How do banks respond to enforcement actions?

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Abstract

Using a unique dataset for virtually all enforcement actions imposed on US banks during the period 2004-2010, this paper examines the impact of these actions on various aspects of bank capital, risk and performance. The findings show that the actions are enacted primarily due to very high levels of risk-weighted assets and poor performance of the involved banks. Following the enforcement actions, risk-weighted capital falls and risk-weighted assets fall by even more to sustain a small increase in the main regulatory risk-weighted capital ratios. However, the falling bank performance and increasing insolvency risk only stabilize three to four quarters after the enforcement action, but the bank is still very risky compared to the industry average at least in the short-term. We suggest that prudential regulation should take the form of milder forms of enforcement actions, to be enacted well in advance the problems become severe.

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1. Introduction

The financial turmoil that started in 2007 and led to a panic in the fall of 2008 shows the importance of bank behavior in the formation and reinforcement of a financial crisis and calls for a rethinking of the current regulatory framework for financial institutions. A number of research studies (e.g., Delis and Staikouras, 2011; Caprio et al., 2008) or discussion papers from the Basel Committee and other international fora (e.g., Basel 2006) suggest that the most important vehicle for the efficient supervision of banks is the enforcement actions taken against banks from regulators for not complying with regulatory law on the books. This paper studies the impact of enforcement actions, also termed sanctions, on the regulatory capital of the involved banks, their risk and their performance. The analysis is carried out using (i) a unique sample that includes information on virtually all the sanctions imposed from the three primary US supervisory agencies on individual banks and (ii) the most recent period that encompasses the financial crisis of the late 2000s. To our knowledge, this is the first study that carries out such an analysis.

Clearly, the objective of an enforcement action taken against a bank is to improve transparency in the banking system, increase financial soundness, discipline banks for faulty behavior and set an example. Thus, in the long run, sanctions are expected to have a stabilizing effect on banks, through the improvement of financial soundness, optimization of their credit and liquidity risk, minimization of operational risk and higher market discipline (private monitoring). More specifically, an enforcement action on a bank for not complying with safety and soundness or other regulations could trigger a response from the managers of the involved bank towards the adjustment of the level of risk-based capital and the composition of the bank's assets. By definition, enforcement actions aim at more prudent bank behavior, which is associated with higher risk-based capital ratios. On this line, the sanction can cause a decrease in

total bank risk or a shift from traditional interest-income generating activities to non-interest income generating ones, or vice versa, depending on which of these activities is optimal for the bank.

However, in the short term the repercussions can be adverse. For example, a sanction might imply a drop in the overall performance of the involved bank, as this bank might find it difficult to obtain capital and short-term funding at usual rates. Moreover, the public announcement of the sanction could trigger a negative sentiment against the involved bank from its creditors, and in severe cases this can even lead to a bank run that would place considerable strain on this bank's performance and overall risk of insolvency. Further, to comply with regulatory minimum capital, a sanctioned bank may decide to reduce its overall asset position because of the potential problems to raise capital in the short run; and this could be more apparent during periods of liquidity shortage and distress. All these consequences can have important adverse effects on financial stability and the macroeconomic environment, as banks have been proved important players in shaping economic outcomes (e.g., Chen and Hasan, 2011; Ioannidou et al., 2009).

Given these considerations, an enforcement action can have both positive and negative effects on the risk and performance of the involved banks. This paper examines the impact of the event of the sanction on the bank's risk-based capital, overall risk and performance. If such changes in these fundamentals are identified following the event of the sanction, then our understanding of the impact of regulatory enforcement on individual risk strategies of banks and their performance will be greatly enhanced and appropriate policy implications can be given to regulators about how they can increase the efficiency of their policy.

To carry out this analysis we employ a rich dataset of enforcement actions imposed on US banks over the period 2004-2010. This is probably the most interesting period for the US banking sector since the Great Depression. Indeed, an increasing number of scholars and policy-makers have been questioning not only the types of banking regulations and accompanied regulatory laws, but also the effectiveness of regulators in enforcing these laws and the actual results that these enforcement actions have on banking fundamentals (e.g., Delis and Staikouras, 2011; FSB, 2010; Masciandro et al., 2011). In the present paper, we consider all the actions enacted by the three main regulatory bodies of the US banking system, namely the Federal Reserve Board (FRB), the Federal Deposit Insurance Corporation (FDIC) and the Office of the Comptroller of the Currency (OCC), and construct a dataset including information on sanctions for individual banks. Moreover, we distinguish between different classes (types) of sanctions as these can have a very different impact on banks' risk and performance. Specifically, we differentiate between four types of sanctions according to their potential influence on banks' safety and soundness, with class 1 including those actions that are most directly relevant for banks' safety and soundness, and class 4 those that are seemingly less likely to bear on banks' safety and soundness.

Our empirical strategy follows a well-established literature that considers the impact of an event on various aspects of the involved firm, here the bank (see e.g., Dewenter and Malatesta, 2001; Norden and Weber, 2010; Baek et al., 2011). The results do show that the sanctioned bank increases the basic regulatory capital ratios, but this increase occurs primarily through a large reduction in the risk-weighted assets. The fact that most sanctioned banks have regulatory capital levels well above the industry's median shows that the regulator targets the banks with very high risk-weighted assets. Since risky assets are the more profitable, a natural

outcome of this chain of events is that bank performance declines significantly and the risk of insolvency increases. The fact that this mechanism is primarily triggered by enforcement actions of class 1, which impose the most severe penalty on the banks, shows that regulators probably need to be more forward looking and act in advance when the first problems emerge. Based on our findings, the enforcement actions of other types appear to have a minor (if any) impact on bank risk and performance and these milder sanctions can be used to mitigate problems when these start to appear.

This study is related to a broad literature on the impact of bank regulatory law on the books on bank fundamentals (see e.g., Demirgüç-Kunt et al., 2008; Barth et al., 2008). Our analysis clearly distinguishes between banking regulation (i.e., law-on-the-books) and supervision (i.e., actual implementation of law-on-the-books). This is an important distinction because just altering regulatory law does not guarantee supervisory effectiveness. This study provides a clear understanding of the pros and cons of sanctioning banks for not complying with law on the books. Therefore, we contend that our findings have specific implications for regulators and supervisors alike, especially in the aftermath of the financial turmoil that begun in 2007.

This study is also related to a small and now somewhat dated literature on enforcement actions. Section 2 reviews this literature, which for the most part is about the effect of sanctions on bank lending and market prices, and further highlights the importance of a study that helps to identify the impact of enforcement actions on banks' capital, risk and performance. Section 3 discusses how the dataset for the present study is constructed, with an emphasis on enforcement actions. Section 4 presents the empirical method and analyzes the findings. Section 5 concludes.

2. Context and related literature

Enforcements actions, also termed sanctions, are remedial measures against supervised financial institutions, which have been found to violate regulatory law on the books. Generally, bank regulators pursue enforcement actions against banks for violations of laws, rules and regulations, unsafe or unsound banking practices, breaches of fiduciary duty, violations of final orders and conditions imposed in writing or written agreements. In addition, the regulator has the statutory authority to terminate the deposit insurance of any insured depository institution if the institution is found guilty for these practices. In other words, sanctions represent the primary disciplinary mechanism of supervising agencies to enforce laws, rules, or regulations and promote safe and sound banking practices.

From a theoretical standpoint, the materialization of legal standards (law-on-the-books) through the employment of enforcement actions is viewed as the means that gives the law "teeth to bite" and offers meaning to the otherwise "blank letter" of legal rules (e.g., Bhattacharya and Daouk, 2002). Swindle (1995) and DeYoung et al. (2001), among others, suggest that the positive relationship between the frequency of on-site audits and banking discipline is due to the fact that the information gained by supervisors following examinations enables them to apply appropriate remedial measures on imprudent banks. Also, according to the second pillar of Basel II, on-site inspections constitute an essential component of supervisory review, in concert with the application of appropriate sanctions where breaches of law are revealed (Basel Committee, 2006).

Quite surprisingly, however, empirical research exploring the nexus between supervisory enforcement actions and bank behavior has been scarce, to say the least. To the best of our knowledge, pending the present paper, no research has gathered raw data on enforcement actions

by all three US bank supervisors (FDIC, FRB, OCC) and assessed their impact on bank behavior, let alone taking into account their classification according to the underlying rationale and their relevance for bank safety and soundness. The latter classification is quite significant for the determination of which types of sanctions are the most effective vehicles for promoting sound banking practices.

The seeds of the discussion can be traced back in the 1991 US General Accounting Office Report on bank supervision, which concluded, from the elaboration of a small sample of 72 formal enforcement actions, that employing the most forceful actions leads to better outcomes in both capital improvement and correcting the causes of capital depletion (US GAO, 1991). In two subsequent papers, Peek and Rosengren (1995, 1996) verify that formal enforcement actions imposed upon New England banks during 1989-1993 by the FDIC and the OCC resulted in the shrinkage of loan portfolios and bank lending, rather than in capital increases. Using data for FDIC enforcement actions for the period 1980-1996, Curry et al. (1999) find that formal enforcement actions are likely to be effective in correcting weaknesses, where bank management can control (i.e., increase the rate of both loan-loss provisioning and net loan charge-offs, reduce cash dividend distributions) as opposed to when external factors play a greater role (e.g., increase external capital injections and, to some extent, reduce asset growth). Finally, and more relevant to the present work, Delis and Staikouras (2011) built a new panel data with information on the number of on-site audits and sanctions for seventeen countries over the period 1998-2008 and infer a linear and negative relation between sanctions and bank risk. However, this study only has information for the aggregate annual number of enforcement actions.

The present work may also be associated, albeit less directly, with the line of research examining the correlation between stock prices and disclosure of enforcement actions. Brous and

Leggett (1996) find a negative stock price reaction to the disclosure of enforcement actions, but do not infer whether this result is attributable to the communication of unfavorable information about the bank's financial health or to curtailment of bank risk-taking behavior. Jordan et al. (1999) report negative abnormal stock returns following publication of enforcement actions consistent with the announcement conveying adverse information about banks' financial condition. Similarly, Slovin et al. (1999) find negative effects upon the targeted bank's equity value after publication of formal enforcement actions, noticing that such actions not only increase regulatory costs for the targeted bank (additional supervisory scrutiny, follow-up examinations, adoption of corrective actions) but also inhibit risk-taking and limit the potential to induce externalities on rivals or/and transfer risk to the deposit insurance fund. In contrast, Gilbert and Vaughan (2000) focus on deposit growth rates and deposit yields spread and find no evidence of unusual deposit withdrawals or spread increases following the announcement of formal actions.

Evidently, none of the above studies utilizes the full range of enforcement actions from all regulatory agencies to infer the impact of these sanctions on a series of bank fundamentals at the bank level. Further, there is no distinction by the type of sanction, and this distinction might provide important insights of the type of action needed to shield the banking sector from systemic problems. Finally, the most relevant literature utilizing panel data at the sanction- and bank-level is now quite dated and does not incorporate an analysis of the events that led to the financial turmoil of the late 2000s.

3. Data

In this section we discuss the data used in the empirical analysis, placing the spotlight on the novel sample of enforcement actions and their categorization. Subsequently, we discuss in some detail the bank-level response variables and only provide a brief note on the control variables of our study.

3.1. Enforcement actions

We start with data on all formal enforcement actions that have been imposed by the three main U.S. banking supervisory authorities (FDIC, FRB and OCC) for the period 2004Q1-2010Q4.[1] This is a new hand-collected dataset with a total number of 4,664 sanctions enacted on institutions that are located in the U.S. We examine these cases one by one and exclude some sanctions (413 in total) that are not relevant to the safety and soundness of the financial institution involved. These are the sanctions characterized as, e.g., "terminating order to cease and desist; decision and order on motion for reconsideration; order of approval of termination of insurance; decision and order on interlocutory review", etc.. After deleting these observations, we end up with 4,251 enforcement actions.

