Regulatory capital management to exceed thresholds

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PROPOSAL FOR THE XIV INTERNATIONAL ACCOUNTING SYMPOSIUM.

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Abstract

We document a discontinuity around the 10% regulatory capital ratio using quarterly data of the universe of commercial banks in the United States. We argue that banks report regulatory capital figures slightly above the 10% to be classified as well capitalized (rather than adequately capitalized), and attract less scrutiny from supervisors. We provide strong empirical evidence of banks using abnormal loan loss provisions, add-backs and realized gains on available for sale securities to increase the reported regulatory capital. The discontinuity and accounting manipulations are only significant before the announcement of the Third Basel Accord, when supervision was arguably more focused on regulatory capital ratios. Finally, we provide evidence of a deterioration on the quality of bank lending for banks that successfully manipulate regulatory capital.

Keywords: Banks, Regulatory capital, Accounting manipulation

JEL Classifications: G28, M41, M48

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1 Introduction

Banks are critical to nationwide economic growth (Jayaratne and Strahan, 1996; Rajan and Zingales, 1998), and particularly to local economic development, where small and medium enterprises rely on bank financing to run their businesses, and ultimately, create employment and wealth (Guiso, Sapienza, and Zingales, 2004; Rice and Strahan, 2010). Bank supervision is intended to protect the safety and soundness of the financial system on behalf of depositors and shareholders to achieve sustainable economic growth. Supervisors use a wide set of instruments to fulfill their objectives, including the use of regulatory capital ratios, which are used, among others, to trigger supervision (Peek and Rosengren, 1996). Banks might delay or avoid timely supervisory action if they are successful in manipulating those ratios to obscure their current situation (Ng and Roychowdhury, 2014; Delis, Staikouras, and Tsoumas, 2016). If banks succeed in manipulating regulatory capital ratios, the effectiveness of bank supervision might be weakened, and therefore the safety and soundness of the financial system. Hence, understanding banks' financial reporting choices and how they manage regulatory capital ratios is essential to attain sustainable economic growth (Ng and Roychowdhury, 2014; Delis et al., 2016).

We analyze the distributional properties of reported regulatory capital ratios to assess whether managers manipulate financial reporting to avoid falling below certain thresholds that might trigger intervention by supervisors. We find a statistically significant discontinuity in the distribution of regulatory capital ratios around the 10% figure, which is an unexpected threshold given that according the Basel Committee on Bank Supervision the minimum capital ratio is 8%.[1] Nonetheless, the 10% figure separates well capitalized from adequately capitalized banks under the Federal Deposit Insurance Corporation Improvement Act (FDICIA) of 1991. We document that banks that fall just below the 10% threshold are more likely to receive an enforcement action in the following year, compared to banks that fall just above it, consistent with banks just above the threshold attracting less scrutiny from supervisors. Therefore, we focus on the unintended consequences of a single regulatory threshold. We explore alternative mechanisms that banks use to manipulate the reported regulatory capital: abnormal loan loss provisions (ALLP) (Beatty and Liao, 2014), add-backs (Ng and Roychowdhury, 2014), and realized gains and losses (RGL) on available for

[1] We find a discontinuity around the 8% as well but it is only marginally significant.

sale (AFS) securities (Barth, Gomez-Biscarri, Kasznik, and López-Espinosa, 2017), and find strong evidence of banks using all these alternative accrual and real manipulations to fall just above the target figures. In addition, we document a deterioration in the quality of financial intermediation for banks that successfully managed regulatory capital. In particular, we analyze changes in insider loans (as a proxy for the quality of bank lending and agency costs), non performing assets, and loans charge-off in the following year. Interestingly, we find that the discontinuity (and the accounting manipulations around it) vanishes after the release of the consultative document of the Third Basel Accord (Basel III) in December 2009. Proposed regulation and supervision increased the attention to alternative measures of banks financial health and riskiness, diminishing the importance of one reported regulatory capital figure.

In the United States supervision is conducted by three federal agencies, the Office of the Comptroller of the Currency (OCC), the Federal Reserve Board (FRB) and the Federal Deposit Insurance Corporation (FDIC).[2] After the savings and loan crisis of 1988-1991, the US Congress passed the FDICIA to enhance the ability to identify and address banks' deficiencies. Under the FDICIA, under-capitalized banks (regulatory capital ratios below 8%) are subject to major restrictions and are required to prepare capital restoration plans (see Table 1). Banks above 8% regulatory capital do not have mandatory restrictions on activities (Peek and Rosengren, 1996). However, the FDICIA makes a distinction between well capitalized and adequately capitalized banks, and the 10% figure makes the difference between belonging to the former or the latter.[3] If supervisors use these reference points to decide whether to intervene the bank or not, bank managers have incentives to engage in accounting practices to fall to the right of the threshold (Degeorge, Patel, and Zeckhauser, 1999).

We base our inference on the universe of FDIC-insured commercial banks in the United States (listed and non-listed) from 1996 to 2015. First, we document a sharp discontinuity around the 10%

[2]The OCC supervises national-chartered banks, the FRB is the supervisor of bank holding companies and state-chartered institutions, the FDIC is the primary supervisor of state-nonmember institutions. The FDIC is also the (independent) agency created by the Congress that insures deposits in the US, and as such, it can supervise any insured bank.

[3]We will mainly focus in the discontinuity around the 10% figure. Although we find a marginally significant discontinuity around the 8% threshold, the number of banks around this figure is very small (we have 579 bank-quarters with regulatory capital between 7.5% and 8%, and 1,126 between 8% and 8.5%), which represents 0.31% of our full sample, consistent with previous studies (e.g. Barth et al., 2017). The sample in the ± 0.5% around the 10% threshold accounts for almost 5% of the full sample (4,396 observations to the left and 21,708 to the right). We conclude that the results around the 10% figure have higher external validity, and we therefore present the analysis based on that threshold.

threshold of reported regulatory capital (see Figure 1). We find that the discontinuity is statistically significant using different sample sizes and nonparamentric tests using alternative polynomial orders. To rule out the possibility of the discontinuity being driven by rounding around integers rather than by Prompt Corrective Action (PCA) classifications,[4] we explore the discontinuity around other integers. Notably, the only threshold that is marginally statistically significant is the 8% (see Figure 2), which coincides with the regulatory capital figure that separates adequately capitalized from undercapitalized banks. These findings provide further support to the FDICIA creating target numbers for evaluating bank quality, and incentivizing managers to manipulate accrual and real numbers to beat those targets.

We cannot directly observe whether these thresholds trigger higher supervisory efforts, and therefore rely on indirect measures of supervision. We use hand-collected FDIC enforcement actions to proxy for attention to banks around the 10% threshold (Danisewicz, McGowan, Onali, and Schaeck, 2018).[5] Formal enforcement actions usually take place when banks engage in inadequate loan loss provisions, insider abuses, or unsound underwriting practices (Curry, O'Keefe, Coburn, and Montgomery, 1999). We document a 0.81% increase in the probability of receiving an enforcement for banks in the 8-10% interval, compared to banks in the 10-12% range (see Figure 3) after controlling for a wide set of bank controls, state and quarter-year fixed effects. This value is economically large because the unconditional probability of receiving an enforcement is 1.1%.

Next we examine several mechanisms that bank managers can use to increase their regulatory capital that have been previously analyzed in the accounting literature. We explore whether bank managers use changes in loan loss reserves to reach the 10% regulatory capital figure. An increase in loan loss reserves trough loan loss provision decreases regulatory capital because it reduces shareholders' equity. We employ the abnormal component of loan loss provision (using the preferred model of Beatty and Liao (2014)) to explore whether banks provision less than expected to manipulate regulatory capital. We find evidence consistent with banks using negative ALLP when they are to the left of the 10% regulatory capital before ALLP (see Panel A of Figure 4). Regarding the economic magnitude, banks slightly below the threshold are 42% more likely to use

[4]The seminal papers by Carslaw (1988) and Thomas (1989) document that listed firms report zeros (nines) more (less) frequently than expected by chance as the second-from-the-left most digit in reported earnings.

[5]Some recent papers have information on the number of hours allocated to each bank (Eisenbach, Lucca, and Townsend, 2016; Hribar, Jenkins, and Johnson, 2006) which is a better measure of supervisory efforts. Unfortunately, that information is not publicly available.

ALLP compared to banks slightly above. Although, loan loss reserves are not allowed to be added to core capital (Tier 1), regulatory capital guidelines allow banks to include a proportion of them as supplementary capital (Tier 2). In particular, loan loss reserves can be added back up to a limit of 1.25% of risk weighted assets. In line with Ng and Roychowdhury (2014), we find that banks use add-backs to increase their regulatory capital. More specifically, we document that banks slightly to the left of the 10% regulatory capital before add-backs are more likely to add-back loan loss reserves compared to banks slightly to the right (see Panel B of Figure 4).

Alternatively, banks might realize gains on AFS securities when they are close (but to the left) of the threshold (before RGL). This means a real manipulation, given that banks have to sell their profitable securities (realizing gains) to have an increase in earnings. Following Barth et al. (2017), we estimate the amount of RGL on AFS securities, and the regulatory capital before RGL. Once again, find that banks are more likely to realize gains when they are slightly to the left of the 10% regulatory capital (see Panel C of Figure 4). Banks slightly below the threshold are 73% more likely to report realized gains compared to financial institutions just to the right after controlling for bank, state and quarter-year determinants.

In additional analysis, we show that all the previous results are driven by the period previous to Basel III proposal (December 2009). Both the discontinuity around reported regulatory capital and the accounting manipulations disappeared after December 2009, at least around the 10% threshold. These results suggest that banks do not longer consider this figure as a relevant threshold that they have to attain. We argue that this finding can be explain by the fact that with Basel III, the banking regulation and supervision switched their attention away from regulatory capital numbers to a wider range of indicators and higher discretion over their intervention decisions. Banks respond to the proposal with strategic financial changes and altered their business model before the regulation being enacted (Hendricks, Neilson, Shakespeare, and Williams, 2018). The disappearance of the discontinuity after Basel III announcement is consistent with Hendricks et al. (2018) findings. This does not imply that banks stopped managing real and accruals numbers, but rather, that they do not manipulate it to reach this specific figure.

Finally, we observe a deterioration in the quality of financial intermediation for banks that successfully managed the regulatory capital compared to banks that have a reported regulatory capital between 8 and 10%. To analyze the change in the quality of financial intermediation, we analyze changes in insider loans in the following year (compared to insider loans in the previous year). This type of loans are a proxy for the quality of bank lending and agency costs, since insider loans are potentially less productive than standard loans, and are more likely to be granted to benefit the managerial team (Jayaratne and Strahan, 1996; Ng and Roychowdhury, 2014). The economic significance of the increase in insider loans for the banks that successfully manipulate is sizable, between 79% and 254%.

Our study contributes to the literature on benchmark beating behavior (Degeorge et al., 1999). Most studies focus on listed firms and show that firm managers engage in accruals and real manipulations to meet or beat analysts forecasts (e.g., Hribar et al., 2006; Burnett, Cripe, Martin, and McAllister, 2012; Almeida, Fos, and Kronlund, 2016), or avoid reporting losses or decreases in earnings (Hayn, 1995; Burgstahler and Dichev, 1997). Our results indicate that non-earnings goals are also important drivers of accounting choices (e.g., Dichev and Skinner, 2002; Gaver and Paterson, 2004; Dyreng, Mayew, and Schipper, 2017). Importantly, we show that this behavior is prevalent among non-listed banks, that are arguably less exposed to short-term pressures.[6] To the best of our knowledge, this is the first paper showing that the distribution of reported regulatory capital ratios exhibit a statistically significant discontinuity around the 10%.

We contribute to the accounting literature providing evidence that banks use real and accrual manipulation to increase regulatory capital. An extensive literature shows that bank managers manipulate their accounts to increase or smooth earnings and to increase regulatory capital (Moyer, 1990; Beatty, Chamberlain, and Magliolo, 1995; Collins, Shackelford, and Wahlen, 1995; Kim and Kross, 1998; Ahmed, Takeda, and Thomas, 1999; Beatty, Ke, and Petroni, 2002; Karaoglu, 2005). More closely related to our paper are Barth et al. (2017) and Ng and Roychowdhury (2014) which show that banks use RGL and add-backs, respectively, to increase regulatory capital. Different from those papers, we explore accounting manipulation around thresholds created by regulatory rules. In other words, we do not assume that reporting higher regulatory capital figures is always better, but only around certain threshold that might discontinuously affect the chances of triggering an increase in supervision.

[6]The differences in regulatory capital management between listed and non-listed banks are reported in the online appendix. Even tough public banks might have more incentives to avoid enforcements actions given the share price effect of its disclosure (Jordan, Peek, and Rosengren, 2000), in the online appendix we show that both publicly traded and private institutions manipulate to exceed the 10% threshold.

Finally, we contribute to the growing literature in banking supervision. This stream of research mainly focuses on the real effects and concludes that tighter supervision reduces bank risks (Eisenbach et al., 2016; Hirtle, Kovner, and Plosser, 2016), contracts lending and liquidity creation (Berger, Kyle, and Scalise, 2001; Danisewicz et al., 2018), reduces risk-weighted assets and non-performing loans (Delis et al., 2016), and reduces the probability of bank failure (Agarwal, Lucca, Seru, and Trebbi, 2014). We add to this literature documenting that setting thresholds to classify banks might create pervasive incentives for bank managers to engage in real and accrual manipulation that might ultimately have negative real effects. If banks succeed in managing regulatory capital through the manipulation of accounting measures, there might be negative impact on the effectiveness of banking supervision, and therefore, on the safety and soundness of the financial system (Ng and Roychowdhury, 2014; Delis et al., 2016).

