of non-performing loans) and are less profitable (lower returns on assets and equity). The table also shows that banks with excess control rights hold lower Tier 1 capital ratios, possibly because of the fear of control dilution. Furthermore, banks with excess control rights are less likely to pay dividends, presumably to more easily increase their capital ratios via internal funds or because of the effect of expropriation (Faccio et al., 2001).

Table 1.3. General financial characteristics by ownership

This table compares the financial characteristics of banks without and with excess control rights over the 2002-2010 period. Using a control threshold of 10%, we classify a bank as without excess control rights (*Absence of Excess Control Rights*) if (1) it is controlled by an ultimate owner with equal control and cash-flow rights, (2) it is widely held, or (3) if its control chain is a cross-holding. We classify a bank as with excess control rights (*Presence of Excess Control Rights*) if it is controlled by an ultimate owner with greater control than cash-flow rights. All variables are expressed in percentages except *Total Assets* (Millions of Euros) and the dummy variable *Dividend*. *Total Assets* is bank's total assets. *Loans Total Assets* is net loans divided by total assets. *Non Performing Loans* is non-performing loans divided by gross loans. *Return On Assets* is net income divided by total assets. *Return On Equity* is net income divided by total equity. *Total Capital Ratio* is total regulatory capital (Tier 1 + Tier 2) divided by risk-weighted assets. *Tier 1 Total Assets* is Tier 1 capital divided by total assets. *Tier 1 RWA* is Tier 1 capital divided by risk-weighted assets. *Dividend* is a dummy equal to one if the bank pays dividend in a given year, and zero otherwise. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively, for a bilateral test.

	Absence of Excess Control Rights (1,416 observations)	Presence of Excess Control Rights (788 observations)	Test for equality of means (t-statistics)
Total Assets	86,978	79,341	0.74
Loans Total Assets	58.71	61.94	-3.45***
Non Performing Loans	3.46	3.86	-2.13**
Return On Assets	0.68	0.44	6.19***
Return On Equity	8.04	6.85	2.39**
Total Capital Ratio	13.60	13.23	1.69*
Tier 1 Total Assets	7.76	6.20	8.64***
Tier 1 RWA	11.72	10.71	4.32***
Dividend	0.92	0.86	3.21***

We now discuss the approach we follow to investigate the impact of excess control rights on banks' adjustment towards target capital ratios.

1.3. Methodology

We question whether ultimate owners' excess control rights affect the way banks adjust their capital ratio to target levels. Banks can achieve targets by adjusting their capital (equity issues/repurchases, higher/lower earnings retention) and/or their assets. Depending on their control and ownership patterns, banks might not uniformly weigh these different adjustment options. Specifically, when they need to increase their capital ratio, banks controlled by shareholders with excess control rights could be reluctant to issue equity since external recapitalization can lead to control dilution. Instead, they are more likely to rely on earnings retention and/or asset downsizing or substitution. Our approach involves two steps. We first estimate the bank's target capital ratio to compute the capital ratio surplus and shortfall relative to the target. We then investigate the way banks react to a capital ratio surplus or shortfall depending on their controlling owners' excess control rights.

1.3.1. Estimating the target capital ratio and computing deviations from the target

We model the target capital ratio as a function of bank and country characteristics (e.g., Marcus, 1983; Nier and Baumann, 2006; Gropp and Heider, 2011) as follows:

$$k_{i,t}^* = \varphi' X_{i,t-1} + \rho \text{ GDP Growth Rate}_{c,t-1} + \omega' \text{ Country} + \tau' \text{ Year} + \mu_i, \qquad (1.1)$$

where k^* is the target level of the bank's Tier 1 capital ratio defined as Tier 1 regulatory capital divided by either total assets (Tier 1 Total Assets) or risk-weighted assets (Tier 1 RWA); X is a vector of bank-level explanatory variables that includes: a dummy for the presence of excess control rights (d(Excess Control Rights)),[9] bank size (Log(Total Assets)), bank profitability (Return On Assets), the ratio of loan loss provisions to net loans (Loan Loss Provisions), the ratio of net loans to total assets (Loans Total Assets), the ratio of long term market funding to total funding as a proxy of market discipline (Market Discipline) and a dummy variable for listed banks (d(Listed Bank)); GDP Growth Rate is the annual growth rate of real GDP for country c. Time-varying explanatory variables are lagged by one year to avoid simultaneity. Country and Year are vectors of country and year dummies, respectively; and finally μ_i is a vector of bank fixed effects.

The model specified in Eq. (1.1) assumes that banks will always maintain their capital ratio at its target level. This is only possible in a frictionless world. In practice, banks need time to adjust their capital and assets to move to the target ratio. Hence, to account for adjustment costs, we consider a partial adjustment framework (Eq. (1.2)) where banks adjust a constant portion λ (λ is a scalar adjustment speed, $\lambda \in [0; 1]$ with higher values indicating faster adjustment) of the gap between the target and the lagged actual capital ratios:

$$k_{i,t} - k_{i,t-1} = \lambda \left(k_{i,t}^* - k_{i,t-1} \right) + \eta_{i,t} \qquad (1.2)$$

Substituting Eq. (1.1) into Eq. (1.2) and rearranging gives the following estimation model:

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[9] We include this variable because, on average, banks without excess control rights exhibit higher Tier 1 capital ratios than banks with excess control rights (see Table 1.3). Our specification is hence flexible enough to account for possible differences in the target capital ratio for banks with and without excess control rights.

$$k_{i,t} = (1-\lambda)\, k_{i,t-1} + \lambda \left(\varphi' \, X_{i,t-1} + \rho \, \text{GDP Growth Rate}_{c,t-1} + \omega' \, \text{Country} + \tau' \, \text{Year} + \mu_i \right) \quad (1.3)$$
$$+ \, \eta_{i,t}$$

Estimating Eq. (1.3) yields an average adjustment speed ($\hat{\lambda}$) and a vector of coefficients (see Table A1.2 in the Appendix for the estimation results) which we replace in Eq. (1.1) to compute a fitted value of the target Tier 1 capital ratio for each bank every year ($\hat{k}_{i,t}^*$).[10] We then use this estimated target to compute capital ratio deviations (Gap) as follows:

$$\text{Gap}_{i,t-1} = \hat{k}_{i,t}^* - k_{i,t-1} \quad\quad (1.4)$$

To test whether banks controlled by a shareholder with excess control rights are reluctant to issue equity and therefore prefer to downsize by possibly refraining from lending, we separate the cases where banks are above the target (Capital Ratio Surplus) and below the target (Capital Ratio Shortfall) and for easier interpretation of the results we consider the absolute value of the capital ratio deviations:

$$\text{Capital Ratio Surplus}_{i,t-1} = \left| \text{Gap}_{i,t-1} \right| \text{ if } k_{i,t-1} > \hat{k}_{i,t}^*, \text{ and zero otherwise}$$
$$\text{Capital Ratio Shortfall}_{i,t-1} = \left| \text{Gap}_{i,t-1} \right| \text{ if } k_{i,t-1} < \hat{k}_{i,t}^*, \text{ and zero otherwise} \quad (1.5)$$

Banks can respond to a capital ratio surplus (shortfall) by decreasing (increasing) capital and/or by expanding (shrinking) assets or by reshuffling them when they target a risk-weighted capital ratio.

1.3.2. Excess control rights and adjustments towards the target capital ratio

Our aim is to investigate how banks react to a capital ratio surplus and shortfall in the absence and in the presence of excess control rights.

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[10] Note that the coefficents obtained from estimating Eq. (1.3) are the product of the adjustment speed ($\hat{\lambda}$) and the variable's contribution to the bank's target capital ratio. Hence, to get the parameter value of the contribution of each variable which we replace in Eq. (1.1), we divide the estimated regression coefficient for that variable by the adjustment speed $\hat{\lambda}$.

Banks can adjust their capital (hereafter referred to as *capital adjustment*) either externally (equity issues/repurchases) or internally (smaller/larger amounts of retained earnings).[11] As a proxy for the level of capital, we use Tier 1 regulatory capital. To test whether banks are reluctant to issue equity in the presence of excess control rights, we differentiate between external and internal changes in capital. We hence define external change in capital (denoted hereafter Δ Tier 1) as the annual change in the level of Tier 1 capital minus the amount of retained earnings, all scaled by average assets defined as: (total assets at time t + total assets at time t-1)/2. Internal change in capital (hereafter Retained Earnings) is the amount of retained earnings scaled by average assets. Banks can also adjust their assets to move to the target capital ratio. We capture such adjustments (hereafter referred to as *assets adjustment*) using the annual change (scaled by average assets) in the following: total assets, net loans (excluding interbank loans) and risk-weighted assets, denoted as Δ Assets, Δ Loans and Δ RWA respectively. We hence specify the following dynamic model:

$$
\begin{aligned}
y_{i,t} = & (\alpha_1 + \beta_1 \, d(\text{Excess Control Rights})) \times \text{Capital Ratio Surplus}_{i,t-1} + (\alpha'_1 + \beta'_1 \\
& d(\text{Excess Control Rights})) \times \text{Capital Ratio Shortfall}_{i,t-1} + \theta \, y_{i,t-1} + \delta' \, Z_{i,t-1} \qquad (1.6) \\
& + \gamma' \, V_{c,t-1} + \alpha_0 + \omega' \, \text{Country} + \tau' \, \text{Year} + \varepsilon_{i,t},
\end{aligned}
$$

where y is the dependent variable which accounts either for capital adjustment (Δ Tier 1 or Retained Earnings) or assets adjustment (Δ Assets, Δ Loans or Δ RWA); Capital Ratio Surplus and Capital Ratio Shortfall refer to the absolute value of the gap between the target and the lagged actual ratios when the bank is above or below the target level respectively; Z and V are respectively vectors of bank- and country-level control variables. Time-varying control variables are lagged (one year) to deal with possible endogeneity issues. Bank-level control variables are: the dummy variable d(Excess Control Rights) for the presence of excess control rights, the deposits to assets ratio as a measure of funding structure (Deposits Total Assets), the natural logarithm of bank age as a proxy of growth opportunities (Log(Age)), a rescue dummy to account for banks which were rescued during the 2008 financial crisis (d(Rescued Bank)), an index for cross listed banks which might more easily raise equity than

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[11] Annual change in capital can be expressed as the annual change in external capital plus the current amount of retained earnings, where retained earnings are defined as current net income minus current dividend payment.

banks listed on a single stock exchange or privately owned banks (Cross Listed Index), and finally a merger acquisition dummy to account for banks which experienced a merger-acquisition event during the period of study (d(Merger Acquisition)). Control variables computed at the country-level (V) include the three-month interbank rate (3-month Interbank Rate) and the growth rate of real GDP (GDP Growth Rate) to account for macroeconomic conditions as well as an indicator of the size and depth of a country's stock market defined as the stock market capitalization to GDP ratio (Stock Traded). Similar to Eq. (1.1) and Eq. (1.3), Country and Year respectively denote vectors of country and year dummies. The definition and summary statistics of these variables are reported in Table 1.4.[12]

The parameters α_1 and α'_1 refer to banks without excess control rights and measure the extent to which they adjust capital and assets to face a capital ratio surplus or shortfall respectively. In the absence of excess control rights, we expect below-target banks to increase their capital internally and externally without strongly reducing their loans and other assets: α'_1 is positive and significant for capital adjustment variables and non-significant or significant and negative for assets adjustment variables. Meanwhile, above-target banks are expected to decrease their capital internally and externally with or without increasing their assets: α_1 is negative and significant for capital adjustment variables and non-significant or significant and positive for assets adjustment variables. The parameters $\alpha_1+\beta_1$ and $\alpha'_1+\beta'_1$ refer to banks with excess control rights and respectively correspond to the proportion of capital and assets used to adjust the capital ratio downwards and upwards. Below-target banks with excess control rights are expected to be reluctant to issue equity (β'_1 significant and negative for Δ Tier 1), and in the extreme case, they might not be issuing equity at all (if $\alpha'_1+\beta'_1$ is not significant). Alternatively, such banks could counterbalance their reluctance to issue equity by increasing retained earnings and/or by downsizing: when the sum $\alpha'_1+\beta'_1$ is significantly positive with regards to earnings retention and significantly negative for assets adjustment variables. When they are above their target, because control dilution is not an issue, such banks are expected to behave similarly to banks without excess control rights.

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[12] For correlations among the explanatory variables, see Table A1.3 in the Appendix.

Table 1.4. Variables definition and summary statistics

This table provides the definition and summary statistics for all the variables used in the regressions. The sample consists of 341 European commercial banks corresponding to 2,204 observations during the 2002-2010 period. We report summary statistics for variables measured at time t. We define average total assets as: (bank's total assets at time t + bank's total assets at time t-1)/2.

Variable name	Definition	Source	Mean	Median	Standard deviation	Minimum	Maximum
Tier 1 Total Assets	Tier 1 capital divided by total assets (%).	Bankscope	7.20	6.07	4.14	1.44	21.83
Tier 1 RWA	Tier 1 capital divided by risk-weighted assets (%).	Bankscope	11.35	9.69	5.27	4.90	31.70
d(Excess Control Rights)	Dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise.	Bankscope, Amadeus and banks' Web sites	0.36	0	0.48	0	1
Log(Total Assets)	Natural logarithm of the bank's total assets (Millions of Euros).	Bankscope	8.84	8.69	2.41	3.83	14.61
Return On Assets	Net income divided by total assets (%).	Bankscope	0.59	0.54	0.86	-2.98	3.31
Loan Loss Provisions	Loan loss provisions divided by net loans (%).	Bankscope	0.72	0.47	1.00	-0.74	5.65
Loans Total Assets	Net loans divided by total assets (%).	Bankscope	60.78	63.87	21.06	10.03	95.96
Market Discipline	Total long term market funding divided by total funding (%).	Bankscope	24.16	16.34	24.98	0.08	84.07
d(Listed Bank)	Dummy equal to one if the bank is publicly listed, and otherwise.	Bankscope	0.39	0	0.49	0	1
GDP Growth Rate	Real Gross Domestic Product (GDP) growth rate (%).	Bloomberg	1.28	1.48	2.73	-8.20	6.64
Tier 1 Total Assets Surplus	Absolute value of the difference between the fitted and the lagged values of the ratio of Tier 1 capital to total assets (Tier 1 Total Assets) when the bank is above the target, and zero otherwise (%).	Bankscope	1.02	0.10	1.56	0.00	5.48
Tier 1 RWA Surplus	Absolute value of the difference between the fitted and the lagged values of the ratio of Tier 1 capital to risk-weighted assets (Tier 1 RWA) when the bank is above the target, and zero otherwise (%).	Bankscope	1.38	0.14	2.34	0.00	8.27
Tier 1 Total Assets Shortfall	Absolute value of the difference between the fitted and the lagged values of the ratio of Tier 1 capital to total assets (Tier 1 Total Assets) when the bank is below the target, and zero otherwise (%).	Bankscope	0.97	0.13	1.45	0.00	6.34
Tier 1 RWA Shortfall	Absolute value of the difference between the fitted and the lagged values of the ratio of Tier 1 capital to risk-weighted assets (Tier 1 RWA) when the bank is below the target, and zero otherwise (%).	Bankscope	1.96	0.62	2.61	0.00	10.91
Δ Tier 1	Annual change in Tier 1 capital minus current retained earnings divided by average total assets (%).	Bankscope	0.41	0.15	1.42	-4.73	10.62
Retained Earnings	Current net income minus current dividend payment divided by average total assets (%).	Bankscope	0.45	0.02	0.85	-3.17	3.23
Δ Assets	Annual change in total assets divided by average total assets (%).	Bankscope	8.48	7.82	14.81	-50.64	72.82
Δ Loans	Annual change in net loans (excluding interbank loans) divided by average total assets (%).		6.18	5.08	10.16	-33.65	48.22
Δ RWA	Annual change in risk-weighted assets divided by average total assets (%).	Bankscope	4.60	4.00	13.16	-45.88	70.58

Table 1.4 (continued)

Deposits Total Assets	Total customer deposits divided by total assets (%).	Bankscope	47.79	48.45	22.70	3.88	91.96
Log(Age)	Natural logarithm of bank age (years).	Bankscope and banks' Web sites	3.73		1.22	0.00	6.29
d(Rescued Bank)	Dummy equal to one if the bank was rescued during the 2008 financial crisis, and zero otherwise.	Petrovic and Tutsch (2009)	0.10	0	0.30	0	1
Cross Listed Index	Index equal to the number of stock markets on which the bank is listed, and zero if the bank is privately owned.	Bankscope	1.63	0.00	3.18	0.00	16
d(Merger Acquisition)	Dummy equal to one if the bank experienced a merger-acquisition event during the sample period, and zero otherwise.	Thomson Reuters Advanced Analytics	0.09	0	0.29	0	1
3-Month Interbank Rate	Three-month interbank rate (%).	Bloomberg	2.57	2.49	1.34	0.11	6.34
Stock Traded	Value of listed shares divided by GDP (%).	World Development Indicators	77.40	64.06	58.28	0.33	394.60
d(Family)	Dummy equal to one if the bank is family-controlled, and zero otherwise.	Bankscope, Amadeus and banks' Web sites	0.19	0	0.39	0	1
d(State)	Dummy equal to one if the bank is state-controlled, and zero otherwise.	Bankscope, Amadeus and banks' Web sites	0.10	0	0.30	0	1
d(Owner Rights)	Dummy equal to one if the shareholder protection index is greater than the median value, and zero otherwise. The shareholder protection index is obtained by adding one when: (1) shareholders are allowed to mail in their proxy votes to the firm; (2) shareholders are not required to deposits hares before any general shareholders' meeting; (3) cumulative voting or proportional representation of minorities in the board is allowed; (4) minority shareholders have legal mechanisms against perceived oppression by the board; (5) the minimum percentage of share capital that entitles a shareholder to call for a special shareholders' meeting is no more than 10%; or (6) shareholders have preemptive rights that can be waived only by shareholders' vote. In our sample, the index has a median of two and half and ranges from one (Luxembourg) with the weakest protection to five (Spain and the United Kingdom) with the highest level of shareholder protection.	Djankov et al. (2008)	0.52	1	0.49	0	1
d(Crisis)	Dummy equal to one if the observation is from 2008 or 2009, and zero otherwise.	Bankscope	0.27	0	0.45	0	1
d(Undercapitalized)	Dummy equal to one if the lagged value of the ratio of Tier 1 capital to risk-weighted assets (Tier 1 RWA) is less than 6%, and zero otherwise.	Bankscope	0.13	0	0.36	0	1
	Dummy equal to one if the lagged value of the ratio of Tier 1 capital to total assets (Tier 1 Total Assets) is less than 4%, and zero otherwise.		0.21	0	0.41	0	1
d(Lending Oriented)	Dummy equal to one if the ratio of net loans (excluding interbank loans) to total assets is greater than the median value, and zero otherwise.	Bankscope	0.50	0.50	0.50	0	1
d(Large Bank)	Dummy equal to one if the bank's total assets is above the median value, and zero otherwise.	Bankscope	0.50	0.50	0.50	0	1

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1.4. Results

We first investigate the link between excess control rights and banks' capital ratio adjustment and then look at various factors that could influence such a relationship.

1.4.1. Effect of excess control rights on adjustments towards target capital ratios

We estimate the coefficients of the dynamic panel model presented in Eq. (1.6) using the Blundell and Bond (1998) Generalized Method of Moments (GMM). We check the validity of the GMM instruments (lagged values) using the Hansen test (a test of exogeneity of all instruments as a group) and the Arellano and Bond test for the absence of second order residual autocorrelation (AR2 test). Table 1.5 reports the results with the two different definitions of Tier 1 capital ratios we use (Tier 1 Total Assets and Tier 1 RWA) and all the dependent variables used to capture capital adjustment (Δ Tier 1 and Retained Earnings) and assets adjustment (Δ Assets, Δ Loans and Δ RWA).

Banks without excess control rights respond to a capital ratio surplus by reducing capital externally and internally but also by expanding assets including lending, and by substituting riskier assets for safer ones (α_1 significant for capital and assets adjustment variables). Such banks issue equity to face a capital ratio shortfall but do not increase their capital internally (α'_1 significant for Δ Tier 1 and non-significant for Retained Earnings). Most importantly, they do not decrease their assets in general or their lending in particular (α'_1 non-significant for Δ Assets and Δ Loans) although they do to some extent reshuffle their assets as shown by the results with the Tier 1 RWA ratio. On the whole, these results suggest that in the absence of excess control rights, ultimate owners do not fear control dilution and that such banks increase capital ratios by issuing equity without reducing assets and particularly lending. Banks controlled by a shareholder with excess control rights repurchase equity to face a capital ratio surplus ($\alpha_1+\beta_1$ significant for Δ Tier 1) but they do not expand their assets in general, or their lending nor reshuffle their assets ($\alpha_1+\beta_1$ non-significant for assets adjustment variables). When such banks are below their target, they do not issue equity

($\alpha'_1 + \beta'_1$ non-significant for Δ Tier 1) which is consistent with the fear of control dilution in the presence of excess control rights. Alternatively, these banks adopt other adjustment methods -free from control dilution- to counterbalance their reluctance to issue equity: they increase their capital internally but also shrink/reshuffle their assets and particularly their loans ($\alpha'_1 + \beta'_1$ significant for Retained Earnings and for assets adjustment variables).

Our results are not only statistically significant but also economically meaningful. In the presence of excess control rights, a one standard deviation (2.61) increase in the capital ratio shortfall leads to a decrease in Δ Loans by 28% of its mean (corresponding to a strong deceleration in loan growth) but does not affect Δ Loans for banks without excess control rights. A one standard deviation (2.35) increase in the capital ratio surplus is associated with a 19% increase in Δ Loans, a 23% decrease in Δ Tier 1 and a 21% decrease in Retained Earnings (of their means) in the absence of excess control rights. But for banks with excess control rights such a change in the capital ratio surplus only leads to a 29% decrease in Δ Tier 1 (of its mean) without any increase in Δ Loans.

On the whole, our results show that banks adjust to their target capital ratio differently depending on the presence or absence of excess control rights. Particularly, banks with excess control rights do not issue equity to adjust upwards. Instead, they rely on earnings retention and sharply reduce their expansion, particularly in lending. Our findings also show that banks without excess control rights adjust to the target by issuing equity without cutting lending. Our results are consistent with Admati et al. (2011) who argue that banks will still maintain their lending even if they had to increase their regulatory capital as long as there is no reluctance to issue equity due to specific governance arrangements within the bank. Our findings show that such reluctance is possible in the presence of excess control rights and this can have a big impact on lending since banks controlled by shareholders with excess control rights prevail in Europe (almost 50% of the controlled banks in our sample) and provide almost 50% of aggregate lending.

Table 1.5

Excess control rights and capital ratio adjustment

This table shows the Blundell and Bond (1998) estimation results on the effect of excess control rights on capital ratio adjustment (Eq. (1.6)) for a sample of 341 European commercial banks (corresponding to 2,204 observations) over the 2002-2010 period. In all the regressions, the fitted target capital ratio is obtained by estimating a partial adjustment model (Eq. (1.3)) using the Blundell and Bond (1998) method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. *Deposits Total Assets* is total customer deposits divided by total assets. *Log(Age)* is the natural logarithm of bank age. *d(Rescued Bank)* is a dummy equal to one if the bank was rescued during the 2008 financial crisis, and zero otherwise. *Cross Listed Index* is an index equal to the number of stock markets on which the bank is listed, and zero if the bank is privately owned. *d(Merger Acquisition)* is a dummy equal to one if the bank experienced a merger-acquisition event during the sample period, and zero otherwise. *3-month Interbank Rate* is the three-month interbank rate. *GDP Growth Rate* is the real Gross Domestic Product (GDP) growth rate. *Stock Traded is* the value of listed shares divided by GDP. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Capital adjustment				Assets adjustment					
	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.07**	-0.04*	-0.04**	-0.04**	0.80**	0.94**	0.43**	0.51**	0.48**	0.71**
	(0.04)	(0.08)	(0.02)	(0.01)	(0.03)	(0.04)	(0.02)	(0.03)	(0.04)	(0.01)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.08	-0.02	0.02	0.01	-0.39**	-0.49**	-0.17*	-0.23**	-0.28*	-0.37*
	(0.33)	(0.58)	(0.60)	(0.66)	(0.04)	(0.04)	(0.05)	(0.04)	(0.06)	(0.07)
Capital Ratio Shortfall (α'_1)	0.15**	0.09***	0.03	0.05*	-0.39	0.13	-0.35	-0.37	-0.22	-0.57**
	(0.01)	(0.00)	(0.39)	(0.09)	(0.19)	(0.64)	(0.30)	(0.10)	(0.55)	(0.02)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.10**	-0.05**	0.05*	0.03*	-0.31**	-0.84**	-0.23**	-0.29**	-0.27*	-0.04
	(0.02)	(0.05)	(0.06)	(0.08)	(0.03)	(0.02)	(0.04)	(0.04)	(0.09)	(0.22)
Lagged dependent variable	0.03	0.02	0.40***	0.37***	0.11***	0.12***	0.13***	0.15***	0.15***	0.17***
	(0.31)	(0.59)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.48***	-0.38***	-0.12	-0.11	-0.65	-0.17	-0.55	-0.19	-0.72	-0.19
	(0.00)	(0.01)	(0.18)	(0.22)	(0.79)	(0.94)	(0.73)	(0.89)	(0.67)	(0.74)
Deposits Total Assets	-0.00**	-0.00**	0.00**	0.00**	0.00	-0.01	0.03**	0.02	0.00	0.02
	(0.03)	(0.02)	(0.04)	(0.02)	(0.86)	(0.73)	(0.03)	(0.11)	(0.96)	(0.16)
Log(Age)	-0.01	-0.02	-0.00	-0.01	-0.35**	-0.29*	-0.28**	-0.20	-0.26*	-0.18
	(0.53)	(0.23)	(0.74)	(0.61)	(0.04)	(0.08)	(0.01)	(0.14)	(0.08)	(0.24)
d(Rescued Bank)	0.04	0.00	0.01	0.04	1.89	1.08	1.07	0.14	0.76	0.08
	(0.67)	(0.97)	(0.91)	(0.55)	(0.16)	(0.47)	(0.18)	(0.86)	(0.50)	(0.94)
Cross Listed Index	0.03**	0.03***	-0.00	0.00	0.22*	0.16	0.08	0.08	0.32*	0.33
	(0.02)	(0.00)	(0.89)	(0.94)	(0.05)	(0.24)	(0.35)	(0.44)	(0.08)	(0.20)
d(Merger Acquisition)	0.03	0.03	0.01	0.01	0.41	0.66	1.42*	1.40*	0.02	1.01
	(0.67)	(0.64)	(0.85)	(0.79)	(0.70)	(0.58)	(0.08)	(0.09)	(0.99)	(0.27)
3-month Interbank Rate	0.03	0.03	-0.11***	-0.11***	-2.11***	-2.37***	-1.91***	-2.09***	-1.44***	-1.59***
	(0.59)	(0.58)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
GDP Growth Rate	0.01**	0.01*	0.01*	0.00	0.26**	0.24**	0.18***	0.20***	0.15*	0.17**
	(0.05)	(0.10)	(0.05)	(0.48)	(0.02)	(0.03)	(0.00)	(0.00)	(0.05)	(0.03)
Stock Traded	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.01	0.00	0.00
	(0.56)	(0.27)	(0.25)	(0.27)	(0.28)	(0.10)	(0.71)	(0.14)	(0.97)	(0.66)
Constant	0.25	0.24	0.57***	0.60***	14.19***	14.02***	8.52***	9.54***	8.65***	9.09***
	(0.28)	(0.32)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Hansen test (P-value)	0.11	0.11	0.14	0.11	0.29	0.23	0.16	0.13	0.12	0.32
AR2 test (P-value)	0.75	0.78	0.70	0.76	0.25	0.21	0.46	0.53	0.25	0.16
Wald tests: $\alpha_1+\beta_1$	-0.15**	-0.06**	-0.02	-0.03*	0.41	0.45	0.26	0.28	0.20	0.34
$\alpha'_1+\beta'_1$	0.05	0.04	0.08**	0.08**	-0.70*	-0.71**	-0.58*	-0.66**	-0.49*	-0.61**

1.4.2. Excess control rights and capital ratio adjustments: further explorations

We go deeper by analyzing some factors that might strengthen or weaken the fear of control dilution (the type of owner, the level of shareholder protection rights, and the 2008 financial crisis). We also consider other characteristics that might affect the adjustment process, specifically downsizing (undercapitalization, asset structure, and size) with potentially strong implications for the real economy. We hence estimate the following augmented version of Eq. (1.6), where Factor stands for one of the six factors:

$$
\begin{aligned}
y_{i,t} = &[\alpha_1 + \alpha_2 \text{ Factor} + (\beta_1 + \beta_2 \text{ Factor}) \times d(\text{Excess Control Rights})] \times \text{Capital Ratio} \\
&\text{Surplus}_{i,t-1} + [\alpha'_1 + \alpha'_2 \text{ Factor} + (\beta'_1 + \beta'_2 \text{ Factor}) \times d(\text{Excess Control Rights})] \\
&\times \text{Capital Ratio Shortfall}_{i,t-1} + \theta \, y_{i,t-1} + \delta' \, Z_{i,t-1} + \gamma' \, V_{c,t-1} + \alpha_0 + \omega' \text{ Country} + \\
&\tau' \text{ Year} + \varepsilon_{i,t}
\end{aligned} \tag{1.7}
$$

1.4.2.1. Factors affecting the fear of control dilution

Various factors might influence the ability and incentives of controlling shareholders to extract private benefits. We therefore examine whether the reluctance to issue equity and reliance on earnings retention and asset downsizing are more or less pronounced under particular conditions.

First, we consider the effect of ownership type. If the controlling shareholder is a widely held institution (e.g., bank, industrial firm, mutual fund) the private benefits of control are diluted among multiple owners and as a consequence, incentives to expropriate are weak (Villalonga and Amit, 2006). If, however, the controlling shareholder is a family or a state, the incentives for expropriation might be stronger since families and the state are more able to efficiently divert benefits to themselves (Claessens et al., 2002). Second, the institutional environment and more specifically the level of shareholder protection could also play an important role. Extraction of private benefits is indeed more likely to occur in countries with weak shareholder protection (La Porta et al., 2002; Dyck and Zingales, 2004). Third, instead of extracting private benefits of control as they do during good times, controlling shareholders with excess control rights could prop up their firms (i.e., transfer funds to the firms) during hard times to avoid their failure with the expectation of extracting valuable benefits in the

future (Friedman et al., 2003). Moreover, because of tighter supervisory scrutiny and market discipline during the 2008 crisis, banks with excess control rights were presumably under greater pressure to adjust their capital ratio upwards even via equity issuance.

We define a set of dummy variables to capture such effects. First, we classify banks into three categories: family- and state-controlled banks and the category Other which is the removed category in our model.[13] We then define two dummy variables d(Family) and d(State) which respectively take a value of one if the bank is family- or state-controlled, and zero otherwise. To represent the level of shareholder protection and capture the effect of the 2008 financial crisis, we define two dummy variables d(Owner Rights) and d(Crisis) which respectively take a value of one if the shareholder protection index, as defined in Djankov et al. (2008), is greater than the cross-country median value and if the observation is from 2008 or 2009, and zero otherwise. The results are reported in Tables 1.6-1.8. We find that banks with excess control rights do not issue equity and, instead, draw on earnings and shrink their assets by mainly cutting their lending only when they are family-controlled or when they are located in a country with weak shareholder protection.[14] State-controlled banks are not found to be reluctant to issue equity potentially because in our sample a large part of state ownership comes from government intervention (capital injections and nationalizations) during the 2008 financial crisis. Moreover, the results show that during the 2008 financial crisis banks with excess control rights did issue equity to increase their capital ratio instead of drawing on earnings or decreasing assets by cutting loans as they tend to do during normal times. Regarding banks without excess control rights, we find that they still rely on equity issuance and do not cut their lending to adjust their capital ratios upwards, even during the 2008 financial crisis.

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[13] The category Other includes widely held banks (with no controlling shareholder) and banks controlled by a widely held financial or nonfinancial corporation. This classification is reasonable because banks controlled by a widely held financial or nonfinancial corporation can be classified as widely held themselves (Caprio et al., 2007). For simplicity, we also remove banks for which the control chain is a cross-holding (five banks corresponding to 33 observations) since we can neither classify them as widely held banks nor as controlled banks.

[14] We are concerned by potential endogeneity between family/state ownership and the level of shareholder protection and therefore we check the prevalence of state and family ownership in countries with weak and strong shareholder protection. The proportion of observations for banks with excess control rights that have a family or a state as an ultimate controlling owner and that are below their target level is 44% in countries with relatively weak shareholder protection rights and 38% in countries with relatively strong rights. We also test the effect of shareholder protection on the capital ratio adjustments by considering a subsample without family-controlled banks and we find that our results are not driven by the presence of family ownership.

Table 1.6. Ownership type and the effect of excess control rights on capital ratio adjustment

This table shows the Blundell and Bond (1998) estimation results on the effect of ownership type on the relationship between excess control rights and capital ratio adjustment (Eq. (1.7)) over the 2002-2010 period. We exclude banks for which the control chain is a cross-holding (for simplicity) and we use a sample of 336 European commercial banks corresponding to 2,171 observations. In all the regressions, the fitted target capital ratio is obtained by estimating a partial adjustment model (Eq. (1.3)) using the Blundell and Bond (1998) estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Family)* is a dummy equal to one if the bank is family-controlled, and zero otherwise. *d(State)* is a dummy equal to one if the bank is state-controlled, and zero otherwise. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. *Deposits Total Assets* is total customer deposits divided by total assets. *Log(Age)* is the natural logarithm of bank age. *d(Rescued Bank)* is a dummy equal to one if the bank was rescued during the 2008 financial crisis, and zero otherwise. *Cross Listed Index* is an index equal to the number of stock markets on which the bank is listed, and zero if the bank is privately owned. *d(Merger Acquisition)* is a dummy equal to one if the bank experienced a merger-acquisition event during the sample period, and zero otherwise. *3-month Interbank Rate* is the three-month interbank rate. *GDP Growth Rate* is the real Gross Domestic Product (GDP) growth rate. *Stock Traded* is the value of listed shares divided by GDP. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

	Capital adjustment				Assets adjustment					
Dependent variable	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.11**	-0.06**	-0.07**	-0.05**	0.75**	0.82*	0.31*	0.46**	0.41**	0.61**
	(0.02)	(0.05)	(0.02)	(0.03)	(0.03)	(0.05)	(0.05)	(0.02)	(0.04)	(0.03)
d(Family) × Capital Ratio Surplus (α_2)	0.07	0.01	0.02	0.02	0.14	0.15	0.18	0.12	0.16	0.14
	(0.27)	(0.85)	(0.21)	(0.18)	(0.37)	(0.16)	(0.26)	(0.36)	(0.34)	(0.32)
d(State) × Capital Ratio Surplus (α_3)	0.07	-0.01	-0.01	0.01	0.04	0.20	0.06	0.08	0.08	0.16
	(0.33)	(0.89)	(0.36)	(0.24)	(0.73)	(0.21)	(0.30)	(0.66)	(0.44)	(0.58)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.04	-0.00	-0.01	-0.01	-0.40	-0.39	-0.11	-0.15	-0.20	-0.29
	(0.67)	(0.95)	(0.12)	(0.75)	(0.27)	(0.51)	(0.88)	(0.70)	(0.35)	(0.26)
d(Family) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	-0.06*	-0.07*	0.04*	0.01	-0.07	-0.17	-0.06	-0.16	-0.15	-0.11
	(0.08)	(0.07)	(0.05)	(0.20)	(0.52)	(0.20)	(0.72)	(0.79)	(0.92)	(0.40)
d(State) × d(Excess Control Rights) × Capital Ratio Surplus (β_3)	-0.02	-0.02	-0.12	-0.01	0.06	-0.15	0.03	-0.08	-0.09	-0.13
	(0.33)	(0.65)	(0.31)	(0.14)	(0.50)	(0.17)	(0.66)	(0.28)	(0.45)	(0.19)
Capital Ratio Shortfall (α'_1)	0.16**	0.08***	0.03	0.05*	-0.37	0.08	-0.42	-0.39	-0.31	-0.53**
	(0.01)	(0.00)	(0.33)	(0.08)	(0.12)	(0.78)	(0.19)	(0.18)	(0.16)	(0.01)
d(Family) × Capital Ratio Shortfall (α'_2)	0.11	0.07	0.01	0.01	0.06	0.07	0.06	-0.07	0.14	-0.03
	(0.15)	(0.10)	(0.84)	(0.47)	(0.38)	(0.49)	(0.26)	(0.81)	(0.48)	(0.41)
d(State) × Capital Ratio Shortfall (α'_3)	0.02	-0.03	-0.04	-0.00	0.03	0.04	0.06	-0.06	0.03	-0.08
	(0.89)	(0.36)	(0.42)	(0.99)	(0.78)	(0.61)	(0.25)	(0.82)	(0.70)	(0.40)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.08	-0.02	0.04	0.00	-0.12	-0.50	-0.06	-0.10	-0.05	-0.05
	(0.24)	(0.26)	(0.35)	(0.91)	(0.20)	(0.29)	(0.70)	(0.16)	(0.48)	(0.21)
d(Family) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	-0.17**	-0.10**	-0.00	0.02*	-0.52**	-0.67**	-0.29**	-0.39**	-0.45*	-0.11
	(0.04)	(0.03)	(0.93)	(0.09)	(0.02)	(0.01)	(0.05)	(0.03)	(0.07)	(0.10)
d(State) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_3)	-0.02	0.08**	-0.05	-0.03	-0.13	-0.17	-0.12	0.11**	-0.09	0.10
	(0.77)	(0.03)	(0.50)	(0.90)	(0.15)	(0.22)	(0.31)	(0.03)	(0.41)	(0.11)
Lagged dependent variable	0.03	0.03	0.43***	0.42***	0.10***	0.13***	0.16***	0.17***	0.15***	0.16***
	(0.45)	(0.42)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.55***	-0.63**	-0.15	-0.16*	-2.96	-0.15	-0.42	-0.22	-0.02	-2.54
	(0.00)	(0.01)	(0.14)	(0.08)	(0.19)	(0.95)	(0.77)	(0.88)	(0.99)	(0.16)
d(Family)	0.19	0.29	0.03	-0.25*	3.42	-0.69	1.16	-0.44	2.04	1.71
	(0.40)	(0.27)	(0.85)	(0.07)	(0.29)	(0.84)	(0.60)	(0.85)	(0.48)	(0.57)
d(State)	0.22	0.29*	0.10	0.09	2.98	1.59	3.60*	3.61*	2.91	-3.17*
	(0.31)	(0.10)	(0.52)	(0.54)	(0.30)	(0.58)	(0.07)	(0.06)	(0.20)	(0.08)

Table 1.6 (continued)

Deposits Total Assets	-0.00**	-0.00*	0.00	0.00	0.00	-0.01	0.02	0.02*	0.00	0.01
	(0.04)	(0.06)	(0.16)	(0.13)	(0.87)	(0.60)	(0.23)	(0.09)	(0.98)	(0.75)
Log(Age)	-0.02	-0.03**	0.00	-0.00	-0.37*	-0.31*	-0.31**	-0.29**	-0.24	-0.22
	(0.31)	(0.04)	(0.90)	(0.72)	(0.05)	(0.08)	(0.01)	(0.03)	(0.12)	(0.20)
d(Rescued Bank)	0.02	0.03	0.00	0.04	1.39	1.05	0.58	0.41	0.66	0.41
	(0.87)	(0.71)	(1.00)	(0.64)	(0.22)	(0.42)	(0.50)	(0.60)	(0.61)	(0.78)
Cross Listed Index	0.02**	0.03***	0.01	0.01	0.21*	0.15	0.08	0.14	0.33***	0.40***
	(0.01)	(0.00)	(0.49)	(0.47)	(0.10)	(0.28)	(0.36)	(0.11)	(0.00)	(0.00)
d(Merger Acquisition)	0.09	0.06	0.00	0.01	0.49	0.52	1.44*	1.36*	0.06	0.26
	(0.20)	(0.42)	(0.94)	(0.85)	(0.66)	(0.65)	(0.07)	(0.06)	(0.95)	(0.80)
3-month Interbank Rate	0.04	0.05	-0.11**	-0.11***	-2.10***	-2.02***	-1.96***	-2.04***	-1.92***	-1.98***
	(0.49)	(0.39)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
GDP Growth Rate	0.01*	0.01	0.00	0.00	0.23**	0.31***	0.18***	0.18***	0.14*	0.15**
	(0.06)	(0.16)	(0.47)	(0.63)	(0.04)	(0.01)	(0.01)	(0.01)	(0.10)	(0.05)
Stock Traded	0.00	0.00	0.00	0.00	0.01	0.01	0.02*	0.02**	0.00	0.00
	(0.46)	(0.59)	(0.18)	(0.42)	(0.71)	(0.31)	(0.06)	(0.04)	(0.88)	(0.87)
Constant	0.13	0.12	0.56**	0.57***	12.14***	13.76***	9.54***	10.85***	9.91***	11.79***
	(0.61)	(0.64)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Hansen test (P-value)	0.13	0.14	0.12	0.12	0.17	0.15	0.16	0.14	0.12	0.20
AR2 test (P-value)	0.85	0.92	0.69	0.95	0.31	0.29	0.66	0.60	0.34	0.22
Wald tests: $\alpha_1 + \alpha_2$	-0.04**	-0.05**	-0.05**	-0.03*	0.89***	0.97***	0.49**	0.58**	0.57**	0.75***
$\alpha_1 + \alpha_3$	-0.04*	-0.07**	-0.08**	-0.04**	0.79**	1.02***	0.37**	0.54**	0.49**	0.77***
$\alpha_1 + \beta_1$	-0.15**	-0.06**	-0.08**	-0.06*	0.35	0.43	0.20	0.31	0.21	0.32
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.14**	-0.12**	-0.02	-0.03	0.42	0.41	0.32	0.27	0.22	0.35
$\alpha_1 + \alpha_3 + \beta_1 + \beta_3$	-0.10**	-0.09**	-0.19**	-0.06**	0.45	0.48	0.29	0.31	0.20	0.35
$\alpha'_1 + \alpha'_2$	0.27***	0.15***	0.04	0.06*	-0.31	0.15	-0.36	-0.46	-0.17	-0.56**
$\alpha'_1 + \alpha'_3$	0.18***	0.05**	-0.01	0.05*	-0.34	0.12	-0.36	-0.45	-0.28	-0.61***
$\alpha'_1 + \beta'_1$	0.08**	0.06**	0.07*	0.05*	-0.49	-0.42	-0.48	-0.49*	-0.36	-0.58**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.02	0.03	0.08**	0.08**	-0.95**	-1.02**	-0.71**	-0.95**	-0.67**	-0.72**
$\alpha'_1 + \alpha'_3 + \beta'_1 + \beta'_3$	0.08**	0.11***	-0.02	0.02	-0.59*	-0.55*	-0.54	-0.44	-0.42	-0.56

Table 1.7. Shareholder protection and the effect of excess control rights on capital ratio adjustment

This table shows the Blundell and Bond (1998) estimation results on the effect of shareholder protection rights on the relationship between excess control rights and capital ratio adjustment (Eq. (1.7)) for a sample of 341 European commercial banks (2,204 observations) over the 2002-2010 period. In all the regressions, the fitted target capital ratio is obtained by estimating a partial adjustment model (Eq. (1.3)) using the Blundell and Bond (1998) method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Owner Rights)* is a dummy equal to one if the shareholder protection index as defined in Djankov et al. (2008) is greater than the median value, and zero otherwise. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. The definition of other variables is provided in Table 1.4. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Capital adjustment				Assets adjustment					
	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.08**	-0.07*	-0.06**	-0.06***	0.72**	0.89**	0.33*	0.43**	0.39**	0.62**
	(0.02)	(0.09)	(0.02)	(0.01)	(0.01)	(0.01)	(0.07)	(0.05)	(0.02)	(0.04)
d(Owner Rights) × Capital Ratio Surplus (α_2)	0.02	0.03	-0.02	0.01	0.15	0.08	0.15	0.14	0.16	0.18
	(0.10)	(0.22)	(0.29)	(0.24)	(0.59)	(0.19)	(0.56)	(0.73)	(0.89)	(0.28)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.08	-0.02	0.05	0.04	-0.36	-0.48	-0.04	-0.17	-0.18	-0.29
	(0.65)	(0.90)	(0.15)	(0.17)	(0.39)	(0.69)	(0.50)	(0.74)	(0.70)	(0.19)
d(Owner Rights) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	0.06	0.02	-0.03	-0.06*	-0.07	-0.02	-0.18	0.07	-0.17	-0.16
	(0.72)	(0.53)	(0.14)	(0.10)	(0.78)	(0.78)	(0.19)	(0.97)	(0.10)	(0.11)
Capital Ratio Shortfall (α'_1)	0.16**	0.07**	0.04	0.04*	-0.35	-0.09	-0.37	-0.29	-0.19	-0.59**
	(0.04)	(0.04)	(0.45)	(0.08)	(0.17)	(0.64)	(0.17)	(0.11)	(0.51)	(0.01)
d(Owner Rights) × Capital Ratio Shortfall (α'_2)	0.06	0.08	0.01	-0.00	-0.10	0.17	-0.05	-0.27	-0.08	-0.03
	(0.41)	(0.11)	(0.79)	(0.98)	(0.92)	(0.17)	(0.93)	(0.34)	(0.21)	(0.43)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.14**	-0.06**	0.04*	0.02*	-0.49**	-0.85**	-0.48*	-0.61**	-0.47*	-0.08
	(0.02)	(0.03)	(0.05)	(0.06)	(0.03)	(0.01)	(0.07)	(0.02)	(0.06)	(0.36)
d(Owner Rights) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	-0.00	-0.00	-0.04	-0.03	0.34	0.27	0.47*	0.58*	0.43	0.13
	(0.95)	(1.00)	(0.60)	(0.54)	(0.51)	(0.38)	(0.07)	(0.07)	(0.46)	(0.48)
Lagged dependent variable	0.03	0.03	0.40***	0.35***	0.11***	0.12***	0.12***	0.13***	0.15***	0.16***
	(0.39)	(0.51)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.55***	-0.54***	-0.14	-0.02	-0.98	-1.47	-1.64	-0.22	-1.85	-2.19
	(0.00)	(0.01)	(0.16)	(0.80)	(0.62)	(0.50)	(0.26)	(0.89)	(0.31)	(0.55)
Deposits Total Assets	-0.00**	-0.00*	0.00*	0.00	0.00	-0.00	0.01	0.02	0.01	0.00
	(0.02)	(0.07)	(0.07)	(0.11)	(0.94)	(0.85)	(0.31)	(0.14)	(0.75)	(0.78)
Log(Age)	-0.02	-0.02	0.00	-0.01	-0.37**	-0.28	-0.30**	-0.27**	-0.26*	-0.27
	(0.20)	(0.16)	(0.92)	(0.61)	(0.04)	(0.10)	(0.01)	(0.04)	(0.09)	(0.11)
d(Rescued Bank)	0.01	0.02	0.00	0.01	1.16	1.47	0.78	0.11	0.28	0.25
	(0.89)	(0.77)	(0.98)	(0.87)	(0.35)	(0.27)	(0.31)	(0.89)	(0.84)	(0.84)
Cross Listed Index	0.03**	0.03***	0.00	0.00	0.18	0.22	0.10	0.07	0.28***	0.40***
	(0.01)	(0.00)	(0.79)	(0.76)	(0.20)	(0.12)	(0.23)	(0.44)	(0.01)	(0.00)
d(Merger Acquisition)	0.07	0.06	0.03	0.05	0.34	0.24	1.72**	1.53*	0.32	0.71
	(0.39)	(0.41)	(0.52)	(0.35)	(0.78)	(0.83)	(0.03)	(0.06)	(0.75)	(0.49)
3-month Interbank Rate	0.02	0.04	-0.13***	-0.12***	-1.97***	-2.04***	-2.14***	-2.25***	-1.78**	-1.91***
	(0.68)	(0.50)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
GDP Growth Rate	0.02**	0.01	0.01	0.00	0.24**	0.26**	0.20***	0.20***	0.18**	0.18**
	(0.01)	(0.30)	(0.25)	(0.48)	(0.03)	(0.02)	(0.00)	(0.00)	(0.03)	(0.04)
Stock Traded	0.00	0.00	0.00	0.00	0.01	0.01	0.01*	0.01	0.00	0.00
	(0.34)	(0.38)	(0.17)	(0.19)	(0.67)	(0.46)	(0.08)	(0.12)	(0.87)	(0.76)
Constant	0.39*	0.30	0.70***	0.72***	13.43***	13.06***	10.91***	10.74***	9.18***	10.97***
	(0.08)	(0.27)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Hansen test (P-value)	0.31	0.18	0.15	0.24	0.33	0.52	0.24	0.20	0.33	0.43
AR2 test (P-value)	0.90	0.98	0.88	0.95	0.25	0.21	0.49	0.57	0.15	0.15
Wald tests: $\alpha_1 + \alpha_2$	-0.06**	-0.04*	-0.08**	-0.05**	0.87***	0.97***	0.48**	0.57**	0.55**	0.80**
$\alpha_1 + \beta_1$	-0.16**	-0.09**	-0.01	-0.02	0.36	0.41	0.29	0.26	0.21	0.33
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.08**	-0.04**	-0.06**	-0.07**	0.44*	0.47*	0.26	0.33	0.20	0.35
$\alpha'_1 + \alpha'_2$	0.22***	0.15***	0.05	0.04	-0.45	0.08	-0.42	-0.56	-0.27	-0.62**
$\alpha'_1 + \beta'_1$	0.02	0.01	0.08**	0.06**	-0.84**	-0.94**	-0.90**	-0.90**	-0.66**	-0.67**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.08**	0.09***	0.05*	0.03	-0.60*	-0.50*	-0.43	-0.59	-0.31	-0.57*

Table 1.8. 2008 financial crisis and the effect of excess control rights on capital ratio adjustment

This table shows the Blundell and Bond (1998) estimation results on the effect of the 2008 financial crisis on the relationship between excess control rights and capital ratio adjustment (Eq. (1.7)) for a sample of 341 European commercial banks (2,204 observations) over the 2002-2010 period. In all the regressions, the fitted target capital ratio is obtained by estimating a partial adjustment model (Eq. (1.3)) using the Blundell and Bond (1998) method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Crisis)* is a dummy equal to one if the observation is from 2008 or 2009, and zero otherwise. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. The definition of other variables is provided in Table 1.4. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

| | Capital adjustment | | | | Assets adjustment | | | | | |
| Dependent variable | Δ Tier 1 | | Retained Earnings | | Δ Assets | | Δ Loans | | Δ RWA | |
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.09***	-0.06**	-0.04**	-0.05**	1.08**	1.15***	0.53**	0.63**	0.61**	0.91**
	(0.01)	(0.02)	(0.03)	(0.03)	(0.02)	(0.00)	(0.03)	(0.02)	(0.02)	(0.01)
d(Crisis) × Capital Ratio Surplus (α_2)	0.05*	0.03	-0.02	-0.01	-0.62	-0.45	-0.20	-0.28	-0.30	-0.40
	(0.07)	(0.49)	(0.13)	(0.12)	(0.75)	(0.67)	(0.71)	(0.59)	(0.12)	(0.27)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.04	-0.03	0.01	0.03	-0.62	-0.65	-0.17	-0.29	-0.32	-0.54
	(0.51)	(0.50)	(0.61)	(0.16)	(0.77)	(0.47)	(0.50)	(0.80)	(0.42)	(0.45)
d(Crisis) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	0.04	0.03	-0.02	-0.03	0.50	0.35	0.06	0.16	0.22	0.37
	(0.63)	(0.25)	(0.92)	(0.65)	(0.23)	(0.41)	(0.88)	(0.70)	(0.80)	(0.28)
Capital Ratio Shortfall (α'_1)	0.16**	0.12**	0.04	0.06	-0.43	0.07	-0.24	-0.32	-0.25	-0.65**
	(0.04)	(0.01)	(0.17)	(0.10)	(0.28)	(0.85)	(0.73)	(0.35)	(0.12)	(0.02)
d(Crisis) × Capital Ratio Shortfall (α'_2)	-0.06	-0.06	-0.01	-0.02	-0.06	0.18	-0.21	-0.14	-0.18	0.18
	(0.39)	(0.85)	(0.21)	(0.19)	(0.51)	(0.66)	(0.75)	(0.59)	(0.22)	(0.80)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.12*	-0.10*	0.06	0.06*	-0.50*	-0.96**	-0.42*	-0.51*	-0.48**	-0.15
	(0.07)	(0.08)	(0.16)	(0.06)	(0.08)	(0.01)	(0.05)	(0.06)	(0.04)	(0.82)
d(Crisis) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	0.10	0.10	-0.04	-0.05	0.47	0.20	0.43	0.51	0.62	0.33
	(0.24)	(0.17)	(0.43)	(0.73)	(0.15)	(0.44)	(0.24)	(0.38)	(0.12)	(0.29)
Lagged dependent variable	0.03	0.02	0.41***	0.39***	0.12***	0.12***	0.23***	0.20***	0.21***	0.18***
	(0.42)	(0.56)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.48***	-0.40***	-0.08	-0.09	-0.08	-0.32	-0.51	-0.32	-1.30	-2.24
	(0.00)	(0.00)	(0.39)	(0.37)	(0.97)	(0.88)	(0.70)	(0.83)	(0.35)	(0.12)
Deposits Total Assets	-0.00*	-0.00**	0.00**	0.00**	0.00	-0.00	0.03**	0.02	0.00	0.01
	(0.05)	(0.02)	(0.01)	(0.01)	(0.90)	(0.84)	(0.03)	(0.21)	(0.97)	(0.36)
Log(Age)	-0.01	-0.02	-0.00	-0.00	-0.34*	-0.36**	-0.25**	-0.23*	-0.19	-0.20
	(0.34)	(0.14)	(0.75)	(0.71)	(0.05)	(0.03)	(0.02)	(0.08)	(0.17)	(0.17)
d(Rescued Bank)	0.02	0.02	0.01	0.02	1.83	1.31	1.24	0.60	0.36	0.13
	(0.83)	(0.80)	(0.85)	(0.82)	(0.13)	(0.36)	(0.11)	(0.46)	(0.73)	(0.91)
Cross Listed Index	0.03**	0.03***	0.00	0.00	0.20*	0.15	0.08	0.13	0.28**	0.32***
	(0.01)	(0.00)	(0.86)	(0.82)	(0.09)	(0.25)	(0.37)	(0.19)	(0.01)	(0.00)
d(Merger Acquisition)	0.01	0.03	0.01	0.03	0.71	0.82	1.48*	1.48*	0.18	0.80
	(0.90)	(0.70)	(0.83)	(0.55)	(0.50)	(0.50)	(0.07)	(0.07)	(0.85)	(0.39)
3-month Interbank Rate	0.03	0.03	-0.11***	-0.09**	-2.20***	-2.32***	-1.95**	-2.12***	-1.36**	-1.39**
	(0.54)	(0.63)	(0.01)	(0.03)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)
GDP Growth Rate	0.01	0.01	0.01	0.00	0.26**	0.26**	0.17**	0.19***	0.16**	0.20**
	(0.22)	(0.24)	(0.11)	(0.50)	(0.02)	(0.02)	(0.01)	(0.00)	(0.04)	(0.02)
Stock Traded	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.01	0.00	0.00
	(0.43)	(0.35)	(0.27)	(0.36)	(0.35)	(0.15)	(0.72)	(0.12)	(0.97)	(0.97)
Constant	0.26	0.30	0.50***	0.48***	13.05***	13.94***	8.53***	10.83***	6.91***	8.27***
	(0.27)	(0.21)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Hansen test (P-value)	0.17	0.14	0.09	0.13	0.26	0.22	0.17	0.11	0.16	0.18
AR2 test (P-value)	0.90	0.89	0.90	0.80	0.21	0.22	0.47	0.61	0.34	0.35
Wald tests: $\alpha_1 + \alpha_2$	-0.04*	-0.03	-0.06**	-0.06**	0.46*	0.70**	0.33	0.35	0.31	0.51**
$\alpha_1 + \beta_1$	-0.13**	-0.09**	-0.03	-0.02	0.46	0.50	0.36	0.34	0.29	0.37
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.04	-0.03*	-0.07**	-0.06**	0.34	0.40	0.22	0.22	0.21	0.34
$\alpha'_1 + \alpha'_2$	0.10**	0.06**	0.03	0.04	-0.49	0.25	-0.45	-0.46	-0.43	-0.47*
$\alpha'_1 + \beta'_1$	0.04	0.02	0.10***	0.12**	-0.93**	-0.89**	-0.66**	-0.83**	-0.73**	-0.80**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.08**	0.06**	0.05	0.05	-0.52	-0.51	-0.44	-0.46	-0.29	-0.29

1.4.2.2. Other factors and implications for bank downsizing

So far, we have examined how banks adjust their capital ratios and found that banks controlled by shareholders with excess control rights tend to reduce lending to increase their capital strength. Because such banks are prevalent in Europe, we go further and investigate the extent to which banks reduce their lending depending on (1) how they are capitalized (regulatory breach), (2) the extent to which they are focused on lending activities, and (3) due to size.

Banks close to the minimum regulatory capital ratio might shrink their assets more extensively to meet regulatory requirements. Moreover, banks could weigh the costs of issuing equity against the costs of liquidating assets and depending on their asset structure, they could behave differently. For instance, if their asset structure is flexible enough, banks might first reduce their interbank lending and other assets (which are easier to liquidate without incurring higher costs) and cut their loans only as a last resort (Mosk and Ongena, 2013). Furthermore, because they face less pressure and suffer lower costs when they are far from the target ratio, large institutions might not imminently need to liquidate assets to adjust (Flannery and Rangan, 2006). To capture the impact of such characteristics on downsizing, we define three dummy variables d(Undercapitalized), d(Lending Oriented), and d(Large Bank) which respectively take a value of one if (1) the bank is undercapitalized,[15] (2) the net loans (excluding interbank loans) to assets ratio is above the median value, (3) the bank's total assets variable is above the median value, and zero otherwise. The results are reported in Tables 1.9-1.11. They show that, in the presence of excess control rights, banks that are close to the minimum regulatory capital ratio reduce their lending to a larger extent. Banks that are either relatively large or more focused on lending activities follow a similar behavior. But in the absence of excess control rights, such factors do not play any role and banks still rely on equity issuance to boost their capital ratios with no reduction in lending.

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[15] We define different dummies for each of the two capital ratios we use (Tier 1 RWA and Tier 1 Total Assets).We consider a bank to be undercapitalized if the lagged actual Tier 1 regulatory capital ratio (Tier 1 RWA) is less than 6% (Gropp and Heider, 2011; Mosk and Ongena, 2013). Under the period of study we have no formal threshold for the Tier 1 Total Assets ratio and we define a bank as undercapitalized if the lagged actual Tier 1 Total Assets ratio is less than 4% (Berger et al., 2008). In our sample, 147 and 291 observations (out of 2,204 observations) refer to below-target banks close to the minimum threshold for respectively the Tier 1 RWA ratio and the Tier 1 Total Assets ratio, of which 87 and 124 observations refer to banks with excess control rights.

Table 1.9. Bank capitalization and the effect of excess control rights on capital ratio adjustment

This table shows the Blundell and Bond (1998) estimation results on the effect of bank capitalization on the relationship between excess control rights and capital ratio adjustment (Eq. (1.7)) for a sample of 341 European commercial banks (2,204 observations) over the 2002-2010 period. In all the regressions, the target capital ratio is obtained by estimating a partial adjustment model (Eq. (1.3)) using the Blundell and Bond (1998) estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Undercapitalized)* is a dummy equal to one if the Tier 1 RWA (Tier 1 Total Assets) ratio is less than 6% (4%), and zero otherwise. The definition of other variables is provided in Table 1.4. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

	Capital adjustment				Assets adjustment					
Dependent variable	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.06**	-0.06*	-0.05**	-0.04*	0.72**	0.83**	0.47*	0.52**	0.45**	0.65***
	(0.03)	(0.08)	(0.04)	(0.06)	(0.01)	(0.03)	(0.05)	(0.01)	(0.02)	(0.00)
d(Undercapitalized) × Capital Ratio Surplus (α_2)	0.02	0.04**	0.01	0.02*	-0.08	-0.41*	-0.03	-0.19*	-0.02	-0.23*
	(0.82)	(0.04)	(0.92)	(0.10)	(0.40)	(0.06)	(0.37)	(0.09)	(0.86)	(0.09)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.10	-0.04	0.02	0.00	-0.42*	-0.40*	-0.18*	-0.10*	-0.14	-0.16
	(0.18)	(0.36)	(0.70)	(0.90)	(0.10)	(0.08)	(0.08)	(0.09)	(0.11)	(0.12)
d(Undercapitalized) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	0.07	0.04*	0.00	0.03*	0.07	0.19	0.19	-0.09	0.11	-0.03
	(0.68)	(0.07)	(0.19)	(0.09)	(0.55)	(0.30)	(0.47)	(0.63)	(0.70)	(0.61)
Capital Ratio Shortfall (α'_1)	0.10**	0.08**	0.02	0.03	-0.36	-0.04	-0.26	-0.38	-0.36	-0.48**
	(0.04)	(0.03)	(0.46)	(0.12)	(0.19)	(0.40)	(0.45)	(0.15)	(0.12)	(0.05)
d(Undercapitalized) × Capital Ratio Shortfall (α'_2)	0.05	0.07*	0.03	0.00	-0.12	0.29	-0.12	-0.12	-0.18	-0.18
	(0.25)	(0.06)	(0.61)	(0.94)	(0.15)	(0.62)	(0.18)	(0.64)	(0.16)	(0.29)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.08**	-0.06**	0.07*	0.03*	-0.27*	-0.44**	-0.40*	-0.22*	-0.43**	-0.12
	(0.02)	(0.02)	(0.06)	(0.07)	(0.06)	(0.03)	(0.06)	(0.06)	(0.01)	(0.12)
d(Undercapitalized) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	-0.04	-0.05	-0.05	-0.00	-0.17	-0.43**	-0.12	-0.27*	0.09	-0.14*
	(0.19)	(0.17)	(0.26)	(0.50)	(0.42)	(0.03)	(0.87)	(0.05)	(0.65)	(0.10)
Lagged dependent variable	0.03	0.03	0.39***	0.37***	0.11***	0.11***	0.12***	0.15***	0.15***	0.17***
	(0.28)	(0.48)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.49***	-0.39**	-0.19*	-0.01	-0.41	-0.35	-1.18	-0.24	-1.47	-2.97**
	(0.00)	(0.01)	(0.05)	(0.89)	(0.85)	(0.87)	(0.43)	(0.86)	(0.33)	(0.04)
d(Undercapitalized)	0.17	0.67***	-0.23*	-0.17*	-2.85	-1.62	-1.43	0.14	-3.37*	-3.25*
	(0.37)	(0.00)	(0.06)	(0.09)	(0.15)	(0.50)	(0.36)	(0.93)	(0.06)	(0.10)
Deposits Total Assets	-0.00**	-0.00**	0.00*	0.00**	0.01	-0.00	0.02*	0.02	-0.00	0.00
	(0.02)	(0.03)	(0.05)	(0.04)	(0.64)	(0.85)	(0.07)	(0.12)	(0.78)	(0.79)
Log(Age)	-0.02	-0.02	-0.01	-0.00	-0.41**	-0.29*	-0.33**	-0.29**	-0.33**	-0.20
	(0.33)	(0.14)	(0.54)	(0.89)	(0.02)	(0.10)	(0.01)	(0.02)	(0.03)	(0.21)
d(Rescued Bank)	0.01	0.06	0.00	0.02	1.37	1.16	0.75	0.59	0.98	0.14
	(0.95)	(0.55)	(0.97)	(0.76)	(0.35)	(0.41)	(0.36)	(0.46)	(0.47)	(0.92)
Cross Listed Index	0.03**	0.03***	0.00	0.00	0.20	0.19	0.09	-0.12	0.33***	0.38***
	(0.01)	(0.00)	(0.95)	(0.97)	(0.16)	(0.17)	(0.29)	(0.19)	(0.00)	(0.00)
d(Merger Acquisition)	0.02	0.03	0.06	0.02	0.65	0.49	1.63**	1.53**	0.21	0.35
	(0.82)	(0.67)	(0.20)	(0.64)	(0.59)	(0.71)	(0.03)	(0.04)	(0.84)	(0.73)
3-month Interbank Rate	0.02	0.04	-0.13***	-0.11***	-2.13***	-2.47***	-2.14**	-2.20***	-1.52**	-1.48***
	(0.62)	(0.50)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)
GDP Growth Rate	0.02**	0.01	0.01	0.00	0.25**	0.29**	0.19***	0.24***	0.19**	0.20**
	(0.03)	(0.12)	(0.20)	(0.64)	(0.03)	(0.01)	(0.00)	(0.00)	(0.03)	(0.01)
Stock Traded	0.00	0.00	0.00	0.00*	0.01	0.01	0.01	0.01*	0.01	0.00
	(0.20)	(0.16)	(0.14)	(0.10)	(0.36)	(0.37)	(0.19)	(0.10)	(0.63)	(0.96)
Constant	0.26	0.11	0.75***	0.69***	15.22***	15.58***	10.17*	11.05***	10.30*	9.30***
	(0.30)	(0.68)	(0.00)	(0.00)	(0.00)	(0.00)	(0.05)	(0.00)	(0.05)	(0.00)
Hansen test (P-value)	0.53	0.65	0.60	0.66	0.86	0.71	0.78	0.64	0.84	0.77
AR2 test (P-value)	0.93	0.96	0.79	0.93	0.28	0.28	0.55	0.58	0.15	0.17
Wald tests: $\alpha_1 + \alpha_2$	-0.04**	-0.02	-0.04*	-0.02	0.64**	0.42	0.44**	0.33	0.43**	0.42
$\alpha_1 + \beta_1$	-0.16**	-0.10**	-0.03	-0.04	0.30	0.43	0.29	0.42	0.31	0.49
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.07**	-0.02	-0.02	0.01	0.29	0.21	0.45	0.14	0.40	0.23
$\alpha'_1 + \alpha'_2$	0.15**	0.15**	0.05	0.03	-0.48	0.25	-0.38	-0.50	-0.54	-0.66**
$\alpha'_1 + \beta'_1$	0.02	0.02	0.09**	0.06**	-0.63**	-0.48**	-0.66**	-0.60**	-0.79**	-0.60**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.03	0.04	0.07**	0.06**	-0.92**	-0.62**	-0.90**	-0.99**	-0.88***	-0.92**

Table 1.10. Asset structure and the effect of excess control rights on capital ratio adjustment

This table shows the Blundell and Bond (1998) estimation results on the effect of asset structure on the relationship between excess control rights and capital ratio adjustment (Eq. (1.7)) for a sample of 341 European commercial banks (2,204 observations) over the 2002-2010 period. In all the regressions, the target capital ratio is obtained by estimating a partial adjustment model (Eq. (1.3)) using the Blundell and Bond (1998) method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Lending Oriented)* is a dummy equal to one if the ratio of net loans (excluding interbank loans) to total assets is greater than the median value, and zero otherwise. The definition of other variables is provided in Table 1.4. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Capital adjustment				Assets adjustment					
	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.08**	-0.07*	-0.06**	-0.06***	0.74**	0.85**	0.40**	0.45**	0.43**	0.64**
	(0.01)	(0.05)	(0.01)	(0.00)	(0.01)	(0.01)	(0.04)	(0.03)	(0.02)	(0.02)
d(Lending Oriented) × Capital Ratio Surplus (α_2)	-0.01	-0.02	-0.01	-0.01	0.14	0.10	-0.02	-0.01	0.10	0.08
	(0.15)	(0.20)	(0.30)	(0.22)	(0.37)	(0.21)	(0.35)	(0.53)	(0.29)	(0.28)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.06	-0.02	0.03	0.04	-0.39*	-0.50*	-0.12*	-0.15*	-0.12*	-0.30**
	(0.25)	(0.40)	(0.19)	(0.21)	(0.09)	(0.06)	(0.10)	(0.07)	(0.07)	(0.05)
d(Lending Oriented) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	0.04	0.02	-0.00	-0.01	-0.12	-0.10	-0.02	-0.02	-0.10	-0.06
	(0.22)	(0.23)	(0.34)	(0.20)	(0.28)	(0.18)	(0.19)	(0.27)	(0.12)	(0.21)
Capital Ratio Shortfall (α'_1)	0.11**	0.07**	0.03	0.03	-0.48*	-0.49*	-0.30	-0.29	-0.39	-0.56**
	(0.03)	(0.02)	(0.24)	(0.18)	(0.07)	(0.06)	(0.21)	(0.15)	(0.15)	(0.01)
d(Lending Oriented) × Capital Ratio Shortfall (α'_2)	0.06	0.06	0.02	0.01	0.15*	0.17*	-0.08	-0.07	0.06	-0.03
	(0.13)	(0.15)	(0.52)	(0.45)	(0.09)	(0.07)	(0.23)	(0.34)	(0.21)	(0.40)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.08**	-0.04**	0.05*	0.04*	-0.45**	-0.43**	-0.25*	-0.26*	-0.40*	-0.10
	(0.02)	(0.02)	(0.05)	(0.06)	(0.01)	(0.01)	(0.08)	(0.06)	(0.06)	(0.36)
d(Lending Oriented) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	-0.04	-0.05	-0.01	-0.00	-0.04	-0.10	-0.28*	-0.30**	-0.07	-0.03
	(0.25)	(0.20)	(0.26)	(0.45)	(0.33)	(0.38)	(0.07)	(0.04)	(0.26)	(0.45)
Lagged dependent variable	0.04	0.03	0.42***	0.37***	0.10***	0.12***	0.12***	0.13***	0.16***	0.16***
	(0.24)	(0.44)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.53***	-0.55***	-0.15	-0.04	-0.55	-0.00	-0.15	-0.05	-1.03	-3.20**
	(0.00)	(0.00)	(0.14)	(0.69)	(0.80)	(1.00)	(0.92)	(0.97)	(0.55)	(0.04)
d(Lending Oriented)	-0.14	0.04	0.15	0.16*	-0.46	1.55	0.17	2.88***	-1.19	3.21**
	(0.24)	(0.70)	(0.11)	(0.06)	(0.79)	(0.30)	(0.87)	(0.01)	(0.39)	(0.03)
Deposits Total Assets	-0.00**	-0.00**	0.00*	0.00**	0.01	-0.01	0.03**	0.02*	-0.00	0.01
	(0.04)	(0.04)	(0.08)	(0.01)	(0.64)	(0.60)	(0.02)	(0.09)	(0.98)	(0.50)
Log(Age)	-0.02	-0.03	-0.00	-0.00	-0.42**	-0.24	-0.33**	-0.21*	-0.24	-0.27*
	(0.35)	(0.13)	(0.88)	(0.71)	(0.02)	(0.15)	(0.01)	(0.08)	(0.10)	(0.09)
d(Rescued Bank)	0.02	0.02	0.03	0.05	1.79	1.79	0.76	0.49	0.18	0.41
	(0.82)	(0.87)	(0.71)	(0.54)	(0.15)	(0.20)	(0.39)	(0.51)	(0.88)	(0.73)
Cross Listed Index	0.03***	0.03***	0.00	0.01	0.19	0.17	0.03	0.05	0.30***	0.27***
	(0.00)	(0.00)	(0.72)	(0.35)	(0.15)	(0.27)	(0.70)	(0.61)	(0.00)	(0.01)
d(Merger Acquisition)	0.08	0.07	0.01	0.02	0.55	0.42	1.89**	1.46**	0.13	0.00
	(0.31)	(0.41)	(0.89)	(0.63)	(0.63)	(0.71)	(0.02)	(0.04)	(0.90)	(1.00)
3-month Interbank Rate	0.02	0.02	-0.12***	-0.12***	-1.80***	-2.14***	-2.13**	-2.22***	-1.80**	-2.00***
	(0.75)	(0.70)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
GDP Growth Rate	0.01*	0.01	0.00	0.00	0.26**	0.24**	0.21***	0.22***	0.14*	0.21***
	(0.07)	(0.14)	(0.39)	(0.57)	(0.01)	(0.02)	(0.00)	(0.00)	(0.09)	(0.01)
Stock Traded	0.00	0.00	0.00	0.00	0.01	0.01	0.02*	0.01	0.00	0.01
	(0.25)	(0.20)	(0.17)	(0.27)	(0.48)	(0.32)	(0.06)	(0.14)	(0.91)	(0.65)
Constant	0.16	0.29	0.74***	0.73***	12.32***	14.77***	10.33*	11.61***	9.52***	12.73***
	(0.52)	(0.27)	(0.00)	(0.00)	(0.00)	(0.00)	(0.05)	(0.00)	(0.00)	(0.00)
Hansen test (P-value)	0.15	0.19	0.18	0.17	0.38	0.57	0.25	0.24	0.27	0.29
AR2 test (P-value)	0.86	0.90	0.91	0.87	0.27	0.27	0.58	0.59	0.13	0.16
Wald tests: $\alpha_1 + \alpha_2$	-0.09**	-0.09**	-0.07**	-0.07**	0.88**	0.95**	0.38**	0.44**	0.53**	0.72**
$\alpha_1 + \beta_1$	-0.14**	-0.09**	-0.03	-0.02	0.35	0.35	0.28	0.30	0.31	0.34
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.11**	-0.09**	-0.04	-0.04	0.37	0.35	0.24	0.27	0.31	0.36
$\alpha'_1 + \alpha'_2$	0.17**	0.13**	0.05	0.04	-0.33	-0.32	-0.38	-0.36	-0.33	-0.59**
$\alpha'_1 + \beta'_1$	0.03	0.03	0.08**	0.07**	-0.93**	-0.92**	-0.55**	-0.55**	-0.79**	-0.66**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.05	0.04	0.09**	0.08**	-0.82**	-0.85**	-0.91***	-0.92***	-0.80**	-0.72**

Table 1.11. Bank size and the effect of excess control rights on capital ratio adjustment

This table shows the Blundell and Bond (1998) estimation results on the effect of bank size on the relationship between excess control rights and capital ratio adjustment (Eq. (1.7)) for a sample of 341 European commercial banks (2,204 observations) over the 2002-2010 period. In all the regressions, the fitted target capital ratio is obtained by estimating a partial adjustment model (Eq. (1.3)) using the Blundell and Bond (1998) estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Large Bank)* is a dummy equal to one if the bank's total assets is above the median value, and zero otherwise. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. The definition of other variables is provided in Table 1.4. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Capital adjustment				Assets adjustment					
	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.06**	-0.05*	-0.08**	-0.05**	0.86**	0.92***	0.41*	0.45**	0.48**	0.64**
	(0.03)	(0.07)	(0.02)	(0.05)	(0.02)	(0.00)	(0.09)	(0.03)	(0.04)	(0.05)
d(Large Bank) × Capital Ratio Surplus (α_2)	-0.03	-0.03	0.02	-0.02	0.07	0.02	0.02	-0.00	0.19	0.16
	(0.44)	(0.59)	(0.17)	(0.52)	(0.79)	(0.75)	(0.75)	(0.99)	(0.42)	(0.28)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.02	-0.01	0.05	0.01	-0.40**	-0.49*	-0.14*	-0.22**	-0.19*	-0.33*
	(0.80)	(0.79)	(0.28)	(0.90)	(0.02)	(0.08)	(0.09)	(0.05)	(0.09)	(0.10)
d(Large Bank) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	-0.08	-0.02	-0.03	0.03	-0.07	-0.05	-0.03	-0.03	-0.05	-0.05
	(0.48)	(0.80)	(0.42)	(0.44)	(0.41)	(0.56)	(0.78)	(0.69)	(0.27)	(0.20)
Capital Ratio Shortfall (α'_1)	0.14***	0.12***	0.04	0.05	-0.34	-0.09	-0.35	-0.38	-0.37	-1.02***
	(0.00)	(0.00)	(0.39)	(0.12)	(0.17)	(0.78)	(0.31)	(0.12)	(0.19)	(0.00)
d(Large Bank) × Capital Ratio Shortfall (α'_2)	0.04	0.04	0.00	-0.01	-0.13	-0.09	-0.08	-0.10	-0.14	-0.08
	(0.53)	(0.21)	(0.93)	(0.70)	(0.61)	(0.87)	(0.23)	(0.68)	(0.20)	(0.33)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.06**	-0.05**	0.03*	0.03*	-0.34*	-0.61**	-0.33**	-0.27*	-0.33*	-0.07
	(0.02)	(0.02)	(0.10)	(0.08)	(0.05)	(0.03)	(0.05)	(0.07)	(0.06)	(0.19)
d(Large Bank) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	-0.05**	-0.08***	-0.04*	-0.03*	-0.41**	-0.31*	-0.46**	-0.36**	-0.36**	-0.05
	(0.02)	(0.00)	(0.07)	(0.05)	(0.05)	(0.06)	(0.04)	(0.03)	(0.03)	(0.28)
Lagged dependent variable	0.03	0.03	0.40***	0.38***	0.11***	0.13***	0.12***	0.12***	0.15***	0.16***
	(0.39)	(0.50)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.39***	-0.60***	-0.13	-0.03	-0.56	-0.84	-0.94	-0.65	-1.84	-3.17**
	(0.00)	(0.00)	(0.20)	(0.72)	(0.75)	(0.68)	(0.43)	(0.63)	(0.15)	(0.04)
d(Large Bank)	-0.18	-0.15	-0.20**	0.01	-3.24	-2.18	-2.10	-1.95	-6.04***	-5.01***
	(0.33)	(0.36)	(0.04)	(0.92)	(0.10)	(0.19)	(0.10)	(0.15)	(0.00)	(0.01)
Deposits Total Assets	-0.00**	-0.00**	0.00*	0.00**	-0.00	-0.02	0.01	0.01	-0.02	-0.00
	(0.01)	(0.03)	(0.06)	(0.04)	(0.92)	(0.45)	(0.61)	(0.44)	(0.29)	(0.82)
Log(Age)	-0.02	-0.02	0.00	-0.00	-0.26	-0.17	-0.21*	-0.18	-0.10	-0.09
	(0.24)	(0.15)	(0.95)	(0.93)	(0.12)	(0.32)	(0.06)	(0.17)	(0.46)	(0.57)
d(Rescued Bank)	0.05	0.00	0.01	0.02	1.80	1.17	1.14	0.65	0.84	1.07
	(0.48)	(0.96)	(0.94)	(0.73)	(0.11)	(0.37)	(0.15)	(0.39)	(0.46)	(0.41)
Cross Listed Index	0.02*	0.03***	0.01	0.00	0.10	0.04	0.03	0.07	0.20**	0.23**
	(0.06)	(0.01)	(0.46)	(0.91)	(0.50)	(0.78)	(0.73)	(0.47)	(0.05)	(0.04)
d(Merger Acquisition)	0.03	0.05	0.05	0.02	0.61	0.20	1.63**	1.32*	0.20	0.05
	(0.72)	(0.53)	(0.32)	(0.63)	(0.58)	(0.88)	(0.05)	(0.10)	(0.84)	(0.96)
3-month Interbank Rate	0.01	0.03	-0.12***	-0.11***	-2.01***	-1.93***	-2.08***	-2.34***	-1.77***	-1.84***
	(0.76)	(0.60)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
GDP Growth Rate	0.02**	0.01*	0.00	0.00	0.22**	0.25**	0.19**	0.21***	0.14*	0.17**
	(0.05)	(0.10)	(0.38)	(0.78)	(0.04)	(0.03)	(0.01)	(0.00)	(0.09)	(0.04)
Stock Traded	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
	(0.46)	(0.31)	(0.26)	(0.36)	(0.47)	(0.56)	(0.20)	(0.12)	(0.69)	(0.34)
Constant	0.41*	0.33	0.75***	0.64***	15.95***	14.05***	11.33***	12.18***	13.54***	12.52***
	(0.10)	(0.25)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Hansen test (P-value)	0.23	0.10	0.23	0.19	0.42	0.35	0.21	0.29	0.28	0.26
AR2 test (P-value)	0.89	0.87	0.86	0.87	0.27	0.20	0.58	0.56	0.15	0.17
Wald tests: $\alpha_1 + \alpha_2$	-0.09**	-0.08**	-0.06**	-0.07**	0.93**	0.94***	0.43*	0.45**	0.67**	0.80**
$\alpha_1 + \beta_1$	-0.08**	-0.06**	-0.03	-0.04	0.46	0.43	0.27	0.23	0.29	0.31
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.19***	-0.11***	-0.04	-0.03	0.46	0.40	0.26	0.20	0.43	0.42
$\alpha'_1 + \alpha'_2$	0.18***	0.16***	0.04	0.04	-0.47	-0.18	-0.43	-0.48	-0.51	-1.10***
$\alpha'_1 + \beta'_1$	0.08*	0.07*	0.07**	0.08**	-0.68**	-0.70**	-0.68**	-0.65**	-0.70**	-1.09***
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.07	0.03	0.03	0.04	-1.22**	-1.10**	-1.22**	-1.11**	-1.20**	-1.22***

In summary (see Table 1.12 for an overview of our results), we find that the presence of excess control rights affects the way banks adjust to their target capital ratios. On the one hand, banks without excess control rights reduce their capital ratios by repurchasing equity and lowering earnings retention but also by expanding their size and lending. Such banks increase their capital ratios by issuing equity and reshuffling their assets without shrinking their loans and other assets, even when they face pressure from regulators or the market to boost their capital strength. On the other hand, banks with excess control rights decrease their capital ratios by repurchasing equity -possibly to strengthen the ultimate owners' controlling power- but they do not increase lending or reshuffle assets. When they need to increase their capital ratios such banks do not issue equity -possibly to avoid the ultimate owners' control dilution- but draw on earnings and shrink their assets by mainly cutting lending. A closer look shows that the reluctance to issue equity and reliance on internal and assets adjustments are mainly apparent during normal times in family-owned banks or for banks operating in countries with relatively weak shareholder protection. Moreover, such banks reduce their lending more extensively when they are either larger, less capitalized, or more lending-oriented. But in all cases, banks without excess control rights never cut their lending in a response to boost their capital ratios.

1.5. Robustness checks

We perform several regressions to check for the robustness of our results obtained in Subsections 1.4.1 and 1.4.2. For each of our checks we re-estimate the target capital ratio to compute the fitted values of the capital ratio surplus and shortfall. The results are reported in the Appendix.

To differentiate banks without and with excess control rights, we run regressions on two distinct subsamples instead of using interaction terms as in Eq. (1.6). This check leads to similar findings (see Tables A1.4-A1.10 in the Appendix).

Table 1.12. A summary of results

This table provides a summary of the results on the relationship between excess control rights and capital ratio adjustment. ↑ indicates a significant increase. ↓ and ↓↓ indicate respectively a significant decrease and a stronger significant decrease. ⟶ indicates no significant effect. Capital adjustment refers to adjustment through capital either externally (equity issues or repurchases) or internally (retained earnings). Assets adjustment includes adjustments through total assets (Assets), customer loans (Loans) and risk-weighted assets (RWA).

	When banks are above the target capital ratio					When banks are below the target capital ratio				
	Capital adjustment		Assets adjustment			Capital adjustment		Assets adjustment		
	Equity	Retained earnings	Assets	Loans	RWA	Equity	Retained earnings	Assets	Loans	RWA
In the absence of excess control rights	↓	↓	↑	↑	↑	↑	→	→	→	↓

In the absence of excess control rights (above target): Effects are similar across ownership types, levels of shareholder protection, bank business models, and bank size, but hold only during normal times and for well capitalized banks.

Effects during distress times:

Equity	Retained earnings	Assets	Loans	RWA
→	↓	↑	→	↑

Effects for undercapitalized banks:

Equity	Retained earnings	Assets	Loans	RWA
→	→	→	→	→

In the absence of excess control rights (below target): Effects are steady across ownership types, levels of shareholder protection, normal and distress times, well-capitalized and undercapitalized banks, more and less lending-oriented banks, large and small banks.

	When banks are above the target capital ratio					When banks are below the target capital ratio				
	Equity	Retained earnings	Assets	Loans	RWA	Equity	Retained earnings	Assets	Loans	RWA
In the presence of excess control rights	↓	→	→	→	→	→	↑	↓	↓	↓

In the presence of excess control rights (above target): Effects are similar across ownership types, levels of shareholder of protection rights, bank size, bank business models but hold only during normal times and for well capitalized banks.

Effects during distress times:

Equity	Retained earnings	Assets	Loans	RWA
→	↓	→	→	→

Effects for undercapitalized banks:

Equity	Retained earnings	Assets	Loans	RWA
→	→	→	→	→

In the presence of excess control rights (below target): Effects mainly hold for family-controlled banks, banks located in countries with relatively weak shareholder protection, or during normal times.

Effects for undercapitalized banks, lending-oriented banks or large banks:

Equity	Retained earnings	Assets	Loans	RWA
→	↑	↓↓	↓↓	↓↓

We test the robustness of the results by computing the capital ratio surplus and shortfall using a baseline target capital ratio which is estimated without including the binary variable d(Excess Control Rights) among the explanatory variables. This check leaves the main findings unchanged (see Tables A1.11-A1.18 in the Appendix).

The period covered by the sample is limited by the availability of data on ownership in Bankscope and Amadeus (9 years). This might limit the effectiveness of a dynamic estimation procedure, namely, the use of a partial adjustment model as specified in Eq. (1.3). Hence, we test the robustness of the results by estimating the values of the target capital ratio using a perfect capital adjustment model as specified in Eq. (1.1).[16] This check leaves the main conclusions unchanged (see Tables A1.19-A1.26 in the Appendix).

We further exclude from the initial sample banks controlled by multiple ultimate shareholders (499 observations). The ability and incentives of a controlling shareholder to expropriate and thus to protect his position might be different in the absence or presence of multiple controlling shareholders. The second largest shareholder could monitor the largest and impede her tendency to extract private benefits of control. In such a case, the reluctance of the largest shareholder to issue equity (to protect her controlling power) and reliance on internal funds and downsizing might be less of a concern. If, however, the second largest shareholder colludes with the largest to render expropriation more efficient (Bennedsen and Wolfenzon, 2000; Maury and Pajuste, 2005; Laeven and Levine, 2008), the reluctance to issue new equity and reliance on internal funds and downsizing to adjust to the target capital ratio might be more pronounced. This check leads again to similar findings (see Tables A1.27-A1.34 in the Appendix).

Since banks from Italy account for almost one third of the sample (corresponding to 678 observations), we re-run regressions without Italian banks and obtain almost similar results (see Tables A1.35-A1.42 in the Appendix).

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[16] The Hausman test fails to reject the null hypothesis of the exogeneity of the regressors of Eq. (1.1). Hence, we estimate this equation using the Generalized Least Squares estimator (GLS) with robust standards errors.

We finally increase the control threshold and re-calculate ownership variables with a control level of 20% instead of 10%. This new minimum control threshold changes our database both quantitatively and qualitatively (see Table A1.43 in the Appendix for the main changes) but our main conclusions are unchanged (see Tables A 1.44-A1.51 in the Appendix).

1.6. Conclusion and policy implications

The aim of this study is to empirically test whether excess control rights affect banks' capital ratio adjustment behavior. For this purpose, we assemble a novel hand-collected data set on bank ultimate control and ownership structure and analyze an unbalanced panel of 341 commercial banks across 17 European countries from 2002 to 2010.

On the whole, the results confirm the conjecture that the bank's decision on how to move to target capital ratios varies according to the presence or absence of excess control rights. In the absence of excess control rights banks increase their capital ratios by issuing equity and by reshuffling their assets but without cutting lending. Moreover, such banks reduce their capital ratios by repurchasing equity and lowering earnings retention but also by expanding their assets and particularly their lending. In contrast, in the presence of excess control rights, instead of expanding assets when they are above the target capital ratio, banks adjust by exclusively repurchasing equity. More importantly, instead of issuing equity, such controlled banks increase their capital ratio by drawing on earnings and by shrinking their assets and particularly their lending. These findings suggest that ultimate shareholders with excess control rights curb external recapitalization to preserve their controlling position. Further investigation shows that the reluctance to issue equity and reliance on internal funds and downsizing are mainly apparent if the ultimate controlling shareholder is a family or when the bank is headquartered in a country with weak shareholder protection. Furthermore, the contraction in lending is more pronounced for banks that are either close to the regulatory minimum, relatively large, or more focused on traditional intermediation activities. However, such behavior was not apparent during the 2008 financial crisis as these banks did issue equity without reducing their lending.

Our findings contribute to the capital structure adjustment literature and provide a rationale for the credit crunch phenomena being driven by specific governance arrangements. We show that over 2002-2010, a period covered by the Basel I and II Accords, only banks controlled by shareholders with excess control rights cut their lending to move to their target capital ratios. Consequently, it is important for regulators and supervisors to consider that a narrower definition of Tier 1 capital (limited to ordinary shares) combined with more stringent capital requirements (higher ratios) might increase the propensity of such banks to shrink their loans to avoid control dilution. If a credit crunch is likely to occur in the transition from Basel II to the last stage of Basel III in 2019, this is most likely to be driven by banks controlled by shareholders with excess control rights. Our study shows that a solution to temper the aversion of controlling shareholders to issue equity -and hence to ensure that banks continue to lend to contribute to the real economy- is to increase the level of shareholder protection. Consistent with the recommendations of the Basel Committee on Banking Supervision (BIS, 2010b), another solution is better disclosure of banks' ownership structure to improve both regulatory and market monitoring and discipline.