We match the name, city and state of each sanctioned bank with the relevant data from the commercial bank and bank holding companies call reports (FFIEC 031/041 and Y-9C Call reports, respectively). If there is any discrepancy between the information provided in the sanctions reports and the call reports we drop the relevant observations. This yields a dataset consisting of 3,974 enforcement actions. In the next step, we classify each of these enforcement actions into four classes (types). We examine the information on these actions on a one-by-one basis from the U.S. banking supervisory authorities' websites and look into their underlying

[1] Informal actions (e.g., memoranda of understanding, bank board resolutions) are not publicized and, thus, are not included.

rationale. On the basis of their raison d'être and relevance for banks' safety and soundness, we then break formal enforcement actions down into four classes. Class 1 encompasses those actions that are most directly relevant for banks' safety and soundness, while class 4 comprises those actions that are seemingly less likely to bear on banks' safety and soundness.[2]

Class 1 encompasses actions that have been taken for violations of the requirements concerning banks' financial soundness (e.g., capital adequacy and liquidity, asset quality, provisions and reserves, large exposures and exposures to related parties). Due to their gravity, we also include actions for failure to comply with prior written agreements, as well as for operating without supervisory authorization. Class 2 comprises actions that have been taken for violations of the requirements regarding banks' internal organization (e.g., internal control and audit systems, including risk management systems, as well as money laundering, bank secrecy, consumer protection and foreign assets control). We generate a separate category from class 1 actions to differentiate between sanctions imposed for breaches of financial soundness vis-à-vis organizational requirements of banks. Class 3 includes actions that have been imposed for breaches of the requirements concerning the fitness and propriety of banks' board members and senior management, as well as other persons closely connected with banks (institution affiliated parties). Finally, class 4 encompasses actions that have been taken for residual reasons, i.e., they

[2] Although the classification contains an element of inherent subjectivity, we are confident that it reflects quite accurately the comparative significance of the formal enforcement actions for banks' safety and soundness, taking into account the Basel Committee's categorization and the US regulatory and supervisory practices. More specifically, the 2006 Basel Committee Core Principles for Effective Banking Supervision explicitly delineates the hardcore of the so-called "prudential requirements", or "safety and soundness requirements" (Principles 6 to 18) to encompass capital adequacy, risk management (including liquidity risk management), quality of assets, adequacy of provisions and reserves, large exposure limits and control of exposures to related parties, as well as internal control and audit systems, including anti-money laundering mechanisms. At a secondary level – as evidenced by the 2011 Basel Committee Consultative Document on Core Principles for Effective Banking Supervision – prudential requirements also comprise the corporate governance of banks, including the fitness and propriety of Board members, senior management and bank's wider group. The refinement of the taxonomy (i.e., creation of four classes) has been dictated by the need to capture the idiosyncratic features of the US regulatory and supervisory framework in the field and the relevant literature distinguishing between "management-internal control weaknesses", "financial problems", "fraudulent behavior of affiliated parties" and "(typical) violations of laws like FDPA and HMDA" (Curry et al., 1999; Brunmeier and Willardson, 2006).

refer to typical infringements of specific laws, which are most likely only remotely related to banks' safety and soundness (e.g., Home Mortgage Disclosure Act, Flood Insurance Act, Flood Disaster Protection Act, Federal Trade Commission Act, Equal Credit Opportunity Act).

Since the call reports data are available on a quarterly basis, we match the sanctions' effective dates with the relevant quarters. For example, all sanctions effective from January 1st to March 31st are matched with the first quarter of that year. Whenever two enforcement actions of different classes that are imposed on a single financial institution become effective in the same quarter, we keep only the enforcement action of the higher class. This choice is justified by the rationale that the effect of the most important enforcement action outshines the less important one. This assumption reduces our dataset to 3,543 enforcement actions. Further, due to call reports' data availability constraints (missing data for the response variables), our dataset reduces to 2,916 enforcement actions imposed on 2,480 distinct institutions (i.e. more than one actions of the same type have been imposed on some financial institutions over the period examined). From these institutions 2,207 are commercial banks and 273 are bank holding companies.

We examine the impact of enforcement actions on a battery of response variables during a time window of (-4, +4) quarters around the sanction quarter. We perform our analysis only for the cases where the time window is clean of any other enforcement action besides that imposed in the event's quarter. In other words, we keep only those observations where the sanction at time t is the only one imposed during the (-4, +4) quarters. This restriction produces a dataset of 1,907 enforcement actions, imposed on 1,707 financial institutions from which 1,617 are commercial banks and 90 are bank holding companies. Based on this cross-sectional dataset of enforcement actions, we construct the unbalanced panel dataset that includes all variables to be

used in the empirical analysis. Since we use a time window around the event, we employ accounting data for the period 2003Q1 – 2011Q4. In this unbalanced panel dataset, the number of cross-sections is further reduced from 1,707 to 1,642, due to some missing observations for the bank-level control variables.

Table 1 provides (i) descriptive statistics for the number of enforcement actions in Panel A and (ii) a classification according to the type of these actions in Panel B. In Panel A, the columns correspond to the supervisory authorities and the rows to the years of the sample. Each cell reports two numbers. The first corresponds to the total number of available enforcement actions and the second to the number of actions employed in our final dataset. In Panel B, the columns correspond to the number of sanctions by class.

As the figures in Panel A show, the number of sanctions originating from all three regulators rises sharply after 2008 and this shows the heavy toll that the financial crisis took on the financial institutions. Yet, this also shows, even partially, that regulators did not quite foresee the seeds of the crisis and did not react prudentially. The distribution across time of the sanctions included in the final dataset is quite similar with that of the initial data. Panel B shows that the class 1 sanctions constitute the largest group (about 47% of total sanctions in the sample), while sanctions of type 2 constitute the smallest group.

3.2. Response variables

To examine how banks respond to enforcement actions we use a number of response variables that characterize capital, risk and performance of banks. We provide exact definitions for these variables in Table 2. All these variables are from the Call reports. The first variable is the total risk-based capital ratio. We complement this ratio with its decomposition, i.e., equivalent ratios

for Tier 1 and Tier 2 capital. The three ratios are the most widely used ratios by researchers and regulators to assess the level of bank capital as a fraction of the risk-weighted assets. A higher level for these ratios, especially for the first two, reflects a higher degree of capitalization and a lower probability of insolvency.

To identify whether sanctions have an impact on the level of regulatory capital, or whether they affect distinctively bank capital and assets, we also employ the (logarithm of) total, Tier 1 and Tier 2 capital, respectively (i.e., without dividing by risk-weighted assets). In further work, we use both risk-weighted assets and total assets. In doing this, we will examine whether, following the event of the sanction, banks decide to shrink their assets instead of raising capital so as to comply with regulatory capital requirements. As a more direct proxy for the level of bank risk in bank portfolios, we consider the ratio of risk-weighted assets to total assets. The change in this ratio would reveal the change in the riskiness of bank assets following the event of the sanction.

The final tests involve the impact of enforcement actions on the risk-related bank performance. The simplest measure of performance is bank profitability, which is usually measured by the ratio of total profits before tax to total assets (ROA). We complement this basic ratio with the standard deviation of bank profits over a period of 12 quarters and the Z-score (explicit definitions are provided in Table 2). These measures reflect both performance and probability of default and are used quite frequently in the related banking literature (e.g., Delis and Staikouras, 2011; Demirgüç-Kunt et al., 2008). Finally, we consider the ratio of the non-interest income to total income, i.e., the means through which banks generate revenue. A change in this ratio would reveal whether, following the sanction, banks shift from traditional income-generating activities to non-traditional activities, or vice versa.

3.3. Control variables

An analysis of the impact of sanctions on the banking fundamentals discussed in the previous sub-section, using conventional regression techniques, requires the use of some control variables to avoid the omitted-variables problem. We start with a large number of bank-level characteristics pertaining to liquidity, provisions, problem loans and the availability of deposits. Many of these bank characteristics have been shown to have a significant impact on bank capital, risk and performance measures in the previous banking literature (e.g., Demirgüç-Kunt et al., 2008; Flannery and Rangan, 2008; Boyd et al., 2006). We enhance these measures with bank characteristics like bank size and the mix of interest and non-interest income.

After carrying out a number of initial regressions and using a large number of potential control variables, we resort to the following controls (explicit definitions are provided in Table 2). To measure bank liquidity we use the ratio of liquid assets to total assets. In our setting, liquid assets include cash and balances due from depository institutions plus the fair value of held to maturity U.S. treasury securities. We include the U.S. treasury securities as these are short-term securities that are very easily liquidated. As a proxy for provisions for loan losses, we use the ratio of the allowance for loan and lease losses over the total loans and leases that are net of unearned income. Besides provisions for loan losses, we also control for the actual loan losses, using the ratio of nonaccrual to total loans and leases, net of unearned income. Further, we control for potential changes in the liability side of the bank's balance sheet by using the simple ratio of total deposits to total assets. Finally, we control for bank size and non-interest income by using the log of total assets and the ratio of non-interest income to total income, respectively. All the bank level variables are from the Call reports.

Besides these bank characteristics, we experiment with many structural and macroeconomic variables that may drive our results. In our final regressions, we include three variables common to all banks that play an important role in our regressions. The first is the industry's median of the dependent variable, where "industry" refers to all banks operating in the USA for which the Call reports provide data for each quarter. We simply call this variable "median of dependent variable" and we construct it based on data from the Call Reports. We use this variable to capture potential trends in the behavior of all US banks. In doing so, we avoid attributing these trends to the coefficients on the dummy variables characterizing the impact of sanctions on the dependent variables. We further discuss this issue in our econometric methodology that follows. The second variable is the federal funds rate, which shows the direction in the Central Bank rate and, as such, the perception of the Fed concerning the state of the macroeconomic environment. The third is the real GDP growth rate (year-on-year) that accounts for the impact of fluctuations in economic activity on the response variables. Clearly, when the economy fluctuates it is natural to affect analogously the balance sheet of banks. The last two variables are obtained from the Federal Reserve Bank of St. Louis.

4. Methodology and results

This section analyzes the empirical methodology and the findings for the impact of enforcement actions on the banking fundamentals discussed in Section 3. Before we proceed with estimations, and given the richness of the dataset, it is worth visualizing the behavior of our response variables following the sanction in simple graphs. We present the fluctuations in our main response variables in the four quarters before and after the sanction along with the

fluctuations of the respective medians for all banks in Figures 1-12. The vertical line depicts the time the sanction is enacted.

A quite interesting story emerges right away. As Figures 1 and 2 show, the falling trend in important variables, such as the risk-based capital ratio and the Tier 1 capital ratio (i.e., the most important component of bank capital) reverses two quarters before the enactment of the sanction and these ratios improve thereafter. This implies either that the banks react to their falling capital ratios through a self-discipline mechanism, or that they foresee the sanction given an associated audit by the regulators that usually takes place 3-6 months before the enactment of the sanction. Notably, the sanctioned banks have higher risk-based capital ratios than the median of the industry, which has further implications to be analyzed below.

Figures 4 to 6 reveal an even more interesting development. Following the enforcement action, both the level of risk-based capital and the Tier 1 and Tier 2 components fall. For the total risk-based capital and the Tier 1, the event line constitutes a structural break: the already negative slope becomes steeper, denoting an accelerated fall in bank capital after the sanction. At first, this seems counter-intuitive in light of the fact that the relevant ratios increase and that the mere reason behind the sanction is to improve bank fundamentals. So what really causes this development? The answer comes from observing Figures 7 and 8, which reflect the behavior of the risk-weighted assets ratio and the level of risk-weighted assets, respectively. Clearly, the trend in these variables is negative. The sanctioned banks have quite higher risk levels than the median of the industry and this is most probably the reason behind the sanction and the reason for having very high risk-based capital levels compared to the industry's median. Especially for the level of risk-weighted assets, which is the denominator in the risk based capital ratios, the event of the sanction accelerates the fall and this contradicts the trend of the median across the

industry, which is upward sloping. Phrased differently, the sanctioned bank raises its capital ratio by lowering its risk-weighted assets by more than the decline in its level of capital.