2 Institutional background and related research

2.1 Related literature and hypothesis

Firm' financial performance is frequently evaluated using reference points, including previous earnings, earnings surprises (compared to analysts' expectations), or positive profits (e.g. Hayn, 1995; Hribar et al., 2006; Almeida et al., 2016; Dyreng et al., 2017). Degeorge et al. (1999) show that if stakeholders evaluate managers following a "threshold mentality," the latter will have incentives to manipulate reported numbers to meet the stakeholders' expectations, generating distortions and discontinuities in the distribution of reported earnings.[7] They argue that the effects might be significant even if only few agents respond to the threshold directly (Degeorge et al., 1999, pp. 7).

Beatty et al. (1995) claim that incentives to manipulate regulatory capital arise because regulators monitor banks using accounting based capital ratios. Having low regulatory capital is costly because it substantially increases the likelihood of regulatory intervention.[8] However, having a high capital ratio is also costly because the cost of equity often exceeds the costs of deposits. If

[7]Building on behavioral explanations, Degeorge et al. (1999) point out that threshold mentality might arise both for rational and perceptual reasons, such as (i) individuals process positive and negative numbers differently, (ii) S-shaped utility functions that are convex for losses and concave for gains (prospect theory), and (iii) the use of rules of thumb to reduce transaction costs.

[8]An examination that results in a formal supervisory action, can negatively impact bank value: Slovin, Sushka, and Polonchek (1999) and Jordan et al. (2000) estimate a drop in share price of 5% around the announcement of an enforcement action.

supervisors evaluate banks using rules based on thresholds, a discontinuity might arise. This will induce banks to report regulatory capital ratios just above the threshold that triggers intervention, and creating incentives to manage capital to achieve those targets.

The passage of the FDICIA of 1991 was intended to increase the timeliness of intervention and reduce the discretion of the supervisory authority, creating simple-to-follow and politically-expedient rules (Peek and Rosengren, 1996). A cornerstone in the FDICIA was the introduction of reported capital ratios as *triggers* that initiate mandatory Prompt Corrective Actions (PCA) by regulators (Jones and King, 1995; Peek and Rosengren, 1996). Under this framework each bank is placed in one of the five possible categories, based on its regulatory capital position: well capitalized, adequately capitalized, undercapitalized, significantly undercapitalized or critically capitalized (Table 1). From a supervisor point of view, these thresholds constituted simple rules of thumb to separate good from bad banks. From a bank manager perspective, these figures might have created incentives to avoid regulatory capital deficits if they believed to be evaluated according to those targets.[9] In other words, for banks, the marginal cost of missing the target by 1% is significantly higher than the marginal benefit of beating it by 1%. Then, we hypothesize that:

H1. Regulatory capital is managed to avoid falling below certain threshold.

The accounting literature has identified different ways in which banks can manipulate regulatory capital (and earnings). In the pre-Basel period Moyer (1990), Beatty et al. (1995) and Collins et al. (1995) find a negative correlation between regulatory capital and provisions. While Collins et al. (1995) find a positive correlation between provisions and earnings, Beatty et al. (1995) does not find evidence of earnings smoothing with the use of loan loss provisions. Ahmed et al. (1999) use the discretionary component of this item and finds a negative correlation with regulatory capital but no evidence of earning management. The lack of consistency in results during this period might respond to the use of very small samples (Beatty and Liao, 2014).

Loan loss provisions are the most important accrual for banks, and therefore it has received the largest attention as a form of earnings smoothing and accrual manipulation to increase low

[9] Indeed, anecdotal evidence suggests that bankers perceived the FDICIA in that way: "It is viewed by bankers as (...) removing regulatory managerial discretions and replacing it with formulas for regulatory action" (Weintraub, 1993)

regulatory capital (Beatty and Liao, 2014). Using a large sample of listed and non-listed banks, Beatty et al. (2002) finds that the former are more likely than the latter to use discretion in loan loss provision and security gains realizations to eliminate small earnings decreases.

Other reporting choices have also been considered. Barth et al. (2017) find evidence that listed and non-listed banks use RGL on AFS securities to increase low regulatory capital, smooth earnings, avoid losses or take a big bath. Ng and Roychowdhury (2014) find a positive association between add-backs and the risk of failure specially when they generate an increase in regulatory capital. Building on the literature mentioned above we explore the use of RGL, addd-backs and ALLP as mechanisms that banks use to manipulate the reported regulatory capital ratio. Other ways of manipulating the regulatory capital ratio include, for instance, loan sales and securitizations (Karaoglu, 2005), but we are not going to analyze them here.

2.2 Regulatory capital manipulation

The regulatory capital ratio is broadly used by supervisors to evaluate banks' financial health (Berger et al., 2001). It is composed by the sum of risk-based Tier 1 and Tier 2. After the Basel Capital Accord (Basel), the Tier 1 is the core capital that includes common equity, perpetual preferred stock and minority interest excluding intangibles, unrealized gains and losses on AFS securities, and loan loss reserves. The Tier 2 is the secondary capital that includes loan loss reserves (up to 1.25% of risk weighted assets), undisclosed reserves, and subordinated debt.[10] Bank managers have some discretion in their choices, and they can use it to manipulate the reported regulatory capital. In this paper we explore ALLP, add-backs, and RGL on AFS securities as discretionary choices made by managers to increase such ratio, and we explain them in detail below.

Changes in loan loss reserves affect regulatory capital ratios in two ways. An increase in loan loss provision decreases Tier 1 as it reduce shareholders' equity. Loan loss reserves are excluded from Tier 1 because they have been created against identified losses and therefore are not freely available to meet unidentified losses that may subsequently arise, which is the essence of having a regulatory capital (Beatty and Liao, 2014). Therefore, for each dollar the bank is not provisioning

[10] According to Ng and Roychowdhury (2014) a substantial fraction of Tier 2 capital is composed of loan loss reserves in US commercial banks.

(but they should have), it is increasing Tier 1 by one unit minus the tax rate (see Table 2). We employ the abnormal component of loan loss provision to observe whether banks provision less than normal to manipulate regulatory capital.

Another way to manipulate regulatory capital is through Tier 2. Although, loan loss reserves are not allowed to be considered as Tier 1, regulatory capital guidelines allow banks to add back as Tier 2 a proportion of them. Loan loss reserves can be added back as capital up to a limit of 1.25% of the risk weighted assets. If loan loss reserves exceed the limit, there is no effect on Tier 2 (only prevails the aforementioned effect on Tier 1). If loan loss reserves do not exceed the 1.25% limit and loan loss provisions are positive, there are two possible scenarios: (i) banks can add back the risk weighted loan loss provision if it does not exceed the difference between 1.25% and the risk weighted loan loss reserves, (ii) banks can add the difference between 1.25% and the risk weighted loan loss reserves if the loan loss provision exceeds this difference. Then the overall effect of loan loss provisions (through add-backs) on regulatory capital can indeed be positive (see Table 2) (Ng and Roychowdhury, 2014)[11].

Accounting Standards Codification Topic 320 (ASC 320) created a new accounting treatment for AFS securities.[12] ASC 320 requires AFS securities to be measured at fair value, and changes in fair value to be recognized in other comprehensive income. Therefore, unrealized gains and losses are not included Tier 1. AFS securities are recognized as earnings only when realized (sold).[13] Consequently, banks can selectively sell their AFS securities to realized gains and increase the Tier 1. An extra dollar in RGL on AFS securities increases Tier 1 by one unit minus the tax rate (see Table 2).[14]

[11]Following Ng and Roychowdhury (2014), pp.1238-1239, we present an example highlighting that an increase in loan loss reserves can have a positive effect on regulatory capital: A bank increase its loan loss reserves by reporting a loan loss provision of \$100 and the marginal tax rate (τ) is 40%. This transaction, ceteris paribus, has two effects on regulatory capital: i) the loan loss provision reduce after tax income by $\$100 * (1-\tau)$, or \$60, which in turn reduce shareholders equity and hence Tier 1 capital by \$60. ii) Tier 2 capital increases by the provision amount of \$100. Total regulatory capital (the sum of Tier 1 and Tier 2) increases by \$ (-60 + 100) or \$40 as a result of the loan loss provision, that is, the marginal tax rate times the provision amount. If loan loss reserves prior to the provision were already equal to or greater than 1.25% of risk weighted assets, the \$100 provision in the example would not increase Tier 2 capital. If loan loss reserve are below the 1.25% but close to it, a portion of the \$100 would count towards Tier 2 capital.

[12]Previous to ASC 320, banks treated them either as investments or as trading securities.

[13]The security sales affect both, the numerator and denominator of capital ratio. With the sale, there is a change in the composition of the risk weighted portfolio therefore the denominator. Unfortunately, we cannot trace the change in the portfolios composition.

[14]For further detail, see Barth et al. (2017), pp.1764-1765.

3 Data and research design

3.1 Sample and variable definition

Our dataset includes listed and non-listed FDIC-insured commercial banks in the Research Information System (RIS) database from 1996 to the first quarter of 2015. We obtain economic variables from the Bureau of Economic Analysis (per capita real GDP growth), the Bureau of Labor Statistics (unemployment), and the Federal Housing Finance Agency (house price index). We drop banks with negative values of total assets and loans, and winsorize all continuous variables at the 0.1 and 0.99% level to reduce the influence of outliers.[15] The final sample contains 550,987 bank-quarter observations from 11,622 banks.

We hand-collect data on formal enforcement actions imposed by the FDIC on commercial banks over the sample period.[16] We include three types of enforcements: i) cease-and-desist orders,[17] ii) suspension, removal or prohibitions of individuals from associating with a bank,[18] and iii) civil money penalties.[19] We have a total number of 1,245 formal enforcements.[20] We create a dummy variable, $D\_Enforcement$, that takes the value one if there is (at least) one enforcement action against a bank in the following year, and zero otherwise.[21] To examine the relation between the probability of receiving an enforcement action and regulatory capital we use the following linear regression:

[15]These thresholds differ from the usual thresholds considered in the literature, i.e., the 1 and 99% levels. However, if we winsorize at the 1% level, the minimum regulatory capital is above 8% and we lose the variation coming from cases that are of interest to this paper.

[16]We obtain the information from the FDIC website: https://www5.fdic.gov/edo/TextSearch.html. We search on the section "FDIC Enforcement Decisions and Orders" using "enforcement" as keyword.

[17]Cease-and-desist orders, not only include prohibition of certain types of practices, but also usually include replacement of top management, approval of promotions and new hires for senior positions, and greater control of credit risks.

[18]Removal or prohibitions orders set aside individuals from associating with an insured institution for specific violations of law, regulations or agreements.

[19]Assessment of Civil Money Penalty, are imposed for violations of law, regulation, Cease-and-desist orders, or any other written agreement. The monetary penalty is proportional to the seriousness of the violation and can range from $1,000 per day for simple violations to $25,000 per day for reckless actions. The fine can reach up to $1 million per day if supervisors find evidence of knowingly committed acts that cause significant loss to the bank or gains to individuals (Curry et al., 1999).

[20] Importantly, the dataset includes banks whose primary regulatory agent is not the FDIC. For instance, Cickasha Bank & Trust Company received a removal and prohibition order the 4th of December 2002 from the FDIC and his primary regulatory agent is the FED.

[21]Results are qualitatively similar when we consider enforcements only in the following quarter.

$$D\_Enforcement_{i,t+1:t+4} = \beta RegCap_{i,t} + \gamma Controls_{i,t-1} + \eta_i + \theta_t + \epsilon_{it} \quad (1)$$

where *RegCap* is the reported regulatory capital, and is measured as the sum of Tier 1 and Tier 2 capital normalized by risk weighted assets (or alternatively, we use *Low_RegCap* that is a dummy variable that takes the value one if *RegCap* is below 10% level, and zero otherwise). Following previous literature we include a set of control variables, $Controls_{i,t-1}$ (Beatty and Liao, 2014; Ng and Roychowdhury, 2014; Lim, Hagendorff, and Armitage, 2016; Barth et al., 2017). *Size* is the natural logarithm of total assets. *Equity* and *Loan* are the percentage of equity and loan, *NI* is the fraction of net income before taxes and RGL, *UGL* is the percentage of accumulated gains and losses on AFS securities. *Equity*, *Loan* *NI* and *UGL* are deflected by total assets at the beginning of the quarter. All control variables are lagged. Because our dependent variables might be influenced by state economic conditions, we include a set of state-level variables: the change in unemployment rate, per capita real GDP growth and the house price index. η are banks fixed effects, and θ are year-quarter fixed effects.

We analyze three accounting tools that banks use to manipulate regulatory capital: ALLP (*ALLP*) (using the preferred Beatty and Liao (2014) model as a benchmark),[22] loan loss reserves added back to capital (*Addbacks*) and RGL on AFS securities (*RGL*). More formally, we estimate the following panel fixed-effects regression:

$$Accretive\_X_{i,t} = \beta RegCap\_X_{i,t} + \gamma Controls_{i,t-1} + \eta_i + \theta_t + \epsilon_{it} \quad (2)$$

where the dependent variable is either *Accretive_ALLP*, *Accretive_Addback*, and *Accretive_RGL*. The explanatory variable is the regulatory capital before manipulations *RegCap_X* (or alternatively, *Low_RegCap_X*, that is a dummy variable equal to one if *RegCap_X* is below 10%). We use the same set of controls as in previous equation, and banks and year-quarter fixed effects (η and θ, respectively).

