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Excess control rights, bank capital structure adjustments, and lending[1]

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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.

JEL classification: G21, G28, G32

Keywords: Dynamic capital structure, Bank lending, Pyramids, Excess control rights, European banking

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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; and Allen, Carletti, and Marquez, 2011) and empirical (e.g., Marcus, 1983; and Flannery and Rangan, 2008) studies indicate that, like other firms, banks have a target capital structure. Some studies also show that the determinants of banks' capital structure are similar to those of nonfinancial firms (e.g., Gropp and Heider, 2011). Moreover, minimum capital requirements might not be binding because banks set target capital ratios well above regulatory minima (Ayuso, Pérez, and Saurina, 2004; and Lindquist, 2004) and, as a consequence, such regulations might not affect banks' capital adjustment (Berger, DeYoung, Flannery, Lee, and Öztekin, 2008). However, banks are known to adjust to their target capital ratio faster than nonfinancial firms (Memmel and Raupach, 2010). Banks' assets are more liquid, and banks can more easily alter the size of their operations by expanding or shrinking assets to reach their target capital structure.

In this paper, 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, Lopez-de-Silanes, and Shleifer, 1999). If, under certain conditions, controlling shareholders are more inclined to reap private benefits of control at the expense of minority shareholders, they will more strongly value their controlling position. Such controlling shareholders might be reluctant to issue new equity that 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, Lopez-de-Silanes, Shleifer, and Vishny, 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 in which controlling shareholders can enhance their control and achieve greater divergence between control and cash flow rights.[2] Such divergence provides the ability and incentives to extract private benefits of control. We, hence, expect dilution to be stronger in banks controlled by a shareholder with excess control rights, and, as a consequence, such banks could 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 or by reshuffling their assets more promptly than other banks. The

[2] For more details on the expropriation hypothesis within pyramids (extraction of private benefits of control), see, e.g., Bertrand, Mehta, and Mullainathan, 2002; Claessens, Djankov, Fan, and Lang, 2002; Joh, 2003; Boubakri and Ghouma, 2010; Jiang, Kim, and Pang, 2011; and Lin, Ma, and Xuan, 2011. For papers that specifically look at banks, see, e.g., Azofra and Santamaría, 2011; and Lin, Ma, Malatesta, and Xuan, 2011.

adjustment process is hence 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 US) 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 or repurchases) or internally (higher or lower earnings retention) and also into how they adjust their assets and, particularly, their lending. 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.[3]

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 especially their loans. Above-target banks adjust both externally and internally (by repurchasing equity and lowering earnings retention) and expand their assets and especially their lending. However, when control rights exceed cash flow rights, while banks do repurchase equity when facing a surplus, they 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 could 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.

[3] 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) that would no longer be eligible under Basel III (Bank For International Settlements, 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).

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, Djankov, Fan, and Lang, 2002; and Villalonga and Amit, 2006) as well as weak shareholder protection (La Porta, Lopez-de-Silanes, Shleifer, and Vishny, 2002; and 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 undercapitalized, relatively large, or 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 especially their lending. This is consistent with the view that ultimate controlling owners who expect to divert higher resources in the future could provide significant support to their firms during a crisis (Friedman, Johnson, and Mitton, 2003).

Our paper makes 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 a bank's ultimate owner in pyramids on capital structure adjustments. We investigate differences in the adjustment process toward the target capital ratio and whether banks are reluctant to issue equity and possibly limit their size and, especially, their lending in the presence of excess control rights. Admati, DeMarzo, Hellwig, and Pfleiderer (2010) argue that banks would limit their lending only if issuing equity is more costly because of frictions and governance problems. Consistently, in our work we show that banks do 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, our paper 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].[4] We also add to the literature investigating asymmetries or cross-variations in the adjustment speed with which firms converge to the target capital structure [e.g., Byoun

[4] 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 US can be explained by the introduction of more stringent capital rules (e.g., Berger and Udell, 1994; Peek and Rosengren, 1995; and Brinkmann and Horvitz, 1995).