This development should have important implications from a managerial and a regulatory perspective. The decline in the already high level of regulatory capital of the sanctioned banks shows that these financial institutions opt to lower their very high risk-weighted assets. Yet, the decline in risk-weighted assets and bank size is usually associated with a decline in bank profitability and an increase in the probability of insolvency. Figures 10-12 illustrate the return on assets (ROA), the volatility of ROA and the Z-score around the event of the sanction. The respective medians for these three variables are relatively stable, while the variables reflecting the behavior of the sanctioned banks fluctuate significantly in the time window around the event. ROA and the Z-score of the sanctioned banks are quite lower than the respective medians and still falling, while the volatility of ROA is higher than the industry's median and rising. Even though the sanctioned banks remain quite riskier than the industry average a year after the enactment of the enforcement action, an optimistic finding is that all three variables seem to stabilize three to four quarters after the sanction.

Overall, the story emerging from the graphs is that banks with higher than average risk-weighted assets are forced to hold very high levels of regulatory capital and this adversely affects their performance. This seems to be the main reason behind imposing a sanction for safety and soundness issues in the first place. Further, this sanction has the effect of reducing the level of capital, reducing the level of risk-weighted assets by even more, and stabilizing bank performance three to four quarters after the sanction. Yet, the average sanctioned bank remains quite riskier than the industry average a year after the event. The figures discussed above already provide a qualitative analysis of our findings, but tell us very little about the statistical

significance of the observed changes or about the differential effect of different classes of sanctions. To quantify these fluctuations and provide deeper insights, we resort to two different estimation methodologies, which we discuss in turn below along with the associated findings.

4.1. Univariate tests

We first look at the impact of enforcement actions on the capital, risk and performance of sanctioned financial institutions using univariate tests. This methodology, also employed in several other event studies (e.g., Dewenter and Malatesta, 2001; Norden and Weber, 2010; Baek et al., 2011), has the advantage of simplicity and transparency regarding the possible effect of a sanction on the response variables. More specifically, we look at the impact of sanctions on the response variables described in Section 3.2, before and after the sanction quarter. For each response variable we calculate its annual averages for each bank over the (t-4) – (t-1) and the (t+1) – (t+4) periods, where t is the event quarter. This choice also deals with seasonality in the financial accounting data that may drive the results. Subsequently, we compare the means across sanctions of these averages. The former captures the mean behavior of the response variable before the sanction; the latter the mean behavior after the sanction.

Table 3 reports the results from the univariate tests for changes in capital, risk and performance of banks around the time the sanction is imposed. For these initial tests, we use all types of enforcement actions and a time window equal to four quarters before and four quarters after the sanction. The most interesting column is the one reporting the difference between the averages of the relevant response variables over the time window prior to the enforcement action and the averages of these variables over the time window after the sanction is imposed.

The results for the differences in all the variables reflecting capitalization of banks (Panel A) are statistically insignificant at conventional levels. More specifically, the changes in the risk-

based capital ratio and the Tier 1 ratio are positive and the changes in the levels of the capital variables are negative. These findings are in line with Figures 1 to 6, but the univariate tests show that these changes are statistically insignificant.

The most significant fluctuations in banking fundamentals concern risky assets and performance. Specifically, as the results in Panel B of Table 3 show, a sanction reduces significantly and within one year the risk-weighted assets ratio of the average bank from about 0.74 to about 0.715, which is a considerable decrease for such a small period of time. Along with the decline in this credit-risk related ratio, bank performance also deteriorates and, thereby, the overall solvency risk of the average bank increases. As shown in the equations with the return on assets as the response variable, the enforcement action takes a heavy toll on the profits of the involved banks. Specifically, the return on assets of the average sanctioned bank turn from slightly positive to negative, indicating that sanctioned banks incur losses during the first year following the enactment of the sanction. This considerable effect of the enforcement action on the bank's profitability extends to increased fluctuations in profitability and higher solvency risk. The standard deviation of the return on assets is 18% higher following the sanction. Further, the risk of insolvency, as measured by the Z-score, is approximately 5% higher (i.e., the Z-score is lower) in the first year after the sanction, as compared to the year before the sanction.

In the results presented in Table 4, we distinguish between the different classes of actions. As expected, the strongest results are related to the first class of sanctions, whereas enforcement actions of class 2 or 3 do not seem have an effect on any of our response variables according to the univariate tests. Finally, enforcement actions of class 4 have an effect only on the return on assets and the Z-score.

Evidently, column I shows a very similar story to the one of Table 3. The new element is that most of the responses in the bank fundamentals are larger and more significant. The fall in the levels of the three risk-based capital variables is now statistically significant and this is effect is stronger for the total risk-based capital and for Tier 1. The risk-weighted assets ratio falls by 4.7 points, following the enactment of the sanction, as opposed to the 2.5 points decline documented in Table 3. Even more importantly, the return on assets declines by almost 53%, the volatility of ROA increases by 34% and the Z-score decreases by almost 12%.

Overall, the findings of Table 4 show that enforcement actions of type 1 lead to quite large fluctuations in bank fundamentals, as opposed to the rest of the types of sanctions. Given these findings, one could argue that "milder" enforcement actions, which are imposed on banks for reasons only remotely related to banks' safety and soundness, can have a prudential effect on banks without causing very large fluctuations in banking fundamentals. This also shows that prudential supervision needs to identify banking problems at a more advanced stage and regulators need to act by relying increasingly on milder types of enforcement actions when they identify the seeds of these problems.

4.2 Panel regression analysis

The univariate tests described above, though straightforward, can be criticized on the basis of not taking explicitly into account other forces, common and/or idiosyncratic, that may drive the results. This is a standard omitted-variables problem that could lead to falsely attributing the behavior of the bank response variable to the event. Given this consideration, we additionally employ a panel fixed effects model of the form:

$$y_{it} = \delta_i + \beta_1 Sanction_{i,t-4\to t-3} + \beta_2 Sanction_{i,t-2\to t-1} + \beta_3 Sanction_{i,t} +$$
$$+\beta_4 Sanction_{i,t+1\to t+4} + \sum_{k=1}^{3} \gamma_k Common_{k,t} + \sum_{j}^{7} \varepsilon_j Bank_{ji,t-1} + u_{it} \quad (1)$$

In equation (1) y is the response variable for bank i at time t and t is also the time when the sanction (event) takes place. Four dummy variables, termed *Sanction* enter the main estimated equations. The first equals to one for the quarters t-4 and t-3. The second equals to one for the quarters t-2 and t-1. The third equals one for the quarter of the event and the fourth equals one for the quarters t+1 to t+4. The reason for this differentiation is the behavior of the bank fundamentals shown in the figures above, where some of the response variables (e.g. the capital ratios) react prior to the enactment of the sanction. In other words, our modeling choice should reflect, through the relevant coefficient estimates, the underlying changes in the response variables between the periods up to t-2, from t-2 to t-1 and from t+1 onward. *Common* is a vector of the three structural and macroeconomic variables described in Section 3.3 and *Bank* the vector of the bank-specific variables. The latter enter the equation lagged once to reduce endogeneity bias stemming from reverse causality.

Equation (1) is estimated with OLS and robust standard errors clustered by bank. We infer the effect of the sanction on bank fundamentals from simple Wald tests of equality of the form $\beta_4 - \beta_1 = 0$ and $\beta_4 - \beta_2 = 0$. These tests reveal the change in the response variables between the relevant periods before and after the sanction. A potential concern is the possible presence of endogeneity in the model. Our model controls for the macroeconomic environment, but another type of endogeneity could also be present. Intuitively, a sanction is usually imposed on a financial institution with deteriorating risk-weighted capital, overly risk-taking behavior and/or unstable performance. Note, however, that in our setting, even if the residuals are correlated with the *Sanction* dummies, our focus is on the Wald test of equality between the pairs of coefficients

given above. Given that the endogeneity bias in β_1, β_3 and β_4, if any, would be in the same direction and approximately of the same order (as the dummies are included to capture the same event) the differences between the three coefficients would be unbiased (i.e. the biases will cancel out). We verify this below by additionally using an instrumental variables regression as a robustness check.

We present the results for the capital-related variables in Table 5 and for the rest of the variables in Table 6. The results reported in both these tables confirm, in general, the findings from the figures and the univariate tests, but also provide a richer picture about the statistical and economic significance of the changes in specific bank fundamentals, as the coefficient estimates in these tables are not subject to omitted-variables bias. The important findings are the ones from the Wald tests reported in the lower part of Tables 5 and 6. The most significant changes in Table 5 are those observed for the risk-based capital ratio (column I). The nature of the responses, i.e. the larger change is identified for the difference $\beta_4 - \beta_1$, confirms the story illustrated by Figure 1. Most of the other response variables appear to also change in the way reflected in the respective figures, however the changes are insignificant. An exception is the fall in the Tier 2 capital after the sanction, which shows that sanctioned banks tend to reduce items such as undisclosed reserves, general provisions and subordinated debt.

Once again, the impact of enforcement actions on bank risk and performance is quite stronger. In Table 6 the response of all variables except from ROA and non-interest income bears some statistical significance associated with the event. Both the risk-weighted assets ratio and its level fall. The magnitude of the fall for the risk-weighted assets ratio does not seem to be of very high economic significance. In contrast, a change of -0.0108 in the risk-weighted assets implies that for a bank with e.g. $100,000 initial worth of such assets, the sanction will decrease

this value by $4,320 within four quarters; this seems to be a considerable effect. A statistically and economically significant effect is also observed for the effect of the sanction on bank size and the Z-score. Between the two quarters before the sanction and the year after the sanction the change in bank size indicates that for a bank with e.g. $100,000 initial worth of total assets, the sanction will decrease this value by $3,170 per quarter or $12,680 per year. Further, the 0.058 point reduction in the Z-score per quarter indicated by the difference $\beta_4 - \beta_1$ is a very large change if one considers that the sample average for the Z-score equals 2.937 (i.e., approximately a 2% reduction per quarter).

Tables 7 and 8 confirm the finding that the most significant changes in bank fundamentals come from sanctions of class 1.[3] The statistical and economic significance of virtually all the coefficient estimates on the Wald tests show once again the stronger effect of sanctions of type 1, compared to the equivalent estimates in Tables 5 and 6. Most notably, the Wald tests reported in Table 8 show that changes in the risk-weighted assets, bank size, the volatility of ROA and the Z-score are very large, while for the first time the non-interest income of the sanctioned banks seems to decrease considerably. These results add to the story provided by the figures and the univariate tests in that the very large increase in the probability of default (the difference between β_4 and β_1 in the Z-score equation is as high as 0.155 per quarter) could render the decrease in the risk-weighted assets an inefficient outcome.

In Tables 9 to 11 we report the results from the impact of enforcement actions of type 2, 3 and 4 on the bank fundamentals. We only report the results on these fundamentals where we identify a statistical significant effect of the sanction. In general, and unlike the findings from the univariate tests, the results show that the impact of less important types of sanctions on several

[3] To save space we do not report the coefficient estimates on the control variables from this point onward. These estimates are available on request.

response variables is quite significant. In particular, the Wald tests reported in the first column of all three tables suggest that the risk-based capital ratio and the Tier 1 capital ratio increase significantly. However, and especially for sanctions of type 3 and 4, this increase originates from higher levels of capital (see columns III and IV of Table 10 and columns II and III in Table 11). More importantly, the risk-weighted assets are not significantly affected by sanctions of type 3 and 4, and the Z-score is not adversely affected by any of the sanctions of type 2, 3 or 4. This is an important finding from a policy perspective, because it suggests that the regulator can achieve the goal of reduced bank risk without hurting solvency risk if the banking problems are identified at an early stage and their solution requires a milder form of enforcement actions.

