Local Bank Supervision*

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Abstract:

This paper provides novel evidence for informational advantages of local bank supervision, outweighing biases due to the pursuit of local interests. For identification, we exploit a policy reform in China that moved supervision for a subset of bank branches from the national to the city level. Following the reform, these branches were 50 to 74% more likely to face an enforcement action. The tighter local supervision results in more conservative lending by banks, reducing in turn aggregate loan supply in cities with more local supervision. Our findings inform the debate on the design of an optimal supervisory architecture.

Keywords: bank supervision, supervisory architecture, decentralization, enforcement actions, lending, information collection, incentives

JEL classification codes: G21, G28

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1. Introduction

The global financial crisis sparked an intense debate among policymakers and academics on the characteristics of an optimal supervisory architecture. The debate centered on the geographical allocation of responsibilities and powers aimed at preserving the safety and soundness of the banking sector (Ampudia et al., 2019). Local and central supervisors differ in their ability to acquire information and their incentives to act based on such information. The goal of this paper is to study how these differences affect supervisory decisions and, as a result, impact loan supply.

Theoretically, the principal trade-off between decentralized (local) supervision versus a centralized one has been formulated as follows. One side of the trade-off is about *incentives* to exercise adequate supervision. The decisions of central supervisors may be superior as they have a broader view of the banking sector and the economy, while decisions of local supervisors may not internalize the consequences of their actions outside their regulatory perimeter.[2] Local supervisors might also be more lenient towards certain banks because they overweight local interests, being either political or economic (Shleifer, 1996). These incentives likely result in biases of the local supervisor. The other side of the trade-off relates to the cost of *acquiring information* about the supervised bank. Local supervisors have advantages relative to central supervisors to obtain information about the true condition of banks they supervise and to specialize in local conditions. Information collection is more difficult for central supervisors due to physical distance to the supervised banks (Repullo, 2018; Colliard, 2020) but also due to distance to the local supervisor when the central supervisor must rely on the latter for information (Carletti et al., 2021).

Evaluating this trade-off between incentives and information is empirically challenging for several reasons. First, policy reforms aimed at (de)centralizing supervision typically go along with explicit changes in the objectives of supervision.

[2] These consequences can take, for instance, the form of financial stability spillovers but also profit externalities (see, e.g., Dell'Ariccia and Marquez, 2006; Calzolari et al., 2019; and Carletti et al., 2021). Beck et al. (2013) provide consistent evidence that cross-border linkages distort intervention policies of national supervisors during the global financial crisis.

For example, the introduction of the Single Supervisory Mechanism (SSM) in the euro area was accompanied by the stated aim of stricter supervision for large banks.[3] Second, changes in the objectives of supervision may also happen when responsibilities are allocated to authorities that are not strictly subordinated to one another. For example, under the SSM, a different authority than national supervisors—the European Central Bank (ECB)—is granted full responsibilities and powers regarding the most significant banks, leading to implicit changes in the objectives of the supervision. Third, the trade-off between incentives and information under different supervisory architectures may depend on characteristics of supervised banks, for example, whether they are significant banks or local banks (Bardhan and Mookherjee, 2000).

In this paper we attempt to overcome these challenges by taking advantage of a policy reform that shifted supervision of bank branches from the national to the city level. In 2015, China decentralized supervision for branches of banks classified as "local" but not for branches belonging to "national" banks.[4] Prior to 2015 all branches were supervised in a hub-and-spoke system in which information was collected by local supervisors, but decisions were made jointly with the central supervisor. The central supervisor had a potential informational disadvantage as the information was provided by the local supervisor. The reform then fully transferred to local supervisors the responsibilities and powers for branches of local banks. Importantly, the reform did not change the overall objective of supervision, as local supervisors are formally subordinated to the central supervisor and fully accountable to the latter.[5] However, local supervisors might be subject to the different biases described earlier, thus creating a tension between incentives and information. An interesting institutional feature in this regard is that local supervisors operate at the city level in China: there are more than 300 local supervisory offices that are supervising banks very close to them (in the same

[3] The chair of the Supervisory Board of SSM, Danièle Nouy, immediately stated that the European Central Bank will be a rigorous supervisor and would accurately measure bank risks—cf. her first regular public hearing at the Committee on Economic and Monetary Affairs of the European Parliament (Brussels, March 18, 2014).

[4] The Chinese banking sector is the largest in the world with about $40 trillion in assets. It serves more than 800 million individuals through more than 4,000 commercials banks.

[5] Through the lens of the principal-agent problem, the reform involves the principal (central supervisor) allocating responsibilities and powers to carry out enforcement actions (supervisory decision) to an agent (local supervisor) who has better access to information.

city). This 2015 policy reform thus provides a suitable setting to investigate the trade-off between incentives and information associated with the decentralization of supervision.

We make use of a large, partly hand-collected, data set covering 5,366 branches over a 10-year window around the 2015 policy reform. We focus on supervisory decisions using novel bank branch- and supervisory-office-level data on enforcement actions. The granularity of the data allows us to exploit both variations across branches of the same bank but also within a supervisory office (regarding decisions about branches belonging to different banks). Our analysis reveals that branches of local banks are more likely to receive enforcement actions following the reform as compared to branches of national banks. This result holds regardless of the type and recipient of penalties arising from enforcement actions. According to our difference-in-differences estimates, the probability for a branch of getting an enforcement action increases by 5.5-8.2 percentage points (pp) following the reform, which corresponds to 50-74% of the unconditional probability of being subject to an enforcement action. This main result indicates tighter local supervision.

Next, we examine whether tighter supervision affects lending behaviors of banks. Using individual (loan-level) lending decisions, we find that branches of local banks are more conservative in their lending after the policy reform. That is, they require a higher compensation for taking on risk, and they reduce the amount they lend. We also find that this has aggregate consequences. That is, cities with a higher share of branches from local banks experience lower credit growth in the aftermath of the reform. This result suggests that national banks do not take up the slack arising from conservative lending by local banks. Combined, our results on lending imply that tighter local supervision—even if only applied to a subset of branches—has real effects at both individual and aggregate levels.

In the second part of our analysis, we explore the channels underlying our main result. We find evidence for both incentive and informational channels, with the informational channel being quantitatively more important. In terms of information, we

examine the informational loss due to centralized supervision. Under the hub-and-spoke system in China, information about a branch is collected from the supervisory office of the city where the branch is located; this information is then shared (or not) with the central supervisor. We can thus approximate the informational loss by the geographical distance between Beijing (the location of the central supervisor) and the city where a branch and its local supervisor are. We find that supervisory interventions increase for branches with a higher informational loss under centralized supervision.[6]

As for incentives, we document several biases in local supervision. First, we find evidence suggesting that local supervisors may pursue local *political* interests. Local supervisors are less likely to issue an enforcement action (that is, supervisory stringency declines) at banks with significant government ownership. Second, we observe that local supervisors care relatively more about local *economic* interests. That is, local supervisors tend to ignore effects materializing outside their regulatory perimeter. Our analysis reveals that local supervisors intervene more stringently at a specific branch when local financial risk (as measured by the stock of nonperforming loans at the province level) is elevated. Our analysis further shows that local supervisors intervene less stringently at the branches for which the associated bank has its main operations outside the branches' city. Together, these results support the idea that decisions of local supervisors are partly driven by their local political and economic interests. However, we document that the economic significance of each of these biases is muted compared to the informational channel.