(2008) and Öztekin and Flannery (2012) and, more specifically, Berger, DeYoung, Flannery, Lee, and Öztekin (2008) and 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, Lopez-de-Silanes, and Shleifer (1999), Claessens, Djankov, and Lang (2000), and Faccio and Lang (2002), and, more specifically, Caprio, Laeven, and Levine (2007) and Laeven and Levine (2009) for banks], which mainly focus on the largest publicly traded corporations at a given 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 especially on the new standards for capital regulation. The Basel Committee on Banking Supervision (Bank For International Settlements, 2010a) has implemented new rules to strengthen existing capital requirements and 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 could entail high costs for controlling shareholders with excess control rights. According to our findings, such shareholders would 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 could severely reduce their lending and overall contribution to the real economy with the implementation of Basel III could be relevant only 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 Supervision (Bank For International Settlements, 2010b) highlighting the relevance of sound corporate governance in the banking industry and recommending the disclosure of banks' ownership.

The remainder of the paper proceeds as follows. Section 2 describes the data, defines the ultimate ownership variables and provides some statistics. In Section 3, we discuss the approach followed to conduct our empirical investigation. Section 4 provides estimation

results, and Section 5 shows robustness checks. Section 6 concludes the paper and provides policy implications.

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.

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 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 (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 involved in lending by requiring the bank to have a ratio of loans to total assets above 10%.[5] 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 with 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).

[Insert Table 1 about here]

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 could arise from both indirect control chains and dual class shares, in-line with

[5] 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. Because our aim is to analyze banks' lending behavior, we need to further restrict our sample.

previous studies (Caprio, Laeven, and Levine, 2007; and Laeven and Levine, 2009) we consider excess control rights stemming only from indirect control chains. This is not only because of data unavailability (Bankscope and Amadeus provide information only on control rights) but also because the use of dual class shares is relatively scarce (Faccio and Lang, 2002; and 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, Laeven, and Levine, 2007; and 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 (e.g., La Porta, Lopez-de-Silanes, and Shleifer, 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 updated only 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 information from annual reports disclosed on the banks' websites. 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, and so on until we reach ultimate shareholders.[6] Because 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, Lopez-de-Silanes, and Shleifer

[6] 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, 60 are continuously classified as controlled by multiple ultimate owners, and 32 switch from one category to the other.

(1999). An ultimate owner can control a bank directly 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 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 (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 it is controlled by an ultimate owner with equal control and cash flow rights, it is widely held, or 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, 113 have excess control rights, and 33 switch from one category to the other.

For the regression analysis, we define a dummy variable, denoted *d(Excess Control Rights)*, equal to one if the control rights are greater than the cash flow rights and zero otherwise. We use a binary variable that we consider more accurate than a continuous variable because 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, Lopez-de-Silanes, and Shleifer (1999) and Claessens, Djankov, and Lang (2000) for the two available methods].

Fig. 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 (C6, C4, and C5). 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 her 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%).

[Insert Fig. 1 about here]

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 2 (Panels A and B) 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 2). In such a case, an ultimate controlling shareholder is more inclined toward 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 instead of her cash flow rights. Furthermore, the type of ultimate owner is generally different in the presence or the absence of excess control rights (Panel B of Table 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; and Haw, Ho, Hu, and Wu, 2010). Not surprisingly, 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).[7] The divergence between both rights could enable ultimate controlling owners, and especially families, to expropriate minority shareholders and divert a larger fraction of resources

[7] We follow La Porta, Lopez-de-Silanes, and Shleifer (1999) by categorizing a bank as family-controlled if the controlling shareholder is a person. We therefore put in this category manager-controlled banks (six banks, four of which are banks with excess control rights). Compared with previous studies (Faccio and Lang, 2002; and Caprio, Laeven, and Levine, 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 by capital injections or nationalizations, or both. Before the crisis (2002–2006) state ownership represents only 4.72% of the observations in the sample of 341 banks, which is consistent with prior studies.