In a nutshell, the results from the panel-data method confirm the finding that the risk-weighted assets shrink shortly after the enactment of the enforcement action. However, the associated very large increase in the risk of insolvency, especially under the impulse of sanctions of class 1, renders the validity of this regulatory approach questionable. After all, the ultimate goal of regulatory actions is to stabilize and strengthen the problematic financial institutions. A solution to this problem clearly comes from identifying soundness and safety issues at an early stage and implementing milder forms of enforcement actions.

5. Conclusions

TO BE ADDED

References

Baek, J. S., Bae, K. H., Kang, J. K., Liu, W. L., 2011. Do controlling shareholders' expropriation incentives imply a link between corporate governance and firm value? Theory and evidence. Journal of Financial Economics, forthcoming.

Barth, J., Caprio, G., Levine, R., 2008. Bank regulation are changing: For better or worse? World Bank Policy Research Working Paper 4646. Washington, D.C.

Basel Committee on Banking Supervision, 2006. International Convergence of Capital Measurement and Capital Standards.

Berger, A., Davies, S., 1998. The information content of bank examinations. Journal of Financial Services Research 14, 117-144.

Bhattacharya, U., Daouk, H., 2002. The world price of insider trading. Journal of Finance 57, 75-108.

Boyd, J.H., De Nicolo, G., Jalal, A.M., 2006. Bank risk-taking and competition revisited: New theory and new evidence. IMF Working Paper, No. WP/06/297.

Brous, P.A., Leggett, K., 1996. Wealth effects of enforcement actions against financially distressed banks. Journal of Financial Research 19, 561-577.

Caprio, G., Demirgüç-Kunt, A., Kane, E., 2008. The 2007 meltdown in structured securitization: Searching for lessons, not scapegoats. World Bank Policy Research Working Paper No 4756.

Chen, Y., Hasan, I., 2011. Subordinated debt, market discipline, and bank risk. Journal of Money, Credit, and Banking 43, 1043-1072.

Curry, T., O'Keefe, J., Coburn, J., Montgomery, L.. 1999. Financial distressed banks: How effective are enforcement actions in the supervision process? FDIC Banking Review 12: 1-18.

Delis, M.D., Hasan, I., Mylonidis, N., 2012. The risk-taking channel of monetary policy in the USA: Evidence from micro-level data. MPRA Working paper, No. 34084.

Delis, M.D., Staikouras, P., 2011. Supervisory effectiveness and bank risk. Review of Finance 15, 511-543.

Demirgüç-Kunt, A., Detragiache, E., Tressel, T., 2008. Banking on the principles: Compliance with Basel Core Principles and bank soundness. Journal of Financial Intermediation 17, 511-542.

DeYoung, R., Flannery, M., Lang, W., Sorescu, S., 2001. The information content of bank exam ratings and subordinated debt prices. Journal of Money, Credit and Banking 33, 900-925.

Dewenter, K.L., Malatesta, P.H., 2001. State-owned and privately owned firms: An empirical analysis of profitability, leverage, and labor intensity. American Economic Review 91, 320-334.

Financial Stability Board (FSB), 2010. Intensity and effectiveness of SIFI supervision. Basel, Switzerland.

Flannery, M.J., Rangan, 2008. What caused the bank capital built-up of the 1990s? Review of Finance 12, 391-429.

Gilbert, R., Vaughan, M., 2000. Do depositors care about enforcement actions? Federal Reserve Bank of St. Louis Working Paper 20A.

Jordan, J., Peek, J., Rosengren, E.S., 1999. The impact of greater bank disclosure amidst a banking crisis. Federal Reserve Bank of Boston Working Paper 1.

Ioannidou, V., Ongena, S., Peydro, J.L., 2009. Monetary policy, risk-taking, and pricing: Evidence from a quasi-natural experiment. Discussion Paper 2009-31 S, Tilburg University, Center for Economic Research.

Kothari, S.P., Warner, J.B., 2007. Econometrics of event studies. In: Eckbo, B.E. (Ed.), Handbook of Corporate Finance: Empirical Corporate Finance. Elsevier/North-Holland, Amsterdam.

Masciandro, D., Pansini, R.V., Quintyn, M., 2011. The economic crisis: Did financial supervision matter? IMF Working Paper No. WP/11/261.

Norden, L., Weber, M., 2010. Credit line usage, checking account activity, and default risk of bank borrowers. Review of Financial Studies 23 (10), 3665-3699.

Peek, J., Rosengren, E.S., 1995. Bank regulatory agreements in New England. New England Economic Review May/June Issue, 15-24.

Peek, J., Rosengren, E.S., 1996. Bank regulatory agreements and real estate lending. Real Estate Economics 24, 55-73.

Slovin, M.B., Sushka, M.E., Polonchek, J.A., 1999. An analysis of contagion and competitive effects at commercial banks. Journal of Financial Economics 54, 197-225.

Swindle, C., 1995. Using CAMEL ratings to evaluate regulator effectiveness at commercial banks. Journal of Financial Services Research 9, 123-141.

US General Accounting Office (GAO), 1991. Bank supervision: Prompt and forceful regulatory actions needed. Report to the Chairman, Subcommittee on Financial Institutions Supervision, Regulation and Insurance, Committee on Banking, Finance and Urban Affairs, House of Representatives available at http://www.gao.gov/products/ GGD-91-69.

Table 1. Enforcement actions: Descriptive statistics

Panel A. Number of enforcement actions

	FDIC	OCC	FRB	Total
2004	174 / 87	133 / 36	45 / 23	352 / 146
2005	156 / 79	159 / 53	29 / 13	344 / 145
2006	202 / 108	139 / 51	27 / 11	368 / 170
2007	192 / 124	115 / 23	27 / 19	334 / 166
2008	271 / 143	154 / 68	62 / 9	487 / 220
2009	573 / 245	223 / 100	239 / 60	1,035 / 405
2010	777 / 410	239 / 134	315 / 111	1,331 / 655
Total	2,345/ 1,196	1,162 / 465	744 / 246	4,251 / 1,907

Panel B. Number of enforcement actions in the final sample according to class

	Class of enforcement action				
	1	2	3	4	Total
2004	45	23	45	33	146
2005	29	20	69	27	145
2006	29	22	77	42	170
2007	32	22	32	80	166
2008	84	19	44	73	220
2009	250	27	37	91	405
2010	430	30	69	126	655
Total	899	163	373	472	1907

Notes: Panel A reports two numbers separated by a slash. The first corresponds to the number of available enforcement actions related to the safety and soundness of the financial institution involved per year and per regulator, and the second to the number of enforcement actions included in the final sample used in the empirical analysis. These enforcement actions in the final sample have been imposed on 1,707 different financial institutions. Panel B reports the number of enforcement actions in the final sample according to class.

Table 2. List of variables and definitions

Variable	Definition
A. Response variables	
Risk-based capital ratio	Total qualifying capital allowable under the risk-based capital guidelines / risk-weighted assets (net of allowances and other deductions))
Tier 1 risk-based capital ratio	Tier 1 capital allowable under the risk-based capital guidelines / risk-weighted assets (net of allowances and other deductions))
Tier 2 risk-based capital ratio	Tier 2 capital allowable under the risk-based capital guidelines / risk-weighted assets (net of allowances and other deductions))
Risk-based capital	Natural logarithm of total qualifying capital allowable under the risk-based capital guidelines
Tier 1 risk-based capital	Natural logarithm of Tier 1 capital allowable under the risk-based capital guidelines
Tier 2 risk-based capital	Natural logarithm of Tier 2 capital allowable under the risk-based capital guidelines
Risk-weighted assets ratio	Risk-weighted assets (net of allowances and other deductions) / total assets
Risk-weighted assets	Natural logarithm of risk-weighted assets (net of allowances and other deductions)
Bank size	Natural logarithm of total assets
Bank profits (ROA)	Income or loss before income taxes and extraordinary items and other adjustments / total assets
Standard deviation of ROA (STDROA)	Standard deviation of ROA, calculated in a rolling 12 quarters window
Non-interest income	Total non-interest income / (total interest income + total non-interest income)
Z-score	log[(ROA+(equity capital / total assets))/STDROA]
B. Explanatory variables	
Sanction	Dummy variable equals 1 for the quarter during which an enforcement action is imposed on a sanctioned financial institution and 0 otherwise
Liquidity	(Cash and balances due from depository institutions + fair value of held to maturity U.S. treasury securities) / total assets
Provisions	Allowance for loan and lease losses / total loans and leases net of unearned income
Non-performing loans	Total loans and lease finance receivables: nonaccrual / total loans and leases net of unearned income

Bank size	Log(total assets)
Deposits ratio	Total deposits / total assets
Non-interest income	Total non-interest income / (total interest income + total non-interest income)
Median of dependent variable	Cross-sectional median of all banks in each quarter of the respective dependent variable
Federal-funds rate	Effective federal funds rate (Federal Reserve Bank of St. Louis and authors' calculations)
Real GDP growth rate	Change of the real GDP, y-o-y, source Federal Reserve Bank of St. Louis

Table 3. Sanctioned financial institutions: Univariate tests for all types of enforcement actions

		Pre quarters (t-4) – (t-1)	Post quarters (t+1) – (t+4)	Difference Post – Pre (t-stat.)
A. Capital				
Risk-based capital ratio	Mean	0.1434	0.1466	0.0032
	St. error	0.0014	0.0017	(1.4019)
	Obs.	1,775		
Tier 1 capital ratio	Mean	0.1315	0.1341	0.0026
	St. error	0.0014	0.0017	(1.1721)
	Obs.	1,862		
Tier 2 capital ratio	Mean	0.0124	0.0125	0.0001
	St. error	0.0001	0.0001	(0.7322)
	Obs.	1,778		
Risk-based capital	Mean	10.0099	9.9736	-0.0363
	St. error	0.0310	0.0319	(-0.817)
	Obs.	1,763		
Tier 1 capital	Mean	9.9849	9.9434	-0.0415
	St. error	0.0331	0.0344	(-0.8688)
	Obs.	1,851		
Tier 2 capital	Mean	7.5661	7.5560	-0.0101
	St. error	0.0348	0.0350	(-0.2044)
	Obs.	1,748		
B. Risk and performance				
Risk-weighted assets ratio	Mean	0.7398	0.7151	-0.0247***
	St. error	0.0027	0.0026	(-6.6454)
	Obs.	1,863		
Risk-weighted assets	Mean	12.1001	12.0566	-0.0435
	St. error	0.0352	0.0357	(-0.8675)
	Obs.	1,869		
Bank size	Mean	12.4275	12.4205	-0.0070
	St. error	0.0346	0.0351	(-0.141)
	Obs.	1,899		
ROA	Mean	0.0006	-0.0015	-0.0021***
	St. error	0.0003	0.0003	(-4.601)
	Obs.	1,868		
STDROA	Mean	0.0072	0.0085	0.0013***
	St. error	0.0002	0.0002	(5.1744)
	Obs.	1,699		
Non-interest income	Mean	0.1237	0.1199	-0.0038
	St. error	0.0028	0.0031	(-0.9138)
	Obs.	1,862		
Z-score	Mean	2.8490	2.7164	-0.1326***
	St. error	0.0163	0.0213	(-4.9403)
	Obs.	1,586		

Notes: The table reports the univariate tests for the equality of means across sanctions between the averages over the (t-4) – (t-1) and the (t+1) – (t+4) periods of the respective variables, when an enforcement action has been imposed at t. For the differences t-statistics are reported in parentheses. Obs. denotes the number of available observations. All variables are explicitly defined in Table 2. Sample period is 2004Q1 – 2010Q4. The ***, **, and * marks denote statistical significance at the 1, 5 and 10% level, respectively.