Our findings have implications for the design of an optimal supervisory architecture. Bank supervision for larger banks moved toward centralization in the aftermath of the global financial crisis (Ampudia et al., 2019). In the euro area in particular, it is accepted that centralized supervision entails significant benefits in terms of lower informational asymmetry and fewer incentives to act in favor of local interests. Haselmann et al. (2022) provide support for this view, showing that supervisory

[6] Consistent with informational gains resulting in more interventions because violations are easier to detect, we find that the severity of fines imposed in a violation *decrease* (if a higher frequency of interventions were to reflect stricter supervision, we would expect fines to *increase*).

stringency improved for the significant banks included in the SSM. Our analysis of the 2015 reform in China constitutes complementing evidence, showing that for smaller (local) banks, a decentralized setting appears preferable. This justifies the design of the SSM where bank size is the main criteria of whether a bank is allocated to the central or local supervisor. In the United States, the stronger effectiveness of federal supervision over state supervision is explained by different weights given by supervisors to local economic conditions and, to some extent, differences in supervisory resources (Agarwal et al., 2014). Our analysis of the China's banking sector suggests that the gains from information collection prevail on costs of local incentives when all supervisory offices are subject to the same hierarchical authority.

Our paper belongs to several strands of the literature. It is directly related to theoretical papers analyzing supervisory architectures involving multiple supervisors (Dell'Ariccia and Marquez, 2006; Kara 2016; Foarta, 2018; Repullo, 2018; Calzolari et al., 2019; Colliard, 2020; Carletti et al., 2021; Lóránth et al., 2022).[7] Several papers examine the benefits and costs of centralized and decentralized supervision empirically. Agarwal et al. (2014) document that state supervisors in the United States are systematically more lenient than federal supervisors in assigning CAMELS ratings. Lim et al. (2023) analyze multiple office closures by different federal supervisors—that is, the geographical location between banks and their (same) supervisor becomes more remote as a result. They find that banks increase their lending and risk following office closures, suggesting that geographical proximity between banks and their supervisors improve supervision and financial stability. Gopalan et al. (2021) focus instead on the closure of the Office of the Comptroller of the Currency's (OCC) field offices and provide consistent evidence that proximity to supervisory field offices mitigates risk-taking incentives of banks through higher capital ratios. Haselmann et al. (2022) show that the ECB treats SSM banks more stringently than national supervisors, but also report a loss of information in banks' risk models associated with centralized

[7] These papers speak to a long-standing literature that explores the question of whether bank supervision should be done by the central bank or by a separate authority (for recent discussions, see Masciandaro and Quintyn, 2016; Ampudia et al., 2019).

supervision. Using a global sample of banks, Beck et al. (2023) study the effectiveness of cooperation among national supervisors (a form of centralization). Our study adds to this literature by showing in China—the largest, though under-researched, banking sector worldwide—the importance of increasing responsibilities and powers of local supervisors to avoiding loss of local information and to mitigating banking sector risk. Importantly, the 2015 reform we exploit arguably does not change objectives of supervision but shifts the responsibilities and powers to local city supervisors that are very close to the supervised, small banks. Echoing Bardhan and Mookherjee's (2000) discussion on decentralized mechanisms, we document that the informational advantage of local supervision in China is not compromised by greater protection of local interests. Furthermore, in contrast to these studies, we directly examine supervisory stringency in a decentralized architecture using novel data on enforcement outputs (that is, enforcement actions and penalties).

Our study is also related to a growing empirical literature assessing how supervisory standards—narrowly defined to exclude regulation—affect supervised banks in terms of their profitability, risk taking, and lending. In a large sample of US banks, Delis et al. (2017) report that enforcement actions are associated with reductions in risk taking.[8] Kandrac and Schlusche (2021) use a natural experiment in which supervisory capacity declined due to relocation of the local supervisory office. The authors show an increase in thrifts' willingness to take risk when they witnessed a reduction in supervision. Granja and Leuz (2022) exploit the extinction of the thrift supervisor to show that stricter supervision increases small business lending by improving bank management practices. Using data on the time use of supervisors, Hirtle et al. (2020) find that banks that receive more supervisory attention are less risky, but do not exhibit lower growth or profitability. Several other recent papers show that increased supervision is generally associated with a reduction in loan supply (Fiordelisi et al., 2017; Danisewicz et al., 2018; Kim et al., 2018; Altavilla et al., 2020; Passalacqua et al., 2021; Ivanov and Wang, 2022; Kleymenova and Tomy, 2022; Abbassi et al., 2023;

[8] Delis and Staikouras (2011) provide consistent evidence in a cross-country setting (that does not include China though).

Bonfim et al., 2023). All these studies focus on the United States or Europe. Similarly, we show that tighter supervision of banks in China is associated with reductions in lending and risk taking at banks. Moreover, we find that heightened enforcement activity also results in reduced loan supply in the aggregate. These findings suggest that enforcement actions are suitable microprudential supervisory tools to also address financial stability concerns—that is, the realm of macroprudential supervision.

More generally, we contribute to the literature on the structure of information and decentralization within organizations. The theoretical literature is large (see Melumad and Reichelstein, 1987; Bolton and Dewatripont, 1994; Aghion and Tirole, 1997; Dessein, 2002; Alonso et al., 2008; among many others). Dessein (2002) and Alonso et al. (2008) argue that it is often desirable for an uninformed principal to decentralize decisions when agents report information strategically. In contrast to the extant theoretical literature on decentralization, the empirical literature is limited. While we cannot directly test these models, we shed light on how local information and the decentralized nature of bank supervision in China can impact examinations and enforcement actions, which in turn impacts bank behavior and the local economy. In that sense, our paper joins an emerging empirical literature on decentralization of firms (see, for example, Huang et al. 2017, for a study on the Chinese experience of decentralizing state-owned firms).

The paper proceeds as follows. Section 2 describes Chinese banking sector and the supervisory architecture before and after the 2015 reform. Section 3 presents our data and research design. Section 4 contains our main results on enforcement decisions, and Section 5 our results on bank lending. Section 6 explores the channels behind our main results. Section 7 concludes the paper with a summary of our findings.

2. Institutional Background

2.1 An overview of the China's banking sector

The Chinese banking system has experienced substantial growth over the past decade and is now the world's largest ($38.98 trillion assets as of the end of 2020,

compared to $27.71 trillion in the United States). There are over 4,000 commercial banks. Eighteen of them operate on a nationwide scale (the six largest state-owned banks and the 12 national joint-stock banks). These *national banks* collectively held $26.96 trillion assets, accounting for 69.5% of all commercial bank assets. In addition to the national banks, there is a diverse range of regional institutions that we refer to as *local banks*: 134 city commercial banks; approximately 1,600 rural commercial banks; several hundred of rural credit cooperatives; and numerous village banks.

Commercial banks are predominantly organized through branches. The typical organizational structure consists of a headquarter, the city-level branches ("Fenhang" in Chinese), and numerous lower-level offices ("Zhihang"). A bank has (at most) one branch in a city. This city-level branch oversees all banking businesses in its perimeter and manages all offices located in counties and towns of the city (a city in China is an administrative unit similar to a Metropolitan Statistical Area in the United States). On average, a bank has 26 offices within a single city. This configuration exemplifies the geographic segmentation of the Chinese banking sector.