We construct our set of dependent variables in the same spirit of Hribar et al. (2006) and Almeida et al. (2016):

[22] This model has been widely used in the accounting literature as a benchmark model (e.g., Jiang, Levine, and Lin, 2016; Lim et al., 2016).

$$Accretive\_ALLP = 1 \quad \text{if} \quad ALLP \times (1-\tau) \leq -0.1\% \tag{3}$$

$$Accretive\_Addback = 1 \quad \text{if} \quad Addback \geq 0.1\% \tag{4}$$

$$Accretive\_RGL = 1 \quad \text{if} \quad RGL \times (1-\tau) \geq 0.1\% \tag{5}$$

where $Accretive\_X$ is an indicator for executing accretive ALLP, add-backs or RGL, to increase regulatory capital by at least 0.1%.[23] τ is the bank marginal tax rate.[24]

The explanatory variable are the set of "as-if" regulatory capitals absent accruals and real manipulations. That is, we re-estimate the regulatory capital before ALLP ($RegCap\_ALLP$), add-backs ($RegCap\_Addbacks$), and RGL ($RegCap\_RGL$), as follows:

$$RegCap\_ALLP = RegCap + ALLP \times (1-\tau) \tag{6}$$

$$RegCap\_Addbacks = RegCap - Addbacks \tag{7}$$

$$RegCap\_RGL = RegCap - RGL \times (1-\tau) \tag{8}$$

All these variables are normalized by risk-weighted assets. In addition, we create a set of dummy variables Low_RegCap_X where $X = \{ALLP, Addbaack, RGL\}$ equal to one if the ratios in Equations 6 to 8 are below 10%, and zero otherwise.

3.2 Summary statistics

Table 3 provides descriptive statistics of the variables included in the regression specifications. In Panel A, we present the summary statistics for the full sample (columns (1) to (3)), and the subsamples of banks that have a regulatory capital between 5 and 15% (columns (4) to (6)) and, 8 and 12% (columns (7) to (9)). The mean of $RegCap$ for the full sample is 17.8%, well above the 8% required and 10% threshold to be considered well capitalized. LLP has a mean of 0.08% and its discretionary component, $ALLP$ is close to zero (-0.004%). On average, for the full sample and the subsamples, banks realize gains on AFS securities (0.007%, 0.005%, and 0.03%, columns (2), (5) and (8) respectively). The mean of $Addbacks$ is 0.031% and represents 0.044% of loan loss reserves

[23] We use different cutoffs and results remain unchanged. For more details, see Online Appendix.

[24] We estimate the banks marginal tax rate following Graham and Mills (2008) specification except for S-corporations that we use the reported income taxes over income before taxes. For more details, see Appendix A.

for the full sample.[25] These values are in line with previous studies (Ng and Roychowdhury, 2014; Barth et al., 2017).

Panel B of Table 3 provides summary statistics for banks that are just below (columns (1) to (3)) and just above (columns (4) to (6)) the 10% threshold of reported regulatory capital. In column (7) we present the t-statistic of the differences in mean, which are all significant at 1% confidence level. The most striking result from the table is the differences in sample sizes between these two subsamples: while there are 9,267 banks in the 8-10% interval, there are 106,932 in the 10-12% range, consistent with a discontinuity in the density function. Interestingly, even tough all these banks are adequately capitalized, banks to the left of the threshold receive more than three times more enforcements than the banks to right, which suggest that they are supervised more closely. Regulatory capital before the accounting adjustments ($RegCap\_RGL$, $RegCap\_Addbacks$ and $RegCap\_ALLP$) is, on average, bigger than 10% figure for banks that are to the right of the threshold. However, many of these banks are in fact, engaging in regulatory capital manipulation. $ALLP$ is significantly higher for banks below the threshold, which is consistent with suspect banks understating loan loss provisions (banks just above the threshold). The proportion of loans relative to total assets is around 75%. Even tough it is statistically different in both subsamples, but they are economically similar. Banks to the left of the threshold are significantly less profitable.

On average banks seems to be executing more accretive ALLP and add-backs than RGL consistent with previous studies. Analyzing industrial firms, Zang (2011) and Burnett et al. (2012) show that they have a preference for using accrual rather than real manipulation tools, consistent with the former being costlier than the latter. Regarding financial firms, Beatty and Liao (2014) argue that loan loss provisions is the most important account that banks can use to manage earnings and regulatory capital numbers. It is important to note that not all banks have unrealized gains on securities to sell and also the cost of realizing securities before the optimal time might be higher than the cost of manipulating accruals. In Appendix A, we provide further evidence showing that there are more banks per quarter that are consider to be executing accretive accruals, compared to the fraction of banks with accretive RGL.

[25]This is the amount that is added back to the Tier 2 in a given quarter on average. The mean (median) *stock* of add-backs is 1.1 (1.24), similar to Ng and Roychowdhury (2014).

4 Results

4.1 Discontinuity around 10% regulatory capital threshold

Panel A of Figure 1 presents a graphical representation of the distribution of regulatory capital ratios in the interval between 5% and 15%. If banks are believed to be evaluated by stakeholders according to certain reference points, they will have incentives to meet those targets, and we should therefore observe a discontinuity around these thresholds (Degeorge et al., 1999). A graphical inspection reveals a strong jump in the density function of reported regulatory capital ratios at the 10% figure, providing preliminary evidence consistent with our research hypothesis.

In the rest of the figure we present nonparametric tests to formally evaluate the statistical significance of the discontinuity around the 10% threshold. Using local polynomial density estimation with robust standard errors (Calonico, Cattaneo, and Titiunik, 2014; Calonico, Cattaneo, Farrell, and Titiunik, 2017) we find that the discontinuity is statistically significant using alternative sample sizes and polynomial orders. Robust t-statistics are reported in each panel of Figure 1. For instance, using the interval from 5% and 15% of regulatory capital we find that the discontinuity is significant at the 1% level (t-statistic = 12.01). In unreported tests we find that the results are even stronger when the density function is estimated for the full sample (t-statistic = 26.01).

Previous papers already document anomalies in earnings numbers. Carslaw (1988) using data from New Zealand listed firms shows a significant bias toward numbers having zero, while he finds a consistent lack of nines as the second digit in income numbers. Thomas (1989) finds similar results using US publicly traded firms. He further shows that rounding is more prevalent in EPS numbers compared to earnings figures. These findings might raise some concerns regarding the motivation for manipulating around the 10% regulatory capital threshold. In particular, it could be argued that the discontinuity arises not because of the separation between well capitalized and adequately capitalize firms, but rather because of a bias towards rounding numbers to the next integer.

To address these concerns we examine whether there is a discontinuity around other regulatory capital integers: 5% to 13% (see Figure 2). T-statistics are reported in each panel, and are estimated using the ± 0.5% sample around each integer. Notably, the only threshold that is statistically significant is the 8%, which coincides with the regulatory capital figure that separates adequately capitalized from undercapitalized firms. In untabulated results we find that the discontinuity is significant when the density function in estimated using the full sample (t-statistic=1.75). The discontinuity around the 7% figure is marginally significant using the sample size of ± 0.5% around the threshold but it does not survive using alternative windows (t-statistic=-1.58). These findings provide further support to the FDICIA creating target numbers for evaluating bank quality, and incentivizing managers to manipulate real activities and accruals to beat those targets.[26]

We next explore whether these thresholds trigger higher supervisory attention using enforcements as the outcome variable. The FDIC uses a variety of enforcement actions with institutions that have significant risk exposure and encourage them to take appropriate steps to mitigate risks (Curry et al., 1999). There are several banks' practices that could lead to enforcement actions such as inadequate capital or loan loss reserves, poor quality or excessive growth of asset, fail to charge off loan losses, inadequate earnings, poor liquidity, insider payments, or failing to file call reports. Violations of these enforcements can result in the termination of deposit insurance.

In principle, all firms above the 8% threshold are (at least) adequately capitalized and are not subject to major restrictions (see Table 1). Assuming that in the vicinity of the 10% threshold higher regulatory capitals are on average desirable (from the point of view of the regulator), the positive effect of having a capital ratio marginally above the threshold should be of similar magnitude to the negative effect of having a capital ratio marginally below that target. Figure 3 presents the probability of having an enforcement action as a function of regulatory capital. Dots represent the sample average within the bin, and the vertical bars, the confidence intervals. The comparison of the bins to the left and to the right of the 10% threshold suggests that the probability of an enforcement action in the following year is substantially higher to the left.

In Table 4 we analyze the relationship between regulatory capital and the probability of receiving an enforcement action in the following year, after controlling for several bank and state controls, as well as time-invariant bank characteristics and year-quarter fixed effects. Columns (1) and (2) present the results for the full sample using the continuous variable ($RegCap$) and a dummy variable equal to one if $RegCap$ is below 10% and zero otherwise, respectively. We regress the

[26]We cannot completely rule out the possibility that 10 by itself is a salient number that bank managers try to reach regardless of FDICIA. However, we are not aware of any paper in the behavioral economics literature proving evidence of a bias around the number 10. Moreover, the fact that we find a (marginally) significant effect at the 8% provides support to our story of a regulation-driven target.

enforcement dummy on the regulatory capital variables using linear probability models.[27] The result from column (1) suggests that there is no significant relationship between these variables. This result is not surprising since 95% of our sample have a regulatory capital above 10%, and there is no apparent relationship beyond that number (see Figure 3). The results change when we use the dummy variable. In this case we find a positive and statistically significant association, suggesting that banks with reported regulatory capital below 10% are more likely to receive enforcement actions in the following year. The economic magnitude is substantial given that the unconditional mean is 0.7%. However, this coefficient might be mainly driven by undercapitalized banks.

In the rest of the table we present the results for the subsample of banks that are close to the 10% threshold. In particular, in columns (3) and (4) we use a sample of ± 5% around the threshold. In columns (5) and (6) we restrict the analysis to banks in the ± 2% interval. In these cases the continuous variable presents the expected sign, showing that the higher the regulatory capital, the lower the chances of receiving a formal enforcement action. Regarding the economic magnitude, the coefficient in the last column indicates that banks with regulatory capitals between 8 and 10% are 21% more likely to receive an enforcement compared to their 10 to 12% regulatory capital counterparts (the unconditional mean in this subsample is 1.1%).

Overall the results suggest that banks with reported regulatory capitals above 10% are subject to less supervisory scrutiny, proxied by the probability of receiving an enforcement action. We acknowledge, however, that this is not a perfect proxy for supervision. In particular, there are different types of enforcements that vary in terms of severity, and we only have information on the most severe cases. Informal enforcements are not legally binding, and are not disclose to the public, therefore, they are not included in our sample.[28] In contrast, since Crime Control Act of 1990, formal agreements signed after November 29, 1990 must be made publicly available.[29]

[27] The results are similar when we use a logit or a poisson (using the number of enforcements) models instead (results available upon request).

[28] Informal enforcements comprise board resolutions, approved safety and soundness plans, and memorandum of understanding.

[29] Among them the FDIC can mandate cease-and-desist orders, suspension, removal or prohibitions of individuals from associating with a bank, civil money penalties, suspension or termination of deposit insurance, and placement in conservatorship or receivership. These actions normally take place when the institution receives a CAMELS rating of 4 or 5, or at times 3 (Delis et al., 2016; Danisewicz et al., 2018; Curry et al., 1999) CAMELS rating is a weighted average of six components: Capital adequacy, Asset quality, Management, Earnings, Liquidity, and Sensitivity to market risk. The rating has a scale of 1 to 5, in which 1 is considered satisfactory condition and 5 represent an extreme level of regulatory concern. These ratings are strictly confidential and the weights are set according the personal judgment of the examiner.

They frequently include specific quantitative objectives for capital ratios and non-performing loans (Jordan et al., 2000).

It might seem somehow surprising that the discontinuity is stronger at the 10% level than at the 8%. Previous papers already documented that banks hold capital well above the minimum legally required (e.g., Ng and Roychowdhury, 2014; Barth et al., 2017), which could be explained by the substantial costs of falling below that threshold. In particular, reporting a capital ratio below 8% explicitly triggers intervention, increases monitoring, and restricts certain activities. Still, it might be not clear why the 10% figure is so relevant. Even though we can not provide conclusive evidence, the literature suggested that the 8% minimum failed to timely identify problem banks (Jones and King, 1995; Peek and Rosengren, 1996; Posner, 2015), and concluded that raising the FDICIA capital ratio triggers was a possible solution to intervene problem institutions earlier (Peek and Rosengren, 1996, pp.57). Consequently, the supervisory attention might have implicitly increase for adequately capitalized banks, which arguably were at risk of being unsafe. If supervision asymmetrically increased for banks just below the 10% compared to just-above banks, incentives were created for managers to beat such target and avoid supervision.

4.2 Accrual and real manipulation to meet the 10% regulatory capital

Having documented the sharp discontinuity around the 10% regulatory capital ratio, we next examine the mechanisms that banks use to manipulate this figure. We build on previous literature to identify which real and accruals manipulations are more widely used in the banking industry. In particular, we explore the use of ALLP (Beatty and Liao, 2014), add-backs (Ng and Roychowdhury, 2014) and RGL on AFS securities (Barth et al., 2017).

Figure 4 provides a graphical representation of accretive ALLP (Panel A), add-backs (Panel B), and RGL (Panel C) in the interval between 8% and 12% of the regulatory capital before those items. The figures already reveal a strong jump around the 10% threshold, providing preliminary evidence consistent with banks using all these mechanisms to move the reported capital ratio. In other words, banks to the left of the 10% regulatory capital before adjustments are more likely to engage in accretive ALLP, add-backs, or RGL, and the results are statistically significant at the 1% level. In unreported tests we use sharp regression discontinuity estimates using local polynomial regression and find that the corresponding robust t-statistics are -9.05, -10.59, and -4.89, respectively.

In Tables 5, 6, and 7 we explore the relationship between regulatory capital before adjustments and the probability of having accretive ALLP, add-backs, or RGL after controlling for bank and state level controls, and bank and year-quarter fixed effects. Columns (1) and (2) present the results for the full sample, columns (3) and (4) restrict the sample to the ± 5% interval, and finally, columns (5) and (6) further restrict the sample to banks in the ± 2% interval around the 10% threshold (before adjustments). Odd columns show the results when the explanatory variable is $RegCap\_X$, while in even columns, it is the dummy variable Low_RegCap_X.