Table 4. Sanctioned financial institutions: Univariate tests per class of enforcement actions

		I			II			III			IV		
		Pre	Post	Diff.	Pre	Post	Diff.	Pre	Post	Diff.	Pre	Post	Diff.
A. Capital													
Risk-based capital ratio	Mean	0.1327	0.1367	0.0040	0.1590	0.1630	0.0040	0.1521	0.1552	0.0031	0.1526	0.1540	0.0014
	St. error	0.0019	0.0028	(1.1808)	0.0061	0.0069	(0.4367)	0.0028	0.0034	(0.6884)	0.0031	0.0028	(0.3347)
	Obs.	848			120			348			459		
Tier 1 risk-based capital ratio	Mean	0.1211	0.1245	0.0034	0.1447	0.1485	0.0037	0.1395	0.1425	0.0031	0.1409	0.1415	0.0006
	St. error	0.0021	0.0028	(0.969)	0.0055	0.0063	(0.4463)	0.0028	0.0033	(0.7058)	0.0031	0.0028	(0.1452)
	Obs.	885			136			370			471		
Tier 2 risk-based capital ratio	Mean	0.0130	0.0131	0.0001	0.0128	0.0129	0.0002	0.0124	0.0125	0.0001	0.0116	0.0119	0.0003
	St. error	0.0002	0.0002	(0.461)	0.0006	0.0005	(0.2377)	0.0001	0.0001	(0.7322)	0.0002	0.0002	(1.1786)
	Obs.	849			120			1778			460		
Risk-based capital	Mean	9.8755	9.7204	-0.1551***	10.1514	10.1741	0.0227	10.2225	10.3050	0.0825	10.0567	10.1311	0.0744
	St. error	0.0417	0.0419	(-2.6223)	0.1662	0.1693	(0.0958)	0.0783	0.0798	(0.7377)	0.0536	0.0553	(0.9658)
	Obs.	836			120			348			459		
Tier 1 risk-based capital	Mean	9.7401	9.5695	-0.1706***	10.3019	10.3379	0.0361	10.3758	10.4643	0.0885	10.0393	10.1126	0.0733
	St. error	0.0402	0.0407	(-2.982)	0.1638	0.1694	(0.1531)	0.0922	0.0941	(0.6716)	0.0579	0.0594	(0.8839)
	Obs.	873			137			370			471		
Tier 2 risk-based capital	Mean	7.5470	7.4399	-0.107*	7.6240	7.6546	0.0306	7.6769	7.7543	0.0774	7.5020	7.5906	0.0886
	St. error	0.0458	0.0452	(-1.662)	0.1945	0.1967	(0.1107)	0.0893	0.0906	(0.6087)	0.0611	0.0622	(1.0172)
	Obs.	827			119			345			457		
B. Risk and performance													
Risk-weighted assets ratio	Mean	0.7592	0.7126	-0.0466***	0.7179	0.7113	-0.0066	0.7017	0.7018	0.0002	0.7397	0.7312	-0.0085
	St. error	0.0035	0.0032	(-9.9511)	0.0127	0.0140	(-0.3483)	0.0065	0.0062	(0.0185)	0.0052	0.0053	(-1.1431)
	Obs.	886			136			370			471		
Risk-weighted assets	Mean	11.9411	11.7870	-0.1541***	12.3401	12.3239	-0.0162	12.4305	12.5065	0.0761	12.0697	12.1324	0.0627
	St. error	0.0424	0.0418	(-2.5868)	0.1812	0.1818	(-0.0631)	0.0993	0.1013	(0.5364)	0.0625	0.0635	(0.7034)
	Obs.	889			137			372			471		
Bank size	Mean	12.2271	12.1367	-0.0904	12.7829	12.8043	0.0214	12.8046	12.8810	0.0764	12.3847	12.4599	0.0752
	St. error	0.0412	0.0409	(-1.5566)	0.1696	0.1690	(0.0894)	0.0961	0.0985	(0.5554)	0.0604	0.0615	(0.873)
	Obs.	891			163			373			472		
ROA	Mean	-0.0059	-0.0091	-0.0031***	0.0039	0.0014	-0.0025	0.0070	0.0070	-0.0001	0.0068	0.0053	-0.0016***
	St. error	0.0004	0.0006	(-4.493)	0.0011	0.0011	(-1.6121)	0.0004	0.0004	(-0.0937)	0.0004	0.0004	(-3.0421)
	Obs.	889			138			371			470		
STDROA	Mean	0.0082	0.0110	0.0028***	0.0077	0.0078	0.0001	0.0066	0.0064	-0.0002	0.0056	0.0057	0.0001
	St. error	0.0002	0.0003	(7.5271)	0.0013	0.0009	(0.0528)	0.0004	0.0004	(-0.3946)	0.0003	0.0002	(0.2159)
	Obs.	814			117			333			435		

Non-interest income	Mean	0.1022	0.0964	-0.0058	0.1579	0.1569	-0.0010	0.1645	0.1565	-0.0080	0.1218	0.1242	0.0024
	St. error	0.0037	0.0048	(-0.9502)	0.0120	0.0114	(-0.058)	0.0071	0.0067	(-0.8198)	0.0048	0.0049	(0.3531)
	Obs.	882			137			372			471		
Z-score	Mean	2.6028	2.2945	-0.3083***	3.0268	2.9555	-0.0713	2.9807	3.0251	0.0444	3.1109	3.1186	0.0077
	St. error	0.0259	0.0347	(-7.1232)	0.0554	0.0762	(-0.7576)	0.0328	0.0323	(0.9649)	0.0217	0.0246	(0.2337)
	Obs.	714			113			331			428		

Notes: The table reports the univariate tests for the equality of means across sanctions between the averages over the (t-4) – (t-1) and the (t+1) – (t+4) periods of the respective variables, per class of enforcement action imposed at t. a) class 1 in column I; b) class 2 in column II; c) class 3 in column III; d) class 4 in column IV. Sample period is 2004Q1 – 2010Q4. The differences are defined as Post – Pre, t-statistics are reported in parentheses. Obs. denotes the number of available observations. All variables are explicitly defined in Table 2. The ***, **, and * marks denote statistical significance at the 1, 5 and 10% level, respectively.

Table 5. Panel model: Effect on bank capital – All classes of enforcement actions

	I	II	III	IV	V	VI
Dependent variable:	Risk-based capital ratio	Tier 1 risk-based capital ratio	Tier 2 risk-based capital ratio	Risk-based capital	Tier 1 risk-based capital	Tier 2 risk-based capital
Intercept	1.0648***	0.8378***	-0.0000	0.5103**	0.6561**	-5.5151***
	(12.0804)	(13.7318)	(-0.0250)	(2.0335)	(2.2046)	(-56.6980)
Sanction $_{(-4, -3)}$	-0.0005	-0.0008	0.0003***	-0.0021	-0.0033	0.0201***
	(-0.5990)	(-1.1658)	(5.7039)	(-0.5701)	(-0.8647)	(4.8365)
Sanction $_{(-2, -1)}$	0.0007	-0.0007	0.0005***	-0.0075*	-0.0111***	0.0301***
	(0.8089)	(-0.9803)	(6.7753)	(-1.7432)	(-2.3908)	(5.8462)
Sanction $_{0}$	0.0028**	0.0004	0.0005***	-0.0034	-0.0065	0.0260***
	(2.1678)	(0.3646)	(6.2149)	(-0.5692)	(-1.0371)	(4.3424)
Sanction $_{(+1, +4)}$	0.0027***	0.0000	0.0003***	-0.0059**	-0.0094***	0.0164***
	(3.0463)	(0.0345)	(4.8096)	(-2.2078)	(-2.8164)	(4.8806)
Median of dependent variable	0.2719	3.6357***	0.6033***	0.1675***	0.1609***	0.0809***
	(0.6214)	(6.7780)	(3.1691)	(8.9323)	(7.0407)	(6.8741)
Federal funds rate	0.0017***	-0.0011	-0.0001***	0.0049**	0.0061**	-0.0093***
	(3.5571)	(-1.5538)	(-8.5977)	(2.2738)	(2.3532)	(-8.0149)
Real GDP growth rate	-0.1025**	-0.0618***	0.0046***	-0.1583	-0.2201	0.1504*
	(-2.0187)	(-2.6260)	(4.8199)	(-1.2335)	(-1.4800)	(1.6568)
ROA $_{t-1}$	-0.1425*	-0.1114	0.0024	1.1567**	1.3759**	-0.5147**
	(-1.7028)	(-1.5033)	(1.1154)	(2.1907)	(2.3184)	(-2.2711)
Non-performing loans $_{t-1}$	-0.1487***	-0.1896***	0.0080***	-1.7381***	-2.1396***	0.5546***
	(-6.7719)	(-9.0339)	(6.1649)	(-12.7706)	(-12.6227)	(4.5150)
Bank size $_{t-1}$	-0.0347***	-0.0427***	0.0006***	0.7413***	0.7329***	0.9461***
	(-10.7728)	(-14.6391)	(7.6215)	(50.4592)	(44.9088)	(110.4678)
Risk-weighted assets ratio $_{t-1}$	-0.2576***	-0.2552***	-0.0011***	0.1173***	0.0630**	1.1646***
	(-20.0888)	(-17.6269)	(-3.1260)	(3.8372)	(2.0100)	(26.5215)
Non-interest income $_{t-1}$	0.0141**	0.0158***	-0.0002	0.0818***	0.1140***	0.0765**
	(2.3234)	(2.6410)	(-0.4274)	(2.7119)	(3.5042)	(2.3092)
Liquidity $_{t-1}$	0.0589***	0.0655***	-0.0037***	-0.1738***	-0.1652***	-0.4759***
	(2.8951)	(3.1403)	(-8.6997)	(-5.8334)	(-5.2656)	(-14.7754)
Deposits ratio $_{t-1}$	-0.4226***	-0.3983***	0.0011**	-1.5725***	-1.5835***	-0.0067
	(-17.2617)	(-16.7571)	(2.0787)	(-19.7045)	(-18.6777)	(-0.1816)
Observations	50345	51589	50341	50277	51519	50232
# of cross-sections	1611	1642	1611	1611	1642	1611
R^2	0.7565	0.7443	0.6055	0.9833	0.9818	0.9798
Diff. Sanction $_{(+1, +4)}$ − Sanction $_{(-4, -3)}$	0.0032***	0.0008	0	-0.0038	-0.0061	-0.0036
Chi-square	11.4294	1.1821	0.0394	0.8002	1.6366	0.562
Diff. Sanction $_{(+1, +4)}$ − Sanction $_{(-2, -1)}$	0.002**	0.0008	-0.0002**	0.0016	0.0017	-0.0136***
Chi-square	6.2479	0.8915	4.3295	0.0908	0.0754	10.1061
Diff. Sanction $_{(-2, -1)}$ − Sanction $_{(-4, -3)}$	0.0012	0.0001	0.0002**	-0.0054	-0.0078	0.01*
Chi-square	1.7384	0.0113	6.2474	1.6455	2.4526	2.9688

Notes: The table reports coefficient estimates and t-statistics (in parentheses) for the sample of financial institutions on which an enforcement action has been

imposed over the 2004Q1-2010Q4. To include lagged terms, the estimation period is 2003Q1-2011Q4. The explanatory variables are defined in Table 2. Sanction $_{(-4, -3)}$ is a dummy variable that takes the value of 1 for the -4 and -3 event quarters and 0 otherwise. Sanction $_{(-2, -1)}$ is a dummy variable that takes the value of 1 for the -2 and -1 event quarters and 0 otherwise. Sanction $_{0}$ is a dummy variable that takes the value of 1 for the sanction-quarter and 0 otherwise. Sanction $_{(+1, +4)}$ is a dummy variable that takes the value of 1 for the +1 through +4 event quarters and 0 otherwise. Estimation method is fixed effects OLS with robust standard errors, clustered by financial institution. ***, ** and * denote statistical significance at the 1, 5 and 10% level, respectively.