2.2 Regulatory and supervisory framework

The China Banking Regulatory Commission (CBRC) was created in 2003 as the main authority regulating and supervising the Chinese banking sector. In 2018, the CBRC merged with the China Insurance Regulatory Commission, which had been responsible for overseeing the insurance sector. This merger led to the formation of the China Banking and Insurance Regulatory Commission (CBIRC).[9] The CBRC has a hub-and-spoke structure akin to the OCC in the United States. Headquartered in Beijing, the CBRC supervises all commercial banks through a network of local supervisory offices. This network comprises provincial offices (CBRC bureaus) in the capitals of the 31 provinces and in five major metropolitan areas (Dalian, Ningbo, Xiamen, Qingdao, and Shenzhen), and municipal offices (CBRC sub-bureaus) in 306 prefecture-level cities (see Figure 1, Panel A). Comparable to the field offices of the OCC in the

[9] China is currently planning to further consolidate oversight functions, by establishing a National Financial Regulatory Administration to replace CBIRC.

United States, these offices (bureaus and sub-bureaus) serve as local entities overseeing the banks within their respective jurisdictions. Local offices carry out on-site examinations and off-site monitoring (that is, collecting and analyzing supervisory information and completing off-site supervision reports).

The CBRC has a fully hierarchical management structure. The CBRC's head (or central) office in Beijing establishes rules, guidelines, and policies. It also directly appoints the heads of local offices. There is, in principle, full alignment of the objectives between central and local supervision.[10] This setting is different in many other countries (an exception is the OCC's hub-and-spoke framework). For example, state supervisors in the United States and national supervisors in the euro area are not fully subordinated to federal and supranational supervisors, respectively, and generally have different objectives.

2.3 The decentralization reform of 2015

In January 2015, the CBRC had its first major reform. The primary objective of the reform is to decentralize administrative powers, bringing supervisors closer to financial institutions, thus reinforcing oversight over local banks. The reform transfers the supervisory responsibilities and powers for local banks to local supervisors, without changing the organization of supervision for national banks. A secondary motivation behind the reform was also that the CBRC's head office found it difficult to supervise a very large number of local banks.

Prior to reform, the central office and local offices of CBRC shared responsibilities and jointly supervised all banks.[11] Both offices collaborated regarding enforcement actions.[12] In some cases, local offices provided recommendations to the central office, which then made the final decision. In other cases, local offices decided on enforcement actions and informed the central office afterwards. The central office also occasionally

[10] The local offices are also legally fully independent of local governments. In practice though, local authorities sometimes have symbiotic relationships with local financial institutions, resulting in local supervisory officials potentially ignoring problems.
[11] With the exception of the headquarters of the national banks, which are solely supervised by the central office.
[12] Enforcement actions result from misconduct by individuals and violations of banking laws and regulations. They play a vital role in China, incentivizing banks to promptly rectify identified problems.

deployed staff to participate in investigations against offending banks and to decide on enforcement actions. The reform fully transferred supervision for local banks, and specifically decisions on enforcement actions, to the local offices. The local offices now independently decide on enforcement actions, without reporting obligations to the central office. Figure 1, Panel B, illustrates the change in the supervisory architecture as a result of the 2015 reform.

While the reform makes supervision of local banks the sole task of local supervisors, its intention is expressly not to modify the objective of supervision. Local offices are accountable to the CBRC's head office. Along with the reform, the CBRC therefore introduced a post-evaluation mechanism for local offices to ensure that (central) guidelines and objectives are maintained. If local offices are deemed to fail in their supervisory obligations, supervisory powers might be curtailed and involved officials might be punished.

3. Data and Research Design

3.1 Sample composition and data sources

Enforcement actions and resulting penalties are disclosed on the CBRC/CBIRC websites. The information disclosed contains the date of the action, the institution or individual concerned by the action, the supervisory authority responsible for the action, the reasons underlying the action, the specific laws or regulations violated, and the penalty (or penalties) incurred.

There are five types of penalties. First, a *warning* is a formal letter issued by a supervisor stating non-compliance with laws or regulations. Second, a *fine* entails a monetary penalty imposed on a bank (like the civil money penalty in the US context), along with the confiscation of any illegal proceeds. Third, a *disqualification* refers to barring bank managers from holding senior positions in the banking sector (for a specified period or permanently). Fourth, a *prohibition* refers to barring bank staff from working in the banking sector (for a specified period or permanently). Fifth, a *license*

revocation is the withdrawal of the authorization to operate the branch. Figure 2 provides an example of a penalty as disclosed on the CBRC/CBIRC website.[13]

We construct the sample of enforcement actions using textual analysis of penalty announcements. Our sample includes 12,044 penalties issued during the period between 2010 and 2020. Table 1 shows statistics on penalties. Panel A reports the frequency of penalties by types, highlighting that warnings and fines are the most issued type of penalties. Panel B breaks down penalties based on their underlying reasons.[14] Although a bank may receive a penalty for several reasons, in more than 50% of the cases the main reason is loan related. Panel C breaks down penalties based on their recipient, that is, either an individual or a bank. It appears that the latter is the most frequent recipient.

The information on enforcement action is manually collected at the disaggregated levels of branches and offices. We compress our enforcement action data at the branch level because supervisory decisions within a city are made at that level. The final sample covers 5,366 branches of 1,011 banks in 342 cities for ten years surrounding the 2015 reform. As shown in Table 2, the 1,011 banks consist of 993 local banks (127 city commercial banks and 866 rural commercial banks[15]) and 18 national banks (6 large state-owned banks and 12 joint-stock banks). Overall, our sample represents about 90% of the assets of the Chinese banking sector. Further statistics about local and national

[13] In 2015, the Yichang branch of Bank of Hubei was punished for inaccurately classifying loans based on their risk level and withholding a certain percentage of the loan as a deposit when the loan was granted. Consequently, the branch received a fine of RMB 400,000 from the local supervisory office, Yichang Bureau (Figure 2).

[14] We identify nine reasons (or categories) for which banks may face penalties. The *loan*-related reasons encompass instances in which banks inaccurately classify loans based on their risk level, conceal non-performing loans, fail to identify illegal use of loan funds, fail to conduct ex ante screening and ex post monitoring, and more. *Deposit*-related reasons include cases of over-reporting deposits, engaging in illegal deposit-taking through kickbacks or offering interest rates exceeding regulatory limits, misclassifying interbank deposits as retail deposits, and so forth. *Interbank*-related reasons involve improper conduct in interbank business, providing implicit guarantees for interbank investments, omitting certain interbank transactions from the balance sheet, and similar issues. *Acceptance*-related reasons entail the issuance of bank acceptance bills without genuine business transactions, conversion of loan funds into bank acceptance deposits, and others. *Credit card*-related reasons encompass instances in which credit cards are issued to applicants who provide false information, failure to detect credit card loans flowing into the real estate market, and similar cases. *Guarantee*-related reasons involve banks providing inappropriate (implicit) guarantees to third parties, among other factors. *Prudential regulation*-related reasons refer to violations of prudential regulation rules. *Internal control*-related reasons include instances of internal control failures resulting in staff misconduct, operational risks, criminal fraud, and more. *Governance*-related reasons encompass the appointment of senior management personnel without undergoing the qualification review by the CBRC, lack of review and approval by the Board of Directors for significant connected transactions, banks' shareholders using loans as equity investments in the bank, and so forth.