(Claessens, Djankov, Fan, and Lang, 2002). Institutional investors and industrial companies are also more present as ultimate controlling shareholders with excess control rights. Foundations are 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.

[Insert Table 2 about here]

Table 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 nonperforming 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, Lang, and Young, 2001).

[Insert Table 3 about here]

3. Methodology

In this paper, 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 or repurchases, higher or lower earnings retention) or their assets, or both. Depending on their control and ownership patterns, banks might not uniformly weigh these different adjustment options. When they need to increase their capital ratio, banks controlled by shareholders with excess control rights could be reluctant to issue equity because external recapitalization can lead to control dilution. Instead, they are more likely to rely on earnings retention 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.

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; and Gropp and Heider, 2011) as follows:

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

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)], 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)]; and GDP Growth Rate is the annual growth rate of real gross domestic product for country c (see Table 4 for the definition and summary statistics of these variables and Table A1 in the online Appendix for correlations among the explanatory variables).[8] Time-varying explanatory variables are lagged by one year to avoid simultaneity. Country and Year are vectors of country and year dummies, respectively. Finally μ_i is a vector of bank fixed effects.

[Insert Table 4 about here]

The model specified in Eq. (1) assumes that banks always maintain their capital ratio at its target level. This is possible only 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. (2)] in which 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:

$$k_{i,t} - k_{i,t-1} = \lambda\left(k^*_{i,t} - k_{i,t-1}\right) + \eta_{i,t}. \tag{2}$$

Substituting Eq. (1) into Eq. (2) and rearranging gives the estimation model

$$k_{i,t} = (1-\lambda)k_{i,t-1} + \lambda\left(\varphi' X_{i,t-1} + \rho\, GDP\,Growth\,Rate_{c,t-1} + \omega' Country + \tau' Year + \mu_i\right) + \eta_{i,t}. \tag{3}$$

Estimating Eq. (3) yields an average adjustment speed ($\hat{\lambda}$) and a vector of coefficients (see Table A2 in the online Appendix for the estimation results), which we replace in Eq. (1) to compute a fitted value of the target Tier 1 capital ratio for each bank every year ($\hat{k}^*_{i,t}$).[9] We then use this estimated target to compute capital ratio deviations (Gap) as follows:

$$Gap_{i,t-1} = \hat{k}^*_{i,t} - k_{i,t-1}. \tag{4}$$

[8] We include *d(Excess Control Rights)* because, on average, banks without excess control rights exhibit higher Tier 1 capital ratios than banks with excess control rights (see Table 3). Our specification, hence, is flexible enough to account for possible differences in the target capital ratio for banks with and without excess control rights.

[9] The coefficients obtained from estimating Eq. (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 that we replace in Eq. (1), we divide the estimated regression coefficient for that variable by the adjustment speed $\hat{\lambda}$.

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 in which banks are above the target (*Capital Ratio Surplus*) and below the target (*Capital Ratio Shortfall*). For easier interpretation of the results, we consider the absolute value of the capital ratio deviations:

$$\begin{aligned} &Capital\ Ratio\ Surplus_{i,t-1} = \left|Gap_{i,t-1}\right| \ \ if\ k_{i,t-1} > \hat{k}^{*}_{i,t}\ \ and\ zero\ otherwise, \\ &Capital\ Ratio\ Shortfall_{i,t-1} = \left|Gap_{i,t-1}\right| if\ k_{i,t-1} < \hat{k}^{*}_{i,t}\ \ and\ zero\ otherwise. \end{aligned} \tag{5}$$