Appendix

Table A1.1. Correlations table

This table shows the correlations among the explanatory variables used to estimate the target capital ratio (Eq. (1.3)). *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. *Log(Total Assets)* is the natural logarithm of the bank's total assets. *Return On Assets* is net income divided by total assets. *Loan Loss Provisions* is loan loss provisions divided by net loans. *Loans Total Assets* is net loans divided by total assets. *Market Discipline* is total long term market funding divided by total funding. *d(Listed Bank)* is a dummy equal to one if the bank is publicly listed, and zero otherwise. *GDP Growth Rate* is the real Gross Domestic Product (GDP) growth rate.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
d(Excess Control Rights) (1)	1							
Log(Total Assets) (2)	0.11	1.00						
Return On Assets (3)	-0.13	-0.17	1.00					
Loan Loss Provisions (4)	0.03	-0.08	-0.28	1.00				
Loans Total Assets (5)	0.07	-0.22	0.03	0.07	1.00			
Market Discipline (6)	-0.04	-0.13	0.02	-0.09	0.14	1.00		
d(Listed Bank) (7)	-0.26	0.22	0.11	0.05	0	-0.15	1	
GDP Growth Rate (8)	-0.01	-0.01	0.20	-0.23	-0.03	-0.01	0.04	1.00

Table A1.2. Estimating the target capital ratio

This table shows the Blundell and Bond (1998) estimation results of the target capital ratio based on a partial adjustment model (Eq. (1.3)) over the 2002-2010 period. The sample consists of 341 European commercial banks corresponding to 2,204 observations. *Tier 1 Total Assets* is Tier 1 capital divided by total assets. *Tier 1 RWA* is Tier 1 capital divided by risk-weighted assets. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. *Log(Total Assets)* is the natural logarithm of the bank's total assets. *Return On Assets* is net income divided by total assets. *Loan Loss Provisions* is loan loss provisions divided by net loans. *Loans Total Assets* is net loans divided by total assets. *Market Discipline* is total long term market funding divided by total funding. *d(Listed Bank)* is a dummy equal to one if the bank is publicly listed, and zero otherwise. *GDP Growth Rate* is the real Gross Domestic Product (GDP) growth rate. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. In the last three rows, we report the summary statistics (mean, maximum and minimum) of the estimated target capital ratio. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Tier 1 Total Assets	Tier 1 RWA
Lagged dependent variable	0.60***	0.66***
	(0.00)	(0.00)
d(Excess Control Rights)	-0.33**	-0.73***
	(0.04)	(0.00)
Log(Total Assets)	-0.51***	-0.57***
	(0.00)	(0.00)
Return On Assets	0.47***	0.54***
	(0.00)	(0.00)
Loan Loss Provisions	0.19***	0.16**
	(0.00)	(0.04)
Loans Total Assets	-0.02***	-0.03***
	(0.00)	(0.00)
Market Discipline	0.00**	0.01**
	(0.02)	(0.02)
d(Listed Bank)	-0.67***	-1.41***
	(0.00)	(0.00)
GDP Growth Rate	-0.00	-0.01
	(0.61)	(0.28)
Constant	5.14***	7.84***
	(0.00)	(0.00)
Hansen test (P-value)	0.11	0.10
AR2 test (P-value)	0.35	0.32
Fitted target (%): Mean	7.02	11.53
Maximum	14.92	24.87
Minimum	1.70	4.08

Table A1.3. Correlations table

This table shows the correlations among the explanatory variables used to test the effect of excess control rights on capital ratio adjustment (Eq. (1.6)). *Tier 1 Total Assets Surplus* and *Tier 1 RWA Surplus* are respectively the absolute value of the difference between the fitted and the lagged values of the ratio of Tier 1 capital to total assets and the ratio of Tier 1 capital to risk-weighted assets (RWA) when the bank is above the target, and zero otherwise. *Tier 1 Total Assets Shortfall* and *Tier 1 RWA Shortfall* are respectively the absolute value of the difference between the fitted and the lagged values of the ratio of Tier 1 capital to total assets and the ratio of Tier 1 capital to risk-weighted assets (RWA) when the bank is below the target, and zero otherwise. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. *Deposits Total Assets* is total customer deposits divided by total assets. *Log(Age)* is the natural logarithm of bank age. *d(Rescued Bank)* is a dummy equal to one if the bank was rescued during the 2008 financial crisis, and zero otherwise. *d(Merger Acquisition)* is a dummy equal to one if the bank experienced a merger-acquisition event during the sample period, and zero otherwise. *Cross Listed Index* is an index equal to the number of stock markets on which the bank is listed, and zero if the bank is privately owned. *3-month Interbank Rate* is the three-month interbank rate. *GDP Growth Rate* is the real Gross Domestic Product (GDP) growth rate. *Stock Traded* is the value of listed shares divided by GDP.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Tier 1 Total Assets Surplus (1)	1.00												
Tier 1 RWA Surplus (2)	0.63	1.00											
Tier 1 Total Assets Shortfall (3)	0.44	0.29	1.00										
Tier 1 RWA Shortfall (4)	0.36	0.44	0.60	1.00									
d(Excess Control Rights) (5)	0.04	-0.01	0.06	0.07	1								
Deposits Total Assets (6)	0.05	0.07	0.13	0.14	-0.14	1.00							
Log(Age) (7)	0.04	0.15	-0.02	0.12	-0.16	0.17	1.00						
d(Rescued Bank) (8)	0.06	0.08	-0.12	-0.06	-0.01	-0.08	0.08	1					
Cross Listed Index (9)	0.04	0.05	-0.05	-0.05	-0.09	-0.10	0.04	0.16	1.00				
d(Merger Acquisition) (10)	0.07	0.12	-0.15	-0.11	-0.20	-0.14	0.03	0.27	0.35	1.00			
3-month Interbank Rate (11)	-0.14	-0.12	-0.23	-0.31	0.00	0.00	0.02	0.01	0.02	0.00	1.00		
GDP Growth Rate (12)	-0.07	-0.11	-0.17	-0.30	0.02	0.03	0.01	0.07	0.02	0.07	0.48	1.00	
Stock Traded (13)	-0.08	-0.09	-0.12	-0.16	-0.12	0.07	-0.07	-0.11	0.00	0.02	0.45	0.19	1.00

Table A1.4. Estimating the target capital ratio: regressions on subsamples

This table shows the Blundell and Bond (1998) estimation results of the target capital ratio based on a partial adjustment model (Eq. (1.3)) over the 2002-2010 period for subsamples of banks without and with excess control rights. Based on a control threshold of 10%, we classify a bank as without excess control rights (*Absence of Excess Control Rights*) if (1) it is controlled by an ultimate owner with equal control and cash-flow rights, (2) it is widely held or (3) if its control chain is a cross-holding. We classify a bank as with excess control rights (*Presence of Excess Control Rights*) if it is controlled by an ultimate owner with greater control than cash-flow rights. *Tier 1 Total Assets* is Tier 1 capital divided by total assets. *Tier 1 RWA* is Tier 1 capital divided by risk-weighted assets. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. *Log(Total Assets)* is the natural logarithm of the bank's total assets. *Return On Assets* is net income divided by total assets. *Loan Loss Provisions* is loan loss provisions divided by net loans. *Loans Total Assets* is net loans divided by total assets. *Market Discipline* is total long term market funding divided by total funding. *d(Listed Bank)* is a dummy equal to one if the bank is publicly listed, and zero otherwise. *GDP Growth Rate* is the real Gross Domestic Product (GDP) growth rate. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. In the last three rows, we report the summary statistics (mean, maximum and minimum) of the estimated target capital ratio. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Absence of Excess Control Rights		Presence of Excess Control Rights	
	Tier 1 Total Assets	Tier 1 RWA	Tier 1 Total Assets	Tier 1 RWA
Lagged dependent variable	0.57***	0.67***	0.56***	0.35***
	(0.00)	(0.00)	(0.00)	(0.00)
Log(Total Assets)	-0.04	-0.04	-0.42***	-0.41***
	(0.33)	(0.58)	(0.00)	(0.00)
Return On Assets	0.59***	0.69***	0.27***	0.45***
	(0.00)	(0.00)	(0.00)	(0.00)
Loan Loss Provisions	0.27***	0.28***	0.18***	-0.07
	(0.00)	(0.00)	(0.00)	(0.25)
Loans Total Assets	-0.01***	-0.02***	-0.00	-0.03***
	(0.00)	(0.00)	(0.20)	(0.00)
Market Discipline	0.01***	0.01***	0.01***	0.00
	(0.00)	(0.00)	(0.00)	(0.27)
d(Listed Bank)	-0.22*	-0.09	-0.44***	-0.51***
	(0.06)	(0.61)	(0.00)	(0.00)
GDP Growth Rate	-0.03**	-0.05**	0.03***	0.02**
	(0.05)	(0.01)	(0.00)	(0.04)
Constant	5.93**	6.95***	5.94***	10.20***
	(0.03)	(0.00)	(0.00)	(0.00)
Number of observations	1,416	1,416	788	788
Number of banks	236	236	154	154
Hansen test (P-value)	0.11	0.12	0.13	0.16
AR2 test (P-value)	0.73	0.46	0.30	0.53
Fitted target (%): Mean	7.04	11.70	6.49	10.14
Maximum	15.73	24.46	12.67	19.76
Minimum	1.61	4.89	2.31	5.98

Table A1.5. Excess control rights and capital ratio adjustment: regressions on subsamples

This table shows the Blundell and Bond (1998) estimation results on the effect of excess control rights on capital ratio adjustment over the 2002-2010 period. For robustness, we run regressions on subsamples of banks without and with excess control rights (Panels 1 and 2) instead of using interaction terms as in Eq. (1.6). Based on a control threshold of 10%, we classify a bank as without excess control rights (*Absence of Excess Control Rights*) if (1) it is controlled by an ultimate owner with equal control and cash-flow rights, (2) it is widely held or (3) if its control chain is a cross-holding. We classify a bank as with excess control rights (*Presence of Excess Control Rights*) if it is controlled by an ultimate owner with greater control than cash-flow rights. In all the regressions, the fitted target capital ratio is obtained by estimating a partial adjustment model using the Blundell and Bond (1998) estimation method for subsamples of banks without and with excess control rights. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *Deposits Total Assets* is total customer deposits divided by total assets. *Log(Age)* is the natural logarithm of bank age. *d(Rescued Bank)* is a dummy equal to one if the bank was rescued during the 2008 financial crisis, and zero otherwise. *Cross Listed Index* is an index equal to the number of stock markets on which the bank is listed, and zero if the bank is privately owned. *d(Merger Acquisition)* is a dummy equal to one if the bank experienced a merger-acquisition event during the sample period, and zero otherwise. *3-month Interbank Rate* is the three-month interbank rate. *GDP Growth Rate* is the real Gross Domestic Product (GDP) growth rate. *Stock Traded* is the value of listed shares divided by GDP. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Capital adjustment				Assets adjustment					
	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Panel 1: Absence of Excess Control Rights										
Capital Ratio Surplus (α_1)	-0.06**	-0.03*	-0.04**	-0.03**	0.75**	0.90**	0.46**	0.50**	0.42**	0.66**
	(0.04)	(0.08)	(0.01)	(0.02)	(0.04)	(0.04)	(0.01)	(0.05)	(0.05)	(0.03)
Capital Ratio Shortfall (α'_1)	0.15***	0.12***	0.03	0.04*	-0.43	0.17	-0.35	-0.31	-0.19	-0.47**
	(0.00)	(0.00)	(0.36)	(0.08)	(0.24)	(0.59)	(0.31)	(0.15)	(0.59)	(0.03)
Lagged dependent variable	0.03	0.04	0.38***	0.39***	0.11***	0.11***	0.16***	0.16***	0.23***	0.24***
	(0.46)	(0.40)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
Deposits Total Assets	-0.00	-0.00**	0.00	0.00	0.00	-0.02	0.02	0.01	0.01	0.02
	(0.27)	(0.03)	(0.11)	(0.28)	(0.96)	(0.53)	(0.28)	(0.46)	(0.52)	(0.35)
Log(Age)	-0.01	-0.03	-0.01	-0.00	-0.16	-0.17	-0.23*	-0.10	-0.12	-0.05
	(0.51)	(0.13)	(0.53)	(0.94)	(0.43)	(0.36)	(0.07)	(0.52)	(0.44)	(0.78)
d(Rescued Bank)	0.12	0.14	0.02	0.08	2.11	1.70	0.32	0.23	0.20	0.18
	(0.39)	(0.34)	(0.84)	(0.34)	(0.30)	(0.45)	(0.76)	(0.86)	(0.89)	(0.91)
Cross Listed Index	0.02*	0.03**	0.00	0.00	0.15	0.09	0.11	0.09	0.35***	0.29**
	(0.09)	(0.03)	(0.79)	(0.71)	(0.24)	(0.58)	(0.24)	(0.40)	(0.00)	(0.01)
d(Merger Acquisition)	0.01	0.05	0.04	0.02	0.28	1.09	1.37	1.08	0.90	1.02
	(0.87)	(0.56)	(0.46)	(0.77)	(0.83)	(0.47)	(0.11)	(0.27)	(0.46)	(0.38)
3-month Interbank Rate	0.05	0.06	-0.12**	-0.09*	-1.96***	-1.88**	-1.86***	-2.21***	-1.15*	-1.23*
	(0.41)	(0.39)	(0.02)	(0.06)	(0.01)	(0.02)	(0.00)	(0.00)	(0.09)	(0.06)
GDP Growth Rate	0.02*	0.01	0.00	0.00	0.19	0.21	0.16*	0.20**	0.11	0.09
	(0.08)	(0.11)	(0.40)	(0.66)	(0.17)	(0.14)	(0.08)	(0.01)	(0.34)	(0.38)
Stock Traded	0.00	0.00	0.00	0.00	0.03**	0.04**	0.01	0.02	0.01	0.00
	(0.71)	(0.98)	(0.63)	(0.79)	(0.05)	(0.02)	(0.23)	(0.12)	(0.69)	(0.94)
Constant	0.08	0.17	0.62***	0.53***	10.25***	11.43***	9.04***	10.12***	5.48**	4.89*
	(0.79)	(0.56)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.08)
Number of observations	1,416	1,416	1,416	1,416	1,416	1,416	1,416	1,416	1,416	1,416
Number of banks	236	236	236	236	236	236	236	236	236	236
Hansen test (P-value)	0.14	0.16	0.15	0.18	0.12	0.19	0.15	0.14	0.15	0.15
AR2 test (P-value)	0.86	0.89	0.86	0.80	0.62	0.59	0.90	0.95	0.28	0.23
Panel 2: Presence of Excess Control Rights										
Capital Ratio Surplus (α_1)	-0.14**	-0.07**	-0.04	-0.03	0.40	0.39	0.27	0.26	0.23	0.38
	(0.01)	(0.04)	(0.28)	(0.14)	(0.39)	(0.86)	(0.35)	(0.65)	(0.39)	(0.17)
Capital Ratio Shortfall (α'_1)	0.05	0.02	0.07**	0.04**	-0.74**	-0.74**	-0.60**	-0.75**	-0.50*	-0.65**
	(0.25)	(0.36)	(0.03)	(0.03)	(0.03)	(0.03)	(0.05)	(0.02)	(0.09)	(0.02)

Table A1.5 (continued)

Lagged dependent variable	0.02	0.02	0.42***	0.40***	0.14**	0.15**	0.15***	0.14**	0.10	0.06
	(0.66)	(0.79)	(0.00)	(0.00)	(0.05)	(0.04)	(0.01)	(0.03)	(0.27)	(0.49)
Deposits Total Assets	-0.00	-0.00	-0.00	0.00	0.02	-0.01	0.03*	0.02	-0.02	0.01
	(0.12)	(0.40)	(0.62)	(0.95)	(0.53)	(0.78)	(0.09)	(0.35)	(0.46)	(0.65)
Log(Age)	0.01	-0.00	-0.01	-0.01	-0.35	-0.25	-0.33	-0.27	-0.05	-0.20
	(0.74)	(0.87)	(0.62)	(0.56)	(0.31)	(0.48)	(0.13)	(0.28)	(0.88)	(0.59)
d(Rescued Bank)	0.08	0.06	0.12	0.05	0.17	0.37	0.81	1.38	0.59	0.43
	(0.54)	(0.52)	(0.26)	(0.59)	(0.94)	(0.89)	(0.61)	(0.46)	(0.77)	(0.88)
Cross Listed Index	0.01	0.02*	0.02	0.01	0.35	0.15	0.18	0.23	0.16	0.13
	(0.32)	(0.05)	(0.13)	(0.43)	(0.40)	(0.68)	(0.40)	(0.36)	(0.30)	(0.54)
d(Merger Acquisition)	0.01	0.04	0.12	0.13	1.06	0.26	2.54	3.13	2.66	2.53
	(0.93)	(0.76)	(0.30)	(0.37)	(0.67)	(0.92)	(0.19)	(0.11)	(0.11)	(0.17)
3-month Interbank Rate	-0.09	-0.06	-0.05	-0.05	-3.17	-3.72	-2.92**	-2.92**	-2.47*	-2.17*
	(0.26)	(0.47)	(0.47)	(0.49)	(0.10)	(0.13)	(0.02)	(0.04)	(0.07)	(0.10)
GDP Growth Rate	0.02*	0.01	0.02***	0.01	0.22	0.32	0.24**	0.23*	0.30**	0.29**
	(0.07)	(0.49)	(0.01)	(0.27)	(0.29)	(0.15)	(0.05)	(0.06)	(0.02)	(0.02)
Stock Traded	0.00	0.00	0.00	0.00	0.04	0.03	0.01	0.01	0.01	0.02
	(0.71)	(0.22)	(0.34)	(0.86)	(0.23)	(0.26)	(0.51)	(0.72)	(0.63)	(0.56)
Constant	0.52	0.53*	0.85**	0.66**	27.40***	31.15***	18.31***	22.21***	18.42**	13.71
	(0.14)	(0.09)	(0.02)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.03)	(0.44)
Number of observations	788	788	788	788	788	788	788	788	788	788
Number of banks	154	154	154	154	154	154	154	154	154	154
Hansen test (P-value)	0.14	0.23	0.25	0.45	0.16	0.15	0.33	0.12	0.22	0.22
AR2 test (P-value)	0.24	0.26	0.74	0.81	0.23	0.18	0.24	0.24	0.18	0.11

Table A1.6. Shareholder protection and the effect of excess control rights on capital ratio adjustment: regressions on subsamples

This table shows the Blundell and Bond (1998) estimation results on the effect of shareholder protection rights on the relationship between excess control rights and capital ratio adjustment over the 2002-2010 period. For robustness, we run regressions on subsamples of banks without and with excess control rights (Panels 1 and 2) instead of using interaction terms as in Eq. (1.7). Based on a control threshold of 10%, we classify a bank as without excess control rights (*Absence of Excess Control Rights*) if (1) it is controlled by an ultimate owner with equal control and cash-flow rights, (2) it is widely held or (3) if its control chain is a cross-holding. We classify a bank as with excess control rights (*Presence of Excess Control Rights*) if it is controlled by an ultimate owner with greater control than cash-flow rights. In all the regressions, the fitted target capital ratio is obtained by estimating a partial adjustment model using the Blundell and Bond (1998) estimation method for subsamples of banks without and with excess control rights. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Owner Rights)* is a dummy equal to one if the shareholder protection index as defined in Djankov et al. (2008) is greater than the median value, and zero otherwise. *Deposits Total Assets* is total customer deposits divided by total assets. *Log(Age)* is the natural logarithm of bank age. *d(Rescued Bank)* is a dummy equal to one if the bank was rescued during the 2008 financial crisis, and zero otherwise. *Cross Listed Index* is an index equal to the number of stock markets on which the bank is listed, and zero if the bank is privately owned. *d(Merger Acquisition)* is a dummy equal to one if the bank experienced a merger-acquisition event during the sample period, and zero otherwise. *3-month Interbank Rate* is the three-month interbank rate. *GDP Growth Rate* is the real Gross Domestic Product (GDP) growth rate. *Stock Traded* is the value of listed shares divided by GDP. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Capital adjustment				Assets adjustment					
	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Panel 1: Absence of Excess Control Rights										
Capital Ratio Surplus (α_1)	-0.08**	-0.06*	-0.06**	-0.05***	0.71**	0.90**	0.33*	0.42**	0.40**	0.62**
	(0.01)	(0.10)	(0.03)	(0.00)	(0.01)	(0.01)	(0.08)	(0.05)	(0.02)	(0.03)
d(Owner Rights) × Capital Ratio Surplus (α_2)	0.02	0.02	-0.02	0.00	0.13	0.08	0.15	0.15	0.18	0.18
	(0.10)	(0.22)	(0.29)	(0.44)	(0.60)	(0.20)	(0.55)	(0.71)	(0.80)	(0.28)
Capital Ratio Shortfall (α'_1)	0.14**	0.08**	0.04	0.04*	-0.36	-0.10	-0.37	-0.30	-0.20	-0.60**
	(0.04)	(0.03)	(0.45)	(0.07)	(0.16)	(0.60)	(0.18)	(0.11)	(0.50)	(0.01)
d(Owner Rights) × Capital Ratio Shortfall (α'_2)	0.06	0.06	0.02	-0.00	-0.09	0.17	-0.05	-0.27	-0.08	-0.04
	(0.22)	(0.20)	(0.70)	(0.99)	(0.91)	(0.18)	(0.92)	(0.33)	(0.20)	(0.42)
Lagged dependent variable	0.02	0.03	0.38***	0.39***	0.13***	0.11***	0.16***	0.15***	0.24***	0.25***
	(0.56)	(0.46)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
Deposits Total Assets	-0.00	-0.00*	0.00	0.00	0.00	-0.02	0.02	0.01	0.01	0.01
	(0.31)	(0.05)	(0.11)	(0.14)	(0.95)	(0.58)	(0.35)	(0.59)	(0.62)	(0.49)
Log(Age)	-0.01	-0.03*	-0.00	-0.00	-0.12	-0.19	-0.22*	-0.16	-0.09	-0.07
	(0.46)	(0.07)	(0.75)	(0.91)	(0.56)	(0.32)	(0.10)	(0.27)	(0.57)	(0.69)
d(Rescued Bank)	0.10	0.07	0.02	0.08	1.83	1.47	0.39	0.18	0.34	0.70
	(0.48)	(0.63)	(0.84)	(0.37)	(0.32)	(0.49)	(0.71)	(0.88)	(0.81)	(0.62)
Cross Listed Index	0.02*	0.02**	0.00	0.00	0.10	0.04	0.10	0.12	0.32***	0.26**
	(0.06)	(0.03)	(0.92)	(0.60)	(0.45)	(0.81)	(0.27)	(0.23)	(0.00)	(0.01)
d(Merger Acquisition)	0.03	0.05	0.04	0.03	0.42	1.15	1.34	1.08	0.98	1.18
	(0.73)	(0.53)	(0.46)	(0.59)	(0.75)	(0.46)	(0.12)	(0.28)	(0.42)	(0.36)
3-month Interbank Rate	0.04	0.05	-0.11**	-0.09*	-2.21***	-2.06**	-1.83**	-2.14***	-1.10*	-1.38**
	(0.50)	(0.47)	(0.03)	(0.06)	(0.00)	(0.01)	(0.01)	(0.00)	(0.08)	(0.04)
GDP Growth Rate	0.02*	0.01	0.00	0.00	0.22	0.23	0.16*	0.18**	0.10	0.07
	(0.10)	(0.11)	(0.59)	(0.49)	(0.10)	(0.11)	(0.06)	(0.03)	(0.36)	(0.55)
Stock Traded	0.00	0.00	0.00	0.00	0.03*	0.03*	0.01	0.02	0.01	0.00
	(0.68)	(0.99)	(0.54)	(0.62)	(0.05)	(0.07)	(0.24)	(0.10)	(0.68)	(0.93)
Constant	0.07	0.23	0.54***	0.49**	10.27***	11.43***	8.87***	10.49***	4.91**	5.12*
	(0.82)	(0.43)	(0.01)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.05)	(0.06)
Number of observations	1,416	1,416	1,416	1,416	1,416	1,416	1,416	1,416	1,416	1,416
Number of banks	236	236	236	236	236	236	236	236	236	236
Hansen test (P-value)	0.27	0.29	0.17	0.12	0.44	0.22	0.15	0.10	0.13	0.47
AR2 test (P-value)	0.96	0.96	0.87	0.93	0.63	0.55	0.92	0.89	0.25	0.22

Table A1.6 (continued)

Wald tests: $\alpha_1 + \alpha_2$	-0.06**	-0.04*	-0.08**	-0.05**	0.84**	0.98**	0.48**	0.57**	0.58**	0.80**
$\alpha'_1 + \alpha'_2$	0.20**	0.14**	0.06	0.04	-0.45	0.07	-0.42	-0.57	-0.28	-0.64**

Panel 2: Presence of Excess Control Rights

Capital Ratio Surplus (α_1)	-0.15**	-0.08**	-0.02	-0.03	0.37	0.42	0.30	0.28	0.22	0.34
	(0.05)	(0.05)	(0.81)	(0.23)	(0.41)	(0.41)	(0.43)	(0.54)	(0.39)	(0.12)
d(Owner Rights) × Capital Ratio Surplus (α_2)	0.08	0.05	-0.05	-0.05	0.08	0.06	-0.03	0.22	-0.01	0.03
	(0.28)	(0.12)	(0.26)	(0.37)	(0.67)	(0.31)	(0.40)	(0.20)	(0.30)	(0.26)
Capital Ratio Shortfall (α'_1)	0.03	0.02	0.07**	0.06**	-0.83**	-0.94**	-0.91**	-0.91**	-0.65**	-0.67**
	(0.64)	(0.73)	(0.01)	(0.01)	(0.02)	(0.02)	(0.04)	(0.02)	(0.01)	(0.01)
d(Owner Rights) × Capital Ratio Shortfall (α'_2)	0.06*	0.07*	-0.02	-0.03	0.25	0.44	0.42	0.31	0.35	0.10
	(0.08)	(0.10)	(0.45)	(0.20)	(0.18)	(0.44)	(0.19)	(0.49)	(0.41)	(0.37)
Lagged dependent variable	0.01	-0.02	0.43***	0.40***	0.14*	0.14**	0.15**	0.14**	0.10	0.07
	(0.89)	(0.79)	(0.00)	(0.00)	(0.06)	(0.05)	(0.01)	(0.02)	(0.22)	(0.46)
Deposits Total Assets	-0.00	-0.00	-0.00	0.00	-0.01	0.00	0.02	0.03	-0.02	0.01
	(0.18)	(0.46)	(0.73)	(0.79)	(0.85)	(0.93)	(0.24)	(0.13)	(0.45)	(0.67)
Log(Age)	-0.00	-0.00	-0.01	-0.00	-0.14	-0.22	-0.26	-0.40	-0.19	-0.04
	(0.83)	(0.99)	(0.65)	(0.79)	(0.73)	(0.49)	(0.30)	(0.14)	(0.61)	(0.93)
d(Rescued Bank)	0.06	0.01	0.09	0.06	0.41	1.08	0.94	0.07	0.25	0.14
	(0.56)	(0.94)	(0.48)	(0.63)	(0.85)	(0.70)	(0.56)	(0.96)	(0.92)	(0.96)
Cross Listed Index	0.01	0.02	0.02	0.01	0.18	0.15	0.15	0.21	0.01	0.15
	(0.64)	(0.19)	(0.10)	(0.51)	(0.65)	(0.64)	(0.44)	(0.36)	(0.96)	(0.47)
d(Merger Acquisition)	0.02	0.08	0.15	0.18	3.00	1.23	2.88*	2.81	2.53	2.60
	(0.86)	(0.51)	(0.23)	(0.20)	(0.25)	(0.63)	(0.08)	(0.12)	(0.13)	(0.15)
3-month Interbank Rate	-0.13	-0.05	-0.09	-0.04	-3.16	-4.05	-2.94**	-3.30**	-2.78**	-2.55*
	(0.11)	(0.51)	(0.26)	(0.54)	(0.27)	(0.15)	(0.01)	(0.03)	(0.03)	(0.06)
GDP Growth Rate	0.01	0.00	0.02***	0.01*	0.32	0.35*	0.19*	0.24**	0.35***	0.31**
	(0.13)	(0.69)	(0.01)	(0.06)	(0.19)	(0.07)	(0.09)	(0.04)	(0.01)	(0.02)
Stock Traded	0.00	0.00	0.00	0.00	0.04	0.04	0.02	0.01	0.03	0.02
	(0.75)	(0.83)	(0.15)	(0.84)	(0.23)	(0.18)	(0.36)	(0.75)	(0.43)	(0.63)
Constant	0.71	0.51	1.07**	0.90**	21.70	36.20***	18.57*	21.33***	27.83**	13.75
	(0.13)	(0.15)	(0.01)	(0.03)	(0.30)	(0.00)	(0.06)	(0.00)	(0.04)	(0.24)
Number of observations	788	788	788	788	788	788	788	788	788	788
Number of banks	154	154	154	154	154	154	154	154	154	154
Hansen test (P-value)	0.81	0.83	0.83	0.98	0.78	0.90	0.96	0.84	0.98	0.95
AR2 test (P-value)	0.26	0.27	0.79	0.95	0.26	0.26	0.14	0.13	0.18	0.18
Wald tests: $\alpha_1 + \alpha_2$	-0.07**	-0.04**	-0.07**	-0.08**	0.45	0.48*	0.27	0.50	0.21	0.37
$\alpha'_1 + \alpha'_2$	0.09**	0.09**	0.05*	0.03	-0.58*	-0.50*	-0.49	-060	-0.30	-0.57*

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Table A1.7. 2008 financial crisis and the relationship between excess control rights and capital ratio adjustment: regressions on subsamples

This table shows the Blundell and Bond (1998) estimation results on the effect of the 2008 financial crisis on the relationship between excess control rights and capital ratio adjustment over the 2002-2010 period for banks without and with excess control rights (Panels 1 and 2). Based on a control threshold of 10%, we classify a bank as without excess control rights (*Absence of Excess Control Rights*) if (1) it is controlled by an ultimate owner with equal control and cash-flow rights, (2) it is widely held or (3) if its control chain is a cross-holding. We classify a bank as with excess control rights (*Presence of Excess Control Rights*) if it is controlled by an ultimate owner with greater control than cash-flow rights. In all the regressions, the target capital ratio is obtained by estimating a partial adjustment model using the Blundell and Bond (1998) estimation method for subsamples of banks without and with excess control rights. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Crisis)* is a dummy equal to one if the observation is from 2008 or 2009, and zero otherwise. *Deposits Total Assets* is total customer deposits divided by total assets. *Log(Age)* is the natural logarithm of bank age. *d(Rescued Bank)* is a dummy equal to one if the bank was rescued during the 2008 financial crisis, and zero otherwise. *Cross Listed Index* is an index equal to the number of stock markets on which the bank is listed, and zero if the bank is privately owned. *d(Merger Acquisition)* is a dummy equal to one if the bank experienced a merger-acquisition event during the sample period, and zero otherwise. *3-month Interbank Rate* is the three-month interbank rate. *GDP Growth Rate* is the real Gross Domestic Product (GDP) growth rate. *Stock Traded* is the value of listed shares divided by GDP. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Capital adjustment				Assets adjustment					
	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Panel 1: Absence of Excess Control Rights										
Capital Ratio Surplus (α_1)	-0.09**	-0.06**	-0.04**	-0.05**	1.04**	1.12**	0.52**	0.62**	0.62**	0.91**
	(0.01)	(0.04)	(0.02)	(0.03)	(0.04)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)
d(Crisis) Capital Ratio Surplus (α_2)	0.04*	0.03	-0.01	-0.01	-0.61	-0.43	-0.19	-0.29	-0.30	-0.39
	(0.06)	(0.51)	(0.13)	(0.19)	(0.72)	(0.68)	(0.77)	(0.42)	(0.14)	(0.17)
Capital Ratio Shortfall (α'_1)	0.15***	0.11***	0.04	0.05	-0.43	0.07	-0.24	-0.31	-0.24	-0.64**
	(0.00)	(0.00)	(0.15)	(0.10)	(0.29)	(0.83)	(0.80)	(0.35)	(0.18)	(0.03)
d(Crisis) Capital Ratio Shortfall (α'_2)	-0.06	-0.05	-0.02	-0.02	-0.06	0.18	-0.20	-0.13	-0.17	0.18
	(0.35)	(0.69)	(0.24)	(0.18)	(0.53)	(0.65)	(0.74)	(0.56)	(0.19)	(0.75)
Lagged dependent variable	0.02	0.03	0.38***	0.39***	0.13***	0.11***	0.16***	0.15***	0.24***	0.25***
	(0.56)	(0.46)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
Deposits Total Assets	-0.00	-0.00*	0.00	0.00	0.00	-0.02	0.02	0.01	0.01	0.01
	(0.31)	(0.05)	(0.11)	(0.14)	(0.95)	(0.58)	(0.35)	(0.59)	(0.62)	(0.49)
Log(Age)	-0.01	-0.03*	-0.00	-0.00	-0.12	-0.19	-0.22*	-0.16	-0.09	-0.07
	(0.46)	(0.07)	(0.75)	(0.91)	(0.56)	(0.32)	(0.10)	(0.27)	(0.57)	(0.69)
d(Rescued Bank)	0.10	0.07	0.02	0.08	1.83	1.47	0.39	0.18	0.34	0.70
	(0.48)	(0.63)	(0.84)	(0.37)	(0.32)	(0.49)	(0.71)	(0.88)	(0.81)	(0.62)
Cross Listed Index	0.02*	0.02**	0.00	0.00	0.10	0.04	0.10	0.12	0.32***	0.26**
	(0.06)	(0.03)	(0.92)	(0.60)	(0.45)	(0.81)	(0.27)	(0.23)	(0.00)	(0.01)
d(Merger Acquisition)	0.03	0.05	0.04	0.03	0.42	1.15	1.34	1.08	0.98	1.18
	(0.73)	(0.53)	(0.46)	(0.59)	(0.75)	(0.46)	(0.12)	(0.28)	(0.42)	(0.36)
3-month Interbank Rate	0.04	0.05	-0.11**	-0.09*	-2.21***	-2.06**	-1.83**	-2.14***	-1.10*	-1.38**
	(0.50)	(0.47)	(0.03)	(0.06)	(0.00)	(0.01)	(0.01)	(0.00)	(0.08)	(0.04)
GDP Growth Rate	0.02*	0.01	0.00	0.00	0.22	0.23	0.16*	0.18**	0.10	0.07
	(0.10)	(0.11)	(0.59)	(0.49)	(0.10)	(0.11)	(0.06)	(0.03)	(0.36)	(0.55)
Stock Traded	0.00	0.00	0.00	0.00	0.03*	0.03*	0.01	0.02	0.01	0.00
	(0.68)	(0.99)	(0.54)	(0.62)	(0.05)	(0.07)	(0.24)	(0.10)	(0.68)	(0.93)
Constant	0.07	0.23	0.54***	0.49**	10.27***	11.43***	8.87***	10.49***	4.91**	5.12*
	(0.82)	(0.43)	(0.01)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.05)	(0.06)
Number of observations	1,416	1,416	1,416	1,416	1,416	1,416	1,416	1,416	1,416	1,416
Number of banks	236	236	236	236	236	236	236	236	236	236
Hansen test (P-value)	0.16	0.17	0.12	0.15	0.30	0.25	0.20	0.12	0.16	0.18
AR2 test (P-value)	0.90	0.89	0.95	0.89	0.55	0.61	0.95	0.91	0.28	0.22

Table A1.7 (continued)

Wald tests: $\alpha_1 + \alpha_2$	-0.05*	-0.03	-0.05**	-0.06**	0.43*	0.69**	0.33	0.33	0.32	0.52**
$\alpha'_1 + \alpha'_2$	0.09**	0.07**	0.02	0.03	-0.49	0.25	-0.44	-0.44	-0.41	-0.46*

Panel 2: Presence of Excess Control Rights

Capital Ratio Surplus (α_1)	-0.14**	-0.09**	-0.03	-0.02	0.46	0.49	0.35	0.32	0.30	035
	(0.01)	(0.02)	(0.59)	(0.13)	(0.14)	(0.42)	(0.48)	(0.66)	(0.52)	(0.32)
d(Crisis) Capital Ratio Surplus (α_2)	0.09*	0.06*	-0.04	-0.04	-0.12	-0.10	-0.13	-0.12	-0.09	-0.04
	(0.09)	(0.07)	(0.21)	(0.18)	(0.44)	(0.35)	(0.15)	(0.38)	(0.18)	(0.30)
Capital Ratio Shortfall (α'_1)	0.05	0.02	0.09**	0.12**	-0.92**	-0.88**	-0.66**	-0.82**	-0.72**	-0.81**
	(0.22)	(0.32)	(0.01)	(0.02)	(0.02)	(0.02)	(0.02)	(0.01)	(0.02)	(0.01)
d(Crisis) Capital Ratio Shortfall (α'_2)	0.03*	0.04*	-0.05*	-0.07*	0.41	0.38	0.22	0.37	0.43	0.48
	(0.07)	(0.08)	(0.03)	(0.09)	(0.18)	(0.13)	(0.13)	(0.12)	(0.18)	(0.17)
Lagged dependent variable	0.03	0.01	0.42***	0.39***	0.15**	0.15**	0.16***	0.14**	0.12	0.08
	(0.55)	(0.86)	(0.00)	(0.00)	(0.02)	(0.05)	(0.00)	(0.01)	(0.20)	(0.36)
Deposits Total Assets	-0.00*	-0.00	-0.00	0.00	0.01	-0.02	0.03*	0.02	-0.02	0.01
	(0.05)	(0.32)	(0.69)	(0.77)	(0.70)	(0.61)	(0.06)	(0.29)	(0.52)	(0.75)
Log(Age)	0.01	-0.01	-0.01	-0.01	-0.38	-0.28	-0.33	-0.30	-0.12	-0.22
	(0.65)	(0.77)	(0.48)	(0.67)	(0.30)	(0.42)	(0.11)	(0.18)	(0.70)	(0.51)
d(Rescued Bank)	0.12	0.11	0.07	0.11	0.51	0.15	1.31	0.45	0.74	0.40
	(0.28)	(0.30)	(0.44)	(0.26)	(0.81)	(0.95)	(0.33)	(0.75)	(0.72)	(0.87)
Cross Listed Index	0.01	0.02	0.02	0.00	0.38	0.19	0.15	0.14	0.13	0.20
	(0.30)	(0.11)	(0.15)	(0.73)	(0.33)	(0.59)	(0.46)	(0.53)	(0.39)	(0.30)
d(Merger Acquisition)	0.00	0.02	0.11	0.09	0.85	0.63	2.86	3.18*	2.40	2.55
	(0.98)	(0.86)	(0.29)	(0.49)	(0.73)	(0.80)	(0.11)	(0.10)	(0.13)	(0.17)
3-month Interbank Rate	-0.07	-0.04	-0.07	0.01	-3.46	-3.36	-2.97**	-2.52*	-2.46*	-1.61
	(0.29)	(0.62)	(0.36)	(0.91)	(0.10)	(0.15)	(0.01)	(0.06)	(0.08)	(0.20)
GDP Growth Rate	0.02**	0.00	0.02**	0.01	0.23	0.32	0.23*	0.22*	0.26**	0.29**
	(0.04)	(0.78)	(0.01)	(0.18)	(0.28)	(0.14)	(0.05)	(0.06)	(0.02)	(0.03)
Stock Traded	0.00	0.00	0.00	0.00	0.04	0.03	0.00	0.00	0.02	0.02
	(0.52)	(0.32)	(0.21)	(0.68)	(0.21)	(0.34)	(0.89)	(0.84)	(0.57)	(0.37)
Constant	0.49	0.58	0.76**	0.67**	28.67***	31.29***	17.24*	20.47***	14.68	12.31
	(0.10)	(0.19)	(0.02)	(0.04)	(0.00)	(0.00)	(0.05)	(0.00)	(0.20)	(0.35)
Number of observations	788	788	788	788	788	788	788	788	788	788
Number of banks	154	154	154	154	154	154	154	154	154	154
Hansen test (P-value)	0.17	0.20	0.10	0.10	0.20	0.23	0.23	0.17	0.18	0.20
AR2 test (P-value)	0.89	0.89	0.92	0.87	0.56	0.62	0.92	0.93	0.26	0.27
Wald tests: $\alpha_1 + \alpha_2$	-0.05	-0.03*	-0.07**	-0.06**	0.34	0.39	0.22	0.20	0.21	0.31
$\alpha'_1 + \alpha'_2$	0.08**	0.06**	0.04	0.05	-0.51	-0.50	-0.44	-0.45	-0.29	-0.33

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Table A1.8. Bank capitalization and the effect of excess control rights on capital ratio adjustment: regressions on subsamples

   This table shows the Blundell and Bond (1998) estimation results on the effect of bank capitalization on the relationship between excess control rights and capital ratio adjustment over the 2002-2010 period for banks without and with excess control rights (Panels 1 and 2). Based on a control threshold of 10%, we classify a bank as without excess control rights (*Absence of Excess Control Rights*) if (1) it is controlled by an ultimate owner with equal control and cash-flow rights, (2) it is widely held or (3) if its control chain is a cross-holding. We classify a bank as with excess control rights (*Presence of Excess Control Rights*) if it is controlled by an ultimate owner with greater control than cash-flow rights. In all the regressions, the target capital ratio is obtained by estimating a partial adjustment model using the Blundell and Bond (1998) estimation method for subsamples of banks without and with excess control rights. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Undercapitalized)* is a dummy equal to one if the Tier 1 RWA (Tier 1 Total Assets) ratio is less than 6% (4%), and zero otherwise. *Deposits Total Assets* is total customer deposits divided by total assets. *Log(Age)* is the natural logarithm of bank age. *d(Rescued Bank)* is a dummy equal to one if the bank was rescued during the 2008 financial crisis, and zero otherwise. *Cross Listed Index* is an index equal to the number of stock markets on which the bank is listed, and zero if the bank is privately owned. *d(Merger Acquisition)* is a dummy equal to one if the bank experienced a merger-acquisition event during the sample period, and zero otherwise. *3-month Interbank Rate* is the three-month interbank rate. *GDP Growth Rate* is the real Gross Domestic Product (GDP) growth rate. *Stock Traded* is the value of listed shares divided by GDP. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Capital adjustment				Assets adjustment					
	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Panel 1: Absence of Excess Control Rights										
Capital Ratio Surplus (α_1)	-0.06**	-0.06**	-0.05**	-0.05*	0.74**	0.82**	0.49**	0.52**	0.47**	0.65***
	(0.02)	(0.05)	(0.03)	(0.06)	(0.01)	(0.04)	(0.04)	(0.01)	(0.01)	(0.00)
d(Undercapitalized) × Capital Ratio Surplus (α_2)	0.01	0.04**	0.00	0.03*	-0.09	-0.44**	-0.04	-0.21*	-0.03	-0.25*
	(0.82)	(0.02)	(0.95)	(0.08)	(0.32)	(0.05)	(0.34)	(0.07)	(0.84)	(0.07)
Capital Ratio Shortfall (α'_1)	0.09**	0.08**	0.03	0.03	-0.35	-0.05	-0.27	-0.38	-0.37	-0.49**
	(0.05)	(0.02)	(0.40)	(0.11)	(0.20)	(0.38)	(0.41)	(0.16)	(0.11)	(0.03)
d(Undercapitalized) × Capital Ratio Shortfall (α'_2)	0.05	0.07**	0.01	0.00	-0.10	0.31	-0.10	-0.09	-0.14	-0.18
	(0.22)	(0.05)	(0.67)	(0.92)	(0.23)	(0.55)	(0.20)	(0.66)	(0.21)	(0.27)
Lagged dependent variable	0.08	0.10	0.43***	0.46***	0.09**	0.11**	0.14***	0.15***	0.28***	0.27***
	(0.16)	(0.11)	(0.00)	(0.00)	(0.05)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)
d(Undercapitalized)	0.02	0.27	-0.09	-0.14	-4.97	-1.37	-4.07**	-3.55	-4.15*	-3.20
	(0.92)	(0.44)	(0.44)	(0.41)	(0.11)	(0.74)	(0.03)	(0.30)	(0.08)	(0.36)
Deposits Total Assets	-0.01***	-0.00	0.01**	0.00*	-0.01	-0.02	0.00	0.00	-0.01	-0.02
	(0.01)	(0.14)	(0.03)	(0.07)	(0.75)	(0.68)	(0.93)	(0.98)	(0.62)	(0.50)
Log(Age)	0.07**	-0.01	0.00	-0.01	0.49	0.43	0.44*	0.70**	0.71**	0.81**
	(0.01)	(0.73)	(0.99)	(0.46)	(0.37)	(0.45)	(0.05)	(0.04)	(0.02)	(0.02)
d(Rescued Bank)	0.08	0.17	0.07	0.26*	2.19	2.34	0.32	0.52	1.73	3.50
	(0.64)	(0.46)	(0.55)	(0.10)	(0.28)	(0.38)	(0.81)	(0.84)	(0.55)	(0.44)
Cross Listed Index	0.03**	0.02	0.00	0.00	0.30	0.17	0.12	0.10	0.40***	0.33**
	(0.04)	(0.19)	(0.67)	(0.75)	(0.12)	(0.36)	(0.17)	(0.43)	(0.00)	(0.03)
d(Merger Acquisition)	0.11	0.13	0.02	0.03	1.06	0.71	0.16	0.16	0.52	0.50
	(0.13)	(0.12)	(0.64)	(0.59)	(0.49)	(0.69)	(0.87)	(0.89)	(0.71)	(0.70)
3-month Interbank Rate	0.17	0.22*	-0.08	-0.06	-1.88*	-0.82	-2.52**	-2.30**	-2.18*	-2.17**
	(0.13)	(0.07)	(0.35)	(0.41)	(0.07)	(0.60)	(0.01)	(0.01)	(0.08)	(0.05)
GDP Growth Rate	0.01	0.01	0.01	0.01	0.23	0.18	0.22**	0.23**	0.28*	0.26**
	(0.30)	(0.54)	(0.18)	(0.19)	(0.23)	(0.34)	(0.03)	(0.02)	(0.05)	(0.03)
Stock Traded	0.00	0.00	0.00	0.00**	0.02	0.02	0.01	0.02	0.02	0.01
	(0.40)	(0.56)	(0.21)	(0.04)	(0.34)	(0.38)	(0.79)	(0.24)	(0.57)	(0.59)
Constant	-0.48	-0.61	0.28	0.42	10.31*	5.13	10.32**	6.24	7.75	9.48*
	(0.41)	(0.36)	(0.45)	(0.22)	(0.07)	(0.48)	(0.04)	(0.18)	(0.16)	(0.10)
Number of observations	1,416	1,416	1,416	1,416	1,416	1,416	1,416	1,416	1,416	1,416
Number of banks	236	236	236	236	236	236	236	236	236	236

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Table A1.8 (continued)

Hansen test (P-value)	0.50	0.56	0.54	0.62	0.78	0.73	0.75	0.49	0.73	0.75
AR2 test (P-value)	0.83	0.94	0.89	0.96	0.68	0.52	0.12	0.15	0.84	0.86
Wald tests: $\alpha_1 + \alpha_2$	-0.05**	-0.02	-0.05**	-0.02	0.65**	0.38	0.45**	0.31	0.44**	0.40
$\alpha'_1 + \alpha'_2$	0.14**	0.15**	0.04	0.03	-0.45	0.26	-0.37	-0.47	-0.51	-0.67**

Panel 2: Presence of Excess Control Rights

Capital Ratio Surplus (α_1)	-0.14**	-0.09**	-0.04	-0.04	0.31	0.41	0.32	0.42	0.33	0.45
	(0.03)	(0.01)	(0.15)	(0.20)	(0.22)	(0.32)	(0.15)	(0.20)	(0.17)	(0.25)
d(Undercapitalized) × Capital Ratio Surplus (α_2)	0.08	0.07	0.00	0.02	-0.01	-0.20	0.17	-0.24	0.10	-0.24
	(0.28)	(0.02)	(0.95)	(0.18)	(0.30)	(0.25)	(0.34)	(0.27)	(0.28)	(0.17)
Capital Ratio Shortfall (α'_1)	0.03	0.02	0.08**	0.05**	-0.65**	-0.48**	-0.66**	-0.61**	-0.77**	-0.60**
	(0.33)	(0.45)	(0.01)	(0.05)	(0.01)	(0.03)	(0.01)	(0.03)	(0.02)	(0.02)
d(Undercapitalized) × Capital Ratio Shortfall (α'_2)	0.01	0.01	-0.03	0.00	-0.28	-0.16**	-0.23	-0.37**	-0.09	-0.32*
	(0.22)	(0.30)	(0.27)	(0.90)	(0.16)	(0.05)	(0.10)	(0.04)	(0.21)	(0.07)
Lagged dependent variable	0.04	0.05	0.36***	0.36***	0.11	0.05	0.20***	0.17**	0.01	0.01
	(0.52)	(0.49)	(0.01)	(0.00)	(0.22)	(0.62)	(0.01)	(0.03)	(0.92)	(0.95)
d(Undercapitalized)	0.21	0.15	0.55	-0.17	2.31	-9.35*	-0.68	-2.78	0.28	1.16
	(0.63)	(0.66)	(0.22)	(0.49)	(0.77)	(0.10)	(0.89)	(0.69)	(0.94)	(0.84)
Deposits Total Assets	-0.00	-0.00	0.00	0.00	0.06	-0.01	0.02	-0.00	-0.02	0.01
	(0.21)	(0.61)	(0.33)	(0.41)	(0.28)	(0.93)	(0.67)	(0.95)	(0.66)	(0.91)
Log(Age)	-0.01	-0.03	-0.03	0.00	-0.79	-2.69	-0.14	0.66	0.66	0.21
	(0.88)	(0.61)	(0.35)	(0.96)	(0.41)	(0.19)	(0.85)	(0.56)	(0.40)	(0.83)
d(Rescued Bank)	0.17	0.13	0.15	0.05	1.35	7.77	0.72	1.32	0.46	0.65
	(0.28)	(0.59)	(0.23)	(0.82)	(0.64)	(0.56)	(0.76)	(0.77)	(0.87)	(0.85)
Cross Listed Index	0.01	0.03	0.01	0.01	0.69	0.35	0.13	0.42	0.14	0.16
	(0.45)	(0.27)	(0.33)	(0.64)	(0.22)	(0.72)	(0.75)	(0.42)	(0.64)	(0.53)
d(Merger Acquisition)	0.07	0.09	0.13	0.03	0.50	0.46	1.19	2.30	2.34	3.01*
	(0.63)	(0.52)	(0.36)	(0.85)	(0.80)	(0.89)	(0.53)	(0.41)	(0.11)	(0.05)
3-month Interbank Rate	-0.18	0.13	-0.04	0.02	1.19	-0.45	-1.21	1.51	-1.37	-0.18
	(0.26)	(0.46)	(0.63)	(0.91)	(0.75)	(0.89)	(0.61)	(0.72)	(0.37)	(0.94)
GDP Growth Rate	0.01	0.01	0.02***	0.01	0.02	0.22	0.03	0.04	0.11	0.07
	(0.51)	(0.65)	(0.00)	(0.35)	(0.95)	(0.40)	(0.89)	(0.85)	(0.34)	(0.71)
Stock Traded	0.00	0.00	0.00	0.00	0.02	0.01	0.01	0.05	0.01	0.02
	(0.93)	(0.73)	(0.89)	(0.40)	(0.80)	(0.87)	(0.93)	(0.39)	(0.80)	(0.58)
Constant	1.18	0.17	0.29	1.11*	1.77	13.58	7.97	6.62	23.34*	8.51
	(0.15)	(0.77)	(0.57)	(0.08)	(0.95)	(0.42)	(0.67)	(0.78)	(0.08)	(0.47)
Number of observations	788	788	788	788	788	788	788	788	788	788
Number of banks	154	154	154	154	154	154	154	154	154	154
Hansen test (P-value)	0.20	0.21	0.22	0.34	0.23	0.21	0.30	0.22	0.24	0.20
AR2 test (P-value)	0.86	0.61	0.20	0.91	0.92	0.74	0.23	0.22	0.82	0.58
Wald tests: $\alpha_1 + \alpha_2$	-0.06**	-0.02	-0.04	-0.02	0.30	0.21	0.49	0.18	0.43	0.21
$\alpha'_1 + \alpha'_2$	0.04	0.03	0.05**	0.05**	-0.93**	-0.64**	-0.89**	-0.98**	-0.86**	-0.92**

Table A1.9. Asset structure and the effect of excess control rights on capital ratio adjustment: regressions on subsamples

This table shows the Blundell and Bond (1998) estimation results on the effect of asset structure on the relationship between excess control rights and capital ratio adjustment over the 2002-2010 period for banks without and with excess control rights (Panels 1 and 2). Based on a control threshold of 10%, we classify a bank as without excess control rights (*Absence of Excess Control Rights*) if (1) it is controlled by an ultimate owner with equal control and cash-flow rights, (2) it is widely held or (3) if its control chain is a cross-holding. We classify a bank as with excess control rights (*Presence of Excess Control Rights*) if it is controlled by an ultimate owner with greater control than cash-flow rights. In all the regressions, the target capital ratio is obtained by estimating a partial adjustment model using the Blundell and Bond (1998) estimation method for subsamples of banks without and with excess control rights. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Lending Oriented)* is a dummy equal to one if the ratio of net loans (excluding interbank loans) to total assets is greater than the median value, and zero otherwise. *Deposits Total Assets* is total customer deposits divided by total assets. *Log(Age)* is the natural logarithm of bank age. *d(Rescued Bank)* is a dummy equal to one if the bank was rescued during the 2008 financial crisis, and zero otherwise. *Cross Listed Index* is an index equal to the number of stock markets on which the bank is listed, and zero if the bank is privately owned. *d(Merger Acquisition)* is a dummy equal to one if the bank experienced a merger-acquisition event during the sample period, and zero otherwise. *3-month Interbank Rate* is the three-month interbank rate. *GDP Growth Rate* is the real Gross Domestic Product (GDP) growth rate. *Stock Traded* is the value of listed shares divided by GDP. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Capital adjustment				Assets adjustment					
	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Panel 1: Absence of Excess Control Rights										
Capital Ratio Surplus (α_1)	-0.09**	-0.07**	-0.06**	-0.06***	0.75**	0.85**	0.41**	0.45**	0.43**	0.64**
	(0.01)	(0.04)	(0.01)	(0.00)	(0.01)	(0.01)	(0.03)	(0.02)	(0.02)	(0.01)
d(Lending Oriented) × Capital Ratio Surplus (α_2)	-0.01	-0.02	-0.01	-0.01	0.14	0.10	-0.02	-0.02	0.11	0.09
	(0.19)	(0.19)	(0.30)	(0.27)	(0.33)	(0.23)	(0.38)	(0.46)	(0.27)	(0.25)
Capital Ratio Shortfall (α'_1)	0.11**	0.08***	0.04	0.04	-0.48*	-0.45*	-0.30	-0.31	-0.38	-0.59**
	(0.01)	(0.00)	(0.20)	(0.17)	(0.06)	(0.06)	(0.18)	(0.14)	(0.13)	(0.01)
d(Lending Oriented) × Capital Ratio Shortfall (α'_2)	0.04	0.04	0.00	0.01	0.18*	0.15*	-0.03	-0.03	0.08	-0.02
	(0.15)	(0.20)	(0.54)	(0.40)	(0.06)	(0.06)	(0.34)	(0.33)	(0.20)	(0.44)
Lagged dependent variable	0.03	0.04	0.40***	0.37***	0.11***	0.13***	0.17***	0.17***	0.26***	0.26***
	(0.49)	(0.36)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Lending Oriented)	0.03	0.09	0.11	0.21**	0.13	3.20	1.95*	3.59***	-0.32	1.59
	(0.84)	(0.49)	(0.31)	(0.03)	(0.95)	(0.10)	(0.10)	(0.01)	(0.81)	(0.31)
Deposits Total Assets	-0.00*	-0.00**	0.00	0.00	0.01	-0.00	0.02	0.02	0.01	0.01
	(0.10)	(0.02)	(0.17)	(0.12)	(0.82)	(0.85)	(0.20)	(0.14)	(0.69)	(0.44)
Log(Age)	-0.01	-0.02	-0.00	-0.00	-0.34	-0.16	-0.23*	-0.11	-0.22	-0.22
	(0.73)	(0.33)	(0.78)	(0.91)	(0.11)	(0.42)	(0.10)	(0.43)	(0.15)	(0.18)
d(Rescued Bank)	0.02	0.09	0.08	0.05	1.38	2.05	0.12	0.02	0.35	1.16
	(0.88)	(0.60)	(0.43)	(0.69)	(0.50)	(0.35)	(0.92)	(0.99)	(0.83)	(0.54)
Cross Listed Index	0.03**	0.03**	0.00	0.01	0.06	0.05	0.04	0.10	0.32***	0.25**
	(0.03)	(0.03)	(0.99)	(0.43)	(0.68)	(0.79)	(0.69)	(0.39)	(0.01)	(0.03)
d(Merger Acquisition)	0.02	0.01	0.06	0.04	0.85	0.03	1.20	1.06	0.39	0.63
	(0.80)	(0.93)	(0.19)	(0.43)	(0.54)	(0.98)	(0.20)	(0.23)	(0.76)	(0.55)
3-month Interbank Rate	0.06	0.06	-0.10**	-0.10**	-1.47**	-1.51**	-1.59**	-1.98***	-1.36**	-1.78***
	(0.32)	(0.33)	(0.02)	(0.01)	(0.03)	(0.04)	(0.01)	(0.00)	(0.02)	(0.00)
GDP Growth Rate	0.02*	0.01	0.00	0.00	0.26*	0.13	0.22**	0.22***	0.15	0.14
	(0.09)	(0.28)	(0.72)	(0.75)	(0.07)	(0.32)	(0.01)	(0.00)	(0.19)	(0.19)
Stock Traded	0.00	0.00	0.00	0.00	0.03**	0.03**	0.02**	0.01	0.01	0.01
	(0.36)	(1.00)	(0.14)	(0.31)	(0.04)	(0.02)	(0.05)	(0.17)	(0.72)	(0.37)
Constant	0.10	0.15	0.59***	0.62***	10.41***	12.03***	9.01***	10.94***	6.54***	8.31***
	(0.72)	(0.60)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
Number of observations	1,416	1,416	1,416	1,416	1,416	1,416	1,416	1,416	1,416	1,416
Number of banks	236	236	236	236	236	236	236	236	236	236

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Table A1.9 (continued)

Hansen test (P-value)	0.22	0.17	0.16	0.14	0.17	0.22	0.17	0.14	0.13	0.12
AR2 test (P-value)	0.93	0.96	0.96	0.82	0.60	0.65	0.74	0.89	0.23	0.21
Wald tests: $\alpha_1 + \alpha_2$	-0.10**	-0.09**	-0.07**	-0.07**	0.89**	0.95**	0.39**	0.43**	0.54**	0.73**
$\alpha'_1 + \alpha'_2$	0.15**	0.12**	0.04	0.05	-0.30	-0.30	-0.33	-0.34	-0.30	-0.61**

Panel 2: Presence of Excess Control Rights

Capital Ratio Surplus (α_1)	-0.14***	-0.08**	-0.03	-0.04	0.35	0.36	0.30	0.26	0.29	0.30
	(0.00)	(0.02)	(0.23)	(0.19)	(0.23)	(0.32)	(0.32)	(0.30)	(0.33)	(0.21)
d(Lending Oriented) × Capital Ratio Surplus (α_2)	0.02	0.00	-0.01	-0.02	0.06	0.01	-0.04	-0.04	0.01	0.01
	(0.20)	(0.22)	(0.30)	(0.26)	(0.40)	(0.26)	(0.17)	(0.20)	(0.17)	(0.20)
Capital Ratio Shortfall (α'_1)	0.03	0.04	0.08**	0.10***	-0.92***	-0.90**	-0.60**	-0.63**	-0.72**	-0.69***
	(0.30)	(0.33)	(0.02)	(0.00)	(0.00)	(0.01)	(0.01)	(0.01)	(0.01)	(0.00)
d(Lending Oriented) × Capital Ratio Shortfall (α'_2)	0.04	0.04	-0.01	-0.02	0.09	0.16	-0.39*	-0.35*	-0.18	-0.14
	(0.29)	(0.20)	(0.30)	(0.34)	(0.31)	(0.14)	(0.05)	(0.05)	(0.16)	(0.23)
Lagged dependent variable	0.01	0.01	0.43***	0.37***	0.10	0.15**	0.14**	0.16**	0.10	0.12
	(0.84)	(0.75)	(0.00)	(0.00)	(0.16)	(0.02)	(0.01)	(0.01)	(0.21)	(0.18)
d(Lending Oriented)	-0.27*	-0.01	0.11	0.13	-0.47	-2.10	-0.94	1.33	-1.84	4.23
	(0.09)	(0.98)	(0.36)	(0.27)	(0.87)	(0.36)	(0.63)	(0.40)	(0.52)	(0.10)
Deposits Total Assets	-0.00*	-0.00	-0.00	0.00	0.02	-0.01	0.02	0.02	-0.02	0.02
	(0.09)	(0.20)	(0.76)	(0.65)	(0.54)	(0.68)	(0.24)	(0.25)	(0.64)	(0.62)
Log(Age)	-0.01	-0.00	-0.00	-0.00	-0.48	-0.19	-0.27	-0.25	-0.10	-0.21
	(0.80)	(0.84)	(0.92)	(0.82)	(0.22)	(0.55)	(0.23)	(0.31)	(0.80)	(0.60)
d(Rescued Bank)	0.08	0.01	0.08	0.04	0.24	0.48	0.26	0.90	0.17	0.95
	(0.48)	(0.95)	(0.51)	(0.76)	(0.91)	(0.84)	(0.86)	(0.58)	(0.95)	(0.63)
Cross Listed Index	0.02	0.02	0.02*	0.01	0.42	0.21	0.07	0.02	0.08	0.04
	(0.25)	(0.15)	(0.09)	(0.29)	(0.33)	(0.49)	(0.73)	(0.91)	(0.72)	(0.85)
d(Merger Acquisition)	0.00	0.00	0.15	0.11	1.56	1.88	2.89*	3.95**	2.38	2.12
	(0.99)	(0.99)	(0.17)	(0.36)	(0.53)	(0.40)	(0.05)	(0.04)	(0.22)	(0.26)
3-month Interbank Rate	-0.08	-0.15*	-0.05	-0.04	-3.48*	-4.86**	-2.86**	-4.04**	-2.60**	-2.37*
	(0.36)	(0.10)	(0.46)	(0.52)	(0.10)	(0.04)	(0.05)	(0.01)	(0.03)	(0.09)
GDP Growth Rate	0.01	0.01	0.02**	0.01	0.30	0.42**	0.20	0.22*	0.31**	0.34***
	(0.18)	(0.59)	(0.02)	(0.20)	(0.14)	(0.04)	(0.17)	(0.06)	(0.02)	(0.01)
Stock Traded	0.00	0.00	0.00	0.00	0.03	0.02	0.01	0.01	0.02	0.04
	(0.67)	(0.85)	(0.39)	(0.42)	(0.48)	(0.44)	(0.70)	(0.59)	(0.50)	(0.26)
Constant	0.46	0.72	0.74*	1.28***	28.48**	34.54**	20.52**	25.36**	25.52**	19.33
	(0.33)	(0.13)	(0.09)	(0.01)	(0.04)	(0.03)	(0.03)	(0.01)	(0.01)	(0.17)
Number of observations	788	788	788	788	788	788	788	788	788	788
Number of banks	154	154	154	154	154	154	154	154	154	154
Hansen test (P-value)	0.87	0.94	0.94	0.95	0.83	0.93	0.92	0.91	0.96	0.91
AR2 test (P-value)	0.26	0.26	0.71	0.73	0.30	0.19	0.12	0.12	0.14	0.10
Wald tests: $\alpha_1 + \alpha_2$	-0.12**	-0.08**	-0.04	-0.06	0.41	0.37	0.26	0.22	0.30	0.31
$\alpha'_1 + \alpha'_2$	0.07	0.08	0.07**	0.08**	-0.83**	-0.74**	-0.99***	-0.98***	-0.90**	-0.83**

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Table A1.10. Bank size and the effect of excess control rights on capital ratio adjustment: regressions on subsamples

This table shows the Blundell and Bond (1998) estimation results on the effect of bank size on the relationship between excess control rights and capital ratio adjustment over the 2002-2010 period for banks without and with excess control rights (Panels 1 and 2). Based on a control threshold of 10%, we classify a bank as without excess control rights (*Absence of Excess Control Rights*) if (1) it is controlled by an ultimate owner with equal control and cash-flow rights, (2) it is widely held or (3) if its control chain is a cross-holding. We classify a bank as with excess control rights (*Presence of Excess Control Rights*) if it is controlled by an ultimate owner with greater control than cash-flow rights. In all the regressions, the target capital ratio is obtained by estimating a partial adjustment model using the Blundell and Bond (1998) estimation method for subsamples of banks without and with excess control rights. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Large Bank)* is a dummy equal to one if the bank's total assets is above the median value, and zero otherwise. *Deposits Total Assets* is total customer deposits divided by total assets. *Log(Age)* is the natural logarithm of bank age. *d(Rescued Bank)* is a dummy equal to one if the bank was rescued during the 2008 financial crisis, and zero otherwise. *Cross Listed Index* is an index equal to the number of stock markets on which the bank is listed, and zero if the bank is privately owned. *d(Merger Acquisition)* is a dummy equal to one if the bank experienced a merger-acquisition event during the sample period, and zero otherwise. *3-month Interbank Rate* is the three-month interbank rate. *GDP Growth Rate* is the real Gross Domestic Product (GDP) growth rate. *Stock Traded* is the value of listed shares divided by GDP. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Capital adjustment				Assets adjustment					
	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Panel 1: Absence of Excess Control Rights										
Capital Ratio Surplus (α_1)	-0.06**	-0.05**	-0.08**	-0.05**	0.85**	0.91***	0.42*	0.45**	0.47**	0.63**
	(0.02)	(0.05)	(0.01)	(0.04)	(0.02)	(0.00)	(0.08)	(0.02)	(0.03)	(0.04)
d(Large Bank) × Capital Ratio Surplus (α_2)	-0.03	-0.02	0.02	-0.03	0.08	0.02	0.03	-0.00	0.16	0.16
	(0.41)	(0.61)	(0.19)	(0.48)	(0.72)	(0.73)	(0.75)	(0.95)	(0.45)	(0.25)
Capital Ratio Shortfall (α'_1)	0.13***	0.12***	0.04	0.05	-0.35	-0.10	-0.36	-0.38	-0.36	-1.00***
	(0.00)	(0.00)	(0.40)	(0.11)	(0.16)	(0.74)	(0.29)	(0.11)	(0.20)	(0.00)
d(Large Bank) × Capital Ratio Shortfall (α'_2)	0.03	0.04	0.00	-0.01	-0.12	-0.10	-0.09	-0.10	-0.12	-0.09
	(0.56)	(0.23)	(0.95)	(0.69)	(0.60)	(0.83)	(0.23)	(0.65)	(0.20)	(0.31)
Lagged dependent variable	0.04	0.04	0.37***	0.39***	0.11***	0.12***	0.24***	0.25***	0.24***	0.24***
	(0.41)	(0.33)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Large Bank)	-0.21	-0.12	-0.26**	-0.04	-6.11**	-2.98	-3.63**	-2.48	-4.10**	-5.46***
	(0.35)	(0.46)	(0.02)	(0.68)	(0.01)	(0.16)	(0.03)	(0.16)	(0.03)	(0.00)
Deposits Total Assets	-0.00*	-0.00**	0.00	0.00	-0.02	-0.01	0.01	0.00	-0.01	-0.01
	(0.06)	(0.03)	(0.15)	(0.16)	(0.51)	(0.65)	(0.75)	(0.92)	(0.67)	(0.66)
Log(Age)	-0.01	-0.03	-0.01	-0.01	-0.20	-0.12	-0.10	-0.09	-0.10	-0.05
	(0.44)	(0.17)	(0.63)	(0.62)	(0.32)	(0.49)	(0.42)	(0.49)	(0.51)	(0.78)
d(Rescued Bank)	0.03	0.13	0.10	0.04	2.14	1.96	0.90	0.76	0.14	0.11
	(0.85)	(0.37)	(0.34)	(0.67)	(0.25)	(0.34)	(0.45)	(0.55)	(0.92)	(0.94)
Cross Listed Index	0.02	0.02*	0.00	0.00	0.06	0.09	0.03	0.03	0.25**	0.12
	(0.16)	(0.10)	(0.77)	(0.80)	(0.71)	(0.59)	(0.76)	(0.76)	(0.03)	(0.27)
d(Merger Acquisition)	0.02	0.01	0.01	0.01	1.14	0.06	1.01	1.20	1.06	0.37
	(0.80)	(0.91)	(0.89)	(0.89)	(0.43)	(0.97)	(0.28)	(0.21)	(0.36)	(0.76)
3-month Interbank Rate	0.06	0.08	-0.12***	-0.11**	-1.70**	-1.62*	-1.82***	-2.08***	-1.42**	-1.36*
	(0.30)	(0.22)	(0.00)	(0.02)	(0.04)	(0.05)	(0.00)	(0.00)	(0.02)	(0.06)
GDP Growth Rate	0.01	0.01	-0.00	-0.00	0.14	0.14	0.17**	0.20***	0.07	0.13
	(0.27)	(0.16)	(0.75)	(0.83)	(0.31)	(0.35)	(0.04)	(0.00)	(0.52)	(0.21)
Stock Traded	0.00	0.00	0.00	0.00	0.02	0.03*	0.01	0.01	0.00	0.00
	(0.69)	(0.75)	(0.54)	(0.44)	(0.27)	(0.09)	(0.13)	(0.18)	(0.81)	(0.81)
Constant	0.18	0.17	0.77***	0.62***	14.66***	12.01***	10.62***	11.04***	9.24***	9.35***
	(0.52)	(0.58)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Number of observations	1,416	1,416	1,416	1,416	1,416	1,416	1,416	1,416	1,416	1,416
Number of banks	236	236	236	236	236	236	236	236	236	236

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Table A1.10 (continued)

Hansen test (P-value)	0.32	0.29	0.15	0.17	0.17	0.17	0.14	0.18	0.13	0.28
AR2 test (P-value)	0.95	0.96	0.91	0.96	0.62	0.57	0.92	0.91	0.26	0.24
Wald tests: $\alpha_1 + \alpha_2$	-0.09**	-0.07**	-0.06**	-0.08**	0.93**	0.93**	0.45**	0.45**	0.63**	0.79**
$\alpha'_1 + \alpha'_2$	0.16**	0.16**	0.04	0.04	-0.47	-0.20	-0.45	-0.48	-0.48	-1.09**

Panel 2: Presence of Excess Control Rights

Capital Ratio Surplus (α_1)	-0.09**	-0.06**	-0.04	-0.05	0.44	0.43	0.29	0.24	0.30	0.31
	(0.02)	(0.03)	(0.34)	(0.12)	(0.40)	(0.29)	(0.18)	(0.23)	(0.33)	(0.17)
d(Large Bank) × Capital Ratio Surplus (α_2)	-0.09	-0.06	-0.01	0.00	0.00	-0.02	-0.01	-0.03	0.12	0.11
	(0.24)	(0.52)	(0.77)	(0.84)	(0.80)	(0.92)	(0.60)	(0.97)	(0.43)	(0.17)
Capital Ratio Shortfall (α'_1)	0.08*	0.07*	0.07**	0.08**	-0.68**	-0.71**	-0.68**	-0.65**	-0.69**	-1.09***
	(0.06)	(0.06)	(0.03)	(0.05)	(0.05)	(0.01)	(0.02)	(0.02)	(0.04)	(0.00)
d(Large Bank) × Capital Ratio Shortfall (α'_2)	-0.03**	-0.04**	-0.04*	-0.04**	-0.54**	-0.41**	-0.55**	-0.45**	-0.51**	-0.11
	(0.04)	(0.02)	(0.08)	(0.04)	(0.04)	(0.05)	(0.04)	(0.04)	(0.03)	(0.45)
Lagged dependent variable	0.01	-0.02	0.40***	0.39***	0.11	0.14*	0.13**	0.15**	0.12	0.06
	(0.88)	(0.72)	(0.00)	(0.00)	(0.12)	(0.06)	(0.02)	(0.02)	(0.15)	(0.48)
d(Large Bank)	0.10	-0.04	-0.03	0.09	0.81	1.59	0.01	-0.10	-4.40	-0.73
	(0.65)	(0.84)	(0.85)	(0.47)	(0.85)	(0.64)	(1.00)	(0.96)	(0.15)	(0.82)
Deposits Total Assets	-0.00	-0.00	-0.00	0.00	0.02	-0.00	0.02	0.02	-0.01	0.01
	(0.32)	(0.28)	(0.87)	(0.62)	(0.50)	(0.89)	(0.26)	(0.29)	(0.67)	(0.74)
Log(Age)	0.00	-0.01	-0.00	-0.01	-0.32	-0.31	-0.33	-0.28	-0.06	0.19
	(0.83)	(0.54)	(0.99)	(0.60)	(0.42)	(0.38)	(0.13)	(0.23)	(0.86)	(0.58)
d(Rescued Bank)	0.07	0.04	0.15	0.11	0.25	0.33	0.18	0.22	1.10	1.69
	(0.51)	(0.70)	(0.22)	(0.29)	(0.90)	(0.90)	(0.89)	(0.91)	(0.60)	(0.43)
Cross Listed Index	0.00	0.01	0.02	0.01	0.39	0.15	0.11	0.20	0.04	0.02
	(0.78)	(0.44)	(0.24)	(0.64)	(0.34)	(0.66)	(0.59)	(0.35)	(0.83)	(0.92)
d(Merger Acquisition)	0.03	0.02	0.15	0.14	2.09	0.15	3.66**	2.98*	2.24	2.01
	(0.84)	(0.86)	(0.28)	(0.30)	(0.37)	(0.95)	(0.05)	(0.07)	(0.16)	(0.31)
3-month Interbank Rate	-0.11	-0.07	-0.09	-0.06	-3.76**	-4.19*	-3.10**	-3.64***	-2.12	-2.58*
	(0.18)	(0.29)	(0.26)	(0.37)	(0.05)	(0.06)	(0.02)	(0.00)	(0.14)	(0.06)
GDP Growth Rate	0.01	0.01	0.02***	0.02**	0.28	0.37	0.19	0.25**	0.29**	0.27**
	(0.19)	(0.27)	(0.00)	(0.03)	(0.20)	(0.11)	(0.12)	(0.02)	(0.02)	(0.04)
Stock Traded	0.00	0.00	0.00	0.00	0.05	0.03	0.00	0.00	0.03	0.03
	(0.85)	(0.81)	(0.30)	(0.38)	(0.17)	(0.36)	(0.95)	(0.95)	(0.45)	(0.45)
Constant	0.76	0.51	1.02**	0.99**	28.28**	34.48***	21.43***	21.93**	26.26***	15.20
	(0.12)	(0.11)	(0.02)	(0.02)	(0.02)	(0.00)	(0.00)	(0.02)	(0.01)	(0.27)
Number of observations	788	788	788	788	788	788	788	788	788	788
Number of banks	154	154	154	154	154	154	154	154	154	154
Hansen test (P-value)	0.89	0.79	0.88	0.96	0.96	0.90	0.78	0.91	0.89	0.89
AR2 test (P-value)	0.29	0.27	0.73	0.86	0.29	0.20	0.15	0.13	0.16	0.11
Wald tests: $\alpha_1 + \alpha_2$	-0.18***	-0.12***	-0.05	-0.05	0.44	0.41	0.28	0.21	0.42	0.42
$\alpha'_1 + \alpha'_2$	0.05	0.03	0.03	0.04	-1.22**	-1.12**	-1.23**	-1.10**	-1.20**	-1.20***

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Table A1.11. Estimating the target capital ratio: a baseline specification

This table shows the Blundell and Bond (1998) estimation results of the target capital ratio based on a partial adjustment model (Eq. (1.3)) over the 2002-2010 period. The sample consists of 341 European commercial banks corresponding to 2,204 observations. For robustness, we estimate a baseline specification without including the dummy variable for the presence of excess control rights in Eq. (1.3) to differentiate banks without and with excess control rights. *Tier 1 RWA* is Tier 1 capital divided by risk-weighted assets. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. *Log(Total Assets)* is the natural logarithm of the bank's total assets. *Return On Assets* is net income divided by total assets. *Loan Loss Provisions* is loan loss provisions divided by net loans. *Loans Total Assets* is net loans divided by total assets. *Market Discipline* is total long term market funding divided by total funding. *d(Listed Bank)* is a dummy equal to one if the bank is publicly listed, and zero otherwise. *GDP Growth Rate* is the real Gross Domestic Product (GDP) growth rate. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. In the last three rows, we report the summary statistics (mean, maximum and minimum) of the estimated target capital ratio. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Tier 1 Total Assets	Tier 1 RWA
Lagged dependent variable	0.59***	0.66***
	(0.00)	(0.00)
Log(Total Assets)	-0.51***	-0.56***
	(0.00)	(0.00)
Return On Assets	0.48***	0.54***
	(0.00)	(0.00)
Loan Loss Provisions	0.19***	0.16**
	(0.00)	(0.04)
Loans Total Assets	-0.02***	-0.03***
	(0.00)	(0.00)
Market Discipline	0.00**	0.01**
	(0.02)	(0.01)
d(Listed Bank)	-0.70***	-1.45***
	(0.00)	(0.00)
GDP Growth Rate	-0.00	-0.01
	(0.64)	(0.29)
Constant	5.12***	7.77***
	(0.00)	(0.00)
Hansen test (P-value)	0.11	0.10
AR2 test (P-value)	0.35	0.31
Fitted target (%): Mean	7.02	11.53
Maximum	14.80	24.95
Minimum	1.79	4.11

Table A1.12. Excess control rights and capital ratio adjustment: a baseline target

This table shows the Blundell and Bond (1998) estimation results on the effect of excess control rights on capital ratio adjustment (Eq. (1.6)) for a sample of 341 European commercial banks (corresponding to 2,204 observations) over the 2002-2010 period. For robustness, we estimate the target capital ratio based on a baseline specification -without including the dummy variable for the presence of excess control rights in Eq. (1.3) to differentiate banks without and with excess control rights- using the Blundell and Bond (1998) method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. *Deposits Total Assets* is total customer deposits divided by total assets. *Log(Age)* is the natural logarithm of bank age. *d(Rescued Bank)* is a dummy equal to one if the bank was rescued during the 2008 financial crisis, and zero otherwise. *Cross Listed Index* is an index equal to the number of stock markets on which the bank is listed, and zero if the bank is privately owned. *d(Merger Acquisition)* is a dummy equal to one if the bank experienced a merger-acquisition event during the sample period, and zero otherwise. *3-month Interbank Rate* is the three-month interbank rate. *GDP Growth Rate* is the real Gross Domestic Product (GDP) growth rate. *Stock Traded* is the value of listed shares divided by GDP. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

	Capital adjustment				Assets adjustment					
Dependent variable	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.07**	-0.05*	-0.04**	-0.05**	0.81**	0.94**	0.44**	0.51**	0.47**	0.72**
	(0.03)	(0.06)	(0.03)	(0.01)	(0.02)	(0.03)	(0.02)	(0.02)	(0.04)	(0.01)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.07	-0.01	0.02	0.02	-0.40**	-0.49**	-0.19**	-0.24**	-0.26*	-0.39*
	(0.35)	(0.60)	(0.60)	(0.60)	(0.04)	(0.02)	(0.04)	(0.03)	(0.07)	(0.06)
Capital Ratio Shortfall (α'_1)	0.14**	0.09***	0.03	0.05*	-0.40	0.15	-0.36	-0.37	-0.23	-0.59**
	(0.01)	(0.00)	(0.36)	(0.10)	(0.17)	(0.60)	(0.30)	(0.11)	(0.51)	(0.01)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.11**	-0.06**	0.04*	0.03*	-0.31**	-0.85**	-0.24**	-0.30**	-0.29*	-0.05
	(0.01)	(0.04)	(0.06)	(0.07)	(0.02)	(0.01)	(0.02)	(0.03)	(0.07)	(0.20)
Lagged dependent variable	0.03	0.02	0.39***	0.37***	0.11***	0.12***	0.13***	0.15***	0.15***	0.17***
	(0.34)	(0.59)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.55***	-0.44***	-0.13	-0.07	-0.42	-0.18	-0.62	-0.00	-0.65	-2.89*
	(0.00)	(0.00)	(0.15)	(0.43)	(0.86)	(0.93)	(0.70)	(1.00)	(0.70)	(0.05)
Deposits Total Assets	-0.00**	-0.00**	0.00**	0.00**	0.00	-0.01	0.03**	0.02	0.00	0.02
	(0.03)	(0.02)	(0.04)	(0.02)	(0.83)	(0.78)	(0.02)	(0.12)	(0.97)	(0.17)
Log(Age)	-0.01	-0.02	-0.00	-0.01	-0.35**	-0.29*	-0.28**	-0.21	-0.25*	-0.18
	(0.46)	(0.20)	(0.70)	(0.62)	(0.04)	(0.08)	(0.01)	(0.12)	(0.09)	(0.23)
d(Rescued Bank)	0.04	0.01	0.01	0.04	1.90	1.08	1.10	0.18	0.77	0.11
	(0.67)	(0.89)	(0.87)	(0.56)	(0.16)	(0.47)	(0.17)	(0.83)	(0.51)	(0.92)
Cross Listed Index	0.03**	0.03***	-0.00	0.00	0.22*	0.17	0.09	0.09	0.32***	0.33***
	(0.01)	(0.00)	(0.90)	(0.97)	(0.06)	(0.22)	(0.35)	(0.42)	(0.00)	(0.00)
d(Merger Acquisition)	0.03	0.03	0.01	0.01	0.46	0.54	1.44*	1.43*	0.06	0.98
	(0.65)	(0.60)	(0.89)	(0.80)	(0.68)	(0.65)	(0.08)	(0.09)	(0.95)	(0.28)
3-month Interbank Rate	0.02	0.03	-0.11***	-0.11**	-2.13***	-2.29***	-1.90***	-2.13***	-1.45***	-1.59***
	(0.67)	(0.60)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
GDP Growth Rate	0.01**	0.01*	0.01**	0.00	0.26**	0.24**	0.19***	0.20***	0.15*	0.17**
	(0.05)	(0.09)	(0.05)	(0.55)	(0.02)	(0.03)	(0.00)	(0.00)	(0.06)	(0.03)
Stock Traded	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.01	0.00	0.00
	(0.52)	(0.26)	(0.26)	(0.25)	(0.27)	(0.12)	(0.73)	(0.11)	(0.95)	(0.71)
Constant	0.29	0.27	0.57***	0.60***	14.13***	13.81***	8.52***	9.75***	8.36***	9.15***
	(0.21)	(0.28)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Hansen test (P-value)	0.19	0.10	0.14	0.19	0.27	0.24	0.15	0.13	0.14	0.37
AR2 test (P-value)	0.95	0.99	0.90	0.96	0.25	0.22	0.46	0.54	0.15	0.16
Wald tests: $\alpha_1 + \beta_1$	-0.14**	-0.06**	-0.02	-0.03*	0.41	0.45	0.25	0.27	0.21	0.33
$\alpha'_1 + \beta'_1$	0.03	0.03	0.07**	0.08**	-0.71**	-0.70**	-0.60*	-0.67**	-0.52*	-0.64**

Table A1.13. Ownership type and the effect of excess control rights on capital ratio adjustment: a baseline target

This table shows the Blundell and Bond (1998) estimation results on the effect of ownership type on the relationship between excess control rights and capital ratio adjustment (Eq. (1.7)) over the 2002-2010 period. The sample excludes banks for which the control chain is a cross-holding (for simplicity) and consists of 336 European commercial banks corresponding to 2,171 observations. For robustness, we estimate the target capital ratio based on a baseline specification -without including the dummy variable for the presence of excess control rights in Eq. (1.3) to differentiate banks without and with excess control rights- using the Blundell and Bond (1998) method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Family)* is a dummy equal to one if the bank is family-controlled, and zero otherwise. *d(State)* is a dummy equal to one if the bank is state-controlled, and zero otherwise. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. *Deposits Total Assets* is total customer deposits divided by total assets. *Log(Age)* is the natural logarithm of bank age. *d(Rescued Bank)* is a dummy equal to one if the bank was rescued during the 2008 financial crisis, and zero otherwise. *Cross Listed Index* is an index equal to the number of stock markets on which the bank is listed, and zero if the bank is privately owned. *d(Merger Acquisition)* is a dummy equal to one if the bank experienced a merger-acquisition event during the sample period, and zero otherwise. *3-month Interbank Rate* is the three-month interbank rate. *GDP Growth Rate* is the real Gross Domestic Product (GDP) growth rate. *Stock Traded* is the value of listed shares divided by GDP. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

	Capital adjustment				Assets adjustment					
Dependent variable	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.11**	-0.07**	-0.07**	-0.05**	0.75**	0.82**	0.32**	0.47**	0.42**	0.62**
	(0.01)	(0.04)	(0.03)	(0.04)	(0.02)	(0.04)	(0.04)	(0.02)	(0.03)	(0.03)
d(Family) × Capital Ratio Surplus (α_2)	0.06	0.01	0.02	0.02	0.12	0.15	0.18	0.11	0.15	0.14
	(0.29)	(0.83)	(0.20)	(0.19)	(0.39)	(0.17)	(0.25)	(0.35)	(0.31)	(0.30)
d(State) × Capital Ratio Surplus (α_3)	0.07	-0.01	-0.00	0.01	0.05	0.19	0.08	0.08	0.08	0.15
	(0.31)	(0.85)	(0.40)	(0.25)	(0.70)	(0.21)	(0.28)	(0.65)	(0.43)	(0.60)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.04	-0.00	-0.01	-0.01	-0.41	-0.40	-0.10	-0.15	-0.20	-0.29
	(0.66)	(0.92)	(0.14)	(0.72)	(0.25)	(0.49)	(0.89)	(0.68)	(0.34)	(0.24)
d(Family) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	-0.07*	-0.07*	0.05*	0.02	-0.08	-0.18	-0.06	-0.15	-0.15	-0.12
	(0.07)	(0.05)	(0.05)	(0.18)	(0.50)	(0.19)	(0.70)	(0.79)	(0.89)	(0.38)
d(State) × d(Excess Control Rights) × Capital Ratio Surplus (β_3)	-0.01	-0.02	-0.11	-0.01	0.07	-0.16	0.03	-0.09	-0.09	-0.14
	(0.37)	(0.62)	(0.30)	(0.16)	(0.49)	(0.15)	(0.65)	(0.28)	(0.42)	(0.19)
Capital Ratio Shortfall (α'_1)	0.15**	0.08**	0.03	0.06*	-0.38	0.10	-0.42	-0.40	-0.32	-0.54**
	(0.01)	(0.01)	(0.31)	(0.07)	(0.12)	(0.75)	(0.20)	(0.17)	(0.15)	(0.01)
d(Family) × Capital Ratio Shortfall (α'_2)	0.11	0.07	0.02	0.00	0.05	0.07	0.07	-0.08	0.14	-0.03
	(0.16)	(0.12)	(0.80)	(0.50)	(0.38)	(0.47)	(0.24)	(0.79)	(0.46)	(0.40)
d(State) × Capital Ratio Shortfall (α'_3)	0.02	-0.02	-0.04	-0.00	0.02	0.03	0.07	-0.07	0.04	-0.09
	(0.87)	(0.37)	(0.40)	(0.95)	(0.80)	(0.61)	(0.23)	(0.78)	(0.70)	(0.38)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.07	-0.02	0.04	0.00	-0.13	-0.51	-0.07	-0.11	-0.06	-0.06
	(0.26)	(0.24)	(0.33)	(0.95)	(0.20)	(0.27)	(0.70)	(0.15)	(0.45)	(0.21)
d(Family) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	-0.17**	-0.11**	-0.00	0.03*	-0.53**	-0.69**	-0.31**	-0.40**	-0.44*	-0.13
	(0.03)	(0.02)	(0.90)	(0.08)	(0.02)	(0.01)	(0.04)	(0.02)	(0.08)	(0.10)
d(State) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_3)	-0.01	0.08*	-0.05	-0.02	-0.13	-0.18	-0.12	0.11*	-0.10	0.11
	(0.79)	(0.05)	(0.48)	(0.92)	(0.16)	(0.21)	(0.31)	(0.05)	(0.39)	(0.11)
Lagged dependent variable	0.03	0.03	0.43***	0.42***	0.10***	0.12***	0.20***	0.19***	0.20***	0.16***
	(0.44)	(0.43)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.62***	-0.68***	-0.16	-0.13	-2.79	-0.34	-0.15	-0.40	-0.72	-2.53
	(0.00)	(0.00)	(0.11)	(0.12)	(0.23)	(0.87)	(0.92)	(0.78)	(0.70)	(0.17)
d(Family)	0.19	0.27	0.02	-0.24*	3.62	-0.12	1.56	-0.30	2.69	2.37
	(0.42)	(0.26)	(0.89)	(0.07)	(0.26)	(0.97)	(0.52)	(0.90)	(0.39)	(0.41)
d(State)	0.28	0.25	0.09	0.11	2.88	1.34	3.46*	2.44	2.63	-2.71
	(0.19)	(0.15)	(0.54)	(0.46)	(0.33)	(0.63)	(0.09)	(0.21)	(0.24)	(0.20)

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Table A1.13 (continued)

Deposits Total Assets	-0.00**	-0.00**	0.00	0.00	0.00	-0.01	0.02	0.02	0.00	0.01
	(0.03)	(0.04)	(0.20)	(0.10)	(0.99)	(0.56)	(0.21)	(0.12)	(0.93)	(0.70)
Log(Age)	-0.02	-0.03**	0.00	-0.01	-0.36**	-0.33*	-0.29**	-0.26**	-0.24	-0.24
	(0.33)	(0.03)	(0.98)	(0.57)	(0.04)	(0.07)	(0.02)	(0.05)	(0.14)	(0.15)
d(Rescued Bank)	0.01	0.00	0.02	0.05	1.49	1.33	0.62	0.54	0.66	0.43
	(0.92)	(0.96)	(0.82)	(0.51)	(0.21)	(0.32)	(0.44)	(0.50)	(0.61)	(0.74)
Cross Listed Index	0.03***	0.03***	0.00	0.01	0.21*	0.15	0.09	0.16*	0.35***	0.39***
	(0.01)	(0.00)	(0.52)	(0.43)	(0.07)	(0.28)	(0.30)	(0.09)	(0.00)	(0.00)
d(Merger Acquisition)	0.09	0.06	0.01	0.01	0.41	0.39	1.50*	1.38*	0.10	0.07
	(0.21)	(0.46)	(0.80)	(0.84)	(0.71)	(0.71)	(0.06)	(0.07)	(0.93)	(0.94)
3-month Interbank Rate	0.04	0.04	-0.11***	-0.10**	-1.93***	-2.05***	-2.03***	-2.09***	-1.77***	-1.89***
	(0.50)	(0.48)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
GDP Growth Rate	0.01**	0.01	0.00	0.00	0.24**	0.31***	0.19***	0.18***	0.13	0.16**
	(0.05)	(0.20)	(0.41)	(0.51)	(0.04)	(0.01)	(0.01)	(0.01)	(0.14)	(0.04)
Stock Traded	0.00	0.00	0.00	0.00	0.01	0.02	0.01*	0.02**	0.00	0.00
	(0.56)	(0.44)	(0.21)	(0.50)	(0.68)	(0.18)	(0.09)	(0.05)	(0.90)	(0.85)
Constant	0.14	0.21	0.58**	0.49***	11.73***	13.33***	9.68***	11.02***	9.00***	11.02***
	(0.56)	(0.43)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Hansen test (P-value)	0.15	0.20	0.18	0.17	0.19	0.17	0.20	0.17	0.15	0.22
AR2 test (P-value)	0.90	0.89	0.89	0.87	0.33	0.22	0.66	0.68	0.15	0.16
Wald tests: $\alpha_1 + \alpha_2$	-0.05**	-0.06**	-0.05**	-0.03*	0.87**	0.97**	0.50**	0.58**	0.57**	0.76**
$\alpha_1 + \alpha_3$	-0.04*	-0.08**	-0.07**	-0.04**	0.80**	1.01**	0.40**	0.55**	0.50**	0.77**
$\alpha_1 + \beta_1$	-0.15**	-0.07**	-0.08**	-0.06*	0.34	0.42	0.22	0.32	0.22	0.33
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.16**	-0.13**	-0.01	-0.02	0.38	0.39	0.34	0.28	0.22	0.35
$\alpha_1 + \alpha_3 + \beta_1 + \beta_3$	-0.09**	-0.10**	-0.19**	-0.06**	0.46	0.45	0.33	0.31	0.21	0.34
$\alpha'_1 + \alpha'_2$	0.26**	0.15**	0.05	0.06*	-0.33	0.17	-0.35	-0.48	-0.18	-0.57**
$\alpha'_1 + \alpha'_3$	0.17**	0.06**	-0.01	0.06*	-0.36	0.13	-0.35	-0.47	-0.28	-0.63**
$\alpha'_1 + \beta'_1$	0.08**	0.06**	0.07*	0.06**	-0.51	-0.41	-0.49	-0.51*	-0.38	-0.60**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.02	0.02	0.09**	0.09**	-0.99**	-1.03**	-0.73**	-0.99**	-0.68**	-0.76**
$\alpha'_1 + \alpha'_3 + \beta'_1 + \beta'_3$	0.09**	0.12***	-0.02	0.04	-0.62	-0.56*	-0.54	-0.47	-0.44	-0.58

Table A1.14. Shareholder protection and the effect of excess control rights on capital ratio adjustment: a baseline target