[15] We exclude rural credit cooperatives, village banks, foreign banks, internet banks, and similar institutions.

banks are presented in Table 2. We supplement the enforcement action data with bank-level, firm-level, city-level, and loan-level data from the Chinese Research Data Services (CNRDS) and the China Stock Market and Accounting Research (CSMAR). Sample summary statistics are presented in Table 3. All variable definitions are given in Table A1 in the Appendix.

3.2 Specification

We use a difference-in-differences design to examine the impact of the decentralization reform of 2015 on enforcement activity. We estimate the following specification at the bank-city-year level:

$$Penalty_{ijt} = \alpha_i + \alpha_j + \alpha_t + \beta Local\ bank_i \times Post_t + \varepsilon_{ijt}, \quad (1)$$

where the subscript i denotes a specific bank i, j the city of the bank branch, and t the year. The dependent variable, $Penalty_{ijt}$, is a one of our measures of penalties imposed on branch belonging to bank i in city j in year t. We use two main variables capturing supervisory stringency. The first variable is a dummy taking the value of 1 if a bank branch receives at least one penalty in year t, and 0 otherwise. The second variable is the log of 1 plus the number of penalties received by a bank branch in year t. In further tests, we also create similarly constructed variables for each type and each recipient of penalties. $Local\ bank_i$ is a dummy taking the value of 1 for branches of local banks i (treated group), and 0 for branches of national banks i (control group). $Post_t$ is a dummy taking the value of 1 from 2015 onwards, and 0 otherwise. The bank fixed effects (α_i) control for differences across banks, while the city fixed effects (α_j) control for differences in local conditions. Since each city has one supervisory office, the city fixed effects also account for any (time-invariant) differences in local supervisory stringencies. We also include year fixed effects (α_t) to control for any macro movements. In some specifications, we further include city × year fixed effects, which control for time-varying city-level heterogeneity. For instance, there may be a turnover of supervisory officers, resulting in a change in local supervisory leniency. In other specifications, we also include bank × city fixed effects (equivalent to branch

fixed effects), which control for heterogeneity across branches of the same bank. Following Gormley and Matsa (2014), our main specification does not include endogenous bank-level controls to avoid "bad control" problems. ε_{ijt} is the error term. The coefficient of interest is β, which measures the effect of the 2015 decentralization reform on treated branches. We expect β to be positive if local banks are subject to more stringent supervision following the reform. Throughout, we report robust standard errors clustered at the level of the city where the branch is located.[16]

The key identifying assumption in a difference-in-differences design is that of parallel trends. Identification relies on the assumption that the outcome would have behaved in a similar way across treated and control groups absent treatment. In our setting, this translates into maintaining that the enforcement output would have evolved in a similar fashion across treated and control branches in the absence of reform. We provide evidence in support of this assumption in Sub-section 4.2. From Table 2, we can already see that branches of local and national banks appear similar in terms of numbers of offices and market share (though national branches are a bit larger), distance to Beijing and in the prevailing local conditions (such as market concentration and credit extension).

4. Decentralization and Penalties

4.1 Basic results

We begin our analysis by examining the effect of the 2015 decentralization reform on penalties imposed by supervisors on bank branches. Table 4 presents the results from estimating equation 1. The first four columns focus on the likelihood of receiving a penalty. In column 1, we run the regression without any fixed effects. In column 2, we add separate bank, city, and year fixed effects, implying that only the interaction between $Local\ bank_i$ and $Post_t$ is estimated. In column 3, we include city × year fixed effects to absorb any time-varying local shocks, meaning that we compare branches of national versus local banks in the same city of the same year. In column 4,

[16] We experiment with alternative clustering levels—in particular, clustering by bank and double clustering by city and year. Clustering by city used in the reported results produces the most conservative standard errors.

we include bank × city fixed effects and year fixed effects to identify the potentially different attitudes of the same supervisor in the same year toward local versus national banks. In columns 1 to 4, the estimated coefficients on the interaction term (statistically significant at the 1% level) show that local banks are 5.5 to 8.2 pp more likely than national banks to receive a penalty following the decentralization reform. Given the unconditional probability of getting a penalty of 11.1%, the effect represents an increased probability ranging from 50 to 74%.[17]

The last four columns focus on the number of penalties as outcome. The results confirm the ones from the previous columns. The estimated coefficients on the interaction term (statistically significant at the 1% level) imply that local banks receive relatively more penalties following the decentralization as compared to national banks. We take the log of 1 plus the number of penalties to retain observations with zero-valued outcomes. However, linear regressions where the dependent variable is the log of 1 plus the count outcome may produce the opposite sign of the true relationship being estimated (Cohn et al., 2022). An alternative to estimating equation 1 is to rely on Poisson regressions as they can accommodate count outcomes with a mass of values at zero. Poisson regressions produce consistent and reasonably efficient estimates under standard exogeneity conditions, even with multiple levels of fixed effects as we have. Table A3 in the Appendix reports the coefficient of a Poisson regression model. As can be observed in column 1, the Poisson regression confirms the finding of column 8 in Table 4.

In Table 5, we control for bank characteristics. However, by doing so, we lose 635 local banks—typically small banks operating in few cities and that are not obligated to publicly disclose their financial statements because they are not listed. We control for bank size, nonperforming loans, net interest margins, loan ratio, and capital adequacy ratio. Although these regressions should be interpreted with caution as some bank

[17] We carry out some robustness checks that are shown in Table A2 of the Appendix. First, these results are unchanged if we drop branches of state-owned banks. State-owned banks may have specific means to influence the enforcement process, and may generally operate differently, while the remaining national banks (the joint-stock banks) operate in a more market-oriented manner as local banks. Second, these results are also unchanged if we exclude penalties issued by the local offices of the CBRC in Beijing. In this case, both central and local office are in the same city, possibly blurring the analysis of decentralization.

characteristics are endogenous to supervisory scrutiny, we can see that the results confirm those reported in Table 4.[18]

Table 6 presents the results for each type and each recipient of penalties employing a specification similar to column 4 of Table 4. In Panel A, we examine each type of penalties, that is, fines, warnings, disqualification, and prohibition.[19] Columns 1 to 8 show that all types of penalties are more likely and more often issued against local banks than national banks after the reform. Regarding the fines, we use the log of the dollar amount instead of their counts. The size of fines post-reform is larger for local than national banks. In Panel B, we split penalties according to whether they are imposed on individuals or institutions. The results show that local supervisors tend to be more stringent against both. Table A3 in the Appendix reports the coefficients of Poisson regression models for count outcomes. Again, the Poisson regressions confirm the findings of Table 6.

4.2 Parallel trends

We now examine the dynamics of the effect. Figure 3 shows a version of our baseline specification that interacts the variable $Local\ bank_i$ with the time in years relative to the decentralization reform. Panel A plots the estimated coefficients for the likelihood of a penalty, while Panel B does the same for the number of penalties. The parallel trends assumption holds as there are no visible differences between the treated group and control group prior to the reform. At the same time, an increase is evident in the years subsequent to the reform. Table A4 in the Appendix also shows the regressions of the dynamic of the effect of decentralization (omitting the year 2015 as the benchmark). Again, no statistically significant effect exists in the years prior to the reform, and a clear increase appears following it.