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

3.2. Excess control rights and adjustments toward 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.

Banks can adjust their capital (hereafter referred to as capital adjustment) either externally (equity issues or repurchases) or internally (smaller or larger amounts of retained earnings).[10] 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 define external change in capital (denoted hereafter as *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 (*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 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 dynamic model

$$\begin{aligned} y_{i,t} = &[\alpha_1 + \beta_1\, d(Excess\ Control\ Rights)] \times Capital\ Ratio\ Surplus_{i,t-1} + [\alpha'_1 + \beta'_1 \\ &d(Excess\ Control\ Rights)] \times Capital\ Ratio\ Shortfall_{i,t-1} + \theta\, y_{i,t-1} + \delta'\, Z_{i,t-1} \end{aligned} \tag{6}$$

[10] 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.

$$+\gamma' V_{c,t-1} + \alpha_0 + \omega' Country + \tau' Year + \varepsilon_{i,t},$$

where y is the dependent variable that 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; and *Z* and *V* are, respectively, vectors of bank- and country-level control variables (see Table 4 for the definition and summary statistics of these variables and Table A3 in the online Appendix for correlations among the explanatory 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 that were rescued during the 2008 financial crisis [*d(Rescued Bank)*], an index for cross-listed banks that could more easily raise equity than banks listed on a single stock exchange or privately owned banks (*Cross-Listed Index*), and a merger acquisition dummy to account for banks that experienced a merger-acquisition event during the period of study [*d(Merger Acquisition)*]. Control variables computed at the country-level (*V*) are the three-month interbank rate (*Three-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) and Eq. (3), *Country* and *Year*, respectively, denote vectors of country and year dummies.

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 nonsignificant 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 nonsignificant 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 downward and upward. 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 or by downsizing; that is, when the sum $\alpha'_1+\beta'_1$ is significantly positive with regard 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.

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 relation.

4.1. Effect of excess control rights on adjustments toward target capital ratios

We estimate the coefficients of the dynamic panel model presented in Eq. (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 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*).

[Insert Table 5 about here]

Banks without excess control rights respond to a capital ratio surplus by reducing capital externally and internally, 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 nonsignificant for Retained Earnings). Most important, they do not decrease their assets in general or their lending in particular (α'_1 nonsignificant 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 and they do not reshuffle their assets ($\alpha_1+\beta_1$ nonsignificant for assets adjustment variables). When such banks are below their target, in contrast to banks without excess control rights, they do not issue equity ($\alpha'_1+\beta'_1$ nonsignificant 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 and 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 leads to only 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 upward. 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, DeMarzo, Hellwig, and Pfleiderer (2010), who argue that banks would 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 that this can have a big impact on lending because 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.

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

In this subsection, we go deeper by analyzing some factors that could 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 could 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. (6), where *Factor* stands for one of the six factors:

$$y_{i,t} = \left[\alpha_1 + \alpha_2\, Factor + \left(\beta_1 + \beta_2\, Factor\right) \times d(Excess\, Control\, Rights)\right] \times Capital\, Ratio$$
$$Surplus_{i,t-1} + \left[\alpha'_1 + \alpha'_2\, Factor + \left(\beta'_1 + \beta'_2\, Factor\right) \times d(Excess\, Control\, Rights)\right] \quad (7)$$

$$\times Capital\ Ratio\ Shortfall_{i,t-1} + \theta\, y_{i,t-1} + \delta' Z_{i,t-1} + \gamma' V_{c,t-1} + \alpha_0 + \omega' Country +$$

$$\tau' Year + \varepsilon_{i,t}.$$

To save space, we report and discuss only the results on below-target banks. Detailed results obtained from running Eq. (7) are reported in the online Appendix (Tables A4–A9).

4.2.1. Factors affecting the fear of control dilution

Various factors could 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), then 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, then the incentives for expropriation could be stronger because families and the state are more able to efficiently divert benefits to themselves (Claessens, Djankov, Fan, and Lang, 2002). Second, the institutional environment and, more specifically, the level of shareholder protection could also play an important role. Extraction of private benefits is more likely to occur in countries with weak shareholder protection (La Porta, Lopez-de-Silanes, Shleifer, and Vishny, 2002; and 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, Johnson, and Mitton, 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 upward even via equity issuance.