In Table 5 we show how regulatory capital affect the probability of making provisions below the expected level in order to increase the Tier 1.[30] Interestingly, the results in column (1) present the opposite sign (but statistically insignificant), because we would expect banks to rely less on ALLP manipulation when regulatory capital is low. However, the results change substantially when we restrict the sample to banks close to the threshold, or when using a dummy variable equal to one when regulatory capital before ALLP is below 10%. The magnitude of the effect increases when we look at banks closer to the threshold. Regarding the economic magnitude, the coefficient in column (6) implies that banks with low regulatory capital are 42% more likely to use accretive ALLP compared to banks above the threshold.

Table 6 shows that the probability of having accretive add-backs decreases with the regulatory capital ratio, that banks with low regulatory capital are more likely to engage in accretive add-backs. The economic magnitude is also large, and is higher for the restricted samples compared to the full sample. The economic magnitude of the coefficient in column (6) implies that banks with low regulatory capital are 54.2% more likely to use accretive add-backs compared to banks above the threshold. These results have straightforward policy implications, since Ng and Roychowdhury (2014) suggest that add-backs cannot substitute for capital, at least under adverse economic conditions. They show that firms that use add-backs to increase their capital positions before the last financial crisis had higher failure rates.[31]

Finally, Table 7 shows that the probability of having suspect RGL are negatively related with

[30]By expected we mean the level predicted by the preferred Beatty and Liao (2014) model that takes into account several bank level variables and state controls that affect loan loss provisions.

[31]Ng and Roychowdhury (2014) argue that regulators will probably also consider the level of Tier 1, and it is therefore necessary to control for it. In untabulated results we find that our findings hold after the inclusion of that control variable, and it remains highly significant. Using the specification in column (6), the coefficient for $Low\_RegCap\_Addbacks$ increase to 0.1275 (t-statistic = 20.74).

the regulatory capital before RGL, consistent with banks using realized gain to boost capital ratios. The results are qualitatively similar when we use a dummy variable equal to one when the adjusted regulatory capital is below the 10% threshold, which is closer to the specification used in Barth et al. (2017).[32] Our findings are in line with their results. For the full sample, having low regulatory capital increases by 73% the probability of having suspect RGL. In the ± 5% interval the economic magnitude is 91% and in the ± 2% range, 73%. The rest of the table provides further support for the findings.

4.3 Additional Analysis

4.3.1 Spurious correlation. In Section 4.1 we document a statistically significant discontinuity around the 10% ratio of reported regulatory capital, and in Section 4.2 we provide evidence of alternative mechanisms that banks use to manipulate around that threshold. One potential concern with the results presented in Section 4.2 is that they might be due to spurious correlation between regulatory capital before the adjustments and ALLP, add-backs and RGL, because the the pre-managed regulatory capital is effectively the reported ratio minus ALLP, add-backs or RGL. In this section we show that spurious correlation is unlikely to be driving the results.

Firstly, notice that the discontinuity documented around (unadjusted) regulatory capital reported by banks is not affected by this concern, and we show that the result is statistically strong using alternative tests, bandwidths and polynomials orders. Moreover, we show that there is no such discontinuity around integers that do not define thresholds to classify banks according to their capital adequacy. In addition, our dependent variable is an indicator rather than the subtracted amount itself, which reduces the likelihood of finding a spurious association.

We further check the robustness of the results in several ways. Following Daniel, Denis, and Naveen (2008), we construct a variable $Deficit$, which equals $\max\{0, 10 - RegCap\_before\}$, rather than the regulatory capital shortfall (below the 10%) itself, which weakens the spurious correlation problem. In Columns (1), (3) and (5) of Table 8 we present the results using the $Deficit\_RegCap\_X$ variable and show that the results are qualitatively similar under this alternative specification (for brevity, we only report the results for the ±2% bandwidth). The economic and statistic significance

[32] They define as $Low\_RegCap\_RGL = 1$ those banks in the lowest decile of the distribution of regulatory capital before RGL.

are large: a typical deviation in $Deficit\_RegCap\_X$ before ALLP, add-backs or RGL increases by 6%, 6% and 11% the probability of having Accretive ALLP, add-backs and RGL, respectively (relative to their unconditional means), and all the t-statistics are well above 2.

Alternatively, we tests for non-linearities in the relationship between pre-managed regulatory capital and ALLP, add-backs or RGL. If our results are due to spurious correlation between these variables, we should expect to find a linear relation, whereas if it is indeed due to banks manipulation, we should expect the effect to be stronger for firms close to the 10% of pre-managed regulatory capital (Daniel et al., 2008). We re-estimate the regressions in columns (1), (3) and (5) using intervals of pre-managed regulatory capital, between 9.5% and 10% (Deficit_[0,0.5]), 9.5% and 9% (Deficit_[0.5,1]), 9% and 8.5% (Deficit_[1,1.5]) and 8.5% and 8% (Deficit_[1,1.5]), relative to firms that exceed the 10% threshold. The results presented in Column (2) show that the banks that are closer to the threshold have a 5.98% higher probability of having Suspect ALLP (compared to non-suspect banks),[33] and the difference is economically larger in this interval compared to intervals farther away from the threshold. In Column (4) we present the estimates for accretive add-backs, and we find that the results are driven by banks with a deficit between 0% and 1%, while the statistical significance vanishes for institutions above those intervals. Finally, in Column (6) we document a pattern inconsistent with spurious correlation for banks managing RGL. In particular, both the economic and the statistical significance are larger for banks in the 0% to 0.5% of regulatory capital deficit before RGL, while the effect disappears for the intervals that are more distant to the threshold, consistent with banks being unable to manipulate their reported regulatory capital when the distance is too large.

4.3.2 Private vs. publicly traded banks. Other potential concern with the results presented in previous sections is that they might be driven by publicly traded banks. In general public firms suffer more from short-term pressures that affects their behavior. For instance, relative to private firms, public firms invest significantly less, are less sensitive to changes in investment opportunities (Asker, Farre-Mensa, and Ljungqvist, 2014), and smooth dividends significantly more than its counterparts (Michaely and Roberts, 2011). In particular, public banks are more likely to use loan loss provisions to eliminate small earnings decreases (Beatty et al., 2002) and might have more

[33] Relative to the unconditional mean of 0.12 this implies a 50% increase in the chances of observing Suspect ALLP.

incentives to avoid enforcements actions given the share price effect of its disclosure (Jordan et al., 2000). In this section we make the distinction between listed and non-listed banks and show that they have similar manipulating behavior.

Firstly, in our sample is dominated by private financial institutions (490,200 vs. 60,787 bank-quarter observations), which reduce the likelihood that public banks are driving our results. Additionally, Figure A.1.1 from the online appendix shows that for both, private and public banks, there is a significant discontinuity around the 10% threshold of reported regulatory capital (T-Statistics 11.52 and 5.27, respectively) and that the provability of receiving and enforcement action is higher for banks below the threshold. In Figure A.1.2 from the online appendix we show that both types of banks manipulate to exceed the 10% threshold.

4.4 Regulatory capital manipulation before and after the announcement of Basel III

The last financial crisis proved that banking supervision and regulation was not bullet proof. The regulators promptly responded to the crisis, with the announcement of Basel III. The intention of the proposed reforms is to strengthens microprudencial regulation and supervision, and add a macroprudential overlay that includes capital buffers. Basel III requires supplementary leverage ratio, stronger capital requirement (a new requirement of 4.5% of core capital and the minimum Tier 1 capital rises from 4 to 6%) and stress testing programs.[34] But more importantly, some pre-crisis rules were challenged. In speaking at the 2016 Financial Stability Conference, Daniel K. Tarullo, member of the Board of Governors of the Federal Reserve System, claimed that "the post-crisis regime differs from pre-crisis days precisely because there is now a well thought through rationale for those much higher minimum requirements." Another important feature of the post-Basel III period is the introduction of quantitative liquidity regulations that refers to high quality liquid assets to meet short-term obligations.[35] Likewise, some regulatory capital guidelines received considerable attention, such as the use of loan loss reserves as Tier 2 capital (e.g. Ng and Roychowdhury, 2014). The number of supervisors increase substantially since the financial crisis in all supervisory

[34]Stress tests are only applied to large banks.

[35]Treasury bonds, guarantee securities and some specific publicly traded common stocks are considered high quality liquid assets. The net stable funding ratio complements the liquidity ratio and requires an amount of stable funding that is tailored to the liquidity risk of banks.

agencies.[36] Overall, there seems to be a wide-ranging change in the regulatory and supervisory paradigm, which (among other things) might have deviated the focus from rules or threshold to thorough examinations of individual banks.

The top panels of Figures 5 provide a graphical representation of the density function of reported regulatory capital before (left column) and after (right column) Basel III for the $\pm 2\%$ interval around the 10% threshold. Notably, the discontinuity is only significant for the period before the regulation change, and it completely disappears after 2009Q4. The density function looks continuous in all the points after Basel III announcement, suggesting that the incentives to beat certain figures might have vanished since then (the nonparametric tests confirm that the discontinuity is not statistically significant). We also observe different patterns in the probability of an enforcement action before and after the regulation (see bottom panels of Figure 5). In particular, the probability of an enforcement before 2008 was virtually zero for firms above the 10% threshold, while more variation is observed in the post-Basel III years.

The accounting manipulations documented in the previous section also disappeared after December 2009, at least around the 10% threshold. In other words, the probability of having accretive ALLP, add-backs, and RGL is no longer significantly higher for banks to the left of the threshold. This preliminary evidence suggests that banks do not longer use all these accounting mechanisms to move the reported capital ratio around the 10% target. In Table 9 we present the robust t-statistics from the regression discontinuity test that provides further evidence that the discontinuity is not longer significant after the announcement of Basel III.

Finally, in Table 9, we formalize the study before- and after-Basel III and explore the relationship between regulatory capital and the probability of having accretive ALLP, add-backs, and RGL after controlling for other determinants of the dependent variable. Odd (even) columns display the sample before (after) the crisis. We present the results for banks in the $\pm$ 2% interval around the threshold. Coefficients from odd columns suggest that the probability of having suspect accounting manipulation is positive and significant when regulatory capital (before adjustments) is below the 10% threshold in the pre-Basel III period. After the regulation (even columns), the probability of having accretive accounting manipulation is positive but the statistical significance is much lower

[36]For instance, Eisenbach et al. (2016) documents that the FRB has increased by about 50% the number of employees conducting supervisory duties since the last financial crisis. The FDIC, in the 2010 and 2008 10-K also highlighted the recent incorporations to the payroll to meet the need for additional human resources.

(and below conventional levels for accretive RGL). Notice that banks might still have incentives to manipulate regulatory capital upward for relatively low values of that ratios, even when those manipulations are not specifically intended to exceed the 10% threshold, which could explain the statistically significant coefficient for ALLP and add-backs.

To sum up, the results presented in this section suggest that accounting manipulations around the 10% threshold were prevalent only before Basel III proposal. The disappearance of the discontinuity and the incentives to manage regulatory capital around the threshold after Basel III announcement is consistent with Hendricks et al. (2018). They find that banks respond to the proposal with strategic financial changes and altered their business model before the regulation being enacted. Even though we find no effect for the most recent period, this does not imply that banks stopped manipulating, but rather, that the 10% figure is not a reference point nowadays. There must still be incentives among bank managers to manipulate earning numbers, or reported regulatory capital around other thresholds or in different situations.

5 The real effects of regulatory capital manipulation

In this paper, we argue that the main motivation for manipulating reported regulatory capital ratios is to avoid supervision and monitoring by federal and state regulators. The objective of bank supervision is to protect the safety and soundness of the financial system, and therefore, we should observe a deterioration in the quality of financial intermediation for banks that successfully managed to avoid it. To further explore this possibility, we identify bank-quarters during which banks meet the 10% threshold but they would not have meet it in the absence of ALLP, add-backs or RGL, and call them $Suspect$. We compared them to firms that do not need to manipulate and fall always above the 10% threshold. In particular, we define $Suspect\_X = 1$ if $RegCap \geq 10\%$ and $9.5\% < RegCap\_beforeX < 10\%$ where $X = \{ALLP, Addbacks, RGL\}$, and $Suspect\_X = 0$ if $10 < RegCap < 10.5$ and $RegCap\_beforeX > 10\%$.[37] We follow Burnett et al. (2012) in the construction of this variable, except for the control sample that we restrict to banks close to the threshold.[38]

[37] Alternatively, we consider a higher bandwidths: $\pm$ 1% and $\pm$ 2%. The results hold but are less significant.

[38] More specifically, Burnett et al. (2012) include all firms for which $Suspect\_X \neq 1$. By doing this, we would be comparing suspect banks with banks that have regulatory capital above 20% that are probably very different from banks with regulatory capital around 10%. Still, we acknowledge that our suspect and non-suspect are not necessarily

We then show that banks that successfully manipulate and end up above the 10% threshold do not have a significantly higher provability of receiving an enforcement action, compared to beaters that need not to manage regulatory capital. The result is presented in Panel A of Table 10. The coefficients on *Suspect_ALLP* and *Suspect_RGL* are positive but statistically insignificant. The coefficient on *Suspect_Addback* is negative and statistically significant. Since enforcements are publicly disclosed, it is important for banks to avoid having them given that not only might involve a monetary penalization but also because enforcements have reputational effects. For instance, Jordan et al. (2000) show that stock market participants find these disclosures informative and that there is a share price drop of 5% after the enforcement. According to our results, banks that are suspect of managing regulatory capital are not penalized with more enforcement actions compared to banks that are not suspects.