This table shows the Blundell and Bond (1998) estimation results on the effect of shareholder protection rights on the relationship between excess control rights and capital ratio adjustment (Eq. (1.7)) for a sample of 341 European commercial banks (2,204 observations) over the 2002-2010 period. For robustness, we estimate the target capital ratio based on a baseline specification -without including the dummy variable for the presence of excess control rights in Eq. (1.3) to differentiate banks without and with excess control rights- using the Blundell and Bond (1998) method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Owner Rights)* is a dummy equal to one if the shareholder protection index as defined in Djankov et al. (2008) is greater than the median value, and zero otherwise. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. The definition of other variables is provided in Table 1.4. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Capital adjustment				Assets adjustment					
	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.08**	-0.07*	-0.05**	-0.06***	0.73**	0.90***	0.34**	0.43**	0.39**	0.64**
	(0.01)	(0.07)	(0.03)	(0.00)	(0.01)	(0.00)	(0.05)	(0.04)	(0.03)	(0.02)
d(Owner Rights) × Capital Ratio Surplus (α_2)	0.02	0.03	-0.01	0.00	0.12	0.06	0.14	0.13	0.15	0.16
	(0.12)	(0.20)	(0.32)	(0.30)	(0.59)	(0.24)	(0.53)	(0.71)	(0.87)	(0.28)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.06	-0.02	0.03	0.03	-0.37	-0.50	-0.05	-0.18	-0.18	-0.30
	(0.67)	(0.89)	(0.19)	(0.20)	(0.35)	(0.60)	(0.50)	(0.71)	(0.67)	(0.17)
d(Owner Rights) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	0.05	0.03	-0.02	-0.05	-0.06	-0.04	-0.16	0.06	-0.17	-0.17
	(0.72)	(0.53)	(0.17)	(0.11)	(0.78)	(0.75)	(0.17)	(0.91)	(0.12)	(0.11)
Capital Ratio Shortfall (α'_1)	0.15**	0.07**	0.04	0.04*	-0.34	-0.10	-0.35	-0.30	-0.18	-0.60**
	(0.05)	(0.03)	(0.43)	(0.09)	(0.19)	(0.62)	(0.20)	(0.11)	(0.51)	(0.01)
d(Owner Rights) × Capital Ratio Shortfall (α'_2)	0.05	0.06	0.02	-0.00	-0.09	0.19	-0.03	-0.24	-0.10	-0.03
	(0.43)	(0.13)	(0.75)	(0.95)	(0.92)	(0.15)	(0.94)	(0.37)	(0.20)	(0.41)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.12**	-0.04**	0.04**	0.02*	-0.50**	-0.82**	-0.50**	-0.62**	-0.48*	-0.09
	(0.03)	(0.04)	(0.04)	(0.05)	(0.01)	(0.02)	(0.05)	(0.03)	(0.05)	(0.35)
d(Owner Rights) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	-0.00	-0.00	-0.04	-0.02	0.30	0.25	0.45*	0.55*	0.44	0.13
	(0.94)	(0.95)	(0.56)	(0.55)	(0.45)	(0.38)	(0.10)	(0.08)	(0.43)	(0.45)
Lagged dependent variable	0.03	0.03	0.40***	0.36***	0.11***	0.12***	0.12***	0.13***	0.15***	0.16***
	(0.39)	(0.49)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.60***	-0.62***	-0.16	-0.01	-0.48	-1.09	-1.72	-0.11	-1.50	-3.12*
	(0.00)	(0.00)	(0.10)	(0.90)	(0.81)	(0.62)	(0.23)	(0.94)	(0.40)	(0.06)
Deposits Total Assets	-0.00**	-0.00*	0.00*	0.00*	0.00	-0.00	0.01	0.02	-0.01	0.00
	(0.02)	(0.06)	(0.07)	(0.08)	(0.98)	(0.85)	(0.29)	(0.17)	(0.69)	(0.93)
Log(Age)	-0.02	-0.03	0.00	-0.01	-0.36**	-0.29*	-0.30**	-0.27*	-0.27*	-0.23
	(0.18)	(0.11)	(0.99)	(0.57)	(0.05)	(0.08)	(0.01)	(0.05)	(0.08)	(0.17)
d(Rescued Bank)	0.02	0.02	0.00	0.02	1.17	1.36	0.75	0.18	0.32	0.15
	(0.85)	(0.82)	(0.95)	(0.78)	(0.35)	(0.30)	(0.33)	(0.81)	(0.82)	(0.90)
Cross Listed Index	0.03***	0.04***	0.00	0.00	0.16	0.21	0.11	0.08	0.28***	0.41***
	(0.01)	(0.00)	(0.82)	(0.81)	(0.26)	(0.12)	(0.21)	(0.41)	(0.00)	(0.00)
d(Merger Acquisition)	0.06	0.07	0.03	0.04	0.39	0.21	1.67**	1.49*	0.26	0.62
	(0.41)	(0.40)	(0.54)	(0.38)	(0.75)	(0.84)	(0.03)	(0.06)	(0.80)	(0.54)
3-month Interbank Rate	0.02	0.04	-0.12***	-0.11***	-1.98***	-2.10***	-2.14**	-2.26***	-1.80**	-1.90***
	(0.69)	(0.41)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
GDP Growth Rate	0.01**	0.01	0.01	0.00	0.25**	0.25**	0.19***	0.20***	0.18**	0.18**
	(0.02)	(0.30)	(0.26)	(0.45)	(0.02)	(0.02)	(0.00)	(0.00)	(0.02)	(0.02)
Stock Traded	0.00	0.00	0.00	0.00	0.01	0.01	0.01*	0.01*	0.00	0.00
	(0.32)	(0.36)	(0.18)	(0.22)	(0.61)	(0.45)	(0.08)	(0.09)	(0.87)	(0.70)
Constant	0.41*	0.30	0.71***	0.69***	13.23***	12.88***	11.00***	10.80***	9.33***	10.90***
	(0.08)	(0.26)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Hansen test (P-value)	0.33	0.19	0.17	0.24	0.31	0.50	0.26	0.20	0.35	0.53
AR2 test (P-value)	0.90	0.97	0.88	0.96	0.25	0.21	0.50	0.57	0.15	0.14
Wald tests: $\alpha_1 + \alpha_2$	-0.06**	-0.04*	-0.06**	-0.06**	0.85**	0.96***	0.48**	0.56**	0.54**	0.80**
$\alpha_1 + \beta_1$	-0.14**	-0.09**	-0.02	-0.03	0.36	0.40	0.29	0.25	0.21	0.34
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.07**	-0.04**	-0.05**	-0.08**	0.42*	0.42*	0.27	0.44	0.19	0.33
$\alpha'_1 + \alpha'_2$	0.20**	0.13**	0.06	0.04	-0.43	0.09	-0.38	-0.54	-0.28	-0.63**
$\alpha'_1 + \beta'_1$	0.03	0.03	0.08**	0.06**	-0.84**	-0.92**	-0.85**	-0.92**	-0.66**	-0.69**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.08**	0.09**	0.06*	0.04	-0.63*	-0.48	-0.43	-0.61	-0.32	-0.59*

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Table A1.15. 2008 financial crisis and the effect of excess control rights on capital ratio adjustment: a baseline target

This table shows the Blundell and Bond (1998) estimation results on the effect of the 2008 financial crisis on the relationship between excess control rights and capital ratio adjustment (Eq. (1.7)) for a sample of 341 European commercial banks (2,204 observations) over the 2002-2010 period. For robustness, we estimate the target capital ratio based on a baseline specification -without including the dummy variable for the presence of excess control rights in Eq. (1.3) to differentiate banks without and with excess control rights- using the Blundell and Bond (1998) method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Crisis)* is a dummy equal to one if the observation is from 2008 or 2009, and zero otherwise. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. The definition of other variables is provided in Table 1.4. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

	Capital adjustment				Assets adjustment					
Dependent variable	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.09**	-0.06**	-0.05**	-0.05**	1.10**	1.14***	0.53**	0.63**	0.62**	0.90**
	(0.01)	(0.01)	(0.03)	(0.02)	(0.02)	(0.00)	(0.02)	(0.01)	(0.02)	(0.01)
d(Crisis) × Capital Ratio Surplus (α_2)	0.05*	0.03	-0.01	-0.01	-0.64	-0.45	-0.22	-0.29	-0.31	-0.40
	(0.08)	(0.45)	(0.17)	(0.15)	(0.72)	(0.65)	(0.66)	(0.57)	(0.12)	(0.26)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.04	-0.03	0.02	0.02	-0.63	-0.67	-0.20	-0.31	-0.32	-0.55
	(0.47)	(0.48)	(0.56)	(0.19)	(0.74)	(0.42)	(0.41)	(0.66)	(0.43)	(0.47)
d(Crisis) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	0.05	0.03	-0.03	-0.03	0.50	0.36	0.08	0.16	0.20	0.37
	(0.57)	(0.22)	(0.90)	(0.62)	(0.25)	(0.40)	(0.86)	(0.65)	(0.71)	(0.23)
Capital Ratio Shortfall (α'_1)	0.15**	0.11**	0.04	0.05	-0.41	0.09	-0.26	-0.31	-0.26	-0.64**
	(0.04)	(0.01)	(0.19)	(0.10)	(0.27)	(0.80)	(0.62)	(0.35)	(0.13)	(0.02)
d(Crisis) × Capital Ratio Shortfall (α'_2)	-0.07	-0.06	-0.00	-0.02	-0.05	0.20	-0.22	-0.14	-0.17	0.20
	(0.35)	(0.81)	(0.33)	(0.20)	(0.55)	(0.60)	(0.74)	(0.53)	(0.22)	(0.66)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.12*	-0.09*	0.06	0.07*	-0.52*	-0.99***	-0.43*	-0.52*	-0.47**	-0.14
	(0.06)	(0.06)	(0.18)	(0.05)	(0.06)	(0.00)	(0.05)	(0.05)	(0.05)	(0.84)
d(Crisis) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	0.09	0.10	-0.03	-0.05	0.45	0.21	0.43	0.52	0.61	0.33
	(0.26)	(0.18)	(0.45)	(0.70)	(0.21)	(0.48)	(0.22)	(0.38)	(0.15)	(0.30)
Lagged dependent variable	0.03	0.02	0.41***	0.39***	0.12***	0.12***	0.24***	0.20***	0.21***	0.19***
	(0.42)	(0.59)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.55***	-0.48***	-0.08	-0.06	-0.29	-0.11	-0.59	-0.25	-1.27	-2.22
	(0.00)	(0.00)	(0.40)	(0.52)	(0.90)	(0.96)	(0.67)	(0.87)	(0.36)	(0.13)
Deposits Total Assets	-0.00*	-0.00**	0.00**	0.00**	0.00	-0.00	0.03**	0.02	0.00	0.01
	(0.05)	(0.03)	(0.02)	(0.01)	(0.87)	(0.90)	(0.03)	(0.21)	(0.96)	(0.39)
Log(Age)	-0.02	-0.02	-0.00	-0.00	-0.33*	-0.36**	-0.25**	-0.24*	-0.18	-0.21
	(0.31)	(0.12)	(0.75)	(0.70)	(0.06)	(0.03)	(0.02)	(0.06)	(0.18)	(0.16)
d(Rescued Bank)	0.01	0.01	0.02	0.01	1.89	1.35	1.23	0.66	0.39	0.18
	(0.88)	(0.87)	(0.80)	(0.87)	(0.13)	(0.35)	(0.11)	(0.40)	(0.71)	(0.87)
Cross Listed Index	0.03***	0.03***	0.00	0.00	0.19	0.15	0.08	0.14	0.28***	0.32***
	(0.01)	(0.00)	(0.85)	(0.85)	(0.11)	(0.23)	(0.35)	(0.16)	(0.00)	(0.00)
d(Merger Acquisition)	0.01	0.03	0.01	0.03	0.76	0.83	1.45*	1.52*	0.23	0.75
	(0.88)	(0.66)	(0.87)	(0.54)	(0.48)	(0.49)	(0.07)	(0.07)	(0.82)	(0.42)
3-month Interbank Rate	0.02	0.03	-0.10***	-0.09**	-2.22***	-2.25***	-1.94***	-2.14***	-1.38**	-1.41**
	(0.65)	(0.65)	(0.01)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
GDP Growth Rate	0.01	0.01	0.01	0.00	0.27**	0.27**	0.17**	0.19***	0.16**	0.20**
	(0.21)	(0.22)	(0.12)	(0.56)	(0.02)	(0.02)	(0.01)	(0.00)	(0.04)	(0.02)
Stock Traded	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.02*	0.00	0.00
	(0.40)	(0.33)	(0.27)	(0.35)	(0.35)	(0.19)	(0.76)	(0.09)	(0.91)	(1.00)
Constant	0.30	0.33	0.49***	0.48**	13.13***	13.73***	8.61***	10.92***	6.75***	8.32***
	(0.19)	(0.17)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Hansen test (P-value)	0.18	0.13	0.10	0.13	0.24	0.23	0.16	0.11	0.13	0.24
AR2 test (P-value)	0.97	0.89	0.90	0.89	0.20	0.22	0.47	0.62	0.14	0.15
Wald tests: $\alpha_1 + \alpha_2$	-0.04*	-0.03	-0.06**	-0.06**	0.46*	0.69**	0.31	0.34	0.31	0.50**
$\alpha_1 + \beta_1$	-0.13**	-0.09**	-0.03	-0.03	0.47	0.47	0.33	0.32	0.30	0.35
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.03	-0.03*	-0.07**	-0.07**	0.33	0.38	0.19	0.19	0.19	0.32
$\alpha'_1 + \alpha'_2$	0.08**	0.05**	0.04	0.03	-0.46	0.29	-0.48	-0.45	-0.43	-0.44*
$\alpha'_1 + \beta'_1$	0.03	0.02	0.10**	0.12**	-0.93**	-0.90**	-0.69**	-0.83**	-0.73**	-0.78**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.05**	0.06**	0.07	0.05	-0.53	-0.49	-0.48	-0.45	-0.29	-0.25

Table A1.16. Bank capitalization and the effect of excess control rights on capital ratio adjustment: a baseline target

This table shows the Blundell and Bond (1998) estimation results on the effect of bank capitalization on the relationship between excess control rights and capital ratio adjustment for a sample of 341 European commercial banks (2,204 observations) over the 2002-2010 period. For robustness, we estimate the target capital ratio based on a baseline specification -without including the dummy variable for the presence of excess control rights in Eq. (1.3) to differentiate banks without and with excess control rights- using the Blundell and Bond (1998) method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Undercapitalized)* is a dummy equal to one if the Tier 1 RWA (Tier 1 Total Assets) ratio is less than 6% (4%), and zero otherwise. The definition of other variables is provided in Table 1.4. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

	Capital adjustment				Assets adjustment					
Dependent variable	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.06**	-0.06*	-0.06**	-0.05*	0.73**	0.82**	0.48**	0.53**	0.44**	0.66***
	(0.02)	(0.06)	(0.03)	(0.06)	(0.01)	(0.03)	(0.04)	(0.01)	(0.02)	(0.00)
d(Undercapitalized) × Capital Ratio Surplus (α_2)	0.02	0.04**	0.02	0.02*	-0.09	-0.43**	-0.04	-0.21*	-0.03	-0.25*
	(0.81)	(0.02)	(0.87)	(0.09)	(0.37)	(0.05)	(0.35)	(0.07)	(0.85)	(0.07)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.09	-0.04	0.03	0.01	-0.44*	-0.43**	-0.20*	-0.11*	-0.16	-0.17
	(0.15)	(0.34)	(0.63)	(0.78)	(0.09)	(0.05)	(0.07)	(0.09)	(0.11)	(0.11)
d(Undercapitalized) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	0.06	0.04**	0.00	0.03*	0.06	0.20	0.18	-0.10	0.12	-0.05
	(0.72)	(0.05)	(0.21)	(0.07)	(0.56)	(0.30)	(0.49)	(0.61)	(0.70)	(0.57)
Capital Ratio Shortfall (α'_1)	0.09**	0.08**	0.03	0.03	-0.35	-0.05	-0.28	-0.38	-0.36	-0.49**
	(0.05)	(0.02)	(0.41)	(0.14)	(0.21)	(0.38)	(0.36)	(0.17)	(0.14)	(0.04)
d(Undercapitalized) × Capital Ratio Shortfall (α'_2)	0.05	0.07*	0.03	0.01	-0.11	0.30	-0.10	-0.09	-0.13	-0.17
	(0.23)	(0.05)	(0.64)	(0.84)	(0.15)	(0.58)	(0.21)	(0.67)	(0.25)	(0.29)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.07**	-0.06**	0.06*	0.04*	-0.28*	-0.46**	-0.41*	-0.21*	-0.44**	-0.13
	(0.02)	(0.01)	(0.07)	(0.06)	(0.06)	(0.02)	(0.05)	(0.06)	(0.01)	(0.12)
d(Undercapitalized) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	-0.03	-0.05	-0.07	-0.00	-0.18	-0.40**	-0.10	-0.26*	0.11	-0.15*
	(0.21)	(0.18)	(0.20)	(0.52)	(0.42)	(0.04)	(0.90)	(0.05)	(0.62)	(0.09)
Lagged dependent variable	0.04	0.03	0.39***	0.36***	0.10***	0.11***	0.12***	0.13***	0.20***	0.17***
	(0.27)	(0.49)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.53***	-0.48***	-0.22**	-0.02	-0.15	-0.24	-1.14	-0.27	-1.00	-2.98**
	(0.00)	(0.00)	(0.02)	(0.85)	(0.95)	(0.91)	(0.43)	(0.85)	(0.52)	(0.05)
d(Undercapitalized)	0.14	0.63***	-0.11	-0.13	-2.94	-1.68	0.09	0.61	-2.44	-2.85
	(0.43)	(0.00)	(0.39)	(0.20)	(0.10)	(0.46)	(0.95)	(0.72)	(0.17)	(0.12)
Deposits Total Assets	-0.00**	-0.00**	0.00*	0.00**	0.01	-0.01	0.02*	0.02	-0.00	0.00
	(0.02)	(0.02)	(0.08)	(0.02)	(0.74)	(0.77)	(0.09)	(0.15)	(0.77)	(0.83)
Log(Age)	-0.02	-0.03	-0.01	-0.00	-0.41**	-0.27	-0.31**	-0.30**	-0.33**	-0.19
	(0.28)	(0.10)	(0.51)	(0.76)	(0.02)	(0.12)	(0.01)	(0.02)	(0.03)	(0.24)
d(Rescued Bank)	0.01	0.04	0.03	0.00	1.09	1.48	0.62	0.67	0.99	0.36
	(0.89)	(0.62)	(0.67)	(1.00)	(0.44)	(0.31)	(0.44)	(0.40)	(0.47)	(0.79)
Cross Listed Index	0.03***	0.03***	0.00	-0.00	0.18	0.19	0.11	0.14	0.34***	0.38***
	(0.01)	(0.00)	(0.77)	(0.91)	(0.19)	(0.13)	(0.19)	(0.13)	(0.00)	(0.00)
d(Merger Acquisition)	0.02	0.05	0.10*	0.02	0.57	0.44	2.04**	1.44*	0.67	0.31
	(0.86)	(0.53)	(0.07)	(0.69)	(0.64)	(0.73)	(0.03)	(0.06)	(0.54)	(0.75)
3-month Interbank Rate	0.01	0.02	-0.12***	-0.10**	-2.17***	-2.44***	-2.07**	-2.30***	-1.45**	-1.49***
	(0.83)	(0.70)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.01)
GDP Growth Rate	0.01*	0.01**	0.01	0.00	0.28**	0.33***	0.19***	0.23***	0.15*	0.21**
	(0.06)	(0.05)	(0.14)	(0.59)	(0.02)	(0.01)	(0.00)	(0.00)	(0.08)	(0.01)
Stock Traded	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00
	(0.26)	(0.41)	(0.15)	(0.12)	(0.40)	(0.41)	(0.11)	(0.14)	(0.75)	(0.83)
Constant	0.31	0.20	0.72***	0.66***	15.47***	15.52***	9.89***	11.34***	10.17*	9.34***
	(0.19)	(0.45)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
Hansen test (P-value)	0.39	0.63	0.50	0.67	0.79	0.74	0.78	0.62	0.74	0.77
AR2 test (P-value)	0.92	0.97	0.77	0.94	0.29	0.28	0.59	0.60	0.15	0.17
Wald tests: $\alpha_1 + \alpha_2$	-0.04**	-0.02	-0.04*	-0.03	0.64**	0.39	0.44**	0.32	0.41**	0.41
$\alpha_1 + \beta_1$	-0.15**	-0.10**	-0.03	-0.04	0.29	0.39	0.28	0.42	0.28	0.49
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.07**	-0.02	-0.01	0.01	0.26	0.16	0.42	0.11	0.37	0.19
$\alpha'_1 + \alpha'_2$	0.14**	0.15**	0.06	0.04	-0.46	0.25	-0.38	-0.47	-0.49	-0.66**
$\alpha'_1 + \beta'_1$	0.02	0.02	0.09**	0.07**	-0.63**	-0.51**	-0.69**	-0.59**	-0.80**	-0.62**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.04	0.04	0.05**	0.08**	-0.92***	-0.61**	-0.89**	-0.94**	-0.82**	-0.94**

Table A1.17. Asset structure and the effect of excess control rights on capital ratio adjustment: a baseline target

This table shows the Blundell and Bond (1998) estimation results on the effect of asset structure on the relationship between excess control rights and capital ratio adjustment for a sample of 341 European commercial banks (2,204 observations) over the 2002-2010 period. For robustness, we estimate the target capital ratio based on a baseline specification -without including the dummy variable for the presence of excess control rights in Eq. (1.3) to differentiate banks without and with excess control rights- using the Blundell and Bond (1998) method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Lending Oriented)* is a dummy equal to one if the ratio of net loans (excluding interbank loans) to total assets is greater than the median value, and zero otherwise. The definition of other variables is provided in Table 1.4. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Capital adjustment				Assets adjustment					
	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.08**	-0.07**	-0.06**	-0.06**	0.73**	0.84**	0.40**	0.44**	0.43**	0.63**
	(0.01)	(0.04)	(0.02)	(0.01)	(0.01)	(0.01)	(0.03)	(0.04)	(0.01)	(0.02)
d(Lending Oriented) × Capital Ratio Surplus (α_2)	-0.01	-0.01	-0.01	-0.01	0.16	0.11	-0.01	-0.02	0.12	0.07
	(0.16)	(0.22)	(0.28)	(0.21)	(0.35)	(0.19)	(0.39)	(0.50)	(0.25)	(0.30)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.06	-0.01	0.03	0.03	-0.40*	-0.49*	-0.13*	-0.14*	-0.14*	-0.32**
	(0.23)	(0.43)	(0.21)	(0.21)	(0.08)	(0.07)	(0.09)	(0.08)	(0.06)	(0.04)
d(Lending Oriented) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	0.03	0.01	-0.00	-0.01	-0.10	-0.10	-0.03	-0.02	-0.11	-0.07
	(0.25)	(0.26)	(0.37)	(0.22)	(0.32)	(0.16)	(0.17)	(0.25)	(0.12)	(0.20)
Capital Ratio Shortfall (α'_1)	0.12**	0.07**	0.04	0.04	-0.47*	-0.49*	-0.29	-0.29	-0.38	-0.57**
	(0.02)	(0.01)	(0.20)	(0.16)	(0.07)	(0.05)	(0.22)	(0.17)	(0.15)	(0.01)
d(Lending Oriented) × Capital Ratio Shortfall (α'_2)	0.05	0.06	0.01	0.01	0.16*	0.17*	-0.09	-0.08	0.07	-0.02
	(0.17)	(0.18)	(0.55)	(0.42)	(0.08)	(0.06)	(0.21)	(0.29)	(0.19)	(0.42)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.09**	-0.04**	0.04*	0.04*	-0.46**	-0.44**	-0.26*	-0.25*	-0.41*	-0.09
	(0.01)	(0.01)	(0.05)	(0.06)	(0.01)	(0.01)	(0.08)	(0.07)	(0.05)	(0.40)
d(Lending Oriented) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	-0.04	-0.04	-0.01	-0.01	-0.05	-0.09	-0.29*	-0.29**	-0.06	-0.04
	(0.22)	(0.24)	(0.24)	(0.38)	(0.30)	(0.40)	(0.05)	(0.05)	(0.26)	(0.42)
Lagged dependent variable	0.04	0.03	0.42***	0.37***	0.10***	0.12***	0.12***	0.13***	0.15***	0.16***
	(0.24)	(0.43)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.60***	-0.63***	-0.17*	-0.00	-0.12	-0.70	-0.40	-0.40	-0.98	-2.99**
	(0.00)	(0.00)	(0.10)	(0.98)	(0.96)	(0.73)	(0.79)	(0.78)	(0.57)	(0.05)
d(Lending Oriented)	-0.15	0.05	0.14	0.17*	-0.49	1.79	-0.00	2.98***	-1.24	3.24**
	(0.20)	(0.67)	(0.14)	(0.06)	(0.77)	(0.22)	(1.00)	(0.00)	(0.36)	(0.03)
Deposits Total Assets	-0.00**	-0.00**	0.00*	0.00**	0.01	-0.01	0.03**	0.02*	-0.00	0.01
	(0.04)	(0.04)	(0.09)	(0.01)	(0.69)	(0.54)	(0.01)	(0.07)	(0.92)	(0.55)
Log(Age)	-0.02	-0.03*	-0.00	-0.00	-0.40**	-0.26	-0.33**	-0.21*	-0.24	-0.26
	(0.30)	(0.09)	(0.87)	(0.74)	(0.02)	(0.11)	(0.01)	(0.08)	(0.10)	(0.10)
d(Rescued Bank)	0.03	0.02	0.02	0.05	1.66	2.06	0.78	0.40	0.10	0.48
	(0.76)	(0.87)	(0.76)	(0.54)	(0.19)	(0.14)	(0.39)	(0.58)	(0.93)	(0.66)
Cross Listed Index	0.04***	0.04***	0.00	0.01	0.18	0.17	0.03	0.06	0.30***	0.26**
	(0.00)	(0.00)	(0.76)	(0.38)	(0.18)	(0.27)	(0.75)	(0.53)	(0.01)	(0.01)
d(Merger Acquisition)	0.09	0.07	0.01	0.02	0.53	0.20	1.87**	1.41**	0.07	0.03
	(0.27)	(0.38)	(0.81)	(0.67)	(0.64)	(0.86)	(0.02)	(0.05)	(0.95)	(0.97)
3-month Interbank Rate	0.02	0.02	-0.12***	-0.12***	-1.79**	-2.13***	-2.11**	-2.19***	-1.83**	-1.96**
	(0.77)	(0.65)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
GDP Growth Rate	0.01*	0.01	0.00	0.00	0.25**	0.23**	0.22***	0.22***	0.14*	0.20**
	(0.07)	(0.15)	(0.40)	(0.59)	(0.02)	(0.02)	(0.00)	(0.00)	(0.09)	(0.01)
Stock Traded	0.00	0.00	0.00	0.00	0.01	0.01	0.02*	0.01*	0.00	0.01
	(0.27)	(0.23)	(0.18)	(0.27)	(0.47)	(0.29)	(0.08)	(0.10)	(0.92)	(0.60)
Constant	0.18	0.31	0.76***	0.74***	12.20***	15.09***	9.83***	11.36***	9.54***	12.50***
	(0.47)	(0.22)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Hansen test (P-value)	0.14	0.21	0.18	0.17	0.36	0.57	0.25	0.24	0.24	0.32
AR2 test (P-value)	0.85	0.89	0.91	0.86	0.27	0.28	0.59	0.59	0.13	0.16
Wald tests: $\alpha_1 + \alpha_2$	-0.09**	-0.08**	-0.07**	-0.07**	0.89**	0.95**	0.39**	0.42**	0.55**	0.70**
$\alpha_1 + \beta_1$	-0.14**	-0.08**	-0.03	-0.03	0.33	0.35	0.27	0.30	0.29	0.31
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.12**	-0.08**	-0.04	-0.05	0.39	0.36	0.23	0.26	0.30	0.31
$\alpha'_1 + \alpha'_2$	0.17**	0.13**	0.05	0.05	-0.31	-0.32	-0.38	-0.37	-0.31	-0.59**
$\alpha'_1 + \beta'_1$	0.03	0.03	0.08**	0.08**	-0.93**	-0.93**	-0.55**	-0.54**	-0.79**	-0.66**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.04	0.05	0.08**	0.08**	-0.82**	-0.85**	-0.93***	-0.91***	-0.78**	-0.72**

Table A1.18. Bank size and the effect of excess control rights on capital ratio adjustment: a baseline target

This table shows the Blundell and Bond (1998) estimation results on the effect of bank size on the relationship between excess control rights and capital ratio adjustment for a sample of 341 European commercial banks (2,204 observations) over the 2002-2010 period. For robustness, we estimate the target capital ratio based on a baseline specification -without including the dummy variable for the presence of excess control rights in Eq. (1.3) to differentiate banks without and with excess control rights- using the Blundell and Bond (1998) method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Large Bank)* is a dummy equal to one if the bank's total assets is above the median value, and zero otherwise. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. The definition of other variables is provided in Table 1.4. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Capital adjustment				Assets adjustment					
	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.07**	-0.06*	-0.07**	-0.05**	0.84**	0.90***	0.44**	0.46**	0.48**	0.62**
	(0.02)	(0.06)	(0.02)	(0.04)	(0.03)	(0.01)	(0.05)	(0.02)	(0.03)	(0.02)
d(Large Bank) × Capital Ratio Surplus (α_2)	-0.02	-0.03	0.01	-0.02	0.06	0.03	0.03	-0.01	0.17	0.14
	(0.37)	(0.46)	(0.20)	(0.44)	(0.72)	(0.66)	(0.71)	(0.79)	(0.34)	(0.30)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.03	-0.02	0.05	0.01	-0.38**	-0.50*	-0.16*	-0.24**	-0.20*	-0.31*
	(0.65)	(0.51)	(0.30)	(0.85)	(0.02)	(0.06)	(0.07)	(0.04)	(0.07)	(0.08)
d(Large Bank) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	-0.07	-0.01	-0.02	0.03	-0.05	-0.05	-0.04	-0.04	-0.05	-0.07
	(0.45)	(0.83)	(0.40)	(0.41)	(0.33)	(0.43)	(0.73)	(0.60)	(0.30)	(0.15)
Capital Ratio Shortfall (α'_1)	0.13***	0.12***	0.05	0.04	-0.36	-0.11	-0.36	-0.38	-0.36	-0.99***
	(0.00)	(0.00)	(0.33)	(0.17)	(0.22)	(0.66)	(0.28)	(0.14)	(0.20)	(0.01)
d(Large Bank) × Capital Ratio Shortfall (α'_2)	0.03	0.04	0.00	-0.00	-0.11	-0.08	-0.09	-0.08	-0.12	-0.05
	(0.46)	(0.23)	(0.95)	(0.76)	(0.72)	(0.88)	(0.21)	(0.65)	(0.18)	(0.40)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.05**	-0.05**	0.04*	0.04*	-0.32*	-0.58**	-0.34**	-0.26*	-0.30*	-0.10
	(0.02)	(0.01)	(0.08)	(0.08)	(0.06)	(0.04)	(0.04)	(0.09)	(0.09)	(0.13)
d(Large Bank) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	-0.06**	-0.07***	-0.04*	-0.04**	-0.42**	-0.33**	-0.47**	-0.38**	-0.35**	-0.07
	(0.01)	(0.01)	(0.06)	(0.04)	(0.04)	(0.04)	(0.04)	(0.02)	(0.03)	(0.23)
Lagged dependent variable	0.03	0.03	0.40***	0.37***	0.11***	0.13***	0.12***	0.12***	0.17***	0.16***
	(0.39)	(0.51)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.42***	-0.66***	-0.13	0.00	-0.13	-0.52	-1.04	-0.38	-1.73	-2.99*
	(0.00)	(0.00)	(0.16)	(0.99)	(0.94)	(0.80)	(0.38)	(0.78)	(0.17)	(0.05)
d(Large Bank)	-0.22	-0.16	-0.19**	0.03	-3.13	-2.12	-2.26*	-1.98	-5.73***	-4.89***
	(0.24)	(0.34)	(0.04)	(0.76)	(0.12)	(0.21)	(0.09)	(0.16)	(0.00)	(0.01)
Deposits Total Assets	-0.00**	-0.00**	0.00*	0.00**	-0.00	-0.01	0.01	0.01	-0.02	-0.00
	(0.02)	(0.03)	(0.06)	(0.05)	(0.89)	(0.54)	(0.62)	(0.38)	(0.29)	(0.85)
Log(Age)	-0.02	-0.02	0.00	-0.00	-0.25	-0.18	-0.21*	-0.18	-0.11	-0.12
	(0.26)	(0.18)	(0.93)	(0.99)	(0.15)	(0.29)	(0.07)	(0.17)	(0.44)	(0.47)
d(Rescued Bank)	0.06	0.01	0.01	0.01	1.93*	1.47	1.21	0.64	0.94	1.04
	(0.45)	(0.92)	(0.94)	(0.87)	(0.09)	(0.23)	(0.13)	(0.36)	(0.42)	(0.42)
Cross Listed Index	0.02*	0.03***	0.01	0.00	0.09	0.02	-0.02	0.07	0.20*	0.23**
	(0.05)	(0.00)	(0.49)	(0.97)	(0.55)	(0.89)	(0.85)	(0.48)	(0.05)	(0.04)
d(Merger Acquisition)	0.03	0.06	0.06	0.03	0.77	0.61	1.65**	1.25	0.16	0.03
	(0.66)	(0.43)	(0.28)	(0.56)	(0.48)	(0.61)	(0.04)	(0.11)	(0.87)	(0.97)
3-month Interbank Rate	0.02	0.03	-0.12***	-0.10***	-2.01***	-1.92***	-2.07***	-2.34***	-1.75***	-1.84***
	(0.72)	(0.53)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
GDP Growth Rate	0.02*	0.01	0.00	0.00	0.22**	0.25**	0.19***	0.21***	0.14*	0.17**
	(0.06)	(0.11)	(0.40)	(0.81)	(0.05)	(0.03)	(0.01)	(0.00)	(0.09)	(0.04)
Stock Traded	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.01
	(0.49)	(0.32)	(0.24)	(0.42)	(0.44)	(0.64)	(0.18)	(0.15)	(0.74)	(0.35)
Constant	0.44*	0.35	0.74***	0.62***	15.80***	13.94***	11.47***	12.17***	12.99***	12.68***
	(0.07)	(0.24)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Hansen test (P-value)	0.22	0.10	0.26	0.22	0.45	0.33	0.17	0.35	0.22	0.29
AR2 test (P-value)	0.90	0.89	0.86	0.87	0.27	0.21	0.58	0.56	0.15	0.17
Wald tests: $\alpha_1 + \alpha_2$	-0.09**	-0.09**	-0.06**	-0.07**	0.90**	0.93**	0.47**	0.45**	0.65**	0.76**
$\alpha_1 + \beta_1$	-0.10**	-0.08**	-0.02	-0.04	0.46	0.40	0.28	0.22	0.28	0.31
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.19***	-0.12**	-0.03	-0.03	0.47	0.38	0.27	0.17	0.40	0.38
$\alpha'_1 + \alpha'_2$	0.16***	0.16**	0.05	0.04	-0.47	-0.19	-0.45	-0.46	-0.48	-1.04**
$\alpha'_1 + \beta'_1$	0.08*	0.07*	0.09**	0.08**	-0.68**	-0.69**	-0.70**	-0.64**	-0.66**	-1.09**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.05	0.04	0.05	0.04	-1.21**	-1.10**	-1.26**	-1.10**	-1.13**	-1.21***

Table A1.19. Estimating the target capital ratio: an alternative method

This table shows the Generalized Least Squares estimation (GLS) results of the target capital ratio based on a perfect adjustment model (Eq. (1.1)) over the 2002-2010 period. The sample consists of 341 European commercial banks corresponding to 2,204 observations. *Tier 1 Total Assets* is Tier 1 capital divided by total assets. *Tier 1 RWA* is Tier 1 capital divided by risk-weighted assets. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. *Log(Total Assets)* is the natural logarithm of the bank's total assets. *Return On Assets* is net income divided by total assets. *Loan Loss Provisions* is loan loss provisions divided by net loans. *Loans Total Assets* is net loans divided by total assets. *Market Discipline* is total long term market funding divided by total funding. *d(Listed Bank)* is a dummy equal to one if the bank is publicly listed, and zero otherwise. *GDP Growth Rate* is the real Gross Domestic Product (GDP) growth rate. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. In the last three rows, we report the summary statistics (mean, maximum and minimum) of the estimated target capital ratio. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Tier 1 Total Assets	Tier 1 RWA
d(Excess Control Rights)	-0.35**	-0.79***
	(0.02)	(0.00)
Log(Total Assets)	-1.34***	-1.11***
	(0.00)	(0.00)
Return On Assets	0.55***	0.75***
	(0.00)	(0.00)
Loan Loss Provisions	0.11*	0.10*
	(0.09)	(0.10)
Loans Total Assets	-0.01**	-0.07***
	(0.04)	(0.00)
Market Discipline	0.89	1.47***
	(0.09)	(0.00)
d(Listed Bank)	-0.70*	-0.99*
	(0.09)	(0.07)
GDP Growth Rate	0.01	0.01
	(0.35)	(0.81)
Constant	7.45***	10.70***
	(0.00)	(0.00)
R-squared	0.50	0.36
Fitted target (%): Mean	6.97	10.88
Maximum	15.10	21.49
Minimum	1.15	4.36

Table A1.20. Excess control rights and capital ratio adjustment: an alternative method to estimate the target capital ratio

This table shows the Blundell and Bond (1998) estimation results on the effect of excess control rights on capital ratio adjustment (Eq. (1.6)) for a sample of 341 European commercial banks (corresponding to 2,204 observations) over the 2002-2010 period. For robustness, the fitted target capital ratio in all the regressions is obtained by estimating a perfect adjustment model (Eq. (1.1)) using the Generalized Least Squares estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *Deposits Total Assets* is total customer deposits divided by total assets. *Log(Age)* is the natural logarithm of bank age. *d(Rescued Bank)* is a dummy equal to one if the bank was rescued during the 2008 financial crisis, and zero otherwise. *Cross Listed Index* is an index equal to the number of stock markets on which the bank is listed, and zero if the bank is privately owned. *d(Merger Acquisition)* is a dummy equal to one if the bank experienced a merger-acquisition event during the sample period, and zero otherwise. *3-month Interbank Rate* is the three-month interbank rate. *GDP Growth Rate* is the real Gross Domestic Product (GDP) growth rate. *Stock Traded* is the value of listed shares divided by GDP. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

	Capital adjustment				Assets adjustment					
Dependent variable	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.06*	-0.04*	-0.05**	-0.04**	0.77**	0.90**	0.45**	0.54**	0.48**	0.70**
	(0.07)	(0.08)	(0.02)	(0.03)	(0.04)	(0.03)	(0.02)	(0.02)	(0.02)	(0.02)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.08	-0.02	0.03	0.01	-0.36**	-0.45**	-0.19*	-0.30**	-0.28*	-0.37*
	(0.43)	(0.70)	(0.47)	(0.79)	(0.04)	(0.03)	(0.06)	(0.04)	(0.07)	(0.07)
Capital Ratio Shortfall (α'_1)	0.16**	0.12***	0.03	0.03	-0.36	0.06	-0.35	-0.38	-0.22	-0.60***
	(0.01)	(0.01)	(0.41)	(0.19)	(0.20)	(0.89)	(0.29)	(0.13)	(0.51)	(0.01)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.11*	-0.09**	0.04	0.04**	-0.40**	-0.76**	-0.26**	-0.25**	-0.32*	-0.04
	(0.08)	(0.04)	(0.37)	(0.07)	(0.03)	(0.03)	(0.03)	(0.02)	(0.06)	(0.49)
Lagged dependent variable	0.03	0.02	0.42***	0.38***	0.11***	0.11***	0.13***	0.12***	0.14***	0.17***
	(0.32)	(0.61)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.71***	-0.43**	-0.07	-0.11	-0.45	-1.55	-1.11	-0.40	-1.43	-0.21
	(0.00)	(0.02)	(0.57)	(0.30)	(0.89)	(0.55)	(0.60)	(0.81)	(0.52)	(0.60)
Deposits Total Assets	-0.01***	-0.00*	0.00*	0.00***	0.02	-0.00	0.05***	0.02	0.02	0.02
	(0.01)	(0.06)	(0.10)	(0.01)	(0.38)	(0.81)	(0.00)	(0.13)	(0.35)	(0.18)
Log(Age)	-0.00	-0.01	-0.00	-0.01	-0.45**	-0.35*	-0.31**	-0.29**	-0.39**	-0.19
	(0.80)	(0.48)	(0.97)	(0.62)	(0.03)	(0.06)	(0.02)	(0.05)	(0.01)	(0.25)
d(Rescued Bank)	0.01	0.04	0.00	0.00	1.01	0.99	0.88	0.03	0.62	0.56
	(0.95)	(0.65)	(0.94)	(0.99)	(0.52)	(0.51)	(0.31)	(0.97)	(0.52)	(0.60)
Cross Listed Index	0.02*	0.02*	-0.00	0.01	0.23*	0.12	0.13	0.15	0.32***	0.39***
	(0.06)	(0.07)	(0.84)	(0.48)	(0.08)	(0.44)	(0.21)	(0.15)	(0.00)	(0.00)
d(Merger Acquisition)	0.05	0.04	0.01	0.02	0.11	0.40	1.03	1.67**	0.16	0.28
	(0.45)	(0.53)	(0.82)	(0.63)	(0.92)	(0.75)	(0.21)	(0.05)	(0.86)	(0.75)
3-month Interbank Rate	0.02	0.03	-0.11***	-0.11**	-2.01***	-2.21***	-2.09***	-2.30***	-1.59***	-1.71***
	(0.78)	(0.52)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
GDP Growth Rate	0.01	0.01**	0.01*	0.01*	0.26**	0.22*	0.21***	0.23***	0.20**	0.19**
	(0.16)	(0.03)	(0.06)	(0.08)	(0.01)	(0.06)	(0.00)	(0.00)	(0.02)	(0.01)
Stock Traded	0.00	0.00	0.00	0.00	0.02	0.02	0.01	0.01	0.00	0.00
	(0.79)	(0.28)	(0.43)	(0.20)	(0.18)	(0.13)	(0.52)	(0.23)	(0.96)	(0.74)
Constant	0.35	0.17	0.56***	0.53***	13.51***	13.28***	7.75***	10.68***	9.97***	9.80***
	(0.19)	(0.44)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Hansen test (P-value)	0.10	0.20	0.16	0.16	0.19	0.16	0.11	0.10	0.50	0.15
AR2 test (P-value)	0.94	0.95	0.89	0.96	0.24	0.25	0.38	0.49	0.14	0.15
Wald tests: $\alpha_1 + \beta_1$	-0.14**	-0.06**	-0.02	-0.03*	0.41	0.45	0.26	0.24	0.20	0.33
$\alpha'_1 + \beta'_1$	0.05	0.03	0.07**	0.07**	-0.76**	-0.70**	-0.61**	-0.63**	-0.54*	-0.64**

Table A1.21. Ownership type and the effect of excess control rights on capital ratio adjustment: an alternative method to estimate the target

This table shows the Blundell and Bond (1998) estimation results on the effect of ownership type on the relationship between excess control rights and capital ratio adjustment (Eq. (1.7)) over the 2002-2010 period. The sample excludes banks for which the control chain is a cross-holding (for simplicity) and consists of 336 European commercial banks corresponding to 2,171 observations. For robustness, the fitted target capital ratio in all the regressions is obtained by estimating a perfect adjustment model (Eq. (1.1)) using the Generalized Least Squares estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Family)* is a dummy equal to one if the bank is family-controlled, and zero otherwise. *d(State)* is a dummy equal to one if the bank is state-controlled, and zero otherwise. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. *Deposits Total Assets* is total customer deposits divided by total assets. *Log(Age)* is the natural logarithm of bank age. *d(Rescued Bank)* is a dummy equal to one if the bank was rescued during the 2008 financial crisis, and zero otherwise. *Cross Listed Index* is an index equal to the number of stock markets on which the bank is listed, and zero if the bank is privately owned. *d(Merger Acquisition)* is a dummy equal to one if the bank experienced a merger-acquisition event during the sample period, and zero otherwise. *3-month Interbank Rate* is the three-month interbank rate. *GDP Growth Rate* is the real Gross Domestic Product (GDP) growth rate. *Stock Traded* is the value of listed shares divided by GDP. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

	Capital adjustment				Assets adjustment					
Dependent variable	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.12**	-0.05**	-0.06**	-0.05**	0.74**	0.81**	0.29*	0.45**	0.41**	0.63**
	(0.01)	(0.05)	(0.04)	(0.03)	(0.02)	(0.04)	(0.08)	(0.04)	(0.03)	(0.03)
d(Family) × Capital Ratio Surplus (α_2)	0.04	0.00	0.01	0.01	0.14	0.14	0.21	0.13	0.15	0.16
	(0.26)	(0.92)	(0.36)	(0.20)	(0.42)	(0.26)	(0.37)	(0.33)	(0.42)	(0.27)
d(State) × Capital Ratio Surplus (α_3)	0.06	-0.01	-0.02	0.01	0.02	0.20	0.07	0.06	0.08	0.14
	(0.35)	(0.83)	(0.20)	(0.31)	(0.96)	(0.29)	(0.22)	(0.76)	(0.39)	(0.42)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.04	-0.01	-0.01	-0.01	-0.38	-0.37	-0.12	-0.14	-0.19	-0.27
	(0.61)	(0.80)	(0.14)	(0.56)	(0.29)	(0.64)	(0.67)	(0.93)	(0.16)	(0.45)
d(Family) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	-0.06*	-0.06*	0.03*	0.02	-0.09	-0.16	-0.04	-0.14	-0.14	-0.12
	(0.05)	(0.06)	(0.09)	(0.20)	(0.51)	(0.24)	(0.89)	(0.98)	(0.83)	(0.28)
d(State) × d(Excess Control Rights) × Capital Ratio Surplus (β_3)	-0.01	-0.02	-0.13	-0.01	0.05	-0.17	0.02	-0.07	-0.10	-0.14
	(0.45)	(0.34)	(0.30)	(0.13)	(0.61)	(0.21)	(0.43)	(0.21)	(0.38)	(0.18)
Capital Ratio Shortfall (α'_1)	0.18**	0.08***	0.03	0.04	-0.38	0.09	-0.42	-0.38	-0.32	-0.52**
	(0.02)	(0.00)	(0.50)	(0.14)	(0.15)	(0.77)	(0.32)	(0.12)	(0.29)	(0.04)
d(Family) × Capital Ratio Shortfall (α'_2)	0.11	0.08	0.02	0.02	0.05	0.08	0.04	-0.06	0.12	-0.04
	(0.31)	(0.37)	(0.66)	(0.27)	(0.39)	(0.43)	(0.38)	(0.84)	(0.39)	(0.63)
d(State) × Capital Ratio Shortfall (α'_3)	0.01	-0.05	-0.04	-0.01	0.03	0.03	0.05	-0.09	0.02	-0.09
	(0.94)	(0.73)	(0.34)	(0.66)	(0.99)	(0.86)	(0.28)	(0.91)	(0.40)	(0.37)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.06	-0.03	0.03	-0.00	-0.12	-0.48	-0.07	-0.09	-0.06	-0.06
	(0.26)	(0.52)	(0.26)	(0.55)	(0.60)	(0.25)	(0.41)	(0.39)	(0.55)	(0.34)
d(Family) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	-0.19**	-0.11**	-0.01	0.02*	-0.47**	-0.72**	-0.31**	-0.41**	-0.48*	-0.12
	(0.01)	(0.04)	(0.67)	(0.08)	(0.03)	(0.01)	(0.04)	(0.04)	(0.05)	(0.13)
d(State) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_3)	-0.03	0.09*	-0.06	-0.02	-0.11	-0.16	-0.11	0.09	-0.06	0.08
	(0.74)	(0.05)	(0.29)	(0.45)	(0.32)	(0.24)	(0.37)	(0.12)	(0.63)	(0.17)
Lagged dependent variable	0.03	0.04	0.43***	0.43***	0.11***	0.12***	0.12***	0.12***	0.19***	0.18***
	(0.39)	(0.32)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.66***	-0.46**	-0.18	-0.10	-0.94	-2.10	-0.34	-0.04	-0.68	-2.93
	(0.00)	(0.01)	(0.14)	(0.26)	(0.76)	(0.33)	(0.86)	(0.98)	(0.74)	(0.13)
d(Family)	-0.04	0.00	-0.01	-0.17	0.34	-1.00	0.56	-0.61	3.52	0.44
	(0.87)	(0.99)	(0.95)	(0.22)	(0.93)	(0.76)	(0.87)	(0.80)	(0.30)	(0.89)
d(State)	0.34	0.08	0.11	0.01	2.01	-1.94	3.28	0.25	4.05	-0.54
	(0.17)	(0.71)	(0.64)	(0.95)	(0.62)	(0.54)	(0.23)	(0.91)	(0.19)	(0.81)

Table A1.21 (continued)

Deposits Total Assets	-0.00***	-0.00	0.00	0.00*	0.02	-0.00	0.03*	0.02*	0.00	0.01
	(0.00)	(0.16)	(0.34)	(0.06)	(0.47)	(0.81)	(0.08)	(0.07)	(0.83)	(0.74)
Log(Age)	-0.01	-0.02	-0.00	-0.00	-0.42*	-0.26	-0.33**	-0.26*	-0.26	-0.25
	(0.46)	(0.13)	(0.92)	(0.83)	(0.05)	(0.15)	(0.01)	(0.06)	(0.12)	(0.15)
d(Rescued Bank)	0.01	0.05	0.03	0.00	0.68	1.80	0.74	0.54	0.67	0.24
	(0.94)	(0.59)	(0.68)	(0.96)	(0.64)	(0.15)	(0.43)	(0.52)	(0.63)	(0.85)
Cross Listed Index	0.02	0.02	0.01	0.01	0.29**	0.14	0.12	0.23**	0.39***	0.50***
	(0.12)	(0.13)	(0.44)	(0.29)	(0.03)	(0.33)	(0.20)	(0.01)	(0.00)	(0.00)
d(Merger Acquisition)	0.09	0.07	0.00	0.00	0.01	0.05	1.64**	1.17	0.29	0.30
	(0.23)	(0.38)	(0.98)	(0.94)	(0.99)	(0.96)	(0.05)	(0.11)	(0.77)	(0.76)
3-month Interbank Rate	0.03	0.04	-0.11***	-0.11**	-1.97***	-2.11***	-2.18***	-2.11***	-1.90***	-2.15***
	(0.52)	(0.43)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
GDP Growth Rate	0.01**	0.01*	0.01	0.00	0.23*	0.28***	0.19***	0.20***	0.14	0.16*
	(0.03)	(0.09)	(0.23)	(0.55)	(0.05)	(0.01)	(0.00)	(0.00)	(0.12)	(0.06)
Stock Traded	0.00	0.00	0.00	0.00	0.01	0.00	0.01	0.01	0.00	0.00
	(0.53)	(0.31)	(0.19)	(0.31)	(0.41)	(0.95)	(0.12)	(0.13)	(0.94)	(0.80)
Constant	0.15	0.02	0.60***	0.60***	12.91***	12.57***	10.21***	10.44***	10.26***	11.85***
	(0.53)	(0.92)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Hansen test (P-value)	0.14	0.15	0.13	0.10	0.12	0.12	0.15	0.12	0.10	0.18
AR2 test (P-value)	0.82	0.96	0.69	0.95	0.27	0.23	0.57	0.57	0.34	0.34
Wald tests: $\alpha_1 + \alpha_2$	-0.08**	-0.05**	-0.05**	-0.04*	0.88***	0.95***	0.50**	0.58**	0.56**	0.79**
$\alpha_1 + \alpha_3$	-0.06**	-0.06**	-0.08**	-0.04**	0.76**	1.01***	0.36**	0.51***	0.49**	0.77**
$\alpha_1 + \beta_1$	-0.16**	-0.06**	-0.07**	-0.06*	0.36	0.44	0.17	0.31	0.22	0.36
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.18**	-0.12**	-0.03	-0.03	0.41	0.42	0.34	0.30	0.23	0.40
$\alpha_1 + \alpha_3 + \beta_1 + \beta_3$	-0.11**	-0.09**	-0.22**	-0.06**	0.43	0.47	0.26	0.30	0.20	0.36
$\alpha'_1 + \alpha'_2$	0.29**	0.16**	0.05	0.06*	-0.33	0.17	-0.38	-0.44	-0.20	-0.56**
$\alpha'_1 + \alpha'_3$	0.19***	0.04**	-0.01	0.03	-0.35	0.12	-0.37	-0.47	-0.30	-0.61**
$\alpha'_1 + \beta'_1$	0.12**	0.05**	0.06*	0.04**	-0.50	-0.39	-0.49	-0.47*	-0.38	-0.58**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.04	0.02	0.07**	0.08**	-0.92**	-1.03**	-0.76**	-0.94**	-0.74*	-0.74**
$\alpha'_1 + \alpha'_3 + \beta'_1 + \beta'_3$	0.10**	0.09***	-0.04	0.01	-0.58	-0.52*	-0.55	-0.47	-0.42	-0.59

Table A1.22. Shareholder protection and the effect of excess control rights on capital ratio adjustment: an alternative method to estimate the target

This table shows the Blundell and Bond (1998) estimation results on the effect of shareholder protection rights on the relationship between excess control rights and capital ratio adjustment (Eq. (1.7)) for a sample of 341 European commercial banks (2,204 observations) over the 2002-2010 period. For robustness, the fitted target capital ratio in all the regressions is obtained by estimating a perfect adjustment model (Eq. (1.1)) using the Generalized Least Squares estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Owner Rights)* is a dummy equal to one if the shareholder protection index as defined in Djankov et al. (2008) is greater than the median value, and zero otherwise. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. The definition of other variables is provided in Table 1.4. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Capital adjustment				Assets adjustment					
	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.07**	-0.06*	-0.07**	-0.05**	0.71**	0.92**	0.35*	0.43**	0.39**	0.64**
	(0.03)	(0.09)	(0.04)	(0.04)	(0.01)	(0.03)	(0.05)	(0.04)	(0.04)	(0.02)
d(Owner Rights) × Capital Ratio Surplus (α_2)	0.01	0.02	-0.02	0.02	0.14	0.09	0.17	0.15	0.15	0.17
	(0.18)	(0.21)	(0.24)	(0.27)	(0.37)	(0.29)	(0.54)	(0.69)	(0.84)	(0.22)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.07	-0.03	0.04	0.03	-0.36	-0.50	-0.03	-0.18	-0.17	-0.27
	(0.75)	(0.61)	(0.15)	(0.20)	(0.39)	(0.61)	(0.79)	(0.69)	(0.73)	(0.24)
d(Owner Rights) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	0.06	0.02	-0.03	-0.06*	-0.05	-0.03	-0.16	0.08	-0.16	-0.16
	(0.65)	(0.54)	(0.22)	(0.09)	(0.82)	(0.73)	(0.24)	(0.95)	(0.20)	(0.14)
Capital Ratio Shortfall (α'_1)	0.15**	0.09**	0.04	0.03	-0.37	-0.07	-0.36	-0.28	-0.20	-0.60**
	(0.02)	(0.01)	(0.50)	(0.31)	(0.21)	(0.65)	(0.43)	(0.42)	(0.57)	(0.01)
d(Owner Rights) × Capital Ratio Shortfall (α'_2)	0.05	0.07	0.02	-0.00	-0.11	0.19	-0.04	-0.27	-0.07	-0.03
	(0.49)	(0.24)	(0.48)	(0.94)	(0.91)	(0.11)	(0.50)	(0.36)	(0.19)	(0.55)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.16**	-0.07**	0.04*	0.01*	-0.50**	-0.88**	-0.50**	-0.63**	-0.48**	-0.07
	(0.01)	(0.02)	(0.09)	(0.08)	(0.02)	(0.02)	(0.03)	(0.03)	(0.04)	(0.44)
d(Owner Rights) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	-0.00	-0.01	-0.03	-0.03	0.37	0.30	0.49	0.57*	0.39	0.16
	(0.94)	(0.76)	(0.80)	(0.59)	(0.62)	(0.27)	(0.24)	(0.09)	(0.48)	(0.40)
Lagged dependent variable	0.04	0.03	0.42***	0.38***	0.12***	0.11***	0.12***	0.14***	0.14***	0.15***
	(0.32)	(0.37)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.65***	-0.64***	-0.24*	-0.01	-0.57	-0.64	-0.68	-0.32	-3.18	-2.09
	(0.00)	(0.00)	(0.07)	(0.91)	(0.83)	(0.77)	(0.67)	(0.84)	(0.20)	(0.22)
Deposits Total Assets	-0.00***	-0.00	0.00	0.00**	0.02	-0.01	0.03*	0.02	0.00	0.00
	(0.01)	(0.13)	(0.13)	(0.03)	(0.35)	(0.58)	(0.07)	(0.24)	(0.98)	(0.97)
Log(Age)	-0.01	-0.02	0.00	-0.00	-0.43**	-0.26	-0.35**	-0.37**	-0.32*	-0.22
	(0.45)	(0.14)	(0.99)	(0.65)	(0.04)	(0.16)	(0.01)	(0.01)	(0.05)	(0.17)
d(Rescued Bank)	0.01	0.01	0.02	0.01	0.86	2.08	0.63	0.09	0.31	0.74
	(0.89)	(0.95)	(0.73)	(0.92)	(0.51)	(0.11)	(0.45)	(0.91)	(0.82)	(0.60)
Cross Listed Index	0.02**	0.02**	0.00	0.01	0.27**	0.27*	0.14	0.21**	0.29**	0.43***
	(0.05)	(0.03)	(0.75)	(0.53)	(0.05)	(0.06)	(0.17)	(0.04)	(0.01)	(0.00)
d(Merger Acquisition)	0.06	0.08	0.04	0.04	0.37	0.05	1.60**	1.24	0.02	0.11
	(0.42)	(0.33)	(0.48)	(0.47)	(0.76)	(0.97)	(0.03)	(0.12)	(0.99)	(0.91)
3-month Interbank Rate	0.03	0.01	-0.12***	-0.12***	-2.31***	-1.97***	-2.15**	-2.35***	-1.92***	-1.91***
	(0.59)	(0.80)	(0.01)	(0.01)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)
GDP Growth Rate	0.02**	0.01*	0.01	0.00	0.30***	0.28**	0.20***	0.25***	0.18**	0.20**
	(0.01)	(0.05)	(0.23)	(0.58)	(0.00)	(0.01)	(0.00)	(0.00)	(0.03)	(0.02)
Stock Traded	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.00
	(0.68)	(0.51)	(0.17)	(0.20)	(0.33)	(0.62)	(0.12)	(0.16)	(0.63)	(0.84)
Constant	0.31	0.34	0.71***	0.64***	14.58***	11.74***	9.78***	11.36***	9.96***	10.00***
	(0.23)	(0.19)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Hansen test (P-value)	0.31	0.18	0.26	0.21	0.57	0.47	0.26	0.18	0.26	0.51
AR2 test (P-value)	0.92	0.91	0.89	0.94	0.24	0.21	0.39	0.48	0.14	0.14
Wald tests: $\alpha_1 + \alpha_2$	-0.06**	-0.04*	-0.09**	-0.04**	0.85***	1.01***	0.52**	0.58**	0.54**	0.81**
$\alpha_1 + \beta_1$	-0.14**	-0.09**	-0.03	-0.02	0.35	0.42	0.32	0.25	0.22	0.37
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.07**	-0.05**	-0.08**	-0.06**	0.44*	0.48*	0.33	0.48	0.21	0.38
$\alpha'_1 + \alpha'_2$	0.20***	0.16**	0.06	0.03	-0.48	0.12	-0.40	-0.55	-0.27	-0.63**
$\alpha'_1 + \beta'_1$	-0.01	0.02	0.08**	0.04**	-0.87**	-0.95**	-0.86**	-0.91**	-0.68**	-0.67***
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.04**	0.08**	0.07*	0.01	-0.61*	-0.46	-0.41	-0.61	-0.36	-0.54*

Table A1.23. 2008 financial crisis and the effect of excess control rights on capital ratio adjustment: an alternative method to estimate the target

This table shows the Blundell and Bond (1998) estimation results on the effect of the 2008 financial crisis on the relationship between excess control rights and capital ratio adjustment (Eq. (1.7)) for a sample of 341 European commercial banks (2,204 observations) over the 2002-2010 period. For robustness, the fitted target capital ratio in all the regressions is obtained by estimating a perfect adjustment model (Eq. (1.1)) using the Generalized Least Squares estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Crisis)* is a dummy equal to one if the observation is from 2008 or 2009, and zero otherwise. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. The definition of other variables is provided in Table 1.4. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

	Capital adjustment				Assets adjustment					
Dependent variable	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.08**	-0.06**	-0.04**	-0.05**	1.07**	1.09**	0.54**	0.63**	0.62**	0.92***
	(0.01)	(0.01)	(0.04)	(0.03)	(0.01)	(0.03)	(0.03)	(0.03)	(0.03)	(0.00)
d(Crisis) × Capital Ratio Surplus (α_2)	0.04	0.03	-0.02	-0.01	-0.61	-0.45	-0.21	-0.27	-0.31	-0.41
	(0.16)	(0.36)	(0.33)	(0.19)	(0.79)	(0.51)	(0.64)	(0.87)	(0.13)	(0.11)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.03	-0.02	0.01	0.02	-0.62	-0.63	-0.18	-0.27	-0.25	-0.52
	(0.57)	(0.72)	(0.40)	(0.20)	(0.82)	(0.76)	(0.76)	(0.94)	(0.26)	(0.24)
d(Crisis) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	0.03	0.03	-0.02	-0.03	0.49	0.33	0.05	0.17	0.23	0.38
	(0.61)	(0.64)	(0.90)	(0.67)	(0.38)	(0.13)	(0.61)	(0.59)	(0.26)	(0.47)
Capital Ratio Shortfall (α'_1)	0.15***	0.11**	0.04	0.05	-0.42	0.09	-0.25	-0.32	-0.23	-0.63**
	(0.00)	(0.05)	(0.32)	(0.12)	(0.52)	(0.67)	(0.26)	(0.24)	(0.43)	(0.05)
d(Crisis) × Capital Ratio Shortfall (α'_2)	-0.07	-0.05	-0.01	-0.01	-0.05	0.17	-0.21	-0.14	-0.19	0.17
	(0.38)	(0.81)	(0.35)	(0.16)	(0.60)	(0.69)	(0.71)	(0.62)	(0.20)	(0.75)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.11*	-0.09*	0.05	0.05**	-0.49*	-0.96**	-0.41*	-0.51*	-0.49**	-0.16
	(0.06)	(0.06)	(0.17)	(0.05)	(0.05)	(0.02)	(0.08)	(0.08)	(0.02)	(0.69)
d(Crisis) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	0.09	0.09	-0.04	-0.05	0.45	0.24	0.44	0.52	0.60	0.32
	(0.26)	(0.16)	(0.48)	(0.65)	(0.19)	(0.39)	(0.17)	(0.35)	(0.17)	(0.34)
Lagged dependent variable	0.02	0.02	0.43***	0.38***	0.11***	0.12***	0.12***	0.15***	0.16***	0.18***
	(0.54)	(0.50)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.65***	-0.42***	-0.09	-0.02	-0.38	-1.03	-0.65	-0.37	-1.67	-2.22
	(0.00)	(0.00)	(0.44)	(0.88)	(0.90)	(0.65)	(0.74)	(0.83)	(0.40)	(0.19)
Deposits Total Assets	-0.00**	-0.00*	0.00**	0.00***	0.00	-0.00	0.03**	0.02	0.00	0.01
	(0.04)	(0.09)	(0.02)	(0.00)	(0.89)	(0.88)	(0.02)	(0.18)	(0.99)	(0.37)
Log(Age)	-0.02	-0.01	-0.00	-0.00	-0.40**	-0.39**	-0.26**	-0.29**	-0.24*	-0.16
	(0.30)	(0.41)	(0.95)	(0.79)	(0.03)	(0.03)	(0.03)	(0.02)	(0.08)	(0.27)
d(Rescued Bank)	0.03	0.01	0.02	0.02	1.37	0.76	1.49*	0.88	0.50	0.10
	(0.73)	(0.90)	(0.79)	(0.79)	(0.32)	(0.59)	(0.06)	(0.22)	(0.58)	(0.92)
Cross Listed Index	0.03**	0.02**	0.00	0.01	0.23*	0.07	0.13	0.13	0.28***	0.35***
	(0.03)	(0.01)	(0.63)	(0.36)	(0.06)	(0.62)	(0.13)	(0.16)	(0.00)	(0.00)
d(Merger Acquisition)	0.03	0.03	0.02	0.00	0.11	0.91	1.08	1.68**	0.17	0.27
	(0.62)	(0.63)	(0.65)	(0.95)	(0.91)	(0.48)	(0.17)	(0.05)	(0.86)	(0.76)
3-month Interbank Rate	0.01	0.04	-0.10**	-0.10**	-1.92***	-2.27***	-2.04**	-2.10***	-1.49**	-1.56***
	(0.79)	(0.38)	(0.01)	(0.03)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
GDP Growth Rate	0.01	0.01	0.01	0.01*	0.22**	0.22**	0.15**	0.21***	0.18**	0.18**
	(0.26)	(0.12)	(0.11)	(0.10)	(0.04)	(0.05)	(0.03)	(0.00)	(0.03)	(0.02)
Stock Traded	0.00	0.00	0.00	0.00	0.02	0.02	0.01	0.01	0.00	0.00
	(0.28)	(0.31)	(0.35)	(0.19)	(0.14)	(0.20)	(0.55)	(0.14)	(0.94)	(0.68)
Constant	0.35	0.12	0.49***	0.48**	14.10***	13.49***	8.84***	10.54***	8.71***	8.98***
	(0.19)	(0.57)	(0.01)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Hansen test (P-value)	0.12	0.14	0.16	0.12	0.34	0.14	0.14	0.15	0.24	0.41
AR2 test (P-value)	0.87	0.89	0.96	0.96	0.22	0.24	0.51	0.59	0.14	0.15
Wald tests: $\alpha_1 + \alpha_2$	-0.04*	-0.03	-0.06**	-0.06**	0.46*	0.64**	0.33	0.36	0.31	0.51**
$\alpha_1 + \beta_1$	-0.11**	-0.08***	-0.03	-0.03	0.45	0.46	0.36	0.36	0.37	0.40
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.04	-0.03*	-0.07**	-0.07**	0.33	0.34	0.20	0.26	0.29	0.37
$\alpha'_1 + \alpha'_2$	0.08*	0.06**	0.03	0.04	-0.47	0.26	-0.46	-0.46	-0.42	-0.46*
$\alpha'_1 + \beta'_1$	0.04	0.02	0.09**	0.10**	-0.91**	-0.87**	-0.66**	-0.83**	-0.72**	-0.79**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.06**	0.06**	0.04	0.04	-0.51	-0.46	-0.43	-0.45	-0.31	-0.30

Table A1.24. Bank capitalization and the effect of excess control rights on capital ratio adjustment: an alternative method to estimate the target

This table shows the Blundell and Bond (1998) estimation results on the effect of bank capitalization on the relationship between excess control rights and capital ratio adjustment for a sample of 341 European commercial banks (2,204 observations) over the 2002-2010 period. For robustness, the target capital ratio in all the regressions is obtained by estimating a perfect adjustment model (Eq. (1.1)) using the Generalized Least Squares estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Undercapitalized)* is a dummy equal to one if the Tier 1 RWA (Tier 1 Total Assets) ratio is less than 6% (4%), and zero otherwise. The definition of other variables is provided in Table 1.4. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Capital adjustment				Assets adjustment					
	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.06**	-0.07*	-0.06**	-0.04*	0.74**	0.86**	0.45*	0.54**	0.46**	0.63***
	(0.02)	(0.05)	(0.02)	(0.05)	(0.01)	(0.01)	(0.07)	(0.01)	(0.01)	(0.00)
d(Undercapitalized) × Capital Ratio Surplus (α_2)	0.01	0.04**	0.02	0.02*	-0.10	-0.44**	-0.06	-0.21*	-0.04	-0.26*
	(0.78)	(0.03)	(0.83)	(0.09)	(0.33)	(0.05)	(0.32)	(0.07)	(0.76)	(0.07)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.08	-0.04	0.03	0.00	-0.45*	-0.46*	-0.20*	-0.13*	-0.16*	-0.20
	(0.21)	(0.32)	(0.66)	(0.87)	(0.09)	(0.05)	(0.07)	(0.08)	(0.08)	(0.10)
d(Undercapitalized) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	0.05	0.04*	0.00	0.02*	0.06	0.21	0.17	-0.10	0.13	-0.06
	(0.72)	(0.06)	(0.25)	(0.10)	(0.50)	(0.25)	(0.42)	(0.55)	(0.67)	(0.56)
Capital Ratio Shortfall (α'_1)	0.09**	0.08**	0.03	0.04	-0.34	-0.06	-0.28	-0.40	-0.34	-0.50**
	(0.05)	(0.02)	(0.34)	(0.11)	(0.27)	(0.36)	(0.44)	(0.12)	(0.15)	(0.03)
d(Undercapitalized) × Capital Ratio Shortfall (α'_2)	0.05	0.08*	0.01	0.00	-0.10	0.32	-0.10	-0.10	-0.16	-0.16
	(0.23)	(0.05)	(0.56)	(0.90)	(0.20)	(0.54)	(0.21)	(0.54)	(0.20)	(0.38)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.07**	-0.06**	0.06*	0.04*	-0.29**	-0.46**	-0.38*	-0.24*	-0.40**	-0.14
	(0.02)	(0.01)	(0.05)	(0.05)	(0.05)	(0.03)	(0.07)	(0.05)	(0.03)	(0.10)
d(Undercapitalized) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	-0.05	-0.05	-0.04	-0.01	-0.14	-0.45**	-0.15	-0.30**	0.11	-0.17*
	(0.13)	(0.15)	(0.32)	(0.44)	(0.53)	(0.02)	(0.76)	(0.04)	(0.55)	(0.08)
Lagged dependent variable	0.03	0.03	0.41***	0.37***	0.10***	0.11***	0.12***	0.14***	0.16***	0.17***
	(0.36)	(0.46)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.49***	-0.43***	-0.15	-0.00	-1.02	-1.10	-1.56	-0.92	-2.32	-4.68***
	(0.01)	(0.00)	(0.24)	(0.96)	(0.73)	(0.60)	(0.40)	(0.56)	(0.24)	(0.01)
d(Undercapitalized)	0.26	0.63***	-0.14	-0.22**	-1.10	-1.03	-0.38	-0.00	-3.70*	-0.88
	(0.19)	(0.00)	(0.28)	(0.05)	(0.63)	(0.66)	(0.85)	(1.00)	(0.07)	(0.67)
Deposits Total Assets	-0.01***	-0.00	0.00*	0.00**	0.02	-0.02	0.03**	0.02	0.00	0.01
	(0.00)	(0.15)	(0.06)	(0.01)	(0.34)	(0.36)	(0.04)	(0.24)	(0.97)	(0.62)
Log(Age)	-0.01	-0.01	-0.00	-0.01	-0.52***	-0.35**	-0.32**	-0.39***	-0.36**	-0.23
	(0.70)	(0.31)	(0.97)	(0.56)	(0.01)	(0.04)	(0.01)	(0.00)	(0.03)	(0.15)
d(Rescued Bank)	0.00	0.04	0.00	0.04	0.89	1.21	0.69	0.34	0.82	-0.39
	(0.98)	(0.64)	(0.97)	(0.54)	(0.53)	(0.37)	(0.42)	(0.63)	(0.48)	(0.76)
Cross Listed Index	0.03**	0.01	0.00	0.00	0.16	0.12	0.08	0.18**	0.30***	0.46***
	(0.03)	(0.18)	(0.92)	(0.59)	(0.29)	(0.38)	(0.36)	(0.05)	(0.00)	(0.00)
d(Merger Acquisition)	0.02	0.04	0.04	0.03	0.62	0.33	1.06	1.48*	0.03	0.27
	(0.82)	(0.64)	(0.45)	(0.60)	(0.63)	(0.78)	(0.20)	(0.07)	(0.98)	(0.79)
3-month Interbank Rate	0.02	0.02	-0.11***	-0.10**	-2.04***	-1.88**	-2.27**	-2.36***	-1.77**	-1.70***
	(0.64)	(0.70)	(0.00)	(0.02)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
GDP Growth Rate	0.01**	0.01**	0.01	0.01	0.27**	0.26**	0.18***	0.26***	0.18*	0.15*
	(0.04)	(0.04)	(0.22)	(0.23)	(0.02)	(0.02)	(0.00)	(0.00)	(0.06)	(0.08)
Stock Traded	0.00	0.00	0.00	0.00*	0.01	0.02	0.01	0.01*	0.00	0.00
	(0.53)	(0.16)	(0.14)	(0.07)	(0.50)	(0.25)	(0.27)	(0.10)	(0.78)	(0.98)
Constant	0.22	0.04	0.63***	0.67***	13.19***	13.67***	9.49***	11.72***	11.43***	9.84***
	(0.36)	(0.87)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Hansen test (P-value)	0.70	0.79	0.77	0.55	0.90	0.89	0.83	0.74	0.93	0.89
AR2 test (P-value)	0.91	0.97	0.90	0.96	0.29	0.27	0.40	0.59	0.14	0.16
Wald tests: $\alpha_1 + \alpha_2$	-0.05**	-0.03	-0.04* *	-0.02	0.64**	0.42	0.39**	0.33	0.42**	0.37
$\alpha_1 + \beta_1$	-0.14**	-0.11**	-0.03	-0.04	0.29	0.40	0.25	0.41	0.30	0.43
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.08**	-0.03	-0.01	0.00	0.25	0.17	0.36	0.10	0.39	0.11
$\alpha'_1 + \alpha'_2$	0.14**	0.16**	0.04	0.04	-0.44	0.26	-0.38	-0.50	-0.50	-0.66**
$\alpha'_1 + \beta'_1$	0.02	0.02	0.09**	0.08**	-0.63**	-0.52**	-0.66**	-0.64**	-0.74**	-0.64**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.02	0.05	0.06**	0.07**	-0.87**	-0.65**	-0.91**	-1.04**	-0.79**	-0.97**

Table A1.25. Asset structure and the effect of excess control rights on capital ratio adjustment: an alternative method to estimate the target

This table shows the Blundell and Bond (1998) estimation results on the effect of asset structure on the relationship between excess control rights and capital ratio adjustment for a sample of 341 European commercial banks (2,204 observations) over the 2002-2010 period. For robustness, the target capital ratio in all the regressions is obtained by estimating a perfect adjustment model (Eq. (1.1)) using the Generalized Least Squares estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Lending Oriented)* is a dummy equal to one if the ratio of net loans (excluding interbank loans) to total assets is greater than the median value, and zero otherwise. The definition of other variables is provided in Table 1.4. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

| | Capital adjustment | | | | Assets adjustment | | | | | |
| Dependent variable | Δ Tier 1 | | Retained Earnings | | Δ Assets | | Δ Loans | | Δ RWA | |
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.08**	-0.07**	-0.07**	-0.07***	0.75**	0.85**	0.42**	0.45**	0.44**	0.65**
	(0.02)	(0.04)	(0.01)	(0.00)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.01)
d(Lending Oriented) × Capital Ratio Surplus (α_2)	-0.02	-0.02	-0.02	-0.02	0.14	0.12	-0.01	-0.01	0.11	0.10
	(0.12)	(0.19)	(0.25)	(0.20)	(0.33)	(0.18)	(0.40)	(0.50)	(0.25)	(0.24)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.05	-0.01	0.04	0.04	-0.38*	-0.48*	-0.13*	-0.16*	-0.14*	-0.32**
	(0.32)	(0.43)	(0.15)	(0.20)	(0.10)	(0.07)	(0.10)	(0.05)	(0.06)	(0.03)
d(Lending Oriented) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	0.06	0.02	-0.01	-0.02	-0.10	-0.12	-0.04	-0.03	-0.12	-0.09
	(0.15)	(0.20)	(0.27)	(0.17)	(0.25)	(0.16)	(0.17)	(0.31)	(0.11)	(0.17)
Capital Ratio Shortfall (α'_1)	0.11**	0.08**	0.04	0.04	-0.46*	-0.48*	-0.31	-0.30	-0.40	-0.57**
	(0.02)	(0.01)	(0.19)	(0.15)	(0.09)	(0.06)	(0.18)	(0.13)	(0.13)	(0.01)
d(Lending Oriented) × Capital Ratio Shortfall (α'_2)	0.05	0.05	0.01	0.01	0.17*	0.18*	-0.06	-0.05	0.08	-0.02
	(0.18)	(0.22)	(0.60)	(0.42)	(0.07)	(0.05)	(0.34)	(0.39)	(0.17)	(0.49)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.07**	-0.05**	0.04*	0.04*	-0.44**	-0.45***	-0.27*	-0.28*	-0.38*	-0.12
	(0.02)	(0.01)	(0.06)	(0.05)	(0.01)	(0.00)	(0.05)	(0.06)	(0.09)	(0.29)
d(Lending Oriented) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	-0.04	-0.04	-0.00	-0.00	-0.02	-0.08	-0.30*	-0.32**	-0.10	-0.06
	(0.20)	(0.31)	(0.35)	(0.39)	(0.45)	(0.44)	(0.05)	(0.02)	(0.20)	(0.38)
Lagged dependent variable	0.04	0.03	0.43***	0.38***	0.11***	0.12***	0.12***	0.13***	0.15***	0.17***
	(0.23)	(0.37)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.56***	-0.55***	-0.21	-0.02	-1.14	-1.63	-1.89	-0.22	-2.52	-4.29**
	(0.00)	(0.00)	(0.13)	(0.87)	(0.72)	(0.44)	(0.36)	(0.90)	(0.34)	(0.04)
d(Lending Oriented)	-0.07	0.09	0.15	0.15*	0.70	2.00	-0.22	2.07*	-0.68	2.92**
	(0.65)	(0.43)	(0.15)	(0.07)	(0.73)	(0.20)	(0.87)	(0.07)	(0.70)	(0.04)
Deposits Total Assets	-0.00***	-0.00	0.00	0.00***	0.03	-0.01	0.04***	0.02**	0.01	0.00
	(0.00)	(0.12)	(0.12)	(0.01)	(0.19)	(0.78)	(0.01)	(0.04)	(0.70)	(0.84)
Log(Age)	-0.00	-0.02	-0.00	-0.00	-0.48**	-0.26	-0.34**	-0.28**	-0.32*	-0.26
	(0.79)	(0.32)	(0.77)	(0.95)	(0.01)	(0.11)	(0.01)	(0.03)	(0.05)	(0.15)
d(Rescued Bank)	0.04	0.03	0.01	0.01	0.24	1.57	0.56	0.38	0.66	0.26
	(0.71)	(0.77)	(0.85)	(0.88)	(0.86)	(0.23)	(0.57)	(0.64)	(0.60)	(0.84)
Cross Listed Index	0.03*	0.03*	0.00	0.01	0.16	0.13	0.03	0.07	0.26**	0.38***
	(0.08)	(0.05)	(0.82)	(0.34)	(0.33)	(0.37)	(0.76)	(0.46)	(0.03)	(0.00)
d(Merger Acquisition)	0.08	0.08	0.03	0.02	0.64	0.27	1.28*	1.21	0.23	0.02
	(0.32)	(0.37)	(0.59)	(0.66)	(0.60)	(0.81)	(0.09)	(0.12)	(0.80)	(0.98)
3-month Interbank Rate	0.02	0.03	-0.11***	-0.12***	-1.85***	-2.29***	-2.16**	-2.28***	-1.71**	-2.04***
	(0.70)	(0.54)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
GDP Growth Rate	0.01*	0.01*	0.00	0.00	0.30***	0.29**	0.21***	0.24***	0.17**	0.21***
	(0.08)	(0.09)	(0.30)	(0.55)	(0.01)	(0.01)	(0.00)	(0.00)	(0.04)	(0.01)
Stock Traded	0.00	0.00	0.00	0.00	0.01	0.00	0.02**	0.01	0.00	0.01
	(0.26)	(0.33)	(0.17)	(0.28)	(0.39)	(0.74)	(0.04)	(0.18)	(0.91)	(0.61)
Constant	0.15	0.21	0.69***	0.72***	13.89***	14.34***	9.47***	12.22***	9.41***	13.19***
	(0.56)	(0.37)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Hansen test (P-value)	0.13	0.16	0.19	0.21	0.41	0.55	0.22	0.22	0.29	0.22
AR2 test (P-value)	0.78	0.89	0.99	0.89	0.29	0.32	0.49	0.50	0.12	0.16
Wald tests: $\alpha_1 + \alpha_2$	-0.10**	-0.09**	-0.09**	-0.09**	0.89**	0.97**	0.41**	0.44**	0.55**	0.75**
$\alpha_1 + \beta_1$	-0.13**	-0.08**	-0.03	-0.03	0.37	0.37	0.29	0.29	0.30	0.33
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.09**	-0.08**	-0.06	-0.07	0.41	0.37	0.24	0.25	0.29	0.34
$\alpha'_1 + \alpha'_2$	0.16**	0.13**	0.05	0.05	-0.29	-0.30	-0.37	-0.35	-0.32	-0.59**
$\alpha'_1 + \beta'_1$	0.04	0.03	0.08**	0.08**	-0.90**	-0.93**	-0.58**	-0.58**	-0.78**	-0.69**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.05	0.04	0.09**	0.09**	-0.75**	-0.83**	-0.94**	-0.95**	-0.80**	-0.77**

Table A1.26. Bank size and the effect of excess control rights on capital ratio adjustment: an alternative method to estimate the target

This table shows the Blundell and Bond (1998) estimation results on the effect of bank size on the relationship between excess control rights and capital ratio adjustment for a sample of 341 European commercial banks (2,204 observations) over the 2002-2010 period. For robustness, the target capital ratio in all the regressions is obtained by estimating a perfect adjustment model (Eq. (1.1)) using the Generalized Least Squares estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Large Bank)* is a dummy equal to one if the bank's total assets is above the median value, and zero otherwise. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. The definition of other variables is provided in Table 1.4. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

	Capital adjustment				Assets adjustment					
Dependent variable	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.07**	-0.05*	-0.07**	-0.05**	0.85**	0.91***	0.43**	0.45**	0.46**	0.64**
	(0.02)	(0.06)	(0.02)	(0.04)	(0.01)	(0.01)	(0.07)	(0.04)	(0.04)	(0.03)
d(Large Bank) × Capital Ratio Surplus (α_2)	-0.02	-0.03	0.01	-0.01	0.09	0.01	0.03	-0.00	0.17	0.13
	(0.52)	(0.29)	(0.63)	(0.47)	(0.61)	(0.93)	(0.56)	(0.89)	(0.43)	(0.37)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.03	-0.01	0.04	0.02	-0.41**	-0.46**	-0.12*	-0.21*	-0.19*	-0.27
	(0.62)	(0.77)	(0.20)	(0.54)	(0.03)	(0.04)	(0.08)	(0.07)	(0.07)	(0.10)
d(Large Bank) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	-0.05	-0.01	-0.02	0.02	-0.09	-0.04	0.01	-0.02	-0.04	-0.08
	(0.51)	(0.18)	(0.92)	(0.66)	(0.23)	(0.81)	(0.91)	(0.87)	(0.41)	(0.25)
Capital Ratio Shortfall (α'_1)	0.12***	0.11***	0.02	0.03	-0.37	-0.10	-0.38	-0.37	-0.36	-1.09**
	(0.00)	(0.00)	(0.25)	(0.24)	(0.20)	(0.79)	(0.34)	(0.15)	(0.20)	(0.01)
d(Large Bank) × Capital Ratio Shortfall (α'_2)	0.04	0.05	0.02	0.00	-0.11	-0.12	-0.07	-0.08	-0.11	-0.10
	(0.67)	(0.46)	(0.92)	(0.92)	(0.59)	(0.91)	(0.23)	(0.42)	(0.20)	(0.56)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.05**	-0.04***	0.07*	0.04*	-0.32*	-0.63**	-0.31*	-0.27*	-0.30*	-0.07
	(0.02)	(0.00)	(0.09)	(0.08)	(0.06)	(0.02)	(0.06)	(0.05)	(0.09)	(0.23)
d(Large Bank) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	-0.06**	-0.07**	-0.08*	-0.04*	-0.42**	-0.35*	-0.49**	-0.33**	-0.38*	-0.04
	(0.01)	(0.01)	(0.09)	(0.08)	(0.03)	(0.07)	(0.02)	(0.01)	(0.09)	(0.20)
Lagged dependent variable	0.03	0.03	0.40***	0.39***	0.10***	0.12***	0.12***	0.12***	0.16***	0.17***
	(0.41)	(0.44)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.51***	-0.53***	-0.18	-0.06	-0.19	-1.18	-1.27	-0.22	-2.92*	-3.66**
	(0.00)	(0.00)	(0.16)	(0.51)	(0.95)	(0.62)	(0.44)	(0.90)	(0.10)	(0.02)
d(Large Bank)	-0.13	-0.17	-0.07	-0.03	-7.53***	-1.98	-3.31**	-1.73	-7.93***	-3.87**
	(0.59)	(0.31)	(0.58)	(0.68)	(0.00)	(0.28)	(0.03)	(0.19)	(0.00)	(0.02)
Deposits Total Assets	-0.00***	-0.00*	0.00	0.00**	0.01	-0.02	0.02	0.01	-0.01	-0.01
	(0.01)	(0.06)	(0.12)	(0.02)	(0.81)	(0.39)	(0.28)	(0.40)	(0.55)	(0.57)
Log(Age)	-0.02	-0.02	0.00	-0.00	-0.30	-0.17	-0.24*	-0.25*	-0.14	-0.12
	(0.42)	(0.31)	(0.96)	(0.98)	(0.12)	(0.30)	(0.06)	(0.06)	(0.37)	(0.45)
d(Rescued Bank)	0.04	0.01	0.02	0.00	1.79	1.45	0.79	0.39	1.01	0.62
	(0.66)	(0.89)	(0.81)	(0.96)	(0.13)	(0.29)	(0.28)	(0.62)	(0.37)	(0.59)
Cross Listed Index	0.02	0.02*	0.01	0.01	0.10	0.07	0.03	0.12	0.20*	0.33***
	(0.21)	(0.06)	(0.55)	(0.48)	(0.54)	(0.63)	(0.77)	(0.26)	(0.06)	(0.00)
d(Merger Acquisition)	0.06	0.07	0.04	0.02	0.35	0.13	1.36*	1.33	0.15	0.13
	(0.49)	(0.39)	(0.41)	(0.73)	(0.77)	(0.92)	(0.07)	(0.10)	(0.88)	(0.90)
3-month Interbank Rate	0.01	0.04	-0.14***	-0.11***	-1.79**	-2.07***	-2.07***	-2.36***	-1.80***	-1.81***
	(0.79)	(0.48)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
GDP Growth Rate	0.01*	0.01	0.00	0.00	0.28**	0.24**	0.20***	0.23***	0.17**	0.14*
	(0.06)	(0.11)	(0.41)	(0.54)	(0.01)	(0.04)	(0.00)	(0.00)	(0.04)	(0.08)
Stock Traded	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
	(0.51)	(0.34)	(0.37)	(0.26)	(0.70)	(0.63)	(0.20)	(0.31)	(0.53)	(0.48)
Constant	0.37	0.28	0.75***	0.58***	17.43***	13.95***	10.95***	12.45***	13.88***	12.67***
	(0.14)	(0.34)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Hansen test (P-value)	0.17	0.12	0.20	0.23	0.29	0.29	0.30	0.32	0.20	0.46
AR2 test (P-value)	0.95	0.97	0.87	0.96	0.30	0.24	0.50	0.53	0.14	0.16
Wald tests: $\alpha_1 + \alpha_2$	-0.09**	-0.08**	-0.06**	-0.06**	0.94**	0.92**	0.46**	0.45**	0.63**	0.77**
$\alpha_1 + \beta_1$	-0.10**	-0.06**	-0.03	-0.03	0.44	0.45	0.31	0.24	0.27	0.37
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.17**	-0.10**	-0.04	-0.02	0.44	0.42	0.35	0.22	0.40	0.42
$\alpha'_1 + \alpha'_2$	0.16***	0.16**	0.04	0.03	-0.48	-0.22	-0.45	-0.45	-0.47	-1.19**
$\alpha'_1 + \beta'_1$	0.07*	0.07*	0.09**	0.07**	-0.69**	-0.73**	-0.69**	-0.64**	-0.66**	-1.16**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.05	0.05	0.03	0.03	-1.22**	-1.20**	-1.25**	-1.05**	-1.15**	-1.30***

Table A1.27. Estimating the target capital ratio: excluding banks controlled by multiple ultimate owners

This table shows the Blundell and Bond (1998) estimation results of the target capital ratio based on a partial adjustment model (Eq. (1.3)) over the 2002-2010 period. For robustness, we exclude from the initial sample banks controlled by more than one ultimate owner and we use a sample of 281 European commercial banks corresponding to 1,705 observations. *Tier 1 Total Assets* is Tier 1 capital divided by total assets. *Tier 1 RWA* is Tier 1 capital divided by risk-weighted assets. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. *Log(Total Assets)* is the natural logarithm of the bank's total assets. *Return On Assets* is net income divided by total assets. *Loan Loss Provisions* is loan loss provisions divided by net loans. *Loans Total Assets* is net loans divided by total assets. *Market Discipline* is total long term market funding divided by total funding. *d(Listed Bank)* is a dummy equal to one if the bank is publicly listed, and zero otherwise. *GDP Growth Rate* is the real Gross Domestic Product (GDP) growth rate. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. In the last three rows, we report the summary statistics (mean, maximum and minimum) of the estimated target capital ratio. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Tier 1 Total Assets	Tier 1 RWA
Lagged dependent variable	0.65***	0.64***
	(0.00)	(0.00)
d(Excess Control Rights)	-0.34**	-0.73***
	(0.02)	(0.00)
Log(Total Assets)	-0.52***	-0.53***
	(0.00)	(0.00)
Return On Assets	0.56***	0.59***
	(0.00)	(0.00)
Loan Loss Provisions	0.20***	0.10*
	(0.00)	(0.07)
Loans Total Assets	-0.01***	-0.03***
	(0.00)	(0.00)
Market Discipline	0.01**	0.02***
	(0.02)	(0.01)
d(Listed Bank)	-0.71***	-1.51***
	(0.00)	(0.00)
GDP Growth Rate	-0.00	0.00
	(1.00)	(0.85)
Constant	2.39***	6.13***
	(0.00)	(0.00)
Hansen test (P-value)	0.11	0.16
AR2 test (P-value)	0.39	0.22
Fitted target (%): Mean	6.89	11.34
Maximum	14.66	23.60
Minimum	1.15	4.17

Table A1.28. Excess control rights and capital ratio adjustment: excluding banks controlled by multiple ultimate owners

This table shows the Blundell and Bond (1998) estimation results on the effect of excess control rights on capital ratio adjustment (Eq. (1.6)) over the 2002-2010 period. For robustness, we exclude from the initial sample banks controlled by more than one ultimate owner and we use a sample of 281 European commercial banks corresponding to 1,705 observations. In all the regressions, the fitted target capital ratio is obtained by estimating a partial adjustment model (Eq. (1.3)) using the Blundell and Bond (1998) estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. *Deposits Total Assets* is total customer deposits divided by total assets. *Log(Age)* is the natural logarithm of bank age. *d(Rescued Bank)* is a dummy equal to one if the bank was rescued during the 2008 financial crisis, and zero otherwise. *Cross Listed Index* is an index equal to the number of stock markets on which the bank is listed, and zero if the bank is privately owned. *d(Merger Acquisition)* is a dummy equal to one if the bank experienced a merger-acquisition event during the sample period, and zero otherwise. *3-month Interbank Rate* is the three-month interbank rate. *GDP Growth Rate* is the real Gross Domestic Product (GDP) growth rate. *Stock Traded* is the value of listed shares divided by GDP. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

| | Capital adjustment | | | | Assets adjustment | | | | | |
| Dependent variable | Δ Tier 1 | | Retained Earnings | | Δ Assets | | Δ Loans | | Δ RWA | |
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.06*	-0.04*	-0.06**	-0.05**	0.76**	0.88**	0.47**	0.47**	0.53**	0.64**
	(0.06)	(0.07)	(0.02)	(0.04)	(0.04)	(0.04)	(0.03)	(0.04)	(0.02)	(0.03)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.07	-0.04	0.03	0.02	-0.42**	-0.48*	-0.20*	-0.23**	-0.35*	-0.30*
	(0.34)	(0.29)	(0.50)	(0.78)	(0.03)	(0.07)	(0.06)	(0.04)	(0.06)	(0.06)
Capital Ratio Shortfall (α'_1)	0.15**	0.10***	0.04	0.04*	-0.34	0.08	-0.36	-0.36	-0.23	-0.63**
	(0.03)	(0.00)	(0.13)	(0.10)	(0.24)	(0.82)	(0.21)	(0.11)	(0.52)	(0.02)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.11*	-0.06*	0.04**	0.02*	-0.37**	-0.79**	-0.27**	-0.30**	-0.29*	-0.02
	(0.05)	(0.07)	(0.03)	(0.08)	(0.02)	(0.02)	(0.03)	(0.03)	(0.07)	(0.28)
Lagged dependent variable	0.03	0.03	0.38***	0.35***	0.10***	0.12***	0.12***	0.12***	0.14***	0.16***
	(0.43)	(0.41)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.25*	-0.27*	-0.14	-0.12	-2.08	-0.16	-0.66	-0.20	-1.58	-0.24
	(0.05)	(0.08)	(0.24)	(0.18)	(0.34)	(0.67)	(0.66)	(0.90)	(0.34)	(0.58)
Deposits Total Assets	-0.00	-0.00	0.00**	0.00**	0.00	-0.00	0.01	0.01	0.01	0.00
	(0.70)	(0.31)	(0.03)	(0.03)	(0.89)	(0.88)	(0.43)	(0.46)	(0.72)	(0.97)
Log(Age)	-0.03*	-0.04***	-0.01	-0.00	-0.39*	-0.33*	-0.31**	-0.28*	-0.26	-0.13
	(0.05)	(0.01)	(0.65)	(0.86)	(0.05)	(0.08)	(0.02)	(0.06)	(0.11)	(0.44)
d(Rescued Bank)	0.04	0.02	0.01	0.06	1.19	2.40	0.68	0.30	0.70	1.21
	(0.74)	(0.88)	(0.91)	(0.48)	(0.51)	(0.22)	(0.53)	(0.76)	(0.66)	(0.35)
Cross Listed Index	0.02**	0.03***	-0.00	0.00	0.16	0.13	0.09	0.17*	0.28***	0.22**
	(0.04)	(0.01)	(0.76)	(0.82)	(0.29)	(0.40)	(0.35)	(0.06)	(0.01)	(0.03)
d(Merger Acquisition)	0.11	0.10	0.04	0.03	0.21	0.41	1.04	1.08	0.05	0.28
	(0.19)	(0.20)	(0.52)	(0.60)	(0.86)	(0.75)	(0.21)	(0.20)	(0.96)	(0.79)
3-month Interbank Rate	0.00	0.02	-0.12**	-0.08	-1.89***	-1.87**	-1.85***	-2.29***	-1.67***	-1.50***
	(0.98)	(0.76)	(0.01)	(0.10)	(0.01)	(0.03)	(0.00)	(0.00)	(0.01)	(0.01)
GDP Growth Rate	0.01	0.01	0.00	0.00	0.18	0.21*	0.18**	0.19**	0.11	0.15*
	(0.19)	(0.33)	(0.66)	(0.50)	(0.14)	(0.08)	(0.01)	(0.01)	(0.23)	(0.09)
Stock Traded	0.00	0.00	0.00	0.00	0.02	0.02	0.01	0.01	0.00	0.00
	(0.32)	(0.10)	(0.28)	(0.25)	(0.14)	(0.16)	(0.15)	(0.12)	(0.85)	(0.83)
Constant	0.32	0.36	0.65***	0.51**	11.96***	12.18***	8.40***	10.93***	8.20***	6.77***
	(0.23)	(0.19)	(0.01)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
Hansen test (P-value)	0.14	0.13	0.10	0.17	0.23	0.29	0.20	0.16	0.15	0.50
AR2 test (P-value)	0.89	0.93	0.86	0.90	0.72	0.65	0.90	0.91	0.15	0.15
Wald tests: $\alpha_1 + \beta_1$	-0.13**	-0.08**	-0.03	-0.03*	0.34	0.4	0.27	0.24	0.18	0.34
$\alpha'_1 + \beta'_1$	0.04	0.04	0.08**	0.06**	-0.71**	-0.71**	-0.63**	-0.66**	-0.52**	-0.65**