We define a set of dummy variables to capture such effects. First, we classify banks into three categories: family- controlled banks, state-controlled banks, and Other, which is the removed category in our model.[11] 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

[11] The category Other contains 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, Laeven, and Levine, 2007). For simplicity, we also remove banks for which the control chain is a cross-holding (five banks corresponding to 33 observations) because we can classify them neither as widely held banks nor as controlled banks.

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, La Porta, Lopez-de-Silanes, and Shleifer (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 Table 6. 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.[12] 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 upward, even during the 2008 financial crisis.

[Insert Table 6 about here]

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 how they are capitalized (regulatory breach), the extent to which they are focused on lending activities, and their size.

Banks close to the minimum regulatory capital ratio could 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 could 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

[12] We are concerned by potential endogeneity between family or 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.

(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 the bank is undercapitalized, the net loans (excluding interbank loans) to assets ratio is above the median value, and the bank's total assets variable is above the median value and zero otherwise.[13] The results are reported in Table 7. 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.

[Insert Table 7 about here]

In summary (see Fig.2 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 and 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.

[Insert Fig. 2 about here]

[13] 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; and 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, DeYoung, Flannery, Lee, and Öztekin, 2008). In our sample, 147 and 291 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.

5. Robustness checks

We perform several regressions to check for the robustness of our results obtained in Subsections 4.1 and 4.2. For each of our checks we reestimate the target capital ratio to compute the fitted values of the capital ratio surplus and shortfall. The results are reported in the online 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. (6). This check leads to similar findings (see Tables A10–A17 in the online Appendix).

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 A18–A25 in the online Appendix).

The period covered by the sample is limited by the availability of data on ownership in Bankscope and Amadeus (nine years). This could limit the effectiveness of a dynamic estimation procedure, namely, the use of a partial adjustment model as specified in Eq. (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).[14] This check leaves the main conclusions unchanged (see Tables A26–A33 in the online 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 could 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 could 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; and Laeven and Levine, 2008), the reluctance to issue new equity and reliance on internal funds and downsizing to adjust to the target capital ratio could be more pronounced. This check leads again to similar findings (see Tables A34–A41 in the online Appendix).

[14] The Hausman test fails to reject the null hypothesis of the exogeneity of the regressors of Eq. (1). Hence, we estimate this equation using the generalized least squares estimator (GLS) with robust standards errors.

Because 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 A42–A49 in the online Appendix).

We finally increase the control threshold and recalculate 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 A50 in the online Appendix for the main changes), but our main conclusions are unchanged (see Tables A51–A58 in the online Appendix).

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 a 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 and by expanding their assets and, particularly, their lending. 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 important, 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 Basel I and II, 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) could 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 (Bank For International Settlements, 2010b), another solution is better disclosure of banks' ownership structure to improve both regulatory and market monitoring and discipline.

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Table 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 contained 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 (percent)
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 or Mean	341	111	78.28