To analyze the change in the quality of financial intermediation for banks that manipulate the reported regulatory capital, we analyze changes in insider loans, non performing assets and loan charge-offs in the following year (compared to insider loans, NPA, and charge-offs in the previous year, respectively). Jayaratne and Strahan (1996) and Ng and Roychowdhury (2014) argue that the fraction of insider loans proxy for the quality of bank lending and agency costs, because those loans are potentially less productive than standard loans, and are more likely to be granted to benefit the managerial team. In columns (5), and (6) of Table 10 we show that suspect banks increase the fraction of insider loans. Columns (7), and (8) show that banks suspect of manipulation have an increase in non-performing assets in the following year. In columns (11) and (12) we show that suspect banks increase the fraction of loan charge-offs in the following year. Finally, results presented in columns (4), (9), and (10) are not statistically significant. Overall, results are consistent with lower supervisory attention increasing bank risk and worsening governance. To put it differently, bank managers might manipulate to reduce external monitoring and increase the leeway to making decisions to their own benefit, which could compromise the safety and soundness of the bank.

similar. Indeed, in untabulated results we find that suspect firms are smaller, less profitable and higher unrealized gains compared to non-suspect firms.

6 Conclusions

In this paper, analyzing the distributional properties of reported regulatory capital ratio, we address whether this ratio is managed to avoid falling below a certain threshold that might trigger intervention by supervisors. We base our inference on a large sample of publicly listed and non-listed FDIC insured commercial banks from 1996 to 2015. In particular, we find a statistically significant discontinuity in the distribution of reported regulatory capital ratios around the 10% figure, a threshold that separates well capitalized from their adequately capitalized banks. We further document that banks that fall just below the 10% threshold are more likely to receive an enforcement action in the following year, compared to banks that fall just above it. We explore alternative mechanism that bank managers use to manipulate the reported regulatory capital: abnormal loan loss provisions, add-backs, and available for sale securities. We provide strong evidence of banks using these alternatives, real and accounting manipulations, to fall just above the target figure. Additionally, we show that after Basel III announcement, the discontinuity in the regulatory capital around the 10% level disappears. The manipulations around such figures disappeared as well: the probability of having accretive ALLP, add-backs and RGL is no longer significantly higher for banks to the left of the threshold. Finally, we provide evidence of a deterioration on the quality of bank lending for banks that successfully manipulate regulatory capital.

Our findings reveal a benchmark beating behavior on reported regulatory capital driven by supervisors categorizations of "well capitalized" and "adequately capitalized" banks. Bank managers opportunistically use the discretion afforded to them by accounting standards and regulatory requirements to understate loan loss provisions, use add-backs, and selectively realize securities. If banks succeed to manage regulatory capital to avoid supervisory intervention the safety and soundness of the financial system might be compromised, and so economic growth.

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A Marginal Tax Rate

To calculate the marginal tax rate we follow Graham and Mills (2008). We use the specification that proxies for the simulated marginal tax rate ($TaxSimMTR$), as follows:

$$\begin{aligned} TaxSimMTR_{it} = 0.336 - 0.034 * USBookLoss_{it} - 0.082 * LowUSETR_{it} \\ - 0.028 * NOL_{it} - 0.09 * BookLoss_{it} \end{aligned} \tag{9}$$

where $USBookLoss$ is a dummy variable that takes the value 1 if income before taxes are negative, zero otherwise. $LowUSETR$ is a dummy that takes value 1 if current effective tax rates (income taxes/income before taxes) are smaller than 10%, zero otherwise. Net operating losses, NOL, proxies the tax loss carry forward.[39] It takes the value 1 when there is a loss and net deferred income taxes are positive, zero otherwise. In our setting we do not have the information of banks outside US jurisdiction, therefore $BookLoss$ is calculated in the same fashion as $USBookLoss$ and we do not include a dummy to capture the presence of substantial foreign income. The reason for differentiating between US and worldwide losses is due to banks can report losses in US while they are profitable worldwide. [40] For banks register as S corporations, [41] we replace Graham and Mills specification of marginal tax rate with the income tax rate. As S corporations do not pay federal taxes but in some cases they do pay state taxes, we cannot compute the marginal tax rate as zero and 9 might create a bias.

As a robustness check, we use alternative specifications of the marginal tax rate: i) Graham and Mills (2008) specification without taking in account the special case of S corporations, ii) the income tax rate, and iii) a constant bank effective tax rate.[42] Main results are quantitative and significantly robust. However, a change resides in the banks that are considered to be suspect of manipulation. In the following table we present the number of banks per quarter that we consider to be suspect of accounting manipulation using our main and alternative specifications to calculate the marginal tax rate.

[39] We do not observe this value directly in our database.

[40] Just a few large banks might have operations outside the country but is very unlikely that they report US losses while being profitable worldwide.

[41] Since 1997 small banks , if they meet certain conditions, can choose to transfer corporate income to their shareholders for federal taxation.

[42] We obtain it from Damodaran's webpage, http://www.stern.nyu.edu/ adamodar/New Home Page/data.html.

Tax Specification		Accretive			Suspect	
	ALLP	Addback	RGL	ALLP	Addback	RGL
Graham & Mills & S-Corp w/IT	91,270	53,975	13,607	1,505	1,928	191
Graham & Mills	77,854	53,975	12,456	1,376	1,928	182
Income Tax Rate	102,120	53,975	15,017	1,614	1,928	228
Damodaran's Tax Rate (τ=0.2954)	80,601	53,975	11,856	1,389	1,928	169

Table 1: Prompt Corrective Actions

	Total Risk-Based Capital Ratio	Tier 1 Leverage Ratio	Major restrictions
Well Capitalized	10%	5%	-None
Adequately Capitalized	8%	4%	-None
Undercapitalized	<8%	<4%	-Capital restoration plan
			-Increase monitoring
			-Suspend dividends
			-Restrict assets growth
Significantly Undercapitalized	<6%	<3%	-Restrictions for Undercapitalized
			-Require recapitalization
			-Restrict interest rate paid
			-Hire, replace senior management
Critically Undercapitalized	Tangible Equity/Total Assets <2%		-Restrictions for Significantly Undercapitalized
			-Receivership or conservatorship within 90 days unless exempted by primary regulator and FDIC

This table highlights some of the PCA contained in the FDICIA of 1991. Source: Jones and King (1995), Table 1, pp.492 and Peek and Rosengren (1996), Table 1, pp.51.

Table 2: Regulatory Capital Adjustments

Accounting variable	Conditions	Tier 1	Tier 2
Loan Loss Provision	If $\frac{LLR}{RWA} \geq 1.25\%$	$-\frac{LLP_t}{RWA} \times (1-\tau)$	0
	If $\frac{LLR}{RWA} < 1.25\%$ & $[1.25 - \frac{LLR}{RWA}] > \frac{LLP}{RWA}$	$-\frac{LLP}{RWA} \times (1-\tau)$	$\frac{LLP}{RWA}$
	If $\frac{LLR}{RWA} < 1.25\%$ & $[1.25 - \frac{LLR}{RWA}] < \frac{LLP}{RWA}$	$-\frac{LLP}{RWA} \times (1-\tau)$	$[1.25 - \frac{LLR}{RWA}]$
RGL		$\frac{RGL_t}{RWA} \times (1-\tau)$	0

The table presents the regulatory capital adjustments for a unitary increase in RGL and loan loss provision. The table shows separately the adjustments for Tier 1 and Tier 2.

Table 3: Summary statistics

Panel A									
	Full sample			RegCap (±5%)			RegCap (±2%)		
	Obs	Mean	S.D.	Obs	Mean	S.D.	Obs	Mean	S.D.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
D_Enforcement	550987	0.007	0.083	277750	0.009	0.095	116205	0.011	0.103
RegCap	550987	17.83	14.46	277750	12.32	1.56	116205	10.92	0.73
LLP	550987	0.083	0.214	277750	0.104	0.243	116205	0.116	0.260
ALLP	550987	-0.004	0.299	277750	0.018	0.321	116205	0.027	0.342
Addback	550987	0.031	0.064	277750	0.037	0.065	116205	0.045	0.070
RGL	550987	0.007	0.068	277750	0.005	0.061	116205	0.003	0.060
RegCap_ALLP	550672	17.84	14.45	277664	12.34	1.55	116179	10.95	0.76
RegCap_Addbacks	550987	17.80	14.47	277750	12.28	1.57	116205	10.88	0.74
RegCap_RGL	550672	17.83	14.46	277664	12.32	1.56	116179	10.92	0.74
Accretive_ALLP	550987	0.166	0.372	277750	0.129	0.335	116205	0.119	0.324
Accretive_Addback	550987	0.098	0.297	277750	0.116	0.320	116205	0.141	0.348
Accretive_RGL	550987	0.025	0.155	277750	0.019	0.137	116205	0.015	0.122
Size	550987	11.66	1.32	277750	12.03	1.36	116205	12.23	1.43
Equity	550987	11.13	5.49	277750	9.08	2.50	116205	8.57	2.53
NI	550987	0.299	0.421	277750	0.291	0.410	116205	0.290	0.433
UGL	550987	0.043	0.438	277750	0.018	0.408	116205	-0.001	0.421
Loan	550987	63.39	16.85	277750	71.43	12.55	116205	75.38	11.75
Insider_Loan	539365	1.42	1.69	273526	1.51	1.60	114700	1.58	1.63

Panel B							
	RegCap (8%,10%)			RegCap (10%,12%)			t-statistic
	Obs	Mean	S.D.	Obs	Mean	S.D.	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
D_Enforcement	9267	0.027	0.161	106932	0.009	0.096	-15.82
RegCap	9267	9.31	0.557	106932	11.06	0.560	288.85
LLP	9267	0.248	0.487	106932	0.104	0.226	-51.71
ALLP	9267	0.231	0.679	106932	0.009	0.288	-60.86
Addback	9267	0.049	0.085	106932	0.044	0.069	-6.42
RGL	9267	0.005	0.085	106932	0.003	0.058	-3.03
RegCap_ALLP	9264	9.53	0.847	106909	11.08	0.613	225.77
RegCap_Addbacks	9267	9.26	0.560	106932	11.02	0.569	285.50
RegCap_RGL	9264	9.32	0.594	106909	11.06	0.565	284.44
Accretive_ALLP	9267	0.107	0.309	106932	0.120	0.325	3.81
Accretive_Addback	9267	0.167	0.373	106932	0.139	0.346	-7.56
Accretive_RGL	9267	0.030	0.172	106932	0.014	0.117	-12.48
Size	9267	11.82	1.13	106932	12.27	1.44	29.23
Equity	9267	7.45	2.29	106932	8.66	2.53	44.37
NI	9267	-0.009	0.720	106932	0.316	0.388	70.59
UGL	9267	-0.028	0.305	106932	0.001	0.429	6.30
Loan	9267	75.84	12.16	106932	75.34	11.71	-3.92
Insider_Loan	9114	1.51	1.58	105580	1.58	1.63	4.11

The table shows descriptive statistics for commercial banks used in this paper. Panel A presents summary statistics for the full sample (column (1) to (3)), and the subsamples restricting the range to ±5% and ±2% around the 10% threshold of regulatory capital (column (4) to (6) and column (7) to (8), respectively). Panel B provides a comparative between banks that are ±2% around the threshold. All variables, except for *D_Enforcement* and *Size*, are multiplied by 100 for expositional convenience. Sample period 1996:Q1–2015:Q1.

Table 4: Enforcement actions and regulatory capital

	Enforcement action					
	(1)	(2)	(3)	(4)	(5)	(6)
RegCap	0.0011		-0.1310		-0.3926	
	(0.3960)		(-3.6095)		(-4.3064)	
Low_RegCap		0.0108		0.0105		0.0081
		(4.1846)		(4.1108)		(3.2968)
Size	0.0028	0.0028	0.0064	0.0067	0.0070	0.0072
	(2.9655)	(2.9654)	(4.4454)	(4.7107)	(3.2155)	(3.3101)
Equity	-0.0003	-0.0003	-0.0000	-0.0002	-0.0000	-0.0002
	(-4.8622)	(-4.6805)	(-0.1415)	(-1.0162)	(-0.0680)	(-0.6536)
LLP	0.0144	0.0139	0.0130	0.0127	0.0126	0.0127
	(7.9421)	(7.7079)	(4.9769)	(4.8968)	(3.4478)	(3.4561)
NI	-0.0029	-0.0024	-0.0042	-0.0040	-0.0035	-0.0036
	(-3.5305)	(-2.9975)	(-2.5831)	(-2.4681)	(-1.5633)	(-1.6432)
UGL	0.0004	0.0004	-0.0001	-0.0000	-0.0012	-0.0011
	(0.9363)	(1.0223)	(-0.1541)	(-0.0009)	(-1.4436)	(-1.3404)
Loan	-0.0001	-0.0001	-0.0002	-0.0001	-0.0002	-0.0001
	(-1.7955)	(-2.2010)	(-3.1100)	(-2.4045)	(-2.2251)	(-1.7223)
Sample	Full	Full	± 5	± 5	± 2	± 2
State controls	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter-year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	550,818	550,812	277,375	277,369	115,688	115,682
Adjusted R-squared	0.112	0.112	0.151	0.151	0.204	0.203

The table reports results from linear regressions that examine the relationship between regulatory capital and the probability of receiving an enforcement action in the following quarter. Columns (1) and (2) present the results for the full sample. Columns (3) and (4) present the results for a subsample of ±5% around the 10% threshold of regulatory capital. Columns (5) and (6) present the results for a subsample of ±2% around the threshold. Standard errors are clustered at the bank level. Robust t-values are reported below the coefficient estimates. Sample period 1996:Q1–2015:Q1.