Table A1.29. Ownership type and the effect of excess control rights on capital ratio adjustment: excluding banks controlled by multiple ultimate owners

This table shows the Blundell and Bond (1998) estimation results on the effect of ownership type on the relationship between excess control rights and capital ratio adjustment (Eq. (1.7)) over the 2002-2010 period. We exclude from the initial sample banks for which the control chain is a cross-holding (for simplicity) and banks controlled by more than one ultimate owner (for robustness) and we use a sample of 276 European commercial banks corresponding to 2,138 observations. In all the regressions, the target capital ratio is obtained by estimating a partial adjustment model (Eq. (1.3)) using the Blundell and Bond (1998) estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *D(Family)* is a dummy equal to one if the bank is family-controlled, and zero otherwise. *d(State)* is a dummy equal to one if the bank is state-controlled, and zero otherwise. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. *Deposits Total Assets* is total customer deposits divided by total assets. *Log(Age)* is the natural logarithm of bank age. *Cross Listed Index* is an index equal to the number of stock markets on which the bank is listed, and zero if the bank is privately owned. *d(Rescued Bank)* is a dummy equal to one if the bank was rescued during the 2008 financial crisis, and zero otherwise. *d(Merger Acquisition)* is dummy equal to one if the bank experienced a merger-acquisition event during the sample period, and zero otherwise. *3-month Interbank Rate* is the three-month interbank rate. *GDP Growth Rate* is the real Gross Domestic Product (GDP) growth rate. *Stock Traded* is the value of listed shares divided by GDP. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

| | Capital adjustment | | | | Assets adjustment | | | | | |
| Dependent variable | Δ Tier 1 | | Retained Earnings | | Δ Assets | | Δ Loans | | Δ RWA | |
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.12**	-0.05**	-0.07**	-0.05**	0.76**	0.81**	0.31*	0.45**	0.42**	0.62**
	(0.01)	(0.05)	(0.01)	(0.03)	(0.02)	(0.02)	(0.08)	(0.01)	(0.05)	(0.01)
d(Family) × Capital Ratio Surplus (α_2)	0.08	0.02	0.01	0.01	0.12	0.14	0.16	0.13	0.15	0.15
	(0.35)	(0.60)	(0.27)	(0.18)	(0.39)	(0.15)	(0.27)	(0.32)	(0.33)	(0.27)
d(State) × Capital Ratio Surplus (α_3)	0.07	-0.00	-0.01	0.01	0.03	0.21	0.07	0.07	0.09	0.15
	(0.36)	(0.74)	(0.31)	(0.23)	(0.68)	(0.25)	(0. 35)	(0.60)	(0.53)	(0.60)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.03	-0.00	-0.01	-0.01	-0.39	-0.40	-0.12	-0.14	-0.22	-0.30
	(0.65)	(0.90)	(0.15)	(0.72)	(0.15)	(0.60)	(0.73)	(0.70)	(0.55)	(0.29)
d(Family) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	-0.06*	-0.06*	0.05*	0.02	-0.06	-0.19	-0.05	-0.17	-0.16	-0.10
	(0.06)	(0.05)	(0.06)	(0.45)	(0.60)	(0.30)	(0.65)	(0.74)	(0.88)	(0.45)
d(State) × d(Excess Control Rights) × Capital Ratio Surplus (β_3)	-0.01	-0.01	-0.11	-0.01	0.07	-0.16	0.02	-0.07	-0.08	-0.12
	(0.18)	(0.69)	(0.37)	(0.21)	(0.48)	(0.20)	(0.77)	(0.15)	(0.35)	(0.20)
Capital Ratio Shortfall (α'_1)	0.15**	0.08***	0.04	0.06*	-0.36	0.09	-0.41	-0.38	-0.32	-0.52**
	(0.01)	(0.00)	(0.29)	(0.05)	(0.16)	(0.66)	(0.22)	(0.17)	(0.15)	(0.02)
d(Family) × Capital Ratio Shortfall (α'_2)	0.10	0.06	0.02	0.01	0.05	0.08	0.07	-0.08	0.13	-0.04
	(0.15)	(0.11)	(0.76)	(0.51)	(0.38)	(0.45)	(0.28)	(0.80)	(0.30)	(0.37)
d(State) × Capital Ratio Shortfall (α'_3)	0.01	-0.02	-0.03	-0.00	0.04	0.04	0.07	-0.07	0.04	-0.09
	(0.77)	(0.30)	(0.68)	(0.85)	(0.68)	(0.54)	(0.35)	(0.94)	(0.62)	(0.50)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.07	-0.03	0.03	0.00	-0.11	-0.48	-0.05	-0.11	-0.06	-0.06
	(0.17)	(0.16)	(0.52)	(0.64)	(0.30)	(0.31)	(0.68)	(0.19)	(0.41)	(0.29)
d(Family) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	-0.16**	-0.11**	-0.00	0.03*	-0.53**	-0.67**	-0.30**	-0.38**	-0.46**	-0.12
	(0.03)	(0.02)	(0.66)	(0.06)	(0.02)	(0.01)	(0.03)	(0.01)	(0.04)	(0.18)
d(State) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_3)	-0.02	0.07**	-0.04	-0.04	-0.12	-0.16	-0.13	0.12**	-0.10	0.11
	(0.58)	(0.04)	(0.66)	(0.80)	(0.17)	(0.21)	(0.44)	(0.01)	(0.30)	(0.29)
Lagged dependent variable	0.03	0.04	0.44***	0.44***	0.10**	0.13***	0.15***	0.17***	0.16***	0.18***
	(0.43)	(0.23)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.34**	-0.29*	-0.17	-0.11	-5.35**	-4.53**	-0.73	-3.81**	-0.28	-1.30
	(0.01)	(0.05)	(0.14)	(0.15)	(0.02)	(0.03)	(0.60)	(0.05)	(0.89)	(0.52)
d(Family)	-0.06	0.02	-0.13	-0.17*	3.29	-0.92	2.15	0.25	1.97	2.54
	(0.81)	(0.91)	(0.49)	(0.09)	(0.34)	(0.78)	(0.31)	(0.92)	(0.48)	(0.36)
d(State)	0.29	-0.14	0.02	-0.04	6.62*	-6.76**	1.22	-10.20***	1.86	-10.97*
	(0.15)	(0.49)	(0.87)	(0.81)	(0.09)	(0.03)	(0.58)	(0.00)	(0.56)	(0.06)

Table A1.29 (continued)

Deposits Total Assets	-0.00	-0.00	0.00**	0.00	0.01	0.01	0.01	0.04**	-0.01	-0.00
	(0.53)	(0.43)	(0.01)	(0.18)	(0.71)	(0.56)	(0.40)	(0.04)	(0.77)	(0.99)
Log(Age)	-0.04**	-0.04***	-0.00	0.00	-0.38*	-0.48**	-0.17	-0.32*	-0.20	-0.14
	(0.03)	(0.01)	(0.84)	(0.88)	(0.07)	(0.01)	(0.24)	(0.07)	(0.21)	(0.46)
d(Rescued Bank)	0.11	0.01	0.00	0.04	0.98	1.71	0.79	1.54	0.68	0.07
	(0.34)	(0.92)	(0.97)	(0.55)	(0.63)	(0.43)	(0.50)	(0.25)	(0.65)	(0.97)
Cross Listed Index	0.02*	0.03***	0.00	0.01	0.13	0.19	0.10	0.08	0.21**	0.21*
	(0.06)	(0.00)	(0.79)	(0.50)	(0.34)	(0.22)	(0.31)	(0.46)	(0.04)	(0.06)
d(Merger Acquisition)	0.10	0.05	0.01	0.05	0.12	0.52	1.56*	1.07	0.07	0.16
	(0.18)	(0.54)	(0.85)	(0.26)	(0.93)	(0.69)	(0.08)	(0.28)	(0.94)	(0.89)
3-month Interbank Rate	-0.00	0.05	-0.11**	-0.08**	-1.80**	-1.32*	-1.90***	-2.09***	-1.66***	-1.40**
	(0.96)	(0.42)	(0.02)	(0.04)	(0.02)	(0.09)	(0.00)	(0.00)	(0.00)	(0.02)
GDP Growth Rate	0.01	0.01	0.00	0.00	0.15	0.28**	0.18***	0.29***	0.17*	0.18*
	(0.16)	(0.37)	(0.57)	(0.56)	(0.19)	(0.03)	(0.01)	(0.00)	(0.06)	(0.06)
Stock Traded	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.03*
	(0.21)	(0.66)	(0.18)	(0.49)	(0.46)	(0.68)	(0.21)	(0.38)	(0.63)	(0.08)
Constant	0.35	0.28	0.65**	0.55**	11.58***	10.96***	7.91***	8.14***	8.10***	4.53
	(0.17)	(0.31)	(0.02)	(0.02)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.20)
Hansen test (P-value)	0.13	0.15	0.15	0.17	0.16	0.14	0.18	0.24	0.22	0.21
AR2 test (P-value)	0.82	0.82	0.72	0.92	0.32	0.30	0.67	0.60	0.36	0.23
Wald tests: $\alpha_1 + \alpha_2$	-0.04**	-0.04**	-0.06**	-0.04*	0.88**	0.95***	0.47**	0.58**	0.57**	0.77**
$\alpha_1 + \alpha_3$	-0.05*	-0.05**	-0.08**	-0.04**	0.79**	1.02**	0.38**	0.52**	0.51**	0.77**
$\alpha_1 + \beta_1$	-0.15**	-0.05**	-0.08**	-0.06**	0.37	0.41	0.19	0.31	0.20	0.32
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.13**	-0.09**	-0.02	-0.03	0.43	0.36	0.30	0.27	0.19	0.37
$\alpha_1 + \alpha_3 + \beta_1 + \beta_3$	-0.09**	-0.06**	-0.20**	-0.06**	0.47	0.46	0.28	0.31	0.21	0.35
$\alpha'_1 + \alpha'_2$	0.25**	0.14***	0.06	0.07*	-0.31	0.17	-0.34	-0.46	-0.19	-0.56**
$\alpha'_1 + \alpha'_3$	0.16**	0.06**	0.01	0.06*	-0.32	0.13	-0.34	-0.45	-0.28	-0.61**
$\alpha'_1 + \beta'_1$	0.08***	0.05**	0.07*	0.06*	-0.47	-0.39	-0.46	-0.49*	-0.38	-0.58**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.02	0.00	0.09**	0.10**	-0.95**	-0.98**	-0.69**	-0.95**	-0.71**	-0.74**
$\alpha'_1 + \alpha'_3 + \beta'_1 + \beta'_3$	0.07**	0.10**	0.00	0.02	-0.55	-0.51*	-0.52	-0.44	-0.44	-0.56

Table A1.30. Shareholder protection and the effect of excess control rights on capital ratio adjustment: excluding banks controlled by multiple ultimate owners

This table shows the Blundell and Bond (1998) estimation results on the effect of shareholder protection rights on the relationship between excess control rights and capital ratio adjustment (Eq. (1.7)) over the 2002-2010 period. For robustness, we exclude from the initial sample banks controlled by more than one ultimate owner and we use a sample of 281 European commercial banks corresponding to 1,705 observations. In all the regressions, the fitted target capital ratio is obtained by estimating a partial adjustment model (Eq. (1.3)) using the Blundell and Bond (1998) estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Owner Rights)* is a dummy equal to one if the shareholder protection index as defined in Djankov et al. (2008) is greater than the median value, and zero otherwise. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. The definition of other variables is provided in Table 1.4. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Capital adjustment				Assets adjustment					
	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.10**	-0.09*	-0.06**	-0.05**	0.71**	0.88**	0.35*	0.41**	0.40***	0.65**
	(0.02)	(0.08)	(0.05)	(0.03)	(0.02)	(0.01)	(0.06)	(0.02)	(0.00)	(0.02)
d(Owner Rights) × Capital Ratio Surplus (α_2)	0.02	0.02	-0.01	0.01	0.12	0.07	0.14	0.14	0.14	0.19
	(0.18)	(0.11)	(0.29)	(0.27)	(0.71)	(0.23)	(0.59)	(0.90)	(0.73)	(0.39)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.07	-0.01	0.04	0.03	-0.37	-0.48	-0.05	-0.18	-0.15	-0.30
	(0.61)	(0.89)	(0.15)	(0.19)	(0.37)	(0.70)	(0.28)	(0.56)	(0.66)	(0.17)
d(Owner Rights) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	0.05	0.03	-0.02	-0.05	-0.06	-0.04	-0.17	0.06	-0.19	-0.18
	(0.81)	(0.47)	(0.20)	(0.32)	(0.44)	(0.35)	(0.16)	(0.94)	(0.15)	(0.18)
Capital Ratio Shortfall (α'_1)	0.14**	0.07**	0.04	0.04*	-0.36	-0.10	-0.37	-0.30	-0.20	-0.60**
	(0.04)	(0.01)	(0.21)	(0.10)	(0.17)	(0.59)	(0.11)	(0.24)	(0.44)	(0.02)
d(Owner Rights) × Capital Ratio Shortfall (α'_2)	0.04	0.09	0.01	-0.00	-0.09	0.15	-0.05	-0.26	-0.07	-0.04
	(0.32)	(0.10)	(0.83)	(0.74)	(0.92)	(0.17)	(0.87)	(0.21)	(0.12)	(0.41)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.12**	-0.05**	0.04**	0.02*	-0.50***	-0.88***	-0.50**	-0.61**	-0.45*	-0.07
	(0.02)	(0.02)	(0.04)	(0.07)	(0.01)	(0.00)	(0.01)	(0.03)	(0.07)	(0.18)
d(Owner Rights) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	-0.01	-0.01	-0.03	-0.03	0.35	0.29	0.48**	0.53*	0.44	0.14
	(0.92)	(0.52)	(0.77)	(0.46)	(0.22)	(0.64)	(0.04)	(0.07)	(0.42)	(0.39)
Lagged dependent variable	0.03	0.03	0.38***	0.35***	0.11***	0.11***	0.12***	0.12***	0.15***	0.16***
	(0.42)	(0.46)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.34**	-0.31**	-0.17*	-0.09	-3.55*	-2.82	-0.76	-1.00	-1.26	-1.28
	(0.04)	(0.04)	(0.10)	(0.37)	(0.07)	(0.13)	(0.54)	(0.48)	(0.52)	(0.58)
Deposits Total Assets	-0.00	-0.00	0.00**	0.00*	0.00	-0.01	0.01	0.01	-0.01	-0.00
	(0.41)	(0.42)	(0.01)	(0.08)	(0.99)	(0.74)	(0.43)	(0.35)	(0.76)	(0.92)
Log(Age)	-0.04**	-0.05***	-0.00	-0.01	-0.45**	-0.26	-0.28**	-0.26*	-0.26	-0.21
	(0.01)	(0.01)	(0.77)	(0.67)	(0.02)	(0.20)	(0.04)	(0.07)	(0.14)	(0.25)
d(Rescued Bank)	0.02	0.05	0.05	0.05	0.91	0.32	0.71	0.07	0.81	0.99
	(0.84)	(0.68)	(0.59)	(0.54)	(0.64)	(0.87)	(0.52)	(0.95)	(0.67)	(0.61)
Cross Listed Index	0.03***	0.03***	0.00	0.00	0.16	0.17	0.13	0.08	0.23**	0.24**
	(0.00)	(0.00)	(0.80)	(0.66)	(0.27)	(0.26)	(0.11)	(0.40)	(0.04)	(0.04)
d(Merger Acquisition)	0.10	0.12	0.03	0.00	0.40	0.23	1.46*	1.39*	0.31	0.56
	(0.23)	(0.14)	(0.51)	(0.95)	(0.72)	(0.85)	(0.06)	(0.10)	(0.77)	(0.61)
3-month Interbank Rate	-0.01	0.02	-0.11**	-0.09*	-1.60**	-1.64**	-1.89**	-2.41***	-1.57**	-1.82***
	(0.82)	(0.78)	(0.02)	(0.05)	(0.02)	(0.03)	(0.01)	(0.00)	(0.01)	(0.00)
GDP Growth Rate	0.01	0.00	0.00	0.00	0.16	0.20*	0.18**	0.24***	0.19**	0.16
	(0.17)	(0.61)	(0.39)	(0.63)	(0.19)	(0.09)	(0.01)	(0.00)	(0.05)	(0.11)
Stock Traded	0.00	0.00	0.00	0.00	0.02	0.02	0.01	0.01	0.01	0.01
	(0.20)	(0.22)	(0.22)	(0.15)	(0.11)	(0.19)	(0.21)	(0.23)	(0.58)	(0.66)
Constant	0.60**	0.49*	0.71**	0.65***	13.46***	10.94***	8.87***	10.06***	6.98**	7.20**
	(0.03)	(0.08)	(0.02)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.02)	(0.01)
Hansen test (P-value)	0.86	0.92	0.89	0.90	0.96	0.94	0.93	0.88	0.96	0.96
AR2 test (P-value)	0.89	0.95	0.88	0.93	0.74	0.64	0.92	0.78	0.14	0.14
Wald tests: $\alpha_1 + \alpha_2$	-0.08**	-0.07*	-0.07**	-0.04**	0.83***	0.95**	0.49**	0.55**	0.54**	0.84**
$\alpha_1 + \beta_1$	-0.17**	-0.10**	-0.02	-0.02	0.34	0.40	0.30	0.23	0.25	0.35
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.10**	-0.05**	-0.05**	-0.06**	0.40*	0.43*	0.27	0.43	0.20	0.36
$\alpha'_1 + \alpha'_2$	0.18**	0.16***	0.05	0.04	-0.45	0.05	-0.42	-0.56	-0.27	-0.64**
$\alpha'_1 + \beta'_1$	0.02	0.02	0.08**	0.06**	-0.86**	-0.98**	-0.87**	-0.91**	-0.65**	-0.67**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.05*	0.10**	0.06*	0.03	-0.60*	-0.54*	-0.44	-0.64	-0.28	-0.57*

Table A1.31. 2008 financial crisis and the effect of excess control rights on capital ratio adjustment: excluding banks controlled by multiple ultimate owners

This table shows the Blundell and Bond (1998) estimation results on the effect of the 2008 financial crisis on the relationship between excess control rights and capital ratio adjustment (Eq. (1.7)) over the 2002-2010 period. For robustness, we exclude from the initial sample banks controlled by more than one ultimate owner and we use a sample of 281 European commercial banks corresponding to 1,705 observations. In all the regressions, the fitted target capital ratio is obtained by estimating a partial adjustment model (Eq. (1.3)) using the Blundell and Bond (1998) estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Crisis)* is a dummy equal to one if the observation is from 2008 or 2009, and zero otherwise. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. The definition of other variables is provided in Table 1.4. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Capital adjustment				Assets adjustment					
	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.08**	-0.06**	-0.05**	-0.05**	1.10**	1.12**	0.52**	0.64**	0.62**	0.92**
	(0.04)	(0.03)	(0.05)	(0.03)	(0.04)	(0.04)	(0.04)	(0.04)	(0.04)	(0.01)
d(Crisis) × Capital Ratio Surplus (α_2)	0.04*	0.02	-0.02	-0.01	-0.63	-0.42	-0.21	-0.27	-0.29	-0.40
	(0.06)	(0.51)	(0.10)	(0.12)	(0.57)	(0.73)	(0.68)	(0.68)	(0.36)	(0.27)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.03	-0.03	0.02	0.02	-0.64	-0.64	-0.15	-0.30	-0.31	-0.53
	(0.43)	(0.52)	(0.52)	(0.14)	(0.70)	(0.20)	(0.39)	(0.87)	(0.25)	(0.54)
d(Crisis) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	0.03	0.03	-0.02	-0.02	0.51	0.35	0.07	0.15	0.24	0.35
	(0.73)	(0.37)	(0.66)	(0.56)	(0.27)	(0.42)	(0.60)	(0.42)	(0.75)	(0.25)
Capital Ratio Shortfall (α'_1)	0.15**	0.11**	0.04	0.06	-0.42	0.08	-0.25	-0.31	-0.27	-0.67**
	(0.05)	(0.02)	(0.12)	(0.10)	(0.17)	(0.66)	(0.52)	(0.37)	(0.28)	(0.03)
d(Crisis) × Capital Ratio Shortfall (α'_2)	-0.05*	-0.05	-0.01	-0.02	-0.05	0.20	-0.22	-0.15	-0.20	0.20
	(0.10)	(0.74)	(0.33)	(0.22)	(0.79)	(0.67)	(0.53)	(0.54)	(0.37)	(0.52)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.12*	-0.09*	0.06	0.06*	-0.52*	-0.97**	-0.44**	-0.52*	-0.50**	-0.16
	(0.08)	(0.08)	(0.14)	(0.08)	(0.10)	(0.03)	(0.04)	(0.06)	(0.03)	(0.50)
d(Crisis) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	0.09	0.09	-0.04	-0.05	0.49	0.20	0.42	0.52	0.61	0.35
	(0.50)	(0.59)	(0.31)	(0.51)	(0.14)	(0.55)	(0.38)	(0.29)	(0.20)	(0.43)
Lagged dependent variable	0.03	0.03	0.40***	0.35***	0.12***	0.13***	0.12***	0.14***	0.16***	0.13***
	(0.48)	(0.45)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.25	-0.35**	-0.13	-0.11	-0.88	-2.73	-1.13	-0.24	-2.21	-1.54
	(0.14)	(0.02)	(0.22)	(0.20)	(0.70)	(0.16)	(0.45)	(0.88)	(0.19)	(0.51)
Deposits Total Assets	-0.00	-0.00	0.00**	0.00**	0.00	-0.01	0.01	0.01	-0.01	-0.00
	(0.77)	(0.24)	(0.01)	(0.02)	(0.99)	(0.74)	(0.47)	(0.46)	(0.59)	(0.83)
Log(Age)	-0.03*	-0.05***	-0.00	-0.00	-0.37*	-0.31	-0.26**	-0.27*	-0.22	-0.07
	(0.05)	(0.00)	(0.97)	(0.97)	(0.06)	(0.10)	(0.04)	(0.06)	(0.21)	(0.67)
d(Rescued Bank)	0.04	0.03	0.02	0.05	0.42	2.34	0.62	0.63	0.63	1.02
	(0.74)	(0.77)	(0.80)	(0.50)	(0.81)	(0.24)	(0.54)	(0.52)	(0.70)	(0.42)
Cross Listed Index	0.02**	0.03***	0.00	0.00	0.05	0.09	0.08	0.17*	0.24**	0.20**
	(0.04)	(0.01)	(0.84)	(0.47)	(0.75)	(0.55)	(0.41)	(0.06)	(0.02)	(0.04)
d(Merger Acquisition)	0.10	0.10	0.05	0.05	0.07	0.62	1.08	1.22	0.28	0.39
	(0.25)	(0.20)	(0.34)	(0.24)	(0.95)	(0.62)	(0.20)	(0.16)	(0.76)	(0.71)
3-month Interbank Rate	-0.02	0.02	-0.10**	-0.08*	-1.84***	-1.87***	-1.91**	-2.23***	-1.79**	-1.41**
	(0.73)	(0.75)	(0.03)	(0.10)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.02)
GDP Growth Rate	0.01	0.01	0.00	0.00	0.14	0.16	0.18**	0.17**	0.14	0.15
	(0.29)	(0.50)	(0.90)	(0.34)	(0.26)	(0.21)	(0.01)	(0.02)	(0.17)	(0.10)
Stock Traded	0.00	0.00	0.00	0.00	0.02	0.02	0.01	0.01	0.01	0.01
	(0.33)	(0.12)	(0.30)	(0.14)	(0.13)	(0.17)	(0.20)	(0.14)	(0.72)	(0.66)
Constant	0.38	0.34	0.43**	0.45*	11.08***	11.75***	8.22***	10.66***	8.10***	5.78**
	(0.14)	(0.17)	(0.04)	(0.08)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)
Hansen test (P-value)	0.12	0.11	0.22	0.29	0.24	0.22	0.16	0.15	0.11	0.46
AR2 test (P-value)	0.96	0.94	0.89	0.92	0.63	0.58	0.87	0.89	0.14	0.15
Wald tests: $\alpha_1 + \alpha_2$	-0.04*	-0.04	-0.07**	-0.06**	0.47*	0.70**	0.31	0.37	0.33	0.52**
$\alpha_1 + \beta_1$	-0.11**	-0.09**	-0.03	-0.03	0.46	0.48	0.37	0.34	0.31	0.39
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.04	-0.04*	-0.07**	-0.06**	0.34	0.41	0.23	0.22	0.26	0.34
$\alpha'_1 + \alpha'_2$	0.10**	0.06**	0.03	0.04	-0.47	0.28	-0.47	-0.46	-0.47	-0.47*
$\alpha'_1 + \beta'_1$	0.03	0.02	0.10**	0.12**	-0.94**	-0.89**	-0.69**	-0.83**	-0.77**	-0.83**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.07**	0.06**	0.05	0.05	-0.50	-0.49	-0.49	-0.46	-0.36	-0.28

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Table A1.32. Bank capitalization and the effect of excess control rights on capital ratio adjustment: excluding banks controlled by multiple ultimate owners

This table shows the Blundell and Bond (1998) estimation results on the effect of bank capitalization on the relationship between excess control rights and capital ratio adjustment over the 2002-2010 period. For robustness, we exclude from the initial sample banks controlled by more than one ultimate owner and we use a sample of 281 European commercial banks corresponding to 1,705 observations. In all the regressions, the target capital ratio is obtained by estimating a partial adjustment model (Eq. (1.3)) using the Blundell and Bond (1998) estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Undercapitalized)* is a dummy equal to one if the Tier 1 RWA (Tier 1 Total Assets) ratio is less than 6% (4%), and zero otherwise. The definition of other variables is provided in Table 1.4. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

	Capital adjustment				Assets adjustment					
Dependent variable	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.06**	-0.07*	-0.05**	-0.05*	0.75**	0.85**	0.45*	0.53**	0.44**	0.65***
	(0.01)	(0.06)	(0.03)	(0.05)	(0.01)	(0.01)	(0.06)	(0.01)	(0.02)	(0.00)
d(Undercapitalized) × Capital Ratio Surplus (α_2)	0.01	0.05**	0.00	0.03*	-0.10	-0.44**	-0.02	-0.22*	-0.01	-0.26*
	(0.85)	(0.03)	(0.95)	(0.09)	(0.35)	(0.04)	(0.40)	(0.08)	(0.90)	(0.08)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.09	-0.05	0.03	0.00	-0.44*	-0.43*	-0.21*	-0.13*	-0.15	-0.20*
	(0.21)	(0.22)	(0.58)	(0.75)	(0.09)	(0.07)	(0.06)	(0.09)	(0.11)	(0.10)
d(Undercapitalized) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	0.06	0.05*	0.01	0.02*	0.10	0.21	0.19	-0.11	0.13	-0.01
	(0.70)	(0.06)	(0.14)	(0.10)	(0.45)	(0.23)	(0.45)	(0.52)	(0.50)	(0.41)
Capital Ratio Shortfall (α'_1)	0.09**	0.07**	0.03	0.04	-0.38	-0.06	-0.28	-0.40	-0.38	-0.49**
	(0.04)	(0.02)	(0.40)	(0.11)	(0.17)	(0.36)	(0.36)	(0.15)	(0.11)	(0.04)
d(Undercapitalized) × Capital Ratio Shortfall (α'_2)	0.03	0.07*	0.01	0.00	-0.10	0.32	-0.10	-0.11	-0.14	-0.20
	(0.35)	(0.05)	(0.66)	(0.90)	(0.21)	(0.53)	(0.25)	(0.70)	(0.20)	(0.34)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.08**	-0.06**	0.06*	0.04*	-0.30*	-0.47**	-0.42*	-0.25**	-0.40**	-0.14
	(0.01)	(0.01)	(0.06)	(0.06)	(0.05)	(0.01)	(0.05)	(0.04)	(0.02)	(0.12)
d(Undercapitalized) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	-0.02	-0.04	-0.02	-0.01	-0.15	-0.45**	-0.14	-0.29**	0.08	-0.16*
	(0.34)	(0.36)	(0.46)	(0.50)	(0.56)	(0.02)	(0.65)	(0.04)	(0.73)	(0.09)
Lagged dependent variable	0.03	0.05	0.41***	0.34***	0.11*	0.08	0.15***	0.14***	0.14***	0.15***
	(0.39)	(0.14)	(0.00)	(0.00)	(0.08)	(0.18)	(0.00)	(0.01)	(0.00)	(0.00)
d(Excess Control Rights)	-0.28*	-0.32	-0.26**	-0.08	-3.91	-0.03	-0.51	-2.08	-0.09	-3.53*
	(0.05)	(0.11)	(0.04)	(0.54)	(0.13)	(0.99)	(0.75)	(0.17)	(0.96)	(0.08)
d(Undercapitalized)	0.29	0.74**	-0.54***	-0.36	-4.50	-0.05	-0.64	1.58	-4.05*	-6.13
	(0.33)	(0.01)	(0.00)	(0.18)	(0.18)	(0.99)	(0.80)	(0.58)	(0.09)	(0.13)
Deposits Total Assets	-0.00	-0.00	0.00***	0.00**	0.00	0.02	0.01	0.02	0.01	-0.01
	(0.96)	(0.66)	(0.00)	(0.01)	(0.86)	(0.60)	(0.44)	(0.24)	(0.80)	(0.79)
Log(Age)	-0.02	-0.03*	-0.00	-0.02	-0.22	-0.13	-0.23	-0.19	-0.22	-0.18
	(0.20)	(0.09)	(0.97)	(0.29)	(0.37)	(0.60)	(0.16)	(0.28)	(0.34)	(0.49)
d(Rescued Bank)	0.03	0.02	0.05	0.03	0.55	0.77	0.48	0.13	1.21	1.05
	(0.83)	(0.88)	(0.57)	(0.75)	(0.79)	(0.67)	(0.66)	(0.90)	(0.51)	(0.51)
Cross Listed Index	0.03**	0.03*	0.02	0.01	0.39**	0.23	0.19*	0.19*	0.34**	0.34**
	(0.04)	(0.07)	(0.18)	(0.53)	(0.05)	(0.24)	(0.09)	(0.10)	(0.03)	(0.05)
d(Merger Acquisition)	0.17*	0.15	0.01	0.02	0.77	0.53	0.38	0.61	0.82	0.88
	(0.05)	(0.12)	(0.93)	(0.73)	(0.63)	(0.76)	(0.72)	(0.57)	(0.45)	(0.47)
3-month Interbank Rate	-0.04	0.02	-0.12**	-0.10*	-1.56**	-1.77**	-2.10**	-2.48***	-1.57**	-1.75***
	(0.52)	(0.71)	(0.03)	(0.05)	(0.03)	(0.03)	(0.01)	(0.00)	(0.01)	(0.00)
GDP Growth Rate	0.01	0.00	0.04***	0.04***	0.24	0.05	0.81***	0.84***	0.68***	0.71***
	(0.68)	(0.88)	(0.01)	(0.00)	(0.42)	(0.87)	(0.00)	(0.00)	(0.00)	(0.00)
Stock Traded	0.00	0.00	0.00	0.00	0.02	0.01	0.01	0.01	0.00	0.00
	(0.82)	(0.44)	(0.36)	(0.38)	(0.18)	(0.44)	(0.18)	(0.23)	(0.97)	(0.95)
Constant	0.33	0.25	0.52**	0.51**	9.55**	8.07**	7.12**	8.44***	6.39**	6.61*
	(0.21)	(0.38)	(0.04)	(0.03)	(0.02)	(0.04)	(0.01)	(0.00)	(0.04)	(0.07)
Hansen test (P-value)	0.50	0.55	0.45	0.52	0.75	0.70	0.78	0.52	0.89	0.80
AR2 test (P-value)	0.35	0.23	0.97	0.82	0.89	0.94	0.64	0.87	0.16	0.17
Wald tests: $\alpha_1 + \alpha_2$	-0.05**	-0.02	-0.05*	-0.02	0.65**	0.41	0.43**	0.31	0.43**	0.39
$\alpha_1 + \beta_1$	-0.15**	-0.12**	-0.02	-0.05	0.31	0.42	0.24	0.40	0.29	0.45
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.08**	-0.02	-0.01	0.00	0.31	0.19	0.41	0.07	0.41	0.18
$\alpha'_1 + \alpha'_2$	0.12**	0.14**	0.04	0.04	-0.48	0.26	-0.38	-0.51	-0.52	-0.69**
$\alpha'_1 + \beta'_1$	0.01	0.01	0.09**	0.08**	-0.68**	-0.53**	-0.70**	-0.65**	-0.78**	-0.63**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.02	0.04	0.08**	0.07**	-0.93**	-0.66**	-0.94**	-1.05**	-0.84***	-0.99**

Table A1.33. Asset structure and the effect of excess control rights on capital ratio adjustment: excluding banks controlled by multiple ultimate owners

This table shows the Blundell and Bond (1998) estimation results on the effect of asset structure on the relationship between excess control rights and capital ratio adjustment over the 2002-2010 period. For robustness, we exclude from the initial sample banks controlled by more than one ultimate owner and we use a sample of 281 European commercial banks corresponding to 1,705 observations. In all the regressions, the target capital ratio is obtained by estimating a partial adjustment model (Eq. (1.3)) using the Blundell and Bond (1998) estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Lending Oriented)* is a dummy equal to one if the ratio of net loans (excluding interbank loans) to total assets is greater than the median value, and zero otherwise. The definition of other variables is provided in Table 1.4. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

	Capital adjustment				Assets adjustment					
Dependent variable	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.08**	-0.06**	-0.06**	-0.06**	0.74**	0.85**	0.43**	0.44**	0.45**	0.62**
	(0.01)	(0.03)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)	(0.03)	(0.01)	(0.01)
d(Lending Oriented) × Capital Ratio Surplus (α_2)	-0.01	-0.02	-0.02	-0.02	0.16	0.12	-0.01	-0.00	0.11	0.06
	(0.15)	(0.20)	(0.22)	(0.21)	(0.36)	(0.25)	(0.34)	(0.52)	(0.25)	(0.20)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.04	-0.02	0.04	0.03	-0.42*	-0.47*	-0.14*	-0.15*	-0.16*	-0.34**
	(0.20)	(0.46)	(0.30)	(0.32)	(0.08)	(0.05)	(0.07)	(0.06)	(0.09)	(0.03)
d(Lending Oriented) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	0.04	0.02	-0.01	-0.00	-0.14	-0.12	-0.05	-0.04	-0.09	-0.09
	(0.19)	(0.31)	(0.27)	(0.42)	(0.15)	(0.19)	(0.23)	(0.33)	(0.21)	(0.30)
Capital Ratio Shortfall (α'_1)	0.12**	0.08**	0.03	0.04	-0.49*	-0.46*	-0.33	-0.34	-0.38	-0.60***
	(0.01)	(0.01)	(0.30)	(0.21)	(0.05)	(0.05)	(0.15)	(0.17)	(0.18)	(0.00)
d(Lending Oriented) × Capital Ratio Shortfall (α'_2)	0.04	0.05	0.02	0.01	0.19*	0.20*	-0.04	-0.03	0.08	-0.01
	(0.23)	(0.15)	(0.37)	(0.40)	(0.08)	(0.06)	(0.23)	(0.33)	(0.21)	(0.38)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.08**	-0.05**	0.04*	0.05*	-0.48**	-0.49**	-0.29*	-0.30*	-0.39*	-0.12
	(0.01)	(0.01)	(0.07)	(0.08)	(0.01)	(0.01)	(0.05)	(0.09)	(0.10)	(0.43)
d(Lending Oriented) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	-0.03	-0.04	-0.02	-0.02	-0.09	-0.13	-0.32**	-0.33**	-0.10	-0.07
	(0.31)	(0.20)	(0.30)	(0.40)	(0.35)	(0.41)	(0.04)	(0.04)	(0.16)	(0.37)
Lagged dependent variable	0.04	0.04	0.40***	0.34***	0.10**	0.13***	0.13***	0.13***	0.15***	0.14***
	(0.37)	(0.28)	(0.00)	(0.00)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.48***	-0.40***	-0.16	-0.06	-3.16	-2.06	-1.03	-0.10	-0.45	-1.42
	(0.00)	(0.01)	(0.13)	(0.54)	(0.11)	(0.29)	(0.56)	(0.95)	(0.78)	(0.56)
d(Lending Oriented)	-0.16	0.04	0.09	0.25**	-0.29	0.50	0.61	2.03*	-0.62	1.86
	(0.21)	(0.73)	(0.29)	(0.01)	(0.87)	(0.75)	(0.61)	(0.08)	(0.63)	(0.20)
Deposits Total Assets	-0.00	-0.00	0.00**	0.00**	0.01	-0.01	0.03	0.02	-0.00	-0.00
	(0.44)	(0.36)	(0.01)	(0.03)	(0.61)	(0.82)	(0.15)	(0.16)	(0.91)	(0.81)
Log(Age)	-0.04**	-0.04**	-0.00	-0.01	-0.48**	-0.34*	-0.29*	-0.27**	-0.24	-0.23
	(0.02)	(0.02)	(0.91)	(0.70)	(0.01)	(0.06)	(0.07)	(0.05)	(0.16)	(0.23)
d(Rescued Bank)	0.03	0.01	0.04	0.05	1.28	0.48	0.65	0.39	0.19	0.53
	(0.79)	(0.94)	(0.64)	(0.68)	(0.50)	(0.79)	(0.64)	(0.71)	(0.92)	(0.74)
Cross Listed Index	0.03***	0.03***	0.00	0.01	0.07	0.09	0.05	0.01	0.21*	0.14
	(0.00)	(0.00)	(0.78)	(0.60)	(0.62)	(0.54)	(0.65)	(0.95)	(0.09)	(0.27)
d(Merger Acquisition)	0.10	0.10	0.03	0.01	0.11	0.56	1.24	1.28	0.39	0.15
	(0.21)	(0.24)	(0.56)	(0.88)	(0.92)	(0.63)	(0.25)	(0.10)	(0.67)	(0.88)
3-month Interbank Rate	-0.00	0.03	-0.11**	-0.09*	-1.74**	-1.48**	-1.85**	-2.10***	-1.70**	-1.94***
	(0.97)	(0.58)	(0.01)	(0.08)	(0.01)	(0.04)	(0.01)	(0.00)	(0.01)	(0.00)
GDP Growth Rate	0.01	0.01	0.01	0.00	0.19	0.23*	0.24***	0.24***	0.16*	0.20**
	(0.11)	(0.45)	(0.35)	(0.67)	(0.12)	(0.07)	(0.00)	(0.00)	(0.08)	(0.03)
Stock Traded	0.00	0.00	0.00	0.00	0.02	0.02	0.02	0.01	0.01	0.01
	(0.22)	(0.12)	(0.22)	(0.29)	(0.21)	(0.28)	(0.19)	(0.16)	(0.71)	(0.51)
Constant	0.32	0.35	0.63***	0.83	10.62***	9.96***	8.51***	10.66***	6.64**	8.07***
	(0.26)	(0.20)	(0.00)	(0.17)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
Hansen test (P-value)	0.85	0.84	0.93	0.87	0.94	0.95	0.90	0.86	0.96	0.97
AR2 test (P-value)	0.90	0.95	0.91	0.86	0.73	0.68	0.89	0.87	0.14	0.14
Wald tests: $\alpha_1 + \alpha_2$	-0.09**	-0.08**	-0.08**	-0.08**	0.90**	0.97**	0.42**	0.44**	0.56**	0.68**
$\alpha_1 + \beta_1$	-0.12**	-0.08**	-0.02	-0.03	0.32	0.38	0.29	0.29	0.29	0.28
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.09**	-0.08**	-0.05	-0.05	0.34	0.38	0.23	0.25	0.31	0.25
$\alpha'_1 + \alpha'_2$	0.16**	0.13**	0.05	0.05	-0.30	-0.26	-0.37	-0.37	-0.30	-0.61**
$\alpha'_1 + \beta'_1$	0.04	0.03	0.07**	0.09**	-0.97**	-0.95**	-0.62**	-0.64**	-0.77**	-0.72***
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.05	0.04	0.07**	0.08**	-0.87**	-0.88**	-0.98***	-1.00***	-0.79**	-0.80***

Table A1.34. Bank size and the effect of excess control rights on capital ratio adjustment: excluding banks controlled by multiple ultimate owners

   This table shows the Blundell and Bond (1998) estimation results on the effect of bank size on the relationship between excess control rights and capital ratio adjustment over the 2002-2010 period. For robustness, we exclude from the initial sample banks controlled by more than one ultimate owner and we use a sample of 281 European commercial banks corresponding to 1,705 observations. In all the regressions, the target capital ratio is obtained by estimating a partial adjustment model (Eq. (1.3)) using the Blundell and Bond (1998) estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Large Bank)* is a dummy equal to one if the bank's total assets is above the median value, and zero otherwise. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. The definition of other variables is provided in Table 1.4. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Capital adjustment				Assets adjustment					
	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.07**	-0.05**	-0.08**	-0.05**	0.84**	0.95***	0.44*	0.46**	0.53**	0.61**
	(0.04)	(0.03)	(0.01)	(0.04)	(0.01)	(0.00)	(0.09)	(0.05)	(0.03)	(0.04)
d(Large Bank) × Capital Ratio Surplus (α_2)	0.00	-0.05	0.01	-0.01	0.03	0.04	0.04	0.04	0.18	0.18
	(0.96)	(0.46)	(0.18)	(0.71)	(0.62)	(0.96)	(0.95)	(0.92)	(0.46)	(0.17)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.01	-0.02	0.04	0.01	-0.42**	-0.50**	-0.15*	-0.22**	-0.16*	-0.36*
	(0.70)	(0.35)	(0.29)	(0.92)	(0.02)	(0.04)	(0.10)	(0.04)	(0.07)	(0.05)
d(Large Bank) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	-0.05	-0.02	-0.03	0.04	-0.09	-0.04	-0.05	-0.08	-0.08	-0.06
	(0.79)	(0.90)	(0.74)	(0.39)	(0.66)	(0.90)	(0.65)	(0.90)	(0.48)	(0.11)
Capital Ratio Shortfall (α'_1)	0.16***	0.14**	0.03	0.06*	-0.27	-0.08	-0.36	-0.35	-0.35	-0.83**
	(0.01)	(0.01)	(0.47)	(0.10)	(0.13)	(0.15)	(0.29)	(0.18)	(0.17)	(0.03)
d(Large Bank) × Capital Ratio Shortfall (α'_2)	0.02	0.02	0.01	-0.01	-0.12	-0.13	-0.11	-0.12	-0.15	-0.05
	(0.58)	(0.34)	(0.86)	(0.58)	(0.84)	(0.75)	(0.62)	(0.55)	(0.23)	(0.28)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.08***	-0.07**	0.04*	0.02*	-0.40**	-0.63**	-0.34**	-0.33**	-0.36**	-0.07
	(0.01)	(0.02)	(0.09)	(0.08)	(0.02)	(0.01)	(0.05)	(0.05)	(0.04)	(0.24)
d(Large Bank) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	-0.06**	-0.07**	-0.03*	-0.05*	-0.45**	-0.27*	-0.48**	-0.35**	-0.35**	-0.08
	(0.01)	(0.01)	(0.08)	(0.07)	(0.05)	(0.07)	(0.02)	(0.03)	(0.04)	(0.62)
Lagged dependent variable	0.03	0.04	0.39***	0.37***	0.10**	0.11***	0.12***	0.12***	0.16***	0.17***
	(0.43)	(0.30)	(0.00)	(0.00)	(0.02)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.23	-0.41**	-0.12	-0.08	-2.42	-1.90	-0.62	-0.36	-2.35	-1.33
	(0.19)	(0.02)	(0.23)	(0.43)	(0.20)	(0.36)	(0.61)	(0.80)	(0.13)	(0.53)
d(Large Bank)	-0.42**	-0.30	-0.24***	-0.02	-4.05*	-1.41	-1.94	-1.58	-6.29***	-4.65**
	(0.04)	(0.10)	(0.01)	(0.84)	(0.06)	(0.44)	(0.19)	(0.25)	(0.01)	(0.03)
Deposits Total Assets	-0.00*	-0.00*	0.00	0.00	-0.02	-0.02	0.00	0.01	-0.03	-0.03
	(0.06)	(0.06)	(0.16)	(0.16)	(0.48)	(0.41)	(0.80)	(0.69)	(0.21)	(0.16)
Log(Age)	-0.02	-0.03*	0.00	-0.00	-0.21	-0.18	-0.26**	-0.25*	-0.00	-0.05
	(0.22)	(0.08)	(0.83)	(0.96)	(0.30)	(0.37)	(0.04)	(0.07)	(0.99)	(0.79)
d(Rescued Bank)	0.04	0.01	0.01	0.04	0.59	0.36	1.07	0.64	0.14	-0.02
	(0.72)	(0.95)	(0.93)	(0.65)	(0.71)	(0.84)	(0.27)	(0.50)	(0.93)	(0.99)
Cross Listed Index	0.01	0.03***	0.01	0.01	0.02	0.01	0.04	0.04	0.12	0.11
	(0.25)	(0.01)	(0.49)	(0.50)	(0.89)	(0.91)	(0.62)	(0.61)	(0.27)	(0.33)
d(Merger Acquisition)	0.11	0.08	0.04	0.01	0.85	0.02	1.59*	1.11	0.04	0.17
	(0.15)	(0.35)	(0.51)	(0.87)	(0.48)	(0.98)	(0.09)	(0.18)	(0.97)	(0.86)
3-month Interbank Rate	-0.01	0.03	-0.10**	-0.08*	-1.86***	-1.87**	-1.89***	-2.36***	-1.66***	-1.49***
	(0.83)	(0.62)	(0.03)	(0.08)	(0.00)	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)
GDP Growth Rate	0.01	0.01	0.00	0.00	0.16	0.19	0.18***	0.21***	0.13	0.10
	(0.17)	(0.40)	(0.44)	(0.80)	(0.18)	(0.14)	(0.01)	(0.00)	(0.18)	(0.29)
Stock Traded	0.00	0.00	0.00	0.00	0.02	0.02	0.01	0.01	0.00	0.01
	(0.58)	(0.20)	(0.26)	(0.46)	(0.21)	(0.18)	(0.14)	(0.23)	(0.79)	(0.52)
Constant	0.77**	0.59*	0.81***	0.55**	13.49***	13.05***	10.87***	12.07***	12.13***	9.29***
	(0.02)	(0.06)	(0.00)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Hansen test (P-value)	0.93	0.79	0.89	0.83	0.94	0.87	0.87	0.91	0.88	0.89
AR2 test (P-value)	0.87	0.90	0.83	0.84	0.82	0.67	0.89	0.92	0.16	0.15
Wald tests: $\alpha_1 + \alpha_2$	-0.07**	-0.10**	-0.07**	-0.06**	0.87**	0.99**	0.48*	0.50**	0.71**	0.79**
$\alpha_1 + \beta_1$	-0.08**	-0.07**	-0.04	-0.04	0.42	0.45	0.29	0.24	0.37	0.25
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.13**	-0.14**	-0.06	-0.01	0.36	0.45	0.28	0.20	0.47	0.37
$\alpha'_1 + \alpha'_2$	0.18**	0.16***	0.04	0.05	-0.39	-0.21	-0.47	-0.47	-0.50	-0.88**
$\alpha'_1 + \beta'_1$	0.08*	0.07*	0.07**	0.08**	-0.67**	-0.71**	-0.70**	-0.68**	-0.71**	-0.90**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.04	0.02	0.05	0.02	-1.24**	-1.11**	-1.29**	-1.15**	-1.21**	-1.03**

Table A1.35. Estimating the target capital ratio: excluding Italian banks

This table shows the Blundell and Bond (1998) estimation results of the target capital ratio based on a partial adjustment model (Eq. (1.3)) over the 2002-2010 period. For robustness, we exclude from the initial sample Italian banks and we use a sample of 242 European commercial banks corresponding to 1,526 observations. *Tier 1 Total Assets* is Tier 1 capital divided by total assets. *Tier 1 RWA* is Tier 1 capital divided by risk-weighted assets. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. *Log(Total Assets)* is the natural logarithm of the bank's total assets. *Return On Assets* is net income divided by total assets. *Loan Loss Provisions* is loan loss provisions divided by net loans. *Loans Total Assets* is net loans divided by total assets. *Market Discipline* is total long term market funding divided by total funding. *d(Listed Bank)* is a dummy equal to one if the bank is publicly listed, and zero otherwise. *GDP Growth Rate* is the real Gross Domestic Product (GDP) growth rate. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. In the last three rows, we report the summary statistics (mean, maximum and minimum) of the estimated target capital ratio. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Tier 1 Total Assets	Tier 1 RWA
Lagged dependent variable	0.60***	0.67***
	(0.00)	(0.00)
d(Excess Control Rights)	-0.35**	-0.72**
	(0.02)	(0.01)
Log(Total Assets)	-0.74***	-0.54***
	(0.00)	(0.00)
Return On Assets	0.55***	0.38***
	(0.00)	(0.00)
Loan Loss Provisions	0.15***	0.13*
	(0.00)	(0.06)
Loans Total Assets	-0.01*	-0.03***
	(0.08)	(0.00)
Market Discipline	0.01***	0.02***
	(0.00)	(0.00)
d(Listed Bank)	-0.80**	-1.00*
	(0.05)	(0.05)
GDP Growth Rate	-0.00	-0.01
	(0.60)	(0.45)
Constant	7.34***	6.82***
	(0.00)	(0.00)
Hansen test (P-value)	0.14	0.15
AR2 test (P-value)	0.27	0.57
Fitted target (%): Mean	7.06	12.07
Maximum	14.25	24.07
Minimum	1.87	4.12

Table A1.36. Excess control rights and capital ratio adjustment: excluding Italian banks

This table shows the Blundell and Bond (1998) estimation results on the effect of excess control rights on capital ratio adjustment (Eq. (1.6)) over the 2002-2010 period. For robustness, we exclude from the initial sample Italian banks and we use a sample of 242 European commercial banks corresponding to 1,526 observations. In all the regressions, the fitted target capital ratio is obtained by estimating a partial adjustment model (Eq. (1.3)) using the Blundell and Bond (1998) estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets, Δ Loans,* and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. *Deposits Total Assets* is total customer deposits divided by total assets. *Log(Age)* is the natural logarithm of bank age. *d(Rescued Bank)* is a dummy equal to one if the bank was rescued during the 2008 financial crisis, and zero otherwise. *Cross Listed Index* is an index equal to the number of stock markets on which the bank is listed, and zero if the bank is privately owned. *d(Merger Acquisition)* is a dummy equal to one if the bank experienced a merger-acquisition event during the sample period, and zero otherwise. *3-month Interbank Rate* is the three-month interbank rate. *GDP Growth Rate* is the real Gross Domestic Product (GDP) growth rate. *Stock Traded* is the value of listed shares divided by GDP. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

	Capital adjustment				Assets adjustment					
Dependent variable	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.06*	-0.04*	-0.04**	-0.04**	0.88**	0.96**	0.41**	0.53**	0.48**	0.66**
	(0.06)	(0.07)	(0.03)	(0.01)	(0.01)	(0.01)	(0.03)	(0.02)	(0.05)	(0.03)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.08	-0.03	0.02	0.02	-0.44**	-0.48**	-0.13*	-0.25**	-0.27**	-0.34*
	(0.14)	(0.34)	(0.78)	(0.60)	(0.05)	(0.02)	(0.06)	(0.02)	(0.04)	(0.06)
Capital Ratio Shortfall (α'_1)	0.16***	0.11***	0.02	0.04*	-0.36	0.16	-0.34	-0.40	-0.25	-0.56**
	(0.00)	(0.00)	(0.59)	(0.09)	(0.16)	(0.57)	(0.34)	(0.11)	(0.50)	(0.02)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.12***	-0.07*	0.05*	0.03*	-0.29*	-0.88**	-0.28**	-0.29**	-0.25*	-0.05
	(0.00)	(0.06)	(0.05)	(0.10)	(0.05)	(0.02)	(0.03)	(0.03)	(0.09)	(0.33)
Lagged dependent variable	0.02	0.03	0.44***	0.41***	0.13***	0.13***	0.14***	0.12***	0.15***	0.16***
	(0.48)	(0.45)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)
d(Excess Control Rights)	-0.37***	-0.41*	-0.21*	-0.12	-3.48	-0.67	-0.50	-0.02	-0.82	-0.25
	(0.01)	(0.06)	(0.08)	(0.25)	(0.11)	(0.78)	(0.68)	(0.99)	(0.66)	(0.54)
Deposits Total Assets	-0.00	-0.00	0.00*	0.00**	0.02	0.00	0.03*	0.03*	0.01	0.01
	(0.10)	(0.21)	(0.08)	(0.03)	(0.50)	(0.85)	(0.06)	(0.09)	(0.58)	(0.62)
Log(Age)	-0.00	-0.02	-0.01	-0.01	-0.35*	-0.11	-0.33**	-0.24	-0.17	-0.23
	(0.86)	(0.37)	(0.51)	(0.32)	(0.10)	(0.57)	(0.03)	(0.16)	(0.36)	(0.20)
d(Rescued Bank)	0.00	0.03	0.00	0.06	1.08	0.69	0.54	0.11	0.02	0.47
	(0.99)	(0.76)	(0.99)	(0.46)	(0.40)	(0.67)	(0.47)	(0.90)	(0.99)	(0.73)
Cross Listed Index	0.03**	0.03**	-0.00	0.00	0.26	0.27	0.16*	0.06	0.34**	0.45***
	(0.02)	(0.03)	(0.68)	(0.83)	(0.16)	(0.11)	(0.09)	(0.64)	(0.01)	(0.00)
d(Merger Acquisition)	0.10	0.09	0.05	0.01	0.61	0.35	1.11	1.32	1.11	1.51
	(0.19)	(0.28)	(0.49)	(0.93)	(0.70)	(0.81)	(0.24)	(0.22)	(0.25)	(0.13)
3-month Interbank Rate	0.01	0.01	-0.12***	-0.12***	-2.00***	-1.93**	-2.33***	-2.54***	-1.79***	-1.81***
	(0.83)	(0.82)	(0.01)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
GDP Growth Rate	0.02	0.02	0.04***	0.03***	0.39	0.32	0.70***	0.70***	0.52***	0.53***
	(0.24)	(0.42)	(0.01)	(0.00)	(0.15)	(0.23)	(0.00)	(0.00)	(0.00)	(0.00)
Stock Traded	0.00	0.00	0.00	0.00	0.01	0.02	0.01	0.01	0.00	0.01
	(0.81)	(0.48)	(0.11)	(0.13)	(0.69)	(0.24)	(0.27)	(0.31)	(0.96)	(0.65)
Constant	0.15	0.14	0.53**	0.48**	12.03***	10.22***	9.47***	9.65***	7.90***	9.34***
	(0.59)	(0.61)	(0.02)	(0.02)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
Hansen test (P-value)	0.15	0.11	0.18	0.22	0.24	0.32	0.12	0.15	0.27	0.40
AR2 test (P-value)	0.40	0.36	0.75	0.19	0.54	0.45	0.44	0.35	0.35	0.25
Wald tests: $\alpha_1 + \beta_1$	-0.14**	-0.07**	-0.02	-0.03*	0.44	0.48	0.28	0.28	0.21	0.32
$\alpha'_1 + \beta'_1$	0.04	0.04	0.07**	0.07**	-0.65**	-0.72**	-0.62**	-0.69**	-0.50*	-0.61**

Table A1.37. Ownership type and the effect of excess control rights on capital ratio adjustment: excluding Italian banks

This table shows the Blundell and Bond (1998) estimation results on the effect of ownership type on the relationship between excess control rights and capital ratio adjustment (Eq. (1.7)) over the 2002-2010 period. We exclude from the initial sample banks for which the control chain is a cross-holding (for simplicity) and Italian banks (for robustness) and we use a sample of 237 European commercial banks corresponding to 1,493 observations. In all the regressions, the fitted target capital ratio is obtained by estimating a partial adjustment model (Eq. (1.3)) using the Blundell and Bond (1998) estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Family)* is a dummy equal to one if the bank is family-controlled, and zero otherwise. *d(State)* is a dummy equal to one if the bank is state-controlled, and zero otherwise. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. *Deposits Total Assets* is total customer deposits divided by total assets. *Log(Age)* is the natural logarithm of bank age. *d(Rescued Bank)* is a dummy equal to one if the bank was rescued during the 2008 financial crisis, and zero otherwise. *Cross Listed Index* is an index equal to the number of stock markets on which the bank is listed, and zero if the bank is privately owned. *d(Merger Acquisition)* is a dummy equal to one if the bank experienced a merger-acquisition event during the sample period, and zero otherwise. *3-month Interbank Rate* is the three-month interbank rate. *GDP Growth Rate* is the real Gross Domestic Product (GDP) growth rate. *Stock Traded* is the value of listed shares divided by GDP. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

| | Capital adjustment | | | | Assets adjustment | | | | | |
| Dependent variable | Δ Tier 1 | | Retained Earnings | | Δ Assets | | Δ Loans | | Δ RWA | |
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.12**	-0.05**	-0.07**	-0.06**	0.74**	0.83**	0.32*	0.45**	0.42**	0.63**
	(0.01)	(0.04)	(0.02)	(0.02)	(0.01)	(0.03)	(0.06)	(0.01)	(0.03)	(0.05)
d(Family) × Capital Ratio Surplus (α_2)	0.08	0.00	0.01	0.03	0.13	0.15	0.16	0.14	0.15	0.15
	(0.66)	(0.76)	(0.30)	(0.27)	(0.45)	(0.30)	(0.28)	(0.49)	(0.48)	(0.57)
d(State) × Capital Ratio Surplus (α_3)	0.06	-0.01	-0.02	0.02	0.03	0.22	0.08	0.07	0.09	0.15
	(0.45)	(0.66)	(0.21)	(0.41)	(0.89)	(0.27)	(0.39)	(0.52)	(0.24)	(0.60)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.05	-0.01	-0.00	-0.01	-0.38	-0.38	-0.12	-0.14	-0.21	-0.30
	(0.54)	(0.92)	(0.18)	(0.61)	(0.13)	(0.68)	(0.67)	(0.60)	(0.28)	(0.43)
d(Family) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	-0.07*	-0.06*	0.03*	0.02	-0.06	-0.16	-0.05	-0.17	-0.17	-0.12
	(0.06)	(0.08)	(0.06)	(0.43)	(0.67)	(0.19)	(0.59)	(0.87)	(0.84)	(0.46)
d(State) × d(Excess Control Rights) × Capital Ratio Surplus (β_3)	-0.01	-0.01	-0.12	-0.02	0.07	-0.16	0.03	-0.07	-0.10	-0.12
	(0.28)	(0.41)	(0.43)	(0.13)	(0.39)	(0.19)	(0.67)	(0.38)	(0.21)	(0.31)
Capital Ratio Shortfall (α'_1)	0.15**	0.08**	0.04	0.06*	-0.36	0.10	-0.41	-0.40	-0.33	-0.52**
	(0.01)	(0.01)	(0.26)	(0.08)	(0.19)	(0.60)	(0.16)	(0.29)	(0.18)	(0.02)
d(Family) × Capital Ratio Shortfall (α'_2)	0.08	0.06	0.02	0.01	0.05	0.08	0.07	-0.09	0.15	-0.04
	(0.14)	(0.13)	(0.94)	(0.36)	(0.38)	(0.38)	(0.26)	(0.83)	(0.49)	(0.57)
d(State) × Capital Ratio Shortfall (α'_3)	0.01	-0.02	-0.03	-0.01	0.02	0.03	0.05	-0.07	0.04	-0.07
	(0.74)	(0.20)	(0.28)	(0.86)	(0.82)	(0.55)	(0.29)	(0.76)	(0.83)	(0.50)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.07	-0.01	0.03	0.00	-0.12	-0.52	-0.07	-0.11	-0.06	-0.07
	(0.12)	(0.26)	(0.18)	(0.84)	(0.36)	(0.17)	(0.61)	(0.14)	(0.54)	(0.27)
d(Family) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	-0.15**	-0.10**	-0.00	0.01*	-0.54**	-0.66**	-0.32**	-0.41**	-0.46*	-0.10
	(0.03)	(0.00)	(0.75)	(0.07)	(0.01)	(0.04)	(0.01)	(0.03)	(0.07)	(0.17)
d(State) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_3)	-0.01	0.07**	-0.05	-0.02	-0.15	-0.15	-0.14	0.12**	-0.10	0.10
	(0.97)	(0.02)	(0.43)	(0.88)	(0.19)	(0.34)	(0.38)	(0.01)	(0.48)	(0.13)
Lagged dependent variable	0.02	0.01	0.49***	0.47***	0.12**	0.12**	0.19***	0.18***	0.14***	0.19***
	(0.65)	(0.74)	(0.00)	(0.00)	(0.02)	(0.02)	(0.00)	(0.00)	(0.00)	(0.01)
d(Excess Control Rights)	-0.37**	-0.56**	-0.22*	-0.17	-4.00*	-0.16	-0.43	-0.21	-0.70	-0.72
	(0.02)	(0.02)	(0.09)	(0.13)	(0.08)	(0.95)	(0.76)	(0.90)	(0.78)	(0.72)
d(Family)	-0.05	0.39	0.16	-0.14	4.00	3.29	1.80	1.71	1.17	2.13
	(0.81)	(0.25)	(0.34)	(0.38)	(0.21)	(0.34)	(0.45)	(0.49)	(0.73)	(0.54)
d(State)	0.18	0.43**	0.27*	0.12	2.92	2.96	3.32	4.29*	2.77	-4.69**
	(0.38)	(0.02)	(0.08)	(0.45)	(0.40)	(0.35)	(0.13)	(0.07)	(0.35)	(0.04)

Table A1.37 (continued)

Deposits Total Assets	-0.00**	-0.00	0.00	0.00	0.02	0.02	0.03*	0.03*	0.02	0.02
	(0.04)	(0.29)	(0.13)	(0.22)	(0.59)	(0.46)	(0.06)	(0.09)	(0.49)	(0.25)
Log(Age)	-0.00	-0.01	-0.00	-0.01	-0.21	-0.17	-0.22	-0.24	-0.18	-0.20
	(0.82)	(0.40)	(0.81)	(0.67)	(0.33)	(0.40)	(0.16)	(0.13)	(0.36)	(0.32)
d(Rescued Bank)	0.05	0.02	0.03	0.02	1.09	2.14	0.06	0.13	0.52	0.66
	(0.64)	(0.85)	(0.61)	(0.77)	(0.36)	(0.19)	(0.94)	(0.88)	(0.69)	(0.61)
Cross Listed Index	0.02*	0.02*	0.00	0.00	0.25	0.19	0.09	0.09	0.28**	0.36***
	(0.05)	(0.06)	(0.80)	(0.58)	(0.17)	(0.28)	(0.41)	(0.40)	(0.03)	(0.00)
d(Merger Acquisition)	0.11	0.11	0.03	0.01	0.29	0.54	1.10	1.00	1.55	0.55
	(0.15)	(0.17)	(0.58)	(0.86)	(0.85)	(0.70)	(0.24)	(0.32)	(0.16)	(0.59)
3-month Interbank Rate	0.01	0.04	-0.10**	-0.12***	-2.20***	-1.95***	-2.25***	-2.37***	-1.81***	-2.04***
	(0.91)	(0.45)	(0.02)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
GDP Growth Rate	0.03	0.02	0.03***	0.03***	0.32	0.18	0.75***	0.67***	0.53***	0.48***
	(0.14)	(0.19)	(0.00)	(0.00)	(0.24)	(0.54)	(0.00)	(0.00)	(0.00)	(0.00)
Stock Traded	0.00	0.00	0.00	0.00	0.01	0.00	0.02	0.01	0.00	0.00
	(0.87)	(0.44)	(0.26)	(0.43)	(0.68)	(0.91)	(0.12)	(0.25)	(0.85)	(0.84)
Constant	0.18	-0.13	0.39*	0.42**	9.63**	10.39**	6.85***	7.91***	7.52**	8.99***
	(0.50)	(0.64)	(0.09)	(0.04)	(0.02)	(0.02)	(0.00)	(0.00)	(0.01)	(0.00)
Hansen test (P-value)	0.12	0.14	0.15	0.10	0.20	0.16	0.17	0.15	0.13	0.10
AR2 test (P-value)	0.88	0.82	0.76	0.85	0.36	0.27	0.67	0.66	0.35	0.21
Wald tests: $\alpha_1+\alpha_2$	-0.04**	-0.05**	-0.06**	-0.03*	0.87**	0.98**	0.48**	0.59**	0.57**	0.78**
$\alpha_1+\alpha_3$	-0.06*	-0.06**	-0.09**	-0.04**	0.77**	1.05**	0.40**	0.52**	0.51**	0.78**
$\alpha_1+\beta_1$	-0.17**	-0.06**	-0.07**	-0.07*	0.36	0.45	0.20	0.31	0.21	0.33
$\alpha_1+\alpha_2+\beta_1+\beta_2$	-0.16**	-0.12**	-0.03	-0.02	0.43	0.44	0.31	0.28	0.19	0.36
$\alpha_1+\alpha_3+\beta_1+\beta_3$	-0.12**	-0.08**	-0.21**	-0.07**	0.46	0.51	0.31	0.31	0.20	0.36
$\alpha'_1+\alpha'_2$	0.23**	0.14**	0.06	0.07*	-0.31	0.18	-0.34	-0.49	-0.18	-0.56**
$\alpha'_1+\alpha'_3$	0.16**	0.06**	0.01	0.05*	-0.34	0.13	-0.36	-0.47	-0.29	-0.59**
$\alpha'_1+\beta'_1$	0.08**	0.07**	0.07*	0.06*	-0.48	-0.42	-0.48	-0.51*	-0.39	-0.59**
$\alpha'_1+\alpha'_2+\beta'_1+\beta'_2$	0.01	0.03	0.09**	0.08**	-0.97**	-1.00**	-0.73**	-1.01**	-0.70*	-0.73**
$\alpha'_1+\alpha'_3+\beta'_1+\beta'_3$	0.08**	0.12**	-0.01	0.03	-0.61	-0.54*	-0.57	-0.46	-0.45	-0.56

Table A1.38. Shareholder protection and the effect of excess control rights on capital ratio adjustment: excluding Italian banks

This table shows the Blundell and Bond (1998) estimation results on the effect of shareholder protection rights on the relationship between excess control rights and capital ratio adjustment (Eq. (1.7)) over the 2002-2010 period. For robustness, we exclude from the initial sample Italian banks and we use a sample of 242 European commercial banks corresponding to 1,526 observations. In all the regressions, the fitted target capital ratio is obtained by estimating a partial adjustment model (Eq. (1.3)) using the Blundell and Bond (1998) estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Owner Rights)* is a dummy equal to one if the shareholder protection index as defined in Djankov et al. (2008) is greater than the median value, and zero otherwise. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. The definition of other variables is provided in Table 1.4. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

	Capital adjustment				Assets adjustment					
Dependent variable	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.07**	-0.07*	-0.07**	-0.06**	0.71**	0.90**	0.32*	0.45**	0.39**	0.61**
	(0.01)	(0.07)	(0.01)	(0.03)	(0.04)	(0.02)	(0.07)	(0.03)	(0.01)	(0.04)
d(Owner Rights) × Capital Ratio Surplus (α_2)	0.01	0.03	-0.02	0.01	0.14	0.09	0.16	0.15	0.17	0.18
	(0.15)	(0.26)	(0.32)	(0.42)	(0.58)	(0.21)	(0.54)	(0.88)	(0.87)	(0.39)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.08	-0.02	0.05	0.04	-0.36	-0.49	-0.03	-0.16	-0.19	-0.30
	(0.57)	(0.67)	(0.19)	(0.19)	(0.28)	(0.63)	(0.38)	(0.62)	(0.70)	(0.31)
d(Owner Rights) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	0.05	0.01	-0.03	-0.05*	-0.08	-0.02	-0.17	0.06	-0.18	-0.15
	(0.94)	(0.67)	(0.14)	(0.09)	(0.68)	(0.68)	(0.20)	(0.91)	(0.35)	(0.33)
Capital Ratio Shortfall (α'_1)	0.14**	0.09**	0.04	0.05*	-0.35	-0.08	-0.35	-0.30	-0.19	-0.57**
	(0.04)	(0.04)	(0.33)	(0.05)	(0.20)	(0.66)	(0.16)	(0.15)	(0.58)	(0.05)
d(Owner Rights) × Capital Ratio Shortfall (α'_2)	0.05	0.06	0.01	-0.00	-0.09	0.16	-0.04	-0.26	-0.07	-0.05
	(0.42)	(0.17)	(0.64)	(0.96)	(0.70)	(0.43)	(0.80)	(0.20)	(0.30)	(0.33)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.12**	-0.08**	0.04*	0.03*	-0.48**	-0.87**	-0.50**	-0.62**	-0.50**	-0.10
	(0.02)	(0.03)	(0.05)	(0.09)	(0.02)	(0.02)	(0.02)	(0.02)	(0.04)	(0.42)
d(Owner Rights) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	-0.00	-0.00	-0.03	-0.04	0.35	0.26	0.47*	0.55*	0.45	0.14
	(0.90)	(0.96)	(0.73)	(0.42)	(0.23)	(0.21)	(0.09)	(0.09)	(0.34)	(0.24)
Lagged dependent variable	0.01	0.02	0.47***	0.44***	0.14***	0.17***	0.13***	0.17***	0.15***	0.17***
	(0.84)	(0.53)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.34**	-0.42**	-0.25*	-0.07	-1.85	-0.79	-1.13	-0.04	-1.04	-2.15
	(0.01)	(0.03)	(0.05)	(0.47)	(0.41)	(0.70)	(0.37)	(0.98)	(0.56)	(0.18)
Deposits Total Assets	-0.00	-0.00	0.00*	0.00	0.02	-0.01	0.03*	0.03**	0.01	0.02
	(0.13)	(0.12)	(0.06)	(0.16)	(0.43)	(0.76)	(0.09)	(0.05)	(0.76)	(0.44)
Log(Age)	-0.01	-0.02	-0.00	-0.00	-0.28	-0.15	-0.31**	-0.31*	-0.13	-0.15
	(0.77)	(0.44)	(0.93)	(0.73)	(0.15)	(0.46)	(0.04)	(0.06)	(0.53)	(0.46)
d(Rescued Bank)	0.01	0.02	0.01	0.07	1.23	1.74	0.54	0.36	0.05	0.23
	(0.93)	(0.87)	(0.87)	(0.33)	(0.35)	(0.18)	(0.47)	(0.65)	(0.97)	(0.86)
Cross Listed Index	0.03**	0.03***	0.01	0.00	0.24	0.19	0.12	0.10	0.31**	0.36**
	(0.03)	(0.01)	(0.44)	(0.99)	(0.20)	(0.25)	(0.21)	(0.29)	(0.03)	(0.01)
d(Merger Acquisition)	0.12	0.11	0.06	0.06	0.13	0.27	1.22	0.88	1.18	1.01
	(0.12)	(0.12)	(0.38)	(0.33)	(0.94)	(0.84)	(0.23)	(0.36)	(0.20)	(0.28)
3-month Interbank Rate	-0.00	0.03	-0.12**	-0.11**	-1.71**	-1.90**	-2.33**	-2.47***	-1.86**	-1.85***
	(0.97)	(0.57)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
GDP Growth Rate	0.03	0.02	0.04***	0.03***	0.39	0.35	0.71***	0.69***	0.60***	0.47***
	(0.21)	(0.21)	(0.00)	(0.00)	(0.17)	(0.16)	(0.00)	(0.00)	(0.00)	(0.00)
Stock Traded	0.00	0.00	0.00	0.00*	0.01	0.01	0.01*	0.01	0.01	0.01
	(0.96)	(0.55)	(0.31)	(0.10)	(0.58)	(0.41)	(0.09)	(0.11)	(0.64)	(0.42)
Constant	0.45	0.20	0.62**	0.49**	9.82**	11.10***	9.22***	9.48***	6.68**	8.43***
	(0.13)	(0.52)	(0.03)	(0.05)	(0.02)	(0.01)	(0.00)	(0.00)	(0.02)	(0.00)
Hansen test (P-value)	0.30	0.20	0.10	0.21	0.30	0.51	0.22	0.20	0.31	0.41
AR2 test (P-value)	0.49	0.37	0.83	0.82	0.48	0.38	0.38	0.39	0.14	0.14
Wald tests: $\alpha_1 + \alpha_2$	-0.06**	-0.04*	-0.09**	-0.05**	0.85**	0.99**	0.48**	0.60**	0.56**	0.79**
$\alpha_1 + \beta_1$	-0.15**	-0.09**	-0.02	-0.02	0.35	0.41	0.29	0.29	0.20	0.31
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.09**	-0.05**	-0.07**	-0.06**	0.41*	0.48*	0.28	0.50	0.19	0.34
$\alpha'_1 + \alpha'_2$	0.19**	0.15**	0.05	0.05	-0.44	0.08	-0.39	-0.56	-0.26	-0.62**
$\alpha'_1 + \beta'_1$	0.02	0.01	0.08**	0.08**	-0.83**	-0.95**	-0.85**	-0.92**	-0.69**	-0.67**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.07**	0.07**	0.06*	0.04	-0.57*	-0.53	-0.42	-0.63	-0.31	-0.58*

Table A1.39. 2008 financial crisis and the effect of excess control rights on capital ratio adjustment: excluding Italian banks

This table shows the Blundell and Bond (1998) estimation results on the effect of the 2008 financial crisis on the relationship between excess control rights and capital ratio adjustment (Eq. (1.7)) over the 2002-2010 period. For robustness, we exclude from the initial sample Italian banks and we use a sample of 242 European commercial banks corresponding to 1,526 observations. In all the regressions, the fitted target capital ratio is obtained by estimating a partial adjustment model (Eq. (1.3)) using the Blundell and Bond (1998) estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Crisis)* is a dummy equal to one if the observation is from 2008 or 2009, and zero otherwise. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. The definition of other variables is provided in Table 1.4. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

| | Capital adjustment | | | | Assets adjustment | | | | | |
| Dependent variable | Δ Tier 1 | | Retained Earnings | | Δ Assets | | Δ Loans | | Δ RWA | |
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.09**	-0.06**	-0.05**	-0.06**	1.08**	1.15**	0.51**	0.63**	0.61**	0.92**
	(0.02)	(0.01)	(0.03)	(0.03)	(0.02)	(0.01)	(0.04)	(0.02)	(0.04)	(0.01)
d(Crisis) × Capital Ratio Surplus (α_2)	0.04*	0.03	-0.01	-0.02	-0.61	-0.41	-0.21	-0.28	-0.30	-0.39
	(0.08)	(0.54)	(0.17)	(0.10)	(0.75)	(0.69)	(0.72)	(0.59)	(0.12)	(0.27)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.03	-0.03	0.02	0.02	-0.62	-0.62	-0.16	-0.28	-0.33	-0.51
	(0.53)	(0.51)	(0.60)	(0.14)	(0.75)	(0.44)	(0.58)	(0.78)	(0.43)	(0.45)
d(Crisis) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	0.02	0.01	-0.01	-0.01	0.50	0.37	0.08	0.16	0.23	0.33
	(0.64)	(0.25)	(0.92)	(0.60)	(0.26)	(0.40)	(0.70)	(0.67)	(0.80)	(0.29)
Capital Ratio Shortfall (α'_1)	0.16**	0.12**	0.05	0.05	-0.42	0.07	-0.25	-0.31	-0.26	-0.66**
	(0.04)	(0.01)	(0.17)	(0.11)	(0.26)	(0.84)	(0.72)	(0.34)	(0.22)	(0.03)
d(Crisis) × Capital Ratio Shortfall (α'_2)	-0.06*	-0.04	-0.01	-0.01	-0.06	0.22	-0.21	-0.16	-0.21	0.21
	(0.08)	(0.82)	(0.21)	(0.20)	(0.50)	(0.68)	(0.65)	(0.59)	(0.12)	(0.81)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.13*	-0.10*	0.04	0.05*	-0.53*	-0.98**	-0.43**	-0.53*	-0.51**	-0.15
	(0.08)	(0.08)	(0.16)	(0.05)	(0.08)	(0.02)	(0.05)	(0.06)	(0.03)	(0.83)
d(Crisis) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	0.10	0.08	-0.03	-0.04	0.50	0.21	0.43	0.51	0.60	0.36
	(0.27)	(0.16)	(0.42)	(0.71)	(0.19)	(0.45)	(0.27)	(0.36)	(0.17)	(0.29)
Lagged dependent variable	0.03	0.02	0.41***	0.39***	0.12***	0.12***	0.13***	0.12***	0.15***	0.18***
	(0.42)	(0.56)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.48***	-0.40***	-0.08	-0.09	-0.08	-0.32	-0.51	-0.32	-1.30	-2.24
	(0.00)	(0.00)	(0.39)	(0.37)	(0.97)	(0.88)	(0.70)	(0.83)	(0.35)	(0.12)
Deposits Total Assets	-0.00*	-0.00**	0.00**	0.00**	0.00	-0.00	0.03**	0.02	-0.00	0.01
	(0.05)	(0.02)	(0.01)	(0.01)	(0.90)	(0.84)	(0.03)	(0.21)	(0.97)	(0.36)
Log(Age)	-0.01	-0.02	-0.00	-0.00	-0.34*	-0.36**	-0.25**	-0.23*	-0.19	-0.20
	(0.34)	(0.14)	(0.75)	(0.71)	(0.05)	(0.03)	(0.02)	(0.08)	(0.17)	(0.17)
d(Rescued Bank)	0.02	0.02	0.01	0.02	1.83	1.31	1.24	0.60	0.36	0.13
	(0.83)	(0.80)	(0.85)	(0.82)	(0.13)	(0.36)	(0.11)	(0.46)	(0.73)	(0.91)
Cross Listed Index	0.03**	0.03***	0.00	0.00	0.20*	0.15	0.08	0.13	0.28***	0.32***
	(0.01)	(0.00)	(0.86)	(0.82)	(0.09)	(0.25)	(0.37)	(0.19)	(0.00)	(0.00)
d(Merger Acquisition)	0.01	0.03	0.01	0.03	0.71	0.82	1.48*	1.48*	0.18	0.80
	(0.90)	(0.70)	(0.83)	(0.55)	(0.50)	(0.50)	(0.07)	(0.07)	(0.85)	(0.39)
3-month Interbank Rate	0.03	0.03	-0.11***	-0.09**	-2.20***	-2.32***	-1.95***	-2.12***	-1.36**	-1.39**
	(0.54)	(0.63)	(0.01)	(0.03)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.01)
GDP Growth Rate	0.01	0.01	0.01	0.00	0.26**	0.26**	0.17**	0.19***	0.16**	0.20**
	(0.22)	(0.24)	(0.11)	(0.50)	(0.02)	(0.02)	(0.01)	(0.00)	(0.04)	(0.02)
Stock Traded	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.01	0.00	0.00
	(0.43)	(0.35)	(0.27)	(0.36)	(0.35)	(0.15)	(0.72)	(0.12)	(0.97)	(0.97)
Constant	0.26	0.30	0.50***	0.48***	13.05***	13.94***	8.53***	10.83***	6.91***	8.27***
	(0.27)	(0.21)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Hansen test (P-value)	0.13	0.14	0.20	0.28	0.25	0.23	0.16	0.17	0.12	0.40
AR2 test (P-value)	0.90	0.92	0.89	0.91	0.65	0.58	0.85	0.85	0.14	0.16
Wald tests: $\alpha_1 + \alpha_2$	-0.05*	-0.03	-0.06**	-0.08**	0.47*	0.74**	0.30	0.35	0.31	0.53**
$\alpha_1 + \beta_1$	-0.12**	-0.09**	-0.03	-0.04	0.46	0.53	0.35	0.35	0.28	0.41
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.06	-0.05*	-0.05**	-0.07**	0.35	0.49	0.22	0.23	0.21	0.35
$\alpha'_1 + \alpha'_2$	0.10**	0.08**	0.04	0.04	-0.48	0.29	-0.46	-0.47	-0.47	-0.45*
$\alpha'_1 + \beta'_1$	0.03	0.02	0.09**	0.10**	-0.95**	-0.91**	-0.68**	-0.84**	-0.77**	-0.81**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.07**	0.06**	0.05	0.05	-0.51	-0.48	-0.46	-0.49	-0.38	-0.24

Table A1.40. Bank capitalization and the effect of excess control rights on capital ratio adjustment: excluding Italian banks

This table shows the Blundell and Bond (1998) estimation results on the effect of bank capitalization on the relationship between excess control rights and capital ratio adjustment over the 2002-2010 period. For robustness, we exclude from the initial sample Italian banks and we use a sample of 242 European commercial banks corresponding to 1,526 observations. In all the regressions, the target capital ratio is obtained by estimating a partial adjustment model (Eq. (1.3)) using the Blundell and Bond (1998) estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Undercapitalized)* is a dummy equal to one if the Tier 1 RWA (Tier 1 Total Assets) ratio is less than 6% (4%), and zero otherwise. The definition of other variables is provided in Table 1.4. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

	Capital adjustment				Assets adjustment					
Dependent variable	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.07**	-0.06*	-0.06**	-0.05*	0.72**	0.84**	0.48**	0.54**	0.46**	0.63**
	(0.01)	(0.07)	(0.03)	(0.07)	(0.02)	(0.02)	(0.04)	(0.01)	(0.01)	(0.01)
d(Undercapitalized) × Capital Ratio Surplus (α_2)	0.02	0.04**	0.01	0.03*	-0.05	-0.44**	-0.01	-0.22*	-0.03	-0.25*
	(0.78)	(0.03)	(0.90)	(0.07)	(0.45)	(0.05)	(0.51)	(0.07)	(0.76)	(0.06)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.08	-0.04	0.03	0.02	-0.44*	-0.42*	-0.22*	-0.13*	-0.16*	-0.18*
	(0.32)	(0.40)	(0.56)	(0.75)	(0.08)	(0.10)	(0.05)	(0.07)	(0.10)	(0.09)
d(Undercapitalized) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	0.05	0.04*	0.00	0.02*	0.10	0.15	0.13	-0.07	0.08	-0.02
	(0.56)	(0.05)	(0.26)	(0.10)	(0.32)	(0.45)	(0.54)	(0.72)	(0.71)	(0.46)
Capital Ratio Shortfall (α'_1)	0.07**	0.08**	0.03	0.02	-0.37	-0.07	-0.29	-0.39	-0.40	-0.50**
	(0.05)	(0.02)	(0.38)	(0.15)	(0.26)	(0.32)	(0.33)	(0.13)	(0.11)	(0.04)
d(Undercapitalized) × Capital Ratio Shortfall (α'_2)	0.06	0.06*	0.02	0.01	-0.09	0.34	-0.11	-0.07	-0.12	-0.20
	(0.17)	(0.07)	(0.42)	(0.66)	(0.24)	(0.56)	(0.40)	(0.75)	(0.33)	(0.13)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.05**	-0.06**	0.06*	0.04*	-0.30*	-0.43**	-0.42*	-0.25*	-0.40**	-0.15
	(0.01)	(0.01)	(0.07)	(0.05)	(0.06)	(0.04)	(0.05)	(0.05)	(0.03)	(0.11)
d(Undercapitalized) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	-0.04	-0.05	-0.04	-0.01	-0.15	-0.41**	-0.15	-0.30**	0.11	-0.16*
	(0.21)	(0.22)	(0.37)	(0.30)	(0.53)	(0.04)	(0.71)	(0.04)	(0.52)	(0.07)
Lagged dependent variable	0.01	0.02	0.42***	0.40***	0.12***	0.12**	0.18***	0.16***	0.15***	0.18***
	(0.74)	(0.67)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)
d(Excess Control Rights)	-0.36*	-0.43*	-0.34**	-0.02	-2.99	-0.60	-0.62	-1.31	-2.03	-3.42**
	(0.05)	(0.09)	(0.01)	(0.84)	(0.29)	(0.81)	(0.69)	(0.46)	(0.38)	(0.04)
d(Undercapitalized)	0.46*	0.52	-0.18	-0.27**	-1.64	0.11	-0.14	0.60	-3.83	-3.55
	(0.08)	(0.46)	(0.25)	(0.02)	(0.59)	(0.98)	(0.95)	(0.82)	(0.21)	(0.23)
Deposits Total Assets	-0.00**	-0.00	0.00**	0.00**	0.05*	-0.01	0.03*	0.02	0.02	0.01
	(0.02)	(0.53)	(0.05)	(0.02)	(0.07)	(0.78)	(0.08)	(0.40)	(0.47)	(0.49)
Log(Age)	-0.00	-0.02	-0.00	-0.01	-0.51**	-0.21	-0.30*	-0.29*	-0.29	-0.18
	(0.90)	(0.82)	(0.95)	(0.65)	(0.02)	(0.32)	(0.05)	(0.07)	(0.19)	(0.40)
d(Rescued Bank)	0.04	0.01	0.01	0.00	0.68	1.09	0.62	0.29	0.92	0.12
	(0.71)	(0.99)	(0.85)	(0.96)	(0.59)	(0.39)	(0.46)	(0.85)	(0.54)	(0.93)
Cross Listed Index	0.03*	0.02	0.01	0.00	0.19	0.28	0.18*	0.24*	0.35**	0.44***
	(0.06)	(0.44)	(0.37)	(1.00)	(0.31)	(0.11)	(0.08)	(0.06)	(0.01)	(0.00)
d(Merger Acquisition)	0.11	0.14	0.08	0.08	0.64	0.02	1.33	1.28	1.19	1.47
	(0.21)	(0.24)	(0.22)	(0.19)	(0.70)	(0.99)	(0.17)	(0.21)	(0.23)	(0.15)
3-month Interbank Rate	0.01	0.01	-0.13***	-0.13***	-1.83**	-1.84**	-2.36**	-2.53***	-2.19**	-2.13***
	(0.80)	(0.92)	(0.01)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)
GDP Growth Rate	0.03	0.03	0.04***	0.04***	0.37	0.35	0.72***	0.70***	0.57***	0.53***
	(0.13)	(0.51)	(0.01)	(0.00)	(0.17)	(0.13)	(0.00)	(0.00)	(0.00)	(0.00)
Stock Traded	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00
	(0.82)	(0.82)	(0.16)	(0.14)	(0.77)	(0.96)	(0.18)	(0.30)	(0.59)	(0.82)
Constant	0.03	0.01	0.55**	0.58**	10.49***	11.11***	9.45***	11.09***	10.13*	10.18***
	(0.92)	(1.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.05)	(0.00)
Hansen test (P-value)	0.47	0.52	0.72	0.42	0.58	0.70	0.47	0.55	0.72	0.56
AR2 test (P-value)	0.46	0.41	0.71	0.89	0.62	0.53	0.38	0.47	0.14	0.15
Wald tests: $\alpha_1 + \alpha_2$	-0.05**	-0.02	-0.05**	-0.02	0.67**	0.40	0.47**	0.32	0.43**	0.38
$\alpha_1 + \beta_1$	-0.15**	-0.10**	-0.03	-0.03	0.28	0.42	0.26	0.41	0.30	0.45
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.08**	-0.02	-0.02	0.02	0.33	0.13	0.38	0.12	0.35	0.18
$\alpha'_1 + \alpha'_2$	0.13**	0.14**	0.05	0.03	-0.46	0.27	-0.40	-0.46	-0.52	-0.70**
$\alpha'_1 + \beta'_1$	0.02	0.02	0.09**	0.06**	-0.67**	-0.50**	-0.71**	-0.64**	-0.80**	-0.65**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.04	0.03	0.07**	0.06**	-0.91**	-0.57**	-0.97***	-1.01**	-0.81**	-1.01**

Table A1.41. Asset structure and the effect of excess control rights on capital ratio adjustment: excluding Italian banks

This table shows the Blundell and Bond (1998) estimation results on the effect of asset structure on the relationship between excess control rights and capital ratio adjustment over the 2002-2010 period. For robustness, we exclude from the initial sample Italian banks and we use a sample of 242 European commercial banks corresponding to 1,526 observations. In all the regressions, the target capital ratio is obtained by estimating a partial adjustment model (Eq. (1.3)) using the Blundell and Bond (1998) estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Lending Oriented)* is a dummy equal to one if the ratio of net loans (excluding interbank loans) to total assets is greater than the median value, and zero otherwise. The definition of other variables is provided in Table 1.4. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

	Capital adjustment				Assets adjustment					
Dependent variable	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.08**	-0.07**	-0.07**	-0.06**	0.76**	0.88**	0.46**	0.42**	0.47**	0.66***
	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.01)	(0.01)	(0.03)	(0.01)	(0.00)
d(Lending Oriented) × Capital Ratio Surplus (α_2)	-0.02	-0.02	-0.02	-0.01	0.13	0.14	-0.03	-0.00	0.15	0.10
	(0.20)	(0.29)	(0.20)	(0.20)	(0.23)	(0.18)	(0.44)	(0.39)	(0.25)	(0.20)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.05	-0.01	0.04	0.02	-0.44**	-0.48*	-0.15*	-0.12*	-0.18*	-0.35**
	(0.15)	(0.33)	(0.28)	(0.31)	(0.04)	(0.06)	(0.07)	(0.05)	(0.10)	(0.02)
d(Lending Oriented) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	0.06	0.02	0.00	0.01	-0.10	-0.15	-0.09	-0.06	-0.10	-0.09
	(0.32)	(0.20)	(0.53)	(0.50)	(0.33)	(0.25)	(0.19)	(0.25)	(0.15)	(0.21)
Capital Ratio Shortfall (α'_1)	0.12**	0.09**	0.04	0.05	-0.46**	-0.48**	-0.30	-0.32	-0.35	-0.59***
	(0.01)	(0.01)	(0.22)	(0.27)	(0.04)	(0.04)	(0.14)	(0.19)	(0.12)	(0.00)
d(Lending Oriented) × Capital Ratio Shortfall (α'_2)	0.04	0.06	0.01	0.01	0.20*	0.26*	-0.06	-0.04	-0.05	-0.07
	(0.17)	(0.19)	(0.45)	(0.37)	(0.07)	(0.06)	(0.23)	(0.31)	(0.24)	(0.36)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.09***	-0.05**	0.04*	0.05*	-0.46**	-0.42***	-0.30*	-0.31**	-0.37*	-0.10
	(0.00)	(0.01)	(0.05)	(0.05)	(0.01)	(0.00)	(0.06)	(0.04)	(0.06)	(0.30)
d(Lending Oriented) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	-0.00	-0.02	-0.02	-0.03	-0.11	-0.10	-0.33**	-0.31**	-0.13	-0.07
	(0.40)	(0.22)	(0.35)	(0.33)	(0.45)	(0.40)	(0.04)	(0.02)	(0.19)	(0.33)
Lagged dependent variable	0.01	0.01	0.47***	0.42***	0.11**	0.14***	0.15***	0.14***	0.16***	0.18***
	(0.85)	(0.82)	(0.00)	(0.00)	(0.04)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.38***	-0.37**	-0.21*	-0.12	-2.00	-0.92	-0.38	-0.12	-0.46	-1.90
	(0.00)	(0.04)	(0.06)	(0.25)	(0.42)	(0.70)	(0.79)	(0.94)	(0.81)	(0.30)
d(Lending Oriented)	-0.43***	-0.21	0.12	0.16	-0.54	0.19	0.36	2.89**	-0.90	3.47**
	(0.00)	(0.15)	(0.24)	(0.11)	(0.77)	(0.92)	(0.77)	(0.01)	(0.58)	(0.02)
Deposits Total Assets	-0.00*	-0.00	0.00	0.00*	0.01	-0.01	0.03*	0.02	0.01	0.01
	(0.07)	(0.25)	(0.10)	(0.05)	(0.55)	(0.71)	(0.05)	(0.19)	(0.66)	(0.59)
Log(Age)	-0.00	-0.01	-0.00	-0.01	-0.38*	-0.09	-0.26*	-0.18	-0.19	-0.17
	(0.94)	(0.60)	(0.90)	(0.72)	(0.09)	(0.66)	(0.08)	(0.24)	(0.35)	(0.43)
d(Rescued Bank)	0.06	0.01	0.02	0.10	0.84	1.09	0.41	0.20	0.60	0.68
	(0.55)	(0.88)	(0.80)	(0.22)	(0.49)	(0.47)	(0.63)	(0.79)	(0.65)	(0.60)
Cross Listed Index	0.04***	0.03**	0.01	0.00	0.25	0.28	0.07	0.00	0.33**	0.29**
	(0.01)	(0.02)	(0.59)	(0.77)	(0.13)	(0.14)	(0.51)	(0.97)	(0.01)	(0.03)
d(Merger Acquisition)	0.14	0.11	0.04	0.03	0.56	0.51	1.35	1.48	1.07	1.43
	(0.13)	(0.16)	(0.54)	(0.64)	(0.72)	(0.72)	(0.17)	(0.14)	(0.30)	(0.17)
3-month Interbank Rate	-0.02	0.02	-0.12**	-0.12***	-1.78**	-2.01***	-2.51**	-2.41***	-2.09**	-2.16***
	(0.74)	(0.63)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
GDP Growth Rate	0.03	0.03	0.03***	0.03***	0.41*	0.33	0.74***	0.69***	0.58***	0.57***
	(0.11)	(0.19)	(0.00)	(0.00)	(0.08)	(0.21)	(0.00)	(0.00)	(0.00)	(0.00)
Stock Traded	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.01
	(0.48)	(0.10)	(0.24)	(0.13)	(0.85)	(0.68)	(0.16)	(0.12)	(0.83)	(0.50)
Constant	0.10	0.16	0.51**	0.50**	9.89**	10.52**	9.72***	11.01***	9.60***	12.76***
	(0.74)	(0.63)	(0.02)	(0.04)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
Hansen test (P-value)	0.83	0.80	0.95	0.80	0.90	0.95	0.89	0.88	0.93	0.92
AR2 test (P-value)	0.47	0.51	0.80	0.91	0.53	0.49	0.46	0.42	0.15	0.15
Wald tests: $\alpha_1 + \alpha_2$	-0.10**	-0.09**	-0.09**	-0.07**	0.89**	1.02**	0.43**	0.42**	0.62**	0.76**
$\alpha_1 + \beta_1$	-0.13**	-0.08**	-0.03	-0.04	0.32	0.40	0.31	0.30	0.29	0.31
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.09**	-0.08***	-0.05	-0.04	0.35	0.39	0.19	0.24	0.34	0.32
$\alpha'_1 + \alpha'_2$	0.16**	0.15**	0.05	0.06	-0.26	-0.22	-0.36	-0.36	-0.40	-0.66**
$\alpha'_1 + \beta'_1$	0.03	0.04	0.08**	0.10**	-0.92**	-0.90**	-0.60**	-0.63**	-0.72**	-0.69**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.07	0.08	0.07**	0.08**	-0.83**	-0.74**	-0.99**	-0.98**	-0.90**	-0.83**

Table A1.42. Bank size and the effect of excess control rights on capital ratio adjustment: excluding Italian banks

This table shows the Blundell and Bond (1998) estimation results on the effect of bank size on the relationship between excess control rights and capital ratio adjustment over the 2002-2010 period. For robustness, we exclude from the initial sample Italian banks and we use a sample of 242 European commercial banks corresponding to 1,526 observations. In all the regressions, the target capital ratio is obtained by estimating a partial adjustment model (Eq. (1.3)) using the Blundell and Bond (1998) estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Large Bank)* is a dummy equal to one if the bank's total assets is above the median value, and zero otherwise. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. The definition of other variables is provided in Table 1.4. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

	Capital adjustment				Assets adjustment					
	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
Dependent variable	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.07**	-0.05*	-0.07**	-0.06**	0.82**	0.87**	0.45*	0.46**	0.47**	0.63**
	(0.02)	(0.06)	(0.01)	(0.02)	(0.01)	(0.01)	(0.07)	(0.02)	(0.04)	(0.04)
d(Large Bank) × Capital Ratio Surplus (α_2)	-0.02	-0.02	0.01	-0.01	0.08	0.02	0.03	0.04	0.16	0.12
	(0.31)	(0.30)	(0.13)	(0.80)	(0.77)	(0.76)	(0.58)	(0.25)	(0.40)	(0.42)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.02	-0.01	0.03	0.02	-0.42**	-0.46*	-0.14*	-0.18**	-0.19*	-0.33*
	(0.33)	(0.79)	(0.53)	(0.30)	(0.02)	(0.05)	(0.09)	(0.03)	(0.08)	(0.08)
d(Large Bank) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	-0.04	-0.02	-0.03	0.03	-0.09	-0.05	-0.02	-0.02	-0.09	-0.06
	(0.24)	(0.81)	(0.45)	(0.57)	(0.33)	(0.65)	(0.66)	(0.32)	(0.29)	(0.46)
Capital Ratio Shortfall (α'_1)	0.14***	0.14***	0.04	0.06	-0.34	-0.12	-0.36	-0.34	-0.38	-0.80**
	(0.00)	(0.00)	(0.36)	(0.13)	(0.16)	(0.60)	(0.29)	(0.17)	(0.14)	(0.01)
d(Large Bank) × Capital Ratio Shortfall (α'_2)	0.01	0.00	0.00	-0.02	-0.12	-0.10	-0.09	-0.08	-0.11	-0.08
	(0.79)	(0.77)	(0.30)	(0.32)	(0.84)	(0.42)	(0.25)	(0.81)	(0.22)	(0.27)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.07***	-0.07***	0.03*	0.02*	-0.34*	-0.60*	-0.37**	-0.25**	-0.35**	-0.08
	(0.00)	(0.01)	(0.06)	(0.05)	(0.06)	(0.06)	(0.04)	(0.03)	(0.03)	(0.36)
d(Large Bank) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	-0.04**	-0.03**	-0.03*	-0.02*	-0.39**	-0.32*	-0.52**	-0.38**	-0.37**	-0.06
	(0.02)	(0.01)	(0.08)	(0.06)	(0.04)	(0.08)	(0.05)	(0.03)	(0.02)	(0.33)
Lagged dependent variable	-0.02	-0.01	0.46***	0.45***	0.13**	0.14***	0.14***	0.13***	0.17***	0.18***
	(0.64)	(0.81)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)
d(Excess Control Rights)	-0.23	-0.39**	-0.18	-0.08	-2.11	-1.24	-0.62	-0.62	-0.88	-2.06
	(0.19)	(0.05)	(0.14)	(0.45)	(0.33)	(0.62)	(0.65)	(0.72)	(0.56)	(0.23)
d(Large Bank)	-0.15	-0.10	-0.13	0.13	-1.30	0.11	-1.71	-0.45	-7.46***	-3.59**
	(0.43)	(0.62)	(0.28)	(0.24)	(0.56)	(0.96)	(0.20)	(0.79)	(0.00)	(0.05)
Deposits Total Assets	-0.00*	-0.00	0.00*	0.00*	0.01	-0.01	0.02	0.02	-0.02	0.00
	(0.07)	(0.25)	(0.07)	(0.09)	(0.60)	(0.76)	(0.12)	(0.19)	(0.46)	(0.87)
Log(Age)	-0.01	-0.01	0.00	-0.00	-0.22	-0.03	-0.25*	-0.26*	-0.04	-0.14
	(0.67)	(0.69)	(0.95)	(0.86)	(0.28)	(0.86)	(0.07)	(0.10)	(0.86)	(0.51)
d(Rescued Bank)	0.02	0.04	0.03	0.03	1.22	0.97	0.16	0.45	0.01	0.68
	(0.80)	(0.70)	(0.61)	(0.64)	(0.30)	(0.49)	(0.82)	(0.59)	(1.00)	(0.59)
Cross Listed Index	0.03*	0.03**	0.01	0.00	0.25	0.24	0.09	0.08	0.14	0.26**
	(0.06)	(0.01)	(0.38)	(0.87)	(0.18)	(0.19)	(0.40)	(0.52)	(0.31)	(0.05)
d(Merger Acquisition)	0.11	0.13	0.06	0.06	0.43	0.19	1.09	0.99	1.49	1.41
	(0.19)	(0.12)	(0.33)	(0.34)	(0.79)	(0.90)	(0.26)	(0.31)	(0.12)	(0.16)
3-month Interbank Rate	-0.02	0.03	-0.13***	-0.12***	-1.95**	-1.82***	-2.46***	-2.51***	-1.82***	-2.18***
	(0.66)	(0.62)	(0.00)	(0.00)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
GDP Growth Rate	0.03	0.03	0.03***	0.03***	0.30	0.27	0.74***	0.75***	0.48***	0.60***
	(0.11)	(0.17)	(0.00)	(0.00)	(0.24)	(0.33)	(0.00)	(0.00)	(0.00)	(0.00)
Stock Traded	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
	(0.97)	(0.28)	(0.22)	(0.31)	(0.88)	(0.62)	(0.17)	(0.17)	(0.50)	(0.45)
Constant	0.43	0.09	0.61***	0.37*	12.10***	10.56**	9.66***	8.94***	13.70***	11.38***
	(0.12)	(0.76)	(0.00)	(0.07)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
Hansen test (P-value)	0.90	0.90	0.87	0.79	0.85	0.90	0.92	0.90	0.87	0.83
AR2 test (P-value)	0.35	0.39	0.82	0.88	0.50	0.42	0.43	0.39	0.15	0.15
Wald tests: $\alpha_1 + \alpha_2$	-0.09**	-0.07**	-0.06**	-0.07**	0.90**	0.89**	0.48**	0.50**	0.63**	0.75**
$\alpha_1 + \beta_1$	-0.09**	-0.06**	-0.04	-0.04	0.40	0.41	0.31	0.28	0.28	0.30
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.15**	-0.10**	-0.06	-0.02	0.39	0.38	0.32	0.30	0.35	0.36
$\alpha'_1 + \alpha'_2$	0.15**	0.14**	0.04	0.04	-0.46	-0.22	-0.45	-0.42	-0.49	-0.88**
$\alpha'_1 + \beta'_1$	0.07*	0.07*	0.07**	0.08**	-0.68**	-0.72**	-0.73**	-0.59**	-0.73**	-0.88***
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.04	0.04	0.04	0.04	-1.19**	-1.14**	-1.34**	-1.05**	-1.21**	-1.02***

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Table A1.43. Ultimate ownership type of European commercial banks

This table reports information on ultimate ownership type for both subsamples of banks without and banks with excess control rights, on average, for the years 2004, 2006 and 2010 using a control threshold of 20%. We classify a bank as without excess control rights (*Absence of Excess Control Rights*) if (1) it is controlled by an ultimate owner with equal control and cash-flow rights, (2) it is widely held or (3) if its control chain is a cross-holding. We classify a bank as with excess control rights (*Presence of Excess Control Rights*) if it is controlled by an ultimate owner with greater control than cash-flow rights. We differentiate banks according to the type of their largest ultimate controlling owner: a bank (*Bank*); an individual, a family or a manager (*Family*); a state or a public authority (*State*); a financial company, an insurance company, a mutual or a pension fund (*Institutional*); an industrial firm (*Industry*); a foundation or a research institute (*Foundation*). *Widely Held* and *Cross Holding* refer to banks that are respectively widely held and those for which the control chain is a cross-holding.