[18] Bank covariates are likely to be affected by the decentralization shock. As a result, the estimation results are indeed prone to the classical "bad control" problem outlined by Angrist and Pischke (2009).
[19] We do not conduct regressions for license revocations as there are only three instances of such a penalty.

4.3 Placebo tests

A potential concern in difference-in-differences analysis is that serial correlation may bias standard errors, in turn leading to over-rejection of the null hypothesis of no effect (Bertrand et al., 2004). We address this concern by performing a permutation test following Chetty et al. (2009) and Ohrn (2018), among others. We start the procedure by randomly selecting a placebo implementation year between 2010 and 2020 for each permutation. Then, we randomly designate 18 banks from the entire sample and assign them (and their branches) the status of national banks, while treating the remaining banks and their branches as local banks. The baseline regression (specification 4 of Table 4) is then re-estimated for each of our two dependent variables using the placebo treatment. Point estimates are recorded, and the procedure is repeated another 499 times to produce the plots in Figure 4. Both panels of Figure 4 display the empirical distribution of placebo effects for both dependent variables. Reassuringly, the estimated coefficients are normally distributed around 0 and are far away from the actual estimated effects.

5. Decentralization and Lending

A natural extension of our analysis is to examine the effect of the 2015 reform on lending decisions, with the prediction that tighter supervision is associated with lower incentives of banks to take on risks. We proceed to testing this prediction using individual loans extended by branches. [20] Specifically, we consider loan announcements of all listed firms in China over our sample period. We rely on textual analysis to extract information on the identity of borrowers, the loan origination date, the loan amount, the loan spread, and the entity of loan issuing bank branches. We start with 16,268 loans taken out by 1,686 firms from 376 banks. We obtain borrower financial information using CNRDS, namely size, leverage, tangibility, cash holdings,

[20] We cannot examine the impact on the riskiness of branches themselves as balance sheet information is not available. However, studying their loan extensions offers arguably a more suitable empirical setting as the granularity of the individual loan data allows to control for many factors, such as borrower fixed effects. In addition, this more directly measures risk-taking behavior as it focuses on new decisions.

and ROA. We then merge this borrower financial information with information on branches, leaving us with 13,356 loans.

We use both loan spreads (i.e., interest rates) and loan quantities (log of loan amounts) to proxy for aggressiveness in lending by branches. Conditional on borrower risk, a less aggressive branch is expected to charge a relatively higher compensation and to issue smaller loans. All the variable definitions are provided in Table A1 of the Appendix and summary statistics on firm characteristics and loan terms are presented in Panels C and D of Table 3.

We report the loan-level estimation results in Table 7. We first examine loan spreads. In column 1, the specification contains lagged borrower characteristics together with year, bank, and borrower fixed effects. In column 2, we add city fixed effects to the previous specification. In both columns, the number of observations is relatively small given that loan spreads are often missing. The estimated coefficients on the interaction term (statistically significant at the 1% level) indicate that local banks charge higher loan spreads following the 2015 reform. The coefficients of interest are 31.3-31.5 basis point (bp), a remarkable effect of about 29% of the standard deviation of loan spreads. Thus, local banks show less aggressive lending behaviour post-reform by requiring higher compensation for identical borrowers. This result is consistent with our prediction that tighter supervision following decentralization is effective at reducing risk-taking incentives at banks. It should also be noted that most borrower controls are insignificant, suggesting that borrower risk is fairly time-invariant and hence well captured by the borrower fixed effects.

In columns 3 and 4, we look at loan quantities. The estimation results provide further support to our prediction. The estimated coefficients on the interaction term (statistically significant at the 1% level) show that local banks significantly reduce the amount they lend after the 2015 reform. The coefficients of interest are 3.3-3.9, that is, about 9% of the standard deviation of loan amounts. Since smaller loan size implies lower risk, this result is indeed consistent with our prediction.

The findings reported in Table 7 suggest that branches of local banks became more conservative in their lending because of decentralization. We next investigate whether such conservative lending at the bank level has real consequences for the aggregate, city level. Specifically, we test whether loan supply in cities with a higher presence of local banks is lower relative to other cities. It is not clear ex ante that such effects happen in the aggregate. First, more conservative lending by local banks post-reform might be compensated by more accommodating lending by national banks. Second, as our analysis exploits variation across cities, we may fail to empirically identify a significant effect if cities do not vary significantly regarding the importance of local banks.

We use city-level information on loan supply, GDP, and fiscal balance to construct a panel of 287 cities over the same sample period as before. We capture loan supply using the ratio of credit over GDP. The interaction term of interest is here between the share of local banks in the city and the dummy $Post_t$. Our specification includes GDP growth and the fiscal balance of the municipal governments as controls. Robust standard errors are clustered at the city level.

Table 8 displays the estimation results. In column 1, the estimated coefficient on the interaction term (statistically significant the 1% level) is negative, meaning a reduction in loan supply in cities with a higher share of local banks. In column 2, we obtain a similar result when including province fixed effects.

To deal with endogeneity, we rely on an instrumental variable (IV) that captures exogenous variations in the actual share of local banks. We closely follow Gilje et al. (2016) by using the predetermined share of local banks in 2010 as an IV. We first show that our IV is powerful, easily passing tests for weak instruments. It also meets the exclusion restriction because in 2010 banks (or cities) could not plausibly have anticipated the decentralization reform of 2015 and therefore adjust the structure of local banking markets. The IV results are presented in columns 3 and 4. We observe that they are very similar to the ones in the previous two columns.

Overall, the findings in this section imply that stringent supervision resulting from the decentralization reform has real aggregate effects. This is remarkable as the change in supervisory stringency is only applied to a subset of bank branches: the local ones.

6. Channels

6.1 Information collection

Central supervisors are thought to be at an informational disadvantage to local supervisors, as they are more distant from the banks they supervise. Hence, decentralization of supervision may provide benefits by making information collection more efficient as the distance between supervisor and bank (branch) falls. Smaller distance also makes it harder for the bank to hide information from supervisors (Colliard, 2020). In our setting, prior to the reform, the central supervisor also (partially) relies on information provided by the local supervisor. Therefore, distance may lead to informational frictions between central and local supervisor that are then removed as a result of the decentralization reform (e.g., Carletti et al., 2021).

We examine this informational channel in Table 9. We proxy the informational gain induced by the reform using the (log) distance in kilometres between the city where the branch (of a local bank) is located and Beijing.[21] We then examine the differential effect of the reform on penalties across local banks that differ in terms of their distance to the central supervisor (proxying for informational gain). In columns 1 and 2, the specification includes year and bank × city fixed effects. Whether we look at the likelihood of a penalty in column 1 or the number of penalties in column 2, the estimated coefficients on the triple interaction term are positive and statistically significant at the 1% level. In columns 3 and 4, we only exploit within-bank variation as different branches of a bank have different locations. The specification in these two columns includes bank × year and city × year fixed effects. The estimated coefficients on the triple interaction term are again positive and statistically significant at the 1%

[21] Previous literature has offered US evidence that the distance from the firm location to the banking regulator, the Department of Justice, or the Securities and Exchange Commission, affects the costs of monitoring and information acquisition (see, e.g., Kedia and Rajgopal, 2011; Wilson and Veuger, 2017; Ganduri, 2019; Gopalan et al., 2021; Ha et al., 2023; and Lim et al., 2023).

level. The implied effect is sizeable. Using the estimated coefficient on the triple interaction term of 0.023 in column 3, we find that a one-standard-deviation increase in the log distance (that is, 0.854 in Table 3) is associated with an increase of 2.0 pp in the probability of getting a penalty for local banks after the reform (that is, 0.023 × 0.854 = 0.020). We obtain implied effects in similar ranges once calculated from the estimated coefficients of the other columns. Together, these estimation results indicate that the increased stringency resulting from the reform is higher when the central supervisor was more at an informational disadvantage, consistent with the informational channel.