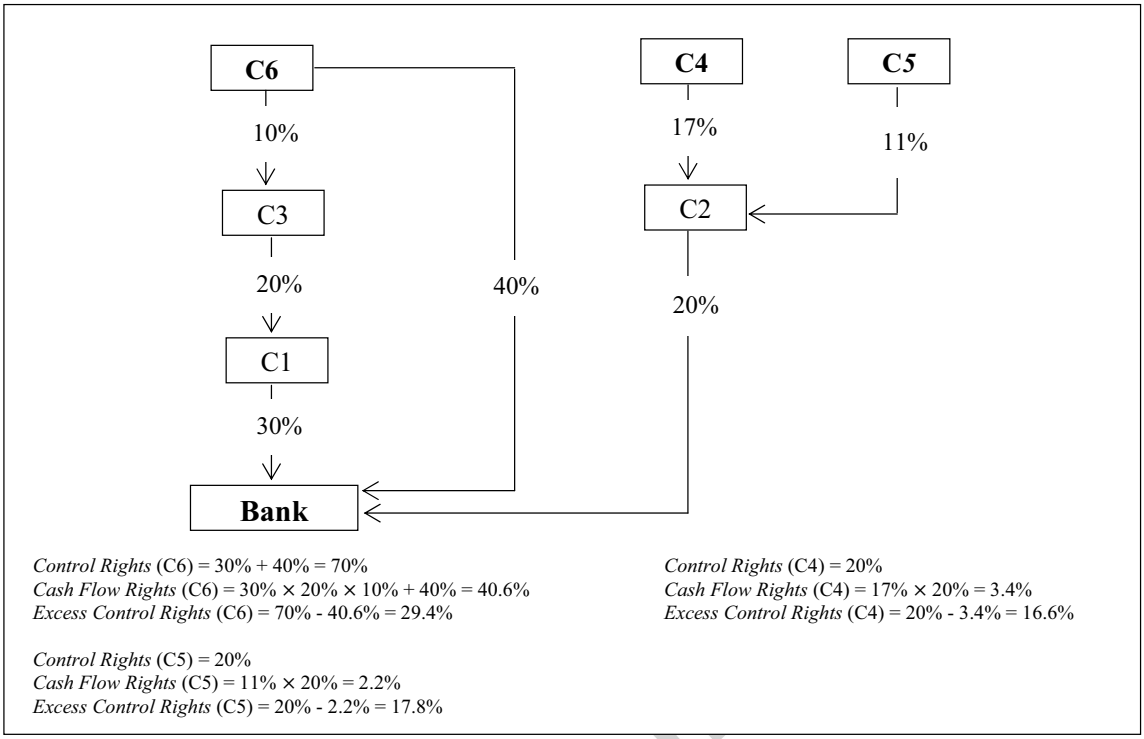

Fig. 1. Example of a control chain. This figure provides an example of a control chain of a bank. C refers to each corporation presented in each box. Arrows represent ownership stakes held by each corporation in the bank or in other corporations in the control chain. *Control Rights* and *Cash Flow Rights*, 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, Lopez-de-Silanes, and Shleifer (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.

Table 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 it is controlled by an ultimate owner with equal control and cash flow rights, it is widely held, or its control chain is a cross-holding (1,416 observations). 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 (788 observations). Panel A 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 B 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 fund, or a pension fund (*Institutional*); an industrial firm (*Industry*); 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.

Panel A: Summary statistics on ultimate ownership variables

	Absence of Excess Control Rights			*Presence of Excess Control Rights*		
Statistics	*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 B: Information on ultimate ownership type

	Absence of Excess Control Rights			*Presence of Excess Control Rights*		
Variable	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 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 it is controlled by an ultimate owner with equal control and cash flow rights, it is widely held, or its control chain is a cross-holding (1,416 observations). 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 (788 observations). 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. *Nonperforming Loans* is nonperforming 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.

Variable	*Absence of Excess Control Rights*	*Presence of Excess Control Rights*	*Test for equality of means* (*t*-statistics)
Total Assets	86,978	79,341	0.74
Loans Total Assets	58.71	61.94	-3.45***
Nonperforming 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***

Table 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	Definition	Source	Mean	Median	Standard deviation	Minimum	Maximum
Tier 1 Total Assets	Tier 1 capital divided by total assets (percent).	Bankscope	7.20	6.07	4.14	1.44	21.83
Tier 1 RWA	Tier 1 capital divided by risk-weighted assets (percent).	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 websites	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 (percent).	Bankscope	0.59	0.54	0.86	-2.98	3.31
Loan Loss Provisions	Loan loss provisions divided by net loans (percent).	Bankscope	0.72	0.47	1.00	-0.74	5.65
Loans Total Assets	Net loans divided by total assets (percent).	Bankscope	60.78	63.87	21.06	10.03	95.96
Market Discipline	Total long term market funding divided by total funding (percent).	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 zero otherwise.	Bankscope	0.39	0	0.49	0	1
GDP Growth Rate	Real gross domestic product (GDP) growth rate (percent).	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