	Absence of Excess Control Rights (1,466 observations)			Presence of Excess Control Rights (738 observations)		
	Percentage of observations	Number of observations	Number of banks	Percentage of observations	Number of observations	Number of banks
Bank	43.25	634	110	30.49	225	35
Family	9.55	140	30	21.82	161	34
State	2.80	41	10	21.00	155	34
Institutional	6.34	93	15	16.40	121	23
Industry	2.32	34	6	7.45	55	7
Foundation	3.41	50	7	2.85	21	4
Widely Held	31.65	464	74	-	-	-
Cross Holding	0.68	10	3	-	-	-

Table A1.44. Estimating the target capital ratio: control threshold of 20%

This table shows the Blundell and Bond (1998) estimation results of the target capital ratio based on a partial adjustment model (Eq. (1.3)) over the 2002-2010 period. The sample consists of 341 European commercial banks corresponding to 2,204 observations. For robustness, we compute ownership variables based on a control threshold of 20%. *Tier 1 Total Assets* is Tier 1 capital divided by total assets. *Tier 1 RWA* is Tier 1 capital divided by risk-weighted assets. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. *Log(Total Assets)* is the natural logarithm of the bank's total assets. *Return On Assets* is net income divided by total assets. *Loan Loss Provisions* is loan loss provisions divided by net loans. *Loans Total Assets* is net loans divided by total assets. *Market Discipline* is total long term market funding divided by total funding. *d(Listed Bank)* is a dummy equal to one if the bank is publicly listed, and zero otherwise. *GDP Growth Rate* is the real Gross Domestic Product (GDP) growth rate. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. In the last three rows, we report the summary statistics (mean, maximum and minimum) of the estimated target capital ratio. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Tier 1 Total Assets	Tier 1 RWA
Lagged dependent variable	0.59***	0.66***
	(0.00)	(0.00)
d(Excess Control Rights)	-0.32**	-0.80***
	(0.03)	(0.00)
Log(Total Assets)	-0.51***	-0.58***
	(0.00)	(0.00)
Return On Assets	0.48***	0.53***
	(0.00)	(0.00)
Loan Loss Provisions	0.19***	0.18**
	(0.00)	(0.02)
Loans Total Assets	-0.00*	-0.03***
	(0.07)	(0.00)
Market Discipline	0.00**	0.01**
	(0.02)	(0.03)
d(Listed Bank)	-0.65***	-1.38***
	(0.00)	(0.00)
GDP Growth Rate	-0.00	-0.01
	(0.61)	(0.26)
Constant	5.33***	8.46***
	(0.00)	(0.00)
Hansen test (P-value)	0.11	0.11
AR2 test (P-value)	0.35	0.32
Fitted target (%): Mean	7.00	11.51
Maximum	14.90	25.10
Minimum	1.32	3.40

Table A1.45. Excess control rights and capital ratio adjustment: control threshold of 20%

This table shows the Blundell and Bond (1998) estimation results on the effect of excess control rights on capital ratio adjustment (Eq. (1.6)) for a sample of 341 European commercial banks (corresponding to 2,204 observations) over the 2002-2010 period. For robustness, we compute ownership variables based on a control threshold of 20% instead of 10%. In all the regressions, the target capital ratio is obtained by estimating a partial adjustment model (Eq. (1.3)) using the Blundell and Bond (1998) estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. *Deposits Total Assets* is total customer deposits divided by total assets. *Log(Age)* is the natural logarithm of bank age. *d(Rescued Bank)* is a dummy equal to one if the bank was rescued during the 2008 financial crisis, and zero otherwise. *Cross Listed Index* is an index equal to the number of stock markets on which the bank is listed, and zero if the bank is privately owned. *d(Merger Acquisition)* is a dummy equal to one if the bank experienced a merger-acquisition event during the sample period, and zero otherwise. *3-month Interbank Rate* is the three-month interbank rate. *GDP Growth Rate* is the real Gross Domestic Product (GDP) growth rate. *Stock Traded* is the value of listed shares divided by GDP. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Capital adjustment				Assets adjustment					
	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.06**	-0.04*	-0.05**	-0.03*	0.81**	0.94**	0.42**	0.54**	0.46**	0.70**
	(0.04)	(0.08)	(0.04)	(0.05)	(0.02)	(0.04)	(0.02)	(0.05)	(0.02)	(0.02)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.09*	-0.03	0.01	0.01	-0.38**	-0.47*	-0.20*	-0.25**	-0.21*	-0.37*
	(0.07)	(0.46)	(0.77)	(0.63)	(0.04)	(0.06)	(0.07)	(0.04)	(0.07)	(0.05)
Capital Ratio Shortfall (α'_1)	0.16***	0.10***	0.03	0.04*	-0.38	0.12	-0.29	-0.34	-0.28	-0.55**
	(0.00)	(0.00)	(0.28)	(0.06)	(0.20)	(0.68)	(0.38)	(0.12)	(0.42)	(0.02)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.13***	-0.07***	0.06*	0.03*	-0.30**	-0.84**	-0.29*	-0.33**	-0.26*	-0.05
	(0.00)	(0.00)	(0.08)	(0.07)	(0.04)	(0.02)	(0.05)	(0.04)	(0.07)	(0.30)
Lagged dependent variable	0.03	0.02	0.41***	0.38***	0.11***	0.13***	0.13***	0.12***	0.12***	0.14***
	(0.30)	(0.52)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.40**	-0.30*	-0.17	-0.00	-0.94	-0.36	-1.00	-0.80	-1.78	-0.25
	(0.02)	(0.09)	(0.15)	(0.97)	(0.65)	(0.86)	(0.53)	(0.64)	(0.31)	(0.56)
Deposits Total Assets	-0.00**	-0.00*	0.00*	0.00**	-0.01	-0.00	0.02	0.01	0.00	0.01
	(0.02)	(0.05)	(0.09)	(0.03)	(0.82)	(0.84)	(0.11)	(0.30)	(0.78)	(0.45)
Log(Age)	-0.00	-0.01	-0.00	-0.01	-0.31*	-0.29*	-0.28**	-0.17	-0.28*	-0.16
	(0.98)	(0.37)	(0.99)	(0.46)	(0.07)	(0.08)	(0.01)	(0.22)	(0.06)	(0.30)
d(Rescued Bank)	0.09	0.00	0.02	0.00	1.64	1.49	1.20	0.33	0.66	0.29
	(0.43)	(0.97)	(0.78)	(0.96)	(0.19)	(0.28)	(0.14)	(0.71)	(0.58)	(0.80)
Cross Listed Index	0.03**	0.03***	0.00	0.00	0.20	0.10	0.13	0.11	0.29***	0.32***
	(0.03)	(0.00)	(0.89)	(0.85)	(0.10)	(0.46)	(0.10)	(0.29)	(0.00)	(0.00)
d(Merger Acquisition)	0.04	0.04	0.03	0.01	1.06	0.75	1.17	1.35	0.06	0.39
	(0.58)	(0.58)	(0.55)	(0.80)	(0.32)	(0.51)	(0.13)	(0.10)	(0.95)	(0.68)
3-month Interbank Rate	0.01	0.02	-0.11***	-0.10**	-1.96***	-1.99***	-1.95***	-2.15***	-1.18**	-1.65***
	(0.81)	(0.79)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.03)	(0.00)
GDP Growth Rate	0.01**	0.01*	0.01	0.00	0.28**	0.22*	0.18***	0.18***	0.14*	0.16**
	(0.04)	(0.10)	(0.14)	(0.76)	(0.01)	(0.06)	(0.01)	(0.00)	(0.07)	(0.04)
Stock Traded	0.00	0.00	0.00	0.00	0.01	0.02	0.01	0.01	0.00	0.00
	(0.53)	(0.42)	(0.43)	(0.38)	(0.24)	(0.11)	(0.40)	(0.19)	(0.93)	(0.99)
Constant	0.52	0.37	0.65***	0.61***	15.01***	13.13***	8.44***	10.35***	6.84***	11.55***
	(0.12)	(0.23)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)
Hansen test (P-value)	0.13	0.14	0.12	0.10	0.50	0.37	0.18	0.14	0.19	0.23
AR2 test (P-value)	0.70	0.67	0.81	0.68	0.22	0.20	0.44	0.50	0.34	0.34
Wald tests: $\alpha_1 + \beta_1$	-0.15**	-0.07***	-0.04	-0.02	0.43	0.47	0.22	0.29	0.25	0.33
$\alpha'_1 + \beta'_1$	0.03	0.03	0.09***	0.07***	-0.68**	-0.72**	-0.58**	-0.67**	-0.54*	-0.60**

Table A1.46. Ownership type and the effect of excess control rights on capital ratio adjustment: control threshold of 20%

This table shows the Blundell and Bond (1998) estimation results on the effect of ownership type on the relationship between excess control rights and capital ratio adjustment (Eq. (1.7)) over the 2002-2010 period. We exclude from the initial sample banks for which the control chain is a cross-holding (for simplicity) and we use a sample of 336 European commercial banks corresponding to 2,171 observations. For robustness, we compute ownership variables based on a control threshold of 20% instead of 10%. In all the regressions, the fitted target capital ratio is obtained by estimating a partial adjustment model (Eq. (1.3)) using the Blundell and Bond (1998) estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Family)* is a dummy equal to one if the bank is family-controlled, and zero otherwise. *d(State)* is a dummy equal to one if the bank is state-controlled, and zero otherwise. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. *Deposits Total Assets* is total customer deposits divided by total assets. *Log(Age)* is the natural logarithm of bank age. *d(Rescued Bank)* is a dummy equal to one if the bank was rescued during the 2008 financial crisis, and zero otherwise. *Cross Listed Index* is an index equal to the number of stock markets on which the bank is listed, and zero if the bank is privately owned. *d(Merger Acquisition)* is a dummy equal to one if the bank experienced a merger-acquisition event during the sample period, and zero otherwise. *3-month Interbank Rate* is the three-month interbank rate. *GDP Growth Rate* is the real Gross Domestic Product (GDP) growth rate. *Stock Traded* is the value of listed shares divided by GDP. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Capital adjustment				Assets adjustment					
	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.13**	-0.06**	-0.06**	-0.06**	0.78**	0.80**	0.34**	0.44**	0.43**	0.63**
	(0.01)	(0.04)	(0.03)	(0.02)	(0.04)	(0.04)	(0.05)	(0.01)	(0.04)	(0.02)
d(Family) × Capital Ratio Surplus (α_2)	0.06	0.02	0.01	0.02	0.16	0.17	0.15	0.14	0.14	0.12
	(0.25)	(0.80)	(0.32)	(0.27)	(0.35)	(0.20)	(0.22)	(0.38)	(0.40)	(0.38)
d(State) × Capital Ratio Surplus (α_3)	0.08	-0.02	-0.01	0.02	0.03	0.22	0.07	0.07	0.07	0.18
	(0.43)	(0.80)	(0.26)	(0.22)	(0.67)	(0.31)	(0.32)	(0.68)	(0.54)	(0.45)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.03	-0.00	-0.02	-0.02	-0.44	-0.42	-0.13	-0.18	-0.23	-0.32
	(0.65)	(0.89)	(0.20)	(0.70)	(0.30)	(0.55)	(0.78)	(0.75)	(0.36)	(0.26)
d(Family) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	-0.07*	-0.06*	0.05*	0.02	-0.10	-0.20	-0.09	-0.18	-0.19	-0.10
	(0.06)	(0.08)	(0.06)	(0.18)	(0.42)	(0.15)	(0.62)	(0.73)	(0.89)	(0.44)
d(State) × d(Excess Control Rights) × Capital Ratio Surplus (β_3)	-0.03	-0.02	-0.14	-0.02	0.09	-0.13	0.06	-0.10	-0.10	-0.15
	(0.30)	(0.62)	(0.30)	(0.19)	(0.40)	(0.20)	(0.62)	(0.30)	(0.35)	(0.29)
Capital Ratio Shortfall (α'_1)	0.15**	0.09***	0.04	0.04*	-0.39	0.10	-0.44	-0.40	-0.35	-0.55**
	(0.02)	(0.00)	(0.23)	(0.09)	(0.12)	(0.67)	(0.15)	(0.20)	(0.16)	(0.02)
d(Family) × Capital Ratio Shortfall (α'_2)	0.12	0.08	0.02	0.02	0.09	0.06	0.09	-0.10	0.19	-0.06
	(0.14)	(0.13)	(0.73)	(0.50)	(0.36)	(0.34)	(0.32)	(0.78)	(0.45)	(0.43)
d(State) × Capital Ratio Shortfall (α'_3)	0.03	-0.04	-0.03	-0.00	0.04	0.05	0.09	-0.07	0.06	-0.08
	(0.85)	(0.32)	(0.36)	(0.97)	(0.75)	(0.58)	(0.32)	(0.72)	(0.75)	(0.40)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.07	-0.02	0.03	0.00	-0.14	-0.48	-0.05	-0.12	-0.08	-0.08
	(0.23)	(0.20)	(0.40)	(0.94)	(0.33)	(0.27)	(0.70)	(0.17)	(0.45)	(0.31)
d(Family) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	-0.16**	-0.10**	-0.00	0.02*	-0.55**	-0.64**	-0.33**	-0.43**	-0.44*	-0.13
	(0.04)	(0.02)	(0.90)	(0.10)	(0.01)	(0.01)	(0.04)	(0.02)	(0.06)	(0.11)
d(State) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_3)	-0.01	0.07*	-0.06	-0.04	-0.15	-0.16	-0.11	0.14**	-0.11	0.15
	(0.69)	(0.06)	(0.45)	(0.86)	(0.14)	(0.32)	(0.23)	(0.05)	(0.34)	(0.14)
Lagged dependent variable	0.01	0.01	0.50***	0.48***	0.12**	0.11**	0.19***	0.19***	0.15***	0.15***
	(0.73)	(0.72)	(0.00)	(0.00)	(0.03)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.34**	-0.36*	-0.22*	-0.11	-4.65**	-0.41	-0.67	-0.01	-0.47	-2.61
	(0.03)	(0.10)	(0.09)	(0.28)	(0.03)	(0.86)	(0.65)	(0.99)	(0.84)	(0.26)
d(Family)	-0.08	0.59*	0.14	-0.06	4.94	3.82	2.31	3.39	1.04	4.55
	(0.68)	(0.05)	(0.41)	(0.69)	(0.14)	(0.24)	(0.32)	(0.21)	(0.75)	(0.20)
d(State)	0.16	0.16	0.32**	0.26	3.92	0.36	4.00*	3.11	2.15	-1.15
	(0.50)	(0.33)	(0.03)	(0.10)	(0.29)	(0.92)	(0.08)	(0.14)	(0.49)	(0.65)

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Table A1.46 (continued)

Deposits Total Assets	-0.00*	-0.00	0.00	0.00	0.03	0.01	0.03*	0.03*	0.02	0.03
	(0.08)	(0.45)	(0.13)	(0.14)	(0.39)	(0.72)	(0.06)	(0.05)	(0.55)	(0.23)
Log(Age)	-0.00	-0.02	-0.00	-0.01	-0.20	-0.14	-0.21	-0.25	-0.20	-0.15
	(0.91)	(0.25)	(0.98)	(0.53)	(0.35)	(0.47)	(0.20)	(0.12)	(0.31)	(0.47)
d(Rescued Bank)	0.02	0.03	0.05	0.02	1.28	1.47	0.13	0.53	0.36	0.66
	(0.87)	(0.77)	(0.45)	(0.70)	(0.26)	(0.26)	(0.87)	(0.51)	(0.78)	(0.63)
Cross Listed Index	0.02**	0.02	0.00	0.01	0.22	0.11	0.08	0.06	0.30**	0.30**
	(0.05)	(0.14)	(0.81)	(0.49)	(0.19)	(0.52)	(0.45)	(0.60)	(0.01)	(0.02)
d(Merger Acquisition)	0.12	0.08	0.04	0.03	0.33	0.78	0.88	1.21	1.45	1.03
	(0.12)	(0.36)	(0.58)	(0.63)	(0.83)	(0.60)	(0.34)	(0.23)	(0.19)	(0.34)
3-month Interbank Rate	-0.00	0.04	-0.12**	-0.11***	-2.20***	-1.82**	-2.20***	-2.31***	-1.84***	-1.84**
	(0.98)	(0.50)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.01)
GDP Growth Rate	0.02	0.02	0.03***	0.03***	0.29	0.29	0.74***	0.71***	0.55***	0.55***
	(0.22)	(0.28)	(0.00)	(0.00)	(0.28)	(0.35)	(0.00)	(0.00)	(0.00)	(0.00)
Stock Traded	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.01
	(0.88)	(0.69)	(0.21)	(0.19)	(0.94)	(0.85)	(0.13)	(0.22)	(0.74)	(0.64)
Constant	0.12	0.16	0.41*	0.41**	7.69*	7.26*	6.45**	7.59***	8.20***	6.67**
	(0.70)	(0.58)	(0.07)	(0.03)	(0.06)	(0.06)	(0.02)	(0.00)	(0.01)	(0.03)
Hansen test (P-value)	0.15	0.17	0.10	0.15	0.15	0.20	0.21	0.18	0.15	0.19
AR2 test (P-value)	0.82	0.90	0.72	0.92	0.33	0.32	0.64	0.62	0.38	0.32
Wald tests: $\alpha_1 + \alpha_2$	-0.07**	-0.04**	-0.05**	-0.04*	0.94**	0.97**	0.49**	0.58**	0.57**	0.75***
$\alpha_1 + \alpha_3$	-0.05*	-0.08**	-0.07**	-0.04**	0.81**	1.02**	0.41**	0.51**	0.50**	0.81**
$\alpha_1 + \beta_1$	-0.16**	-0.06**	-0.08**	-0.08*	0.34	0.38	0.21	0.26	0.20	0.31
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.17**	-0.10**	-0.02	-0.04	0.40	0.35	0.27	0.22	0.15	0.33
$\alpha_1 + \alpha_3 + \beta_1 + \beta_3$	-0.11**	-0.10**	-0.23**	-0.08**	0.46	0.47	0.34	0.23	0.17	0.34
$\alpha'_1 + \alpha'_2$	0.27**	0.17**	0.06	0.06*	-0.30	0.16	-0.35	-0.50	-0.16	-0.61**
$\alpha'_1 + \alpha'_3$	0.18**	0.05**	0.01	0.04*	-0.35	0.15	-0.35	-0.47	-0.29	-0.63**
$\alpha'_1 + \beta'_1$	0.08**	0.07**	0.07*	0.04*	-0.53	-0.38	-0.49	-0.52*	-0.43	-0.63**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.04	0.05	0.09**	0.08**	-0.99**	-0.96**	-0.73**	-1.05**	-0.68*	-0.82**
$\alpha'_1 + \alpha'_3 + \beta'_1 + \beta'_3$	0.10**	0.10**	-0.02	0.00	-0.64	-0.49*	-0.51	-0.45	-0.48	-0.56

Table A1.47. Shareholder protection and the effect of excess control rights on capital ratio adjustment: control threshold of 20%

This table shows the Blundell and Bond (1998) estimation results on the effect of shareholder protection rights on the relationship between excess control rights and capital ratio adjustment (Eq. (1.7)) for a sample of 341 European commercial banks (corresponding to 2,204 year observations) over the 2002-2010 period. For robustness, we compute ownership variables based on a control threshold of 20% instead of 10%. In all the regressions, the fitted target capital ratio is obtained by estimating a partial adjustment model (Eq. (1.3)) using the Blundell and Bond (1998) estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Owner Rights)* is a dummy equal to one if the shareholder protection index as defined in Djankov et al. (2008) is greater than the median value, and zero otherwise. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. The definition of other variables is provided in Table 1.4. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

	Capital adjustment				Assets adjustment					
Dependent variable	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.07**	-0.06*	-0.06**	-0.06**	0.74**	0.90**	0.32*	0.42**	0.39**	0.60**
	(0.01)	(0.09)	(0.02)	(0.04)	(0.04)	(0.03)	(0.09)	(0.04)	(0.03)	(0.03)
d(Owner Rights) × Capital Ratio Surplus (α_2)	0.02	0.02	-0.01	0.01	0.13	0.07	0.13	0.13	0.14	0.17
	(0.11)	(0.26)	(0.26)	(0.25)	(0.60)	(0.18)	(0.60)	(0.76)	(0.85)	(0.29)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.08	-0.01	0.04	0.04	-0.38	-0.46	-0.05	-0.18	-0.17	-0.27
	(0.57)	(0.87)	(0.19)	(0.17)	(0.45)	(0.58)	(0.60)	(0.64)	(0.70)	(0.35)
d(Owner Rights) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	0.06	0.01	-0.03	-0.05*	-0.06	-0.03	-0.18	0.07	-0.16	-0.15
	(0.73)	(0.72)	(0.17)	(0.06)	(0.63)	(0.61)	(0.25)	(0.92)	(0.19)	(0.14)
Capital Ratio Shortfall (α'_1)	0.15**	0.08**	0.04	0.06**	-0.35	-0.08	-0.39	-0.27	-0.18	-0.60**
	(0.04)	(0.03)	(0.39)	(0.04)	(0.17)	(0.57)	(0.26)	(0.26)	(0.58)	(0.03)
d(Owner Rights) × Capital Ratio Shortfall (α'_2)	0.05	0.07	0.01	-0.00	-0.11	0.16	-0.03	-0.25	-0.09	-0.03
	(0.32)	(0.16)	(0.64)	(0.92)	(0.87)	(0.28)	(0.88)	(0.43)	(0.21)	(0.25)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.12**	-0.06*	0.03*	0.03*	-0.51**	-0.82**	-0.47**	-0.61**	-0.46*	-0.07
	(0.01)	(0.04)	(0.07)	(0.05)	(0.02)	(0.01)	(0.03)	(0.01)	(0.06)	(0.40)
d(Owner Rights) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	-0.00	-0.00	-0.04	-0.03	0.36	0.25	0.45	0.57*	0.41	0.14
	(0.94)	(0.99)	(0.64)	(0.48)	(0.43)	(0.25)	(0.10)	(0.08)	(0.30)	(0.45)
Lagged dependent variable	0.01	0.02	0.48***	0.44***	0.14***	0.16***	0.16***	0.17***	0.16***	0.17***
	(0.78)	(0.54)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.33**	-0.36*	-0.21*	-0.08	-1.99	-0.05	-0.80	-0.51	-1.35	-2.06
	(0.02)	(0.08)	(0.10)	(0.40)	(0.35)	(0.98)	(0.55)	(0.69)	(0.49)	(0.19)
Deposits Total Assets	-0.00	-0.00*	0.00**	0.00	0.02	-0.01	0.03*	0.04**	0.01	0.02
	(0.17)	(0.07)	(0.04)	(0.15)	(0.49)	(0.81)	(0.08)	(0.04)	(0.80)	(0.31)
Log(Age)	-0.00	-0.02	-0.00	-0.01	-0.25	-0.12	-0.28*	-0.29*	-0.15	-0.19
	(0.88)	(0.44)	(0.88)	(0.60)	(0.22)	(0.58)	(0.08)	(0.09)	(0.47)	(0.32)
d(Rescued Bank)	0.01	0.01	0.01	0.04	1.14	1.35	0.66	0.49	0.03	0.36
	(0.91)	(0.91)	(0.91)	(0.51)	(0.36)	(0.30)	(0.37)	(0.53)	(0.98)	(0.77)
Cross Listed Index	0.03**	0.03**	0.00	0.00	0.25	0.18	0.12	0.10	0.29**	0.34**
	(0.02)	(0.02)	(0.66)	(0.85)	(0.16)	(0.32)	(0.19)	(0.34)	(0.03)	(0.01)
d(Merger Acquisition)	0.12	0.14*	0.05	0.08	0.39	0.61	1.31	1.03	1.46	1.44
	(0.14)	(0.10)	(0.41)	(0.20)	(0.82)	(0.70)	(0.18)	(0.29)	(0.13)	(0.15)
3-month Interbank Rate	0.00	0.02	-0.13***	-0.12***	-1.79**	-1.47**	-2.40***	-2.37***	-2.01***	-1.95***
	(0.93)	(0.72)	(0.01)	(0.01)	(0.02)	(0.05)	(0.00)	(0.00)	(0.00)	(0.00)
GDP Growth Rate	0.03	0.02	0.04***	0.04***	0.43	0.22	0.69***	0.77***	0.62***	0.46***
	(0.15)	(0.17)	(0.01)	(0.00)	(0.14)	(0.46)	(0.00)	(0.00)	(0.00)	(0.01)
Stock Traded	0.00	0.00	0.00	0.00*	0.01	0.00	0.02*	0.01	0.01	0.01
	(0.94)	(0.79)	(0.23)	(0.07)	(0.73)	(0.77)	(0.08)	(0.12)	(0.56)	(0.58)
Constant	0.35	0.23	0.64***	0.48*	10.23**	8.95**	9.14***	8.83***	8.00***	9.70***
	(0.17)	(0.40)	(0.01)	(0.06)	(0.01)	(0.03)	(0.00)	(0.00)	(0.01)	(0.00)
Hansen test (P-value)	0.29	0.21	0.18	0.30	0.40	0.56	0.28	0.20	0.33	0.40
AR2 test (P-value)	0.47	0.39	0.84	0.83	0.46	0.39	0.41	0.39	0.14	0.14
Wald tests: $\alpha_1 + \alpha_2$	-0.05***	-0.04*	-0.07**	-0.05**	0.87**	0.97**	0.45**	0.55**	0.53**	0.77**
$\alpha_1 + \beta_1$	-0.15**	-0.07**	-0.02	-0.02	0.36	0.44	0.27	0.24	0.22	0.33
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.07**	-0.04**	-0.06**	-0.06**	0.43**	0.48*	0.22	0.44	0.20	0.35
$\alpha'_1 + \alpha'_2$	0.20**	0.15**	0.05	0.06	-0.46	0.08	-0.42	-0.52	-0.27	-0.63**
$\alpha'_1 + \beta'_1$	0.03	0.02	0.07**	0.09**	-0.86**	-0.90**	-0.86**	-0.88**	-0.64**	-0.67**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.08**	0.09***	0.04**	0.06	-0.61**	-0.49	-0.44	-0.56	-0.32	-0.56*

Table A1.48. 2008 financial crisis and the effect of excess control rights on capital ratio adjustment: control threshold of 20%

This table shows the Blundell and Bond (1998) estimation results on the effect of the 2008 financial crisis on the relationship between excess control rights and capital ratio adjustment (Eq. (1.7)) for a sample of 341 European commercial banks (corresponding to 2,204 observations) over the 2002-2010 period. For robustness, we compute ownership variables based on a control threshold of 20% instead of 10%. In all the regressions, the fitted target capital ratio is obtained by estimating a partial adjustment model (Eq. (1.3)) using the Blundell and Bond (1998) estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Crisis)* is a dummy equal to one if the observation is from 2008 or 2009, and zero otherwise. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. The definition of other variables is provided in Table 1.4. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Capital adjustment				Assets adjustment					
	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.08***	-0.06**	-0.04**	-0.06**	1.10**	1.13***	0.54**	0.63**	0.60**	0.90**
	(0.00)	(0.02)	(0.04)	(0.01)	(0.02)	(0.00)	(0.02)	(0.02)	(0.05)	(0.04)
d(Crisis) × Capital Ratio Surplus (α_2)	0.05*	0.02	-0.01	-0.01	-0.61	-0.44	-0.22	-0.27	-0.29	-0.39
	(0.08)	(0.48)	(0.15)	(0.12)	(0.84)	(0.73)	(0.74)	(0.44)	(0.14)	(0.36)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.04	-0.02	0.02	0.03	-0.61	-0.64	-0.18	-0.30	-0.31	-0.54
	(0.57)	(0.48)	(0.70)	(0.20)	(0.81)	(0.31)	(0.53)	(0.92)	(0.41)	(0.41)
d(Crisis) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	0.03	0.02	-0.03	-0.02	0.49	0.36	0.06	0.17	0.21	0.36
	(0.70)	(0.36)	(0.83)	(0.69)	(0.22)	(0.33)	(0.76)	(0.89)	(0.80)	(0.30)
Capital Ratio Shortfall (α'_1)	0.15**	0.11**	0.05	0.05	-0.42	0.08	-0.25	-0.33	-0.24	-0.66**
	(0.04)	(0.01)	(0.17)	(0.14)	(0.23)	(0.86)	(0.68)	(0.49)	(0.25)	(0.03)
d(Crisis) × Capital Ratio Shortfall (α'_2)	-0.05	-0.05	-0.02	-0.01	-0.06	0.17	-0.20	-0.15	-0.18	0.19
	(0.39)	(0.78)	(0.20)	(0.22)	(0.42)	(0.74)	(0.66)	(0.59)	(0.16)	(0.79)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.12*	-0.09*	0.05	0.06*	-0.49*	-0.94**	-0.41*	-0.50*	-0.49**	-0.16
	(0.05)	(0.05)	(0.13)	(0.07)	(0.08)	(0.02)	(0.06)	(0.06)	(0.01)	(0.60)
d(Crisis) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	0.09	0.09	-0.03	-0.05	0.48	0.21	0.42	0.52	0.60	0.35
	(0.26)	(0.18)	(0.35)	(0.79)	(0.19)	(0.22)	(0.66)	(0.29)	(0.13)	(0.28)
Lagged dependent variable	0.03	0.03	0.41***	0.39***	0.12***	0.12***	0.13***	0.12***	0.15***	0.17***
	(0.42)	(0.47)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.50***	-0.33**	-0.07	-0.06	-0.15	-0.34	-0.42	-0.70	-1.37	-2.05
	(0.00)	(0.02)	(0.42)	(0.53)	(0.95)	(0.86)	(0.76)	(0.63)	(0.34)	(0.28)
Deposits Total Assets	-0.00**	-0.00**	0.00**	0.00**	0.00	-0.02	0.03**	0.01	-0.00	0.01
	(0.03)	(0.03)	(0.01)	(0.01)	(0.92)	(0.38)	(0.03)	(0.43)	(0.91)	(0.44)
Log(Age)	-0.02	-0.02	-0.00	-0.00	-0.32*	-0.38**	-0.26**	-0.24*	-0.18	-0.22
	(0.32)	(0.14)	(0.80)	(0.84)	(0.06)	(0.02)	(0.02)	(0.07)	(0.18)	(0.11)
d(Rescued Bank)	0.03	0.01	0.02	0.01	1.69	1.57	1.36*	0.69	0.39	0.36
	(0.77)	(0.90)	(0.78)	(0.93)	(0.16)	(0.24)	(0.08)	(0.38)	(0.71)	(0.73)
Cross Listed Index	0.03***	0.03***	0.00	0.00	0.20*	0.10	0.07	0.14	0.28***	0.31***
	(0.01)	(0.00)	(0.74)	(0.92)	(0.09)	(0.43)	(0.36)	(0.16)	(0.00)	(0.00)
d(Merger Acquisition)	0.01	0.02	0.01	0.02	0.77	0.68	1.48*	1.34	0.16	0.43
	(0.88)	(0.79)	(0.82)	(0.66)	(0.48)	(0.57)	(0.06)	(0.11)	(0.87)	(0.65)
3-month Interbank Rate	0.03	0.02	-0.11***	-0.08*	-2.22***	-2.50***	-1.93**	-2.22***	-1.35**	-1.34**
	(0.63)	(0.72)	(0.01)	(0.06)	(0.00)	(0.00)	(0.01)	(0.00)	(0.02)	(0.01)
GDP Growth Rate	0.01	0.01	0.01	0.00	0.26**	0.27**	0.16**	0.18***	0.15*	0.19**
	(0.20)	(0.16)	(0.11)	(0.58)	(0.02)	(0.02)	(0.01)	(0.00)	(0.05)	(0.02)
Stock Traded	0.00	0.00	0.00	0.00	0.01	0.02	0.00	0.01	0.00	0.00
	(0.47)	(0.50)	(0.28)	(0.33)	(0.32)	(0.16)	(0.74)	(0.14)	(0.99)	(0.97)
Constant	0.28	0.31	0.49***	0.45**	13.27***	14.95***	8.43***	11.13***	6.73***	8.58***
	(0.23)	(0.21)	(0.01)	(0.02)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Hansen test (P-value)	0.18	0.15	0.11	0.17	0.20	0.21	0.20	0.12	0.17	0.20
AR2 test (P-value)	0.80	0.89	0.92	0.85	0.22	0.20	0.45	0.62	0.36	0.37
Wald tests: $\alpha_1 + \alpha_2$	-0.03*	-0.04	-0.05**	-0.07**	0.49*	0.69**	0.32	0.36	0.31	0.51**
$\alpha_1 + \beta_1$	-0.12**	-0.08**	-0.02	-0.03	0.49	0.49	0.36	0.33	0.29	0.36
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.04	-0.04*	-0.06**	-0.06**	0.37	0.41	0.20	0.23	0.21	0.33
$\alpha'_1 + \alpha'_2$	0.10**	0.06**	0.03	0.04	-0.48	0.25	-0.45	-0.48	-0.42	-0.47*
$\alpha'_1 + \beta'_1$	0.03	0.02	0.10**	0.11**	-0.91**	-0.86**	-0.66**	-0.83**	-0.73**	-0.82**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.07**	0.06**	0.05	0.05	-0.49	-0.48	-0.44	-0.46	-0.31	-0.28

Table A1.49. Bank capitalization and the effect of excess control rights on capital ratio adjustment: control threshold of 20%

This table shows the Blundell and Bond (1998) estimation results on the effect of bank capitalization on the relationship between excess control rights and capital ratio adjustment for a sample of 341 European commercial banks (2,204 observations) over the 2002-2010 period. For robustness, we compute ownership variables based on a control threshold of 20%. In all the regressions, the target capital ratio is obtained by estimating a partial adjustment model (Eq. (1.3)) using the Blundell and Bond (1998) estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Undercapitalized)* is a dummy equal to one if the Tier 1 RWA (Tier 1 Total Assets) ratio is less than 6% (4%), and zero otherwise. The definition of other variables is provided in Table 1.4. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

	Capital adjustment				Assets adjustment					
Dependent variable	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.08**	-0.07*	-0.05**	-0.04*	0.75**	0.86**	0.45*	0.55**	0.48**	0.66***
	(0.01)	(0.05)	(0.03)	(0.05)	(0.01)	(0.01)	(0.05)	(0.01)	(0.02)	(0.00)
d(Undercapitalized) × Capital Ratio Surplus (α_2)	0.02	0.05**	0.01	0.03*	-0.02	-0.45**	-0.01	-0.23*	-0.03	-0.27**
	(0.75)	(0.01)	(0.87)	(0.06)	(0.48)	(0.04)	(0.51)	(0.06)	(0.74)	(0.04)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.09	-0.06	0.03	0.01	-0.45*	-0.44**	-0.23*	-0.18*	-0.17*	-0.20*
	(0.27)	(0.26)	(0.52)	(0.65)	(0.10)	(0.05)	(0.06)	(0.09)	(0.10)	(0.08)
d(Undercapitalized) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	0.07	0.05*	0.00	0.03*	0.05	0.16	0.19	-0.10	0.11	-0.03
	(0.55)	(0.05)	(0.25)	(0.10)	(0.43)	(0.21)	(0.40)	(0.35)	(0.63)	(0.56)
Capital Ratio Shortfall (α'_1)	0.09**	0.08**	0.03	0.02	-0.38	-0.10	-0.29	-0.39	-0.40	-0.50**
	(0.02)	(0.01)	(0.40)	(0.18)	(0.23)	(0.35)	(0.44)	(0.17)	(0.12)	(0.03)
d(Undercapitalized) × Capital Ratio Shortfall (α'_2)	0.05	0.06*	0.02	0.02	-0.09	0.29	-0.10	-0.05	-0.16	-0.18
	(0.30)	(0.05)	(0.60)	(0.58)	(0.34)	(0.38)	(0.25)	(0.47)	(0.22)	(0.23)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.07**	-0.06**	0.06**	0.04*	-0.30*	-0.48**	-0.39*	-0.19**	-0.42**	-0.10
	(0.01)	(0.02)	(0.04)	(0.05)	(0.05)	(0.01)	(0.05)	(0.03)	(0.02)	(0.19)
d(Undercapitalized) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	-0.04	-0.05	-0.07	-0.00	-0.18	-0.42**	-0.13	-0.28**	0.09	-0.17*
	(0.16)	(0.20)	(0.30)	(0.49)	(0.51)	(0.02)	(0.56)	(0.04)	(0.55)	(0.07)
Lagged dependent variable	0.04	0.03	0.40***	0.36***	0.11***	0.12***	0.12***	0.14***	0.16***	0.17***
	(0.26)	(0.44)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.48***	-0.31*	-0.17*	-0.05	-0.21	-0.61	-1.27	-0.75	-1.58	-2.76*
	(0.00)	(0.05)	(0.07)	(0.49)	(0.92)	(0.77)	(0.38)	(0.59)	(0.32)	(0.06)
d(Undercapitalized)	0.18	0.55***	-0.24**	-0.17**	-2.49	-2.00	-1.41	0.62	-3.30*	-2.37
	(0.39)	(0.00)	(0.03)	(0.04)	(0.24)	(0.37)	(0.37)	(0.69)	(0.08)	(0.19)
Deposits Total Assets	-0.00**	-0.00**	0.00**	0.00*	0.01	-0.01	0.02*	0.02	-0.01	0.00
	(0.01)	(0.02)	(0.05)	(0.07)	(0.51)	(0.76)	(0.09)	(0.15)	(0.69)	(0.78)
Log(Age)	-0.01	-0.02	-0.01	-0.01	-0.41**	-0.31*	-0.31**	-0.30**	-0.32**	-0.23
	(0.39)	(0.24)	(0.55)	(0.61)	(0.02)	(0.08)	(0.01)	(0.02)	(0.04)	(0.15)
d(Rescued Bank)	0.00	0.05	0.00	0.01	1.01	0.96	0.64	0.62	0.98	0.17
	(0.97)	(0.57)	(0.96)	(0.88)	(0.47)	(0.48)	(0.45)	(0.46)	(0.46)	(0.89)
Cross Listed Index	0.03**	0.03***	0.00	0.00	0.19	0.15	0.10	0.11	0.32***	0.37***
	(0.01)	(0.00)	(0.92)	(0.86)	(0.17)	(0.27)	(0.25)	(0.28)	(0.00)	(0.00)
d(Merger Acquisition)	0.02	0.01	0.05	0.03	0.43	0.02	1.48*	1.64**	0.25	0.54
	(0.81)	(0.93)	(0.27)	(0.57)	(0.71)	(0.99)	(0.06)	(0.05)	(0.80)	(0.60)
3-month Interbank Rate	0.03	0.04	-0.12***	-0.10**	-2.18***	-2.78***	-2.13**	-2.27***	-1.52**	-1.70***
	(0.55)	(0.54)	(0.00)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
GDP Growth Rate	0.02**	0.01	0.01	0.00	0.25**	0.30***	0.19***	0.23***	0.16*	0.18**
	(0.02)	(0.15)	(0.25)	(0.40)	(0.03)	(0.01)	(0.00)	(0.00)	(0.06)	(0.03)
Stock Traded	0.00	0.00	0.00	0.00	0.01	0.02	0.01	0.01	0.00	0.00
	(0.19)	(0.25)	(0.16)	(0.13)	(0.33)	(0.27)	(0.17)	(0.12)	(0.81)	(0.79)
Constant	0.24	0.11	0.70***	0.64***	14.45***	15.92***	10.13***	10.36***	10.36***	10.29***
	(0.33)	(0.69)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Hansen test (P-value)	0.55	0.73	0.69	0.81	0.91	0.86	0.79	0.55	0.88	0.75
AR2 test (P-value)	0.92	0.96	0.81	0.98	0.27	0.24	0.51	0.55	0.15	0.16
Wald tests: $\alpha_1 + \alpha_2$	-0.06**	-0.02	-0.04*	-0.01	0.73**	0.41	0.44**	0.32	0.45**	0.39
$\alpha_1 + \beta_1$	-0.17**	-0.13**	-0.02	-0.03	0.30	0.42	0.22	0.37	0.31	0.46
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.08**	-0.03	-0.01	0.03	0.33	0.13	0.40	0.04	0.39	0.16
$\alpha'_1 + \alpha'_2$	0.14**	0.14**	0.05	0.04	-0.47	0.19	-0.39	-0.44	-0.56	-0.68**
$\alpha'_1 + \beta'_1$	0.02	0.02	0.09**	0.06**	-0.68**	-0.58**	-0.68**	-0.58**	-0.82**	-0.60**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.03	0.03	0.04**	0.08**	-0.95**	-0.71**	-0.91***	-0.91***	-0.89**	-0.95**

Table A1.50. Asset structure and the effect of excess control rights on capital ratio adjustment: control threshold of 20%

This table shows the Blundell and Bond (1998) estimation results on the effect of asset structure on the relationship between excess control rights and capital ratio adjustment for a sample of 341 European commercial banks (2,204 observations) over the 2002-2010 period. For robustness, we compute ownership variables based on a control threshold of 20%. In all the regressions, the target capital ratio is obtained by estimating a partial adjustment model (Eq. (1.3)) using the Blundell and Bond (1998) estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Lending Oriented)* is a dummy equal to one if the ratio of net loans (excluding interbank loans) to total assets is greater than the median value, and zero otherwise. The definition of other variables is provided in Table 1.4. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

	Capital adjustment				Assets adjustment					
Dependent variable	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.09***	-0.06**	-0.07**	-0.06**	0.77**	0.86**	0.45**	0.43**	0.45**	0.63***
	(0.00)	(0.02)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)	(0.02)	(0.01)	(0.00)
d(Lending Oriented) × Capital Ratio Surplus (α_2)	-0.01	-0.03	-0.02	-0.03	0.17	0.10	-0.00	-0.00	0.13	0.12
	(0.20)	(0.21)	(0.20)	(0.29)	(0.23)	(0.15)	(0.36)	(0.45)	(0.35)	(0.29)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.05	-0.02	0.04	0.02	-0.42*	-0.50**	-0.15*	-0.17*	-0.16*	-0.33**
	(0.33)	(0.40)	(0.19)	(0.23)	(0.06)	(0.03)	(0.05)	(0.06)	(0.05)	(0.02)
d(Lending Oriented) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	0.06	0.04	-0.00	0.01	-0.11	-0.10	-0.05	-0.07	-0.10	-0.10
	(0.22)	(0.15)	(0.37)	(0.35)	(0.22)	(0.24)	(0.31)	(0.31)	(0.19)	(0.20)
Capital Ratio Shortfall (α'_1)	0.12***	0.08**	0.04	0.04	-0.45*	-0.45*	-0.32	-0.28	-0.35	-0.58***
	(0.00)	(0.01)	(0.21)	(0.21)	(0.05)	(0.06)	(0.23)	(0.21)	(0.25)	(0.00)
d(Lending Oriented) × Capital Ratio Shortfall (α'_2)	0.03	0.04	0.01	0.01	0.21*	0.24*	-0.03	-0.03	0.03	-0.03
	(0.27)	(0.29)	(0.40)	(0.30)	(0.06)	(0.06)	(0.22)	(0.26)	(0.25)	(0.36)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.09**	-0.04**	0.06*	0.05*	-0.45**	-0.45**	-0.27*	-0.26*	-0.41*	-0.12
	(0.01)	(0.01)	(0.05)	(0.06)	(0.01)	(0.01)	(0.05)	(0.08)	(0.08)	(0.30)
d(Lending Oriented) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	-0.03	-0.04	-0.03	-0.02	-0.05	-0.08	-0.28**	-0.30**	-0.08	-0.06
	(0.20)	(0.31)	(0.35)	(0.39)	(0.45)	(0.44)	(0.04)	(0.03)	(0.22)	(0.40)
Lagged dependent variable	0.04	0.03	0.42***	0.37***	0.10***	0.12***	0.13***	0.14***	0.16***	0.16***
	(0.24)	(0.45)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.52***	-0.48***	-0.15	-0.05	-0.66	-0.48	-0.21	-0.71	-0.97	-2.94*
	(0.00)	(0.01)	(0.14)	(0.62)	(0.77)	(0.82)	(0.89)	(0.62)	(0.57)	(0.07)
d(Lending Oriented)	-0.14	0.02	0.15	0.18**	-0.10	1.30	0.22	2.85***	-1.11	3.05**
	(0.23)	(0.88)	(0.10)	(0.03)	(0.95)	(0.42)	(0.83)	(0.01)	(0.42)	(0.03)
Deposits Total Assets	-0.00**	-0.00**	0.00*	0.00**	0.01	-0.01	0.03**	0.02*	-0.00	0.01
	(0.03)	(0.04)	(0.10)	(0.02)	(0.67)	(0.73)	(0.02)	(0.07)	(0.98)	(0.56)
Log(Age)	-0.02	-0.02	-0.00	-0.00	-0.42**	-0.23	-0.31**	-0.22*	-0.24*	-0.27*
	(0.39)	(0.17)	(0.87)	(0.78)	(0.02)	(0.16)	(0.01)	(0.06)	(0.09)	(0.09)
d(Rescued Bank)	0.02	0.01	0.03	0.04	1.66	1.46	0.92	0.27	0.26	0.47
	(0.85)	(0.92)	(0.66)	(0.61)	(0.18)	(0.30)	(0.29)	(0.73)	(0.83)	(0.70)
Cross Listed Index	0.03***	0.04***	0.00	0.01	0.19	0.15	0.02	0.04	0.31***	0.27***
	(0.00)	(0.00)	(0.75)	(0.42)	(0.15)	(0.34)	(0.80)	(0.67)	(0.00)	(0.01)
d(Merger Acquisition)	0.08	0.05	0.01	0.01	0.31	0.49	1.95**	1.54**	0.02	0.06
	(0.30)	(0.56)	(0.84)	(0.77)	(0.79)	(0.67)	(0.02)	(0.05)	(0.98)	(0.95)
3-month Interbank Rate	0.02	0.03	-0.12***	-0.12***	-1.76***	-2.04***	-2.13**	-2.42***	-1.79**	-2.18***
	(0.65)	(0.53)	(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.00)	(0.01)	(0.00)
GDP Growth Rate	0.01*	0.01	0.00	0.00	0.26**	0.28***	0.21***	0.24***	0.15*	0.20***
	(0.05)	(0.14)	(0.36)	(0.48)	(0.02)	(0.01)	(0.00)	(0.00)	(0.06)	(0.01)
Stock Traded	0.00	0.00	0.00	0.00	0.01	0.01	0.02*	0.01	0.00	0.01
	(0.31)	(0.22)	(0.19)	(0.21)	(0.50)	(0.33)	(0.06)	(0.21)	(0.96)	(0.60)
Constant	0.11	0.24	0.73***	0.77***	12.66***	14.47***	9.94***	12.91***	9.30***	13.36***
	(0.66)	(0.32)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Hansen test (P-value)	0.14	0.15	0.20	0.21	0.38	0.56	0.21	0.28	0.30	0.27
AR2 test (P-value)	0.85	0.90	0.90	0.87	0.27	0.26	0.57	0.56	0.13	0.15
Wald tests: $\alpha_1 + \alpha_2$	-0.10**	-0.09**	-0.09**	-0.09**	0.94**	0.96**	0.45**	0.43**	0.58**	0.75**
$\alpha_1 + \beta_1$	-0.14**	-0.08**	-0.03	-0.04	0.35	0.36	0.30	0.26	0.29	0.30
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.09**	-0.07**	-0.05	-0.06	0.41	0.36	0.25	0.19	0.32	0.32
$\alpha'_1 + \alpha'_2$	0.15**	0.12**	0.05	0.05	-0.24	-0.21	-0.35	-0.31	-0.32	-0.61**
$\alpha'_1 + \beta'_1$	0.03	0.04	0.10**	0.09**	-0.90**	-0.90**	-0.59**	-0.54**	-0.76**	-0.70**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.03	0.04	0.08**	0.08**	-0.74**	-0.74**	-0.90**	-0.87***	-0.81**	-0.79**

Table A1.51. Bank size and the effect of excess control rights on capital ratio adjustment: control threshold of 20%

This table shows the Blundell and Bond (1998) estimation results on the effect of bank size on the relationship between excess control rights and capital ratio adjustment for a sample of 341 European commercial banks (2,204 observations) over the 2002-2010 period. For robustness, we compute ownership variables based on a control threshold of 20%. In all the regressions, the target capital ratio is obtained by estimating a partial adjustment model (Eq. (1.3)) using the Blundell and Bond (1998) estimation method. The target capital ratio is Tier 1 capital divided by total assets (*Tier 1 Total Assets*) in columns *(1)* and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in columns *(2)*. *Δ Tier 1* is the annual change in Tier 1 capital less current retained earnings divided by average assets. *Retained Earnings* is current net income less current dividend payment divided by average assets. *Δ Assets*, *Δ Loans*, and *Δ RWA* are respectively the annual changes in total assets, net loans (excluding interbank loans) and risk-weighted assets divided by average assets. We define average assets as: (total assets at time t + total assets at time t-1)/2. *Capital Ratio Surplus* and *Capital Ratio Shortfall* denote the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is above or below its target respectively, and zero otherwise. *d(Large Bank)* is a dummy equal to one if the bank's total assets is above the median value, and zero otherwise. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash-flow rights, and zero otherwise. The definition of other variables is provided in Table 1.4. Country and year dummies are included but not reported. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Capital adjustment				Assets adjustment					
	Δ Tier 1		Retained Earnings		Δ Assets		Δ Loans		Δ RWA	
	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)	(1)	(2)
Capital Ratio Surplus (α_1)	-0.08**	-0.05**	-0.08**	-0.04*	0.82**	0.87**	0.41*	0.45**	0.52**	0.62**
	(0.01)	(0.04)	(0.02)	(0.06)	(0.02)	(0.01)	(0.07)	(0.01)	(0.02)	(0.02)
d(Large Bank) × Capital Ratio Surplus (α_2)	-0.02	-0.03	0.01	-0.03	0.09	0.03	0.03	-0.00	0.18	0.16
	(0.47)	(0.66)	(0.18)	(0.41)	(0.63)	(0.76)	(0.63)	(0.81)	(0.41)	(0.22)
d(Excess Control Rights) × Capital Ratio Surplus (β_1)	-0.03	-0.02	0.05	0.01	-0.39**	-0.45**	-0.12*	-0.19**	-0.19*	-0.36*
	(0.79)	(0.39)	(0.28)	(0.83)	(0.02)	(0.05)	(0.08)	(0.04)	(0.09)	(0.08)
d(Large Bank) × d(Excess Control Rights) × Capital Ratio Surplus (β_2)	-0.03	-0.02	-0.03	0.03	-0.11	-0.04	-0.06	-0.03	-0.06	-0.06
	(0.49)	(0.85)	(0.35)	(0.47)	(0.29)	(0.65)	(0.79)	(0.46)	(0.23)	(0.19)
Capital Ratio Shortfall (α'_1)	0.13***	0.12***	0.03	0.04	-0.32	-0.10	-0.35	-0.35	-0.39	-1.10***
	(0.00)	(0.00)	(0.40)	(0.13)	(0.18)	(0.47)	(0.33)	(0.12)	(0.14)	(0.00)
d(Large Bank) × Capital Ratio Shortfall (α'_2)	0.02	0.02	0.01	-0.00	-0.15	-0.10	-0.07	-0.07	-0.10	-0.07
	(0.52)	(0.21)	(0.83)	(0.64)	(0.59)	(0.45)	(0.22)	(0.82)	(0.20)	(0.35)
d(Excess Control Rights) × Capital Ratio Shortfall (β'_1)	-0.06***	-0.05***	0.04*	0.03*	-0.32**	-0.64**	-0.29*	-0.23**	-0.31*	-0.07
	(0.00)	(0.00)	(0.06)	(0.07)	(0.03)	(0.02)	(0.06)	(0.04)	(0.09)	(0.16)
d(Large Bank) × d(Excess Control Rights) × Capital Ratio Shortfall (β'_2)	-0.04**	-0.05***	-0.03*	-0.03*	-0.39**	-0.37*	-0.52**	-0.37**	-0.36**	-0.07
	(0.02)	(0.00)	(0.06)	(0.06)	(0.05)	(0.05)	(0.05)	(0.03)	(0.02)	(0.39)
Lagged dependent variable	0.03	0.03	0.40***	0.38***	0.11***	0.12***	0.12***	0.13***	0.18***	0.16***
	(0.35)	(0.43)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
d(Excess Control Rights)	-0.39***	-0.54***	-0.12	-0.06	-0.21	-1.19	-1.01	-1.49	-1.94	-3.43**
	(0.00)	(0.00)	(0.22)	(0.55)	(0.90)	(0.57)	(0.39)	(0.32)	(0.15)	(0.02)
d(Large Bank)	-0.17	-0.11	-0.19*	-0.00	-3.10	-1.41	-1.98	-1.63	-6.44***	-5.08***
	(0.39)	(0.46)	(0.06)	(1.00)	(0.13)	(0.42)	(0.15)	(0.22)	(0.00)	(0.00)
Deposits Total Assets	-0.00**	-0.00**	0.00**	0.00*	-0.00	-0.02	0.01	0.01	-0.02	-0.01
	(0.02)	(0.02)	(0.05)	(0.09)	(0.97)	(0.44)	(0.52)	(0.39)	(0.27)	(0.64)
Log(Age)	-0.02	-0.02	-0.00	-0.00	-0.26	-0.18	-0.20*	-0.19	-0.11	-0.06
	(0.34)	(0.17)	(0.90)	(0.82)	(0.13)	(0.28)	(0.07)	(0.14)	(0.47)	(0.73)
d(Rescued Bank)	0.03	0.01	0.01	0.02	2.07*	1.26	1.26	0.74	0.80	0.72
	(0.72)	(0.95)	(0.92)	(0.79)	(0.08)	(0.31)	(0.10)	(0.32)	(0.48)	(0.59)
Cross Listed Index	0.02*	0.03**	0.01	0.00	0.11	0.04	0.03	0.06	0.19*	0.22**
	(0.09)	(0.01)	(0.51)	(0.92)	(0.42)	(0.78)	(0.73)	(0.54)	(0.06)	(0.04)
d(Merger Acquisition)	0.03	0.06	0.05	0.03	0.40	0.29	1.49**	1.47*	0.19	0.01
	(0.70)	(0.47)	(0.28)	(0.60)	(0.73)	(0.81)	(0.05)	(0.06)	(0.85)	(0.99)
3-month Interbank Rate	0.01	0.03	-0.12***	-0.10***	-1.99***	-1.88**	-2.13***	-2.42***	-1.89***	-1.72***
	(0.78)	(0.56)	(0.00)	(0.01)	(0.01)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
GDP Growth Rate	0.02**	0.01	0.00	0.00	0.22**	0.27**	0.18***	0.23***	0.14*	0.18**
	(0.04)	(0.13)	(0.44)	(0.68)	(0.04)	(0.02)	(0.01)	(0.00)	(0.09)	(0.02)
Stock Traded	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
	(0.33)	(0.25)	(0.30)	(0.29)	(0.60)	(0.48)	(0.13)	(0.19)	(0.68)	(0.36)
Constant	0.37	0.33	0.72***	0.61***	15.93***	13.25***	10.96***	11.96***	14.17***	11.86***
	(0.13)	(0.21)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
Hansen test (P-value)	0.17	0.10	0.23	0.21	0.28	0.39	0.28	0.26	0.23	0.47
AR2 test (P-value)	0.87	0.86	0.84	0.90	0.27	0.21	0.54	0.53	0.15	0.17
Wald tests: $\alpha_1 + \alpha_2$	-0.10**	-0.08**	-0.07**	-0.07**	0.91**	0.90**	0.44**	0.45**	0.70**	0.78**
$\alpha_1 + \beta_1$	-0.11**	-0.07**	-0.03	-0.03	0.43	0.42	0.29	0.26	0.33	0.26
$\alpha_1 + \alpha_2 + \beta_1 + \beta_2$	-0.16**	-0.12**	-0.05	-0.03	0.41	0.41	0.26	0.23	0.45	0.36
$\alpha'_1 + \alpha'_2$	0.15**	0.14**	0.04	0.04	-0.47	-0.20	-0.42	-0.42	-0.49	-1.17**
$\alpha'_1 + \beta'_1$	0.07*	0.07*	0.07**	0.07**	-0.64**	-0.74**	-0.64**	-0.58**	-0.70**	-1.17**
$\alpha'_1 + \alpha'_2 + \beta'_1 + \beta'_2$	0.05	0.04	0.05	0.04	-1.18**	-1.21**	-1.23**	-1.02**	-1.16**	-1.31***

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CHAPTER 2

Excess control rights, financial crisis and bank profitability and risk

ABSTRACT

We empirically investigate the impact of shareholders' excess control rights (greater control than cash-flow rights) on bank profitability and risk and how the global financial crisis of 2007-2008 might have modified such an impact for a sample of European commercial banks. While the presence of excess control rights is associated with lower profitability, higher earnings volatility and higher default risk before the crisis (2002-2006) but also at the later stage of the financial crisis (2009-2010), conversely, it improves profitability, lowers earnings volatility and no longer affects default risk during the 2007-2008 financial crisis years. Further evidence shows that, regardless of the period, the effect of excess control rights on profitability and risk is accentuated in family-controlled banks and in countries with relatively weak shareholder protection rights and that such an effect is mainly effective at intermediate and high levels of excess control rights. Overall, our findings contribute to the literature examining the corporate governance determinants of banks' performance during the 2007-2008 global financial crisis and have several policy implications.

2.1. Introduction

Weak corporate governance in the banking industry has often been considered as one of the causes of the global financial crisis of 2007-2008. As such, the Basel Committee on Banking Supervision (BIS, 2010b) has called for better governance mechanisms within financial institutions. Although a large number of banks failed or were rescued during the crisis, some banks performed worse than others. Various papers have investigated the factors behind such cross-variation in bank performance and some works (Gropp and Köhler, 2010; Fahlenbrach and Stulz, 2011; Aebi et al., 2012; Beltratti and Stulz, 2012; Berger et al., 2012; Erkens et al., 2012) have specifically examined the role played by corporate governance (e.g., manager compensation schemes, board structure, ownership concentration). In this study, we investigate whether the presence of controlling shareholders with greater control rights than cash-flow rights in pyramidal ownership structures -who play a major role in the European banking industry- affects bank profitability and risk differently during normal times and distress times.

The corporate governance literature argues that the presence of controlling shareholders can be either good or bad for minority shareholders and the firm's performance. On the positive side (incentives view), the presence of controlling shareholders mitigates the standard owner-manager agency problem (Jensen and Meckling, 1976) because of their ability and incentives to monitor managers (Shleifer and Vishny, 1986; 1997). On the negative side (entrenchment view), controlling shareholders may pursue their own interests and distort management decision-making leading to insider expropriation (Shleifer and Vishny, 1997).[17] In the extant literature (Claessens et al., 2002; Boubakri and Ghouma, 2010; Lin et al., 2011a), the likelihood of expropriation and tunneling is generally measured by the divergence between control or voting rights (the right to vote and therefore to control) and cash-flow rights (the right to receive dividends) in pyramids, namely referred to as *excess control rights*.

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[17] Expropriation can take several forms. For example, entrenched controlling shareholders can tunnel (divert) resources from a firm where they have lower financial interests to another firm where they hold substantial financial interests (e.g., Bertrand et al., 2002; La Porta et al., 2003; Baek et al., 2004). Tunneling behavior can take several forms and mainly the form of related-lending (Laeven, 2001; Beck et al., 2003; La Porta et al., 2003).

While the divergence between control and cash-flow rights is found to negatively impact firm value and performance in general (Claessens et al., 2002) and bank profitability more specifically (Azofra and Santamaría, 2011),[18] how it affects shareholder behavior and profitability but also risk-taking and default risk during times of distress remains an open question. On the one hand, firms controlled by entrenched shareholders could suffer from sharper declines in profitability during bad times. Consistent with the expropriation view (Johnson et al., 2000; Mitton, 2002; Baek et al., 2004), entrenched controlling shareholders might have even stronger incentives to divert resources for their own benefits during bad times to compensate the losses (or lower returns) they might be enduring in their other firms. Moreover, while investors and market participants might pay less attention to weak governance when the economy is doing well, they are likely to take it more into consideration during a crisis and might pull out from the firm leading to poorer performance (Rajan and Zingales, 1998). On the other hand, according to the propping up view (Friedman et al., 2003), firms controlled by entrenched shareholders might endure lower declines in profitability if they benefit from private funds from their shareholders who are keen on redistributing resources among all the entities they control (pyramidal ownership structure) to prevent all the firms from financial distress. From the profit-sharing view (among all the controlled firms), keeping the firm in business is important because it increases the expectations of future expropriation opportunities (e.g., providing support for connected-firms). In any case, propping up behavior makes firms suffer less during a crisis period (Friedman et al., 2003).

The global financial crisis of 2007-2008, followed late 2009 by the European sovereign debt crisis, provides a natural experiment that allows us to investigate the effect of excess control rights on bank performance (profitability and risk) during sound and distress periods. Investigating such a relationship across crisis and sound periods for banks is of particular interest because such behaviors (expropriation or propping up) might be exacerbated or attenuated in the banking industry given its unique features. During a sound period, expropriation might be easier in banks because they are considered as more opaque than other

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[18] Azofra and Santamaría (2011) study Spanish commercial banks during the 1996-2004 sound period and find that a divergence between control and cash-flow rights negatively impacts their profitability.

firms and their assets are more complex (Morgan, 2002). For instance, entrenched controlling shareholders can push banks to lend at favorable conditions to other related-firms where they have considerable financial interests (La Porta et al., 2003). During a distress period, expropriation might more likely occur than propping up because banks benefit from safety nets and public support (deposit insurance, bail-out policies and government intervention). Furthermore, during downturns, banks generally reduce their lending (Ivashina and Scharfstein, 2010) but might extend it (or reduce it but to a lesser extent) to their shareholders' related-firms than to other firms to support them. However, during a financial crisis, more stringent regulatory oversight and stronger market discipline might also mitigate entrenchment and opportunistic behavior more strongly in banks than other firms. Also, bankruptcy costs could be higher for banks related to other firms within a pyramid. If such banks fail, related-firms would need to borrow from other banks at possibly less favorable conditions increasing the overall cost of funding for the pyramid. Hence, just like non-financial firms, banks controlled by entrenched shareholders in pyramids might also benefit from the support of related-firms (propping up behavior) but such a support might even be more pronounced for banks than for non-financial firms. Consequently, banks controlled by shareholders with excess control rights might possibly outperform other banks during a crisis.

Specifically, in this study we use a unique hand-crafted sample with detailed ownership information on 750 commercial banks based in 17 Western European countries[19] over the 2002-2010 period to explore the effect of excess control rights on bank profitability and risk and how this effect might differ depending on the soundness of the banking industry. Consistent with the conjecture that the crisis should be large enough to effectively cause a change in the behavior of entrenched controlling shareholders (Friedman et al., 2003), we disentangle the effect of the severe crisis years of the financial crisis (2007-2008) from that of the later stage of the crisis (2009-2010).[20] While the global financial crisis of 2007-2008 is widely regarded as the worst financial crisis since the Great Depression of 1929, the 2009-

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[19] We focus on European countries where the presence of excess control rights is more acute compared to other countries, for instance, the U.S. (La Porta et al., 1998).

[20] The acute financial crisis period is from July 2007 to March 2009 (BIS, 2010c). According to the timeline provided by the Bank of France (2012), the European debt crisis started to affect some of European countries (i.e., the so called GIPS countries including Greece, Ireland, Portugal and Spain) from late 2009 and reached its peak in 2011.

2010 period could be viewed as moderate crisis years characterized by the implementation of generalized rescue programs along with unconventional monetary policies which to some extent have contributed to stabilize the banking industry while the sovereign debt crisis started to afflict some of European countries. More precisely, the objective of this study is to investigate the effect of excess control rights on bank profitability and risk and how the global financial crisis of 2007-2008 might have affected such a relationship but also to test whether the effect of the acute crisis years (2007-2008) is persistent or short-lived by considering the relationship between excess control rights and bank profitability and risk at the later stage of the financial crisis (2009-2010).

We control for various factors and, in line with the entrenchment view, find excess control rights to be negatively associated with bank profitability and positively linked with risk-taking and default risk before the crisis (2002-2006). However, at the peak of the financial crisis (2007-2008), consistent with the propping up view, the impact of excess control rights on profitability (risk-taking) becomes positive (negative) and it is no longer significant regarding default risk. Nevertheless, such a reversed impact is short-lived because at the later stage of the financial crisis (2009-2010) excess control rights are again negatively linked with profitability and positively with risk.

We go further in our investigation by considering the factors that might influence the relationship between excess control rights and bank profitability and risk. Specifically, we consider the effect of family ownership and the level of shareholder protection rights since the incentives and the likelihood of expropriation are known to be higher in family-controlled firms (Claessens et al., 2002; Villalonga and Amit, 2006) and in countries with weak shareholder protection rights (La Porta et al., 2002; Dyck and Zingales, 2004). Consistent with such predictions, we find that, regardless of the period, the effect of excess control rights on profitability and risk is stronger in family-controlled banks or in shareholder less protective countries. Particularly, family-controlled banks and banks located in countries with weak shareholder protection which are found to have poorer performance (lower profitability and higher earnings volatility and default risk) before the crisis are also the ones with higher profitability and lower earnings volatility during the 2007-2008 acute financial crisis years.

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For deeper insights, we further examine whether the shareholder's entrenchment behavior depends on the extent of excess control rights since the relationship between ownership and firm performance is known to be nonlinear (Morck et al., 1988; Adams and Santos, 2006). Consistent with this conjecture, we find that, irrespective of the period we consider, the effect of excess control rights on bank performance is essentially effective at intermediate and high levels of excess control rights. The relationship also becomes stronger with higher levels of excess control rights.

This study extends the literature in several directions. First, we focus on whether bank profitability and risk are impacted by shareholders' excess control rights during distress periods. Unlike studies on nonfinancial firms (Johnson et al., 2000; Mitton, 2002; Baek et al., 2004; Bae et al., 2012), we find banks controlled by shareholders with excess control rights to be more resilient to shocks. Also, this study adds to the growing body of literature which investigates whether the cross-variation in banks' performance during the 2007-2008 financial crisis can be explained by corporate governance mechanisms (Fahlenbrach and Stulz, 2011; Aebi et al., 2012; Beltratti and Stulz, 2012; Berger et al., 2012; Erkens et al., 2012). While these studies have mainly focused on owner-manager conflicts of interest (Jensen and Meckling, 1976), in our work we consider the conflicts between controlling and minority shareholders in complex pyramidal ownership structures (La Porta et al., 1998) and find that ownership structure and control do matter in explaining cross-variation in profitability and risk. In our work, we question whether the magnitude of the shock matters to effectively induce a change in the behavior of entrenched shareholders. For this purpose, we disentangle the effect at the height of the financial crisis (2007-2008) from the effect at the later stage of the financial crisis (2009-2010). We hence concomitantly consider the pre-crisis (2002-2006) and the acute financial crisis years (2007-2008) but also the later stage of the financial crisis (2009-2010) to shed light on whether a different influence of excess control rights on profitability and risk at the height of the financial crisis is more or less persistent. Second, instead of investigating the impact of the divergence between control and cash-flow rights on profitability per se (as in Azofra and Santamaría, 2011), we also consider implications on bank risk-taking and stability by computing a large set of risk and insolvency measures based

on accounting data but also on market data at the bank individual level. Moreover, we go beyond by looking at the type of controlling owners (e.g., family, state, firm, bank, institutional investors) and account for the level of shareholder protection in different European countries. Finally, unlike studies on pyramidal ownership structure (see, e.g., La Porta et al., 1999; Claessens et al., 2000; Faccio and Lang, 2002 for nonfinancial firms and Caprio et al., 2007; Laeven and Levine, 2009 for banking firms) which mainly consider the largest publicly traded corporations at a given point in time, we collect a larger database including large and small banks, both publicly traded and privately owned and account for changes in ownership structure through time.[21] Our results are consistent with the concerns of the Basel Committee on Banking Supervision (BIS, 2010b) regarding corporate governance within complex ownership structures and recommending further disclosure of banking entities' ownership.

The rest of this chapter is structured as follows. In Section 2.2, we describe the data and the empirical method. Section 2.3 presents the sample characteristics and some univariate analysis. In Section 2.4, we discuss the econometric results. Section 2.5 reports the robustness checks and Section 2.6 concludes the chapter.

2.2. Data and model specification

Before presenting the empirical approach and our set of variables, we describe the sample.

2.2.1. Sample

Our study focuses on commercial banks based in 17 Western European countries (Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom) during the 2002-2010 period. We retrieve accounting data from BvD Bankscope. All the banks in our sample (European banks) report annual financial statements following an accounting period

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[21] Azofra and Santamaría (2011) also consider publicly traded and privately owned banks in their database and account for the time dimension of ownership structure but they focus on a single country (Spain) before the crisis period (1996-2004). In their work, they look at bank profitability but not at bank risk-taking and bank solvency.

running from January 1 to December 31. For each bank, we use unconsolidated data if available; otherwise we use consolidated statements.[22] To collect ownership information of the sampled banks, we use Bankscope and Amadeus databases -as primary sources- together with annual reports. For the time period and countries covered by this study, we identify 846 commercial banks for which we have detailed information on ownership structure and at least three subsequent years of time series observations.[23] To minimize the effect of outliers, we remove 96 banks by eliminating extreme observations (2.5% lowest and highest values) for each financial variable of interest. Based on this clean sample, we also consider a subsample of listed banks. We obtain daily market data from the Bloomberg database. We restrict this subsample to banks with continuously traded stocks. We hence end up with a final sample of 4,261 bank-year observations corresponding to 750 commercial banks, 109 of which are listed (see Table A2.1 in Appendix A for a breakdown of the sample by country and its representativeness).

2.2.2. Timeline, model specification and variables

We aim to investigate the effect of excess control rights on bank profitability and risk and more specifically how this effect differs according to the state and soundness of the banking industry. A crisis (shock) might affect the behavior of entrenched controlling shareholders, encouraging them to either expropriate more (than in a sound period) or to prop up banks. The global financial crisis of 2007-2008 followed by the European sovereign debt crisis (late 2009) enables us to look for differential effects of excess control rights on bank performance depending on the soundness of the banking industry. Because a shock should be large enough to actually induce a change in shareholders' behavior (Friedman et al., 2003), these two events (global financial crisis and European sovereign debt crisis) might have affected banks' shareholders differently. Indeed, while the financial crisis had already spread to the entire banking industry and reached its peak in the fall of 2008, the debt crisis had only affected some of the European countries included in our sample (Greece, Ireland, Portugal and Spain)

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[22] Our empirical analysis relies to a large extent on unconsolidated bank statements. In some cases, Bankscope provides information only for consolidated data. We check the robustness of our results using unconsolidated data solely.

[23] This criterion enables us to compute rolling-window standard deviations of our risk indicators.

and reached its peak only in 2011 (a year which is not included in our sample). Consequently, the debt crisis has not necessarily affected the banking industry deeply enough during that period to cause a change in the banks' shareholder behavior.[24]

Because we focus on entrenched controlling shareholders in the banking industry, we disentangle the effect of a high-fletched financial crisis from the effect of the beginning of a sovereign debt crisis. We define the 2007-2008 period as the acute financial crisis years and the 2009-2010 period as relatively moderate crisis years, referred to thereafter as the *later stage of the financial crisis*. According to aforementioned differences between the two events and consistent with theory (Friedman et al., 2003), we expect the change in the shareholders' behavior (if any) to be less pronounced at the later stage of the financial crisis (2009-2010) and in extreme cases we could even observe a return to pre-crisis habits during that period (2009-2010). To capture the effect of the two events, we define two binary variables $D_{2007-2008}$ and $D_{2009-2010}$ which respectively take a value of one if the observation is from 2007-2008 and 2009-2010, and zero otherwise. We therefore estimate the following model including a set of control variables (X) and country dummies (Country):

$$y_{it} = (\alpha_1 + \alpha_2 D_{2007-2008} + \alpha_3 D_{2009-2010}) ExcessControl_{it} + \varphi' X + \alpha_0 + \omega' \, Country + \varepsilon_{it}, \qquad (2.1)$$

where y is a measure of bank profitability or risk; ExcessControl corresponds to excess control rights which is the difference between control and cash-flow rights and ε is the error term. The parameters α_1, $\alpha_1 + \alpha_2$ and $\alpha_1 + \alpha_3$ measure the effect of the shareholder's excess control rights (ExcessControl) on bank profitability and risk during the pre-crisis period (2002-2006), the acute financial crisis years (2007-2008) and during the later stage of the financial crisis (2009-2010) respectively.

We now turn to the definitions of our dependent variable reflecting bank performance (profitability and risk), our ownership variable of interest (excess control rights) and the different control variables introduced in our regressions.

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[24] Prior to the Lehman Brothers bankruptcy in September 2008, public support to distressed banks was only provided on a case by case basis in addition to generalized central bank liquidity support. But thereafter, banks benefited from global rescue packages while central banks expanded their balance sheets by implementing unconventional monetary policies. The latter might have helped to restore confidence and to stabilize the banking system in the early stages of the European sovereign debt crisis that started in late 2009.

2.2.2.1. Profitability, risk and default risk measures

We compute several accounting-based indicators to capture bank profitability and risk. We measure profitability for each bank using the return on assets defined as the ratio of net income to total assets (ROA).[25] As a measure of bank risk-taking, we use the standard deviation of the return on assets (SDROA) computed on a rolling-window of three years ([t-2, t]). A higher standard deviation of the return on assets indicates higher risk-taking. We also consider a proxy of default risk for each bank. We compute the Z-score (ZScore) as proposed by Boyd and Graham (1986). Lower values of ZScore indicate a higher probability of failure. For deeper insights, we also split ZScore into its two additive components Z1Score and Z2Score as in Goyeau and Tarazi (1992) and Lepetit et al. (2008). Z1Score is a measure of asset risk and Z2Score is a measure of leverage risk.[26] Considering these two components allows us to capture the extent to which a change in default risk (ZScore) is driven by a change in leverage and/or in asset risk.

However, our accounting-based measures have some shortcomings in our specific setting. First, computing risk measures on the basis of three-year rolling windows may affect our results because of overlapping. For instance, risk in 2008 is measured using observations from 2006 (which is not a crisis year), 2007 and 2008. Second, accounting-based measures may not accurately capture sudden changes in bank performance to be able to reflect changes in shareholders' behavior during the 2007-2008 and 2009-2010 periods.

To overcome this problem, we compute several market-based indicators for the subsample of 109 listed banks. We first consider a profitability measure (Return) defined as the mean of daily bank stock returns within a calendar year.[27] Risk-taking is then captured using the standard deviation of daily bank stock returns within a calendar year (σ(Return)). Eventually,

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[25] We use the return on assets (ROA) rather than the return on equity (ROE) because we are more concerned by banks' effectiveness in efficiently managing their assets in good and bad times than by their leverage (capital) ratio which is severely impacted during a crisis.

[26] $ZScore = Z1Score + Z2Score = \frac{ROA}{SDROA} + \frac{Equity}{SDROA}$, where Equity is the ratio of total equity to total assets.

[27] For each bank, we compute the daily stock return as the logarithm of the ratio of two adjacent daily stock prices (i.e., $\ln(\frac{Price_t}{Price_{t-1}})$).

default risk is measured using a market data based ZScore (MZScore) and the Merton's distance to default (DD).[28]

2.2.2.2. Building control chains and measuring excess control rights

Our variable of interest is excess control rights which we define as the difference between control and cash-flow rights of the largest ultimate owner (ExcessControl). To obtain information on control and cash-flow rights, we first need to trace indirect control chains in pyramids. Even though excess control rights can arise from both indirect control chains and dual class shares, like in previous studies (Caprio et al., 2007; Laeven and Levine, 2009) we only consider excess control rights arising from indirect control chains. This is not only because of limited data availability (Bankscope and Amadeus only provide information on control rights) but also because some studies find that the use of dual class shares is relatively scarce (Faccio and Lang, 2002; Azofra and Santamaría, 2011). We also need to set a threshold (minimum percentage of shares held) to identify each owner inside the control chain. We follow previous studies on both banks (Caprio et al., 2007; Laeven and Levine, 2009) and nonfinancial firms (La Porta et al., 1999; Laeven and Levine, 2008) and we use a control threshold of 10% assuming that it provides a significant fraction of votes for effective control. As a robustness check, we also consider a 20% threshold. To depict ownership structure prior to the financial crisis of 2007-2008, we build the control chain for each bank for the years 2004 and 2006. Before 2004, Bankscope and Amadeus do not report information on the types of shareholders (e.g., firms, banks, institutional investors). Ownership structure is known to be relatively stable over time (La Porta et al., 1999; Laeven and Levine, 2009) and therefore we do not collect ownership for each year of the pre-crisis period, which in any case would not be possible as ownership information (in Bankscope and Amadeus) is only updated every 18 months. We also build the control chains for the year 2010 which we use to reflect ownership structure during the distress period of 2007-2010.[29]

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[28] Market data based ZScore is computed as $\frac{100+\text{Return}}{\sigma(\text{Return})}$, where Return and $\sigma(\text{Return})$ are expressed in percentages. Details on the computation of the Merton's distance to default (DD) are provided in Appendix B.

[29] More precisely, ownership for 2002 and 2003 comes from 2004, ownership for 2005 comes from 2006 and ownership for 2007, 2008 and 2009 comes from 2010.

To build these control chains, we first identify all the shareholders holding at least 10% of the shares of each bank by collecting data on direct ownership from Bankscope and complete it with information from annual reports disclosed on banks' Web sites. If the bank has at least one shareholder with 10% or more of total outstanding shares, we classify it as controlled; otherwise, it is classified as widely held. If some of these identified shareholders are not controlled by another shareholder (such as a family or a state), we consider them to be the ultimate controlling owners. If, however, some or all of these shareholders are themselves financial or nonfinancial corporations, we continue the process and build indirect control chains by identifying their owners, the owners of their owners until we reach ultimate shareholders.[30] Since Bankscope reports ownership information only for banks, we use the Amadeus database and annual reports (still considering data from 2004, 2006 and 2010) to gather ownership data on nonbanking firms that are shareholders at the intermediate levels of indirect control chains.

Given the built control chain for each bank, we compute control rights, cash-flow rights and excess control rights using the method initially proposed by La Porta et al. (1999). An ultimate owner can hold a bank directly and/or indirectly. We define the aggregate control rights (ControlRights) and the aggregate cash-flow rights (CashFlowRights) of an ultimate owner as the sum of direct and indirect rights held in the bank. Direct rights (either control or cash-flow rights) are measured by the ultimate controlling shareholder's stake directly held in the bank. Following La Porta et al. (1999), we define indirect control rights as the stake held in the first layer of the control chain. We measure indirect cash-flow rights as the product of ownership stakes held indirectly along the control chain. When the bank is widely-held (there is no shareholder with at least 10% of control rights), we set aggregate control and cash-flow rights equal to zero. When a bank is controlled by multiple ultimate owners, we define the ultimate controlling shareholder as the owner with the greatest control rights.[31] We finally

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[30] Horizontally, the number of different ultimate controlling owners for a given bank in our sample reaches a maximum of nine. Vertically, the maximum number of intermediate levels required to build the indirect control chain until the ultimate owner is eight.

[31] Over the 2002-2010 period, among the set of controlled banks in our sample, 447 are continuously classified as controlled by a single ultimate owner and 170 are continuously classified as controlled by multiple ultimate owners while 84 banks switch from one category to the other.

define excess control rights as the difference between control and cash-flow rights (ExcessControl = ControlRights - CashFlowRights) as for instance in La Porta et al. (1999).

Fig. 2.1 provides a simple example of a control chain to illustrate how we compute excess control rights. The reported bank has two ultimate controlling owners (C4 and C5). The largest one (with the greatest control rights) is C4 and holds the bank directly and indirectly through two other intermediate corporations C1 and C3. Direct control and cash-flow rights of C4 are identical and equal to 30%. C4's indirect control rights are equal to 20% (the percentage of shares held by C1) and indirect cash-flow rights are equal to 0.9% (20% × 30% × 15%). Aggregate control and cash-flow rights are equal to 50% (20% + 30%) and 30.9% (0.9% + 30%) respectively. The difference between both aggregate rights (ExcessControl) is equal to 19.1% (50% - 30.9%).

Fig. 2.1. Example of a control chain

Fig. 2.1 provides an example of a control chain of a bank. C refers to each corporation presented in each box. Arrows represent ownership stakes held by each corporation in the bank or in other corporations in the control chain. ControlRights and CashFlowRights respectively indicate aggregate control rights and aggregate cash-flow rights of the two identified ultimate controlling shareholders (C4 and C5). Aggregate rights are the sum of direct and indirect rights. Direct rights (either control or cash-flow rights) refer to the percentage of shares directly held by the ultimate owner in the bank. Indirect control rights are computed on the basis of the standard method initially proposed by La Porta et al. (1999), that is indirect control rights of an ultimate controlling owner are equal to the percentage of shares held by the shareholder directly linked to the bank. Indirect cash-flow rights are calculated as the product of the percentages of shares held by the shareholders along the indirect control chain. We define ExcessControl as the difference between control and cash-flow rights.