Table 5: Regulatory capital manipulation using abnormal loan loss provisions

	Accretive ALLP					
	(1)	(2)	(3)	(4)	(5)	(6)
RegCap_ALLP	0.0253		-1.3312		-2.3272	
	(1.2204)		(-16.9761)		(-12.3419)	
Low_RegCap_ALLP		0.0542		0.0601		0.0499
		(12.7137)		(13.9478)		(11.0899)
Size	1.4729	1.4604	-0.8602	-0.5039	-1.8727	-1.7629
	(4.8492)	(4.7490)	(-2.3094)	(-1.3713)	(-3.1196)	(-2.9580)
Equity	0.0350	0.0888	0.8416	0.6147	0.8100	0.7301
	(1.1454)	(3.5314)	(16.1006)	(12.5440)	(10.9525)	(10.0789)
LLP	-5.7784	-5.9472	-3.5830	-3.6764	-1.9113	-1.9219
	(-11.7717)	(-12.1624)	(-6.5404)	(-6.6758)	(-2.3664)	(-2.3825)
NI	1.7278	2.0114	1.0242	0.9412	1.2140	1.1256
	(6.0842)	(7.0471)	(2.9647)	(2.7129)	(2.2926)	(2.1258)
UGL	1.8765	1.8670	1.0697	1.1549	0.9662	1.0122
	(4.9885)	(5.0121)	(4.1807)	(4.2732)	(3.5299)	(3.6440)
Loan	-0.3791	-0.3884	-0.3946	-0.3416	-0.3327	-0.3112
	(-38.7193)	(-41.7159)	(-30.2319)	(-27.8187)	(-17.4113)	(-16.6213)
Sample	Full	Full	± 5	± 5	± 2	± 2
State controls	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter-year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	550,504	550,504	277,470	277,470	115,679	115,679
Adjusted R-squared	0.237	0.238	0.202	0.202	0.220	0.220

The table reports results from linear regressions that examine the relationship between regulatory capital before ALLP and the probability of having accretive ALLP. Columns (1) and (2) present the results for the full sample. Columns (3) and (4) present the results for a subsample of ±5% around the 10% threshold of regulatory capital. Columns (5) and (6) present the results for a subsample of ±2% around the threshold. Standard errors are clustered at the bank level. Robust t-values are reported below the coefficient estimates. Sample period 1996:Q1–2015:Q1.

Table 6: Regulatory capital manipulation using addbacks

	Accretive Addbacks					
	(1)	(2)	(3)	(4)	(5)	(6)
RegCap_Addbacks	-0.2162		-1.8451		-3.4135	
	(-11.7726)		(-20.9335)		(-15.2610)	
Low_RegCap_Addbacks		0.0564		0.0681		0.0764
		(11.0014)		(13.6291)		(14.3335)
Size	-0.0255	-0.0221	-0.0219	-0.0170	-0.0168	-0.0151
	(-8.6544)	(-6.8267)	(-5.2156)	(-4.0412)	(-2.5005)	(-2.2466)
Equity	0.0101	0.0081	0.0094	0.0060	0.0073	0.0061
	(26.8302)	(23.7947)	(14.2520)	(10.6965)	(7.9351)	(6.9531)
LLP	-0.0679	-0.0720	-0.0612	-0.0607	-0.0770	-0.0766
	(-15.4440)	(-15.9609)	(-10.6267)	(-10.6672)	(-10.1909)	(-10.2355)
NI	-0.0394	-0.0405	0.0025	0.0004	0.0112	0.0102
	(-13.6869)	(-13.3487)	(0.6076)	(0.1099)	(1.9852)	(1.8282)
UGL	-0.0038	-0.0019	-0.0041	-0.0030	-0.0082	-0.0076
	(-2.1417)	(-1.1638)	(-1.4852)	(-1.2548)	(-2.3208)	(-2.2120)
Loan	0.0009	0.0015	0.0008	0.0015	0.0013	0.0016
	(9.3558)	(14.9603)	(5.3466)	(11.2744)	(5.7724)	(7.2548)
Sample	Full	Full	± 5	± 5	± 2	± 2
State controls	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter-year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	550,818	550,814	278,556	278,552	117,815	117,811
Adjusted R-squared	0.150	0.149	0.153	0.151	0.183	0.182

The table reports results from linear regressions that examine the relationship between regulatory capital before add-backs and the probability of having accretive add-backs. Columns (1) and (2) present the results for the full sample. Columns (3) and (4) present the results for a subsample of ±5% around the 10% threshold of regulatory capital. Columns (5) and (6) present the results for a subsample of ±2% around the threshold. Standard errors are clustered at the bank level. Robust t-values are reported below the coefficient estimates. Sample period 1996:Q1–2015:Q1.

Table 7: Regulatory capital manipulation using realized gains and losses

	Accretive RGL					
	(1)	(2)	(3)	(4)	(5)	(6)
RegCap_RGL	-0.0185		-0.3531		-0.4357	
	(-2.8112)		(-8.8007)		(-4.8711)	
Low_RegCap_RGL		0.0183		0.0173		0.0110
		(7.3351)		(6.9950)		(4.5502)
Size	0.4138	0.4472	0.1553	0.2529	0.3628	0.3888
	(3.5976)	(3.8847)	(1.0978)	(1.8027)	(1.7656)	(1.8913)
Equity	-0.0138	-0.0242	0.1480	0.0891	0.0988	0.0847
	(-0.9283)	(-1.7821)	(5.2238)	(3.4061)	(3.0370)	(2.6660)
LLP	0.6695	0.5678	0.2155	0.2026	0.1578	0.1524
	(2.7865)	(2.3742)	(0.7491)	(0.7015)	(0.4285)	(0.4136)
NI	-0.5394	-0.4869	-0.6313	-0.6465	-0.4085	-0.4145
	(-3.8501)	(-3.5054)	(-3.6792)	(-3.7838)	(-1.8731)	(-1.8988)
UGL	3.6525	3.6733	2.6557	2.6824	1.8083	1.8174
	(5.7655)	(5.7781)	(3.0049)	(3.0348)	(1.6640)	(1.6709)
Loan	-0.0970	-0.0933	-0.1069	-0.0929	-0.0818	-0.0779
	(-20.8888)	(-21.0428)	(-17.8243)	(-17.0020)	(-10.3933)	(-10.1275)
Sample	Full	Full	± 5	± 5	± 2	± 2
State controls	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter-year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	550,504	550,500	277,499	277,495	115,862	115,858
Adjusted R-squared	0.096	0.096	0.083	0.082	0.094	0.094

The table reports results from linear regressions that examine the relationship between regulatory capital before RGL and the probability of having accretive RGL. Columns (1) and (2) present the results for the full sample. Columns (3) and (4) present the results for a subsample of ±5% around the 10% threshold of regulatory capital. Columns (5) and (6) present the results for a subsample of ±2% around the threshold. Standard errors are clustered at the bank level. Robust t-values are reported below the coefficient estimates. Sample period 1996:Q1–2015:Q1.

Table 8: Spurious correlation

	Accretive_ALLP		Accretive_Addback		Accretive_RGL	
	(1)	(2)	(3)	(4)	(5)	(6)
Deficit_RegCap_X	0.0308		0.0339		0.0070	
	(5.4961)		(5.0467)		(2.1937)	
Deficit_[0,0.5]		0.0598		0.0968		0.0146
		(10.6092)		(15.8449)		(5.0125)
Deficit_[0.5,1]		0.0306		0.0528		0.0050
		(4.0080)		(5.4122)		(1.1739)
Deficit_[1,1.5]		0.0362		0.0495		0.0069
		(3.3944)		(4.0415)		(1.2602)
Deficit_[1.5,2]		0.0470		0.0253		0.0113
		(3.8159)		(2.0029)		(1.4913)
Bank controls	Yes	Yes	Yes	Yes	Yes	Yes
State controls	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter-year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	115,679	115,679	117,815	117,815	115,862	115,862
Adjusted R-squared	0.219	0.220	0.180	0.183	0.094	0.094

The table reports results from linear regressions that examine the relationship between deficit in regulatory capital before add-backs, ALLP or RGL ($max\{0, 10 - RegCap\_before\}$) and the probability of having suspect add-backs, ALLP, and RGL in columns (1), (3) and (6), respectively. In columns (2), (4) and (6) the explanatory variable is the regulatory capital deficit (before adjustments) for different intervals (Deficit_[i,j], between i and j%). We present the results for the subsample of ±2% around the threshold. Standard errors are clustered at the bank level. Robust t-values are reported below the coefficient estimates. Sample period 1996:Q1–2015:Q1.

Table 9: Regulatory capital manipulation before and after the last financial crisis

	Accretive_ALLP		Accretive_Addback		Accretive_RGL	
	(1)	(2)	(3)	(4)	(5)	(6)
Low_RegCap_ALLP	0.0422	0.0358				
	(9.4543)	(2.1719)				
Low_RegCap_Addbacks			0.0748	0.0655		
			(14.0482)	(5.5618)		
Low_RegCap_RGL					0.0169	0.0074
					(2.9485)	(0.4351)
RD Test	-7.4337	0.1612	-7.9771	-1.4745	-3.7767	0.2164
Sample period	B.C.	A.C.	B.C.	A.C.	B.C.	A.C.
Bank controls	Yes	Yes	Yes	Yes	Yes	Yes
State controls	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Quarter-year FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	87,079	12,541	88,037	13,387	86,744	13,139
Adjusted R-squared	0.217	0.130	0.216	0.259	0.064	0.179

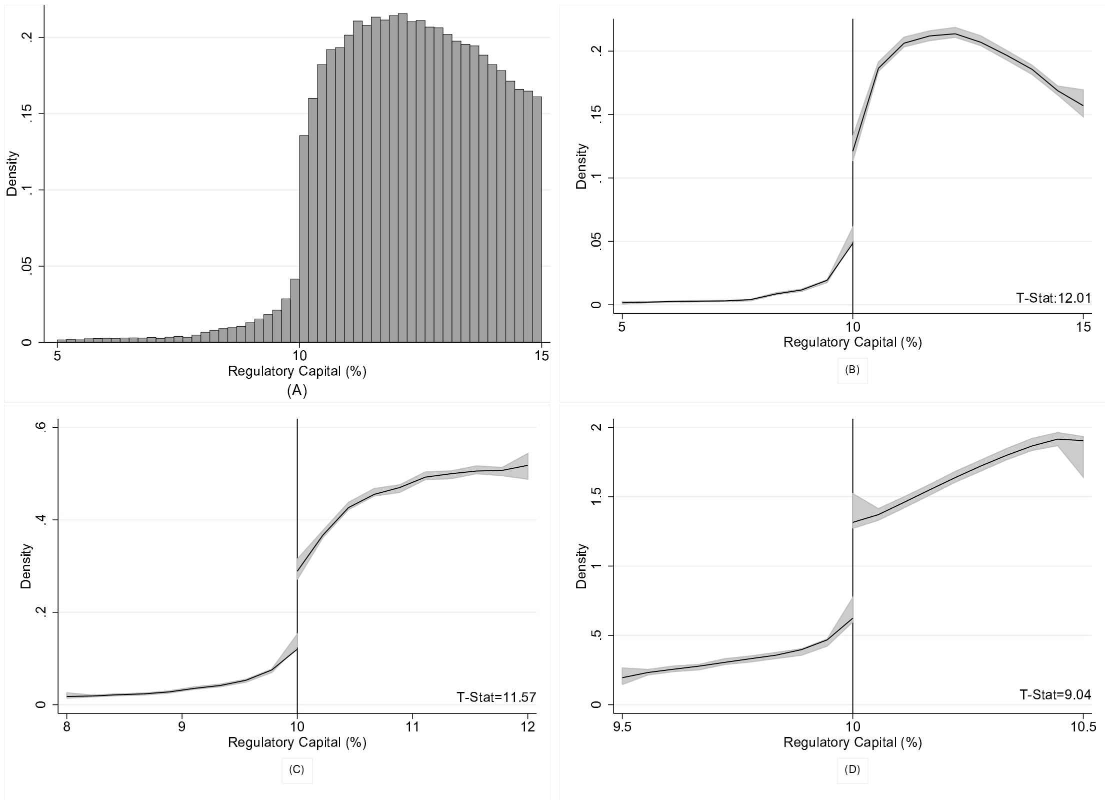
The table reports results from linear regressions that examine the relationship between regulatory capital before accounting manipulations and the probability of having accretive ALLP (Columns (1) and (2)), add-backs (Columns (3) and (4)) or RGL (Columns (5) and (6)) before (odd columns) and after (even columns) the last financial crisis. Standard errors are clustered at the bank level. Robust t-values are reported below the coefficient estimates. Sample period before the crisis 1996:Q1–2007:Q4 and after the crisis 2009:Q3–2015:Q1.