Table 6. Panel model: Effect on risk and performance – All classes of enforcement actions

	I	II	III	IV	V	VI	VII
Dependent variable:	Risk-weighted assets ratio	Risk-weighted assets	Bank size	ROA	STDROA	Non-interest income	Z-score
Intercept	-0.0568**	-0.4003***	2.2365***	-0.0549***	0.0184***	0.3390***	1.3632*
	(-1.9438)	(-4.1737)	(3.2536)	(-5.1268)	(4.8546)	(9.7642)	(1.6458)
Sanction $_{(-4,\ -3)}$	0.0058***	-0.0008	0.0621***	-0.0011***	-0.0000	0.0012	-0.0459***
	(4.2193)	(-0.6422)	(8.8529)	(-3.1468)	(-0.3298)	(1.0493)	(-4.5884)
Sanction $_{(-2,\ -1)}$	0.0002	-0.0062***	0.0750***	-0.0020***	0.0001	0.0013	-0.1103***
	(0.1309)	(-3.7695)	(8.7966)	(-3.0198)	(0.9012)	(0.7452)	(-6.1507)
Sanction $_{0}$	-0.0022	-0.0086***	0.0747***	-0.0020***	0.0001	0.0013	-0.1015***
	(-1.2870)	(-5.6016)	(7.5662)	(-3.3426)	(0.7581)	(0.9824)	(-5.1418)
Sanction $_{(+1,\ +4)}$	-0.0028***	-0.0117***	0.0433***	-0.0016***	0.0004***	-0.0011	-0.1038***
	(-3.3938)	(-12.4509)	(5.7589)	(-3.8037)	(4.9642)	(-0.5562)	(-7.3387)
Median of dependent variable	0.8732***	0.0416***	0.8014***	0.7044***	0.9122**	0.5605***	0.5543**
	(22.5712)	(6.0115)	(12.9962)	(9.0686)	(1.8375)	(6.0553)	(2.0142)
Federal funds rate	-0.0009***	0.0027***	0.0067*	0.0001	0.0001	-0.0030***	-0.0004
	(-2.4776)	(5.0125)	(1.7608)	(1.2014)	(1.5453)	(-5.2645)	(-0.0612)
Real GDP growth rate	0.0179	-0.0912*	-1.2765***	0.0467***	0.0008	-0.0220	0.0591
	(0.9305)	(-1.8568)	(-3.9682)	(2.5216)	(0.3424)	(-0.6461)	(0.1304)
ROA $_{t-1}$	0.3058***	0.0248	3.1712***		-0.1435***	0.4268*	15.4192***
	(5.2283)	(0.1112)	(7.1442)		(-8.2126)	(1.6420)	(7.3720)
Non-performing loans $_{t-1}$	-0.1343***	-0.4168***	0.3311**	-0.1651***	0.0393***	-0.1050***	-6.6494***
	(-5.5708)	(-6.1000)	(2.0831)	(-5.7833)	(7.7321)	(-3.0530)	(-9.4070)
Bank size $_{t-1}$	0.0087***	0.9121***		0.0033***	-0.0015***	-0.0206***	0.0827***
	(3.2621)	(146.7199)		(5.0300)	(-6.6246)	(-7.8432)	(2.7024)
Risk-weighted assets ratio $_{t-1}$		1.2055***	0.4080***	0.0055***	0.0000	-0.0188**	-0.0007
		(58.3759)	(5.9410)	(2.9318)	(0.0601)	(-1.9980)	(-0.0115)
Non-interest income $_{t-1}$	-0.0218***	0.0006	-0.3366**	0.0212***	0.0013*		0.1310**
	(-3.2283)	(0.0470)	(-5.7748)	(4.3955)	(1.6937)		(1.9282)
Liquidity $_{t-1}$	-0.3934***	-0.1720***	-0.1986**	-0.0132***	0.0045***	0.0701***	-0.4905***
	(-33.0556)	(-9.7531)	(-2.4095)	(-3.1942)	(3.6051)	(3.4976)	(-4.0634)
Deposits ratio $_{t-1}$	0.1104***	-0.2109***	0.3774***	0.0124***	0.0019	-0.0040	-1.3402***
	(11.1414)	(-11.0978)	(5.6884)	(2.7255)	(1.5390)	(-0.2960)	(-7.8756)
Observations	51600	51600	51639	51638	45533	51638	45103
# of cross-sections	1642	1642	1642	1642	1637	1642	1637
Adj. – R^2	0.7854	0.9976	0.9762	0.4812	0.6652	0.6527	0.6187
Diff. Sanction $_{(+1,\ +4)}$ – Sanction $_{(-4,\ -3)}$	-0.0086***	-0.0108***	-0.0188**	-0.0005	0.0004***	-0.0023	-0.0579***
Chi-square	28.2811	47.6169	4.9676	0.779	16.3864	2.2157	13.3984
Diff. Sanction $_{(+1,\ +4)}$ – Sanction $_{(-2,\ -1)}$	-0.003**	-0.0055***	-0.0317***	0.0004	0.0003***	-0.0024	0.0064
Chi-square	4.0818	11.2082	16.6122	0.2554	10.4606	1.7584	0.0732
Diff. Sanction $_{(-2,\ -1)}$ – Sanction $_{(-4,\ -3)}$	-0.0056***	-0.0053***	0.0129**	-0.0009**	0.0001	0.0001	-0.0644***
Chi-square	7.1284	11.2206	4.4855	5.0251	0.9946	0.0065	14.488

Notes: The table reports coefficient estimates and t-statistics (in parentheses) for the sample of financial institutions on which an enforcement action has been imposed over the 2004Q1-2010Q4. To include lagged terms, the estimation period is 2003Q1-2011Q4. The explanatory variables are defined in Table 2. Sanction $_{(-4,\ -3)}$ is a dummy variable that takes the value of 1 for the -4 and -3 event quarters and 0 otherwise. Sanction $_{(-2,\ -1)}$ is a dummy variable that takes the value of 1 for the -2 and -1 event quarters and 0 otherwise. Sanction $_{0}$ is a dummy variable that takes the value of 1 for the sanction-quarter and 0 otherwise. Sanction $_{(+1,\ +4)}$ is a dummy variable that takes the value of 1 for the +1 through +4 event quarters and 0 otherwise. Estimation method is fixed effects OLS with robust standard errors, clustered by financial institution. ***, ** and * denote statistical significance at the 1, 5 and 10% level, respectively.

Table 7. Panel model: Effect on bank capital – Class 1 enforcement actions

	I	II	III	IV	V	VI
Dependent variable:	Risk-based capital ratio	Tier 1 risk-based capital ratio	Tier 2 risk-based capital ratio	Risk-based capital	Tier 1 risk-based capital	Tier 2 risk-based capital
Intercept	0.8398***	0.6317***	0.0029	-0.1307	0.2795	-5.5146***
	(9.8018)	(12.0151)	(1.4372)	(-0.6074)	(1.0650)	(-31.0001)
Sanction $_{(-4, -3)}$	0.0011	0.0006	0.0003***	0.0035	0.0052	0.0235***
	(0.6653)	(0.3910)	(2.5076)	(0.5600)	(0.7180)	(2.7143)
Sanction $_{(-2, -1)}$	0.0022	0.0011	0.0007***	-0.0071	-0.0077	0.0465***
	(1.1585)	(0.5996)	(6.3370)	(-0.7318)	(-0.6879)	(4.3521)
Sanction $_{0}$	0.0058**	0.0039	0.0008***	-0.0000	-0.0001	0.0495***
	(2.1715)	(1.5876)	(7.6880)	(-0.0031)	(-0.0052)	(4.2597)
Sanction $_{(+1, +4)}$	0.0063***	0.0044**	0.0004***	-0.0008	0.0004	0.0208***
	(3.4959)	(2.3158)	(3.6327)	(-0.0838)	(0.0374)	(2.6186)
Observations	22487	22606	22485	22431	22549	22395
# of cross-sections	830	833	830	830	833	830
R^2	0.7281	0.7090	0.5847	0.9799	0.9726	0.9751
Diff. Sanction $_{(+1, +4)}$ − Sanction $_{(-4, -3)}$	0.0052**	0.0038*	0.0002	-0.0042	-0.0048	-0.0028
Chi-square	5.7909	2.8403	1.095	0.1366	0.1227	0.0755
Diff. Sanction $_{(+1, +4)}$ − Sanction $_{(-2, -1)}$	0.0041***	0.0033*	-0.0002*	0.0063	0.0081	-0.0257**
Chi-square	6.7342	3.5894	3.4274	0.2394	0.2883	6.4104
Diff. Sanction $_{(-2, -1)}$ − Sanction $_{(-4, -3)}$	0.0012	0.0005	0.0004***	-0.0106	-0.0129	0.023**
Chi-square	0.6627	0.153	11.2696	1.7784	1.9158	4.0304

Notes: The table reports coefficient estimates and t-statistics (in parentheses) for the sample of financial institutions on which an enforcement action of type 1 has been imposed over the 2004Q1-2010Q4. To include lagged terms, the estimation period is 2003Q1-2011Q4. The explanatory variables are defined in Table 2. Sanction $_{(-4, -3)}$ is a dummy variable that takes the value of 1 for the -4 and -3 event quarters and 0 otherwise. Sanction $_{(-2, -1)}$ is a dummy variable that takes the value of 1 for the -2 and -1 event quarters and 0 otherwise. Sanction $_{0}$ is a dummy variable that takes the value of 1 for the sanction-quarter and 0 otherwise. Sanction $_{(+1, +4)}$ is a dummy variable that takes the value of 1 for the +1 through +4 event quarters and 0 otherwise. Estimation method is fixed effects OLS with robust standard errors, clustered by financial institution. ***, ** and * denote statistical significance at the 1, 5 and 10% level, respectively.

Table 8. Panel model: Effect on asset composition, size, performance and risk – Class 1 enforcement actions

	I	II	III	IV	V	VI	VII
Dependent variable:	Risk-weighted assets ratio	Risk-weighted assets	Bank size	ROA	STDROA	Non-interest income	Z-score
Intercept	0.0654	-0.5608***	6.1797***	-0.0123	0.0209***	0.5024***	3.3360***
	(1.5922)	(-6.7877)	(9.2888)	(-1.1506)	(3.6620)	(8.8195)	(3.0863)
Sanction $_{(-4, -3)}$	0.0107***	0.0002	0.1245***	-0.0026***	-0.0002	-0.0018	-0.0586***
	(5.0111)	(0.0946)	(7.1847)	(-3.5917)	(-1.5822)	(-0.9240)	(-2.9762)
Sanction $_{(-2, -1)}$	0.0019	-0.0102***	0.1455***	-0.0042***	0.0002	-0.0001	-0.1863***
	(0.8466)	(-3.2234)	(7.8053)	(-3.2152)	(0.9921)	(-0.0455)	(-5.9136)
Sanction $_{0}$	-0.0046	-0.0185***	0.1440***	-0.0042***	0.0003**	-0.0037	-0.1877***
	(-1.4908)	(-4.6807)	(8.0930)	(-3.7646)	(2.1303)	(-1.1124)	(-5.6709)
Sanction $_{(+1, +4)}$	-0.0090***	-0.0210***	0.0785***	-0.0038***	0.0009***	-0.0102***	-0.2140***
	(-3.5460)	(-5.7487)	(5.3917)	(-5.1048)	(6.8096)	(-3.7320)	(-11.2584)
Observations	22615	22615	22618	22617	20392	22617	20120
# of cross-sections	833	833	833	833	819	833	812
Adj. – R^2	0.7473	0.9970	0.9676	0.4910	0.7092	0.6366	0.6158
Diff. Sanction $_{(+1, +4)}$ – Sanction $_{(-4, -3)}$	-0.0197***	-0.0212***	-0.046***	-0.0012	0.0011***	-0.0084***	-0.1554***
Chi-square	46.9894	34.5593	10.9111	1.8329	39.631	8.6941	31.0066
Diff. Sanction $_{(+1, +4)}$ – Sanction $_{(-2, -1)}$	-0.0109***	-0.0108***	-0.067***	0.0004	0.0008***	-0.0101***	-0.0277
Chi-square	18.8348	10.3442	23.4647	0.0591	23.4739	9.008	0.4644
Diff. Sanction $_{(-2, -1)}$ – Sanction $_{(-4, -3)}$	-0.0088***	-0.0104***	0.021*	-0.0016*	0.0003**	0.0017	-0.1276***
Chi-square	11.8475	9.6718	3.5136	3.8341	5.4717	0.2965	34.1444

Notes: The table reports coefficient estimates and t-statistics (in parentheses) for the sample of financial institutions on which an enforcement action of type 1 has been imposed over the 2004Q1-2010Q4. To include lagged terms, the estimation period is 2003Q1-2011Q4. The explanatory variables are defined in Table 2. Sanction $_{(-4, -3)}$ is a dummy variable that takes the value of 1 for the -4 and -3 event quarters and 0 otherwise. Sanction $_{(-2, -1)}$ is a dummy variable that takes the value of 1 for the -2 and -1 event quarters and 0 otherwise. Sanction $_{0}$ is a dummy variable that takes the value of 1 for the sanction-quarter and 0 otherwise. Sanction $_{(+1, +4)}$ is a dummy variable that takes the value of 1 for the +1 through +4 event quarters and 0 otherwise. Estimation method is fixed effects OLS with robust standard errors, clustered by financial institution. ***, ** and * denote statistical significance at the 1, 5 and 10% level, respectively.