ControlRights (C4) = 20% + 30% = 50%
CashFlowRights (C4) = 20% × 30% × 15% + 30% = 30.9%
ExcessControl (C4) = 50% - 30.9% = 19.1%

ControlRights (C5) = 15%
CashFlowRights (C5) = 15% × 20% = 3%
ExcessControl (C5) = 15% - 3% = 12%
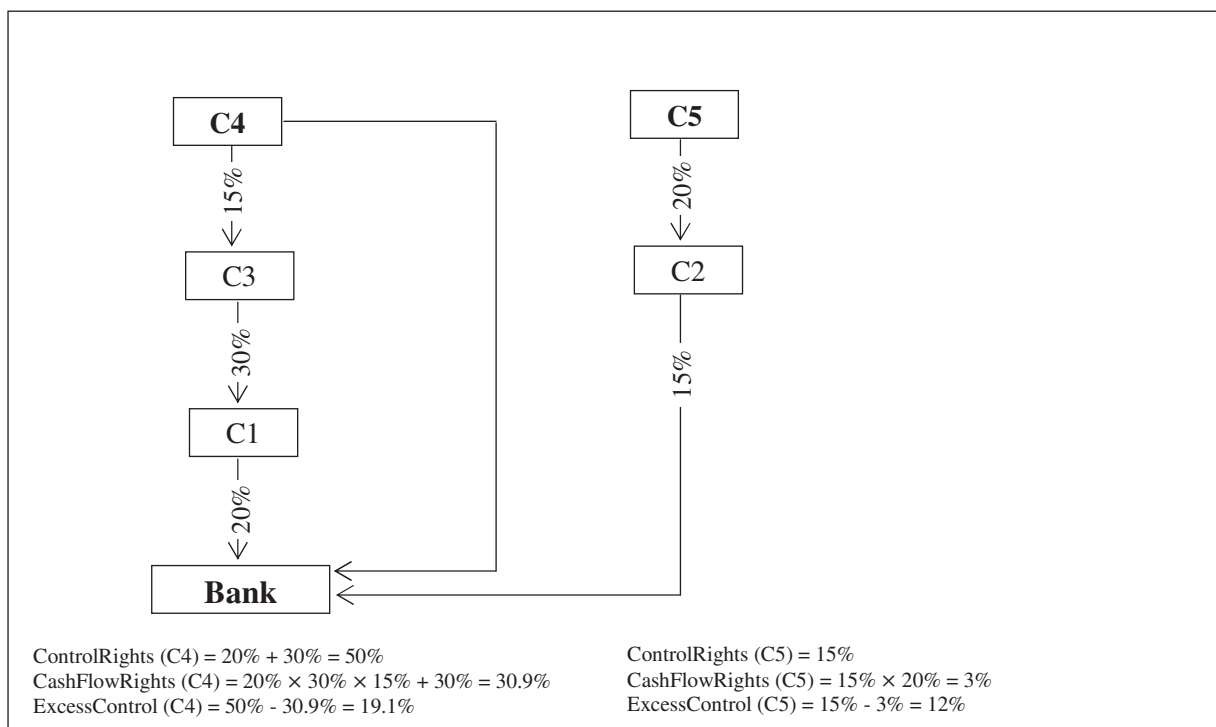
2.2.2.3. Control variables

We include in our estimations a set of control variables (X) which are expected to affect bank profitability and risk.

We include the natural logarithm of bank total assets (Log(Assets)) and the ratio of equity to total assets (Equity) to respectively account for bank size and capitalization.[32] Larger banks could be more profitable than small banks if they benefit from scale and scope economies and from higher market power (McAllister and McManus, 1993; Pasiouras and Kosmidou, 2007). But they could also be less profitable due to higher agency costs inherent to their complexity (Berger et al., 1987). In terms of risk, larger banks have greater ability to diversify their activities and should be less risky (Demsetz and Strahan, 1997) but because of the presence of too-big-to-fail policies, they might also have higher incentives to take more risk (Galloway et al., 1997). Better capitalized banks are expected to be more profitable because they can raise funds at a lower cost (Bourke, 1989; Berger, 1995; Iannotta et al., 2007). While the effect of bank capitalization on default risk is expected to be negative, its effect on risk-taking is not clear. Banks with higher capital ratios are safer and take less risk (Keeley, 1990). But higher capital ratios due to more stringent capital regulation can encourage banks to take on more risk to maintain the expected return to shareholders (Koehn and Santomero, 1980; Kim and Santomero, 1988), leading to a positive relationship (Iannotta, 2006; Barry et al., 2011).

We introduce in our regressions the ratio of deposits to total assets (Deposits). While banks with higher deposits-to-assets ratio are expected to be more risky (Iannotta et al., 2007), the impact on profitability is uncertain. Banks with larger deposit base could be more profitable because such funds are cheaper especially in the presence of deposit insurance (Iannotta et al., 2007) but could also be less profitable because deposits are costly in terms of fixed and labor costs (branching). We also include the ratio of total loans to total assets (Loans). A higher loans-to-assets ratio might lead to higher profitability if loans are more profitable than other assets (Iannotta et al., 2007) but also to lower profitability if loans are more costly to produce

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[32] Table C2.1 in Appendix C shows the correlation coefficients among the key explanatory variables used in our regressions. On the whole, the correlation coefficients are low except for bank size as measured by the natural logarithm of total assets (Log(Assets)) and the ratio of equity to total assets (Equity). We hence orthogonalize Equity with respect to Log(Assets).

than other assets and some of them become non-performing (Bourke, 1989; Molyneux and Thornton, 1992). Regarding risk, the impact is expected to be negative because loans are usually more stable than non-traditional intermediation activities (Iannotta et al., 2007). We control for differences in business models by including the ratio of net non-interest income to net operating income (NNII) which we expect to have a positive effect on profitability and risk. Greater reliance on non-interest income activities is generally found to be associated with higher risk and lower risk-adjusted profitability (Stiroh, 2004; Lepetit et al., 2008). To account for operational efficiency, we use the cost-to-income ratio (CostIncomeRatio) which we expect to have a negative effect on bank profitability and a positive effect on risk (Athanasoglou et al., 2008; Shehzad et al., 2010; Barry et al., 2011).

When we consider the broad sample of 750 banks, we include a dummy variable Listed to control for the public or private status of the bank. Publicly listed banks are expected to be more profitable but also more risky (Shehzad et al., 2010; Barry et al., 2011). To account for the influence of government interventions, and specifically capital injections, we include a dummy variable Rescue indicating if the bank benefited from public support during the 2008 financial crisis. We also account for differences in ownership types (Barry et al., 2011) by including a set of dummy variables which reflect the type of the largest ultimate controlling shareholder: Bank, Family, State, Institutional, Industry and Foundation which respectively take the value of one if the largest ultimate controlling owner is a bank; an individual, a family or a manager;[33] a state or a public authority; a financial company, an insurance company, a mutual or a pension fund; an industrial firm; and a foundation or a research institute (the category of widely held banks is the benchmark group).

Finally, we include the growth rate of the real gross domestic product (GDPGrowth) to control for differences in the macroeconomic environment. We expect a higher growth rate of GDP to be associated with higher profitability (Molyneux and Thornton, 1992; Iannotta et al., 2007; Albertazzi and Gambacorta, 2009) and lower risk (Distinguin et al., 2013).

The definition, descriptive statistics and sources of all the variables used in our regressions are provided in Table 2.1.

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[33] We follow La Porta et al. (1999) and classify a bank as family-controlled if the controlling shareholder is a person. We hence include inside this category banks controlled by an individual, a family or a manager.

Table 2.1. Variables definition and summary statistics

Variable name	Definition	Source	Mean	Median	Standard deviation	Minimum	Maximum	Number of observations
ROA	Return on assets defined as the ratio of net income to total assets (%).	Bankscope	0.634	0.511	1.078	-4.959	4.831	4,261
SDROA	Three-year rolling-window standard deviation of the return on assets (%).	Bankscope	0.482	0.270	0.610	0.010	3.900	4,261
ZScore	Measure of bank default risk. ZScore=(ROA+ Equity)/SDROA, where Equity is the ratio of total equity to total assets.	Bankscope	63.933	37.680	80.355	1.146	594.782	4,261
Z1Score	Measure of bank asset risk. Z1Score=ROA/SDROA.	Bankscope	4.363	2.839	5.710	-7.148	39.736	4,261
Z2Score	Measure of leverage risk. Z2Score=Equity/SDROA.	Bankscope	59.570	34.214	76.840	0.603	571.657	4,261
Return	Market based bank return defined as the mean of daily bank stock returns within a calendar year (%).	Bloomberg	0.082	0.067	0.184	-1.378	4.138	805
σ(Return)	Market based bank risk defined as the standard deviation of daily stock returns within a calendar year (%).	Bloomberg	1.999	1.668	1.290	0.101	12.251	805
MZScore	Market based ZScore defined as $\frac{100+\text{Return}}{\sigma(\text{Return})}$, where Return and σ(Return) are expressed in percentages.	Bloomberg	70.351	59.979	56.649	8.161	989.324	805
DD	Bank distance to default. Details on the computation of DD are provided in Appendix B.	Bloomberg	4.794	4.143	3.201	-0.172	29.935	805
$D_{2007-2008}$	Dummy equal to one if the year is 2007 or 2008, and zero otherwise.	Bankscope	0.254	0	0.435	0	1	4,261
$D_{2009-2010}$	Dummy equal to one if the year is 2009 or 2010, and zero otherwise.	Bankscope	0.224	0	0.417	0	1	4,261
ExcessControl	Difference between control and cash-flow rights (%).	Bankscope, Amadeus and annual Reports	17.131	0.000	29.492	0.000	99.993	4,261
Bank	Dummy equal to one if the largest ultimate controlling owner is a bank, and zero otherwise.	Bankscope, Amadeus and annual Reports	0.320	0	0.466	0	1	4,261
Family	Dummy equal to one if the largest ultimate controlling owner is an individual, a family or a manager, and zero otherwise.	Bankscope, Amadeus and annual Reports	0.230	0	0.421	0	1	4,261
State	Dummy equal to one if the largest ultimate controlling owner is a state or a public authority, and zero otherwise.	Bankscope, Amadeus and annual Reports	0.120	0	0.325	0	1	4,261
Institutional	Dummy equal to one if the largest ultimate controlling owner is a financial company, an insurance company, a mutual or a pension fund, and zero otherwise.	Bankscope, Amadeus and annual Reports	0.130	0	0.336	0	1	4,261
Industry	Dummy equal to one if the largest ultimate controlling owner is an industrial firm, and zero otherwise.	Bankscope, Amadeus and annual Reports	0.038	0	0.192	0	1	4,261

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Table 2.1 (continued)

Foundation	Dummy equal to one if the largest ultimate controlling owner is a foundation or research institute, and zero otherwise.	Bankscope, Amadeus and annual Reports	0.045	0	0.208	0	1	4,261
Log(Assets)	Natural logarithm of total assets (Millions of Euros).	Bankscope	7.674	7.324	2.345	1.955	14.605	4,261
Equity	Ratio of total equity to total assets (%).	Bankscope	10.108	7.732	11.052	1.023	54.685	4,261
Deposits	Ratio of customer deposits to total assets (%).	Bankscope	49.155	51.079	26.403	1.002	91.727	4,261
Loans	Ratio of net loans to total assets (%).	Bankscope	49.968	55.131	27.067	1.512	94.889	4,261
NNII	Ratio of net noninterest income to net operating income (%).	Bankscope	38.648	34.714	28.316	-29.326	109.431	4,261
CostIncomeRatio	Cost to income ratio (%).	Bankscope	65.773	63.158	28.062	1.351	352.941	4,261
Listed	Dummy equal to one if the bank is publicly listed, and zero otherwise.	Bankscope	0.189	0	0.391	0	1	4,261
Rescue	Dummy equal to one during the 2007-2010 period if the bank was rescued during the financial crisis, and zero otherwise.	Petrovic and Tutsch (2009)	0.019	0	0.138	0	1	4,261
GDPGrowth	Real GDP (Gross Domestic Product) growth rate (%).	Bloomberg	1.299	1.827	2.543	-8.204	6.639	4,261
ShareRight	Dummy equal to one if the anti-director index is lower than the median value, and zero otherwise. In our sample, the anti-director index has a median value of three and ranges from one (Luxembourg) with the weakest protection to five (Spain and the United Kingdom) with the highest level of shareholder protection. This index is obtained by adding one when: (1) shareholders are allowed to mail in their proxy votes to the firm; (2) shareholders are not required to deposits hares before any general shareholders' meeting; (3) cumulative voting or proportional representation of minorities in the board is allowed; (4) minority shareholders have legal mechanisms against perceived oppression by the board; (5) the minimum percentage of share capital that entitles a shareholder to call for a special shareholders' meeting is no more than 10%; or (6) shareholders have preemptive rights that can be waived only by a shareholders' vote.	Djankov et al. (2008)	0.684	1	0.465	0	1	4,261

2.3. Sample characteristics and univariate analysis

We first present the ultimate ownership characteristics of our two samples (broad sample of banks and the subsample of listed banks). Then, using univariate mean tests we look into excess control rights and banks' characteristics for the three considered periods (2002-2006, 2007-2008 and 2009-2010).

2.3.1. Ultimate ownership characteristics in Western Europe

Our data set indicates that around 88% of the observations relate to banks controlled by at least one ultimate shareholder. Amongst banks that are controlled, 58% of the observations refer to an ultimate shareholder with equal control and cash-flow rights and 42% to an ultimate shareholder with excess control rights.

To better emphasize the ownership characteristics of the sample banks, we further analyze the ownership type depending on the presence and the absence of excess control rights. We hence divide the sampled banks into two groups based on the median value of the excess control rights variable: banks without excess control rights (ExcessControl=0) and banks with excess control rights (ExcessControl>0).[34] We report in Table 2.2 (Panel 1 for the broad sample of banks and Panel 2 for the subsample of listed banks) information on ultimate ownership type for the subsamples of banks without and with excess control rights. Considering the broad sample of banks (Panel 1 of Table 2.2), the data show that, banks (Bank) are more frequently controlling owners in the absence of excess control rights (almost 40% against only 18% of the observations in the presence of excess control rights). Families (Family) and states (State) are predominantly controlling shareholders with excess control rights (respectively around 31% and 23% against 19% and 6% of the observations in banks without excess control rights), which is consistent with the view that excess control rights enable controlling shareholders, and especially families, to expropriate minority shareholders

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[34] A bank is classified as without excess control rights if it is controlled by an ultimate owner with equal control and cash-flow rights or if it is widely-held. A bank is classified as with excess control rights if it is controlled by an ultimate owner with greater control than cash-flow rights. The classification of banks as without or with excess control rights changes over time. Amongst the 750 banks in our sample, 384 are continuously categorized as without excess control rights and 294 as with excess control rights while 72 banks switch from one category to the other over the 2002-2010 period.

(Claessens et al., 2002). Institutional investors (Institutional) are also more frequent in the presence of excess control rights (around 18% against 10% in the absence of excess control rights). Industrial companies (Industry) and Foundations are less frequent in both subsamples but they exhibit an even weaker presence in banks without excess control rights (respectively almost 3% and 4% versus 5% and 6% of the observations in the presence of excess control rights).[35] In the subsample of banks without excess control rights, widely held banks represent about 18% of the observations. Ownership type in the subsample of listed banks follows almost a similar distribution (Panel 2 of Table 2.2).

Table 2.2. Information on ultimate ownership type

This table reports information on ultimate ownership type for the subsamples of banks without and with excess control rights, on average, for the years 2004, 2006 and 2010 using a control threshold of 10%. We classify a bank as without excess control rights (*ExcessControl=0*) if it is controlled by an ultimate owner with equal control and cash-flow rights or if it is widely held. We classify a bank as with excess control rights (*ExcessControl>0*) if it is controlled by an ultimate owner with greater control than cash-flow rights. We differentiate banks according to the type of their largest ultimate controlling owner: a bank (*Bank*); an individual, a family or a manager (*Family*); a state or a public authority (*State*); a financial company, an insurance company, a mutual or a pension fund (*Institutional*); an industrial firm (*Industry*); a foundation or a research institute (*Foundation*). *WidelyHeld* refers to banks with no controlling shareholder.

	Percentage of observations	Number of observations	Number of banks	Percentage of observations	Number of observations	Number of banks
Panel 1: Broad sample of banks ExcessControl=0 (2,680 observations)				ExcessControl>0 (1,581 observations)		
Bank	40.522	1,086	206	17.521	277	66
Family	18.246	489	95	31.183	493	122
State	5.858	157	27	22.517	356	83
Institutional	10.000	268	53	18.027	285	73
Industry	3.134	84	16	5.060	80	22
Foundation	3.843	103	19	5.693	90	24
WidelyHeld	18.396	493	96	-	-	-
Panel 2: Subsample of listed banks ExcessControl=0 (596 observations)				ExcessControl>0 (209 observations)		
Bank	16.107	96	19	15.311	32	5
Family	14.430	86	16	35.885	75	12
State	4.530	27	5	15.311	32	5
Institutional	15.268	91	23	18.182	38	6
Industry	2.181	13	3	9.569	20	6
Foundation	5.034	30	7	5.742	12	2
WidelyHeld	42.450	253	53	-	-	-

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[35] Our data set indicates (not reported in Table 2.2) that in the subsample of banks without excess control rights, each shareholder category holds more than 50% (majority) of the cash-flow rights, consistently with the view that controlling shareholders with equal rights are more oriented to profit maximization rather than expropriation (Villalonga and Amit, 2006; Haw et al., 2010).

2.3.2. Excess control rights and bank characteristics: univariate analysis

Table 2.3 compares the key financial characteristics and the performance (profitability and risk) of banks without and with excess control rights throughout the 2002-2006, 2007-2008 and 2009-2010 periods considering the broad sample of banks (Panel 1) and the subsample of listed banks (Panel 2). The data mainly show that banks with excess control rights are less capitalized (lower equity-to-total assets ratio) irrespective of the period. The cost-to-income ratio (CostIncomeRatio) is not different for banks with and without excess control rights before the crisis but also during the later stage of the financial crisis (2009-2010). However, during the acute crisis years (2007-2008), banks with excess control rights have a lower cost-to-income ratio suggesting that they become significantly more cost-efficient. The table also indicates that banks with excess control rights have higher ratios of non-performing loans than other banks during the 2002-2006 and 2009-2010 periods.

Considering bank profitability and risk, before the crisis (2002-2006), banks with excess control rights have a significantly lower profitability (ROA and Return), higher risk (higher SDROA and σ(Return), and lower ZScore, Z1Score, Z2Score, MZScore and DD) than banks without excess control rights. Such stylized facts are consistent with the expropriation hypothesis of divergence between control and cash-flow rights (Claessens et al., 2002; Boubakri and Ghouma, 2010; Azofra and Santamaría, 2011). However, during the severe crisis years (2007-2008), banks with excess control rights perform better than other banks: they exhibit a significantly higher profitability (ROA and Return), lower risk (lower SDROA and σ(Return) and lower Z1Score) compared to their peers, with no longer any significant difference in terms of default risk (ZScore and Z2Score). A possible explanation could be the lower incentives for controlling shareholders with excess control rights to undertake lax decisions as suggested by their higher cost-efficiency during the acute crisis period (i.e., lower cost-to-income ratio). Alternatively, such banks might have also benefited from private support from their ultimate controlling shareholders or their related-firms within the pyramid. At the later stage of the financial crisis (2009-2010), banks with excess control rights are again less profitable (ROA and Return) and more risky (higher SDROA and σ(Return), lower ZScore, Z1Score, Z2Score, MZScore and DD) than other banks suggesting that the reversed effect observed during the acute crisis period is not persistent.

Table 2.3. Bank characteristics by excess control rights, on average, across the 2002-2006, 2007-2008 and 2009-2010 periods

This table compares the characteristics of banks without and with excess control rights across the 2002-2006, 2007-2008 and the 2009-2010 periods for both the broad sample of 750 banks (Panel 1) and the subsample of 109 listed banks (Panel 2). Using a control threshold of 10%, we classify a bank as without excess control rights (*ExcessControl=0*) if it is controlled by an ultimate owner with equal control and cash-flow rights or if it is widely held. We classify a bank as with excess control rights (*ExcessControl>0*) if it is controlled by an ultimate owner with greater control rights than cash-flow rights. *T-statistics* test for the null: "bank characteristics are not different between banks with and without excess control rights during the 2002-2006, the 2007-2008 and the 2009-2010 periods"; ***, ** and * indicate significance at the 1%, 5% and 10% levels, respectively, for a bilateral test. *Assets* is bank total assets; *Equity* is the ratio of total equity to total assets; *Deposits* is the ratio of customer deposits to total assets; *Loans* is the ratio of net loans to total assets; *NNII* is the ratio of net noninterest income to net operating income; *CostIncomeRatio* is cost to income ratio; *NPL* is the ratio of non-performing loans to gross loans; *ROA* is the return on assets defined as net income divided by total assets; *SDROA* is the three-year rolling-window standard deviation of the return on assets; *ZScore* is a measure of bank default risk; *Z1Score* is a measure of bank asset risk; *Z2Score* is a measure of leverage risk; *Return* is the mean of daily bank stock returns within a calendar year; *σ(Return)* is the standard deviation of daily stock returns within a calendar year; *MZScore* is market based ZScore defined as $\frac{100+Return}{\sigma(Return)}$; *DD* is the bank distance to default.

Period	Pre-crisis period (2002-2006)			Acute financial crisis period (2007-2008)			Later stage of the financial crisis (2009-2010)		
	ExcessControl=0	ExcessControl>0	T-statistics	ExcessControl=0	ExcessControl>0	T-statistics	ExcessControl=0	ExcessControl>0	T-statistics
Panel 1: Broad sample of banks									
General characteristics									
Assets (Millions of Euros)	43950.503	42238.253	0.985	52067.002	42813.737	0.765	55777.595	42347.337	1.018
Equity (%)	11.087	9.764	2.240**	10.826	9.474	2.060**	10.565	9.525	2.046**
Deposits (%)	50.426	46.626	3.263***	50.935	44.412	3.960***	51.158	48.809	1.343
Loans (%)	50.949	46.859	1.311	52.210	50.734	1.032	52.839	49.749	1.215
NNII (%)	38.839	39.914	-1.145	34.159	36.043	-1.200	37.677	39.177	-1.187
CostIncomeRatio (%)	64.981	66.098	-0.937	65.514	62.996	2.098**	65.825	66.983	-0.085
NPL (%)	2.916	5.159	-4.302***	3.292	3.572	-0.842	4.382	5.913	-2.184**
Profitability and risk									
ROA (%)	0.822	0.651	6.008***	0.669	0.782	-2.195**	0.359	0.220	2.114**
SDROA (%)	0.425	0.590	-4.183***	0.493	0.383	2.036**	0.536	0.599	-3.506***
ZScore	80.369	52.928	7.193***	66.393	61.107	1.184	58.698	43.727	5.424***
Z1Score	5.434	4.209	4.483***	4.268	5.048	-2.144**	2.790	1.890	3.325***
Z2Score	74.935	48.719	7.194***	62.125	56.059	1.201	55.908	41.837	5.430***
Panel 2: Subsample of listed banks									
General characteristics									
Assets (Millions of Euros)	99515.658	121879.800	-0.724	156320.000	127087.300	0.398	160459.500	89572.731	0.978
Equity (%)	9.253	7.483	2.292**	8.655	6.947	2.396**	8.459	7.076	1.881*
Deposits (%)	52.728	53.186	-0.184	50.809	50.840	-0.008	53.591	53.166	0.118
Loans (%)	59.451	54.937	1.842*	63.575	60.247	0.854	59.809	61.059	-0.332
NNII (%)	38.907	36.129	0.827	28.652	30.683	-0.422	34.272	32.318	0.446
CostIncomeRatio (%)	61.858	63.432	-0.787	70.870	63.836	2.174**	61.981	65.717	-0.734
NPL (%)	2.511	3.547	-2.171**	2.916	3.917	-1.215	4.233	5.978	-2.196**
Profitability and risk									
Return (%)	0.087	0.035	1.872*	-0.200	-0.044	-3.336***	0.005	-0.030	1.873*
σ(Return) (%)	1.518	1.947	-4.287***	2.374	1.857	2.069**	2.909	3.312	-1.588*
MZScore	83.865	51.596	5.084***	57.024	72.584	-2.145**	47.424	31.024	2.170**
DD	5.787	4.756	2.291**	4.605	4.947	-0.692	2.768	1.628	2.490**

2.4. Econometric results

We first examine the effect of excess control rights on bank profitability and risk depending on the state and soundness of the banking industry and then look at various factors that could influence such an effect. We also test for potential nonlinear relationships between excess control rights and bank profitability and risk.

2.4.1. Effect of excess control rights on bank profitability and risk

We perform several tests to choose the appropriate method to estimate the coefficients of Eq. (2.1). The Fischer test points to the presence of individual effects and the Hausman test indicates that random effects are more suitable for our data set. While the modified Wald test points to the presence of heteroscedasticity, the Wooldridge test fails to reject the null hypothesis of absence of first order autocorrelation in the residuals. As a consequence, we estimate Eq. (2.1) using the random effects model (Generalized Least Squares estimation method GLS)[36] with robust standard errors to correct for heteroscedasticity. Table 2.4 reports the estimation results obtained for the broad sample of banks (Panel 1) and for the subsample of listed banks (Panel 2).

Before the crisis (2002-2006), higher excess control rights are associated with poorer profitability and higher risk and this holds in all the regressions using either an accounting- or a market-based measure for the dependent variable: α_1 is negative and significant for the profitability (ROA and Return) and default risk (ZScore, Z1Score, Z2Score, MZScore and DD) proxies and positive and significant for the risk-taking proxies (SDROA and σ(Return)). Our results also reveal that the effect of excess control rights on profitability and risk is significantly different during the acute crisis (2007-2008) and the pre-crisis (2002-2006) periods: α_2 is significant in all the regressions and carries the opposite sign to α_1. Particularly,

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[36] Prior studies (e.g., Demsetz and Lehn, 1985; Himmelberg et al., 1999; Almeida et al., 2011) highlight that ownership is endogenous because it is affected by the firm's level of profitability and risk. We hence test for the presence of endogeneity for the excess control rights variable (ExcessControl). Following Laeven and Levine (2009) and Lin et al. (2011a), for each bank in a given country we use an average measure of ExcessControl obtained from all other banks in the same country to instrument ExcessControl. The Hausman test, used to determine whether the variable ExcessControl is endogenous, shows that the null hypothesis of exogeneity is not rejected.

the Wald test indicates that while the effect of excess control rights on profitability (ROA and Return), risk (SDROA, σ(Return) and Z1Score) is completely reversed during the 2007-2008 crisis years ($\alpha_1 + \alpha_2$ is significant and carries the opposite sign to α_1), its positive effect on default risk simply disappears ($\alpha_1 + \alpha_2$ is not significant for ZScore, Z2Score, MZScore and DD variables). Furthermore, the results indicate that the effect of excess control rights on bank profitability and risk is not different across the pre-crisis period and the 2009-2010 period: α_3 is not significant in all the regressions. As shown by the Wald test, at the later stage of the financial crisis (2009-2010), we again find excess control rights to be negatively linked with profitability and positively with risk, highlighting that the reversed effect observed during the acute crisis years (2007-2008) is short-lived.

The effect of excess control rights on bank profitability and risk is not only statistically significant but also economically important. For instance, considering its effect on profitability (Panel 1 of Table 2.4), a one standard deviation (27.91%) increase in excess control rights decreases the profitability proxy (ROA) by around 19% and 9% of its mean respectively during the 2002-2006 and 2009-2010 periods.[37] During the severe crisis years (2007-2008), a one standard deviation increase in excess control rights increases the profitability proxy (ROA) by 9% of its mean (from 0.63% to 0.72%).

Regarding control variables, most of them enter significant and carry the expected sign as in previous studies. Not surprisingly, the coefficients on both dummies $D_{2007\text{-}2008}$ and $D_{2009\text{-}2010}$ show a drop in profitability and an increase in risk during the 2007-2008 and 2009-2010 periods likely because of the adverse effects of the crisis but also because banks needed to secure a higher portion of their loans.[38] The results also indicate a lower profitability and risk (lower ROA, SDROA, σ(Return) and higher Z1Score) for larger banks but a higher probability of failure (lower ZScore and Z2Score). In contrast, better capitalized[39] banks are more profitable (higher ROA), take more risk (higher SDROA) but they are less vulnerable

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[37] For example, the effect of excess control rights on profitability before the crisis is computed as follows:
$\frac{\partial \text{ROA}}{\partial \text{ExcessControl}}\left(D_{2007\text{-}2008}{=}D_{2009\text{-}2010}{=}0\right){=}{-}0.004{\times}29.49{\approx}0.12$

[38] In our sample, the ratio of loan loss provisions has increased from 0.38% before the crisis to 0.50% during the acute crisis years (2007-2008) and further to 0.87% during the second stage of the distress period (2009-2010).

[39] Note that in the reported results, to deal with colinearity, Equity is orthogonalized with respect to bank size (Log(Assets)).

(higher ZScore, Z2Score and MZScore). We also find banks more reliant on deposit funding to exhibit a higher profitability (ROA) and a lower risk (higher Z1Score). While banks with a higher share of loans in total assets are less risky (lower SDROA, higher ZScore, Z1Score and Z2Score), banks more reliant on non-interest generating activities are more profitable but also more vulnerable (lower ZScore and Z2Score); a finding consistent with the view that an expansion into non-traditional activities leads to higher risk (Lepetit et al., 2008). In all the regressions, less cost-efficient banks are less profitable and more risky. As expected, we find that publicly listed banks are more profitable but more vulnerable (lower ZScore and Z2Score) than privately owned banks. Rescued banks are found to be less profitable (Return) and more risky (higher σ(Return) and lower ZScore, Z1Score and Z2Score). The dummy variables included to account for the type of the controlling shareholder are generally non-significant. Coherently, we find that the annual growth rate of the gross domestic product is positively associated with profitability (ROA) and negatively with risk.

To summarize, we find that the presence of excess control rights does not uniformly affect bank profitability and risk across sound and crisis periods. Specifically, in line with the entrenchment view (Claessens et al., 2002; Azofra and Santamaría 2011), our results show that being controlled by an ultimate owner with sharper divergence between control and cash-flow rights contributes to lower profitability and increases risk-taking and default risk during sound periods. However, our results show that, during the financial crisis of 2007-2008, excess control rights had the opposite effect: they contributed to improve bank profitability and reduce risk without impacting default risk. A possible explanation could be that entrenched controlling shareholders were voluntarily and temporarily postponing their opportunistic behavior to keep the bank in business and benefit from future profits (Friedman et al., 2003). Alternatively, because of higher market discipline and closer supervisory scrutiny during the crisis, such shareholders might have had less latitude to pursue their own interests. Finally, our results indicate that such a reversed effect was short-lived and quickly disappeared during the later stage of the financial crisis (2009-2010).

Table 2.4. Excess control rights, bank profitability and risk

This table shows the Generalized Least Squares estimation results on the effect of excess control rights on bank profitability and risk (Eq. (2.1)) over the 2002-2010 period. In Panel 1, all regressions are performed on the broad sample of 750 European commercial banks corresponding to 4,261 observations. In Panel 2, all regressions are performed on the subsample of 109 listed banks corresponding to 805 observations. *ROA* is the return on assets defined as net income divided by total assets; *SDROA* is the three-year rolling-window standard deviation of the return on assets; *ZScore* is a measure of bank default risk; *Z1Score* is a measure of bank asset risk; *Z2Score* is a measure of leverage risk; *Return* is the mean of daily bank stock returns within a calendar year; $\sigma(Return)$ is the standard deviation of daily stock returns within a calendar year; *MZScore* is market based ZScore defined as $\frac{100+Return}{\sigma(Return)}$; *DD* is the bank distance to default; *ExcessControl* is the difference between control and cash-flow rights; $D_{2007\text{-}2008}$ is a dummy equal to one if the year is 2007 or 2008, and zero otherwise; $D_{2009\text{-}2010}$ is a dummy equal to one if the year is 2009 or 2010, and zero otherwise; *Log(Assets)* is the natural logarithm of total assets; *Equity* is the ratio of total equity to total assets; *Deposits* is the ratio of customer deposits to total assets; *Loans* is the ratio of net loans to total assets; *NNII* is the ratio of net noninterest income to net operating income; *CostIncomeRatio* is cost to income ratio; *Listed* is a dummy equal to one if the bank is publicly listed, and zero otherwise; *Rescue* is a dummy equal to one during the 2007-2010 period if the bank was rescued during the financial crisis, and zero otherwise; *Bank-Foundation* is a set of dummy variables representing the type of the largest ultimate owner (*WidelyHeld* is the benchmark group); *GDPGrowth* is the real Gross Domestic Product (GDP) growth rate. P-values based on robust standard errors are shown in parentheses. ***, ** and * indicate significance respectively at the 1%, 5% and 10% levels. *Fischer test* is a test of the absence of individual effects. *Hausman test* is a test of exogeneity of the regressors (random effects vs fixed effects). *Modified Wald test* is a test of homoscedasticity. *Wooldridge test* is a test of the absence of first order autocorrelation in panel data.

Dependent variable	Panel 1: Broad sample of banks					Panel 2: Subsample of listed banks			
	ROA	SDROA	ZSCORE	Z1SCORE	Z2SCORE	Return	σ(Return)	MZScore	DD
ExcessControl (α_1)	-0.004***	0.002***	-0.417***	-0.017***	-0.399***	-0.001***	0.006*	-0.491***	-0.026**
	(0.000)	(0.003)	(0.000)	(0.001)	(0.000)	(0.008)	(0.082)	(0.004)	(0.013)
$D_{2007\text{-}2008}$ × ExcessControl (α_2)	0.006***	-0.004***	0.320***	0.030***	0.290***	0.004***	-0.012***	0.726***	0.036***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.004)	(0.001)	(0.002)
$D_{2009\text{-}2010}$ × ExcessControl (α_3)	0.002	-0.000	0.079	0.004	0.075	0.000	-0.001	0.269	0.007
	(0.171)	(0.696)	(0.304)	(0.549)	(0.306)	(0.660)	(0.922)	(0.183)	(0.584)
$D_{2007\text{-}2008}$	-0.123**	0.016**	-13.187***	-0.701***	-12.451***	-0.245***	0.447***	-19.836***	-0.993***
	(0.017)	(0.043)	(0.000)	(0.004)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$D_{2009\text{-}2010}$	-0.297***	0.104***	-18.533***	-1.910***	-16.585***	-0.029**	0.482***	-28.204***	-2.611***
	(0.000)	(0.004)	(0.000)	(0.000)	(0.000)	(0.034)	(0.000)	(0.000)	(0.000)
Log(Assets)	-0.070***	-0.093***	-1.592**	0.290***	-1.816**	-0.016	-0.065**	-0.742	-0.038
	(0.000)	(0.000)	(0.030)	(0.000)	(0.036)	(0.272)	(0.036)	(0.383)	(0.575)
Equity	0.233***	0.150***	5.224**	0.010	5.216**	0.106	0.210	5.287**	0.044
	(0.000)	(0.000)	(0.012)	(0.922)	(0.010)	(0.209)	(0.163)	(0.041)	(0.860)
Deposits	0.003**	0.001	0.008	0.016***	-0.005	0.000	0.003	0.129	0.004
	(0.028)	(0.803)	(0.930)	(0.001)	(0.953)	(0.803)	(0.513)	(0.455)	(0.756)
Loans	-0.001	-0.002***	0.206***	0.011***	0.194**	-0.000	-0.001	0.115	0.007
	(0.286)	(0.002)	(0.008)	(0.010)	(0.011)	(0.573)	(0.868)	(0.472)	(0.499)
NNII	0.003***	0.000	-0.187***	0.005	-0.187***	0.000	0.002	-0.074	-0.003
	(0.001)	(0.693)	(0.002)	(0.230)	(0.001)	(0.171)	(0.122)	(0.157)	(0.404)
CostIncomeRatio	-0.018***	0.004***	-0.189***	-0.051***	-0.140***	-0.002***	0.011***	-0.211***	-0.012**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.004)	(0.000)	(0.001)	(0.036)
Listed	0.203***	0.021	-16.132***	1.874***	-18.088**	-	-	-	-
	(0.003)	(0.687)	(0.009)	(0.000)	(0.028)	-	-	-	-
Rescue	-0.032	0.035	-18.668**	-2.954***	-15.418**	-0.224***	1.381***	-11.496	-0.274
	(0.716)	(0.574)	(0.024)	(0.001)	(0.039)	(0.000)	(0.000)	(0.155)	(0.603)
Bank	0.037	-0.057	3.043	0.309	2.752	0.038	-0.127	6.073	0.592
	(0.583)	(0.256)	(0.743)	(0.607)	(0.754)	(0.107)	(0.527)	(0.454)	(0.210)
Family	-0.141*	-0.002	-0.661	-0.515	-0.148	-0.021	-0.001	-3.818	-0.050
	(0.097)	(0.972)	(0.941)	(0.393)	(0.894)	(0.321)	(0.991)	(0.336)	(0.859)
State	-0.010	-0.035	11.439	0.292	11.191	-0.017	-0.112	0.481	0.195
	(0.900)	(0.534)	(0.285)	(0.679)	(0.267)	(0.666)	(0.535)	(0.944)	(0.608)
Institutional	0.081	0.072	-2.898	0.444	-2.335	0.009	0.179	13.176*	0.709
	(0.342)	(0.179)	(0.741)	(0.457)	(0.778)	(0.545)	(0.295)	(0.085)	(0.154)
Industry	0.102	-0.047	10.991	0.888	9.910	0.009	-0.223	0.080	0.207
	(0.443)	(0.557)	(0.272)	(0.259)	(0.291)	(0.750)	(0.447)	(0.990)	(0.629)
Foundation	-0.106	0.003	9.869	0.561	9.196	-0.026	-0.168	6.195	0.132
	(0.306)	(0.965)	(0.567)	(0.565)	(0.576)	(0.200)	(0.256)	(0.523)	(0.862)
GDPGrowth	0.043***	-0.017***	1.500***	0.214***	1.287***	0.002	-0.165***	1.339**	0.101**
	(0.000)	(0.000)	(0.003)	(0.000)	(0.008)	(0.396)	(0.000)	(0.014)	(0.013)
Constant	1.987***	1.103***	73.626***	5.238***	67.892***	0.370*	0.824	253.009***	16.758***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.068)	(0.131)	(0.000)	(0.000)
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Square	0.353	0.293	0.115	0.203	0.112	0.379	0.474	0.351	0.374
Wald tests: $\alpha_1+\alpha_2$	0.002**	-0.001**	-0.097	0.013*	-0.109	0.003***	-0.006*	0.235	0.011
$\alpha_1+\alpha_3$	-0.002**	0.002**	-0.338**	-0.013**	-0.324***	-0.001**	0.005*	-0.223**	-0.019*
Fischer test (p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Hausman test (p-value)	0.132	0.102	0.318	0.423	0.293	0.121	0.246	0.137	0.356
Modified Wald test (p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Wooldridge test (p-value)	0.155	0.123	0.116	0.264	0.113	0.125	0.188	0.164	0.239

2.4.2. Deeper investigation of the impact of excess control rights on profitability and risk

We go deeper by investigating the factors that may affect the relationship between excess control rights and bank profitability and risk during the three considered periods. We also test for the presence of nonlinearity in the observed relationships. Due to limited data on listed banks, we here focus on the broad sample of 750 banks.

2.4.2.1. Factors influencing the effect of excess control rights on bank profitability and risk

Consistent with the entrenchment view, our main results indicate that banks controlled by a shareholder with excess control rights underperform other banks before the crisis (2002-2006) and at the later stage of the financial crisis (2009-2010) but that they outperform them during the acute financial crisis years (2007-2008). Since entrenchment behavior might vary across owner types (Claessens et al., 2002; Villalonga and Amit, 2006) and the level of shareholder protection (La Porta et al., 2002; Dyck and Zingales, 2004), we test whether these factors affect the observed relationships during the three considered periods. Hence, if the observed effect is mainly due to the entrenchment behavior of the controlling shareholder, we expect it to be stronger in family-controlled banks or in banks located in countries with weak shareholder protection since expropriation is more likely to occur in these two situations. In other words, the poor performance observed during the 2002-2006 and 2009-2010 periods should be enhanced in family-controlled banks and in countries with weak shareholder protection and the reversed impact of excess control rights during the severe financial crisis years (2007-2008) should be short-lived. For simplicity, we here perform our regressions for each period separately (instead of augmenting Eq. (2.1) with interaction terms) and estimate the following model where Factor refers to one of the two factors that are expected to affect the relationship between excess control rights and bank performance:

$$y_{it} = (\alpha_1 + \alpha_2 \text{Factor}) \text{ExcessControl}_{it} + \varphi' X + \alpha_0 + \omega' \text{ Country} + \varepsilon_{it} \qquad (2.2)$$

To capture the effect of owner type, we define a dummy variable Family which takes the value of one if the bank is family-controlled, and zero otherwise.[40] To represent the level of shareholder protection, we define a dummy variable ShareRight which takes the value of one if the shareholder protection index, as defined in Djankov et al. (2008), is lower than the median value (which is equal to three in our sample), and zero otherwise. Tables 2.5 and 2.6 report the estimation results.

Consistent with our predictions, we find that the effect of excess control rights is enhanced in family-controlled banks and in banks operating in countries with weak shareholder protection independently of the period we consider. Before the crisis (2002-2006), although excess control rights negatively affect profitability and positively impact risk irrespective of the owner type and the level of shareholder protection, the results indicate that such an entrenchment behavior is aggravated in family-controlled banks or in banks located in countries with weak shareholder protection (α_2 is significant and carries the same sign as α_1 in almost all the regressions).

During the acute financial crisis years (2007-2008), while the effect of excess control rights on profitability and risk simply disappears in nonfamily-controlled banks or in banks operating in shareholder more protective countries (α_1 is not significant in the ROA and SDROA regressions), the Wald test shows that such an effect is completely reversed in family-controlled banks or in banks located in shareholder less protective countries: excess control rights increase profitability and reduce risk (SDROA and Z1Score).

Furthermore, the results indicate that during the 2007-2008 crisis years the effect of excess control rights on default and leverage risks (ZScore and Z2Score) disappears only in family-controlled banks or in banks operating in countries with weak shareholder protection. Similarly, during the later stage of the financial crisis (2009-2010), family-controlled banks or banks operating in shareholder less protective countries return to their pre-crisis performance (profitability and risk) more quickly than nonfamily-controlled banks or banks located in a shareholder more protective environment (as shown by the Wald tests).

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[40] We classify the sample banks into two categories: family- and nonfamily-controlled banks. The category of nonfamily-controlled banks includes widely held banks (with no controlling shareholder), banks controlled by a widely held financial or nonfinancial corporation as well as state-controlled banks. This classification is reasonable because banks controlled by a widely held financial or nonfinancial corporation can be classified as widely held themselves (Caprio et al., 2007). We also include state-controlled banks inside this category because a large part of state ownership in our sample comes from government intervention (capital injections and nationalizations) during the financial crisis.

Table 2.5. Excess control rights, bank profitability and risk: effect of family ownership

This table shows the Generalized Least Squares estimation results on the effect of family ownership on the relationship between excess control rights and bank profitability and risk (Eq. (2.2)) across the 2002-2006, 2007-2008 and 2009-2010 periods. *ROA* is the return on assets defined as net income divided by total assets; *SDROA* is the three-year rolling-window standard deviation of the return on assets; *ZScore* is a measure of bank default risk; *Z1Score* is a measure of bank asset risk; *Z2Score* is a measure of leverage risk; *ExcessControl* is the difference between control and cash-flow rights; *Family* is a dummy equal to one if the largest controlling owner is an individual, a family or a manager, and zero otherwise; *Log(Assets)* is the natural logarithm of total assets; *Equity* is the ratio of total equity to total assets; *Deposits* is the ratio of customer deposits to total assets; *Loans* is the ratio of net loans to total assets; *NNII* is the ratio of net non-interest income to net operating income; *CostIncomeRatio* is cost to income ratio; *Listed* is a dummy equal to one if the bank is publicly listed, and zero otherwise; *Rescue* is a dummy equal to one during the 2007-2010 period if the bank was rescued during the financial crisis, and zero otherwise; *Bank-Foundation* is a set of dummy variables representing the type of the largest ultimate owner (WidelyHeld is the benchmark group); *GDPGrowth* is the real Gross Domestic Product (GDP) growth rate. P-values based on robust standard errors are shown in parentheses. ***, ** and * indicate significance respectively at the 1%, 5% and 10% levels. *Fischer test* is a test of the absence of individual effects. *Hausman test* is a test of exogeneity of the regressors (random effects vs fixed effects). *Modified Wald test* is a test of homoscedasticity. *Wooldridge test* is a test of the absence of first order autocorrelation in panel data.

Period	Pre-crisis period (2002-2006)					Acute financial crisis period (2007-2008)					Later stage of the financial crisis (2009-2010)				
Dependent variable	ROA	SDROA	ZSCORE	Z1SCORE	Z2SCORE	ROA	SDROA	ZSCORE	Z1SCORE	Z2SCORE	ROA	SDROA	ZSCORE	Z1SCORE	Z2SCORE
ExcessControl (α_1)	-0.002**	0.001*	-0.408***	-0.008*	-0.398***	0.001	-0.000	-0.234**	0.005	-0.241**	-0.001	0.002	-0.341***	-0.011*	-0.331***
	(0.041)	(0.072)	(0.000)	(0.052)	(0.000)	(0.584)	(0.616)	(0.031)	(0.543)	(0.022)	(0.094)	(0.133)	(0.001)	(0.068)	(0.001)
Family × ExcessControl (α_2)	-0.002*	0.003**	-0.172*	-0.015*	-0.159*	0.003*	-0.003**	0.348*	0.043**	0.303*	-0.001*	0.001**	-0.100*	-0.003*	-0.102*
	(0.086)	(0.017)	(0.082)	(0.075)	(0.097)	(0.058)	(0.011)	(0.063)	(0.036)	(0.095)	(0.090)	(0.050)	(0.097)	(0.072)	(0.088)
Log(Assets)	-0.069***	-0.098***	2.890***	0.509***	2.390*	-0.050*	-0.064***	0.022	0.303***	-0.284	-0.058***	-0.083***	-2.162	-0.047	-2.125
	(0.000)	(0.000)	(0.044)	(0.000)	(0.086)	(0.051)	(0.000)	(0.985)	(0.001)	(0.801)	(0.005)	(0.000)	(0.127)	(0.556)	(0.123)
Equity	0.120**	0.173***	5.593**	0.028	5.583**	0.351***	0.133***	3.221	-0.205	3.481	0.269***	0.106***	9.097**	0.138	8.973**
	(0.018)	(0.000)	(0.022)	(0.793)	(0.020)	(0.000)	(0.000)	(0.274)	(0.167)	(0.226)	(0.000)	(0.009)	(0.019)	(0.589)	(0.015)
Deposits	0.002	-0.001	0.024	0.021***	0.008	0.005***	-0.001	0.041	0.028***	0.016	0.005***	-0.003***	0.070	0.008	0.063
	(0.128)	(0.300)	(0.841)	(0.001)	(0.947)	(0.009)	(0.419)	(0.709)	(0.000)	(0.881)	(0.003)	(0.004)	(0.521)	(0.178)	(0.556)
Loans	-0.003**	-0.002***	0.279***	0.015**	0.266**	-0.000	-0.002**	0.188*	0.011*	0.177*	-0.003**	-0.001	0.153	0.002	0.151
	(0.024)	(0.006)	(0.010)	(0.010)	(0.011)	(0.913)	(0.027)	(0.050)	(0.074)	(0.057)	(0.036)	(0.292)	(0.193)	(0.753)	(0.187)
NNII	0.003***	0.001**	-0.269***	0.004	-0.267***	0.005**	-0.001	-0.280***	0.000	-0.275***	0.003**	0.002*	-0.258***	-0.001	-0.255***
	(0.001)	(0.050)	(0.001)	(0.470)	(0.001)	(0.007)	(0.339)	(0.002)	(0.969)	(0.002)	(0.042)	(0.089)	(0.003)	(0.925)	(0.002)
CostIncomeRatio	-0.020***	0.001	-0.114	-0.051***	-0.062	-0.015***	0.003***	-0.256***	-0.054***	-0.205***	-0.019***	0.004***	-0.231***	-0.048***	-0.187***
	(0.000)	(0.171)	(0.106)	(0.000)	(0.358)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Listed	0.196**	-0.008	-1.111	2.082***	-3.234	0.051	0.036	-4.841	1.165	-6.084	0.139	0.018	5.226	1.353*	3.864
	(0.038)	(0.884)	(0.915)	(0.001)	(0.747)	(0.666)	(0.665)	(0.684)	(0.114)	(0.592)	(0.153)	(0.836)	(0.676)	(0.052)	(0.746)
Rescue	-	-	-	-	-	0.073	0.000	-25.788***	-2.350*	-23.013***	0.071	0.082	-11.091	-0.860	-10.200
	-	-	-	-	-	(0.555)	(0.991)	(0.005)	(0.068)	(0.005)	(0.643)	(0.425)	(0.299)	(0.278)	(0.309)
Bank	-0.081	-0.029	6.206	0.504	5.633	0.177*	-0.130	-9.566	-0.051	-9.595	0.044	-0.070	-15.251	-0.588	-14.645
	(0.295)	(0.652)	(0.593)	(0.477)	(0.612)	(0.078)	(0.120)	(0.508)	(0.949)	(0.488)	(0.724)	(0.568)	(0.244)	(0.410)	(0.242)
Family	0.067	-0.045	10.190	0.998	9.157	0.370***	-0.021	-7.392	0.425	-7.960	-0.015	0.117	-21.851	-0.385	-21.437
	(0.469)	(0.444)	(0.407)	(0.211)	(0.432)	(0.009)	(0.834)	(0.643)	(0.635)	(0.603)	(0.932)	(0.419)	(0.153)	(0.673)	(0.141)

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Table 2.5 (continued)

State	-0.213**	-0.067	31.008**	0.777	30.115**	0.165	-0.175**	5.571	0.912	4.673	-0.158	0.022	-11.322	-0.696	-10.605
	(0.047)	(0.406)	(0.042)	(0.331)	(0.040)	(0.240)	(0.039)	(0.737)	(0.294)	(0.771)	(0.350)	(0.881)	(0.531)	(0.444)	(0.540)
Institutional	-0.040	0.163**	-2.129	-0.093	-2.195	-0.054	-0.052	-12.292	-0.696	-11.666	-0.050	0.124	-20.983	-0.828	-20.139
	(0.704)	(0.034)	(0.852)	(0.899)	(0.839)	(0.708)	(0.581)	(0.366)	(0.387)	(0.371)	(0.722)	(0.335)	(0.116)	(0.262)	(0.113)
Industry	-0.138	-0.022	23.807*	0.963	22.640*	0.199	-0.112	-7.243	0.396	-7.806	0.072	-0.202	18.065	1.242	16.851
	(0.318)	(0.855)	(0.071)	(0.329)	(0.068)	(0.213)	(0.269)	(0.619)	(0.668)	(0.574)	(0.747)	(0.319)	(0.393)	(0.286)	(0.407)
Foundation	-0.053	0.040	16.052	0.633	15.028	0.082	-0.175*	9.448	1.393	7.983	-0.115	-0.073	5.051	-0.424	5.498
	(0.651)	(0.579)	(0.537)	(0.656)	(0.547)	(0.742)	(0.059)	(0.581)	(0.180)	(0.627)	(0.541)	(0.674)	(0.836)	(0.740)	(0.813)
GDPGrowth	0.056***	-0.021**	-1.712	0.142	-1.860	0.107***	-0.027***	3.305***	0.608***	2.702***	0.013**	-0.013***	1.788***	0.114***	1.682***
	(0.000)	(0.041)	(0.304)	(0.239)	(0.238)	(0.000)	(0.000)	(0.001)	(0.000)	(0.004)	(0.028)	(0.000)	(0.000)	(0.003)	(0.000)
Constant	1.958***	1.296***	53.029**	3.075**	49.252**	1.356***	0.872***	79.721***	3.401**	76.211***	1.932***	1.270***	91.852***	7.053***	85.097***
	(0.000)	(0.000)	(0.013)	(0.039)	(0.016)	(0.000)	(0.000)	(0.000)	(0.018)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Number of observations	2,224	2,224	2,224	2,224	2,224	1,083	1,083	1,083	1,083	1083	954	954	954	954	954
Number of banks	657	657	657	657	657	600	600	600	600	600	547	547	547	547	547
R-Square	0.365	0.336	0.108	0.195	0.107	0.375	0.281	0.126	0.234	0.122	0.390	0.264	0.153	0.215	0.150
Wald test: $\alpha_1+\alpha_2$	-0.005***	0.004***	-0.579***	-0.023***	-0.557***	0.004**	-0.003***	0.114	0.048**	0.063	-0.002**	0.003**	-0.442***	-0.014*	-0.429***
Fischer test (p-value)	0.000	0.000	0.096	0.000	0.102	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000
Hausman test (p-value)	0.169	0.112	0.193	0.154	0.201	0.162	0.143	0.780	0.197	0.785	0.146	0.171	0.326	0.121	0.382
Modified Wald test (p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Wooldridge test (p-value)	0.404	0.132	0.210	0.102	0.221	0.251	0.106	0.134	0.156	0.129	0.210	0.193	0.123	0.146	0.119

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Table 2.6. Excess control rights, bank profitability and risk: effect of shareholder protection rights

This table shows the Generalized Least Squares estimation results on the effect of the level of shareholder protection on the relationship between excess control rights and bank profitability and risk (Eq. (2.2)) across the 2002-2006, 2007-2008 and 2009-2010 periods. *ROA* is the return on assets defined as net income divided by total assets; *SDROA* is the three-year rolling-window standard deviation of the return on assets; *ZScore* is a measure of bank default risk; *Z1Score* is a measure of bank asset risk; *Z2Score* is a measure of leverage risk; ExcessControl is the difference between control and cash-flow rights; ShareRight is a dummy equal to one if the anti-director index is lower than the median value, and zero otherwise; *Log(Assets)* is the natural logarithm of total assets; *Equity* is the ratio of total equity to total assets; *Deposits* is the ratio of customer deposits to total assets; *Loans* is the ratio of net loans to total assets; *NNII* is the ratio of net non-interest income to net operating income; *CostIncomeRatio* is cost to income ratio; *Listed* is a dummy equal to one if the bank is publicly listed, and zero otherwise; *Rescue* is a dummy equal to one during the 2007-2010 period if the bank was rescued during the financial crisis, and zero otherwise; *Bank-Foundation* is a set of dummy variables representing the type of the largest ultimate owner (WidelyHeld is the benchmark group); *GDPGrowth* is the real Gross Domestic Product (GDP) growth rate. P-values based on robust standard errors are shown in parentheses. ***, ** and * indicate significance respectively at the 1%, 5% and 10% levels. *Fischer test* is a test of the absence of individual effects. *Hausman test* is a test of exogeneity of the regressors (random effects vs fixed effects). *Modified Wald test* is a test of homoscedasticity. *Wooldridge test* is a test of the absence of first order autocorrelation in panel data.

Period	Pre-crisis period (2002-2006)					Acute financial crisis period (2007-2008)					Later stage of the financial crisis (2009-2010)				
Dependent variable	ROA	SDROA	ZSCORE	Z1SCORE	Z2SCORE	ROA	SDROA	ZSCORE	Z1SCORE	Z2SCORE	ROA	SDROA	ZSCORE	Z1SCORE	Z2SCORE
ExcessControl (α_1)	-0.002**	0.003**	-0.267**	-0.004*	-0.265**	-0.003	0.001	-0.164**	0.008	-0.162**	-0.001	0.001	-0.200**	-0.003	-0.207**
	(0.036)	(0.047)	(0.027)	(0.086)	(0.015)	(0.419)	(0.668)	(0.038)	(0.421)	(0.026)	(0.821)	(0.503)	(0.036)	(0.724)	(0.031)
ShareRight × ExcessControl (α_2)	-0.002**	-0.001	-0.326***	-0.014*	-0.309***	0.006*	-0.003**	0.088*	0.007*	0.079*	-0.001*	0.001*	-0.292***	-0.009**	-0.284***
	(0.028)	(0.401)	(0.006)	(0.088)	(0.006)	(0.078)	(0.021)	(0.078)	(0.060)	(0.080)	(0.071)	(0.080)	(0.000)	(0.034)	(0.000)
Log(Assets)	-0.070***	-0.097***	2.681*	0.500***	2.192	-0.046*	-0.066***	0.055	0.316***	-0.263	-0.058***	-0.083***	-2.328*	-0.054	-2.285*
	(0.000)	(0.000)	(0.060)	(0.000)	(0.114)	(0.069)	(0.000)	(0.962)	(0.001)	(0.814)	(0.005)	(0.000)	(0.098)	(0.499)	(0.095)
Equity	0.118**	0.170***	4.973**	0.013	4.990**	0.359***	0.131***	3.037	-0.200	3.293	0.269***	0.108***	8.428**	0.114	8.332**
	(0.022)	(0.000)	(0.043)	(0.907)	(0.039)	(0.000)	(0.000)	(0.307)	(0.177)	(0.257)	(0.000)	(0.009)	(0.032)	(0.658)	(0.025)
Deposits	0.002	-0.001	0.013	0.020***	-0.003	0.005***	-0.001	0.041	0.029***	0.015	0.005***	-0.003***	0.058	0.008	0.051
	(0.141)	(0.331)	(0.914)	(0.002)	(0.982)	(0.004)	(0.298)	(0.705)	(0.000)	(0.884)	(0.003)	(0.004)	(0.601)	(0.214)	(0.636)
Loans	-0.003**	-0.002***	0.295***	0.016***	0.281***	-0.000	-0.002**	0.190**	0.011*	0.179*	-0.003**	-0.001	0.137	0.001	0.136
	(0.028)	(0.005)	(0.006)	(0.006)	(0.007)	(0.856)	(0.031)	(0.048)	(0.078)	(0.055)	(0.036)	(0.344)	(0.244)	(0.833)	(0.236)
NNII	0.003***	0.001*	-0.277***	0.004	-0.275***	0.005***	-0.001	-0.287***	-0.000	-0.281***	0.003**	0.002*	-0.270***	-0.001	-0.267***
	(0.001)	(0.052)	(0.001)	(0.482)	(0.001)	(0.007)	(0.333)	(0.002)	(0.966)	(0.002)	(0.044)	(0.078)	(0.002)	(0.864)	(0.001)
CostIncomeRatio	-0.020***	0.001	-0.118*	-0.051***	-0.066	-0.015***	0.003***	-0.260***	-0.054***	-0.208***	-0.019***	0.004***	-0.237***	-0.048***	-0.193***
	(0.000)	(0.155)	(0.096)	(0.000)	(0.331)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.001)
Listed	0.205**	-0.001	1.397	2.149***	-0.800	0.018	0.044	-3.699	1.190	-4.965	0.137	-0.002	7.090	1.404**	5.678
	(0.033)	(0.986)	(0.893)	(0.001)	(0.936)	(0.874)	(0.578)	(0.756)	(0.101)	(0.662)	(0.157)	(0.978)	(0.570)	(0.043)	(0.634)
Rescue	-	-	-	-	-	0.070	0.002	-26.099***	-2.420*	-23.273***	0.076	0.094	-9.682	-0.790	-8.859
	-	-	-	-	-	(0.580)	(0.956)	(0.005)	(0.061)	(0.004)	(0.616)	(0.358)	(0.361)	(0.313)	(0.373)
Bank	-0.079	-0.037	5.698	0.500	5.140	0.198**	-0.137*	-9.726	-0.009	-9.794	0.044	-0.067	-15.774	-0.605	-15.151
	(0.306)	(0.556)	(0.623)	(0.481)	(0.643)	(0.047)	(0.098)	(0.504)	(0.991)	(0.483)	(0.724)	(0.584)	(0.228)	(0.396)	(0.225)
Family	0.031	0.001	7.611	0.768	6.791	0.461***	-0.076	-2.382	1.127	-3.670	-0.029	0.049	-21.724	-0.450	-21.257
	(0.712)	(0.981)	(0.516)	(0.311)	(0.541)	(0.000)	(0.405)	(0.876)	(0.181)	(0.802)	(0.846)	(0.717)	(0.130)	(0.590)	(0.120)

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Table 2.6 (continued)

State	-0.189*	-0.120	30.326**	0.893	29.390**	0.172	-0.166*	2.722	0.672	2.079	-0.151	0.075	-14.912	-0.784	-14.101
	(0.081)	(0.119)	(0.037)	(0.259)	(0.036)	(0.226)	(0.055)	(0.869)	(0.458)	(0.896)	(0.376)	(0.615)	(0.412)	(0.393)	(0.417)
Institutional	-0.008	0.118	-0.230	0.096	-0.447	-0.075	-0.035	-14.566	-0.959	-13.669	-0.044	0.160	-21.979*	-0.829	-21.131*
	(0.939)	(0.118)	(0.983)	(0.894)	(0.966)	(0.593)	(0.707)	(0.282)	(0.237)	(0.292)	(0.755)	(0.218)	(0.097)	(0.262)	(0.094)
Industry	-0.117	-0.046	25.555*	1.090	24.259**	0.188	-0.103	-8.478	0.257	-8.895	0.076	-0.182	17.932	1.260	16.701
	(0.389)	(0.699)	(0.051)	(0.275)	(0.049)	(0.247)	(0.311)	(0.560)	(0.783)	(0.522)	(0.733)	(0.368)	(0.389)	(0.276)	(0.403)
Foundation	-0.032	0.006	16.854	0.753	15.727	0.065	-0.161*	7.737	1.191	6.479	-0.108	-0.040	4.659	-0.403	5.088
	(0.780)	(0.935)	(0.504)	(0.589)	(0.517)	(0.790)	(0.085)	(0.650)	(0.249)	(0.693)	(0.565)	(0.821)	(0.846)	(0.751)	(0.824)
GDPGrowth	0.056***	-0.021**	-1.696	0.143	-1.844	0.107***	-0.027***	3.322***	0.608***	2.718***	0.013**	-0.013***	1.784***	0.113***	1.678***
	(0.000)	(0.038)	(0.308)	(0.235)	(0.241)	(0.000)	(0.000)	(0.001)	(0.000)	(0.003)	(0.028)	(0.000)	(0.000)	(0.003)	(0.000)
Constant	1.969***	1.308***	56.361***	3.167**	52.462**	1.265***	0.906***	79.934***	3.184**	76.634***	1.935***	1.252***	97.292***	7.259***	90.320***
	(0.000)	(0.000)	(0.009)	(0.035)	(0.010)	(0.001)	(0.000)	(0.000)	(0.029)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Number of observations	2,224	2,224	2,224	2,224	2,224	1,083	1,083	1,083	1,083	1,083	954	954	954	954	954
Number of banks	657	657	657	657	657	600	600	600	600	600	547	547	547	547	547
R-Square	0.363	0.329	0.112	0.194	0.111	0.381	0.283	0.124	0.229	0.121	0.390	0.262	0.158	0.217	0.156
Wald test: $\alpha_1 + \alpha_2$	-0.004***	0.002**	-0.593***	-0.018***	-0.574***	0.003**	-0.002***	-0.076	0.015*	-0.083	-0.002**	0.002*	-0.492***	-0.012**	-0.486***
Fischer test (p-value)	0.000	0.000	0.094	0.000	0.108	0.000	0.000	0.000	0.000	0.002	0.000	0.000	0.000	0.000	0.000
Hausman test (p-value)	0.175	0.119	0.120	0.158	0.199	0.164	0.140	0.750	0.195	0.781	0.145	0.170	0.325	0.120	0.384
Modified Wald test (p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Wooldridge test (p-value)	0.406	0.135	0.198	0.102	0.223	0.256	0.105	0.136	0.154	0.127	0.212	0.191	0.123	0.144	0.117

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2.4.2.2. Nonlinearity in the relationship between excess control rights and bank performance

We now test whether the relationship between excess control rights and bank profitability and risk depends on the extent of the shareholder's excess control rights. Previous studies (Morck et al., 1988; Adams and Santos, 2006) show that the relationship between ownership and performance (profitability and risk) is not linear. Similarly, in our study we assume that the observed entrenchment behavior is triggered only when excess control rights reach a sufficient level and that the marginal effect declines at higher levels. At very low levels, the controlling shareholder may not be entrenched and at very high levels, the relationship may even become flat. To address this potential nonlinearity in the relationship between excess control rights and bank profitability and risk, we replace our variable of interest (ExcessControl) by a set of four dummy variables based on the four quartiles of the excess control rights variable (Q1, Q2, Q3 and Q4): $ExcessControlQ_1$, $ExcessControlQ_2$, $ExcessControlQ_3$, and $ExcessControlQ_4$ which respectively take a value of one if $0 < ExcessControl \leq Q1$, $Q1 < ExcessControl \leq Q2$, $Q2 < ExcessControl \leq Q3$, $ExcessControl > Q3$, and zero otherwise. We hence use the following model where the removed category is the group of banks without excess control rights (ExcessControl=0) which includes banks controlled by a shareholder with equal control and cash-flow rights as well as widely held banks:

$$y_{it} = \sum_{j=1}^{4} \alpha_j ExcessControlQ_j + D_{2007\text{-}2008} \sum_{j=1}^{4} \beta_j ExcessControlQ_j + D_{2009\text{-}2010}$$
$$\sum_{j=1}^{4} \tau_j ExcessControlQ_j + \varphi^{'} X + \alpha_0 + \varepsilon_{it}$$

$$(2.3)$$

Table 2.7 reports the results of estimating Eq. (2.3). They show that the observed relationships between excess control rights and bank profitability and risk mainly hold for values of excess control rights greater than the second quartile (Q_2) irrespective of the period we consider. Before the crisis, the effect of excess control rights on ROA and Z1Score is significant for values of excess control rights greater than the first quartile (Q1) but when the dependent variable is SDROA, ZScore or Z2Score, excess control rights positively affect risk

even at levels of excess control rights lower than the first quartile. Similarly, the improvement (i.e., the reversed impact) in bank profitability and risk (ROA, SDROA, and Z1Score) during the acute financial crisis years is only effective for values of excess control rights greater than the second quartile (Q2). At the later stage of the financial crisis (2009-2010), the results also show that only banks controlled by a shareholder with excess control rights greater than the second quartile exhibit a significantly lower profitability and higher risk than banks without excess control rights. Furthermore, the results show that irrespective of the period we consider, the effect on profitability and risk becomes stronger with higher levels of excess control rights.

Table 2.7. Nonlinearity in the relationship between excess control and bank profitability and risk

This table shows the Generalized Least Squares estimation results on the effect of excess control rights on bank profitability and risk (Eq. (2.3)) for a sample of 750 European commercial banks (corresponding to 4,261 observations) over the 2002-2010 period. *ROA* is the return on assets defined as net income divided by total assets; *SDROA* is the three-year rolling-window standard deviation of the return on assets; *ZScore* is a measure of bank default risk; *Z1Score* is a measure of bank asset risk; *Z2Score* is a measure of leverage risk; *ExcessControlQ$_1$* is a dummy equal to one if $0<$ExcessControl$\leq$Q1, and zero otherwise; *ExcessControlQ$_2$* is a dummy equal to one if Q1$<$ExcessControl$\leq$Q2, and zero otherwise; *ExcessControlQ$_3$* is a dummy equal to one if Q2$<$ExcessControl$\leq$Q3, and zero otherwise; *ExcessControlQ$_4$* is a dummy equal to one if ExcessControl$>$Q3, and zero otherwise; Q1, Q2, Q3 and Q4 are respectively the first, second, third and fourth quartile of the variable ExcessControl when ExcessControl$>$0; *ExcessControl* is the difference between control and cash-flow rights; $D_{2007-2008}$ is a dummy equal to one if the year is 2007 or 2008, and zero otherwise; $D_{2009-2010}$ is a dummy equal to one if the year is 2009 or 2010, and zero otherwise. P-values based on robust standard errors are shown in parentheses. ***, ** and * indicate significance respectively at the 1%, 5% and 10% levels. *Fischer test* is a test of the absence of individual effects. *Hausman test* is a test of exogeneity of the regressors (random effects vs fixed effects). *Modified Wald test* is a test of homoscedasticity. *Wooldridge test* is a test of the absence of first order autocorrelation in panel data.

Dependent variable	ROA	SDROA	ZSCORE	Z1SCORE	Z2SCORE
ExcessControlQ$_1$ (α_1)	-0.112	0.098*	-17.477**	-0.839	-16.449**
	(0.105)	(0.058)	(0.037)	(0.182)	(0.036)
ExcessControlQ$_2$ (α_2)	-0.195**	0.100**	-31.595***	-1.055**	-30.423***
	(0.010)	(0.020)	(0.000)	(0.049)	(0.000)
ExcessControlQ$_3$ (α_3)	-0.307***	0.121**	-34.084***	-1.288**	-32.587***
	(0.007)	(0.016)	(0.000)	(0.013)	(0.000)
ExcessControlQ$_4$ (α_4)	-0.344***	0.138***	-36.627***	-2.001***	-34.372***
	(0.000)	(0.003)	(0.000)	(0.000)	(0.000)
$D_{2007-2008}$ × ExcessControlQ$_1$ (β_1)	0.143*	-0.105***	3.401	1.574**	1.856
	(0.072)	(0.000)	(0.156)	(0.028)	(0.191)
$D_{2007-2008}$ × ExcessControlQ$_2$ (β_2)	0.258**	-0.108***	19.970**	1.953***	18.073**
	(0.010)	(0.000)	(0.013)	(0.003)	(0.024)
$D_{2007-2008}$ × ExcessControlQ$_3$ (β_3)	0.437***	-0.205***	23.328***	2.438***	20.895**
	(0.002)	(0.000)	(0.001)	(0.003)	(0.019)
$D_{2007-2008}$ × ExcessControlQ$_4$ (β_4)	0.541***	-0.233***	26.599***	3.266***	23.358***
	(0.000)	(0.000)	(0.002)	(0.000)	(0.004)
$D_{2009-2010}$ × ExcessControlQ$_1$ (τ_1)	0.108	-0.014	7.406**	0.088	7.546**
	(0.357)	(0.168)	(0.024)	(0.664)	(0.016)
$D_{2009-2010}$ × ExcessControlQ$_2$ (τ_2)	0.130	-0.012	4.301	0.133	4.161
	(0.317)	(0.293)	(0.972)	(0.597)	(0.675)
$D_{2009-2010}$ × ExcessControlQ$_3$ (τ_3)	0.131	-0.019	3.919	0.334	3.543
	(0. 351)	(0.424)	(0.715)	(0.547)	(0.828)
$D_{2009-2010}$ × ExcessControlQ$_4$ (τ_4)	0.124	-0.017	3.426	0.575	2.633
	(0.217)	(0.521)	(0.726)	(0.775)	(0.672)
Control variables	Yes	Yes	Yes	Yes	Yes
Country dummies	Yes	Yes	Yes	Yes	Yes
R-Square	0.363	0.299	0.121	0.206	0.119
Wald tests: $\alpha_1+\beta_1$	0.032	-0.007	-14.076*	0.734	-14.593*
$\alpha_2+\beta_2$	0.063	-0.008	-11.625	0.898	-12.350
$\alpha_3+\beta_3$	0.130**	-0.084*	-10.755	1.151*	-11.692
$\alpha_4+\beta_4$	0.197**	-0.095**	-10.027	1.265*	-11.014
$\alpha_1+\tau_1$	-0.004	0.084*	-10.070	-0.751	-8.904
$\alpha_2+\tau_2$	-0.065	0.088**	-27.293***	-0.922*	-26.262***
$\alpha_3+\tau_3$	-0.176*	0.102**	-30.165***	-0.955**	-29.044***
$\alpha_4+\tau_4$	-0.220**	0.121**	-33.201***	-1.443***	-31.738***
Fischer test (p-value)	0.000	0.000	0.000	0.000	0.000
Hausman test (p-value)	0.124	0.110	0.677	0.105	0.728
Modified Wald test (p-value)	0.000	0.000	0.000	0.000	0.000
Wooldridge test (p-value)	0.178	0.102	0.100	0.177	0.100

2.5. Robustness checks

In this section, we run various regressions to check the robustness of the results obtained in subsection 2.4.1. The results are reported in Appendix C.

First, to ensure that our results are not affected by the use of overlapping periods (rolling-windows), besides the use of market-based dependent variables, we compute our accounting-based risk variables on the basis of two-year rolling-windows ([t-1, t]) instead of three-year rolling-windows. For the same purpose, we also focus on cross-sectional variation and run Ordinary Least Squares (OLS) regressions separately for each period (2002-2006, 2007-2008 and 2009-2010).[41] In both cases, the obtained results are consistent with our main findings (see Tables C2.2 and C2.3 in Appendix C).

Second, consistent with the prediction that a negative shock needs to be large enough to induce a change in shareholder behavior (Friedman et al., 2003), we find that the excess control rights variable is again associated with lower profitability and higher risk at the later stage of the financial crisis (2009-2010). For robustness, we check whether such a result identically holds for Greece, Ireland, Portugal and Spain (referred to as GIPS countries) which were already severely affected by the debt crisis in late 2009 and the remaining European countries (referred to as Non GIPS countries) which began to be strongly affected by the debt crisis only in 2011. For this purpose, we run regressions on subsamples of countries (GIPS and Non GIPS countries). Consistent with our prediction, the results show that the return to pre-crisis habits is mainly attributable to Non GIPS countries (see Table C2.4 in Appendix C).

Third, previous values of our dependent variables (particularly profitability) could partially explain their current values. We therefore augment Eq. (2.1) by the lagged value of the dependent variable and estimate a dynamic panel model using the Blundell and Bond (1998) Generalized Method of Moments (GMM). Our main conclusions remain the same (see Table C2.5 in Appendix C).

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[41] For each bank, risk is computed as the standard deviations of the return on assets over each period (2002-2006, 2007-2008 or 2009-2010).

Fourth, we remove banks that benefitted from government support during the crisis (corresponding to 83 observations). Such banks might display spurious accounting information leading to biased profitability and risk measures. Our results remain unchanged (see Table C2.6 in Appendix C).

Finally, we increase the control threshold and recalculate ownership variables with a control level of 20% instead of 10%. This new minimum control threshold changes our dataset both quantitatively and qualitatively[42] but our main results are unchanged (see Table C2.7 in Appendix C).

2.6. Conclusion

The objective of this study is to empirically investigate whether the presence of ultimate shareholders with excess control rights affects bank profitability and risk and how the 2007-2008 financial crisis might have modified such relationships. For this purpose, we construct a data set on ultimate control and ownership structure of 750 commercial banks based in 17 Western European countries during the 2002-2010 period.

Our findings show that, before the crisis, a larger divergence between ultimate shareholders' control and cash-flow rights is associated with lower profitability and higher risk-taking and default risk. However, our results also highlight the existence of a reversed effect: divergence between both types of rights positively (negatively) impacts profitability (risk-taking) and no longer affects default risk during the 2007-2008 acute crisis years. A closer look into the changes in profitability indicates that excess control rights have contributed to enhance banks' performance -compared to the pre-crisis period- both individually and relatively to their peers. Our investigation of the later stage of the financial crisis (2009-2010) show that such a reversal was short-lived. Just like before the crisis, the presence of excess control rights negatively affects bank profitability and positively impacts risk during the 2009-2010 period. Further investigation shows that the relationship between excess control rights and bank profitability and risk is enhanced (i) in family-controlled

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[42] With a threshold of 20% instead of 10%, our dataset contains a higher proportion of banks considered as widely held and banks controlled by another bank. The proportion of family and state-owned banks is lower.

banks, (ii) in countries with relatively weak shareholder protection and (iii) is mainly effective at intermediate and high levels of excess control rights by getting significantly stronger with higher levels of excess control rights.

As a whole, we show that ownership structure does matter in explaining cross-variation in bank performance during the 2007-2008 financial crisis. Our findings have various policy implications. First, although banks controlled via complex pyramidal arrangements might be less profitable and more risky than their peers in normal times, they also appear to be more resilient to shocks possibly because of their strong links with related firms in the pyramid. Second, bank monitoring and supervision by regulators should closely account for shareholder behavior in complex ownership structures. Furthermore, market discipline should also be enhanced by increasing the level of shareholder protection and by a better disclosure of banks' controlling shareholders and of their stakes in other banks and firms.

Appendix A

Table A2.1. Distribution of European commercial banks and representativeness of the final sample

This table shows the breakdown for both the *broad sample of banks* and the *subsample of listed banks* by country and their representativeness. To assess each sample's representativeness, we compute the ratio (*Percentage of total assets*) of aggregate total assets of the banks included in the final sample to aggregate total assets of the banks provided in Bankscope from 2002 to 2010.

Country	Broad sample of banks		Subsample of listed banks	
	Number of banks	Percentage of total assets	Number of banks	Percentage of total assets
Austria	33	31.863	1	25.726
Belgium	22	96.617	0	0.000
Denmark	46	98.929	34	98.815
Finland	4	85.005	1	29.381
France	95	87.583	7	95.832
Germany	88	77.660	11	79.207
Greece	14	96.528	9	97.237
Ireland	16	85.009	3	86.659
Italy	119	88.792	16	95.713
Luxembourg	59	66.416	2	25.164
Netherlands	21	68.041	2	96.297
Norway	6	20.149	2	41.658
Portugal	14	83.199	3	98.605
Spain	42	81.469	9	83.492
Sweden	12	86.132	2	93.348
Switzerland	69	90.635	4	94.381
United Kingdom	90	65.147	3	47.051
Total/Average	**750**	**77.010**	**109**	**74.285**

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Appendix B

Distance to default

The distance to default (DD) is derived from the option pricing model of Black and Scholes (1973) using this formula:

$$DD_{it} = \frac{\ln\left(\frac{VA_{it}}{L_{it}}\right) + \left(r_f - \frac{\sigma_{A,it}^2}{2}\right) \times T}{\sigma_{A,it}\sqrt{T}},$$
(B2.1)

where VA is the market value of the bank's assets; L is the book value of the debt and T is its maturity; r_f is the risk-free interest rate; σ_A is the volatility of the bank's assets.

However, the distance to default cannot be measured directly. Rather, it is derived from this formula only once the market value (VA) and volatility (σ_A) of assets are known. Equity-holders have the residual claim on a firm's assets and have a limited liability. As first highlighted by Merton (1977), equity can be modelled as a call option on the underlying assets of the bank, with a strike price equal to the book value of the bank's debt. Option pricing theory is therefore used to estimate the market value and volatility of the bank's underlying assets from observed stock prices (VE) and their volatility (σ_E). Specifically, we solve this system:

$$VA_{it} = \frac{VE_{it} + L_{it}\,e^{-r_f T}\,N(d2)}{N(d1)},$$

$$\sigma_{A,it} = \frac{VE_{it}}{VA_{it}}\frac{\sigma_{E,it}}{N(d1)},$$
(B2.2)

where N is the cumulative normal distribution function and d1 and d2 are given by:

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$$d1 = \frac{\log\left(\frac{VA_{it}}{L_{it}}\right) + \left(r_f + \frac{\sigma^2_{A,it}}{2}\right) \times T}{\sigma_{A,it}\sqrt{T}}$$

(B2.3)

$$d2 = d1 - \sigma_{A,it}\sqrt{T}$$

According to this modeling, default takes place when the market value of assets (VA) falls below the book value of the debt L, that is when DD is null or negative (the default point). The DD is the number of standard deviations of the market value of assets away from the default point. Hence, the larger the DD, the greater is the distance of a bank from the default point, and the lower is the probability of default.

Practically, computing the distance to default requires both market and accounting data which are all extracted from the Bloomberg database. The market value of equity (VE) is defined as daily stock prices (closing price) multiplied by the number of outstanding shares. The annual (252 trading days) volatility of the bank's equity (σ_E) is estimated as the standard deviation of the annual rolling average of daily stock returns multiplied by $\sqrt{252}$. Annual book value of the debt (defined as the difference between total assets and equity) is interpolated using a cubic spline method to get daily observations. The maturity of the debt is set equal to one (i.e., one year). This assumption is common when information about the maturity structure of the debt is not available. For the risk-free rate, we use the three-month interbank rate except for Italy, Luxembourg and Greece for which we use the three-month Euribor because of data unavailability.

Appendix C

Table C2.1. Correlations table

This table shows the correlations among the main explanatory variables used in the regressions. *ExcessControl* is the difference between control and cash-flow rights; *Log(Assets)* is the natural logarithm of total assets; *Equity* is the ratio of total equity to total assets; *Deposits* is the ratio of customer deposits to total assets; *Loans* is the ratio of net loans to total assets; *NNII* is the ratio of net noninterest income to net operating income; *CostIncomeRatio* is the cost to income ratio; *Listed* is a dummy equal to one if the bank is publicly listed, and zero otherwise; *Rescue* is a dummy equal to one during the 2007-2010 period if the bank was rescued during the financial crisis, and zero otherwise; *GDPGrowth* is the real Gross Domestic Product (GDP) growth rate.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
ExcessControl (1)	1									
Log(Assets) (2)	-0.042	1								
Equity (3)	0.013	-0.514	1							
Deposits (4)	-0.033	-0.212	-0.168	1						
Loans (5)	0.078	0.117	-0.134	-0.024	1					
NNII (6)	0.046	-0.105	0.122	0.059	-0.316	1				
CostIncomeRatio (7)	-0.001	-0.187	0.032	0.164	-0.103	0.141	1			
Listed (8)	-0.203	0.278	-0.106	0.061	0.179	-0.058	-0.046	1		
Rescue (9)	0.034	0.227	-0.076	-0.056	0.032	-0.058	0.002	0.127	1	
GDPGrowth (10)	0.051	-0.029	0.000	0.011	-0.088	0.061	-0.055	-0.033	-0.139	1

Table C2.2. Excess control rights, bank profitability and risk: risk dependent variables computed using two-year rolling-windows

This table shows the Generalized Least Squares estimation results on the effect of excess control rights on bank profitability and risk (Eq. (2.1)) over the 2002-2010 period for a sample of 750 European commercial banks corresponding to 4,261 observations. For robustness, we compute dependent variables on the basis of two-year rolling windows instead of three-year rolling windows. *SDROA* is the two-year rolling-window standard deviation of the return on assets; *ZScore* is a measure of bank default risk; *Z1Score* is a measure of bank asset risk; *Z2Score* is a measure of leverage risk; *ExcessControl* is the difference between control and cash-flow rights; $D_{2007-2008}$ is a dummy equal to one if the year is 2007 or 2008, and zero otherwise; $D_{2009-2010}$ is a dummy equal to one if the year is 2009 or 2010, and zero otherwise; *Log(Assets)* is the natural logarithm of total assets; *Equity* is the ratio of total equity to total assets; *Deposits* is the ratio of customer deposits to total assets; *Loans* is the ratio of net loans to total assets; *NNII* is the ratio of net non-interest income to net operating income; *CostIncomeRatio* is cost to income ratio; *Listed* is a dummy equal to one if the bank is publicly listed, and zero otherwise; *Rescue* is a dummy equal to one during the 2007-2010 period if the bank was rescued during the financial crisis, and zero otherwise; *Bank-Foundation* is a set of dummy variables representing the type of the largest ultimate owner (WidelyHeld is the benchmark group); *GDPGrowth* is the real Gross Domestic Product (GDP) growth rate. P-values based on robust standard errors are shown in parentheses. ***, ** and * indicate significance respectively at the 1%, 5% and 10% levels. *Fischer test* is a test of the absence of individual effects. *Hausman test* is a test of exogeneity of the regressors (random effects vs fixed effects). *Modified Wald test* is a test of homoscedasticity. *Wooldridge test* is a test of the absence of first order autocorrelation in panel data.

Dependent variable	SDROA	ZSCORE	Z1SCORE	Z2SCORE
ExcessControl (α_1)	0.002**	-0.494***	-0.033***	-0.451***
	(0.021)	(0.005)	(0.000)	(0.006)
$D_{2007-2008}$ × ExcessControl (α_2)	-0.004**	0.447*	0.064***	0.369
	(0.014)	(0.088)	(0.000)	(0.125)
$D_{2009-2010}$ × ExcessControl (α_3)	0.000	0.003	0.007	-0.008
	(0.266)	(0.991)	(0.601)	(0.972)
$D_{2007-2008}$	0.068***	-11.724**	-0.730*	-11.499
	(0.002)	(0.020)	(0.067)	(0.173)
$D_{2009-2010}$	0.017	-3.469	-1.426**	-1.481
	(0.550)	(0.756)	(0.018)	(0.886)
Log(Assets)	-0.076***	-2.218**	0.503***	-2.406**
	(0.000)	(0.034)	(0.000)	(0.024)
Equity	0.166***	3.726**	-0.027	3.826**
	(0.000)	(0.034)	(0.882)	(0.030)
Deposits	0.001*	0.129	0.023***	-0.150
	(0.070)	(0.514)	(0.006)	(0.416)
Loans	-0.001*	0.080	0.017**	0.070
	(0.090)	(0.649)	(0.031)	(0.670)
NNII	0.001**	-0.332**	-0.008	-0.328**
	(0.037)	(0.037)	(0.312)	(0.027)
CostIncomeRatio	0.004***	-0.326**	-0.074***	-0.254*
	(0.000)	(0.021)	(0.000)	(0.053)
Listed	0.027	-19.335**	2.327***	-20.246**
	(0.499)	(0.045)	(0.002)	(0.049)
Rescue	0.044	-11.299	-2.594*	-8.975
	(0.445)	(0.667)	(0.084)	(0.713)
Bank	-0.010	16.529	0.173	15.897
	(0.804)	(0.317)	(0.835)	(0.303)
Family	0.003	4.956	1.080	4.309
	(0.941)	(0.761)	(0.200)	(0.777)
State	0.001	-1.206	-0.774	0.773
	(0.977)	(0.951)	(0.421)	(0.967)
Institutional	0.055	8.145	-0.562	8.989
	(0.198)	(0.612)	(0.536)	(0.548)
Industry	-0.050	36.034	2.004*	34.173*
	(0.494)	(0.104)	(0.096)	(0.098)
Foundation	-0.011	26.950	0.152	26.755
	(0.824)	(0.325)	(0.912)	(0.294)
GDPGrowth	-0.022***	7.211***	0.550***	6.523***
	(0.000)	(0.000)	(0.000)	(0.000)
Constant	0.876***	142.368***	8.227***	133.686***
	(0.000)	(0.000)	(0.000)	(0.000)
Country dummies	Yes	Yes	Yes	Yes
R-Square	0.235	0.047	0.106	0.047
Wald tests: $\alpha_1+\alpha_2$	-0.002*	-0.047	0.031**	-0.082
$\alpha_1+\alpha_3$	0.002**	-0.492**	-0.026**	-0.459**
Fischer test (p-value)	0.000	0.000	0.000	0.000
Hausman test (p-value)	0.236	0.104	0.126	0.101
Modified Wald test (p-value)	0.000	0.000	0.000	0.000
Wooldridge test (p-value)	0.636	0.843	0.579	0.859

Table C2.3. Cross-sectional regression analysis

This table shows the Ordinary Least Squares results for cross section regressions performed separately on each period (2002-2006, 2007-2008 and 2009-2010). *SDROA* is the standard deviation of the return on assets computed throughout each period (2002-206, 2007-2008 and 2009-2010); *ZScore* is a measure of bank default risk; *Z1Score* is a measure of bank asset risk; *Z2Score* is a measure of leverage risk; *Log(Assets)* is the natural logarithm of total assets; *Equity* is the ratio of total equity to total assets; *Deposits* is the ratio of customer deposits to total assets; *Loans* is the ratio of net loans to total assets; *NNII* is the ratio of net non-interest income to net operating income; *CostIncomeRatio* is cost to income ratio; *Listed* is a dummy equal to one if the bank is publicly listed, and zero otherwise; *Rescue* is a dummy equal to one during the 2007-2008 and 2009-2010 periods if the bank was rescued during the financial crisis, and zero otherwise; *Bank-Foundation* is a set of dummy variables representing the type of the largest ultimate owner (WidelyHeld is the benchmark group); *GDPGrowth* is the real Gross Domestic Product (GDP) growth rate. P-values based on robust standard errors are shown in parentheses. ***, ** and * indicate significance respectively at the 1%, 5% and 10% levels.