Table 10: Real effects

	D_Enforcement			D_Insider			D_NPA			D_Charge-Off		
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
Suspect_ALLP	0.004			0.032			0.278			-0.012		
	(1.041)			(1.165)			(6.416)			(-1.447)		
Suspect_AddBack		-0.007			0.040			0.062			0.030	
		(-3.206)			(1.694)			(2.363)			(4.035)	
Suspect_RGL			0.017			0.153			0.008			0.085
			(1.079)			(2.328)			(0.098)			(2.490)
Sample	± 0.5	± 0.5	± 0.5	± 0.5	± 0.5	±0.5	± 0.5	±0.5	± 0.5	±0.5		
Bank controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State controls	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank FE	No	No	No	No	No	No	No	No	No	No	No	No
Quarter-year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	17,208	17,217	17,206	16,748	16,758	16,746	16,748	16,758	16,746	16,748	16,758	16,746
Adj R-squared	0.014	0.014	0.014	0.013	0.013	0.013	0.078	0.073	0.072	0.076	0.077	0.077

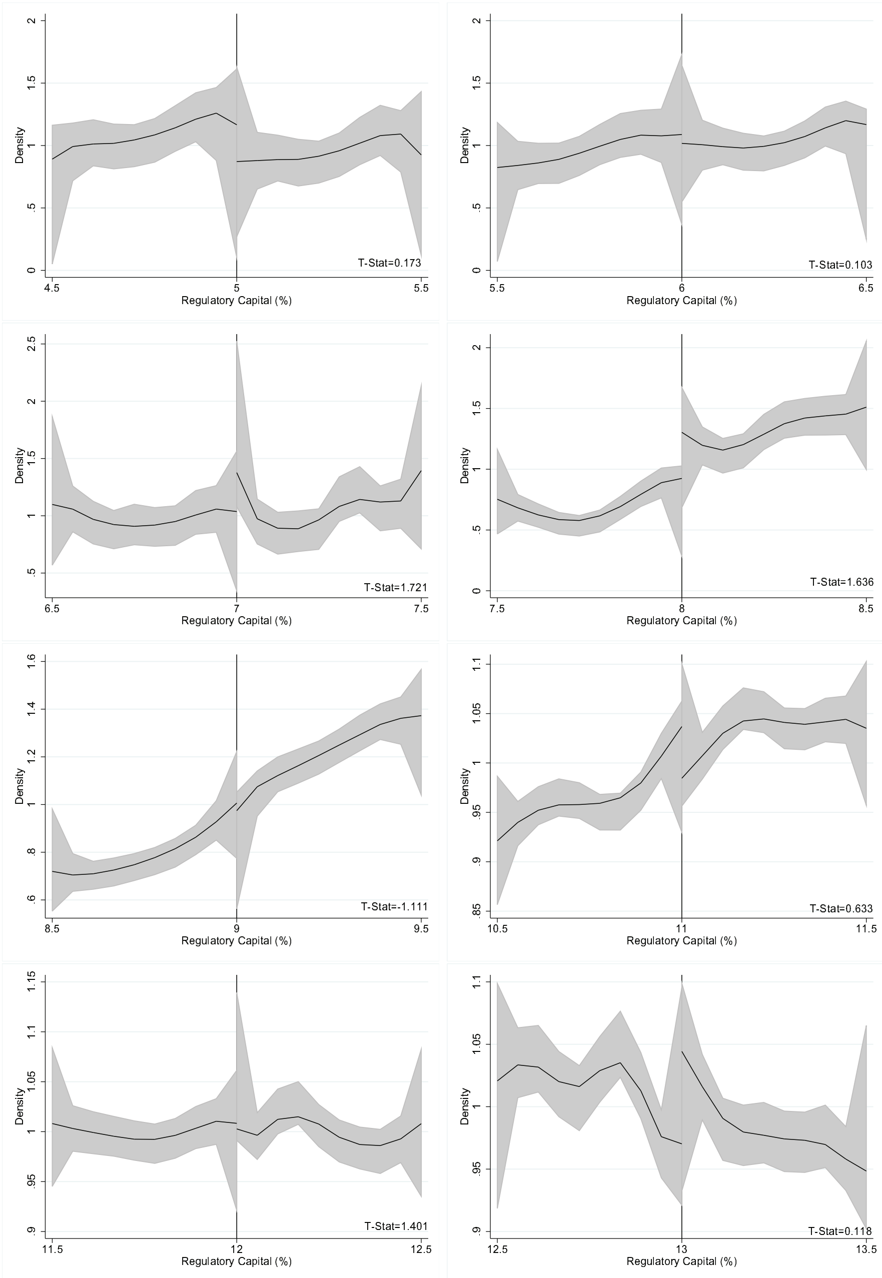
The table presents the results from linear regressions that examine the relationship between suspect banks (i.e., banks that would have missed the 10% regulatory capital threshold in the absence of ALLP, add-backs and RGL), and the probability of having an enforcement action (columns (1) to (3)), changes in insider loans (columns (4) to (6)), changes in non-performing assets (columns (7) to (9)), and changes in loan charge-off (columns (10) to (12)) in the following year. Standard errors are clustered at the bank level. Robust t-values are reported below the coefficient estimates. Sample period 1996:Q1-2009:Q4.

Figure 1: Discontinuity around the 10% Regulatory Capital



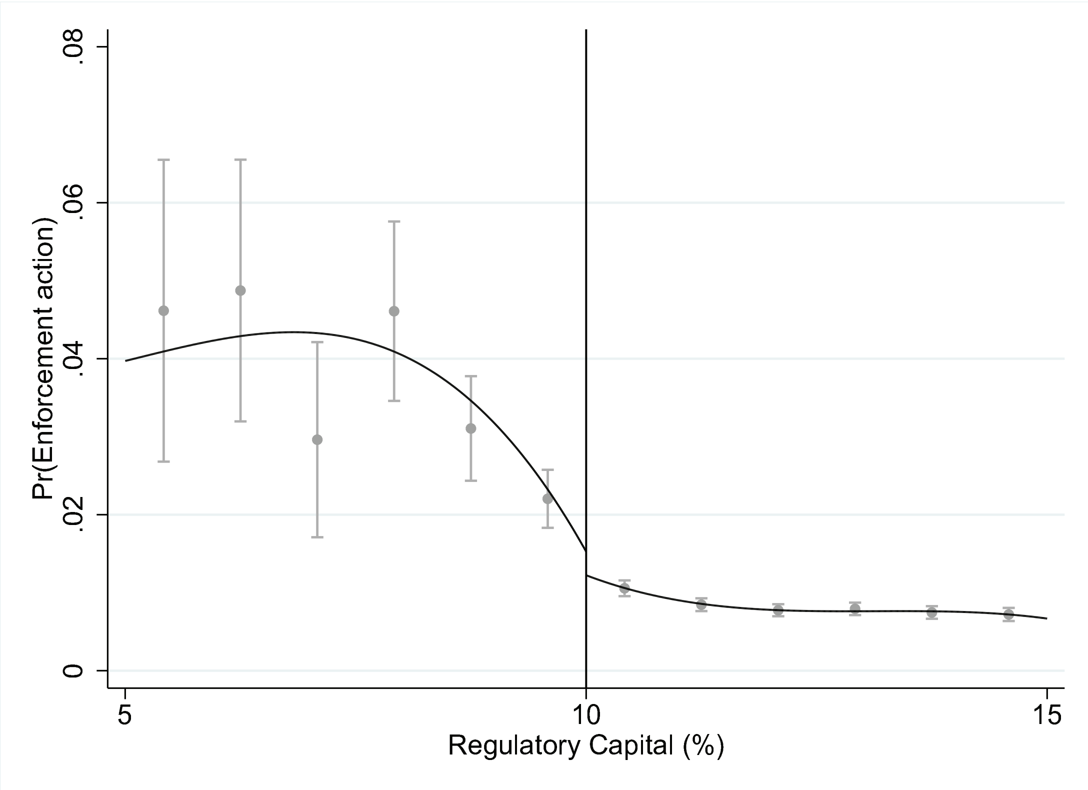
Panel (A) is the histogram of reported regulatory capital for the interval (5% to 15%). Panels (B), (C) and (D) show the regression discontinuity manipulation test using local polynomial density estimation (polynomial of order 2). Solid lines show the point estimates, and gray areas present 95% confidence intervals. T-statistics are presented in each panel. Panels (B), (C) and (D) display the discontinuity using the ± 5%, ±2% and ± 0.5% thresholds around the 10% regulatory capital, respectively

Figure 2: Discontinuity around other integers



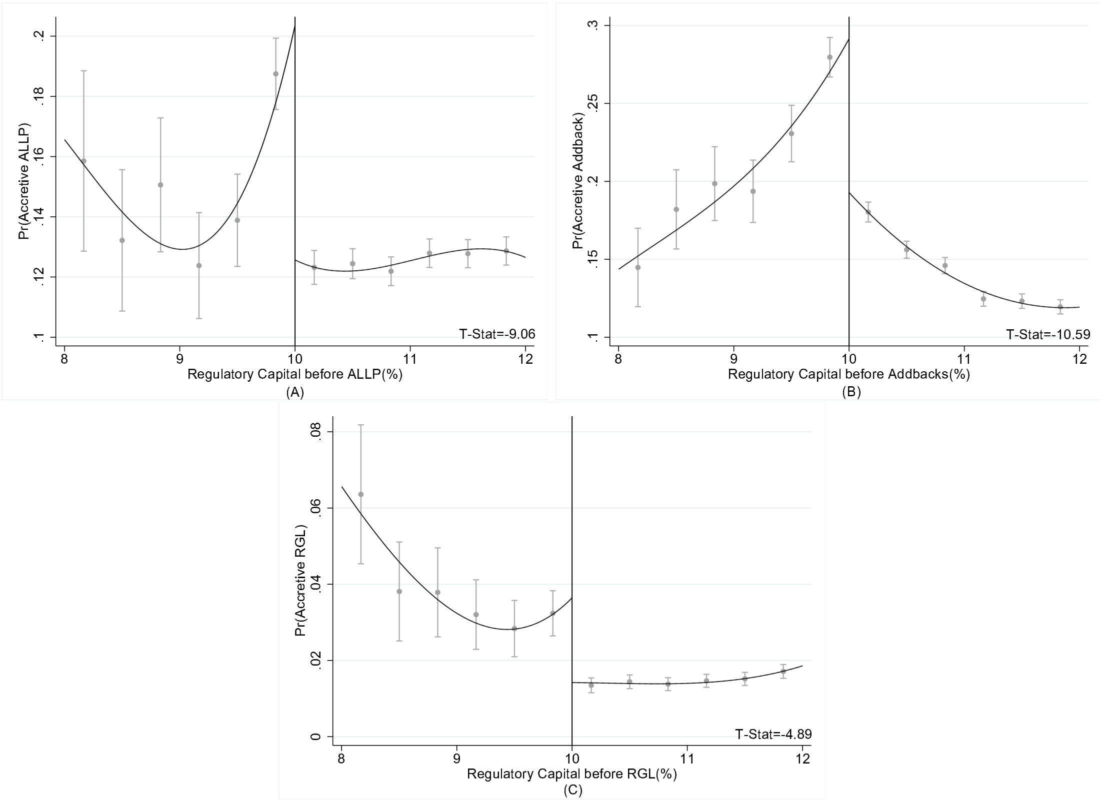
The figure present regulatory capital densities in the ± 0.5% intervals around different integers. T-statistics are presented in each panel.

Figure 3: Enforcement actions and Regulatory Capital



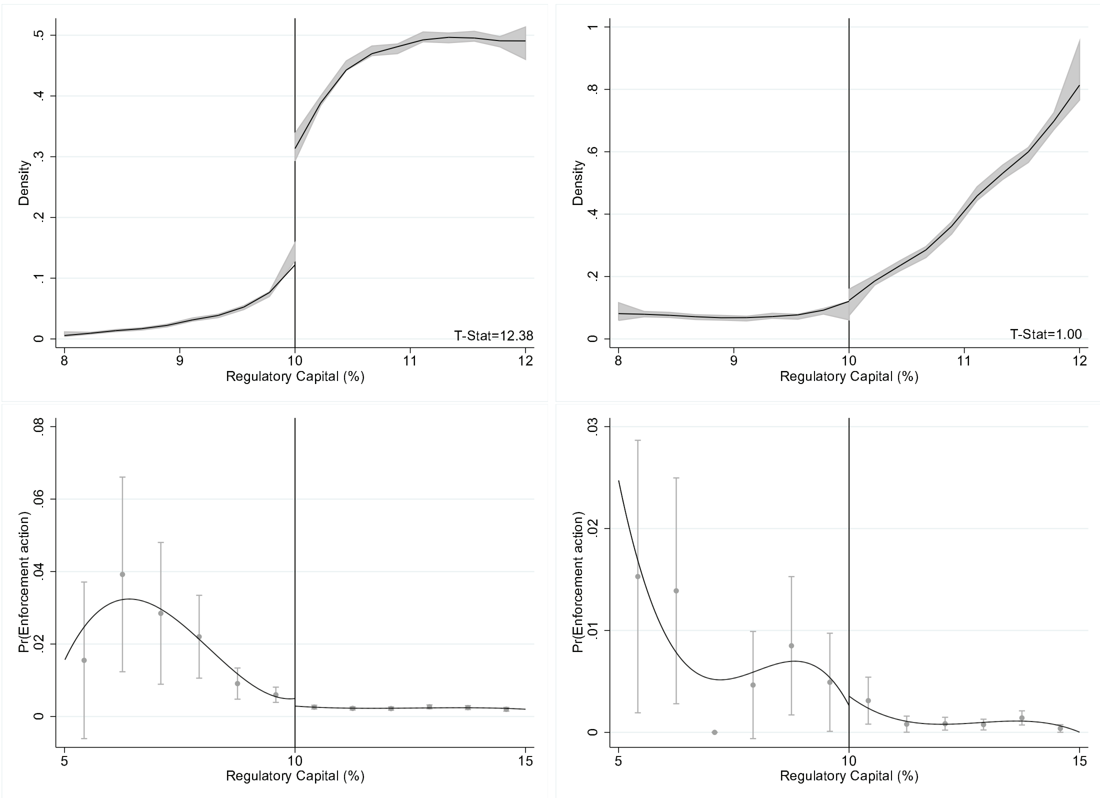
This figure presents the probability of receiving an enforcement action in the following quarter as a function of the reported regulatory capital. Dots represent the sample average within bin, and the vertical gray lines show the confidence intervals. The black line show the polynomial fit (order 3).