In columns 5 and 6 of Table 9, we examine whether the informational gain is a linear one, or whether it predominantly arises for branches that are very far from Beijing. We create distance dummies (long, intermediate, and short) based on the tercile distribution that we interact with $Local\ bank_i \times Post_t$. The estimated coefficients on the triple interaction term are increasing from short, to intermediate, and eventually to long distance. It is noteworthy that already the coefficient on the triple interaction term for a short distance is sizeable. This speaks to the importance of eliminating even small informational frictions.

In addition, we explore how decentralization affects supervisory outcomes. Better information under local supervision suggests that it becomes easier for supervisors to detect more minor violations, thus resulting in more frequent penalties. This should lead on average to *lower* fine amounts whenever a penalty is imposed (as now a higher fraction of minor violations is detected by the supervisor). By contrast, we would expect that changes in supervisory interventions that arise purely because a supervisor becomes stricter show up in higher fines amounts.

In the last two columns, we test this prediction by running our baseline regression of Table 4 using in column 7 (8) the (log of) average fine (that is, the total amount of fines divided by the number of penalties that involve fines). Branch-year observations without fines are dropped. As can be observed in column 7, the interaction term is negative and statistically significant at the 10% level. Taking instead the log of average fines as dependent variable in column 8 shows an estimated coefficient negative and

statistically significant at the 5% level. These results give support to the prediction that local supervisors are better able to detect violations, but are not necessarily stricter.

6.2 Incentives

Local supervisors are typically in a better position than centralized ones to collect information about the banks they supervised and act on the basis of such information. However, local supervisors may have incentives to favour local interests at the expense of broader financial stability objectives (Shleifer, 1996). We now examine this channel by testing whether local supervisors pursue local interests when issuing enforcement actions. The estimation results are presented in Table 10.

First, local supervisors may be more susceptible to get influenced by local political interests. The closer the supervisor is to the bank the more likely her incentives to collude with local banks' stakeholders and to diverge from that of the distant supervisory hub (Gopalan et al., 2021; Lim et al. 2023). Transferring responsibilities and powers to local supervisors may thus encourage favourable treatment of some connected banks, as reflected in lax enforcement outcome (Correia, 2014; Lambert, 2019; Lim et al., 2019; Yue et al., 2022).[22] Although local supervisory offices in China are in principle independent of the government, local governments (that is, provincial-level or city-level governments) might interfere in the supervisory process to protect their banks. This may particularly be so when local governments have an equity ownership, or even are the controlling shareholders of local banks. We test this idea in columns 1 and 2. Specifically, we rely on a triple interaction term with a proxy for local government ownership at banks. Our proxy is the total share of local governments among the top three shareholders of the bank. We obtain information on bank shareholders and their equity ownership from CNRDS. Shareholders are identified as being affiliated with the central or local government based on their names and

[22] As explained in Section 2, post-reform local supervisors are subject to evaluations by the central supervisor, which may help to limit capture. For instance, in 2018 the CBRC punished local supervisors in Chengdu for their negligence and inability to stop widespread fraud taking place at the Chengdu branch of the Shanghai Pudong Development Bank (see: https://www.retailbankerinternational.com/news/shanghai-pudong-development-bank-fined-using-shell-firms-hide-bad-debt/ last accessed: August 2023).

registration information.[23] The estimated coefficients on the triple interaction terms appear negative and statistically significant at the 5% level, which implies that a larger local government ownership weakens the effect of decentralization on local banks. This result is consistent with the idea that local supervisors may be laxer in their enforcement decisions because they favour local political interests.

Second, local supervisors may support local economic interests when making enforcement decisions. In particular, they may be more intervention-prone when the local financial sector is weak. To test this prediction, we measure the weakness of the local financial sector using the stock of nonperforming loans among banks in the province. We show the estimation results of the triple interaction term with nonperforming loans in columns 3 and 4. The estimated coefficients on the triple interaction term (significant at the 1% level) show that local banks face tighter enforcement in provinces experiencing high nonperforming loan problems. This result supports the idea that local supervisors care more about local economic interests.

Third, local supervisors may not consider that the consequences of their actions outside their jurisdiction. Prior theoretical literature has identified two opposing forces. On the one hand, more stringent supervision is likely to reduce banks' profits, hurting their shareholders located in other jurisdictions (e.g., Beck et al., 2013; Kara, 2016; Calzolari et al., 2019). On the other hand, more stringent supervision may yield benefits in other jurisdictions, as it makes it less likely that local banks will be the source of financial instability (e.g., Dell'Ariccia and Marquez, 2006; Calzolari et al., 2019; Carletti et al., 2021). To shed light on these forces, we approximate the externalities posed by the local supervision of a branch located in a specific city through the share of the banks' offices that are located outside the city. To avoid multicollinearity (this share is negatively correlated with the local bank dummy) we run a regression for the local banks only and examine the interaction effect of the reform dummy with the externality proxy. Columns 5 and 6 show that the decentralization effect is less

[23] Examples of local government entities that serve as shareholders for certain local banks on behalf of the local governments are Local Finance Bureau, State-owned Assets Supervision and Administration Commission, Management Committee of Development Zones.

pronounced for banks with a larger externality. This result is consistent with a positive supervisory externality where local supervisors ignore the stabilizing effect of less risky local banks for other cities, resulting in more lenient supervision.

6.3 Net effect

In the previous sub-sections, we provide some evidence supporting both the informational and incentive channels. Since both channels work in opposite directions regarding how they affect enforcement activity, it raises the question of their combined effect. In what follows, we provide a calculation for this effect for a representative local bank undergoing the 2015-reform.

Consider a local bank with "average" sample characteristics. Regarding the informational channel, this implies that the bank's distance to Beijing (that is, the distance to the central supervisor) is equal to the mean (log) distance of all banks (6.845). As the reform moves this distance to zero, we can calculate the implied change in supervisory stringency on account of the informational channel as the product of the coefficient of the triple interaction effect (0.030 in column 1 of Table 9) and the mean distance (6.845). This gives a total effect of 0.205 for the penalty dummy.

We can make a similar calculation for the distortion implied by local political interests. Assuming that under central supervision, there was no distortion arising from local government ownership, the reform implies a change in supervisory stringency equal to the product of the interaction effect (-0.003 in column 1 of Table 10) with the mean ownership (1.503). The distortion on account of local political interests is thus -0.005 for the penalty dummy, which is a smaller magnitude than for the informational channel. The estimation for the local economic interest as captured by the weakness of the financial sector at the province level does not imply a bias at the average bank since, on average, provincial financial conditions will equal national financial conditions, thus not biasing supervisory interventions. However, we can calculate an implied effect for the last incentive channel arising from externalities. Local supervisory decisions will be unbiased if externalities are inexistent, that is, if the share of branches outside the

city is 0 (as opposed to the mean value of 0.793). Given coefficient estimates of -0.152 for the triple interaction term (cf. column 5 in Table 10) and a mean externality of 0.793, this yields total effect of -0.121, which is again smaller than the informational effect.