Table 9. Panel model: Effect on bank capital, risk, size and performance – Class 2 enforcement actions

	I	II	III	IV	V
Dependent variable:	Risk-based capital ratio	Tier 1 risk-based capital ratio	Risk-weighted assets	Bank size	Z-score
Intercept	0.6755***	0.4240***	-0.6744***	4.0105***	-0.7493
	(9.3136)	(6.4616)	(-3.6743)	(8.1200)	(-0.7604)
Sanction $_{(-4, -3)}$	-0.0048***	-0.0047***	0.0056	0.0869***	-0.0144
	(-3.0381)	(-3.4337)	(1.0275)	(7.2712)	(-0.7058)
Sanction $_{(-2, -1)}$	-0.0021	-0.0040***	-0.0037	0.0940***	-0.0069
	(-1.5378)	(-2.8523)	(-0.9513)	(6.4359)	(-0.3366)
Sanction $_{0}$	-0.0004	-0.0024	-0.0030	0.0818***	0.0060
	(-0.1635)	(-1.1139)	(-0.4170)	(4.4671)	(0.1520)
Sanction $_{(+1, +4)}$	0.0014	0.0001	-0.0159***	0.0530***	0.0361**
	(1.1530)	(0.0569)	(-4.6532)	(4.0346)	(2.2052)
Observations	3030	3318	3318	3326	2979
# of cross-sections	119	131	131	131	127
R^2	0.8463	0.8407	0.9989	0.9913	0.6883
Diff. Sanction $_{(+1, +4)}$ − Sanction $_{(-4, -3)}$	0.0062***	0.0048***	-0.0214***	-0.0339*	0.0505*
Chi-square	18.7793	8.3196	11.0358	3.5468	3.7724
Diff. Sanction $_{(+1, +4)}$ − Sanction $_{(-2, -1)}$	0.0035**	0.0041**	-0.0122**	-0.041***	0.043*
Chi-square	5.3894	5.6051	6.4776	6.6918	3.543
Diff. Sanction $_{(-2, -1)}$ − Sanction $_{(-4, -3)}$	0.0027	0.0007	-0.0092*	0.0071	0.0075
Chi-square	1.9001	0.1115	3.1304	0.3619	0.0627

Notes: The table reports coefficient estimates and t-statistics (in parentheses) for the sample of financial institutions on which an enforcement action of type 2 has been imposed over the 2004Q1-2010Q4. To include lagged terms, the estimation period is 2003Q1-2011Q4. The explanatory variables are defined in Table 2. Sanction $_{(-4, -3)}$ is a dummy variable that takes the value of 1 for the -4 and -3 event quarters and 0 otherwise. Sanction $_{(-2, -1)}$ is a dummy variable that takes the value of 1 for the -2 and -1 event quarters and 0 otherwise. Sanction $_{0}$ is a dummy variable that takes the value of 1 for the sanction-quarter and 0 otherwise. Sanction $_{(+1, +4)}$ is a dummy variable that takes the value of 1 for the +1 through +4 event quarters and 0 otherwise. Estimation method is fixed effects OLS with robust standard errors, clustered by financial institution. ***, ** and * denote statistical significance at the 1, 5 and 10% level, respectively.

Table 10. Panel model: Effect on bank capital, risk, size and performance – Class 3 enforcement actions

	I	II	III	IV	V
Dependent variable:	Risk-based capital ratio	Tier 1 risk-based capital ratio	Risk-based capital	Tier 1 risk-based capital	Non-interest income
Intercept	0.5402***	0.3541***	-2.1308***	-2.6278***	0.4613***
	(9.3082)	(9.8278)	(-11.1243)	(-12.4231)	(6.1742)
Sanction $_{(-4,\ -3)}$	-0.0019**	-0.0016*	-0.0060	-0.0054	0.0066***
	(-1.9646)	(-1.8163)	(-1.4172)	(-1.0585)	(3.1430)
Sanction $_{(-2,\ -1)}$	0.0011	0.0006	0.0052	0.0035	0.0056**
	(1.2482)	(0.7038)	(0.9125)	(0.6922)	(2.2635)
Sanction $_{0}$	0.0023**	0.0014	0.0106	0.0132	0.0035
	(1.9948)	(1.1716)	(1.1187)	(1.3009)	(1.3930)
Sanction $_{(+1,\ +4)}$	0.0018**	0.0010	0.0066	0.0076	0.0018
	(2.0573)	(1.2474)	(1.4972)	(1.6325)	(0.7973)
Observations	8461	9020	8459	9018	9037
# of cross-sections	333	347	333	347	347
R^2	0.8457	0.8475	0.9930	0.9941	0.7519
Diff. Sanction $_{(+1,\ +4)}$ − Sanction $_{(-4,\ -3)}$	0.0037***	0.0026**	0.0125**	0.013*	-0.0048**
Chi-square	9.5387	5.1701	4.6824	3.6247	3.8782
Diff. Sanction $_{(+1,\ +4)}$ − Sanction $_{(-2,\ -1)}$	0.0007	0.0004	0.0014	0.0041	-0.0038
Chi-square	0.4391	0.1723	0.0579	0.5185	1.6092
Diff. Sanction $_{(-2,\ -1)}$ − Sanction $_{(-4,\ -3)}$	0.003**	0.0022	0.0112	0.0089	-0.0011
Chi-square	3.9522	2.2748	2.0303	1.2736	0.1164

Notes: The table reports coefficient estimates and t-statistics (in parentheses) for the sample of financial institutions on which an enforcement action of type 3 has been imposed over the 2004Q1-2010Q4. To include lagged terms, the estimation period is 2003Q1-2011Q4. The explanatory variables are defined in Table 2. Sanction $_{(-4,\ -3)}$ is a dummy variable that takes the value of 1 for the -4 and -3 event quarters and 0 otherwise. Sanction $_{(-2,\ -1)}$ is a dummy variable that takes the value of 1 for the -2 and -1 event quarters and 0 otherwise. Sanction $_{0}$ is a dummy variable that takes the value of 1 for the sanction-quarter and 0 otherwise. Sanction $_{(+1,\ +4)}$ is a dummy variable that takes the value of 1 for the +1 through +4 event quarters and 0 otherwise. Estimation method is fixed effects OLS with robust standard errors, clustered by financial institution. ***, ** and * denote statistical significance at the 1, 5 and 10% level, respectively.

Table 11. Panel model: Effect on bank capital, risk, size and performance – Class 4 enforcement actions

	I	II	III	IV	V	VI
Dependent variable:	Risk-based capital ratio	Risk-based capital	Tier 1 risk-based capital	ROA	STDROA	Z-score
Intercept	0.3957***	-2.0047***	-2.1310***	-0.0136**	0.0167***	-0.4183
	(12.6068)	(-9.2587)	(-9.3924)	(-1.9269)	(3.9024)	(-0.5016)
Sanction $_{(-4,\ -3)}$	0.0006	-0.0026	-0.0021	0.0009***	0.0000	0.0128
	(1.0335)	(-0.6359)	(-0.4725)	(3.0721)	(0.1470)	(0.8440)
Sanction $_{(-2,\ -1)}$	0.0009	-0.0013	-0.0014	0.0001	0.0001	-0.0011
	(1.5051)	(-0.3802)	(-0.3660)	(0.6754)	(0.9399)	(-0.0856)
Sanction $_{0}$	0.0020***	0.0140*	0.0150**	0.0006**	-0.0001	0.0301**
	(2.8456)	(1.8487)	(1.9263)	(2.1192)	(-1.4508)	(1.9202)
Sanction $_{(+1,\ +4)}$	0.0020***	0.0061***	0.0052***	-0.0000	-0.0001*	0.0235**
	(4.3780)	(3.6558)	(2.5774)	(-0.0099)	(-1.7981)	(2.1000)
Observations	11541	11537	11778	11791	10667	10626
# of cross-sections	442	442	446	446	444	444
R^2	0.9129	0.9924	0.9918	0.5542	0.6353	0.6589
Diff. Sanction $_{(+1,\ +4)}$ − Sanction $_{(-4,\ -3)}$	0.0013*	0.0086**	0.0072	-0.0009***	-0.0002	0.0107
Chi-square	2.9722	3.9776	2.2738	8.3106	1.5432	0.3928
Diff. Sanction $_{(+1,\ +4)}$ − Sanction $_{(-2,\ -1)}$	0.001*	0.0074**	0.0065*	-0.0001	-0.0002***	0.0247**
Chi-square	3.1665	4.7854	2.7659	0.2097	7.5137	4.0788
Diff. Sanction $_{(-2,\ -1)}$ − Sanction $_{(-4,\ -3)}$	0.0003	0.0013	0.0007	-0.0007**	0	-0.0139
Chi-square	0.1267	0.0696	0.0168	5.8503	0.1451	0.5877

Notes: The table reports coefficient estimates and t-statistics (in parentheses) for the sample of financial institutions on which an enforcement action of type 4 has been imposed over the 2004Q1-2010Q4. To include lagged terms, the estimation period is 2003Q1-2011Q4. The explanatory variables are defined in Table 2. Sanction $_{(-4,\ -3)}$ is a dummy variable that takes the value of 1 for the -4 and -3 event quarters and 0 otherwise. Sanction $_{(-2,\ -1)}$ is a dummy variable that takes the value of 1 for the -2 and -1 event quarters and 0 otherwise. Sanction $_{0}$ is a dummy variable that takes the value of 1 for the sanction-quarter and 0 otherwise. Sanction $_{(+1,\ +4)}$ is a dummy variable that takes the value of 1 for the +1 through +4 event quarters and 0 otherwise. Estimation method is fixed effects OLS with robust standard errors, clustered by financial institution. ***, ** and * denote statistical significance at the 1, 5 and 10% level, respectively.