	(percent).						
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 (percent).	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 (percent).	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 (percent).	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 (percent).	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 (percent).	Bankscope	0.45	0.02	0.85	-3.17	3.23
Δ Assets	Annual change in total assets divided by average total assets (percent).	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 (percent).		6.18	5.08	10.16	-33.65	48.22
Δ RWA	Annual change in risk-weighted assets divided by average total assets (percent).	Bankscope	4.60	4.00	13.16	-45.88	70.58

Table 4 (continued)

Deposits Total Assets	Total customer deposits divided by total assets (percent).	Bankscope	47.79	48.45	22.70	3.88	91.96
Log(Age)	Natural logarithm of bank age (years).	Bankscope and banks' websites	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
Three-Month Interbank Rate	Three-month interbank rate (percent).	Bloomberg	2.57	2.49	1.34	0.11	6.34
Stock Traded	Value of listed shares divided by GDP (percent).	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' websites	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' websites	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	Djankov, La Porta, Lopez-de-Silanes,	0.52	1	0.49	0	1

	otherwise. The shareholder protection index is obtained by adding one when shareholders are allowed to mail in their proxy votes to the firm, shareholders are not required to deposits hares before any general shareholders' meeting, cumulative voting or proportional representation of minorities in the board is allowed, minority shareholders have legal mechanisms against perceived oppression by the board, the minimum percentage of share capital that entitles a shareholder to call for a special shareholders' meeting is no more than 10%, or 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.	and Shleifer (2008)					
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

Table 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. (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. (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, 3, 5, 7, and 9 and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in Columns 2, 4, 6, 8, and 10. *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. *Three-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% level, respectively.

	Capital adjustment				Assets adjustment					
	Δ Tier 1		*Retained Earnings*		*Δ Assets*		*Δ Loans*		*Δ RWA*	
Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
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) ×	-0.08	-0.02	0.02	0.01	-0.39**	-0.49**	-0.17*	-0.23**	-0.28*	-0.37*
Capital Ratio Surplus (β_1)	(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) ×	-0.10**	-0.05**	0.05*	0.03*	-0.31**	-0.84**	-0.23**	-0.29**	-0.27*	-0.04
Capital Ratio Shortfall (β'_1)	(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)
Three-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**

Table 6

Excess control rights and capital ratio adjustment: effect of ownership type, shareholder protection rights and, the 2008 financial crisis

This table shows the Blundell and Bond (1998) estimation results on the effect of ownership type (Panel A), the level of shareholder protection rights (Panel B), and the effect of the 2008 financial crisis (Panel C) on the relation between excess control rights and capital ratio adjustment [Eq. (7)] over the 2002–2010 period. In Panel A, 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 Panels B and C, we use a sample of 341 European commercial banks corresponding to 2,204 observations. In all the regressions, the fitted target capital ratio is obtained by estimating a partial adjustment model [Eq. (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, 3, 5, 7, and 9 and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in Columns 2, 4, 6, 8, and 10. *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 Shortfall* denotes the absolute value of the gap between the fitted target and the lagged Tier 1 ratios when the bank is below its target 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. *d(Owner Rights)* is a dummy equal to one if the shareholder protection index as defined in Djankov, La Porta, Lopez-de-Silanes, and Shleifer (2008) is greater than the median value and zero otherwise. *d(Crisis)* is a dummy equal to one if the observation is from 2008 or 2009, and zero otherwise. Detailed results on these regressions are reported in the online Appendix (see Tables A4–A6). *p*-values based on robust standard errors are shown in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	Capital adjustment				Assets adjustment					
	Δ Tier 1		*Retained Earnings*		*Δ Assets*		*Δ Loans*		*Δ RWA*	
Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Ownership type and the effect of excess control rights on capital ratio adjustment										
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)
Wald tests										
$\alpha'_1+\alpha'_2$	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
Panel B: Shareholder protection and the effect of excess control rights on capital ratio adjustment										
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*	0.06	0.08	0.01	-0.00	-0.10	0.17	-0.05	-0.27	-0.08	-0.03