	Pre-crisis period (2002-2006)				Acute financial crisis period (2007-2008)				Later stage of the financial crisis (2009-2010)			
Dependent variable	SDROA	ZSCORE	Z1SCORE	Z2SCORE	SDROA	ZSCORE	Z1SCORE	Z2SCORE	SDROA	ZSCORE	Z1SCORE	Z2SCORE
ExcessControl	0.002**	-0.513**	-0.029***	-0.476**	-0.001**	0.298	0.047**	0.248	0.002*	-0.398**	-0.029**	-0.357**
	(0.045)	(0.019)	(0.006)	(0.019)	(0.044)	(0.475)	(0.027)	(0.520)	(0.086)	(0.020)	(0.028)	(0.015)
Log(Assets)	-0.072***	4.665	0.681***	3.635	-0.063***	-7.348	-0.231	-7.013	-0.073***	-0.677	0.222	-1.039
	(0.000)	(0.137)	(0.000)	(0.212)	(0.000)	(0.151)	(0.301)	(0.139)	(0.000)	(0.903)	(0.466)	(0.841)
Equity	0.199***	11.582**	0.213	11.209**	0.100***	12.521	0.254	11.964	0.206***	-2.056	-0.685	-1.438
	(0.000)	(0.030)	(0.463)	(0.026)	(0.009)	(0.375)	(0.688)	(0.361)	(0.000)	(0.807)	(0.109)	(0.855)
Deposits	0.001	-0.186	0.019	-0.202	0.002*	0.231	0.030	0.168	0.003**	0.263	0.018	0.237
	(0.389)	(0.483)	(0.123)	(0.414)	(0.088)	(0.603)	(0.147)	(0.683)	(0.018)	(0.532)	(0.414)	(0.545)
Loans	-0.001	0.335	0.025*	0.303	-0.001	-0.542	-0.005	-0.502	0.001	0.144	0.003	0.142
	(0.278)	(0.221)	(0.076)	(0.233)	(0.435)	(0.164)	(0.783)	(0.160)	(0.695)	(0.764)	(0.892)	(0.715)
NNII	0.002**	-0.418	-0.008	-0.419	0.002	-0.740**	-0.039**	-0.695**	0.002	-1.074***	-0.040	-1.015***
	(0.027)	(0.131)	(0.612)	(0.103)	(0.105)	(0.029)	(0.020)	(0.027)	(0.183)	(0.010)	(0.129)	(0.008)
CostIncomeRatio	0.004***	-0.389**	-0.071***	-0.315*	0.005***	-0.291	-0.076***	-0.232	0.003**	-0.650*	-0.080***	-0.568*
	(0.000)	(0.047)	(0.000)	(0.088)	(0.000)	(0.261)	(0.000)	(0.334)	(0.020)	(0.064)	(0.000)	(0.082)
Listed	0.003	-5.668	3.237***	-7.671	-0.035	-0.388	3.395*	-3.073	-0.094	12.331	1.711	11.707
	(0.952)	(0.758)	(0.002)	(0.655)	(0.688)	(0.969)	(0.081)	(0.925)	(0.154)	(0.731)	(0.378)	(0.726)
Rescue	-	-	-	-	0.135	52.296	1.412	46.717	0.016	24.039	1.451	22.418
	-	-	-	-	(0.204)	(0.410)	(0.703)	(0.421)	(0.867)	(0.699)	(0.697)	(0.696)
Bank	0.013	11.491	0.461	10.752	-0.160	-3.640	-0.088	-4.410	-0.000	-11.234	-1.307	-10.647
	(0.800)	(0.607)	(0.663)	(0.606)	(0.145)	(0.926)	(0.964)	(0.904)	(1.000)	(0.768)	(0.530)	(0.763)
Family	0.062	-0.589	0.654	-0.488	-0.070	-10.970	3.190	-13.534	0.010	-42.681	-0.928	-40.392
	(0.283)	(0.979)	(0.549)	(0.981)	(0.595)	(0.807)	(0.159)	(0.746)	(0.913)	(0.303)	(0.699)	(0.292)
State	-0.021	13.324	0.189	14.175	-0.127	-26.000	-0.756	-24.400	0.062	-66.550	-3.201	-62.424
	(0.755)	(0.623)	(0.891)	(0.576)	(0.298)	(0.546)	(0.709)	(0.544)	(0.604)	(0.186)	(0.252)	(0.179)
Institutional	0.090	-7.398	-0.174	-6.034	-0.087	-32.250	-2.637	-29.784	0.300***	-59.738*	-2.692	-56.098*
	(0.247)	(0.740)	(0.882)	(0.771)	(0.466)	(0.391)	(0.168)	(0.394)	(0.005)	(0.094)	(0.189)	(0.089)
Industry	0.059	30.944	2.236	29.919	-0.287*	1.050	2.964	-2.332	-0.077	36.108	3.940	31.705
	(0.676)	(0.278)	(0.146)	(0.262)	(0.052)	(0.987)	(0.434)	(0.969)	(0.753)	(0.581)	(0.335)	(0.599)
Foundation	-0.104*	59.778*	2.820	56.669*	-0.159	43.750	-0.821	44.396	0.076	21.977	1.019	18.767
	(0.098)	(0.099)	(0.154)	(0.092)	(0.348)	(0.485)	(0.825)	(0.454)	(0.660)	(0.736)	(0.771)	(0.755)
GDPGrowth	-0.056	21.066*	-0.662	21.706*	-0.063	13.878	0.611	13.368	-0.005	23.601*	1.960***	21.417*
	(0.203)	(0.072)	(0.323)	(0.068)	(0.171)	(0.225)	(0.446)	(0.180)	(0.867)	(0.052)	(0.006)	(0.057)
Constant	0.483***	186.068***	8.353***	176.546***	0.888***	227.982***	10.952***	211.777***	0.903***	174.445**	8.609*	163.592**
	(0.003)	(0.000)	(0.005)	(0.000)	(0.000)	(0.001)	(0.002)	(0.001)	(0.000)	(0.050)	(0.070)	(0.047)
	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of banks	657	657	657	657	530	530	530	530	447	447	447	447
R-Square	0.469	0.113	0.247	0.113	0.255	0.086	0.176	0.087	0.254	0.128	0.130	0.129

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Table C2.4. Excess control rights and bank profitability and risk: regressions on subsamples of GIPS and Non GIPS countries

This table shows the Generalized Least Squares estimation results on the effect of excess control rights on bank profitability and risk (Eq. (2.1)) over the 2002-2010 period for subsamples of GIPS (Greece, Ireland, Portugal and Spain) and Non GIPS European countries (Austria, Belgium, Denmark, Finland, France, Germany, Italy, Luxembourg, the Netherlands, Norway, Sweden, Switzerland and the United Kingdom). *ROA* is the return on assets defined as net income divided by total assets; *SDROA* is the three-year rolling-window standard deviation of the return on assets; *ZScore* is a measure of bank default risk; *Z1Score* is a measure of bank asset risk; *Z2Score* is a measure of leverage risk; $D_{2007-2008}$ is a dummy equal to one if the year is 2007 or 2008, and zero otherwise; $D_{2009-2010}$ is a dummy equal to one if the year is 2009 or 2010, and zero otherwise; *Log(Assets)* is the natural logarithm of total assets; *Equity* is the ratio of total equity to total assets; *Deposits* is the ratio of customer deposits to total assets; *Loans* is the ratio of net loans to total assets; *NNII* is the ratio of net non-interest income to net operating income; *CostIncomeRatio* is cost to income ratio; *Listed* is a dummy equal to one if the bank is publicly listed, and zero otherwise; *Rescue* is a dummy equal to one during the 2007-2010 period if the bank was rescued during the financial crisis, and zero otherwise; *Bank-Foundation* is a set of dummy variables representing the type of the largest ultimate owner (WidelyHeld is the benchmark group); *GDPGrowth* is the real Gross Domestic Product (GDP) growth rate. P-values based on robust standard errors are shown in parentheses. ***, ** and * indicate significance respectively at the 1%, 5% and 10% levels. *Fischer test* is a test of the absence of individual effects. *Hausman test* is a test of exogeneity of the regressors (random effects vs fixed effects). *Modified Wald test* is a test of homoscedasticity. *Wooldridge test* is a test of the absence of first order autocorrelation

Dependent variable	Subsample of GIPS countries					Subsample of Non GIPS countries				
	ROA	SDROA	ZSCORE	Z1SCORE	Z2SCORE	ROA	SDROA	ZSCORE	Z1SCORE	Z2SCORE
ExcessControl (α_1)	-0.004***	0.002*	-0.380**	-0.012**	-0.376**	-0.003***	0.002**	-0.466***	-0.018***	-0.447***
	(0.006)	(0.063)	(0.047)	(0.045)	(0.039)	(0.010)	(0.005)	(0.000)	(0.001)	(0.000)
$D_{2007-2008} \times$ ExcessControl (α_2)	0.006**	-0.003**	0.249**	0.019**	0.231**	0.006***	-0.003***	0.340***	0.031***	0.309***
	(0.045)	(0.040)	(0.011)	(0.035)	(0.016)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$D_{2009-2010} \times$ ExcessControl (α_3)	0.003*	-0.002*	0.149*	0.012**	0.135*	0.000	0.000	0.113	0.005	0.107
	(0.051)	(0.089)	(0.081)	(0.027)	(0.087)	(0.880)	(0.741)	(0.145)	(0.401)	(0.146)
$D_{2007-2008}$	-0.103**	0.017**	-29.225***	-1.419*	-27.783***	-0.129**	0.015**	-10.904***	-0.603**	-10.256***
	(0.038)	(0.031)	(0.004)	(0.070)	(0.004)	(0.027)	(0.045)	(0.002)	(0.018)	(0.003)
$D_{2009-2010}$	-0.207**	0.076**	-27.422**	-2.763***	-24.580**	-0.303***	0.117***	-17.890***	-1.825***	-16.022***
	(0.022)	(0.035)	(0.035)	(0.005)	(0.044)	(0.000)	(0.003)	(0.000)	(0.000)	(0.001)
Log(Assets)	0.048	-0.186***	0.251	0.425*	-0.127	-0.082***	-0.088***	-1.515**	0.282***	-1.772**
	(0.312)	(0.000)	(0.938)	(0.085)	(0.967)	(0.000)	(0.000)	(0.047)	(0.000)	(0.027)
Equity	0.374***	0.082	1.721	0.140	1.549	0.234***	0.155***	6.222***	0.010	6.219***
	(0.000)	(0.150)	(0.689)	(0.627)	(0.710)	(0.000)	(0.000)	(0.006)	(0.929)	(0.005)
Deposits	0.002	0.002	-0.184	-0.012	-0.170	0.003**	0.001	0.026	0.018***	0.012
	(0.512)	(0.127)	(0.466)	(0.447)	(0.480)	(0.040)	(0.172)	(0.781)	(0.001)	(0.898)
Loans	-0.001	-0.000	0.352	0.011	0.347	-0.001	-0.002***	0.166**	0.010**	0.154*
	(0.825)	(0.778)	(0.122)	(0.337)	(0.116)	(0.268)	(0.003)	(0.050)	(0.027)	(0.062)
NNII	0.003	0.004**	-0.001	0.006	-0.007	0.003***	0.001	-0.200***	0.006	-0.201***
	(0.267)	(0.015)	(0.993)	(0.459)	(0.964)	(0.003)	(0.195)	(0.003)	(0.234)	(0.001)
CostIncomeRatio	-0.008	0.003**	-0.368***	-0.036***	-0.332***	-0.020***	0.004***	-0.156***	-0.053***	-0.104***
	(0.113)	(0.010)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.009)
Listed	0.212	0.345***	-13.064**	3.169	-16.757**	0.247***	-0.017	-11.829**	1.507***	-13.404**
	(0.382)	(0.009)	(0.040)	(0.127)	(0.049)	(0.001)	(0.783)	(0.038)	(0.008)	(0.015)
Rescue	-0.222	-0.010	-2.692	-2.107	-0.615	0.122	0.039	-27.726**	-3.848***	-23.459**
	(0.223)	(0.935)	(0.857)	(0.149)	(0.964)	(0.133)	(0.443)	(0.014)	(0.001)	(0.021)
Bank	-0.149	-0.113	30.093*	1.313	29.027*	0.104	-0.079	-3.779	0.128	-4.031
	(0.200)	(0.191)	(0.098)	(0.421)	(0.086)	(0.210)	(0.201)	(0.717)	(0.843)	(0.683)
Family	-0.127	0.133	1.881	-1.089	2.948	-0.194*	-0.059	-4.869	-0.343	-4.221
	(0.469)	(0.111)	(0.868)	(0.373)	(0.927)	(0.068)	(0.364)	(0.725)	(0.621)	(0.686)
State	-0.245	0.054	32.836	0.640	32.174	-0.014	-0.065	8.272	0.204	8.107
	(0.287)	(0.771)	(0.122)	(0.657)	(0.112)	(0.887)	(0.311)	(0.512)	(0.801)	(0.496)
Institutional	0.015	0.063	17.132	1.287	16.058	0.013	0.052	-8.903	-0.707	-8.152
	(0.926)	(0.637)	(0.184)	(0.305)	(0.179)	(0.894)	(0.423)	(0.404)	(0.302)	(0.420)
Industry	-0.231	0.017	15.813	-0.718	16.319	0.213	-0.097	8.152	1.125	6.726
	(0.301)	(0.850)	(0.230)	(0.545)	(0.181)	(0.159)	(0.331)	(0.515)	(0.219)	(0.568)
Foundation	-0.505	-0.140	1.095	-0.809	2.017	-0.063	-0.016	7.378	0.528	6.665
	(0.143)	(0.288)	(0.951)	(0.630)	(0.904)	(0.578)	(0.809)	(0.706)	(0.625)	(0.721)
GDPGrowth	0.052**	-0.028**	1.780	0.187**	1.598	0.039***	-0.016***	1.387***	0.208***	1.180**
	(0.012)	(0.014)	(0.229)	(0.035)	(0.257)	(0.000)	(0.000)	(0.010)	(0.000)	(0.020)
Constant	0.293	2.092***	-	0.703	-	2.185***	1.083***	75.630***	5.484***	69.804***
	(0.543)	(0.000)	-	(0.814)	-	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Number of observations	520	520	520	520	520	3,741	3,741	3,741	3,741	3,741
Number of banks	86	86	86	86	86	664	664	664	664	664
R-Square	0.419	0.342	0.133	0.293	0.124	0.358	0.287	0.116	0.197	0.114
Wald tests: $\alpha_1+\alpha_2$	0.002*	-0.001**	-0.130	0.007*	-0.143	0.003**	-0.002***	-0.126	0.013*	-0.139
$\alpha_1+\alpha_3$	0.000	-0.000	-0.231	0.001	-0.242	-0.003**	0.002**	-0.353***	-0.013**	-0.340**
Fischer test (p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Hausman test (p-value)	0.110	0.106	0.086	0.111	0.103	0.107	0.109	0.128	0.112	0.145
Modified Wald test (p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Wooldridge test (p-value)	0.134	0.689	0.120	0.160	0.102	0.253	0.101	0.305	0.334	0.310

Table C2.5. Excess control rights, bank profitability and risk: an alternative estimation method

This table shows the Blundell and Bond (1998) estimation results on the effect of excess control rights on bank profitability and risk over the 2002-2010 period. In Panel 1, all regressions are performed on the broad sample of 750 European commercial banks corresponding to 4,261 observations. In Panel 2, all regressions are performed on the subsample of 109 listed banks corresponding to 805 observations. *ROA* is the return on assets defined as net income divided by total assets; *SDROA* is the three-year rolling-window standard deviation of the return on assets; *ZScore* is a measure of bank default risk; *Z1Score* is a measure of bank asset risk; *Z2Score* is a measure of leverage risk; *Return* is the mean of daily bank stock returns within a calendar year; *σ(Return)* is the standard deviation of daily stock returns within a calendar year; *MZScore* is market data based ZScore defined as $\frac{100+Return}{\sigma(Return)}$; *DD* is the bank distance to default; *ExcessControl* is the difference between control and cash-flow rights; $D_{2007\text{-}2008}$ is a dummy equal to one if the year is 2007 or 2008, and zero otherwise; $D_{2009\text{-}2010}$ is a dummy equal to one if the year is 2009 or 2010, and zero otherwise; *Log(Assets)* is the natural logarithm of total assets; *Equity* is the ratio of total equity to total assets; *Deposits* is the ratio of customer deposits to total assets; *Loans* is the ratio of net loans to total assets; *NNII* is the ratio of net non-interest income to net operating income; *CostIncomeRatio* is cost to income ratio; *Listed* is a dummy equal to one if the bank is publicly listed, and zero otherwise; *Rescue* is a dummy equal to one during the 2007-2010 period if the bank was rescued during the financial crisis, and zero otherwise; *Bank-Foundation* is a set of dummy variables representing the type of the largest ultimate owner (WidelyHeld is the benchmark group); *GDPGrowth* is the real Gross Domestic Product (GDP) growth rate. P-values based on robust standard errors are shown in parentheses. ***, ** and * indicate significance respectively at the 1%, 5% and 10% levels. *Hansen test* is a test of exogeneity of all instruments as a group. *AR2 test* is a test of the absence of second order residual autocorrelation.

Dependent variable	Panel 1: Broad sample of banks					Panel 2: Subsample of listed banks			
	ROA	SDROA	ZSCORE	Z1SCORE	Z2SCORE	Return	σ(Return)	MZScore	DD
ExcessControl (α_1)	-0.004***	0.002***	-0.326***	-0.015***	-0.311***	-0.001**	0.007**	-0.392**	-0.020*
	(0.000)	(0.003)	(0.000)	(0.000)	(0.000)	(0.034)	(0.011)	(0.046)	(0.083)
$D_{2007\text{-}2008}$ × ExcessControl (α_2)	0.006***	-0.004***	0.264***	0.024***	0.240***	0.002***	-0.012***	0.663**	0.029**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.009)	(0.006)	(0.019)	(0.043)
$D_{2009\text{-}2010}$ × ExcessControl (α_3)	0.002	-0.000	0.128	0.008*	0.117**	0.000	-0.002	0.080	-0.003
	(0.169)	(0.120)	(0.130)	(0.092)	(0.035)	(0.592)	(0.268)	(0.187)	(0.797)
$D_{2007\text{-}2008}$	-0.133***	0.076**	-12.144***	-0.999***	-11.185***	-0.025***	0.570***	-15.023***	-1.073***
	(0.008)	(0.040)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$D_{2009\text{-}2010}$	-0.201***	0.049	-14.956***	-1.624***	-13.108***	-0.003	-0.041	2.925	-1.823**
	(0.000)	(0.344)	(0.000)	(0.000)	(0.000)	(0.877)	(0.787)	(0.577)	(0.026)
Lagged dependent variable	0.377***	0.459***	0.362***	0.366***	0.364***	-0.684***	0.450***	0.800***	0.255
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.341)
Log(Assets)	-0.047***	-0.040***	-1.278**	0.168***	-1.397**	-0.019	-0.031	-0.196	-0.043
	(0.000)	(0.000)	(0.047)	(0.000)	(0.049)	(0.197)	(0.203)	(0.722)	(0.190)
Equity	0.151***	0.105***	3.131*	0.015	3.091*	0.126	0.176	2.027	0.097
	(0.000)	(0.000)	(0.056)	(0.831)	(0.053)	(0.167)	(0.115)	(0.167)	(0.493)
Deposits	0.003***	0.000	0.001	0.011***	-0.008	0.000	0.007	0.124	0.003
	(0.001)	(0.343)	(0.983)	(0.001)	(0.906)	(0.768)	(0.156)	(0.201)	(0.593)
Loans	-0.001	-0.000	0.121**	0.004	0.118**	-0.000	-0.002	0.072	0.001
	(0.185)	(0.490)	(0.050)	(0.211)	(0.050)	(0.616)	(0.644)	(0.477)	(0.930)
NNII	0.003***	0.000	-0.160***	0.003	-0.166***	0.001*	0.002*	-0.050	-0.004
	(0.000)	(0.532)	(0.001)	(0.338)	(0.001)	(0.052)	(0.094)	(0.363)	(0.244)
CostIncomeRatio	-0.015***	0.003***	-0.174***	-0.040***	-0.132***	-0.003***	0.011***	-0.181***	-0.009*
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.008)	(0.068)
Listed	0.106**	0.034	-14.464**	0.925***	-14.779**	-	-	-	-
	(0.016)	(0.384)	(0.042)	(0.007)	(0.036)	-	-	-	-
Rescue	-0.006	0.018	-13.714**	-2.444***	-11.510*	-0.028***	1.083***	-1.864	-0.203
	(0.931)	(0.743)	(0.044)	(0.001)	(0.060)	(0.002)	(0.000)	(0.644)	(0.601)
Bank	0.010	-0.003	1.642	0.186	1.559	0.054*	0.049	4.634	0.575
	(0.801)	(0.942)	(0.795)	(0.640)	(0.783)	(0.051)	(0.719)	(0.504)	(0.225)
Family	-0.109**	-0.042	-1.315	0.178	-1.400	-0.039	-0.095	-3.385	-0.061
	(0.035)	(0.384)	(0.833)	(0.662)	(0.814)	(0.232)	(0.312)	(0.304)	(0.769)
State	-0.016	-0.126*	5.180	0.107	5.821	-0.014	-0.106	3.163	0.226
	(0.770)	(0.089)	(0.516)	(0.819)	(0.446)	(0.753)	(0.526)	(0.437)	(0.471)
Institutional	0.009	0.059	-3.350	0.210	-3.480	0.028	0.113	0.770	0.611
	(0.859)	(0.331)	(0.576)	(0.593)	(0.622)	(0.174)	(0.328)	(0.864)	(0.184)
Industry	0.038	-0.053	5.887	0.489	5.645	0.033	0.028	-2.214	0.195
	(0.677)	(0.383)	(0.395)	(0.363)	(0.386)	(0.423)	(0.889)	(0.579)	(0.475)
Foundation	-0.080	-0.060	4.784	0.371	4.726	-0.045*	-0.073	1.079	0.068
	(0.251)	(0.297)	(0.685)	(0.611)	(0.670)	(0.084)	(0.578)	(0.866)	(0.930)
GDPGrowth	0.038***	-0.019***	1.393***	0.198***	1.198***	0.029***	-0.125***	2.120***	0.139***
	(0.000)	(0.000)	(0.004)	(0.000)	(0.008)	(0.000)	(0.000)	(0.000)	(0.000)
Constant	1.427***	0.333***	58.616***	4.524***	53.687***	0.307	1.336	21.452	7.782
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.120)	(0.126)	(0.295)	(0.155)
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Wald tests: $\alpha_1+\alpha_2$	0.002**	-0.002**	-0.062	0.009*	-0.070	0.001**	-0.005*	0.272	0.009
$\alpha_1+\alpha_3$	-0.002**	0.002*	-0.198***	-0.007*	-0.194***	-0.001**	0.005*	-0.312**	-0.023***
Hansen test (p-value)	0.294	0.110	0.108	0.116	0.111	0.101	0.353	0.104	0.116
AR2 test (p-value)	0.213	0.398	0.111	0.157	0.104	0.126	0.199	0.339	0.137

Table C2.6. Excess control rights, bank profitability and risk: excluding rescued banks

This table shows the Generalized Least Squares estimation results on the effect of excess control rights on bank profitability and risk (Eq. (2.1)) over the 2002-2010 period. For robustness, we exclude banks which have benefited from public support during the 2008 financial crisis. In Panel 1, all regressions are performed on the broad sample of 750 European commercial banks corresponding to 4,178 observations. In Panel 2, all regressions are performed on the subsample of 109 listed banks corresponding to 760 observations. *ROA* is the return on assets defined as net income divided by total assets; *SDROA* is the three-year rolling-window standard deviation of the return on assets; *ZScore* is a measure of bank default risk; *Z1Score* is a measure of bank asset risk; *Z2Score* is a measure of leverage risk; *Return* is the mean of daily bank stock returns within a calendar year; *σ(Return)* is the standard deviation of daily bank stock returns within a calendar year; *MZScore* is market data based ZScore defined as $\frac{100+Return}{\sigma(Return)}$; *DD* is the bank distance to default; *ExcessControl* is the difference between control and cash-flow rights; $D_{2007-2008}$ is a dummy equal to one if the year is 2007 or 2008, and zero otherwise; $D_{2009-2010}$ is a dummy equal to one if the year is 2009 or 2010, and zero otherwise; *Log(Assets)* is the natural logarithm of total assets; *Equity* is the ratio of total equity to total assets; *Deposits* is the ratio of customer deposits to total assets; *Loans* is the ratio of net loans to total assets; *NNII* is the ratio of net non-interest income to net operating income; *CostIncomeRatio* is cost to income ratio; *Listed* is a dummy equal to one if the bank is publicly listed, and zero otherwise; *Bank-Foundation* is a set of dummy variables representing the type of the largest ultimate owner (WidelyHeld is the benchmark group); *GDPGrowth* is the real Gross Domestic Product (GDP) growth rate. P-values based on robust standard errors are shown in parentheses. ***, ** and * indicate significance respectively at the 1%, 5% & 10% levels. *Fischer test* is a test of the absence of individual effects. *Hausman test* is a test of exogeneity of the regressors (random effects vs fixed effects). *Modified Wald test* is a test of homoscedasticity. *Wooldridge test* is a test of the absence of first order autocorrelation in panel data.

Dependent variable	Panel 1: Broad sample of banks					Panel 2: Subsample of listed banks			
	ROA	SDROA	ZSCORE	Z1SCORE	Z2SCORE	Return	σ(Return)	MZScore	DD
ExcessControl (α_1)	-0.004***	0.002***	-0.427***	-0.018***	-0.408***	-0.001**	0.008**	-0.509***	-0.028***
	(0.000)	(0.001)	(0.000)	(0.000)	(0.000)	(0.024)	(0.039)	(0.003)	(0.010)
$D_{2007-2008}$ × ExcessControl (α_2)	0.006***	-0.004***	0.318***	0.030***	0.287***	0.002***	-0.011***	0.652***	0.033***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.006)	(0.003)	(0.006)
$D_{2009-2010}$ × ExcessControl (α_3)	0.002	-0.000	0.070	0.003	0.067	0.000	-0.001	0.240	0.004
	(0.159)	(0.796)	(0.377)	(0.639)	(0.376)	(0.606)	(0.972)	(0.271)	(0.773)
$D_{2007-2008}$	-0.123**	0.016**	-13.053***	-0.706***	-12.314***	-0.046***	0.436***	-19.108***	-0.948***
	(0.018)	(0.049)	(0.000)	(0.004)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
$D_{2009-2010}$	-0.295***	0.102***	-18.443***	-1.897***	-16.517***	-0.041***	0.620***	-28.444***	-2.607***
	(0.000)	(0.005)	(0.000)	(0.000)	(0.000)	(0.005)	(0.000)	(0.000)	(0.000)
Log(Assets)	-0.072***	-0.092***	-1.639**	0.289***	-1.924**	-0.029	-0.065**	-0.631	-0.042
	(0.000)	(0.000)	(0.033)	(0.000)	(0.047)	(0.238)	(0.044)	(0.470)	(0.543)
Equity	0.229***	0.153***	5.284**	0.023	5.266**	0.176	0.249	5.089*	0.017
	(0.000)	(0.000)	(0.012)	(0.820)	(0.010)	(0.175)	(0.101)	(0.055)	(0.945)
Deposits	0.003**	0.001	0.016	0.016***	0.002	0.001	0.004	0.134	0.004
	(0.031)	(0.809)	(0.856)	(0.001)	(0.978)	(0.725)	(0.345)	(0.460)	(0.759)
Loans	-0.001	-0.002***	0.209***	0.011***	0.198***	-0.001	-0.000	0.141	0.010
	(0.290)	(0.002)	(0.008)	(0.008)	(0.010)	(0.431)	(0.976)	(0.387)	(0.351)
NNII	0.003***	0.000	-0.179***	0.007	-0.182***	0.000*	0.003**	-0.067	-0.003
	(0.001)	(0.568)	(0.004)	(0.128)	(0.002)	(0.083)	(0.022)	(0.207)	(0.455)
CostIncomeRatio	-0.019***	0.004***	-0.196***	-0.051***	-0.145***	-0.002	0.014***	-0.233***	-0.015**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.120)	(0.000)	(0.001)	(0.011)
Listed	0.214***	0.011	-16.757**	1.947***	-18.219**	-	-	-	-
	(0.002)	(0.835)	(0.049)	(0.000)	(0.038)	-	-	-	-
Bank	0.030	-0.059	3.293	0.344	2.999	0.033	-0.172	7.022	0.677
	(0.658)	(0.252)	(0.731)	(0.581)	(0.741)	(0.138)	(0.393)	(0.388)	(0.151)
Family	-0.149*	-0.015	-1.185	-0.562	-0.682	-0.021	-0.065	-4.121	-0.077
	(0.091)	(0.778)	(0.984)	(0.367)	(0.938)	(0.507)	(0.581)	(0.306)	(0.789)
State	-0.011	-0.053	13.661	0.448	13.246	-0.045	-0.004	0.678	0.414
	(0.900)	(0.374)	(0.227)	(0.533)	(0.217)	(0.149)	(0.983)	(0.929)	(0.304)
Institutional	0.063	0.054	-1.464	0.316	-1.637	0.004	0.342***	15.893**	0.932*
	(0.467)	(0.330)	(0.873)	(0.615)	(0.905)	(0.820)	(0.008)	(0.048)	(0.078)
Industry	0.093	-0.056	11.461	0.956	10.341	0.015	-0.108	2.072	0.387
	(0.507)	(0.503)	(0.274)	(0.246)	(0.293)	(0.512)	(0.562)	(0.769)	(0.427)
Foundation	-0.095	0.011	11.675	0.721	10.849	-0.024	-0.221	7.367	0.231
	(0.360)	(0.860)	(0.506)	(0.483)	(0.516)	(0.343)	(0.128)	(0.449)	(0.763)
GDPGrowth	0.041***	-0.017***	1.569***	0.219***	1.351***	0.001	-0.125***	1.363***	0.105**
	(0.000)	(0.000)	(0.003)	(0.000)	(0.007)	(0.637)	(0.000)	(0.010)	(0.016)
Constant	2.010***	1.110***	71.314***	5.018***	65.813***	0.508*	0.662	256.268***	17.078***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.098)	(0.203)	(0.000)	(0.000)
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Square	0.351	0.295	0.112	0.203	0.110	0.311	0.329	0.330	0.350
Wald tests: $\alpha_1+\alpha_2$	0.002*	-0.001*	-0.110	0.012*	-0.120*	0.001**	-0.004*	0.143	0.005
$\alpha_1+\alpha_3$	-0.002**	0.002**	-0.357***	-0.015***	-0.341***	-0.001*	0.006*	-0.269**	-0.024**
Fischer test (p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Hausman test (p-value)	0.134	0.110	0.470	0.213	0.551	0.337	0.451	0.117	0.201
Modified Wald test (p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Wooldridge test (p-value)	0.145	0.109	0.116	0.264	0.113	0.278	0.192	0.175	0.234

Table C 2.7. Excess control rights, bank profitability and risk: control threshold of 20%

This table shows the Generalized Least Squares estimation results on the effect of excess control rights on bank profitability and risk (Eq. (2.1)) over the 2002-2010 period. For robustness, we compute ownership variables based on a control threshold of 20% instead of 10%. In Panel 1, all regressions are performed on the broad sample of 750 European commercial banks corresponding to 4,261 observations. In Panel 2, all regressions are performed on the subsample of 109 listed banks corresponding to 805 observations. *ROA* is the return on assets defined as net income divided by total assets; *SDROA* is the three-year rolling-window standard deviation of the return on assets; *ZScore* is a measure of bank default risk; *Z1Score* is a measure of bank asset risk; *Z2Score* is a measure of leverage risk; *Return* is the mean of daily bank stock returns within a calendar year; *σ(Return)* is the standard deviation of daily bank stock returns within a calendar year; *MZScore* is market data based ZScore defined as $\frac{100+Return}{\sigma(Return)}$; *DD* is the bank distance to default; *ExcessControl* is the difference between control and cash-flow rights; $D_{2007\text{-}2008}$ is a dummy equal to one if the year is 2007 or 2008, and zero otherwise; $D_{2009\text{-}2010}$ is a dummy equal to one if the year is 2009 or 2010, and zero otherwise; *Log(Assets)* is the natural logarithm of total assets; *Equity* is the ratio of total equity to total assets; *Deposits* is the ratio of customer deposits to total assets; *Loans* is the ratio of net loans to total assets; *NNII* is the ratio of net non-interest income to net operating income; *CostIncomeRatio* is cost to income ratio; *Listed* is a dummy equal to one if the bank is publicly listed, and zero otherwise; *Rescue* is a dummy equal to one during the 2007-2010 period if the bank was rescued during the financial crisis, and zero otherwise; *Bank-Foundation* is a set of dummy variables representing the type of the largest ultimate owner (WidelyHeld is the benchmark group); *GDPGrowth* is the real GDP growth rate. P-values based on robust standard errors are shown in parentheses. ***, ** and * indicate significance respectively at the 1%, 5% and 10% levels. *Fischer test* is a test of the absence of individual effects. *Hausman test* is a test of exogeneity of the regressors (random effects vs fixed effects). *Modified Wald test* is a test of homoscedasticity. *Wooldridge test* is a test of the absence of first order autocorrelation in panel data.

Dependent variable	Panel 1: Broad sample of banks					Panel 2: Subsample of listed banks			
	ROA	SDROA	ZSCORE	Z1SCORE	Z2SCORE	Return	σ(Return)	MZScore	DD
ExcessControl (α_1)	-0.004***	0.001*	-0.489***	-0.021***	-0.467***	-0.001**	0.011**	-0.496***	-0.024***
	(0.000)	(0.067)	(0.000)	(0.002)	(0.000)	(0.017)	(0.025)	(0.001)	(0.001)
$D_{2007\text{-}2008}$ × ExcessControl (α_2)	0.006***	-0.003***	0.382***	0.032***	0.369***	0.002***	-0.018***	0.713**	0.031***
	(0.000)	(0.000)	(0.004)	(0.001)	(0.006)	(0.000)	(0.005)	(0.012)	(0.008)
$D_{2009\text{-}2010}$ × ExcessControl (α_3)	0.002	0.000	0.092	0.009	0.081	-0.000	-0.005	0.198	0.009
	(0.217)	(0.481)	(0.362)	(0.225)	(0.397)	(0.986)	(0.691)	(0.213)	(0.257)
$D_{2007\text{-}2008}$	-0.111**	0.023**	-10.510***	-0.527**	-9.936***	-0.037***	0.431***	-19.012***	-0.948***
	(0.028)	(0.029)	(0.001)	(0.022)	(0.001)	(0.000)	(0.000)	(0.000)	(0.000)
$D_{2009\text{-}2010}$	-0.283***	0.089***	-17.945***	-1.950***	-15.948***	-0.027*	0.503***	-28.088***	-2.642***
	(0.000)	(0.010)	(0.000)	(0.000)	(0.000)	(0.051)	(0.000)	(0.000)	(0.000)
Log(Assets)	-0.066***	-0.096***	-1.863**	0.305***	-2.089**	-0.017	-0.074**	-1.460	-0.003
	(0.000)	(0.000)	(0.039)	(0.000)	(0.032)	(0.250)	(0.022)	(0.122)	(0.971)
Equity	0.228***	0.152***	4.699**	-0.021	4.725**	0.107	0.206	4.563*	0.074
	(0.000)	(0.000)	(0.024)	(0.835)	(0.021)	(0.205)	(0.194)	(0.087)	(0.776)
Deposits	0.002**	0.001	-0.005	0.015***	-0.016	0.000	0.004	0.157	0.005
	(0.032)	(0.103)	(0.953)	(0.003)	(0.849)	(0.781)	(0.411)	(0.384)	(0.675)
Loans	-0.001	-0.002***	0.196**	0.010**	0.186**	-0.000	-0.001	0.107	0.008
	(0.262)	(0.002)	(0.013)	(0.017)	(0.015)	(0.777)	(0.830)	(0.504)	(0.445)
NNII	0.003***	0.000	-0.192***	0.005	-0.192***	0.000	0.002	-0.075	-0.003
	(0.001)	(0.734)	(0.002)	(0.232)	(0.001)	(0.182)	(0.112)	(0.177)	(0.429)
CostIncomeRatio	-0.018***	0.004***	-0.194***	-0.051***	-0.144***	-0.002***	0.011***	-0.187***	-0.011**
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.007)	(0.000)	(0.005)	(0.044)
Listed	0.221***	0.024	-16.545***	1.729***	-18.346***	-	-	-	-
	(0.001)	(0.648)	(0.008)	(0.001)	(0.007)	-	-	-	-
Rescue	-0.056	0.050	-18.927**	-2.935***	-15.708**	-0.025***	1.366***	-11.729	-0.254
	(0.525)	(0.418)	(0.016)	(0.001)	(0.026)	(0.000)	(0.000)	(0.139)	(0.614)
Bank	0.041	-0.020	-8.163	-0.252	-7.953	0.028	-0.276**	12.921*	0.813*
	(0.499)	(0.654)	(0.240)	(0.565)	(0.226)	(0.128)	(0.039)	(0.076)	(0.095)
Family	-0.240***	-0.033	-8.002	-0.192	-7.691	-0.008	-0.034	-1.143	-0.047
	(0.009)	(0.564)	(0.312)	(0.714)	(0.277)	(0.834)	(0.808)	(0.815)	(0.914)
State	-0.030	-0.012	4.305	-0.342	4.725	-0.021	-0.124	3.180	0.376
	(0.732)	(0.848)	(0.695)	(0.606)	(0.649)	(0.618)	(0.616)	(0.731)	(0.400)
Institutional	0.049	0.113*	-14.428*	0.776	-15.172*	0.017	0.129	5.831	0.277
	(0.607)	(0.057)	(0.056)	(0.110)	(0.051)	(0.423)	(0.445)	(0.294)	(0.455)
Industry	0.220	-0.022	5.013	0.502	4.494	0.017	0.096	12.789	0.928
	(0.177)	(0.815)	(0.586)	(0.472)	(0.603)	(0.711)	(0.875)	(0.240)	(0.145)
Foundation	-0.065	0.035	-4.504	-0.122	-4.357	-0.034*	-0.194	7.184	0.130
	(0.513)	(0.515)	(0.694)	(0.844)	(0.691)	(0.060)	(0.158)	(0.441)	(0.864)
GDPGrowth	0.042***	-0.016***	1.388***	0.209***	1.181**	0.002	-0.163***	1.243**	0.096**
	(0.000)	(0.000)	(0.007)	(0.000)	(0.015)	(0.396)	(0.000)	(0.023)	(0.019)
Constant	1.911***	1.130***	81.348***	5.630***	75.172***	0.362*	1.005*	242.837***	16.383***
	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.092)	(0.090)	(0.000)	(0.000)
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Square	0.353	0.287	0.111	0.200	0.109	0.378	0.471	0.342	0.362
Wald tests: $\alpha_1+\alpha_2$	0.002***	-0.002***	-0.107	0.011*	-0.098	0.001**	-0.007*	0.216	0.007
$\alpha_1+\alpha_3$	-0.002*	0.002**	-0.397***	-0.011*	-0.386***	-0.001**	0.007*	-0.299**	-0.016*
Fischer test (p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Hausman test (p-value)	0.141	0.111	0.455	0.235	0.556	0.121	0.160	0.542	0.739
Modified Wald test (p-value)	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
Wooldridge test (p-value)	0.154	0.132	0.092	0.223	0.091	0.207	0.195	0.173	0.234

CHAPTER 3

Product diversification and bank performance: does ownership depth matter?

ABSTRACT

We empirically test whether banks' ownership network affects the relationship between product diversification and performance for a sample of European commercial banks. We measure ownership network by the distance between the bank and its largest ultimate owner in pyramids. This measure simultaneously captures the ultimate owner's expropriation incentives and the depth of ownership (i.e., multiplicity and diversity of controlling owners within the pyramid). We find that diseconomies of diversification vanish the farther is the bank in the pyramid so that the farthest banks enjoy economies of diversification (higher profits, lower costs and lower risk). Further exploration shows that such economies are attributable to the presence of institutional owners and mainly to the domestic ones, potentially by delivering additional skills to manage activities to which the bank expands. Our findings provide insights on why banks suffer from greater activity diversification and have several policy implications.

3.1. Introduction

Empirical evidence provides conflicting results about the impact of greater activity diversification on banks' performance. From the profit dimension, activity diversification improves revenues and allows for economies of scope through the sharing of inputs (labor, technology, and information) across multiple products (e.g., Vennet, 2002). Alternatively, diversification within a single financial conglomerate could intensify agency problems between insiders and outsiders, leading to higher agency costs (e.g., DeLong, 2001; Laeven and Levine, 2007). Diversified banks could also suffer from diluting the managerial ability of the bank going beyond its existing expertise and from the lack of experience in managing new activities to which they expand (Mercieca et al., 2007; Chiorazzo et al., 2008). From the risk dimension, combined streams of profits from uncorrelated income sources should be more stable than the constituent parts (Gallo et al., 1996). However, diversification can also increase risk because income from nontraditional activities may suffer from larger fluctuations and can increase operational and financial leverage of banks (e.g., DeYoung and Roland, 2001; Stiroh, 2004).

Despite the extensive literature on diversification performance, to our best of knowledge no study has addressed whether the effect of diversification on performance depends on the bank's ownership structure. Our aim herein is therefore to take into account differences in bank ownership structure when assessing the relationship between product diversification and performance. Indeed, in some countries -such as in Europe- banks and firms are not stand-alone but, rather, they belong to a group of firms linked via strong shareholding relationships. In such ownership settings, a shareholder achieves control of a particular bank through a large number of intermediate corporations, generally organized in a pyramidal structure: the shareholder directly controls a firm, which in turn controls another firm, which might itself control another firm, and so forth.[43] Conceptually, this kind of multilayer ownership structure (pyramid) could affect both the extent of agency costs and the bank's expertise in managing

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[43] For more details on the prevalence of pyramids, see, e.g., La Porta et al., 1999; Claessens et al., 2000; and Faccio and Lang, 2002.

new activities, and, as a consequence, it could shape the diversification performance in two conflicting ways.

On the one hand, controlling shareholders in pyramids achieve control of a particular firm through substantial divergence between control rights (the right to vote and therefore to control) and cash-flow rights (the right to receive dividends). Such a divergence provides the ability and the incentives to extract private benefits at the expense of minority shareholders.[44] Banks' insiders (controlling shareholders/managers) can use activity diversification as a channel to derive private benefits that exceed private costs. For instance, because the scale and the scope of the bank affect the challenge and the complexity of the managerial task, running a diversified institution enhances insiders' power and prestige, allows for better compensation packages, and makes the insiders indispensable to the institution. In addition, by diversifying his bank a controlling shareholder can defraud public investors by misrepresenting the quality of the issuance they underwrite. Let's consider a controlling shareholder who holds both a bank and a firm and has substantial financial interests in the latter. Such a controlling shareholder can encourage the bank to both make loans to the firm and underwrite its securities -generally at favorable conditions- because, thanks to the bank's lending informational advantage, combining diverse activities would certify the firm's quality, allows the firm to sell securities at inflated prices, and ease its access to the market.[45] If product diversification facilitates or enhances the ability of insiders to extract private benefits, shareholders with greater control than cash-flow rights could encourage bank diversification. In this case, banks controlled through such control arrangements (pyramids) are likely to suffer from diseconomies of diversification. We term this conjecture the expropriation hypothesis.

On the other hand, pyramids include several shareholders (potentially of different types) which are involved in the bank's decision making: banks, institutional investors (mutual funds, financial and insurance companies), industrial companies and so forth. If product

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[44] For more details on the expropriation hypothesis within pyramids (extraction of private benefits of control) see, e.g., Bertrand et al., 2002; Claessens et al., 2002; Friedman et al., 2003; Joh, 2003; Boubakri and Ghouma, 2010; and Jiang et al., 2011. For papers that specifically look at banks see, Azofra and Santamaría, 2011.

[45] See Kroszner and Rajan (1994) and Denis et al. (1997) and the references cited therein for more details on private benefits arising from activity diversification.

diversification could induce diseconomies by diluting the comparative advantage of bank management going beyond its existing expertise, the presence of numerous controlling shareholders with prior experience in loans syndication, securities and insurance underwriting, brokerage and mutual fund activities -referred to as *ownership depth*- might deliver additional skills and expertise to the bank. For instance, Gallo et al. (1996) find that, at some extent, combining bank and mutual fund activities improves profitability and reduces risk. If beyond the mere combination of both activities the bank has a strong network of controlling shareholders specialized in mutual fund activities, one could expect the bank to efficiently manage such activities and to reap benefits from greater diversification. More precisely, ownership depth could be a source of labor pool, advanced techniques, knowledge, and a source of reducing monitoring costs allowing the bank to easily diversify without bearing high diseconomies. If the expertise accruing from ownership depth fully compensates for the lack in banks' experience in managing activities to which they expand, banks controlled by multiple and diverse shareholders in pyramids could enjoy economies of diversification. This prediction is referred to as the expertise of ownership depth.

The objective of this study is to empirically assess the net effect of a multilayer ownership structure on the relationship between diversification and performance over the 2002-2010 period. More precisely, we test the effect of product diversification on performance while taking into account differences in ownership network surrounding the bank. Performance is captured by profitability, cost efficiency and risk. To measure banks' ownership, we construct the control chains of 672 commercial banks established in 17 Western European countries to identify the set of intermediate and ultimate controlling shareholders involved in the bank's decision making. Based on the number of layers in the built control chains, we assess how far the bank is with regards to its largest ultimate owner to construct an ownership indicator referred to thereafter as *Position*. This measure (Position) simultaneously captures the ultimate owner's expropriation incentives as well the bank's ownership depth. The farther is the bank from its largest ultimate owner (higher values of Position) the higher is the divergence between control and cash-flow rights and therefore the higher are the incentives to extract private benefits. Meanwhile, the farther is the bank within the pyramid the broader is

the set of controlling shareholders involved in the bank's decision making and therefore the stronger is the bank's ownership depth. If the negative diversification effect induced by the ultimate owner's expropriation incentives exceeds the positive diversification effect of ownership depth, banks located lower down the pyramid (high values of Position) would suffer higher diseconomies or benefit from lower economies of diversification. Otherwise, banks located lower down the pyramid would enjoy higher economies or suffer lower diseconomies of diversification.

Our findings do not support the conjecture that ultimate controlling shareholders encourage diversification of activities to enhance their ability to extract private benefits. Instead, consistent with the conjecture of ownership depth expertise, pyramidal ownership structure mitigates diseconomies of activity diversification: banks located lower down the pyramid enjoy higher profits, suffer lower costs, and exhibit lower risk when they diversify their activities. The bank's ownership depth is therefore a source of delivering additional skills and expertise which facilitate to the bank to reap the benefits from more diverse activities. These findings suggest that diseconomies of diversification in European banks, at least partially, come from the lack of experience in managing activities to which they expand, consistent with the argument of Mercieca et al. (2007).

We go deeper in our investigation and exploit several dimensions of ownership depth to probe our previous result. We examine whether the type of controlling shareholders involved in the bank's control chain matters in mitigating diseconomies of diversification, beyond the mere presence of several shareholders. Consistent with our conjecture that institutional owners have more experience and greater ability to process information than atomistic individual owners (Pound, 1988; Morck et al., 2000), we find that only the former mitigate diseconomies of diversification. Furthermore, such mitigating roles are greater for domestic institutional owners than for foreign ones, consistent with the home field advantage view (Berger et al., 2001; Lensink and Naaborg, 2007) under which domestic owners hold a home country advantage and should be more efficient in mitigating diseconomies of diversification than do foreign owners.

This study is related to and contributes to the literature in several ways. First, we contribute to the literature investigating the implications of activity diversification on bank performance by taking into account differences in ownership network to which the bank belongs. Instead of examining the diversification performance of public versus private and domestic versus foreign dimensions of ownership (e.g., Berger et al., 2010; Pennathur et al., 2012), we investigate how the association between product diversification and performance may depend on the extent of ownership depth. We thereby shed light on how more stringent regulatory activity restrictions might lead to unintended effects depending on the strength of ownership network to which banks belong. Unlike these studies which focus on emerging markets, we find that both domestic and foreign owners play mitigating roles but those associated to domestic owners are significantly higher. We thereby add to the literature finding that domestic owners hold a home country advantage and should be more efficient in mitigating diseconomies of diversification than do foreign owners (Berger et al., 2001; Claessens et al., 2001; Lensink and Naaborg, 2007). Second, this study focuses on why banks suffer or benefit from their diversification strategy instead of investigating whether banks suffer diseconomies or gain economies of diversification. We hence confirm the argument that European banks suffer from diversification diseconomies because of the lack of expertise in managing activities to which they expand (Mercieca et al., 2007; Chiorazzo et al., 2008). Finally, our study uses a novel data set on pyramidal ownership structure and adds to the literature by constructing several ownership indicators. Unlike studies on pyramidal ownership structure[46] which mainly consider the largest publicly traded corporations at a given point in time, we use a larger sample including large and small banks, both publicly traded and privately owned and account for changes in ownership structure through time. We do not look only at the effect of ultimate owners but we also consider the effect of all the intermediate shareholders involved in the bank's control chain.

The remainder of the chapter is organized as follows. Section 3.2 describes the data, defines the variables and presents the model. In Section 3.3, we discuss the empirical results.

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[46] See, e.g., La Porta et al., 1999; Claessens et al., 2000; Faccio and Lang, 2002; Caprio et al., 2007; Laeven and Levine, 2009.

Section 3.4 presents deeper investigations and Section 3.5 reports the robustness of the results. Section 3.6 concludes the chapter.

3.2. Data, variables and model

Before presenting our set of variables and the empirical model, we describe the sample.

3.2.1. Sample

Our study covers the 2002-2010 period and consists of commercial banks established in 17 Western European countries: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom. We obtain bank accounting data from Bankscope. For each bank, we use unconsolidated data if available, otherwise we use consolidated data.[47] To retrieve ownership data, we use both Bankscope and Amadeus databases -as primary sources- together with annual reports. For the time period and countries covered by this study, we identify 794 banks for which we have detailed information on the main variables for at least three subsequent years of time series observations.[48] To mitigate the impact of outliers, we remove 122 banks by eliminating extreme observations at the 2.5% and 97.5% levels for each financial variable. This gives rise to a final sample of 4,032 annual observations corresponding to 672 commercial banks, 99 of which are listed banks (see Table 3.1 for a breakdown of these banks by country). To gauge the representativeness of the final sample, we compare the aggregate total assets of the sample banks in a given country to the aggregate assets of all the banks covered by Bankscope in the same country over the 2002-2010 period. The mean data coverage of the final sample lies at almost 79%.

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[47] Our empirical analysis relies to a large extent on unconsolidated bank statements. In some cases, Bankscope provides information only for consolidated data.

[48] This criterion enables us to accurately compute rolling-window standard deviations of our risk indicators.

Table 3.1. Distribution of European commercial banks and representativeness of the final sample

This table shows the breakdown of European commercial banks by country and the representativeness of the final sample. To assess the sample's representativeness, we compute the ratio of aggregate total assets of banks included in the final sample to aggregate total assets of all banks provided in Bankscope in the same country from 2002 to 2010.

Country	Number of all sample banks	Number of listed banks	Total assets of the sample banks divided by total assets of all banks provided in Bankscope (%)
Austria	28	2	67.982
Belgium	20	0	90.880
Denmark	42	29	92.983
Finland	4	1	62.590
France	87	9	80.456
Germany	80	7	84.680
Greece	13	9	99.460
Ireland	12	3	57.158
Italy	109	13	92.534
Luxembourg	50	4	75.089
Netherlands	19	3	30.893
Norway	5	2	86.860
Portugal	14	3	89.178
Spain	32	8	95.675
Sweden	12	2	94.394
Switzerland	67	3	96.894
United Kingdom	78	1	47.212
Total/Mean	**672**	**99**	**79.112**

3.2.2. Variables

We present the definition of our dependent variable reflecting bank performance (profitability, cost efficiency and risk) and our independent variables including ownership and diversification measures as well as the different control variables introduced in our regressions.

3.2.2.1. Measuring bank performance

We compute several indicators to capture bank performance (profitability, cost efficiency and risk). We measure profitability using the return on assets defined as the ratio of net income to total assets (ROA).[49] We use the ratio of total expenses (i.e., the sum of total interest expenses, total noninterest expenses and tax-expenses) to total assets (Expenses) as an

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[49] We use the return on assets (ROA) rather than the return on equity (ROE) in order not to have our main results contaminated by differences in the leverage ratio.

indicator of cost efficiency (Berger et al., 2010). As a measure of risk-taking, we use the standard deviation of the return on assets (SDROA) which we compute on a rolling-window of three years ([t-2, t]), but also on a rolling-window of five years for robustness considerations. A higher standard deviation of the return on assets indicates higher risk-taking. We also compute a risk-adjusted profitability measure (RiskAdjusROA) which we define as the ratio of the return on assets to its three-year rolling-window standard deviation. Finally, we consider a measure of default risk by computing the Z-Score (ZScore) as proposed by Boyd and Graham (1986). Lower values of both RiskAdjusROA and ZScore indicate respectively a higher risk and a higher probability of failure.

3.2.2.2. Ownership measures

In-line with the aim of this study, we borrow from the Almeida et al. (2011) work and construct an ownership index which -in our setting- simultaneously captures the expropriation incentives of ultimate controlling shareholders and the bank's ownership depth (i.e., the presence of multiple and diverse controlling shareholders involved in the bank's decision making). For this purpose, we need to build the control chains of the sampled banks. Based on a control threshold of 10%,[50] we draw the control chain for each bank for the years 2004 and 2006 (to reflect ownership prior to the 2007-2008 financial crisis), and for the year 2010 (to account for possible changes stemming from government intervention during the crisis). Our starting point for ownership data is 2004 rather than 2002 because before 2004, Bankscope and Amadeus do not report information on owners' types (e.g., firms, banks, and institutional investors). Since ownership structure is known to be relatively stable during a short period (e.g., La Porta et al., 1999; Laeven and Levine, 2009), building control chains for only three years of the sample period is reasonably accurate to depict the ownership anatomy. We consider that ownership for 2002 and 2003 comes from 2004, ownership for 2005 comes from 2006 and ownership for 2007, 2008 and 2009 comes from 2010.

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[50] A control threshold is the minimum percentage of shares that should be held by the owner to be included inside the control chain. Prior studies assume that a control threshold of 10% is enough to provide a significant fraction of votes for effective control over the intermediate and the final corporations involved in the control chain (e.g., La Porta et al., 1999; Laeven and Levine, 2008; 2009). We check the sensitivity of the results by increasing the control threshold to 20%.

To build the control chains, we first identify the major controlling shareholders (holding at least 10% of the shares) of each bank by gathering information on direct ownership from Bankscope and complete it from annual reports available on the banks' websites. We then analyze the ownership structure of these major controlling shareholders to trace indirect control chains until the ultimate controlling shareholders. If an identified controlling shareholder is not controlled by another shareholder (such as a family or a state), we consider him as the bank's ultimate owner. If, however, some of the controlling shareholders identified at this tier of the control chain are themselves financial or nonfinancial corporations, we identify their owners, the owners of their owners, and so forth until we achieve the ultimate owners. Since Bankscope provides ownership information only on banks, we use Amadeus as a primary source and complete it with information from annual reports available on websites to get ownership information on nonbanking firms found as controlling shareholders at the intermediate tiers.

We use these control chains to compute our ownership measure. The conventional proxy used to capture the expropriation incentives of an ultimate controlling owner is the divergence between control and cash-flow rights (e.g., Claessens et al., 2002; Azofra and Santamaría, 2011). The higher this divergence the higher are the ability and the incentives to expropriate. Because our aim is to simultaneously capture the expropriation incentives of the largest ultimate owner but also the bank's ownership depth, instead of simply using the divergence between both rights we construct another ownership indicator, denoted Position. This measure (Position) is computed based on the number of tiers necessary to reach the largest ultimate owner in the bank's control chain. Both the divergence between control and cash-flow rights and the number of tiers necessary to trace the control chain are positively correlated with the number of controlling shareholders which would reflect the bank's ownership depth. However, in our specific setting, such a correlation is higher for the number of tiers necessary to trace the control chain (0.47 against only 0.19 for the divergence between control and cash-

flow rights).[51] We hence favor the use of the variable Position which we compute based on this formula:

$$Position_{it} = \sum_{k=1}^{K} Rank_{kit} \times \frac{CashFlowRights_{kit}}{CashFlowRights_{it}},$$ (3.1)

where subscripts i, t and k refer respectively to the bank, the year (2004, 2006 or 2010) and to the kth sub-chain through which the largest ultimate owner holds the bank. Rank is the number of tiers necessary to reach the largest ultimate owner in the kth sub-chain (Rank=1 if the bank belongs to the first tier, Rank=2 if the bank inhabits the second tier and so on). If the bank is widely held (i.e., with no controlling shareholder holding at least 10% of ownership stakes), Rank is equal to zero and the variable Position also takes a value of zero. The variable CashFlowRights refers to the aggregate cash-flow rights of the largest ultimate owner computed as the sum of direct and indirect cash-flow rights. While direct cash-flow rights refer to the percentage of shares directly held in the bank, indirect cash-flow rights are calculated as the product of the percentages of shares held by the shareholders along the indirect control chain linking the ultimate controlling owner to the bank. In the presence of multiple ultimate owners, we define the largest ultimate owner as the one with the highest aggregate control rights (i.e., the sum of direct and indirect control rights). While direct control rights refer to the percentage of shares held directly by the ultimate owner in the bank, indirect control rights are computed following the method initially proposed by La Porta et al. (1999); that is indirect control rights are equal to the percentage of shares held by the shareholder directly linked to the bank. Even though the variable Position measures the distance between the bank with regards to only its largest ultimate and ignores the presence of the remaining ultimate controlling owners, this is not a serious shortcoming in our setting because the sample is mainly composed of banks with a single ultimate owner. Over the

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[51] This might be explained by the fact that the number of controlling shareholders is an increasing exponential function of the number of tiers in the control chain. Given a control threshold of 10%, the maximum number of controlling shareholders at each level of the bank's control chain is equal to ten. If Rank stands for the number of tiers in the control chain, the maximum number of controlling shareholders inside the control chain (N) is equal to the sum of Rank terms of a geometric sequence with an initial value and a common ratio of 10. Formally, $N=10/9(10^{Rank}-1)$. In our sample, the maximum number of intermediate tiers necessary to trace the indirect control chain until the ultimate owner is eight and the number of controlling shareholders ranges between zero (for widely held banks) and 64.

2002-2010 period, among the set of controlled banks in our sample, 430 are continuously classified as controlled by a single ultimate owner, 124 are continuously classified as controlled by multiple ultimate owners, and 68 banks switch from one category to the other. The number of different ultimate controlling owners for a given bank in our sample reaches a maximum of eight.

The variable Position is then used as a proxy for the incentives of the largest ultimate owner to expropriate but also as a proxy for the extent of the bank's ownership depth. The farther is the bank from its largest ultimate owner (higher values of the variable Position) the higher are the incentives to expropriate but also the higher is the number of controlling shareholders involved in the bank's decision making and therefore the stronger is the bank's ownership depth.

Fig.3.1 reports a simple example of a control chain to illustrate how we define the variable Position. The reported control chain consists of an ultimate owner who holds a bank through three sub-chains (directly and indirectly). If we consider that the ultimate owner holds the bank directly (only through the third sub-chain), we would allocate the bank to the first tier (Rank=1). The ultimate owner's cash-flow rights held in the bank through only this third sub-chain are equal to 20%. The variable Position takes therefore a value of one. If we consider that the ultimate owner holds the bank indirectly through only the first sub-chain, the bank belongs to the fourth tier (Rank=4). The ultimate owner's cash-flow rights held in the bank through only this first sub-chain are equal to 0.48% (30%×40%×20%×20%). The variable Position is equal to 4. If we consider the whole control chain, the ultimate owner's aggregate cash-flow rights are equal to the sum of his cash-flow rights held in the three sub-chains (k=1, 2, 3): CashFlowRights$_1$=30%×40%×20%×20%=0.48%; CashFlowRights$_2$=15%×40%×10% =0.60%; CashFlowRights$_3$=20% and the aggregate cash-flow rights (CashFlowRights) are equal to 21.08% (0.48% + 0.60% + 20%). The rank of the bank in each sub-chain is respectively Rank$_1$=4, Rank$_2$=3 and Rank$_3$=1. The variable Position is therefore computed as follows: $\text{Position} = \frac{4 \times 0.48\% + 3 \times 0.60\% + 1 \times 20\%}{21.08\%} = 1.12$.

Fig. 3.1. Example of a control chain

This figure provides an example of a control chain of a bank (Bank). C refers to each corporation presented in each box. Arrows represent equity stakes held by each corporation in the bank (Bank) or in other corporations in the control chain. *ControlRights* and *CashFlowRights* respectively indicate aggregate control and cash-flow rights of the identified ultimate owner. Aggregate rights are the sum of direct and indirect rights. Direct rights (either control or cash-flow rights) refer to the percentage of shares directly held in the bank. Indirect control rights are computed on the basis of the standard method initially proposed by La Porta et al. (1999), that is indirect control rights of an ultimate controlling owner are equal to the percentage of shares held by the shareholder directly linked to the bank. Indirect cash-flow rights are computed as the product of the percentages held along the indirect control chain.

Sub-chain 1:
$Rank_1=4$
$CashFlowRights_1=30\%*40\%*20\%*20\%=0.48\%$
$ControlRights_1=20\%$

Sub-chain 2:
$Rank_2=3$
$CashFlowRights_2=15\%*40\%*10\%=0.60\%$
$ControlRights_2=10\%$

Sub-chain 3:
$Rank_3=1$
$CashFlowRights_3=20\%$
$ControlRights_3=20\%$

Whole control chain:
$CashFlowRights=0.48\%+0.60\%+20\%=21.08\%$
$ControlRights=20\%+10\%+20\%=50\%$
$Position=\frac{4\times0.48\%+3\times0.6\%+1\times20\%}{21.08\%}=1.12$
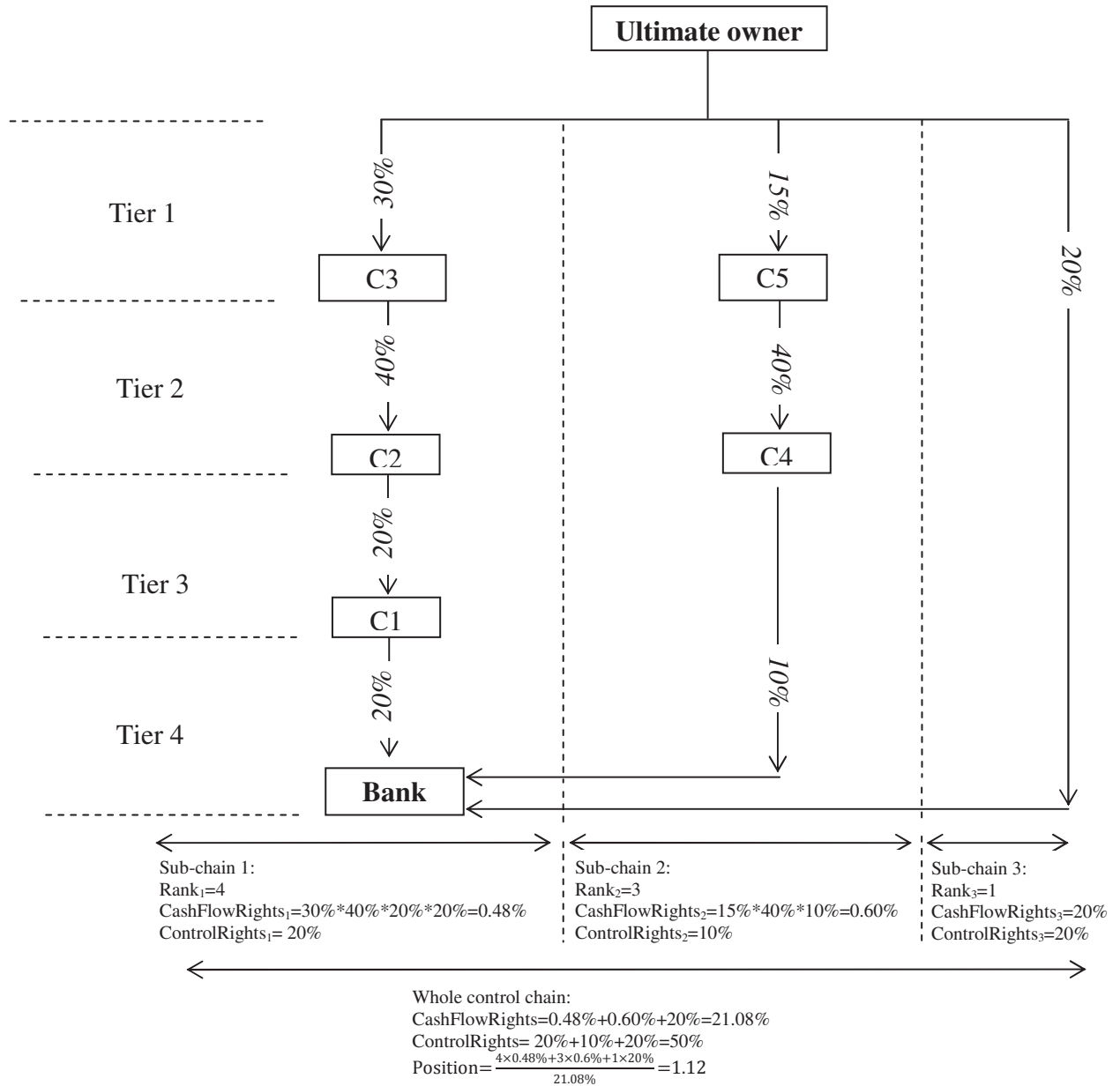
3.2.2.3. Measuring product diversification

We capture the degree of product diversification using both asset and income structures.[52] We define asset diversity (Asset Diversity) as one minus the sum of the square of the ratio of net loans to total earnings assets and the square of the ratio of other earning assets to total earning assets. Total earning assets is the sum of net loans and other earning assets. Other earning assets include securities and investments (other securities and other remaining assets). Income diversity (Income Diversity) is defined as one minus the sum of the square of the ratio of net interest income to net operating income and the square of the ratio of net noninterest income to net operating income. Net operating income is the sum of net interest income and net noninterest income.[53] By construction, both measures range between zero and a half. Asset Diversity (Income Diversity) is equal to zero when diversification reaches its minimum, meaning that total earning assets (net operating income) stem entirely either from loans (interest based activities) or from other earning assets (noninterest based activities). They are equal to a half when there is a complete diversification.

Diversification effects (either positive or negative) on performance may have limits and become smaller when banks reach a higher level of diversification. For instance, banks may suffer from diversification when they start diversifying into a new product line, but this negative effect becomes smaller or even positive for a higher level of diversification. To account for such nonlinearity, we include in our regressions the quadratic term of the diversification measures (Squared Asset Diversity and Squared Income Diversity) like for instance in Stiroh (2004).

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[52] We use an asset-based measure together with an income-based one to capture product diversification because the latter (income diversity measure) may overestimate the extent to which banks engage in nontraditional activities since loans can also produce fee income (Laeven and Levine, 2007).
[53] Our diversification measures include only two activity categories (interest and noninterest generating activities). Ideally, we would like detailed data on the extent to which banks underwrite securities, operate mutual funds, securitize assets, provide brokerage services, and so on. These details allow us to accurately test our hypotheses, and more specifically the hypothesis on ownership depth. Data availability, however, restricts our ability to measure the diversification of bank activities.

3.2.2.4. Control variables

To account for other determinants of bank performance (profitability, cost efficiency and risk), we add a set of control variables.

To account for bank size, we include the natural logarithm of bank total assets (Log(Assets)). The effect of bank size on profitability and cost efficiency is not clear-cut. In the presence of scale economies, larger banks are expected to be more profitable and/or more cost efficient than small banks (McAllister and McManus, 1993; Pasiouras and Kosmidou, 2007). However, larger banks may be less profitable and/or less cost efficient if higher agency costs associated to their complexity mitigate the effect of scale economies (Berger et al., 1987). Similarly, the relationship between bank size and risk is uncertain. On the one hand, larger banks are expected to have more stable earnings because they have greater ability to diversify their risk (Demsetz and Strahan, 1997). On the other hand, because of the presence of too-big-to-fail policies, larger banks might have higher incentives to take more risk and to be more volatile (Galloway et al., 1997). The net impact of bank size on the risk-adjusted profitability and default risk is therefore unpredictable and depends on its effect on profitability and risk.

The second control variable we include is the ratio of equity to total assets (Equity). Better capitalized banks are expected to have higher profitability and lower costs because they face lower costs of funding (Bourke, 1989; Berger, 1995; Iannotta et al., 2007). While the effect of bank capitalization on default risk is expected to be negative, its effect on risk-taking is not clear. Banks with higher capital ratios are safer and take less risk (Keeley, 1990; Distinguin et al., 2013). However, higher capital ratios due to more stringent capital regulation can encourage banks to take on more risk to maintain the expected return to shareholders (Koehn and Santomero, 1980; Kim and Santomero, 1988). In such a case, a positive link would be expected between the ratio of equity to total assets and risk-taking (Iannotta, 2006; Barry et al., 2011). As a result, the net impact of Equity on the risk-adjusted profitability is uncertain.

As an additional control variable, we introduce the ratio of deposits to total assets (Deposits). While deposits-to-total assets ratio is expected to increase risk (Iannotta et al.,

2007), its impact on profitability and cost efficiency is indeterminate. On the one hand, banks more reliant on deposit funding should be more profitable (Iannotta et al., 2007) and face lower costs because deposits present a cheaper source of finance. On the other hand, such funds are also more costly in terms of fixed and labor costs (branching) possibly leading to higher costs (Iannotta et al., 2007) and lower profitability (Barry et al., 2011). As a consequence, the relationship between deposits-to-total-assets ratio and risk-adjusted profitability is unpredictable.

We also account for the ratio of loans to total assets (Loans). If loans are more costly to produce than other assets, banks with a higher loans-to-assets ratio are expected to face higher costs (Iannotta et al., 2007) and potentially lower profitability (Bourke, 1989; Molyneux and Thornton, 1992). However, if loans are more profitable than other assets banks with higher loans-to-assets ratio might enjoy higher levels of profitability (Iannotta et al., 2007). Banks with a higher share of loans in total assets are expected to be less risky because lending activities are usually more stable than non-lending activities (Lepetit et al., 2008). The effect on risk-adjusted profitability and default risk depends on the net impact of the ratio of loans to total assets on profitability.

We include a dummy variable Listed to control for the public or private status of the bank. Publicly listed banks are expected to be more profitable but also more risky (Shehzad et al., 2010; Barry et al., 2011). Therefore, the impact on risk-adjusted profitability depends on which effect dominates. Finally, we include the growth rate of the real gross domestic product (GDPGrowth) to control for differences in the macroeconomic environment. We expect a higher growth rate of GDP to be associated with higher profitability (Molyneux and Thornton, 1992; Iannotta et al., 2007; Albertazzi and Gambacorta, 2009) and lower risk (Distinguin et al., 2013).

The definition and descriptive statistics of all the variables used in our regressions are provided in Table 3.2.

3.2.3. Model specification

To test whether the bank's position within the pyramid affects the relationship between activity diversification and performance, we estimate this model:

$$y_{it} = (\alpha_1 + \alpha_2\ \text{Position}_{it}) \times \text{Diversity}_{it\text{-}1} + \alpha_3 \text{Position}_{it} + \alpha_4 \text{Squared Diversity}_{it\text{-}1} + \beta^{'}X + \alpha_0 \tag{3.2}$$
$$+ \varphi^{'}\text{Country} + \delta^{'}\text{Year} + \varepsilon_{it},$$

where y is the dependent variable which accounts for profitability (ROA), cost efficiency (Expenses), risk-taking (SDROA), risk-adjusted profitability (RiskAdjusROA) or default risk (ZScore); Diversity is the lagged value of the diversity measure (Asset Diversity or Income Diversity);[54] Position is the bank's position within the pyramid capturing both the largest ultimate owner's expropriation incentives and the bank's ownership depth; Squared Diversity is the square of the diversity measure (Squared Asset Diversity or Squared Income Diversity); X is a vector of the aforementioned control variables;[55] Country and Year respectively denote vectors of country and year dummies; and ε is the error term.

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[54] There is a potential simultaneity issue between diversification and performance because a bank's expansion into nontraditional activities is not exogenous since it is chosen by bank managers and therefore causal inference is difficult. To partially deal with this endogeneity issue, we follow previous studies (e.g., Berger et al., 2010) and consider the relationship between the lagged value of the diversity measure and the current values of performance measures.

[55] Table A3.1 in the Appendix shows the correlation coefficients among the key explanatory variables used in our regressions. On the whole, the correlation coefficients are low except for bank size as measured by the natural logarithm of total assets (Log(Assets)) and the ratio of equity to total assets (Equity). We hence orthogonalize Equity with respect to Log(Assets).

Table 3.2. Variables' definition and summary statistics

This table provides the definition and summary statistics of all the variables used in the regressions. The sample consists of 672 European commercial banks corresponding to 4,032 observations during the 2002-2010 period. Bank level accounting variables are retrieved from Bankscope database and ownership variables are obtained from Bankscope, Amadeus and Annual Reports available on the Web sites. GDP growth rate is obtained from the Bloomberg database.

Variable name	Definition	Mean	Median	Standard deviation	Minimum	Maximum
ROA	Net income divided by total assets (%).	0.515	0.501	0.899	-3.656	4.769
Expenses	Total expenses divided by total assets (%).	4.920	4.636	2.268	0.503	19.674
SDROA	Three-year rolling-window standard deviation of the return on assets (%).	0.475	0.286	0.618	0.006	7.056
RiskAdjusROA	Return on assets divided by its three-year rolling-window standard deviation.	3.594	2.010	6.400	-7.183	45.191
ZScore	Measure of bank default risk. ZScore=(ROA+ Equity)/SDROA, where Equity is the ratio of total equity to total assets.	55.183	28.871	76.046	0.372	597.502
Position	Distance between the largest ultimate owner and the bank computed as: Position=$\sum_{k=1}^{K}$ Rank$_k \times \frac{CashFlowRights_k}{CashFlowRights}$, where Rank is the number of tiers necessary to reach the largest ultimate owner in the kth sub-chain, CashFlowRights refer to the largest ultimate owner's cash-flow rights.	1.975	2.283	1.131	0	8
Asset Diversity	$1-\left[\left(\frac{\text{Net loans}}{\text{Total Earnings Assets}}\right)^2 + \left(\frac{\text{Other Earning Assets}}{\text{Total Earning Assets}}\right)^2\right]$, Other Earning assets is defined as the sum of securities, other securities and other remaining securities (%).	35.702	39.185	12.665	0	50
Income Diversity	$1-\left[\left(\frac{\text{Net Interest Income}}{\text{Net Operating Income}}\right)^2 + \left(\frac{\text{Net NonInterest Income}}{\text{Net Operating Income}}\right)^2\right]$, Net Operating Income is defined as the sum of net interest income and net noninterest income (%).	35.954	39.921	10.280	0	50
Squared Asset Diversity	Square of Asset Diversity (%).	14.350	15.355	8.013	0	25
Squared Income Diversity	Square of Income Diversity (%).	14.534	15.937	8.026	0	25
Log(Assets)	Natural logarithm of the bank's total assets (Millions of Euros).	8.121	7.710	2.194	3.466	14.394
Equity	Total equity divided by total assets (%).	8.907	7.223	6.346	1.253	54.622
Deposits	Total customer deposits divided by total assets (%).	52.786	53.397	23.767	0.000	97.525
Loans	Net loans divided by total assets (%).	52.907	57.882	24.567	2.080	93.548
Listed	Dummy equal to one if the bank is publicly listed; and zero otherwise.	0.268	0	0.443	0	1
GDPGrowth	Real GDP (Growth Domestic Product) growth rate (%).	1.239	1.482	2.861	-8.204	6.639
InstitutionalOwners Proportion	Number of owners which are institutional investors (a mutual fund, an insurance company or a financial company) divided by the total number of owners in the bank's control chain (%).	15.442	6.608	28.407	0	100
OtherOwners Proportion	Number of owners which are neither banks nor institutional investors, i.e. owners which are classified as individuals/families, states, industrial companies and foundations (%).	22.298	8.660	33.871	0	100
DomesticInstitutionalOwners Proportion	Number of domestic institutional owners (a mutual fund, an insurance company or a financial company) divided by the total number of owners in the bank's control chain (%).	8.545	0	23.507	0	100
ForeignInstitutionalOwners Proportion	Number of foreign institutional owners (a mutual fund, an insurance company or a financial company) divided by the total number of owners in the bank's control chain (%).	6.897	0	18.806	0	100

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The coefficient α_1 measures the effect of greater activity diversification for widely held banks (i.e., Position=0). If diversification of activities yields diseconomies, the coefficient α_1 would be significant and negative for profitability and default risk variables but positive for risk and cost efficiency variables. If, instead, greater activity diversification yields economies, the coefficient α_1 would be significant and positive for profitability and default risk variables but negative for risk and cost efficiency variables.

The coefficient α_2 captures whether the bank's location within the pyramid affects diversification performance. If banks' ultimate owners in pyramids use activity diversification as a channel to enhance their ability to extract private benefits, we would expect banks located lower down the pyramid to suffer higher diseconomies of diversification or to have lower economies of diversification: α_2 should be significant and negative when the dependent variable is a profitability (risk-adjusted or not), or a default risk proxy, and positive when we consider a cost efficiency or a risk-taking proxy to be in support with the expropriation conjecture. If, however, the existence of multiple owners in pyramids facilitates activity diversification and brings additional skills, we would expect banks located lower down the pyramid to suffer lower diseconomies of diversification or to enjoy higher economies of diversification: α_2 should be significant and positive for ROA, RiskAdjusROA and ZScore proxies and negative when the dependent variable is a cost efficiency or a risk-taking proxy to be in support with the expectation of the expertise accruing from ownership depth.

The coefficient α_3 measures the effect of the bank's location within the pyramid on bank performance. Based on the expropriation view of pyramidal ownership structure (e.g., Haw et al., 2010; Azofra and Santamaría, 2011), we expect banks located lower down the pyramid (higher values of Position) to be negatively associated with profitability and positively with risk: α_3 should be significant and negative when the dependent variable is ROA, RiskAdjusROA or ZScore, and positive when we refer to SDROA or Expenses proxies. Finally, the coefficient α_4 tests for the presence of nonlinearity in the relationship between performance and activity diversification.

3.3. Results

In this section, we first examine whether banks benefit or suffer from their diversification strategy regardless of their ownership structure. We then test whether the deepness of the bank's position in the pyramid affects diversification performance, leading banks to suffer higher diseconomies of diversification or to have lower economies of diversification (in-line with the expropriation conjecture), or rather, to suffer lower diseconomies of diversification or to enjoy higher economies of diversification (in-line with the expectation of ownership depth expertise).

We perform several diagnostic tests to choose the appropriate method to estimate the coefficients of Eq. (3.2). The Fischer test indicates that data are not homogenous in the individual dimension (i.e., presence of individual effects) and the Hausman test accepts the null hypothesis of exogeneity of the regressors (i.e., random individual effects are more suitable than fixed individual effects). Furthermore, the modified Wald test points to the presence of heteroscedasticity but the Wooldridge test accepts the null hypothesis of absence of first order autocorrelation in the residuals. We also test for the presence of endogeneity for the variable Position since prior studies (e.g., Demsetz and Lehn, 1985; Himmelberg et al., 1999; Almeida et al., 2011) highlight that ownership may be endogenous as it is affected by the firm's level of profitability and risk. The Hausman test, used to determine whether the variable Position is endogenous, shows that the null hypothesis of exogeneity is not rejected.[56] As a result, we estimate Eq. (3.2) using the Generalized Least Squares estimation method (GLS) with robust standard errors to correct for heteroscedasticity.

3.3.1. Baseline results: product diversification and bank performance

Table 3.3 reports the results from regressing performance measures (ROA, Expenses, SDROA, RiskAdjusROA and ZScore) on the asset (Panel 1) and income (Panel 2) diversity measures. We find that both asset and income diversity are positively linked to profitability (ROA) and risk (SDROA, ZScore), suggesting that diversification improves profitability but it

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[56] Following Laeven and Levine (2009) and Lin et al. (2011a), for each bank in a given country we use an average measure of Position obtained from all other banks in the same country to instrument Position.

also increases risk consistent with the finding of previous studies (e.g., Lepetit et al. 2008). Furthermore, the results indicate that the benefits accruing from diversification (i.e., the positive effect on profitability) do not outweigh the increase in earnings volatility (SDROA): α_1 is not significant in the regression where the dependent variable is RiskAdjusROA. The results also indicate that the coefficients on the squared terms of income diversity and asset diversity are not significant in all the regressions, suggesting that the relationship between activity diversification and performance is linear.

Regarding control variables, most of them enter significant and carry the expected sign. Consistent with the expropriation hypothesis of pyramidal ownership structure, we find that higher Position is associated with lower profitability (either risk-adjusted or not), higher SDROA (although only at the 10% level) and higher default risk (ZScore). The results also show that large banks are more cost-efficient and less risky (lower Expenses and SDROA) than small banks but they also exhibit a higher probability of failure (lower ZScore). In contrast, better capitalized banks are more profitable and less vulnerable (higher ZScore) but less cost-efficient and more risky (higher Expenses and SDROA). Moreover, the results show that banks more reliant on lending activities face higher costs but they are less risky (lower SDROA, and higher RiskAdjusROA and ZScore). Coherently, we find that listed banks have a higher probability of failure (lower ZScore) than privately owned banks. Finally, the results show that the annual growth rate of the gross domestic product (GDPGrowth) is positively related to profitability (ROA and RiskAdjusROA) and negatively to risk (SDROA).

Table 3.3. Product diversification and bank performance

This table shows the Generalized Least Squares estimation results of the effect of product diversification on performance for a sample of 672 European banks (corresponding to 4,032 observations) over the 2002-2010 period. We measure product diversification using an asset-based measure (Panel 1) and an income-based measure (Panel 2). *ROA* is net income divided by total assets. *Expenses* is total expenses divided by total assets. *SDROA* is the three-year rolling-window standard deviation of the return on assets. *RiskAdjusROA* is the return on assets divided by its three-year rolling-window standard deviation. *ZScore* is a measure of bank default risk. *Asset Diversity* is $1-\left[\left(\frac{\text{Net Loans}}{\text{Total Earning Assets}}\right)^2 + \left(\frac{\text{Other Earning Assets}}{\text{Total Earning Assets}}\right)^2\right]$, with Other Earning Assets is defined as the sum of securities, other securities and other remaining assets. *Income Diversity* is $1-\left[\left(\frac{\text{Net Interest Income}}{\text{Net Operating Income}}\right)^2 + \left(\frac{\text{Net NonInterest Income}}{\text{Net Operating Income}}\right)^2\right]$, with Net Operating Income is defined as the sum of net interest income and net noninterest income. Both *Asset Diversity* and *Income Diversity* measures are lagged one year to avoid simultaneity. *Position* is the distance between the ultimate owner and the bank computed as: $\text{Position}=\sum_{k=1}^{K}\text{Rank}_k \times \frac{\text{CashFlowRights}_k}{\text{CashFlowRights}}$, where *Rank* is the number of tiers necessary to reach the largest ultimate owner in the kth sub-chain, *CashFlowRights* refer to the largest ultimate owner's cash-flow rights. *Squared Diversity* is the square of the lagged value of *Asset Diversity* (*Income Diversity*) in Panel 1 (Panel 2). *Log(Assets)* is the natural logarithm of the bank's total assets. *Equity* is total equity divided by total assets. *Deposits* is total customer deposits divided by total assets. *Loans* is net loans divided by total assets. *Listed* is a dummy equal to one if the bank is publicly listed, and zero otherwise. *GDPGrowth* is the real Gross Domestic Product (GDP) growth rate. *Equity* is orthogonalized with respect to *Log(Assets)* to avoid colinearity issue. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Panel 1: Asset Diversity measure					Panel 2: Income Diversity measure				
	ROA	Expenses	SDROA	RiskAdjusROA	ZScore	ROA	Expenses	SDROA	RiskAdjusROA	ZScore
Diversity (α_1)	0.008***	0.002	0.003*	0.004	-0.554***	0.008***	0.001	0.003**	0.014	-0.460***
	(0.000)	(0.650)	(0.077)	(0.766)	(0.001)	(0.000)	(0.730)	(0.034)	(0.299)	(0.003)
Position	-0.066**	0.047	0.032*	-0.371**	-3.610**	-0.068***	0.047	0.031*	-0.362**	-3.427**
	(0.023)	(0.684)	(0.067)	(0.026)	(0.021)	(0.002)	(0.317)	(0.056)	(0.024)	(0.020)
Squared Diversity	-0.002	-0.001	0.004	-0.029	-0.162	-0.003	-0.003	0.002	-0.012	-0.140
	(0.297)	(0.814)	(0.144)	(0.144)	(0.114)	(0.179)	(0.392)	(0.113)	(0.392)	(0.146)
Log(Assets)	-0.019	-0.289***	-0.070***	0.094	-1.964**	-0.019	-0.288***	-0.070***	0.081	-2.133**
	(0.238)	(0.000)	(0.000)	(0.376)	(0.016)	(0.217)	(0.000)	(0.000)	(0.446)	(0.010)
Equity	0.281***	0.279***	0.084**	-0.033	4.060**	0.282***	0.280***	0.086***	-0.056	3.613**
	(0.000)	(0.005)	(0.017)	(0.818)	(0.019)	(0.000)	(0.000)	(0.000)	(0.752)	(0.019)
Deposits	0.002*	-0.002	-0.000	0.005	-0.130	0.002**	-0.002	-0.000	0.005	-0.129
	(0.053)	(0.630)	(0.755)	(0.535)	(0.147)	(0.036)	(0.424)	(0.625)	(0.539)	(0.188)
Loans	0.001	0.009***	-0.003**	0.030***	0.468***	0.001	0.009***	-0.003***	0.031***	0.485***
	(0.492)	(0.009)	(0.034)	(0.000)	(0.000)	(0.446)	(0.001)	(0.000)	(0.000)	(0.000)
Listed	0.042	0.100	0.025	0.585	-16.902**	0.039	0.101	0.021	0.594	-16.402**
	(0.512)	(0.684)	(0.633)	(0.418)	(0.019)	(0.656)	(0.718)	(0.776)	(0.312)	(0.018)
GDPGrowth	0.014***	0.003	-0.010***	0.190***	0.307	0.014***	0.003	-0.010***	0.192***	0.283
	(0.001)	(0.634)	(0.000)	(0.006)	(0.304)	(0.001)	(0.694)	(0.000)	(0.005)	(0.483)
Constant	0.315	7.149***	1.105***	1.394	86.690***	0.319	7.190***	1.118***	1.019	83.340***
	(0.136)	(0.000)	(0.000)	(0.303)	(0.000)	(0.139)	(0.000)	(0.000)	(0.503)	(0.000)
Country dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Year dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-Square	0.205	0.222	0.146	0.100	0.106	0.205	0.223	0.144	0.100	0.104

We now examine whether ownership structure and more specifically the bank's position within the pyramid constrains (consistent with the ownership depth hypothesis) or intensifies (consistent with the expropriation hypothesis) the negative effect of activity diversification on European banks' performance.

3.3.2. Banks' position within the pyramid and diversification performance

Table 3.4 reports the estimation results for all the dependent variables used to measure bank performance (ROA, Expenses, SDROA, RiskAdjusROA and ZScore) based on both asset (Panel 1) and income (Panel 2) diversity measures. To examine the effect of the bank's position within the pyramid on the association between product diversification and performance, we compute the relevant marginal effects as $\frac{\partial y}{\partial \text{Diversity}} = \alpha_1 + \alpha_2 \times \text{Position} + 2 \times \alpha_4 \times \text{Diversity}_{it-1}$ (see Eq. (3.2)), with the variable Position evaluated at median, 75th percentile and maximum levels.

Table 3.4 shows that the magnitude and the sign of the relationship between performance and product diversification depend critically on the bank's position in the pyramid (α_2 is significant). More precisely, these results indicate that the diseconomies of European banks' diversification diminish the deeper is the bank's position in the pyramid: α_2 is positive when the dependent variable is a profitability, a risk-adjusted profitability or a default risk proxy and negative when we consider a cost efficiency or a risk-taking proxy. The Wald tests show that at high levels of Position, the association between diversification and performance is reversed and that diversification strategy yields economies: when the dependent variable is profitability (either risk-adjusted or not), the effect of diversification becomes positive for values of Position higher than 4 (i.e., 75th percentile) but the negative effect of diversification is reversed only at the maximum level of Position when we consider a risk-taking, cost efficiency or a default risk proxy.

Our results are not only statistically significant but also economically meaningful. For instance, if we consider a bank for which Asset Diversity is equal to the median value (39%) the regression where risk-taking is the dependent variable (SDROA) suggests that bank risk

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will increase by almost 28% of its mean (from 0.47% to 0.60%) if there is a one standard deviation increase in Asset Diversity (13%) when the bank is widely held (i.e., Position=0).[57] But for such an increase in Asset Diversity (13%), risk falls by almost 17% of its mean (from 0.47% to 0.39%) when the bank belongs to the deepest pyramidal tier (i.e., Position=8).

On the whole, our results suggest that activity diversification induces diseconomies (higher costs and higher risk) but the extent of such diseconomies depends on the strength of ownership network to which the bank belongs: banks tend to suffer lower diseconomies of diversification the deeper is their location in the pyramid, and banks with the most complex ownership network benefit from diversification economies. These results are consistent with the expertise of ownership depth, and indicate that diseconomies of diversification in European banks result, at least partially, from the lack of expertise to manage new activities. From a policy perspective, this study also suggests that the governance structure of banks should be taken into account when assessing the impact of more stringent activity restrictions on bank performance.

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[57] The calculation is as follows: $\frac{\partial \text{SDROA}}{\partial \text{Asset Diversity}}$=0.008+2×0.003×0.39=0.01. Hence, for a one standard deviation increase in Asset Diversity (13%), SDROA will increase by 0.01×13=0.13 (from 0.47% to 0.60%).

Table 3.4. Ownership structure, product diversification and bank performance

This table shows the Generalized Least Squares estimation results of the effect of the bank's position within the pyramid on the relationship between product diversification and performance (Eq. (3.2)) for a sample of 672 European banks (corresponding to 4,032 observations) over the 2002-2010 period. We measure product diversification using an asset-based measure (Panel 1) and an income-based measure (Panel 2). *ROA* is net income divided by total assets. *Expenses* is total expenses divided by total assets. *SDROA* is the three-year rolling-window standard deviation of the return on assets. *RiskAdjusROA* is the return on assets divided by its three-year rolling-window standard deviation. *ZScore* is a measure of bank default risk. *Asset Diversity* is $1 - \left[\left(\frac{\text{Net Loans}}{\text{Total Earning Assets}} \right)^2 + \left(\frac{\text{Other Earning Assets}}{\text{Total Earning Assets}} \right)^2 \right]$, with *Other Earning Assets* is defined as the sum of securities, other securities and other remaining assets. *Income Diversity* is $1 - \left[\left(\frac{\text{Net Interest Income}}{\text{Net Operating Income}} \right)^2 + \left(\frac{\text{Net NonInterest Income}}{\text{Net Operating Income}} \right)^2 \right]$, with *Net Operating Income* is defined as the sum of net interest income and net noninterest income. Both *Asset Diversity* and *Income Diversity* variables are lagged one year to avoid simultanity. *Position* is the distance between the ultimate owner and the bank computed as: $\text{Position} = \sum_{k=1}^{K} \text{Rank}_k \times \frac{\text{CashFlowRights}_k}{\text{CashFlowRights}}$, where *Rank* is the number of tiers necessary to reach the largest ultimate owner in the kth sub-chain, *CashFlowRights* refer to the largest ultimate owner's cash-flow rights. *Squared Diversity* is the square of the lagged value of *Asset Diversity* (*Income Diversity*) in Panel 1 (Panel 2). *Log(Assets)* is the natural logarithm of the bank's total assets. *Equity* is total equity divided by total assets. *Deposits* is total customer deposits divided by total assets. *Loans* is net loans divided by total assets. *Listed* is a dummy equal to one if the bank is publicly listed, and zero otherwise. *GDPGrowth* is the real Gross Domestic Product (GDP) growth rate. *Equity* is orthogonalized with respect to *Log(Assets)* to avoid colinearity issue. In all the regressions, *Country* and *Year* dummies are included but not reported. To examine the effect of ownership structure on the relationship between product diversification and bank performance, we report in the last three rows the marginal effects computed as $\frac{\partial Y}{\partial \text{Diversity}} = \alpha_1 + \alpha_2 \times \text{Position} + 2 \times \alpha_4 \times \text{Diversity}$, with the variable *Position* evaluated at median, 75th percentile and maximum levels, and the variable *Diversity* is evaluated at the median value. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable (y)	Panel 1: Asset Diversity measure					Panel 2: Income Diversity measure				
	ROA	Expenses	SDROA	RiskAdjusROA	ZScore	ROA	Expenses	SDROA	RiskAdjusROA	ZScore
Diversity (α_1)	0.002	0.017**	0.008***	-0.051**	-0.948***	0.001	0.019**	0.007***	-0.041*	-0.862***
	(0.522)	(0.018)	(0.001)	(0.030)	(0.002)	(0.777)	(0.014)	(0.002)	(0.094)	(0.004)
Position × Diversity (α_2)	0.002**	-0.009**	-0.002**	0.031***	0.323**	0.002**	-0.010*	-0.002**	0.031***	0.330**
	(0.011)	(0.019)	(0.017)	(0.002)	(0.016)	(0.021)	(0.017)	(0.030)	(0.002)	(0.015)
Position (α_3)	-0.230***	0.372	0.144**	-1.445***	-10.368**	-0.208***	0.430	0.133**	-1.459***	-10.503**
	(0.003)	(0.174)	(0.015)	(0.000)	(0.041)	(0.004)	(0.150)	(0.031)	(0.000)	(0.044)
Squared Diversity (α_4)	-0.002	-0.002	0.003	-0.027	-0.143	-0.002	-0.004	0.002	-0.009	-0.115
	(0.382)	(0.678)	(0.163)	(0.165)	(0.219)	(0.367)	(0.309)	(0.382)	(0.534)	(0.385)
Log(Assets)	-0.016	-0.296***	-0.072***	0.117	-1.806**	-0.017	-0.296***	-0.071***	0.102	-1.987**
	(0.332)	(0.000)	(0.000)	(0.260)	(0.018)	(0.308)	(0.000)	(0.000)	(0.318)	(0.015)
Equity	0.280***	0.288***	0.086**	-0.038	4.010**	0.281***	0.290***	0.087**	-0.060	3.572**
	(0.000)	(0.004)	(0.013)	(0.786)	(0.010)	(0.000)	(0.003)	(0.013)	(0.672)	(0.014)
Deposits	0.003**	-0.002	-0.000	0.006	-0.124	0.002**	-0.002	-0.000	0.006	-0.125
	(0.042)	(0.611)	(0.715)	(0.471)	(0.163)	(0.049)	(0.613)	(0.694)	(0.497)	(0.162)
Loans	0.001	0.009***	-0.003**	0.028***	0.457***	0.001	0.009***	-0.003**	0.030***	0.474***
	(0.610)	(0.006)	(0.041)	(0.000)	(0.000)	(0.595)	(0.006)	(0.028)	(0.000)	(0.000)
Listed	0.045	0.106	0.025	0.619	-16.673**	0.042	0.111	0.020	0.624	-16.196**
	(0.466)	(0.662)	(0.643)	(0.393)	(0.018)	(0.504)	(0.648)	(0.700)	(0.389)	(0.016)
GDPGrowth	0.014***	0.002	-0.010***	0.200***	0.316	0.014***	0.002	-0.010***	0.200***	0.295
	(0.001)	(0.693)	(0.000)	(0.004)	(0.290)	(0.002)	(0.736)	(0.000)	(0.005)	(0.331)
Constant	0.607***	6.596***	0.908***	3.301**	100.481***	0.567**	6.543***	0.940***	2.957*	97.647***
	(0.010)	(0.000)	(0.001)	(0.037)	(0.000)	(0.014)	(0.000)	(0.000)	(0.067)	(0.000)
R-Square	0.210	0.223	0.147	0.105	0.107	0.209	0.223	0.146	0.105	0.106

Marginal effects: $\frac{\partial Y}{\partial \text{Diversity}} = \alpha_1 + \alpha_2 \times \text{Position} + 2 \times \alpha_4 \times \text{Diversity}$, with Diversity is evaluated at the median value, and Position is evaluated at:

Median = 2.28	0.005	-0.005	0.006	-0.001	-0.323	0.004	-0.007	0.004	0.023	-0.200
75th percentile = 4	0.008**	-0.020	0.003	0.052*	0.232	0.007*	-0.024	0.000	0.076**	0.368
Maximum = 8	0.016***	-0.056**	-0.006**	0.176**	1.524**	0.015**	-0.064**	-0.008***	0.200***	1.688**

Our findings being consistent with the role of ownership depth in mitigating the diseconomies accruing from greater activity diversification potentially by delivering additional skills, we go deeper and examine other dimensions of ownership depth.

3.4. Ownership depth and diversification performance: a deeper investigation

In this section, we consider some factors which might affect the effectiveness of ownership depth in mitigating diseconomies of diversification. We test the role of both ownership type and the effect of foreign and domestic ownership.

3.4.1. Shareholders types within the control chain

The effectiveness of ownership depth in mitigating diseconomies of diversification might differ across owners types. We hence hypothesize that -beyond the mere presence of multiple shareholders- the type of controlling shareholders involved in the bank's control chain might matter in delivering expertise to manage lines of products to which the bank expands. Specifically, if shareholders are themselves banks, although they are numerous, they would be less effective in delivering managerial expertise beyond the existing one: a bank, when it is a controlling owner of another bank, is less able to bring additional experience which is different from the existing one because such an owner and the bank he owns could engage in similar activities. Furthermore, all non-bank owners might not have the same ability to deliver managerial expertise. Compared to atomistic individual owners (such as families), institutional owners are larger, have more expertise in processing information and monitoring managers, and have more experience allowing them to exert greater control at a lower cost (Pound, 1988). In addition, institutional owners generally have skills in activities which require higher experience for the bank to be able to reap benefits of diversification. For instance, institutional owners engage in securities underwriting to which if the bank expands its activities may sacrify loans and therefore it needs substantial additional efforts to efficiently manage such activities to be profitable. Also, institutional owners are involved in term and riskier syndicated loans (Lim et al., 2014) and therefore have a habit to manage riskier activities. In contrast, other shareholders, such as families, limit executive management

positions to family members which might restrict labor pool to obtain qualified talent. Families could also see innovation and openness as potential threats to their control.[58]

To capture the role of ownership type in mitigating diseconomies of diversification, we identify all shareholders involved in the bank's control chain and classify them into three categories: the category Bank if the controlling shareholder is another bank, the category Institutional if the controlling shareholder is an institutional investor (a mutual fund, an insurance or a financial company) and the category Other which includes the remaining categories of non-bank owners (families, states, foundations, and industrial companies). We then compute the proportion of each shareholder category (Bank, Institutional and Other) as the ratio of the number of shareholders of each category to the total number of owners in the control chain (respectively BankOwners Proportion, InstitutionalOwners Proportion and OtherOwners Proportion).[59] We hence specify the following model:

$$
y_{it} = \left(\alpha_1 + \sum_{j=2}^{3} \alpha_j \, \text{Category}\right) \times \text{Diversity}_{it-1} + \sum_{j=4}^{5} \alpha_j \, \text{Category} + \alpha_6 \text{Squared Diversity}_{it-1} \tag{3.3}
$$
$$
+ \beta' X + \alpha_0 + \varphi' \text{Country} + \delta' \text{Year} + \varepsilon_{it},
$$

Where Category = {InstitutionalOwners Proportion, OtherOwners Proportion}.