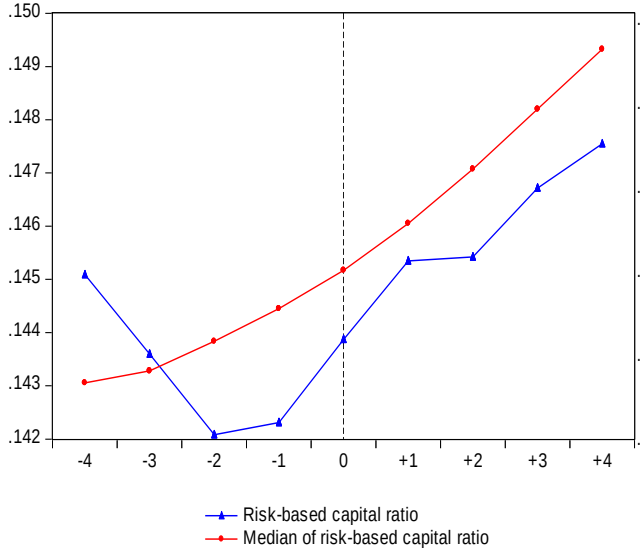


Figure 1

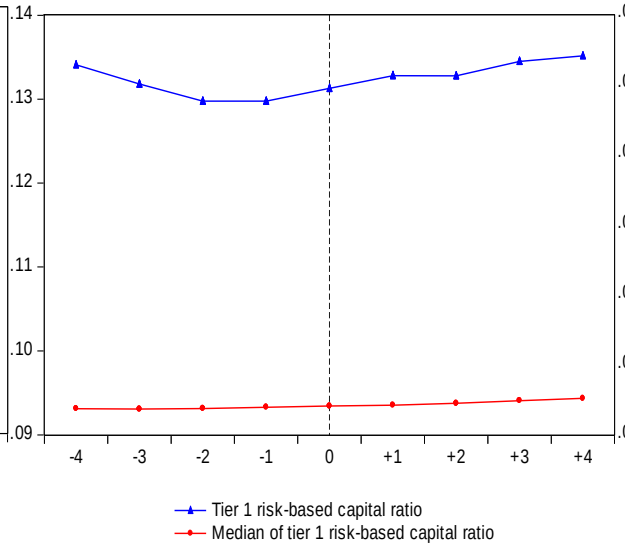


Figure 2

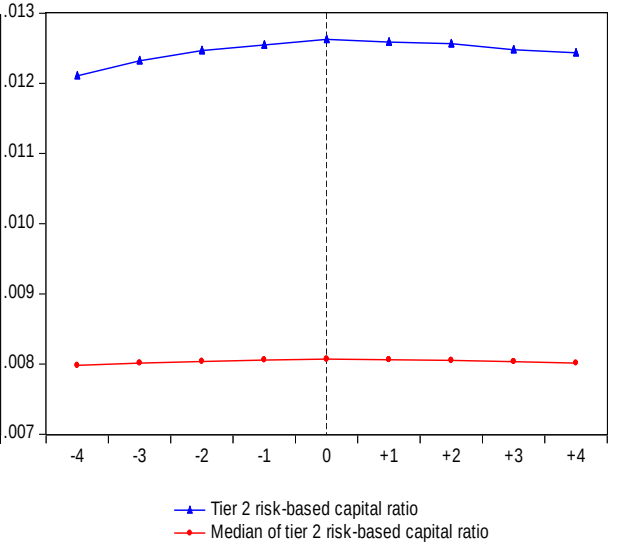


Figure 3

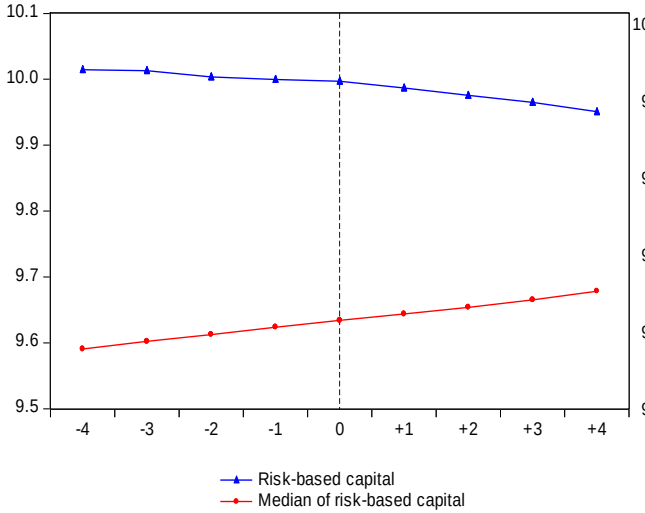


Figure 4

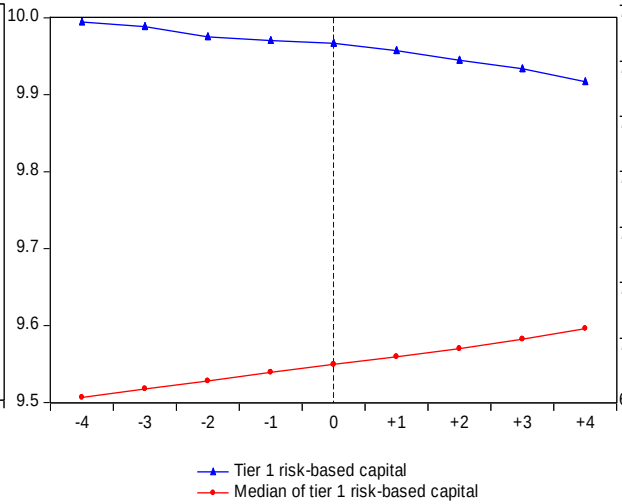
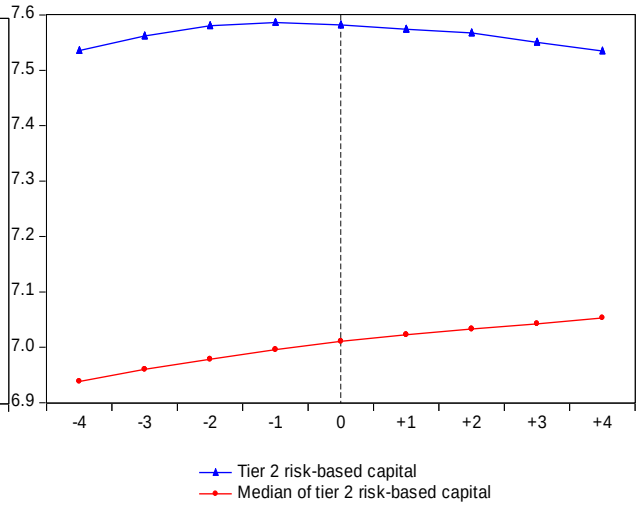


Figure 5



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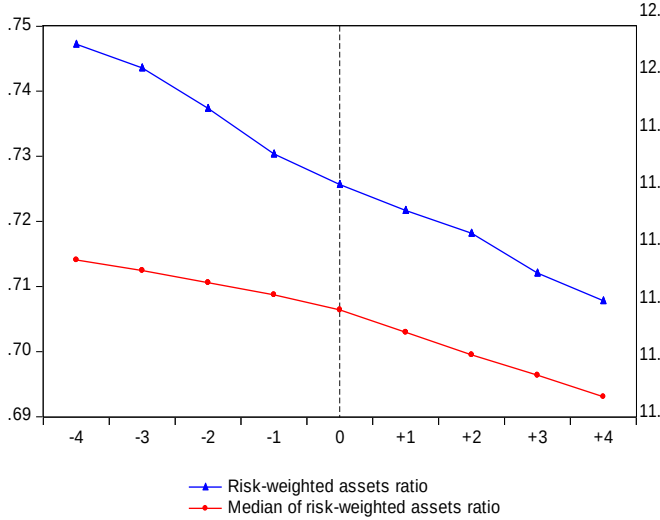

Figure 7

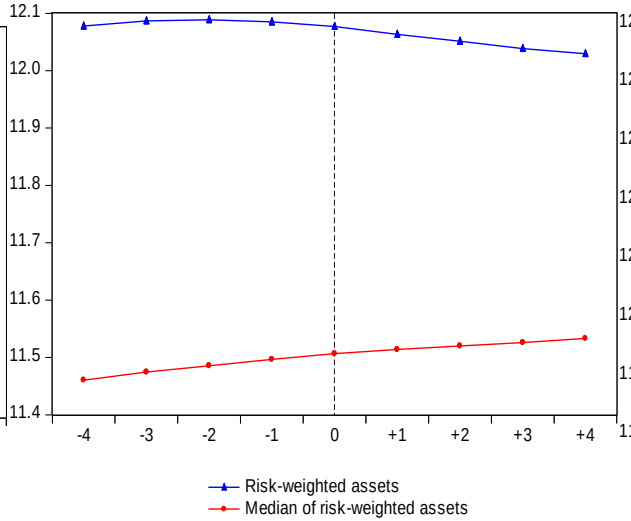

Figure 8

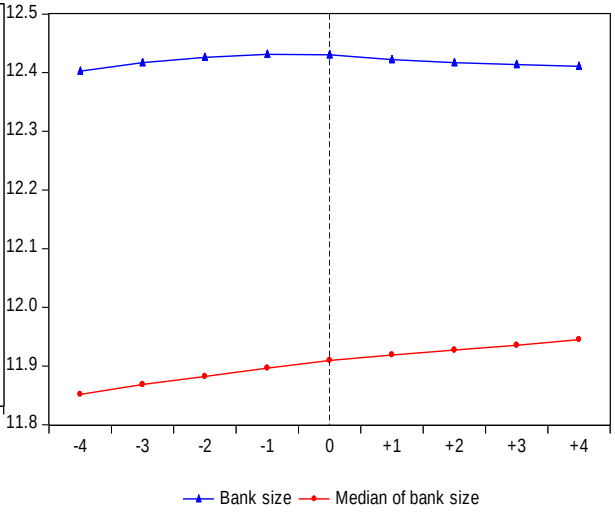

Figure 9

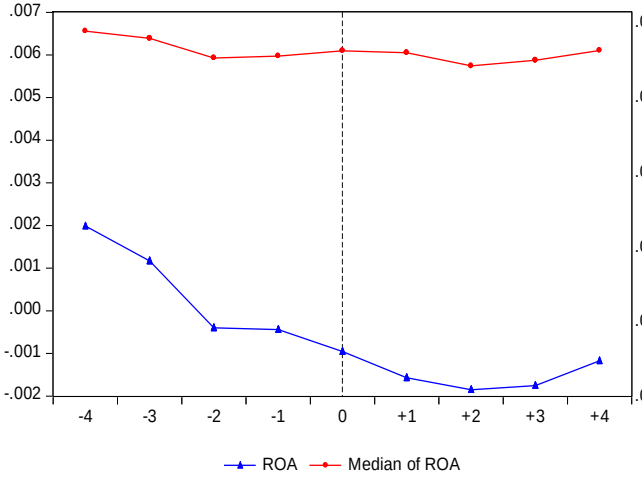

Figure 10

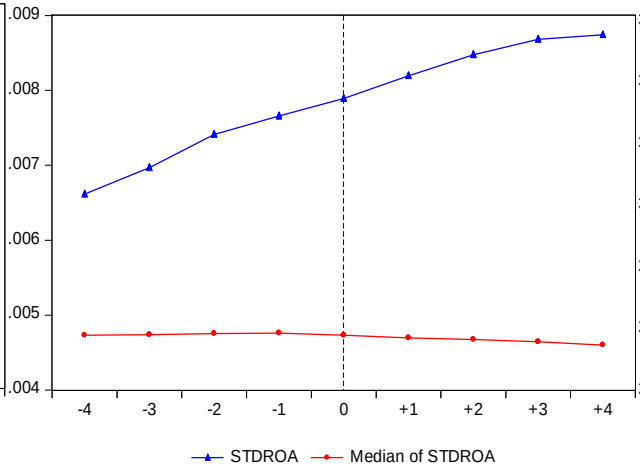

Figure 11

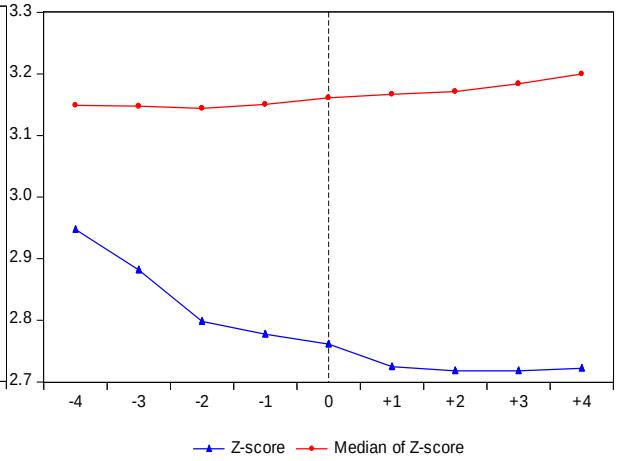

Figure 12