Summing up, we can calculate the implied net effect of the reform on a representative local bank as 0.079 (= 0.205 - 0.005 - 0.121) for the penalty dummy. The implied net effect remaining positive is consistent with the prediction that the decentralization reform tightens enforcement at local banks. We also note that the implied net effect we calculate falls in a similar range of magnitude than total effect of the reform we estimated for the penalty dummy (see estimated coefficients of 0.055 in column 3 of Table 4).

7. Conclusion

When the banking sector falls short to deliver outcomes serving the public, it is necessary to make use of enforcement actions to correct its failures and gaps. However, supervisory authorities are embedded in supervisory architectures subject to informational asymmetries and economic incentives that may affect (bias) their enforcement decisions, potentially at the expense of the public. This paper studies the effects of the specific supervisory architecture of the world's largest banking sector, China, on enforcement and lending decisions.

In 2015, China shifted responsibilities and powers for undertaking enforcement actions from central (national) to local (city) supervisors. We find that local supervisors are more likely to initiate enforcement actions against branches of local banks following the decentralization reform. Economically, the likelihood of a penalty increases by 50% to 74%. In addition, we observe that the tighter local supervision is effective as it results in more conservative lending by banks, reducing in turn aggregate loan supply in cities with more local supervision.

We also shed light on the channels via which decentralization affects local supervision. We first find evidence for an informational channel in that supervisory stringency increases more post-reform for branches with a higher informational loss

under centralized supervision. We also find evidence for incentive channels according to which local supervisors pursue local political and economic interests. However, the informational channel enjoys, on the net, more support in the data.

Our findings add to the debate on the design of an optimal supervisory architecture. In particular, they highlight the importance of considering size in the assessment of benefits and costs of centralized and decentralized supervision. Information and incentives play out differently when supervised banks are small (or local) versus big (national) in a given architecture. Our findings imply that when supervised banks are relatively small the informational benefits of decentralized supervision outweigh the costs of biased incentives due to the pursuit of local interests. As acknowledged by Ampudia et al. (2019), this size dimension has received surprisingly little attention in the literature.

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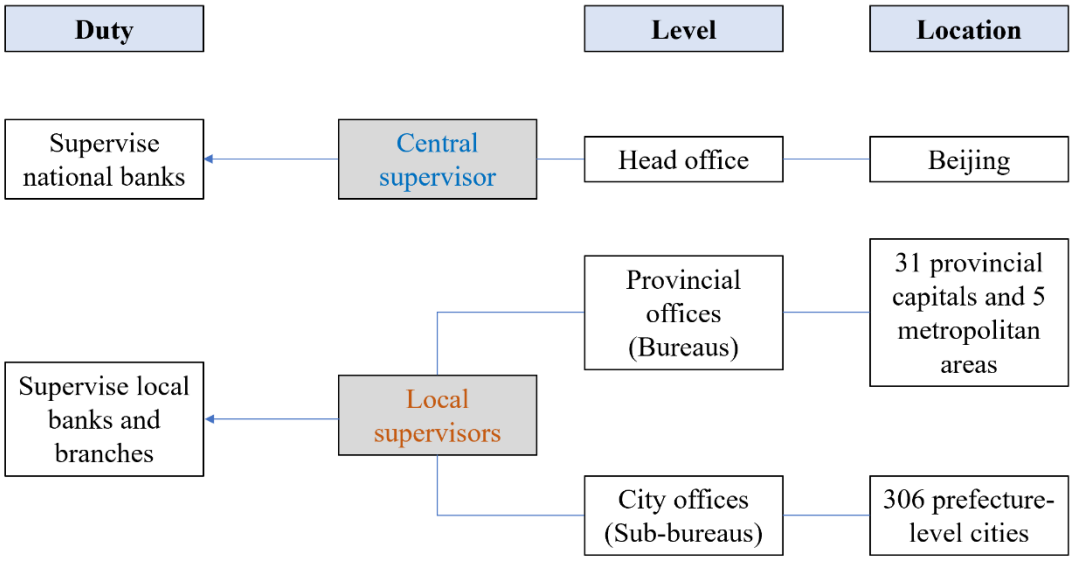
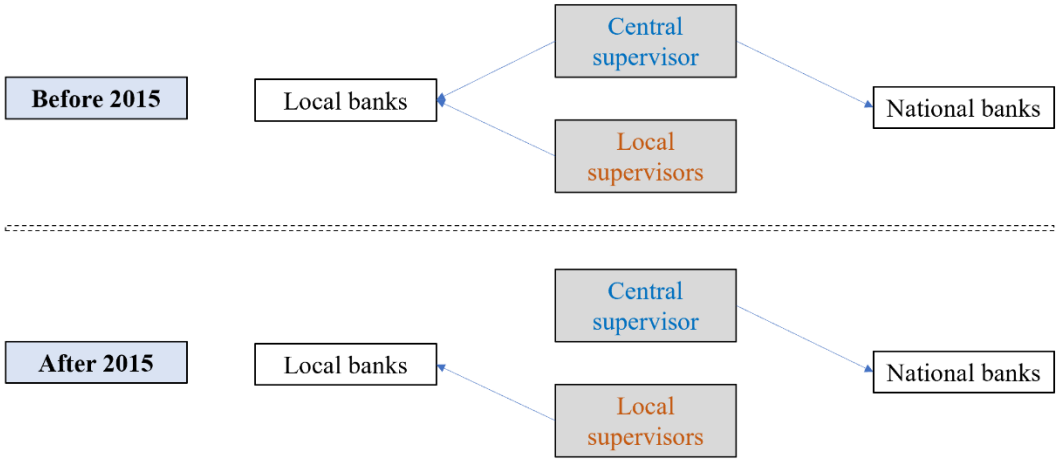
Figure 1. Supervisory architecture