Figure 4: Discontinuity around the 10% of the adjusted Regulatory Capital



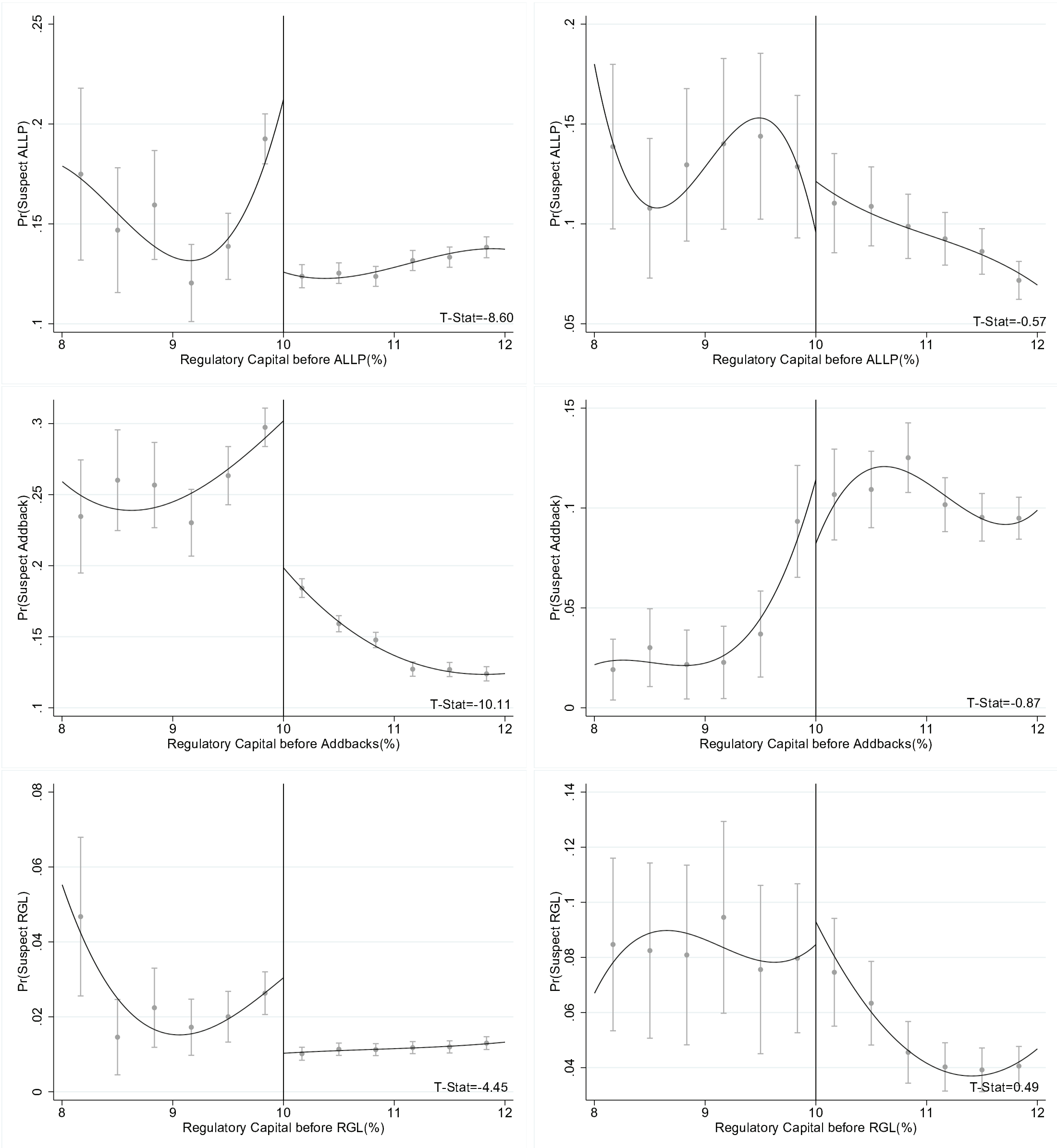
This figure presents the probability of having suspect abnormal loan loss provisions(Panel (A)), addbacks (Panel (B)), and realized gains and losses (Panel (C)) as a function of the regulatory capital before those items. Dots represent the sample average within bin, and the vertical gray lines show the confidence intervals. The black line show the polynomial fit (order 3).

Figure 5: Discontinuity before and after Basel III announcement



The figure present the discontinuity around the 10% threshold before (left column) and after (right column) the Basel III announcement for the ± 2% interval around the 10% threshold. Top panels show the density function of reported regulatory capital and bottom panels display the probability of an enforcement action.

Figure 6: Accounting manipulation before and after Basel III announcement

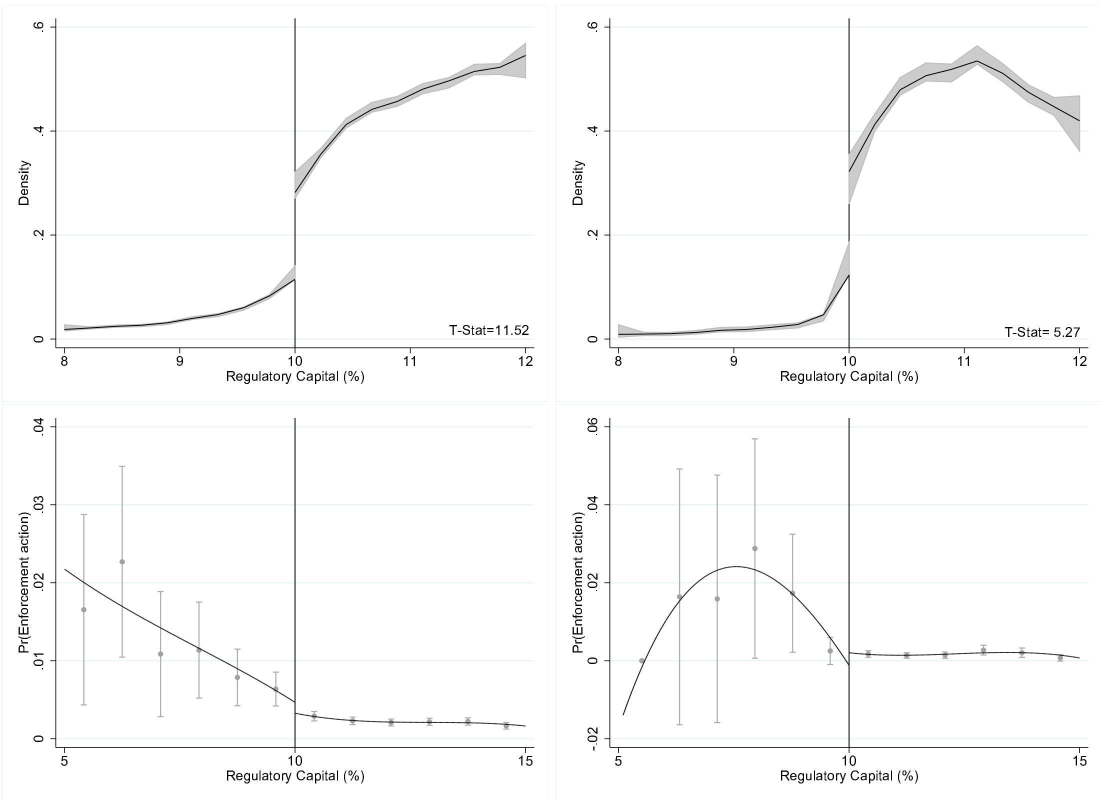


The figure present the discontinuity around the 10% threshold before (left column) and after (right column) the Basel III announcement for the ± 2% interval around the threshold. From top to bottom, the panels present the probability of having suspect ALLP, add-backs and RGL.

A Online Appendix

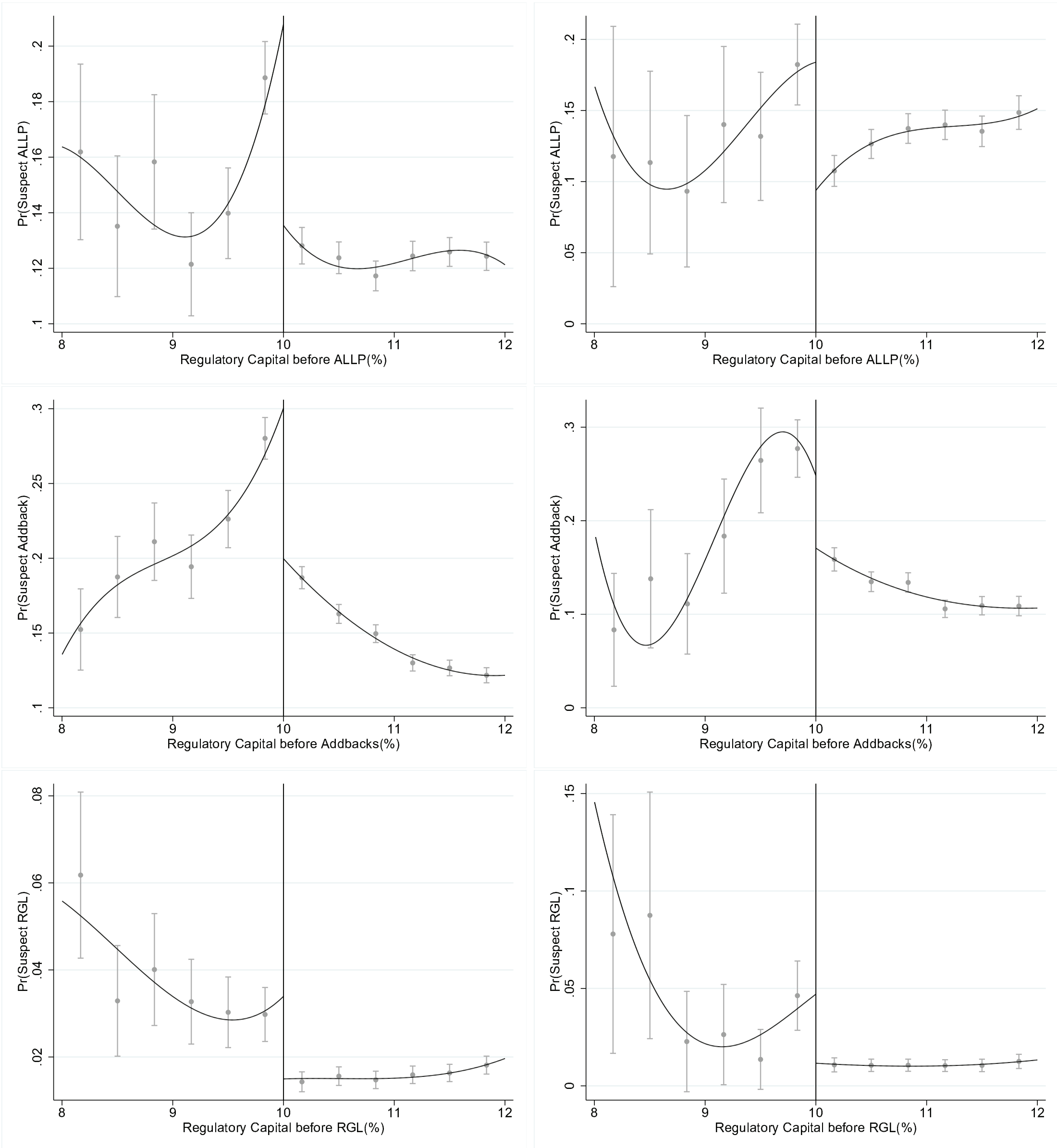
A.1 Private vs publicly traded banks

Figure A.1.1: Discontinuity for private and publicly traded banks



The figure present the discontinuity around the 10% threshold for private (left column) and public (right column) banks for the ± 2% interval around the 10% threshold. Top panels show the density function of reported regulatory capital and bottom panels display the probability of an enforcement action.

Figure A.1.2: Accounting manipulation for private and publicly traded banks



The figure present the discontinuity around the 10% threshold for private (left column) and public (right column) banks for the $\pm$ 2% interval around the threshold. From top to bottom, the panels present the probability of having suspect ALLP, add-backs and RGL.

A.2 Regulatory capital manipulation using different cutoffs for accretive ALLP, Addbacks and RGL

Table A.2.1: Regulatory capital manipulation

	Accretive_ALLP		Accretive_Addback		Accretive_RGL	
Panel A: Change in RegCap by at least 0.05%						
	(1)	(2)	(3)	(4)	(5)	(6)
RegCap_X	-3.7266		-4.9589		-0.6118	
	(-14.0453)		(-16.1613)		(-4.9947)	
Low_RegCap_X		0.0592		0.0923		0.0161
		(9.7791)		(14.0484)		(5.0753)
Observations	115,679	115,679	117,815	117,811	115,862	115,858
Adjusted R-squared	0.261	0.260	0.281	0.279	0.128	0.128
Panel B: Change in RegCap by at least 0.15%						
	Accretive_ALLP		Accretive_Addback		Accretive_RGL	
	(1)	(2)	(3)	(4)	(5)	(6)
RegCap_X	-1.4115		-2.5047		-0.2938	
	(-10.5506)		(-15.7968)		(-4.4670)	
Low_RegCap_X		0.0324		0.0597		0.0070
		(9.7740)		(14.2768)		(3.9806)
Observations	115,679	115,679	117,815	117,811	115,862	115,858
Adjusted R-squared	0.146	0.146	0.126	0.126	0.080	0.080
Panel C: Change in RegCap by at least 0.20%						
	Accretive_ALLP		Accretive_Addback		Accretive_RGL	
	(1)	(2)	(3)	(4)	(5)	(6)
RegCap_X	-0.8676		-2.0956		-0.2013	
	(-8.9349)		(-17.2852)		(-3.7504)	
Low_RegCap_X		0.0203		0.0492		0.0055
		(7.983)		(14.9883)		(3.7744)
Observations	115,679	115,679	117,815	117,811	115,862	115,858
Adjusted R-squared	0.100	0.100	0.092	0.092	0.069	0.069

The table reports results from OLS regressions that examine the relationship between RegCap before manipulations and the probability of having accretive ALLP (Columns 1 and 2), add-backs (Columns 3 and 4) or RGL (Columns 5 and 6) using different cutoffs for the accretive definition. Sample is restricted to banks in the ± 2% interval around the 10% threshold before adjustments. Bank and state controls are included as well as bank and year-quarter fixed effects. Robust t-values are reported below the coefficient estimates. Standard errors are clustered at the bank level.