We remove the proportion of bank owners from the model to use this category (Bank) as a benchmark against which we analyze whether a shift from bank owners to another category of owners (Institutional and Other) results in an increase or a decrease in diseconomies of diversification. The coefficient α_1 measures the effect of greater diversification on performance of banks for which the control chain is composed only of bank owners. According to the aforementioned conceptual framework, while we cannot predict the effect of a shift from bank ownership to the category of other owners (i.e., the sign on the coefficient α_3 is unpredictable a priori), we expect that a shift from bank ownership to institutional ownership (Institutional) results in a decrease of diseconomies of diversification: the

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[58] See Morck et al. (2000) for more details on why controlling families may be loath to finance innovations.
[59] To allow for easier interpretation, we remove widely held bank and we only focus on controlled banks.

coefficient α_2 should be significant and positive when the dependent variable is a profitability (risk-adjusted or not), or a default risk proxy, and negative when we consider a cost efficiency or a risk-taking proxy.

The estimation results are reported in Table 3.5. We find that the role of ownership depth in mitigating diseconomies of diversification is attributable to institutional owners: α_2 is significant in all the regressions and carries the expected sign. The Wald tests show that at high proportions of institutional ownership, activity diversification yields economies. For instance, when the control chain is fully composed of institutional owners, activity diversification leads to higher profits (risk-adjusted or not), lower costs (Expenses) and lower risk (SDROA and ZScore).

3.4.2. Foreign versus domestic owners

The effect of foreign and domestic ownership in mitigating diseconomies of diversification is not clear a priori. Under the global advantage hypothesis of foreign ownership, foreign owners might have superior skills that can be transferred to bank managers and they can bring substantial improvements in terms of culture, technological advancement, and risk management (Berger et al., 2001; Bonin et al., 2005). For instance, one channel through which foreign ownership might deliver managerial expertise is to send employees to the foreign owner's headquarters for advanced training (Berger et al., 2009). Also, foreign owners are generally associated with more and better networks and partnerships (Berger et al., 2009). However, under the home field advantage view (Berger et al., 2001; Lensink and Naaborg, 2007), domestic owners hold a home country advantage and should be more efficient in mitigating diseconomies of diversification than do foreign owners. This advantage is partly due to organizational diseconomies to efficiently operate or monitor an institution from a distance. Organizational diseconomies may make it difficult to foreign owners to transfer their skills to managers working abroad, even though such skills could be superior to those of domestic owners. In a distant market, even if foreign owners succeed to transfer such skills and advanced techniques, monitoring problems may prevent them from evaluating the efforts of managers to implement such techniques in managing their activities. If the global

advantage effect prevails, we conjecture the role of ownership depth in mitigating diseconomies of diversification to be more pronounced for foreign owners. Otherwise, domestic owners may better limit the negative effects of diversification than foreign owners.

To test these hypotheses, we distinguish between foreign and domestic institutional owners and define two variables DomesticInstitutionalOwners Proportion and ForeignInstitutional-Owners Proportion which are, respectively, the number of domestic and foreign institutional owners divided by the number of total owners in the bank's control chain.[60] We hence specify the following model where Category refers to DomesticInstitutionalOwners Proportion, ForeignInstitutionalOwners Proportion, and OtherOwners Proportion, respectively:

$$
y_{it} = \left(\alpha_1 + \sum_{j=2}^{4} \alpha_j \text{ Category}\right) \times \text{Diversity}_{it-1} + \sum_{j=5}^{7} \alpha_j \text{ Category} + \alpha_8 \text{ Squared Diversity}_{it-1}
$$
$$
+ \beta' X + \alpha_0 + \delta' \text{Year} + \varphi' \text{Country} + \varepsilon_{it}
$$

(3.4)

The results are reported in Table 3.6. They show that both domestic and institutional owners contribute to mitigate diseconomies of diversification but such mitigating roles are higher for domestic institutional owners, consistent with the home field advantage view.[61]

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[60] In some cases, Bankscope and Amadeus do not provide information on the owner's country especially when the owner is a family. Given the information we have, we only separate institutional owners (for which we have complete information) into foreign and domestic owners. This is not a serious shortcoming of this study because other owners (Other) are not found to affect the relationship between diversification and bank performance.

[61] Similarly, Claessens et al. (2001) investigate performance differences between domestic and foreign banks in developed and developing countries. They find that domestic banks have higher profits than foreign banks in developed countries and the opposite is the case in developing countries.

Table 3.5. Ownership depth, product diversification and bank performance: ownership type within the control chain

This table shows the Generalized Least Squares estimation results of the effect of ownership type on the relationship between product diversification and bank performance (Eq. (3.3)) over the 2002-2010 period. For simplicity, we remove from the sample widely held banks and consider a sample of 614 European banks corresponding to 3,757 observations. We measure product diversification using an asset-based measure (Panel 1) and an income-based measure (Panel 2). *ROA* is net income divided by total assets. *Expenses* is total expenses divided by total assets. *SDROA* is the three-year rolling-window standard deviation of the return on assets. *RiskAdjusROA* is the return on assets divided by its three-year rolling-window standard deviation. *ZScore* is a measure of bank default risk. *Asset Diversity* is $1-\left[\left(\frac{\text{Net Loans}}{\text{Total Earnings Assets}}\right)^2+\left(\frac{\text{Other Earning Assets}}{\text{Total Earnings Assets}}\right)^2\right]$, with *Other Earnings Assets* is defined as the sum of securities, other securities, and other remaining assets. *Income Diversity* is $1-\left[\left(\frac{\text{Net Interest Income}}{\text{Net Operating Income}}\right)^2+\left(\frac{\text{Net NonInterest Income}}{\text{Net Operating Income}}\right)^2\right]$, with *Net Operating Income* is defined as the sum of net interest income and net noninterest income. Both *Asset Diversity* and *Income Diversity* variables are lagged one year to avoid simultaneity. *InstitutionalOwners Proportion* is the number of owners which are institutional investors (a mutual fund, an insurance company or a financial company) divided by the total number of owners in the bank's control chain. *OtherOwners Proportion* is the number of owners which are neither banks nor institutional investors, i.e. owners which are classified as individuals/families, states, industrial companies or foundations. *Squared Diversity* is the square of the lagged value of *Asset Diversity* (*Income Diversity*) in Panel 1 (Panel 2). *Log(Assets)* is the natural logarithm of the bank's total assets. *Equity* is total equity divided by total assets. *Deposits* is total customer deposits divided by total assets. *Loans* is net loans divided by total assets. *Listed* is a dummy equal to one if the bank is publicly listed, and zero otherwise. *GDPGrowth* is the real Gross Domestic Product (GDP) growth rate. *Equity* is orthogonalized with respect to *Log(Assets)* to avoid colinearity issue. In all the regressions, *Country* and *Year* dummies are included but not reported. To examine the effect of ownership type on the relationship between product diversification and bank performance, we report in the last three rows the marginal effects computed as $\frac{\partial Y}{\partial \text{Diversity}}=\alpha_1+\alpha_2\times\text{InstitutionalOwners Proportion}+\alpha_3\times\text{OtherOwners Proportion}+\alpha_6\times\text{Diversity}$, with the variable *InstitutionalOwners Proportion* evaluated at median, 75th percentile and maximum levels, *OtherOwners Proportion* is evaluated at the minimum (which is equal to zero), and the variable *Diversity* is evaluated at the median value. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Panel 1: Asset Diversity measure					Panel 2: Income Diversity measure				
	ROA	Expenses	SDROA	RiskAdjusROA	ZScore	ROA	Expenses	SDROA	RiskAdjusROA	ZScore
Diversity (α_1)	0.005*	0.005*	0.006***	-0.006	-0.580***	0.005**	0.006**	0.005***	0.005	-0.492**
	(0.075)	(0.063)	(0.003)	(0.702)	(0.009)	(0.036)	(0.036)	(0.007)	(0.789)	(0.027)
InstitutionalOwners Proportion × Diversity (α_2)	0.013***	-0.031**	-0.013**	0.083**	1.253**	0.014**	-0.038**	-0.011**	0.080**	1.116**
	(0.006)	(0.018)	(0.015)	(0.029)	(0.018)	(0.011)	(0.026)	(0.033)	(0.021)	(0.016)
OtherOwners Proportion × Diversity (α_3)	0.000	-0.008	-0.007	0.034	-0.265	-0.002	-0.003	-0.004	0.023	-0.286
	(0.980)	(0.474)	(0.117)	(0.480)	(0.629)	(0.800)	(0.793)	(0.329)	(0.609)	(0.588)
InstitutionalOwners Proportion (α_4)	-0.002	0.008	0.005*	-0.030	-0.385	-0.001	0.007	0.005*	-0.032	-0.409*
	(0.511)	(0.241)	(0.066)	(0.109)	(0.104)	(0.689)	(0.286)	(0.093)	(0.192)	(0.095)
OtherOwners Proportion (α_5)	-0.007***	0.001	0.003*	-0.020	0.063	-0.006**	-0.001	0.002	-0.017	0.070
	(0.007)	(0.760)	(0.082)	(0.315)	(0.790)	(0.011)	(0.873)	(0.200)	(0.389)	(0.761)
Squared Diversity (α_6)	-0.002	-0.000	0.004	-0.030	-0.184	-0.002	-0.003	0.002	-0.013	-0.1634
	(0.328)	(0.860)	(0.139)	(0.139)	(0.111)	(0.308)	(0.499)	(0.238)	(0.370)	(0.149)
Log(Assets)	-0.020	-0.292***	-0.068***	0.082	-2.069**	-0.020	-0.291***	-0.068***	0.069	-2.245**
	(0.225)	(0.000)	(0.000)	(0.434)	(0.015)	(0.224)	(0.000)	(0.000)	(0.507)	(0.032)
Equity	0.282***	0.278***	0.082**	-0.020	4.221**	0.282***	0.280***	0.085**	-0.044	3.790**
	(0.000)	(0.005)	(0.018)	(0.890)	(0.017)	(0.000)	(0.005)	(0.015)	(0.761)	(0.012)
Deposits	0.003**	-0.003	-0.001	0.008	-0.117	0.003**	-0.002	-0.001	0.008	-0.115
	(0.024)	(0.564)	(0.623)	(0.351)	(0.196)	(0.027)	(0.568)	(0.591)	(0.355)	(0.201)
Loans	0.001	0.009**	-0.003**	0.031***	0.469***	0.001	0.009**	-0.003**	0.032***	0.487***
	(0.303)	(0.012)	(0.021)	(0.000)	(0.000)	(0.345)	(0.010)	(0.016)	(0.000)	(0.000)
Listed	0.090	0.058	0.006	0.880	-16.314**	0.093	0.054	0.000	0.888	-16.585**
	(0.145)	(0.797)	(0.907)	(0.220)	(0.036)	(0.134)	(0.810)	(0.995)	(0.213)	(0.031)
GDPGrowth	0.014***	0.002	-0.010***	0.210***	0.329	0.014***	0.002	-0.010***	0.210***	0.312
	(0.002)	(0.726)	(0.000)	(0.004)	(0.273)	(0.002)	(0.757)	(0.000)	(0.003)	(0.309)
Constant	0.333	7.172***	1.014***	1.448	85.938***	0.318	7.271***	1.046***	1.046	82.811***
	(0.133)	(0.000)	(0.000)	(0.278)	(0.000)	(0.148)	(0.000)	(0.000)	(0.447)	(0.000)
R-Square	0.204	0.231	0.153	0.100	0.106	0.204	0.231	0.151	0.100	0.105

Marginal effects: $\frac{\partial Y}{\partial \text{Diversity}}=\alpha_1+\alpha_2 \times \text{InstitutionalOwners Proportion}+ \alpha_3 \times \text{OtherOwners Proportion} + \alpha_6 \times \text{Diversity}$, OtherOwners Proportion is evaluated at its minimum (zero), the variable Diversity is evaluated at the median value, and InstitutionalOwners proportion is evaluated at:

	ROA	Expenses	SDROA	RiskAdjusROA	ZScore	ROA	Expenses	SDROA	RiskAdjusROA	ZScore
Median = 7%	0.004*	0.002	0.008**	-0.024	-0.636**	0.004*	0.001	0.006*	0.000	-0.542*
75th percentile = 25%	0.006*	-0.003	0.006	-0.009	-0.411*	0.007**	-0.006	0.004	0.015	-0.341
Maximum = 100%	0.016**	-0.027**	-0.005*	0.053**	0.529**	0.017***	-0.034***	-0.005**	0.075**	0.496**

Table 3.6. Ownership depth, product diversification and bank performance: domestic versus foreign institutional ownership

This table shows the Generalized Least Squares estimation results of the effect of foreign and domestic institutional ownership on the relationship between product diversification and bank performance (Eq. (3.4)) over the 2002-2010 period. For simplicity, we remove from the sample widely held banks and consider a sample of 614 European banks corresponding to 3,757 observations. We measure product diversification using an asset-based measure (Panel 1) and an income-based measure (Panel 2). *ROA* is net income divided by total assets. *Expenses* is total expenses divided by total assets. *SDROA* is the three-year rolling-window standard deviation of the return on assets. *RiskAdjusROA* is the return on assets divided by its three-year rolling-window standard deviation. *ZScore* is a measure of bank default risk. *Asset Diversity* is $1 - \left[\left(\frac{\text{Net Loans}}{\text{Total Earnings Assets}} \right)^2 + \left(\frac{\text{Other Earnings Assets}}{\text{Total Earnings Assets}} \right)^2 \right]$, with *Other Earning Assets* is defined as the sum of securities, other securities and other remaining assets. *Income Diversity* is $1 - \left[\left(\frac{\text{Net Interest Income}}{\text{Net Operating Income}} \right)^2 + \left(\frac{\text{Net NonInterest Income}}{\text{Net Operating Income}} \right)^2 \right]$, with *Net Operating Income* is defined as the sum of net interest income and net noninterest income. Both *Asset Diversity* and *Income Diversity* measures are lagged one year to avoid simultaneity. *DomesticInstitutionalOwners Proportion* is the number of domestic institutional owners (a mutual fund, an insurance company or a financial company) divided by the total number of owners in the bank's control chain. *ForeignInstitutionalOwners Proportion* is the number of foreign institutional owners (a mutual fund, an insurance company or a financial company) divided by the total number of owners in the bank's control chain. *OtherOwners Proportion* is the number of owners which are neither banks nor institutional investors, i.e. owners which are classified as individuals/families, states, industrial companies or foundations. *Squared Diversity* is the square of the lagged value of *Asset Diversity* (*Income Diversity*) in Panel 1 (Panel 2). *Log(Assets)* is the natural logarithm of the bank's total assets. *Equity* is total equity divided by total assets. *Deposits* is total customer deposits divided by total assets. *Loans* is net loans divided by total assets. *Listed* is a dummy equal to one if the bank is publicly listed, and zero otherwise. *GDPGrowth* is the real Gross Domestic Product (GDP) growth rate. *Equity* is orthogonalized with respect to *Log(Assets)* to avoid colinearity issue. In all regressions, *Country* and *Year* dummies are included but not reported. To examine the effect of foreign versus s domestic ownership on diversification performance, we report in the last rows the marginal effects computed as $\frac{\partial Y}{\partial \text{Diversity}} = \alpha_1 + \alpha_2 \times \text{DomesticInstitutionalOwners Proportion} + \alpha_3 \times \text{ForeignInstitutionalOwners Proportion} + \alpha_3 \times \text{OtherOwners Proportion} + \alpha_8 \times \text{Diversity}$. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Panel 1: Asset Diversity measure					Panel 2: Income Diversity measure				
	ROA	Expenses	SDROA	RiskAdjusROA	ZScore	ROA	Expenses	SDROA	RiskAdjusROA	ZScore
Diversity (α_1)	0.004*	0.004**	0.006***	-0.004	-0.541**	0.005**	0.005*	0.005***	0.007	-0.443**
	(0.096)	(0.043)	(0.003)	(0.793)	(0.014)	(0.048)	(0.064)	(0.006)	(0.672)	(0.046)
DomesticInstitutionalOwners Proportion × Diversity (α_2)	0.014**	-0.036**	-0.013**	0.103***	1.672***	0.015**	-0.031**	-0.013**	0.117**	1.827***
	(0.035)	(0.015)	(0.017)	(0.005)	(0.008)	(0.045)	(0.024)	(0.048)	(0.046)	(0.007)
Foreign InstitutionalOwners Proportion × Diversity (α_3)	0.008*	-0.013*	-0.011**	0.040*	0.501*	0.010*	-0.017*	-0.009*	0.053*	0.675*
	(0.065)	(0.092)	(0.034)	(0.093)	(0.067)	(0.058)	(0.080)	(0.093)	(0.063)	(0.082)
OtherOwners Proportion × Diversity (α_4)	0.000	-0.008	-0.007	0.033	-0.286	-0.002	-0.002	-0.004	0.022	-0.320
	(0.960)	(0.520)	(0.104)	(0.489)	(0.602)	(0.750)	(0.886)	(0.304)	(0.633)	(0.546)
DomesticInstitutionalOwners Proportion (α_5)	-0.000	0.010	0.006**	-0.056**	-0.712***	0.000	0.009	0.006*	-0.062***	-0.780***
	(0.925)	(0.176)	(0.046)	(0.017)	(0.003)	(0.986)	(0.195)	(0.050)	(0.009)	(0.002)
ForeignInstitutionalOwners Proportion (α_6)	-0.004	0.008	0.004	0.009	0.074	-0.003	0.006	0.003	0.014	0.153
	(0.344)	(0.507)	(0.449)	(0.731)	(0.869)	(0.466)	(0.617)	(0.562)	(0.591)	(0.737)
OtherOwners Proportion (α_7)	-0.007***	0.001	0.003*	-0.020	0.071	-0.006***	-0.001	0.002	-0.016	0.083
	(0.006)	(0.833)	(0.072)	(0.324)	(0.763)	(0.009)	(0.770)	(0.180)	(0.410)	(0.716)
Squared Diversity (α_8)	-0.002	-0.001	0.004	-0.030	-0.181	-0.002	-0.003	0.002	-0.014	-0.165
	(0.308)	(0.800)	(0.134)	(0.137)	(0.112)	(0.297)	(0.470)	(0.219)	(0.350)	(0.151)
Log(Assets)	-0.020	-0.294***	-0.068***	0.074	-2.095**	-0.021	-0.293***	-0.067***	0.063	-2.234**
	(0.213)	(0.000)	(0.000)	(0.482)	(0.045)	(0.207)	(0.000)	(0.000)	(0.543)	(0.032)
Equity	0.281***	0.273***	0.084**	-0.029	4.281**	0.280***	0.275***	0.087**	-0.051	3.877**
	(0.000)	(0.006)	(0.014)	(0.837)	(0.012)	(0.000)	(0.005)	(0.012)	(0.722)	(0.011)
Deposits	0.003**	-0.003	-0.000	0.006	-0.130	0.003**	-0.002	-0.001	0.006	-0.131
	(0.023)	(0.562)	(0.649)	(0.437)	(0.156)	(0.025)	(0.574)	(0.622)	(0.453)	(0.152)
Loans	0.001	0.008**	-0.003**	0.034***	0.504***	0.001	0.008**	-0.003**	0.036***	0.529***
	(0.376)	(0.012)	(0.019)	(0.000)	(0.000)	(0.411)	(0.011)	(0.014)	(0.000)	(0.000)
Listed	0.097	0.078	0.000	0.912	-16.136**	0.099	0.073	-0.006	0.926	-16.518**
	(0.130)	(0.724)	(0.994)	(0.203)	(0.048)	(0.122)	(0.743)	(0.922)	(0.193)	(0.039)
GDPGrowth	0.013***	0.003	-0.010***	0.190***	0.299	0.013***	0.002	-0.010***	0.190***	0.274
	(0.002)	(0.665)	(0.000)	(0.007)	(0.319)	(0.002)	(0.689)	(0.000)	(0.005)	(0.369)
Constant	0.349	7.202***	1.010***	1.391	84.402***	0.337	7.311***	1.044***	0.916	80.182***
	(0.113)	(0.000)	(0.000)	(0.293)	(0.000)	(0.123)	(0.000)	(0.000)	(0.502)	(0.000)

Table 3.6 (continued)

R-Square	0.204	0.234	0.151	0.103	0.108	0.204	0.234	0.150	0.104	0.107

Marginal effects for the variable DomesticInstitutionalOwners Proportion:
OtherOwners Proportion=ForeignInstitutionalOwners Proportion=0, Diversity=Median, and the variable DomesticInstitutionalOwners Proportion is evaluated at:

75th percentile = 15%	0.004*	-0.002	0.007*	-0.012	-0.432	0.005*	-0.002	0.005*	0.014	-0.301
Maximum = 100%	0.016***	-0.033**	-0.004**	0.075**	0.989**	0.018**	-0.028**	-0.006**	0.113**	1.252**

Marginal effects for the variable DomesticInstitutionalOwners Proportion:
OtherOwners Proportion=DomesticInstitutionalOwners Proportion=0, Diversity=Median, and the variable ForeignInstitutionalOwners Proportion is evaluated at:

75th percentile = 12%	0.003	0.001	0.008*	-0.023	-0.623*	0.004*	0.001	0.006*	0.003	-0.494*
Maximum = 100%	0.010**	-0.010	-0.002	0.012	-0.182	0.013**	-0.014	-0.002	0.049*	0.100

3.5. Robustness checks

In this section, we report a number of further regressions that were undertaken to probe the overall robustness of the results obtained in subsection 3.3.2. The results are reported in the Appendix.

First, we run regressions on subsamples of banks instead of using interaction terms as in Eq. (3.2). For this purpose, we classify the sample banks into upper- and lower-tier banks according to the median value of the variable Position. Our main findings remain the same (see Table A3.2 in the Appendix).

Second, as discussed before the variable Position measures the distance between the bank with regards to only its largest ultimate owner and ignores the remaining ultimate controlling owners in the presence of multiple ultimate controlling shareholders. To check the robustness of the results, we exclude banks controlled by multiple shareholders (corresponding to 640 observations). Our main findings remain unchanged (see Table A3.3 in the Appendix).

Third, computing risk dependent variables on the basis of three-year rolling windows can affect our results because using only three observations may be insufficient to capture a second moment of a distribution. To overcome this problem, we compute several market-based risk indicators for a subsample of 88 listed banks.[62] We capture risk-taking by the standard deviation of daily bank stock returns within a calendar year (σ(Return)).[63] We measure default risk using a market data based ZScore (MZScore) and the Merton's distance to default (DD).[64] For the same purpose, we also compute our risk measures based on five year-rolling windows. In both cases, the obtained results are consistent with our main findings (see Tables A3.4 and A3.5 in the Appendix).

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[62] The number of listed banks has been reduced from 99 to 88 because we focus on banks with continuously traded stocks as provided by the Bloomberg database.

[63] For each bank, we compute the daily stock return as the logarithm of the ratio of two adjacent daily stock prices (i.e., $\ln(\frac{\text{Stock Price}_t}{\text{Stock Price}_{t-1}})$).

[64] Market data based ZScore is computed as $\frac{100+\text{Return}}{\sigma(\text{Return})}$, where Return is defined as the mean of daily bank stock returns within a calendar year. Both variables (Return and σ(Return)) are expressed in percentages. Details on the computation of the Merton's distance to default (DD) are provided in Chapter 2 (Appendix B).

Fourth, as explained before, our set of control variables contain the ratio of net loans to total assets (Loans). Provided that our diversity measures are constructed on the basis of only two types of activities (interest and noninterest generating activities), including the variable Loans as a control variable may strip off some of the effects of the diversity measures (and mainly the asset diversity measure). To ensure that our results are not affected by including the ratio of loans to total assets along with the diversity measures, we exclude the variable Loans from our regressions. Our main findings remain the same (see Table A3.6 in the Appendix).

Fifth, bank size might affect our results in the sense that small banks may suffer more from the lack of expertise to manage activities to which they expand (e.g., Mercieca et al., 2007). In such a case, small banks might benefit more from greater ownership depth than do large banks. For this purpose, we run regressions separately for subsamples of large and small banks according to the median value of the bank's total assets. Coherently, the results show that even though the effect is stronger for small banks, both large and small banks benefit from greater ownership depth (see Table A3.7 in the Appendix).

Finally, we increase the control threshold and recalculate ownership variables with a control level of 20% instead of 10%. This new minimum control threshold changes our data set both quantitatively and qualitatively[65] but our main results are unchanged (see Table A3.8 in the Appendix).

3.6. Conclusion

The objective of this study is to empirically investigate whether ownership structure affects the association between product diversification and bank performance. For this purpose, we build the control chains of 672 commercial banks established in 17 Western European countries during the 2002-2010 period, and construct several indicators to capture the expropriation incentives of ultimate controlling owners as well as the depth of the bank's ownership.

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[65] With a threshold of 20% instead of 10%, our data set contains a higher proportion of banks considered as widely held and banks controlled by another bank. The proportion of family and state-owned banks is lower.

Our findings do not support the expropriation conjecture regarding the effect of ownership structure on the association between diversification and performance: ultimate owners in pyramids do not use diversification as a channel to enable themselves to extract private benefits of control. In contrast, we find that diseconomies of diversification vanish the deeper is the bank's position in the pyramid and that the deepest banks enjoy economies of diversification (higher profitability, lower costs, lower earnings volatility and higher risk-adjusted profitability and solvency). The results suggest that the presence of multiple owners in the pyramid (i.e., the bank's ownership depth) provides ability to banks to manage activities to which they expand, allowing them to reap the benefits accruing to product diversification. We go deeper in our analysis and exploit several dimensions of ownership depth. We look at shareholders types in the pyramid and we find that such economies of diversification are associated to institutional owners and more importantly to domestic ones.

From a policy perspective, our findings suggest that banks' supervisors and regulators should consider the effect of ownership structure when evaluating the impact of more stringent activity restrictions on bank performance. In countries as the United States where banks are likely to be widely held, greater diversification is likely to yield diseconomies. But, in countries with concentrated ownership such as Europe, banks could enjoy economies of diversification thanks to their ownership depth. Furthermore, our study suggests that the diseconomies of diversification in European banks come, at least partially, from the lack of experience in managing new activities to which they expand.

Appendix

Table A3.1. Correlations table

This table shows the correlations among the explanatory variables used in the regressions. *Position* is the distance between the largest ultimate owner and the bank computed as: Position=$\sum_{k=1}^{K}$ Rank$_k \times \frac{CashFlowRights_k}{CashFlowRights}$, where *Rank* is the number of tiers necessary to reach the largest ultimate owner in the kth sub-chain, *CashFlowRights* refer to the largest ultimate owner's cash-flow rights. *Asset Diversity* is 1-$\left[\left(\frac{Net\ Loans}{Total\ Earning\ Assets}\right)^2 + \left(\frac{Other\ Earning\ Assets}{Total\ Earning\ Assets}\right)^2\right]$, with *Other Earning Assets* is defined as the sum of securities, other securities and other remaining assets. *Income Diversity* is 1-$\left[\left(\frac{Net\ Interest\ Income}{Net\ Operating\ Income}\right)^2 + \left(\frac{Net\ NonInterest\ Income}{Net\ Operating\ Income}\right)^2\right]$, with *Net Operating Income* is defined as the sum of net interest income and net noninterest income. *Squared Asset Diversity* (*Squared Income Diversity*) is the square of the lagged value of *Asset Diversity* (*Income Diversity*). *Log(Assets)* is the natural logarithm of the bank's total assets. *Equity* is total equity divided by total assets. *Deposits* is total customer deposits divided by total assets. *Loans* is net loans divided by total assets. *Listed* is a dummy equal to one if the bank is publicly listed, and zero otherwise. *GDPGrowth* is real Gross Domestic Product (GDP) growth rate. *InstitutionalOwners Proportion* is the number of institutional owners (a mutual fund, an insurance company or a financial company) divided by the total number of owners in the bank's control chain. *OtherOwners Proportion* is the number of owners which are neither banks nor institutional investors, i.e. owners which are classified as individuals/families, states, industrial companies or foundations. *DomesticInstitutionalOwners Proportion* is the number of domestic institutional owners (a mutual fund, an insurance company or a financial company) divided by the total number of owners in the bank's control chain. *ForeignInstitutionalOwners Proportion* is the number of foreign institutional owners (a mutual fund, an insurance company or a financial company) divided by the total number of owners in the bank's control chain.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Position (1)	1.000														
Asset Diversity (2)	-0.096	1.000													
Income Diversity (3)	-0.102	0.262	1.000												
Squared Asset Diversity (4)	-0.088	0.982	0.231	1.000											
Squared Income Diversity (5)	-0.098	0.236	0.982	0.937	1.000										
Log(Assets) (6)	-0.061	0.193	0.184	0.197	0.187	1.000									
Equity (7)	-0.021	0.065	0.058	0.064	0.052	-0.484	1.000								
Deposits (8)	-0.032	0.024	0.036	0.003	0.017	-0.315	-0.076	1.000							
Loans (9)	-0.142	-0.086	-0.065	-0.123	-0.095	-0.023	-0.039	0.026	1.000						
Listed (10)	-0.373	0.161	0.175	0.143	0.163	0.328	-0.106	-0.008	0.134	1.000					
GDPGrowth (11)	0.005	0.015	0.022	0.019	0.029	0.026	-0.042	-0.016	-0.070	0.005	1.000				
InstitutionalOwners Proportion (12)	0.107	0.054	0.070	0.045	0.066	0.036	-0.022	0.040	-0.008	0.092	-0.041	1.000			
OtherOwners Proportion (13)	0.063	0.010	0.003	0.013	0.004	-0.083	0.030	0.139	0.037	-0.030	0.043	-0.205	1.000		
DomesticInstitutionalOwners Proportion (14)	-0.018	0.027	0.037	0.016	0.030	0.015	-0.038	0.026	0.096	0.168	-0.024	0.755	-0.137	1.000	
ForeignInstitutionalOwners Proportion (15)	0.184	0.048	0.059	0.048	0.063	0.035	0.014	0.029	-0.132	-0.072	-0.032	0.568	-0.139	-0.111	1.000

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Table A3.2. Ownership structure, product diversification and bank performance: regressions on subsamples

This table shows the Generalized Least Squares estimation results of the effect of product diversification on performance over the 2002-2010 period. For robustness, we run regressions on subsamples of upper- and lower-tier banks (Panels 1 and 2) instead of using interaction terms as in Eq. (3.2). Based on a control threshold of 10%, we classify a bank as an upper-tier (lower-tier) bank if the bank is located in pyramidal tier greater (lower) than the median value of Position (which is equal to 2.68). We measure product diversification using an asset-based measure (in columns *Asset Diversity* measure) and an income-based (in columns *Income Diversity* measure) measure. *ROA* is net income divided by total assets. *Expenses* is total expenses divided by total assets. *SDROA* is the three-year rolling-window standard deviation of the return on assets. *RiskAdjusROA* is the return on assets divided by its three-year rolling-window standard deviation. *ZScore* is a measure of bank default risk. *Asset Diversity* is $1-\left[\left(\frac{\text{Net Loans}}{\text{Total Earning Assets}}\right)^2+\left(\frac{\text{Other Earning Assets}}{\text{Total Earning Assets}}\right)^2\right]$, with *Other Earning Assets* is defined as the sum of securities, other securities and other remaining assets. *Income Diversity* is $1-\left[\left(\frac{\text{Net Interest Income}}{\text{Net Operating Income}}\right)^2+\left(\frac{\text{Net NonInterest Income}}{\text{Net Operating Income}}\right)^2\right]$, with *Net Operating Income* is defined as the sum of net interest income and net noninterest income. Both *Asset Diversity* and *Income Diversity* variables are lagged one year to avoid simultaneity. *Squared Diversity* is the square of the lagged value of *Asset Diversity* (*Income Diversity*) in Panel 1 (Panel 2). *Log(Assets)* is the natural logarithm of the bank's total assets. *Equity* is total equity divided by total assets. *Deposits* is total customer deposits divided by total assets. *Loans* is net loans divided by total assets. *Listed* is a dummy equal to one if the bank is publicly listed, and zero otherwise. *GDPGrowth* is the real Gross Domestic Product (GDP) growth rate. *Equity* is orthogonalized with respect to *Log(Assets)* to avoid colinearity issue. In all the regressions, *Country* and *Year* dummies are included but not reported. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

	Asset Diversity measure					Income Diversity measure				
Dependent variable	ROA	Expenses	SDROA	RiskAdjusROA	ZScore	ROA	Expenses	SDROA	RiskAdjusROA	ZScore
Panel 1: Upper- tier banks (362 banks corresponding to 2,018 observations)										
Diversity (α_1)	0.004*	0.004*	0.007***	-0.038*	-0.766***	0.003*	0.004*	0.005***	-0.027*	-0.683**
	(0.053)	(0.072)	(0.001)	(0.087)	(0.005)	(0.091)	(0.083)	(0.007)	(0.093)	(0.013)
Squared Diversity	0.000	0.000	0.003	-0.034*	-0.130	-0.002	-0.002	0.000	-0.014	-0.117
	(0.821)	(0.976)	(0.282)	(0.063)	(0.230)	(0.476)	(0.766)	(0.924)	(0.438)	(0.401)
Log(Assets)	0.002	-0.318***	-0.085***	0.284**	-1.408	0.004	-0.314***	-0.085***	0.274**	-1.604
	(0.920)	(0.000)	(0.000)	(0.020)	(0.316)	(0.862)	(0.000)	(0.000)	(0.023)	(0.251)
Equity	0.234***	0.137	0.035	-0.145	5.795**	0.241***	0.148	0.035	-0.176	4.990**
	(0.000)	(0.254)	(0.424)	(0.402)	(0.025)	(0.000)	(0.218)	(0.403)	(0.299)	(0.028)
Deposits	0.002	-0.003	-0.000	0.010	-0.104	0.001	-0.003	-0.000	0.010	-0.098
	(0.289)	(0.531)	(0.921)	(0.236)	(0.285)	(0.328)	(0.538)	(0.873)	(0.251)	(0.317)
Loans	0.000	0.012***	-0.005**	0.017**	0.408***	0.000	0.012***	-0.006**	0.018**	0.429***
	(0.789)	(0.008)	(0.022)	(0.042)	(0.001)	(0.880)	(0.008)	(0.015)	(0.036)	(0.000)
Listed	-0.026	0.014	-0.081	1.485*	-16.217**	-0.026	0.015	-0.082	1.491*	-16.760**
	(0.764)	(0.967)	(0.364)	(0.061)	(0.025)	(0.768)	(0.964)	(0.363)	(0.059)	(0.018)
GDPGrowth	0.024***	-0.006	-0.015***	0.340***	-0.021	0.024***	-0.007	-0.015***	0.330***	-0.082
	(0.001)	(0.545)	(0.000)	(0.004)	(0.958)	(0.001)	(0.516)	(0.000)	(0.003)	(0.844)
Constant	-0.085	6.717***	1.279***	-3.569**	58.961***	-0.026	6.845***	1.274***	-3.880***	54.921***
	(0.741)	(0.000)	(0.000)	(0.013)	(0.003)	(0.919)	(0.000)	(0.000)	(0.010)	(0.007)
R-Square	0.202	0.231	0.161	0.092	0.115	0.198	0.232	0.155	0.093	0.111
Panel 2: Lower-tier banks (320 banks corresponding to 2,016 observations)										
Diversity (α_1)	0.006**	0.002	0.002	0.035**	0.309*	-0.005**	-0.000	0.003	0.044***	0.318*
	(0.020)	(0.803)	(0.393)	(0.027)	(0.090)	(0.042)	(0.973)	(0.232)	(0.004)	(0.081)
Squared Diversity	-0.003	-0.007	0.004*	0.002	0.211	0.000	-0.008	0.003	0.014	0.229
	(0.229)	(0.215)	(0.074)	(0.917)	(0.447)	(0.931)	(0.105)	(0.125)	(0.530)	(0.413)
Log(Assets)	-0.030	-0.268***	-0.058***	-0.169	-4.600***	-0.032	-0.273***	-0.054***	-0.187	-4.765***
	(0.213)	(0.000)	(0.000)	(0.326)	(0.007)	(0.177)	(0.000)	(0.000)	(0.272)	(0.004)
Equity	0.353***	0.482***	0.133**	0.078	3.047	0.354***	0.476***	0.137**	0.064	2.803
	(0.000)	(0.000)	(0.048)	(0.763)	(0.422)	(0.000)	(0.000)	(0.043)	(0.804)	(0.462)
Deposits	0.004**	0.001	-0.002	-0.003	-0.194	0.004**	0.001	-0.001	-0.004	-0.205
	(0.022)	(0.853)	(0.252)	(0.861)	(0.288)	(0.024)	(0.894)	(0.338)	(0.826)	(0.261)
Loans	-0.001	0.003	0.000	0.040***	0.468***	-0.000	0.003	-0.000	0.043***	0.484***
	(0.670)	(0.578)	(0.901)	(0.002)	(0.003)	(0.911)	(0.501)	(0.858)	(0.001)	(0.002)
Listed	0.017	-0.088	0.041	1.913*	8.177	0.018	-0.081	0.034	1.922*	8.419
	(0.835)	(0.806)	(0.583)	(0.056)	(0.389)	(0.830)	(0.822)	(0.648)	(0.055)	(0.371)
GDPGrowth	0.009*	0.008	-0.006**	0.027	0.314	0.009*	0.007	-0.007**	0.027	0.303
	(0.081)	(0.224)	(0.026)	(0.423)	(0.426)	(0.083)	(0.243)	(0.021)	(0.429)	(0.445)
Constant	0.719**	7.892***	0.842**	5.909***	128.658***	0.624**	7.829***	0.894**	5.501**	126.358***
	(0.023)	(0.000)	(0.030)	(0.009)	(0.000)	(0.049)	(0.000)	(0.020)	(0.016)	(0.000)
R-Square	0.262	0.273	0.154	0.160	0.152	0.263	0.271	0.158	0.160	0.152

Table A3.3. Ownership structure, product diversification and bank performance: excluding banks controlled by multiple ultimate shareholders

This table shows the Generalized Least Squares estimation results of the effect of the bank's position within the pyramid on the relationship between product diversification and performance (Eq. (3.2)) over the 2002-2010 period. For robustness, we exclude from the initial sample banks controlled by more than one ultimate owner and we use a sample of 512 European commercial banks corresponding to 3,394 observations. We measure product diversification using an asset-based measure (Panel 1) and an income-based measure (Panel 2). *ROA* is net income divided by total assets. *Expenses* is total expenses divided by total assets. *SDROA* is the three-year rolling-window standard deviation of the return on assets. *RiskAdjusROA* is the return on assets divided by its three-year rolling-window standard deviation. *ZScore* is a measure of bank default risk. *Asset Diversity* is $1 - \left[\left(\frac{Net\ Loans}{Total\ Earning\ Assets}\right)^2 + \left(\frac{Other\ Earning\ Assets}{Total\ Earning\ Assets}\right)^2\right]$, with *Other Earning Assets* is defined as the sum of securities, other securities and other remaining assets. *Income Diversity* is $1 - \left[\left(\frac{Net\ Interest\ Income}{Net\ Operating\ Income}\right)^2 + \left(\frac{Net\ NonInterest\ Income}{Net\ Operating\ Income}\right)^2\right]$, with *Net Operating Income* is defined as the sum of net interest income and net noninterest income. Both *Asset Diversity* and *Income Diversity* variables are lagged one year to avoid simultaneity. *Position* is the distance between the ultimate owner and the bank computed as: $Position = \sum_{k=1}^{K} Rank_k \times \frac{CashFlowRights_k}{CashFlowRights}$, where *Rank* is the number of tiers necessary to reach the largest ultimate owner in the kth sub-chain, *CashFlowRights* refer to the largest ultimate owner's cash-flow rights. *Squared Diversity* is the square of the lagged value of *Asset Diversity* (*Income Diversity*) in Panel 1 (Panel 2). *Log(Assets)* is the natural logarithm of the bank's total assets. *Equity* is total equity divided by total assets. *Deposits* is total customer deposits divided by total assets. *Loans* is net loans divided by total assets. *Listed* is a dummy equal to one if the bank is publicly listed, and zero otherwise. *GDPGrowth* is the real Gross Domestic Product (GDP) growth rate. *Equity* is orthogonalized with respect to *Log(Assets)* to avoid colinearity issue. In all regressions, *Country* and *Year* dummies are included but not reported. To examine the effect of ownership structure on the relationship between product diversification and bank performance, we report in the last three rows the marginal effects computed as $\frac{\partial Y}{\partial Diversity} = \alpha_1 + \alpha_2 \times Position + 2 \times \alpha_4 \times Diversity$, with the variable *Position* evaluated at median, 75th percentile and maximum levels, and the variable *Diversity* is evaluated at the median value. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Panel 1: Asset Diversity measure					Panel 2: Income Diversity measure				
	ROA	Expenses	SDROA	RiskAdjusROA	ZScore	ROA	Expenses	SDROA	RiskAdjusROA	ZScore
Diversity (α_1)	-0.000	0.015**	0.006**	-0.044*	-0.712**	0.002	0.017**	0.006**	-0.036*	-0.625*
	(0.922)	(0.041)	(0.020)	(0.088)	(0.032)	(0.670)	(0.021)	(0.027)	(0.095)	(0.062)
Position × Diversity (α_2)	0.003**	-0.008**	-0.003*	0.022**	0.256**	0.002**	-0.009**	-0.002*	0.024**	0.271**
	(0.017)	(0.018)	(0.052)	(0.039)	(0.023)	(0.028)	(0.016)	(0.084)	(0.027)	(0.019)
Position (α_3)	-0.182**	0.355	0.121**	-1.173***	-7.174*	-0.153*	0.404	0.114*	-1.242***	-7.495*
	(0.037)	(0.260)	(0.039)	(0.002)	(0.068)	(0.057)	(0.248)	(0.074)	(0.001)	(0.063)
Squared Diversity (α_4)	-0.001	-0.003	0.005	-0.016	-0.161	0.000	-0.004	0.002	0.001	-0.177
	(0.839)	(0.682)	(0.127)	(0.330)	(0.140)	(0.915)	(0.470)	(0.364)	(0.961)	(0.187)
Log(Assets)	-0.011	-0.319***	-0.073***	0.060	-2.400**	-0.012	-0.320***	-0.073***	0.044	-2.599**
	(0.598)	(0.000)	(0.000)	(0.598)	(0.044)	(0.552)	(0.000)	(0.000)	(0.695)	(0.028)
Equity	0.289***	0.241**	0.098**	-0.069	3.414**	0.289***	0.243**	0.098**	-0.089	3.019**
	(0.000)	(0.029)	(0.010)	(0.677)	(0.023)	(0.000)	(0.027)	(0.012)	(0.597)	(0.029)
Deposits	0.003*	-0.003	-0.001	0.006	-0.091	0.003*	-0.003	-0.002	0.006	-0.093
	(0.082)	(0.555)	(0.313)	(0.543)	(0.404)	(0.091)	(0.561)	(0.284)	(0.558)	(0.396)
Loans	-0.000	0.008**	-0.002	0.029***	0.472***	-0.000	0.008**	-0.002	0.031***	0.490***
	(0.970)	(0.038)	(0.198)	(0.000)	(0.000)	(0.996)	(0.036)	(0.133)	(0.000)	(0.000)
Listed	0.060	0.219	-0.001	1.199	-16.576**	0.056	0.223	-0.006	1.208	-16.129**
	(0.411)	(0.431)	(0.983)	(0.337)	(0.040)	(0.447)	(0.424)	(0.918)	(0.133)	(0.045)
GDPGrowth	0.014***	-0.002	-0.009***	0.220***	0.463	0.014***	-0.002	-0.009***	0.230***	0.442
	(0.004)	(0.790)	(0.001)	(0.005)	(0.188)	(0.004)	(0.758)	(0.001)	(0.003)	(0.217)
Constant	0.512*	6.988***	1.014***	2.738	83.409***	0.449	6.931***	1.041***	2.461	80.662***
	(0.079)	(0.000)	(0.000)	(0.122)	(0.000)	(0.118)	(0.000)	(0.000)	(0.170)	(0.000)
R-Square	0.226	0.230	0.158	0.128	0.119	0.226	0.230	0.154	0.128	0.117

Marginal effects: $\frac{\partial Y}{\partial Diversity} = \alpha_1 + \alpha_2 \times Position + 2 \times \alpha_4 \times Diversity$, Diversity is evaluated at the median value, and the variable Position is evaluated at:

	ROA	Expenses	SDROA	RiskAdjusROA	ZScore	ROA	Expenses	SDROA	RiskAdjusROA	ZScore
Median = 2.28	0.006	-0.005	0.003	-0.007	-0.254	0.006	-0.007	0.003	0.019	-0.146
75th percentile = 4	0.012*	-0.019	-0.002	0.031*	0.186	0.010*	-0.022	0.000	0.061*	0.320
Maximum = 8	0.024***	-0.051**	-0.014**	0.119**	1.210**	0.018**	-0.058**	-0.008**	0.157**	1.404**

Table A3.4. Ownership structure, product diversification and bank performance: computing risk dependent variables using market data

   This table shows the Generalized Least Squares estimation results of the effect of the bank's position within the pyramid on the relationship between product diversification and performance (Eq. (3.2)) for a subsample of 88 European commercial listed banks (corresponding to 441 observations) over the 2002-2010 period. We measure product diversification using an asset-based measure (Panel 1) and an income-based measure (Panel 2). $\sigma(Return)$ is the standard deviation of daily stock returns within a calendar year. *MZScore* is market based ZScore. *DD* is the bank distance to default. *Asset Diversity* is $1-\left[\left(\frac{\text{Net Loans}}{\text{Total Earning Assets}}\right)^2 + \left(\frac{\text{Other Earning Assets}}{\text{Total Earning Assets}}\right)^2\right]$, with *Other Earning Assets* is defined as the sum of securities, other securities and other remaining assets. *Income Diversity* is $1-\left[\left(\frac{\text{Net Interest Income}}{\text{Net Operating Income}}\right)^2 + \left(\frac{\text{Net NonInterest Income}}{\text{Net Operating Income}}\right)^2\right]$, with *Net Operating Income* is defined as the sum of net interest income and net noninterest income. Both *Asset Diversity* and *Income Diversity* variables are lagged one year to avoid simultaneity. *Position* is the distance between the ultimate owner and the bank computed as: $\text{Position}=\sum_{k=1}^{K}\text{Rank}_k \times \frac{\text{CashFlowRights}_k}{\text{CashFlowRights}}$, where *Rank* is the number of tiers necessary to reach the largest ultimate owner in the kth sub-chain, *CashFlowRights* refer to the largest ultimate owner's cash-flow rights. *Squared Diversity* is the square of the lagged value of *Asset Diversity* (*Income Diversity*) in Panel 1 (Panel 2). *Log(Assets)* is the natural logarithm of the bank's total assets. *Equity* is total equity divided by total assets. *Deposits* is total customer deposits divided by total assets. *Loans* is net loans divided by total assets. *GDPGrowth* is the real Gross Domestic Product (GDP) growth rate. *Equity* is orthogonalized with respect to *Log(Assets)* to avoid colinearity issue. In all the regressions, *Country* and *Year* dummies are included but not reported. To examine the effect of ownership structure on the relationship between product diversification and bank performance, we report in the last three rows the marginal effects computed as $\frac{\partial Y}{\partial \text{Diversity}} = \alpha_1 + \alpha_2 \times \text{Position} + 2 \times \alpha_4 \times \text{Diversity}$, with the variable *Position* evaluated at median, 75th percentile and maximum levels, and the variable *Diversity* is evaluated at the median value. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

	Panel 1: Asset Diversity measure			Panel 2: Income Diversity measure		
Dependent variable	σ(Return)	MZScore	DD	σ(Return)	MZScore	DD
Diversity (α_1)	0.008*	-0.034	-0.008	0.007	-0.030	-0.008
	(0.053)	(0.892)	(0.630)	(0.207)	(0.400)	(0.125)
Position × Diversity (α_2)	-0.007**	0.760**	0.150**	-0.007**	0.732**	0.145*
	(0.038)	(0.049)	(0.047)	(0.024)	(0.028)	(0.097)
Position (α_3)	0.509**	-3.439*	-0.170*	0.325*	-8.089**	-0.698*
	(0.010)	(0.056)	(0.067)	(0.052)	(0.036)	(0.075)
Squared Diversity (α_4)	0.010	0.427	0.021	0.011	0.584	0.033
	(0.203)	(0.107)	(0.246)	(0.130)	(0.088)	(0.112)
Log(Assets)	-0.014	-0.617	-0.004	-0.006	-0.513	-0.015
	(0.749)	(0.698)	(0.967)	(0.879)	(0.731)	(0.884)
Equity	-0.043	5.680	0.289	-0.043	4.755	0.235
	(0.620)	(0.211)	(0.344)	(0.631)	(0.282)	(0.428)
Deposits	0.001	0.248	0.012	0.002	0.246	0.012
	(0.798)	(0.420)	(0.580)	(0.725)	(0.406)	(0.541)
Loans	-0.001	0.103	0.011	-0.003	0.137	0.014
	(0.894)	(0.647)	(0.451)	(0.677)	(0.513)	(0.335)
GDPGrowth	0.006	0.564*	0.043*	0.007	0.566*	0.042*
	(0.709)	(0.091)	(0.086)	(0.655)	(0.099)	(0.082)
Constant	1.068	248.224***	15.934***	1.065	263.050***	17.232***
	(0.140)	(0.000)	(0.000)	(0.154)	(0.000)	(0.000)
R-Square	0.578	0.540	0.517	0.573	0.538	0.514

Marginal effects: $\frac{\partial Y}{\partial \text{Diversity}} = \alpha_1 + \alpha_2 \times \text{Position} + 2 \times \alpha_4 \times \text{Diversity}$, Diversity is evaluated at the median value, Position is evaluated at:

	σ(Return)	MZScore	DD	σ(Return)	MZScore	DD
Median = 1	0.008	1.076	0.159	0.009	1.181	0.164
75th percentile = 2	0.002	1.836*	0.309	0.002	1.913*	0.309
Maximum = 5	-0.019**	4.116**	0.759**	-0.019**	4.109**	0.744**

Table A3.5. Ownership structure, product diversification and bank performance: computing risk indicators on the basis of five-year rolling windows

This table shows the Generalized Least Squares estimation results of the effect of the bank's position within the pyramid on the relationship between product diversification and performance (Eq. (3.2)) for a sample of 453 European banks (corresponding to 2,232 observations) over the 2002-2010 period. For robustness, we compute risk dependent variables on the basis of five-year rolling windows instead of three-year rolling windows. We measure product diversification using an asset-based measure (Panel 1) and an income-based measure (Panel 2). *SDROA* is the five-year rolling-window standard deviation of the return on assets. *RiskAdjusROA* is the return on assets divided by its five-year rolling-window standard deviation. *ZScore* is a measure of bank default risk. *Asset Diversity* is $1-\left[\left(\frac{Net\ Loans}{Total\ Earning\ Assets}\right)^2+\left(\frac{Other\ Earning\ Assets}{Total\ Earning\ Assets}\right)^2\right]$, with *Other Earning Assets* is defined as the sum of securities, other securities and other remaining assets. *Income Diversity* is $1-\left[\left(\frac{Net\ Interest\ Income}{Net\ Operating\ Income}\right)^2+\left(\frac{Net\ NonInterest\ Income}{Net\ Operating\ Income}\right)^2\right]$, with *Net Operating Income* is defined as the sum of net interest income and net noninterest income. Both *Asset Diversity* and *Income Diversity* variables are lagged one year to avoid simultaneity. *Position* is the distance between the ultimate owner and the bank computed as: $Position=\sum_{k=1}^{K}Rank_k\times\frac{CashFlowRights_k}{CashFlowRights}$, where *Rank* is the number of tiers necessary to reach the largest ultimate owner in the kth sub-chain, *CashFlowRights* refer to the largest ultimate owner's cash-flow rights. *Squared Diversity* is the square of the lagged value of *Asset Diversity* (*Income Diversity*) in Panel 1 (Panel 2). *Log(Assets)* is the natural logarithm of the bank's total assets. *Equity* is total equity divided by total assets. *Deposits* is total customer deposits divided by total assets. *Loans* is net loans divided by total assets. *Listed* is a dummy equal to one if the bank is publicly listed, and zero otherwise. *GDPGrowth* is the real Gross Domestic Product (GDP) growth rate. *Equity* is orthogonalized with respect to *Log(Assets)* to avoid colinearity issue. In all the regressions, *Country* and *Year* dummies are included but not reported. To examine the effect of ownership structure on the relationship between product diversification and bank performance, we report in the last three rows the marginal effects computed as $\frac{\partial Y}{\partial Diversity}=\alpha_1+\alpha_2\times Position+2\times\alpha_4\times Diversity$, with the variable *Position* evaluated at median, 75th percentile and maximum levels, and the variable *Diversity* is evaluated at the median value. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

	Panel 1: Asset Diversity measure			Panel 2: Income Diversity measure		
Dependent variable	SDROA	RiskAdjusROA	ZScore	SDROA	RiskAdjusROA	ZScore
Diversity (α_1)	0.007**	-0.039**	-0.738**	0.008**	-0.033	-0.701**
	(0.030)	(0.046)	(0.036)	(0.011)	(0.193)	(0.039)
Position × Diversity (α_2)	-0.002**	0.028**	0.214**	-0.002**	0.026**	0.205**
	(0.043)	(0.014)	(0.017)	(0.048)	(0.040)	(0.037)
Position (α_3)	0.118*	-0.718**	-10.498**	0.117*	-0.883***	-12.483**
	(0.067)	(0.019)	(0.019)	(0.071)	(0.003)	(0.026)
Squared Diversity (α_4)	0.001	-0.008	1.119***	0.000	-0.002	0.869
	(0.691)	(0.671)	(0.001)	(0.848)	(0.934)	(0.011)
Log(Assets)	-0.048***	0.040	-4.380**	-0.047***	0.039	-4.219**
	(0.000)	(0.541)	(0.028)	(0.000)	(0.551)	(0.030)
Equity	0.045	0.157	4.907**	0.046	0.158	4.784**
	(0.246)	(0.469)	(0.034)	(0.243)	(0.469)	(0.044)
Deposits	-0.001	0.011*	-0.476	-0.001	0.010*	-0.477
	(0.479)	(0.071)	(0.312)	(0.458)	(0.073)	(0.310)
Loans	-0.001	0.014**	0.605**	-0.001	0.015**	0.562**
	(0.645)	(0.024)	(0.039)	(0.534)	(0.017)	(0.044)
Listed	0.095	-0.470	-14.671**	0.095	-0.464	-13.412**
	(0.137)	(0.106)	(0.027)	(0.135)	(0.110)	(0.029)
GDPGrowth	-0.004	0.004	0.032*	-0.004	0.005	0.026*
	(0.165)	(0.857)	(0.094)	(0.150)	(0.808)	(0.099)
Constant	0.524***	1.017	37.883	0.552***	1.159	49.188**
	(0.002)	(0.359)	(0.148)	(0.001)	(0.295)	(0.047)
R-Square	0.264	0.158	0.137	0.269	0.163	0.136

Marginal effects: $\frac{\partial Y}{\partial Diversity}=\alpha_1+\alpha_2\times Position+2\times\alpha_4\times Diversity$, Diversity is evaluated at the median value, Position is evaluated at:

Median = 2.28	0.003	0.019	0.187	0.003	0.024	0.444
75th percentile = 4	-0.000	0.070**	0.556*	0.000	0.070*	0.796
Maximum = 8	-0.009**	0.178***	1.412**	-0.008**	0.174**	1.612**

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Table A3.6. Ownership structure, product diversification and bank performance: excluding the variable Loans from the set of control variables

This table shows the Generalized Least Squares estimation results of the effect of the bank's position within the pyramid on the relationship between product diversification and performance (Eq. (3.2)) for a sample of 672 European banks (corresponding to 4,032 observations) over the 2002-2010 period. We measure product diversification using an asset-based measure (Panel 1) and an income-based measure (Panel 2). *ROA* is net income divided by total assets. *Expenses* is total expenses divided by total assets. *SDROA* is the three-year rolling-window standard deviation of the return on assets. *RiskAdjusROA* is the return on assets divided by its three-year rolling-window standard deviation. *ZScore* is a measure of bank default risk. *Asset Diversity* is $1-\left[\left(\frac{\text{Net Loans}}{\text{Total Earning Assets}}\right)^2+\left(\frac{\text{Other Earning Assets}}{\text{Total Earning Assets}}\right)^2\right]$, with *Other Earning Assets* is defined as the sum of securities, other securities and other remaining assets. *Income Diversity* is $1-\left[\left(\frac{\text{Net Interest Income}}{\text{Net Operating Income}}\right)^2+\left(\frac{\text{Net NonInterest Income}}{\text{Net Operating Income}}\right)^2\right]$, with *Net Operating Income* is defined as the sum of net interest income and net noninterest income. Both *Asset Diversity* and *Income Diversity* measures are lagged one year to avoid simultaneity. *Position* is the distance between the ultimate owner and the bank computed as: $\text{Position}=\sum_{k=1}^{K}\text{Rank}_k\times\frac{\text{CashFlowRights}_k}{\text{CashFlowRights}}$, where *Rank* is the number of tiers necessary to reach the largest ultimate owner in the kth sub-chain, *CashFlowRights* refer to the largest ultimate owner's cash-flow rights. *Squared Diversity* is the square of the lagged value of *Asset Diversity* (*Income Diversity*) in Panel 1 (Panel 2). *Log(Assets)* is the natural logarithm of the bank's total assets. *Equity* is total equity divided by total assets. *Deposits* is total customer deposits divided by total assets. *Listed* is a dummy equal to one if the bank is publicly listed, and zero otherwise. *GDPGrowth* is the real Gross Domestic Product (GDP) growth rate. *Equity* is orthogonalized with respect to *Log(Assets)* to avoid colinearity issue. In all the regressions, *Country* and *Year* dummies are included but not reported. To examine the effect of ownership structure on the relationship between product diversification and bank performance, we report in the last three rows the marginal effects computed as $\frac{\partial Y}{\partial \text{Diversity}}=\alpha_1+\alpha_2\times\text{Position}+2\times\alpha_4\times\text{Diversity}$, with the variable *Position* evaluated at median, 75th percentile and maximum levels, and the variable *Diversity* is evaluated at the median value. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Panel 1: Asset Diversity measure					Panel 2: Income Diversity measure				
	ROA	Expenses	SDROA	RiskAdjusROA	ZScore	ROA	Expenses	SDROA	RiskAdjusROA	ZScore
Diversity (α_1)	-0.001	0.016*	0.008***	-0.058**	-1.062***	0.001	0.017*	0.008***	-0.048*	-0.961***
	(0.890)	(0.090)	(0.000)	(0.015)	(0.001)	(0.805)	(0.083)	(0.001)	(0.057)	(0.002)
Position × Diversity (α_2)	0.003***	-0.009**	-0.002**	0.034***	0.302**	0.002**	-0.010*	-0.002**	0.034***	0.269**
	(0.010)	(0.018)	(0.012)	(0.001)	(0.034)	(0.020)	(0.083)	(0.021)	(0.001)	(0.031)
Position (α_3)	-0.232***	0.363	0.151**	-1.534***	-11.643**	-0.210***	0.421	0.139**	-1.547***	-11.731**
	(0.002)	(0.186)	(0.012)	(0.000)	(0.029)	(0.004)	(0.159)	(0.025)	(0.000)	(0.031)
Squared Diversity (α_4)	-0.003	-0.003	0.003	-0.034	-0.551	-0.002	-0.005	0.002	-0.015	-0.398
	(0.351)	(0.503)	(0.227)	(0.119)	(0.114)	(0.342)	(0.242)	(0.273)	(0.300)	(0.130)
Log(Assets)	-0.016	-0.298***	-0.072***	0.111	-1.851*	-0.017	-0.299***	-0.071***	0.094	-2.067*
	(0.329)	(0.000)	(0.000)	(0.284)	(0.081)	(0.304)	(0.000)	(0.000)	(0.357)	(0.050)
Equity	0.279***	0.299***	0.087**	-0.085	3.383	0.280***	0.300***	0.088**	-0.113	2.837
	(0.000)	(0.002)	(0.012)	(0.545)	(0.169)	(0.000)	(0.002)	(0.011)	(0.421)	(0.246)
Deposits	0.003**	-0.002	-0.000	0.005	-0.140	0.002*	-0.002	-0.000	0.004	-0.141
	(0.044)	(0.599)	(0.760)	(0.562)	(0.115)	(0.051)	(0.602)	(0.743)	(0.595)	(0.111)
Listed	0.048	0.142	0.014	0.716	-15.090**	0.044	0.148	0.009	0.732	-15.539**
	(0.443)	(0.557)	(0.791)	(0.333)	(0.019)	(0.478)	(0.542)	(0.867)	(0.322)	(0.042)
GDPGrowth	0.014***	0.001	-0.010***	0.150***	0.242	0.014***	0.001	-0.010***	0.152***	0.213
	(0.001)	(0.830)	(0.000)	(0.006)	(0.418)	(0.001)	(0.883)	(0.000)	(0.004)	(0.482)
Constant	0.641***	7.097***	0.748***	4.883***	125.728***	0.602***	7.034***	0.773***	4.599***	123.321***
	(0.005)	(0.000)	(0.002)	(0.003)	(0.000)	(0.008)	(0.000)	(0.002)	(0.006)	(0.000)
R-Square	0.210	0.226	0.136	0.093	0.086	0.209	0.226	0.133	0.092	0.083

Marginal effects: $\frac{\partial Y}{\partial \text{Diversity}}=\alpha_1+\alpha_2\times\text{Position}+2\times\alpha_4\times\text{Diversity}$, Diversity is evaluated at the median value, Position is evaluated at:

Median = 2.28	0.004	-0.007	0.006	-0.007	-0.803	0.005	-0.008	0.004	0.017	-0.658
75th percentile = 4	0.009**	-0.022	0.002	0.051**	-0.283	0.008**	-0.025	0.001	0.076**	-0.195
Maximum = 8	0.020***	-0.058**	-0.006**	0.187***	0.924**	0.016***	-0.065**	-0.007**	0.212***	0.880**

Table A3.7. Ownership structure, product diversification and bank performance: large versus small banks

This table shows the Generalized Least Squares estimation results of the effect of the bank's position within the pyramid on the relationship between product diversification and performance (Eq. (3.2)) over the 2002-2010 period. For robustness, we run regressions on subsamples of large and small banks. We classify a bank as large (small) if its total assets are above (below) the median value. We measure product diversification using an asset-based measure (Panel 1) and an income-based measure (Panel 2). *ROA* is net income divided by total assets. Expenses is total expenses divided by total assets. *SDROA* is the three-year rolling-window standard deviation of the return on assets. *RiskAdjusROA* is the return on assets divided by its three-year rolling-window standard deviation. *ZScore* is a measure of bank default risk. *Asset Diversity* is $1-\left[\left(\frac{\text{Net Loans}}{\text{Total Earning Assets}}\right)^2+\left(\frac{\text{Other Earning Assets}}{\text{Total Earning Assets}}\right)^2\right]$, with *Other Earning Assets* is defined as the sum of securities, other securities and other remaining assets. *Income Diversity* is $1-\left[\left(\frac{\text{Net Interest Income}}{\text{Net Operating Income}}\right)^2+\left(\frac{\text{Net NonInterest Income}}{\text{Net Operating Income}}\right)^2\right]$, with *Net Operating Income* is defined as the sum of net interest income and net noninterest income. Both *Asset Diversity* and *Income Diversity* variables are lagged one year to avoid simultaneity. *Position* is the distance between the ultimate owner and the bank computed as: $\text{Position}=\sum_{k=1}^{K}\text{Rank}_k\times\frac{\text{CashFlowRights}_k}{\text{CashFlowRights}}$, where *Rank* is the number of tiers necessary to reach the largest ultimate owner in the kth sub-chain, *CashFlowRights* refer to the largest ultimate owner's cash-flow rights. *Squared Diversity* is the square of the lagged value of *Asset Diversity* (*Income Diversity*) in Panel 1 (Panel 2). *Log(Assets)* is the natural logarithm of the bank's total assets. *Equity* is total equity divided by total assets. *Deposits* is total customer deposits divided by total assets. *Loans* is net loans divided by total assets. *Listed* is a dummy equal to one if the bank is publicly listed, and zero otherwise. *GDPGrowth* is the real Gross Domestic Product (GDP) growth rate. *Equity* is orthogonalized with respect to *Log(Assets)* to avoid colinearity issue. In all the regressions, *Country* and *Year* dummies are included but not reported. To examine the effect of ownership structure on the relationship between product diversification and bank performance, we report in the last three rows of each panel the marginal effects computed as $\frac{\partial Y}{\partial \text{Diversity}}=\alpha_1+\alpha_2\times\text{Position}+2\times\alpha_4\times\text{Diversity}$, with the variable *Position* evaluated at median, 75th percentile and maximum levels, and the variable *Diversity* is evaluated at the median value. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Asset Diversity measure					Income Diversity measure				
	ROA	Expenses	SDROA	RiskAdjusROA	ZScore	ROA	Expenses	SDROA	RiskAdjusROA	ZScore
Panel 1: Large banks (326 banks corresponding to 2,016 observations)										
Diversity (α_1)	-0.003	-0.011	0.005**	-0.054*	-0.336	-0.004	-0.007	0.006***	-0.035*	-0.198
	(0.423)	(0.215)	(0.032)	(0.094)	(0.330)	(0.335)	(0.414)	(0.003)	(0.089)	(0.558)
Position × Diversity (α_2)	0.002**	-0.000	-0.002**	0.023**	0.130*	0.002**	-0.003	-0.002**	0.019*	0.187*
	(0.046)	(0.916)	(0.039)	(0.021)	(0.083)	(0.037)	(0.466)	(0.015)	(0.096)	(0.097)
Position (α_3)	-0.226***	-0.100	0.088*	-1.171**	-0.454	-0.224***	-0.003	0.138***	-1.010*	0.264
	(0.004)	(0.528)	(0.056)	(0.045)	(0.940)	(0.004)	(0.986)	(0.003)	(0.080)	(0.966)
Squared Diversity (α_4)	0.002	-0.008	0.004	-0.019	-0.433	0.000	-0.010	0.004	0.012	-0.152
	(0.569)	(0.263)	(0.026)	(0.452)	(0.090)	(0.938)	(0.117)	(0.058)	(0.631)	(0.551)
Log(Assets)	-0.048*	-0.215***	-0.063***	-0.020	-6.004***	-0.045*	-0.216***	-0.061***	-0.074	-6.556***
	(0.063)	(0.004)	(0.001)	(0.909)	(0.001)	(0.081)	(0.004)	(0.002)	(0.663)	(0.000)
Equity	0.250***	0.385***	0.198***	-0.223	4.617	0.252***	0.377***	0.200***	-0.244	4.271
	(0.005)	(0.006)	(0.003)	(0.590)	(0.423)	(0.005)	(0.007)	(0.003)	(0.556)	(0.453)
Deposits	0.004***	0.007	-0.000	-0.003	-0.257	0.004***	0.007	-0.000	-0.003	-0.253
	(0.008)	(0.238)	(0.876)	(0.847)	(0.106)	(0.010)	(0.252)	(0.831)	(0.868)	(0.113)
Loans	0.001	0.006	-0.000	0.015	0.078	0.000	0.006	-0.000	0.018	0.109
	(0.714)	(0.212)	(0.960)	(0.182)	(0.562)	(0.848)	(0.204)	(0.829)	(0.124)	(0.426)
Listed	-0.038	-0.056	0.038	0.549	3.395	-0.039	-0.041	0.033	0.567	3.876
	(0.520)	(0.812)	(0.406)	(0.471)	(0.688)	(0.507)	(0.860)	(0.477)	(0.455)	(0.645)
GDPGrowth	0.003	0.010	0.004	0.027	0.479	0.004	0.008	0.004	0.027	0.444
	(0.428)	(0.192)	(0.223)	(0.532)	(0.294)	(0.371)	(0.286)	(0.207)	(0.529)	(0.330)
Constant	1.036***	6.754***	0.684***	7.888***	175.170***	1.048***	6.601***	0.590**	7.314***	172.161***
	(0.000)	(0.000)	(0.003)	(0.004)	(0.000)	(0.000)	(0.000)	(0.011)	(0.006)	(0.000)
R-Square	0.227	0.280	0.180	0.143	0.139	0.222	0.285	0.180	0.146	0.138

Marginal effects: $\frac{\partial Y}{\partial \text{Diversity}}=\alpha_1+\alpha_2\times\text{Position}+2\times\alpha_4\times\text{Diversity}$, Diversity is evaluated at the median value, Position is evaluated at:

	ROA	Expenses	SDROA	RiskAdjusROA	ZScore	ROA	Expenses	SDROA	RiskAdjusROA	ZScore
Median = 2.28	0.003	-0.017	0.004	-0.016	-0.379	0.000	-0.021	0.004	0.017	0.109
75th percentile = 4	0.006	-0.017	0.000	0.023	-0.156	0.004	-0.027	0.001	0.050	0.431
Maximum = 8	0.014**	-0.017	-0.008*	0.115**	0.364	0.012**	-0.039	-0.007*	0.126**	1.179*

Table A3.7 (continued)

Panel 2: Small banks (356 banks corresponding to 2,016 observations)

Diversity (α_1)	0.003*	0.027**	0.008**	-0.049**	-1.399***	0.003*	0.026**	0.005*	-0.043**	-1.335***
	(0.065)	(0.023)	(0.047)	(0.013)	(0.001)	(0.079)	(0.039)	(0.075)	(0.018)	(0.002)
Position × Diversity (α_2)	0.001***	-0.008**	-0.003**	0.032**	0.368**	0.001**	-0.009**	-0.002**	0.033**	0.373**
	(0.005)	(0.017)	(0.021)	(0.033)	(0.010)	(0.021)	(0.044)	(0.028)	(0.026)	(0.017)
Position (α_3)	-0.243**	0.638*	0.136	-1.379**	-13.257*	-0.212*	0.650	0.077	-1.437***	-13.572*
	(0.049)	(0.068)	(0.128)	(0.014)	(0.070)	(0.060)	(0.113)	(0.404)	(0.009)	(0.072)
Squared Diversity (α_4)	-0.002	0.006	0.003	-0.031	-0.172	-0.001	0.004	0.001	-0.021	-0.158
	(0.483)	(0.274)	(0.282)	(0.086)	(0.121)	(0.826)	(0.455)	(0.838)	(0.221)	(0.117)
Log(Assets)	0.085	-0.885***	-0.165***	0.502*	6.576*	0.083	-0.889***	-0.167***	0.507**	6.828*
	(0.173)	(0.000)	(0.002)	(0.050)	(0.061)	(0.181)	(0.000)	(0.002)	(0.048)	(0.051)
Equity	0.285***	0.125	0.037	0.096	7.252**	0.285***	0.133	0.036	0.076	6.736**
	(0.000)	(0.321)	(0.425)	(0.550)	(0.014)	(0.000)	(0.287)	(0.449)	(0.637)	(0.021)
Deposits	0.001	-0.010	-0.002	0.013	0.011	0.001	-0.009	-0.002	0.012	0.008
	(0.626)	(0.113)	(0.377)	(0.162)	(0.930)	(0.684)	(0.118)	(0.365)	(0.188)	(0.951)
Loans	-0.001	0.010**	-0.005**	0.033***	0.716***	-0.001	0.010**	-0.005**	0.034***	0.727***
	(0.760)	(0.017)	(0.037)	(0.000)	(0.000)	(0.798)	(0.017)	(0.024)	(0.000)	(0.000)
Listed	0.550***	0.108	-0.291	2.162	-13.124**	0.547***	0.112	-0.304	2.135	-13.271**
	(0.005)	(0.880)	(0.144)	(0.268)	(0.037)	(0.003)	(0.877)	(0.124)	(0.274)	(0.038)
GDPGrowth	0.026***	-0.004	-0.015***	0.001	-0.006	0.026***	-0.003	-0.015***	-0.000	-0.079
	(0.000)	(0.688)	(0.000)	(0.977)	(0.989)	(0.000)	(0.753)	(0.000)	(0.995)	(0.858)
Constant	0.085	9.858***	1.485***	-0.055	53.337	-0.015	9.912***	1.628***	-0.272	49.984
	(0.862)	(0.000)	(0.002)	(0.984)	(0.125)	(0.975)	(0.000)	(0.001)	(0.920)	(0.150)
R-Square	0.253	0.200	0.173	0.106	0.146	0.256	0.200	0.171	0.105	0.146

Marginal effects: $\frac{\partial Y}{\partial \text{Diversity}} = \alpha_1 + \alpha_2 \times \text{Position} + 2 \times \alpha_4 \times \text{Diversity}$, Diversity is evaluated at the median value, Position is evaluated at:

Median = 2.28	0.003	0.014	0.003	0.000	-0.695	0.005*	0.009	0.001	0.015	-0.608
75th percentile = 4	0.005**	0.000	-0.002	0.055**	-0.062	0.006**	-0.007	-0.003	0.072**	0.033
Maximum = 8	0.009**	-0.032**	-0.014**	0.183**	1.410**	0.010**	-0.043**	-0.011**	0.204**	1.525**

Table A3.8. Ownership structure, product diversification and bank performance: control threshold of 20%

This table shows the Generalized Least Squares estimation results of the effect of the bank's position within the pyramid on the relationship between product diversification and performance (Eq. (3.2)) for a sample of 672 European banks (corresponding to 4,032 observations) over the 2002-2010 period. For robustness, we compute ownership variables based on a control threshold of 20% instead of 10%. We measure product diversification using an asset-based measure (Panel 1) and an income-based measure (Panel 2). *ROA* is net income divided by total assets. *Expenses* is total expenses divided by total assets. *SDROA* is the three-year rolling-window standard deviation of the return on assets. *RiskAdjusROA* is the return on assets divided by its three-year rolling-window standard deviation. *ZScore* is a measure of bank default risk. *Asset Diversity* is $1-\left[\left(\frac{\text{Net Loans}}{\text{Total Earning Assets}}\right)^2+\left(\frac{\text{Other Earning Assets}}{\text{Total Earning Assets}}\right)^2\right]$, with *Other Earning Assets* is defined as the sum of securities, other securities and other remaining assets. *Income Diversity* is $1-\left[\left(\frac{\text{Net Interest Income}}{\text{Net Operating Income}}\right)^2+\left(\frac{\text{Net NonInterest Income}}{\text{Net Operating Income}}\right)^2\right]$, with *Net Operating Income* is defined as the sum of net interest income and net noninterest income. Both *Asset Diversity* and *Income Diversity* variables are lagged one year to avoid simultaneity. *Position* is the distance between the ultimate owner and the bank computed as: $\text{Position}=\sum_{k=1}^{K}\text{Rank}_k\times\frac{\text{CashFlowRights}_k}{\text{CashFlowRights}}$, where *Rank* is the number of tiers necessary to reach the largest ultimate owner in the kth sub-chain, *CashFlowRights* refer to the largest ultimate owner's cash-flow rights. *Squared Diversity* is the square of the lagged value of *Asset Diversity* (*Income Diversity*) in Panel 1 (Panel 2). *Log(Assets)* is the natural logarithm of the bank's total assets. *Equity* is total equity divided by total assets. *Deposits* is total customer deposits divided by total assets. *Loans* is net loans divided by total assets. *Listed* is a dummy equal to one if the bank is publicly listed, and zero otherwise. *GDPGrowth* is the real Gross Domestic Product (GDP) growth rate. *Equity* is orthogonalized with respect to *Log(Assets)* to avoid colinearity issue. In all the regressions, *Country* and *Year* dummies are included but not reported. To examine the effect of ownership structure on the relationship between product diversification and bank performance, we report in the last three rows the marginal effects computed as $\frac{\partial Y}{\partial \text{Diversity}}=\alpha_1+\alpha_2\times\text{Position}+2\times\alpha_4\times\text{Diversity}$, with the variable *Position* evaluated at median, 75th percentile and maximum levels, and the variable *Diversity* is evaluated at the median value. P-values based on robust standard errors are shown in parentheses. *, ** and *** indicate statistical significance at the 10%, 5% and 1% levels respectively.

Dependent variable	Panel 1: Asset Diversity measure					Panel 2: Income Diversity measure				
	ROA	Expenses	SDROA	RiskAdjusROA	ZScore	ROA	Expenses	SDROA	RiskAdjusROA	ZScore
Diversity (α_1)	0.000	0.012**	0.008***	-0.036*	-0.961***	0.002	0.014**	0.007***	-0.022*	-0.811***
	(0.974)	(0.026)	(0.001)	(0.081)	(0.001)	(0.640)	(0.033)	(0.003)	(0.065)	(0.005)
Position × Diversity (α_2)	0.002**	-0.006*	-0.002**	0.025**	0.252**	0.001**	-0.008*	-0.003**	0.023**	0.221*
	(0.014)	(0.072)	(0.015)	(0.012)	(0.033)	(0.023)	(0.063)	(0.050)	(0.028)	(0.074)
Position (α_3)	-0.214***	0.276	0.130**	-1.027***	-10.198**	-0.187**	0.358	0.109*	-0.942**	-9.137*
	(0.009)	(0.365)	(0.020)	(0.008)	(0.045)	(0.013)	(0.277)	(0.064)	(0.017)	(0.087)
Squared Diversity (α_4)	-0.002	-0.002	0.003*	-0.027*	-1.362	-0.002	-0.004	0.002	-0.009	-0.110
	(0.409)	(0.716)	(0.067)	(0.068)	(0.221)	(0.389)	(0.327)	(0.390)	(0.527)	(0.392)
Log(Assets)	-0.015	-0.296***	-0.073***	0.114	-1.740*	-0.016	-0.297***	-0.071***	0.097	-1.962*
	(0.364)	(0.000)	(0.000)	(0.269)	(0.100)	(0.324)	(0.000)	(0.000)	(0.343)	(0.062)
Equity	0.282***	0.279***	0.084**	-0.026	4.137*	0.283***	0.279***	0.085**	-0.048	3.695*
	(0.000)	(0.005)	(0.015)	(0.851)	(0.089)	(0.000)	(0.005)	(0.014)	(0.733)	(0.067)
Deposits	0.003**	-0.002	-0.000	0.006	-0.125	0.002*	-0.002	-0.000	0.005	-0.126
	(0.042)	(0.615)	(0.714)	(0.492)	(0.163)	(0.051)	(0.613)	(0.702)	(0.521)	(0.158)
Loans	0.001	0.009***	-0.003**	0.028***	0.455***	0.001	0.009***	-0.003**	0.030***	0.474***
	(0.618)	(0.007)	(0.043)	(0.000)	(0.000)	(0.605)	(0.006)	(0.029)	(0.000)	(0.000)
Listed	0.054	0.118	0.016	0.740	-16.159**	0.052	0.123	0.012	0.747	-15.741**
	(0.400)	(0.644)	(0.765)	(0.314)	(0.024)	(0.419)	(0.632)	(0.823)	(0.309)	(0.019)
GDPGrowth	0.014***	0.003	-0.010***	0.190**	0.316	0.014***	0.002	-0.010***	0.200**	0.294
	(0.001)	(0.677)	(0.000)	(0.040)	(0.290)	(0.002)	(0.728)	(0.000)	(0.028)	(0.331)
Constant	0.546**	6.809***	0.953***	2.425	98.583***	0.505**	6.734***	0.996***	1.927	93.776***
	(0.020)	(0.000)	(0.000)	(0.123)	(0.000)	(0.028)	(0.000)	(0.000)	(0.226)	(0.000)
R-Square	0.207	0.223	0.146	0.100	0.106	0.206	0.223	0.144	0.100	0.105

Marginal effects: $\frac{\partial Y}{\partial \text{Diversity}}=\alpha_1+\alpha_2\times\text{Position}+2\times\alpha_4\times\text{Diversity}$, Diversity is evaluated at the median value, Position is evaluated at:

	ROA	Expenses	SDROA	RiskAdjusROA	ZScore	ROA	Expenses	SDROA	RiskAdjusROA	ZScore
Median = 1.68	0.003	-0.003	0.006	0.000	-0.493**	0.003	-0.007	0.001	0.023	-0.394
75th percentile = 3.25	0.007**	-0.013	0.003	0.043**	-0.060	0.004*	-0.021	-0.004	0.063**	-0.013
Maximum = 8	0.015***	-0.037**	-0.005*	0.143***	0.948**	0.008**	-0.053**	-0.016**	0.155**	0.871**

GENERAL CONCLUSION

The global financial crisis of 2007-2008 has re-launched the debate on the effect of corporate governance, and specifically ownership structure, on bank stability and economic growth. The aim of this dissertation is therefore to investigate whether the presence of controlling shareholders in pyramids harms or benefits banks' behavior. Specifically, we test the effect of pyramidal ownership structure on capital structure and performance (profitability and risk) of commercial banks established in 17 Western European countries. To this end, this dissertation revolves around three main empirical issues.

In the first chapter, we investigate whether excess control rights (i.e., greater control rights than cash-flow rights) of ultimate owners in pyramids affect banks' adjustment to their target capital ratio. In the aftermath of the 2008 financial crisis, there was a considerable debate on whether new standards for capital regulation (mainly the narrower definition of Tier 1 capital to ordinary shares) affect bank lending decisions and inhibit economic growth. From this perspective, Chapter 1 analyzes the effect of excess control rights on bank capital ratio adjustments towards the target level. If controlling shareholders with excess control rights are more inclined to reap private benefits of control at the expense of minority shareholders, they will strongly value their controlling position and might actually discourage banks to issue new equity that could dilute their private benefits of control. Rather, they will encourage them to rely on internal resources (when possible) or to downsize. Concretely, we investigate the various channels that banks rely on when they face a capital ratio shortfall (below the target) or surplus (above the target) to capture possible differences due to the presence of excess control rights. We look into how banks adjust their equity either externally (equity issues/repurchases) or internally (higher/lower earnings retention) and also into how they adjust their assets and particularly their lending.

Using a sample of 341 European commercial banks, the results show that the presence of excess control rights actually affects the way banks adjust towards the target capital ratio. In the absence of excess control rights (equal control and cash-flow rights), banks move upwards to the target by issuing equity and by reshuffling their assets without reducing their lending and other activities. When they face a downward adjustment, such banks decrease their Tier 1

capital by repurchasing equity, by distributing more dividends, and by expanding their size and lending. In the presence of excess control rights, the results show that banks do not increase their lending or reshuffle their assets when they face a downward adjustment. Instead, they repurchase equity to possibly strengthen the shareholder's controlling power. When they need to increase their capital ratio to move to the target, banks controlled by a shareholder with excess control rights do not raise equity potentially because of the owner's fear of control dilution. In such a case, they instead rely on internal resources and shrink their assets and particularly their lending. A deeper look shows that such a behavior is mainly effective for banks operating in countries with relatively weak shareholder protection or for family-owned banks. Moreover, such controlled banks reduce their lending by even larger amounts when they are undercapitalized, relatively large, or more focused on traditional intermediation activities. Nevertheless, during the 2008 financial crisis such banks did issue equity (just like any other bank) to adjust to the target instead of cutting their assets and specifically their lending.

The second chapter investigates the impact of shareholders' excess control rights on bank profitability and risk during normal times and distress times to shed light on whether such effect is different according to the soundness of the banking industry. The global financial crisis of 2007-2008, followed late 2009 by the European sovereign debt crisis, provides a timely case to explore the effect of excess control rights on bank performance (i.e., profitability and risk) and how this effect might differ depending on the state and soundness of the banking industry. Although overall bank performance was negatively affected, there were significant differences in banks' performance during the crisis. Various papers have used this cross-variation in banks' performance to evaluate the importance of factors that have been emphasized as having contributed to the poor performance of banks during the crisis. Thus far, most empirical studies have tested the effect of lax regulation, insufficient capital, excessive reliance on short-term financing, and have specifically looked at the effect of corporate governance by mainly considering manager compensation schemes, board structure and ownership concentration dimensions. Our study adds to this literature by exploiting

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another dimension of corporate governance; this is the presence of controlling shareholders with greater control rights than cash-flow rights in pyramids.

Particularly, in this chapter we test the effect of excess control rights of ultimate controlling shareholders on bank profitability and risk during the pre-crisis (2002-2006) and the acute financial crisis years (2007-2008), but also during the later stage of the financial crisis (2009-2010) to shed light on whether a different influence of excess control rights on profitability and risk at the height of the financial crisis is persistent or short-lived. We go further and investigate the factors that may affect the relationship between excess control rights and bank performance during the three considered periods by looking at the type of ultimate controlling owners and by accounting for the level of shareholder protection in different European countries. For deeper insights, we also test for the presence of nonlinearity in the observed relationships. Using a sample of 750 European commercial banks, our results reveal that the effect of excess control rights on profitability and risk is different during distress times and normal times. Specifically, we find excess control rights to be negatively associated with bank profitability and positively linked with risk before the crisis (2002-2006) but also at the later stage of the financial crisis (2009-2010). However, our results show a reversed effect during the acute financial crisis years (2007-2008): excess control rights contributed to improve bank profitability and to reduce earnings volatility without impacting default risk. The results show that the observed relationship between excess control rights and bank profitability and risk is enhanced in family-controlled banks, in countries with relatively weak shareholder protection and it is stronger at intermediate and high levels of excess control rights.

Finally, in the third chapter we test whether the strength of banks' ownership network in pyramids affects diversification performance. Over the last three decades, banking institutions expanded their activities and developed new lines of businesses beside their traditional lending activities. The implications of this trend of diversification have been broadly examined in the literature but no consensus has been reached at this stage. Some studies suggest that banks may benefit from greater activity diversification due to factors such as costs savings and risk reduction. On the contrary, other studies provide evidence that banks

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suffer from their diversification strategy, including lower market valuation, poorer risk-adjusted profitability, higher earnings volatility and insolvency, and higher systematic risk. However, to date no study has taken into account differences in the strength of ownership network to which banks belong in pyramids when assessing diversification performance. Indeed, pyramidal ownership structure can either intensify or dampen the negative effects of diversification. If diversification yields diseconomies because it intensifies agency costs, entrenched ultimate controlling shareholders can push banks to diversify to enable themselves to extract private benefits of control. In such a case, banks controlled through pyramidal arrangements might suffer higher diseconomies of diversification. Alternatively, if diversification yields diseconomies because banks lack the experience necessary to manage activities to which they expand, the presence of multiple controlling shareholders with prior such activities could play mitigating roles by delivering additional and valuable skills facilitating bank diversification. If such mitigating roles are sufficiently high, banks controlled through pyramidal arrangements could in such a specific case benefit from economies of diversification when they expand the range of their activities. Chapter 3 contributes therefore to the existing literature by testing which effect prevails: the negative effect of the ultimate controlling owner or the positive effect of the strength of the bank's ownership network within pyramids.

Concretely, Chapter 3 uses a sample of 672 European commercial banks to construct an ownership indicator which measures the distance between the bank and its largest ultimate owner within pyramids. This indicator simultaneously captures the expropriation incentives of the bank's ultimate owner but also the bank's ownership depth (i.e., the strength of ownership network to which the bank belongs within the pyramid). The results do not support the conjecture that ultimate owners in pyramids use diversification as a channel to enable themselves to extract private benefits of control. In the contrary, we find that diseconomies of diversification vanish the deeper is the bank's position in the pyramid, making banks located lower down the pyramid to enjoy economies of diversification (higher profitability, lower costs, lower earnings volatility and higher solvency). A deeper analysis shows that such

mitigating roles are attributable to domestic and foreign institutional owners although the effect is significantly greater for the former.

Our findings give rise to several policy implications.

First, our results suggest that banks controlled by a shareholder with divergence between control and cash-flow rights are reluctant to raise equity that may dilute the controlling power of ultimate owners. To face an upward adjustment such banks draw on earnings and slow their lending. Hence, regulators and supervisors have to consider that the effect of more stringent capital requirements, particularly the narrower definition of Tier 1 capital to ordinary shares, is different depending on the banks' ownership pattern. Indeed, banks can no longer increase their Tier 1 capital by issuing preferred shares and other types of hybrid capital that carry only cash-flow rights because such hybrid instruments are no more eligible under Basel III. Our findings show that banks controlled by a shareholder with excess control rights are less keen to dilute control rights by issuing more ordinary shares and therefore rely more on earnings retention and cut their lending to increase their Tier 1 capital ratio. These results suggest that credit crunch phenomena are more likely to occur under Basel III.

Second, our results claim that the divergence between control and cash-flow rights does matter in explaining banks' performance during normal and distress times. Although banks controlled via complex pyramidal arrangements are found to be less profitable and more risky than their peers in normal times, they are also more resilient to shocks possibly because of their strong shareholding relationships with other firms within the pyramid. Third, our findings suggest that although pyramidal ownership structure harms overall performance of banks because of expropriation by entrenched ultimate owners, such an ownership structure plays mitigating roles and helps banks to reap benefits from diversification potentially because of various and strong shareholdings relationships within pyramids which might bring additional skills and techniques to manage activities to which banks expand. Banks' supervisors and regulators should therefore take into account the effect of ownership structure when assessing the impact of more stringent activity restrictions on bank performance.

Finally, the findings suggest that increasing the level of shareholder protection is a solution to temper the reluctance of controlling shareholders to raise equity to ensure that banks do not refrain from lending to actually contribute to the real economy. An increase in the level of shareholder protection could be also a solution to constrain the entrenchment behavior of ultimate controlling shareholders. Moreover, our results emphasize that improving regulatory and market disciplines by imposing a better disclosure of banks' ownership structures following the recommendations of the Basel Committee on Banking Regulation and Supervision (BIS, 2010b) could be a solution.

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ABSTRACT

This dissertation examines the role of ownership structure in explaining capital structure and performance of European commercial banks from 2002 to 2010. It comprises three empirical essays. The first chapter explores the effect of greater control rights than cash-flow rights of an ultimate owner on the bank's capital ratio adjustment and its lending decisions. The results show that whenever control rights exceed cash-flow rights, banks do not issue equity to increase their capital ratio and, instead, downsize by mainly slowing their lending. Chapter 2 provides evidence on how the divergence between control and cash-flow rights affects bank profitability and risk during normal times and distress times. The findings emphasize that during normal times the divergence between control and cash-flow rights is associated with lower profitability and higher risk. Conversely, during the acute financial crisis period (2007-2008), such a divergence improves profitability and banks' resilience to shocks. The third chapter takes into account differences in the strength of ownership network to which banks belong when assessing the effect of greater activity diversification on bank performance. The results show that diseconomies of diversification vanish the stronger is the ownership network surrounding the bank in the control chain. Such mitigating roles are attributable to the presence of domestic and foreign institutional owners in the pyramid.

Keywords: [excess control rights, capital structure, performance, diversification, European banking]

RÉSUMÉ

Cette thèse examine l'impact de la structure actionnariale sur la structure du capital et la performance des banques commerciales européennes sur la période 2002-2010. Elle est composée de trois essais empiriques. Le premier chapitre teste l'effet de la divergence entre les droits de contrôle et les droits pécuniaires d'un actionnaire ultime sur l'ajustement du ratio du capital à son niveau optimal et sur l'offre de crédit par les banques. Les résultats montrent qu'en présence de divergence entre les droits de contrôle et les droits pécuniaires, les banques n'émettent pas du capital pour augmenter leur ratio et, au contraire, elles réduisent leur taille en ralentissant leur offre de prêts. Le chapitre 2 teste l'effet de cette divergence sur la rentabilité et le risque bancaires en temps normal et en temps de crise. Les résultats montrent que bien qu'une divergence entre les droits de contrôle et les droits pécuniaires soit associée en temps normal à une rentabilité plus faible et un risque plus élevé elle a, à contrario, amélioré la rentabilité et contribué à la résilience des banques pendant la crise financière de 2007-2008. Le troisième chapitre teste si le réseau des actionnaires auquel la banque est liée au sein d'une chaîne de contrôle affecte la relation entre la diversification et la performance. Les résultats montrent que la présence des investisseurs institutionnels dans les chaînes de contrôle aide les banques à tirer des bénéfices lorsqu'elles diversifient leurs activités.

Mots clés: [divergence entre droits de contrôle et droits pécuniaires, structure du capital, performance, diversification, banques européennes]