Shortfall (α'_2)	(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*	-0.14**	-0.06**	0.04*	0.02*	-0.49**	-0.85**	-0.48*	-0.61**	-0.47*	-0.08
Ratio Shortfall (β'_1)	(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*	-0.00	-0.00	-0.04	-0.03	0.34	0.27	0.47*	0.58*	0.43	0.13
Ratio Shortfall (β'_2)	(0.95)	(1.00)	(0.60)	(0.54)	(0.51)	(0.38)	(0.07)	(0.07)	(0.46)	(0.48)
Wald tests										
$\alpha'_1+\alpha'_2$	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*
Panel C: 2008 financial crisis and the effect of excess control rights on capital ratio adjustment										
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)
Wald tests										
$\alpha'_1+\alpha'_2$	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

Table 7

Excess control rights and capital ratio adjustment: effect of bank capitalization, asset structure, and size

This table shows the Blundell and Bond (1998) estimation results on the effect of bank capitalization (Panel A), bank asset structure (Panel B), and the effect of bank size (Panel C) on the relation between excess control rights and capital ratio adjustment 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. (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, 3, 5, 7, and 9 and Tier 1 capital divided by risk-weighted assets (*Tier 1 RWA*) in Columns 2, 4, 6, 8, and 10. *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 Shortfall* denotes the absolute value of the gap between the target and the lagged Tier 1 ratios when the bank is below its target 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. *d(Excess Control Rights)* is a dummy equal to one if control rights are greater than cash flow rights 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. *d(Large Bank)* is a dummy equal to one if the bank's total assets is above the median value and zero otherwise. Detailed results on these regressions are reported in the online Appendix (see Tables A7–A9). P-values based on robust standard errors are shown in parentheses. *, **, and *** indicate statistical significance at the 10%, 5%, and 1% level, respectively.

	Capital adjustment				Assets adjustment					
	Δ Tier 1		*Retained Earnings*		*Δ Assets*		*Δ Loans*		*Δ RWA*	
Dependent variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Panel A: Bank capitalization and the effect of excess control rights on capital ratio adjustment										
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)
Wald tests										
$\alpha'_1+\alpha'_2$	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**
Panel B: Asset structure and the effect of excess control rights on capital ratio adjustment										
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)
Wald tests										
$\alpha'_1+\alpha'_2$	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**
Panel C: Bank size and the effect of excess control rights on capital ratio adjustment										
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)
Wald tests										
$\alpha'_1+\alpha'_2$	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***

	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	↓	↓	↑	↑	↑	↑	→	→	→	↓
	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 are steady across ownership types, levels of shareholder protection, normal and distress times, well-capitalized and undercapitalized banks, more and less lending-oriented banks, and large and small banks.				
	Effects during distress times									
	→	↓	↑	→	↑					
	Effects for undercapitalized banks									
	→	→	→	→	→					
In the presence of excess control rights	↓	→	→	→	→	→	↑	↓	↓	↓
	Effects are similar across ownership types, levels of shareholder of protection rights, bank size, and bank business models but hold only during normal times and for well-capitalized banks.					Effects mainly hold for family-controlled banks, banks located in countries with relatively weak shareholder protection, and during normal times.				
	Effects during distress times									
	→	↓	→	→	→					
	Effects for undercapitalized banks					Effects for undercapitalized banks, lending-oriented banks, and large banks				
	→	→	→	→	→	→	↑	↓↓	↓↓	↓↓

Fig. 2. A summary of results. This figure provides a summary of the results on the relation 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 refers to adjustments through total assets (assets), customer loans (loans) and risk-weighted assets (RWA).