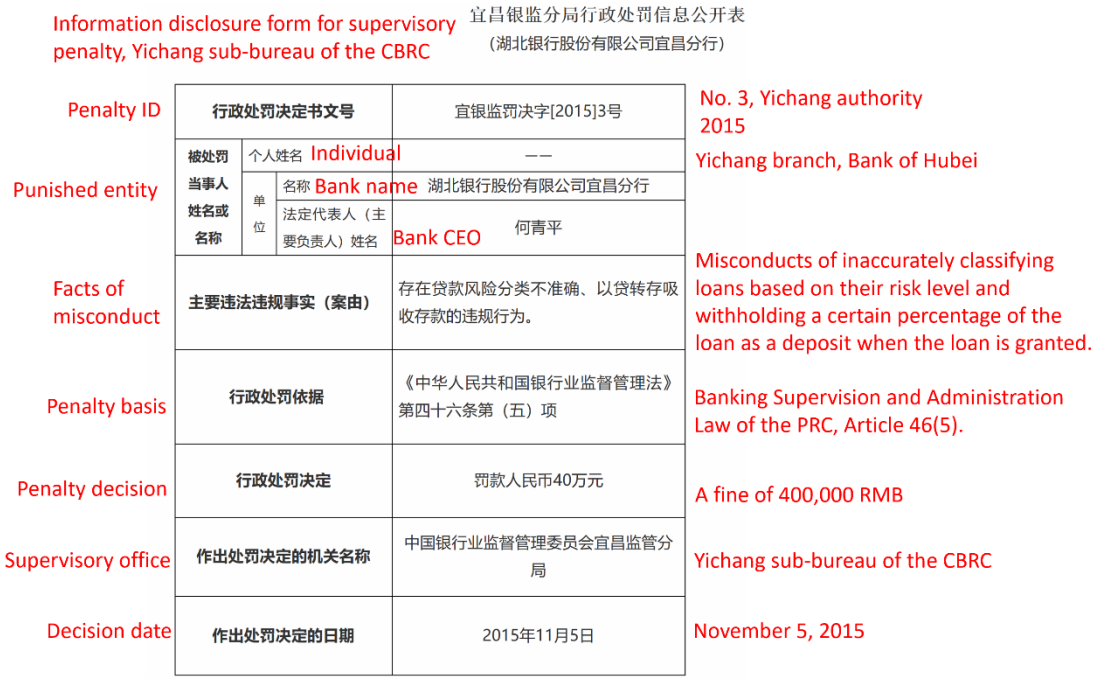
(a) Structure of China Banking Regulatory Commission (CBRC)



(b) Responsibilities and powers for enforcement actions before/after 2015

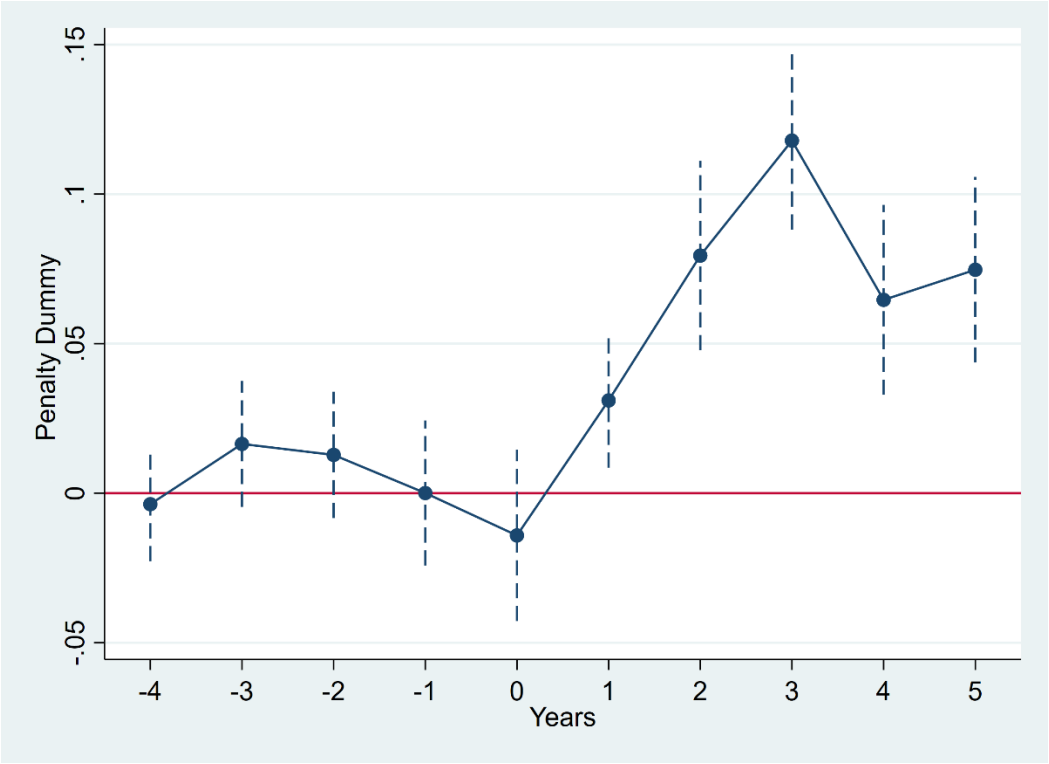
Note: The figures show the structure of China Banking Regulatory Commission (Panel A) and the allocation of responsibilities and powers before and after the decentralization reform of 2015 (Panel B).

Figure 2. Example of a penalty

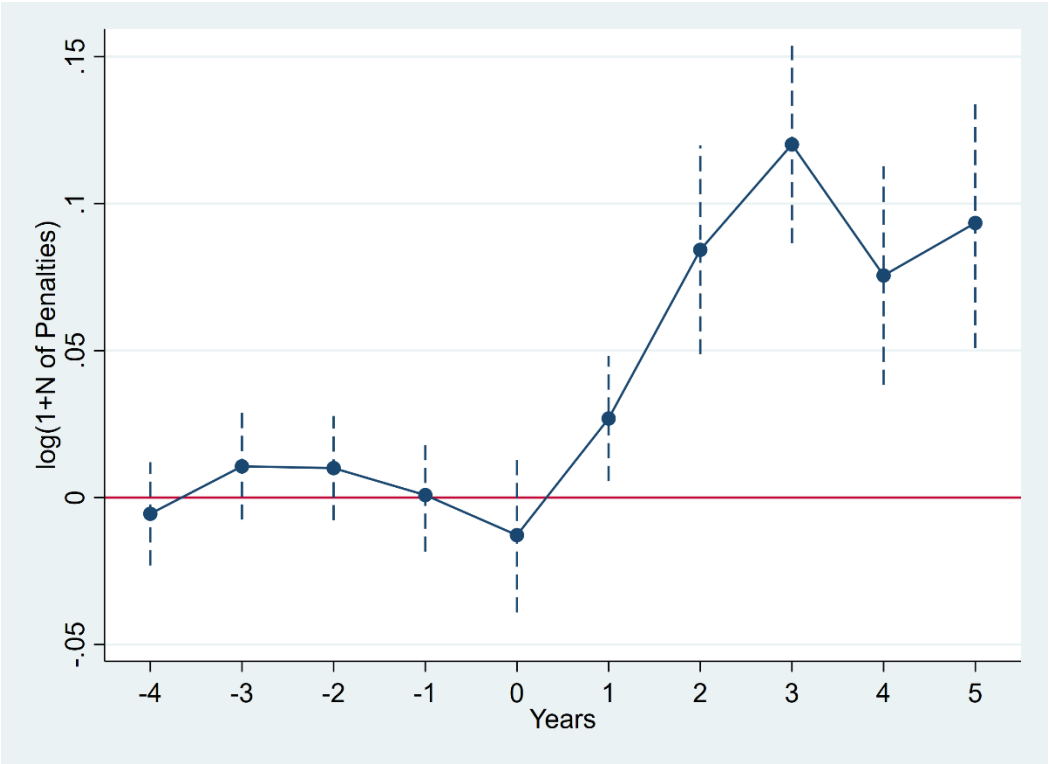


Note: The figure shows a snapshot of a randomly chosen penalty from the website of the CBIRC (source: www.cbirc.gov.cn/branch/hubei/view/pages/common/ItemDetail.html?docId=107940&itemId=1437&generaltype=0; last accessed: August 2023).

Figure 3. Parallel trends



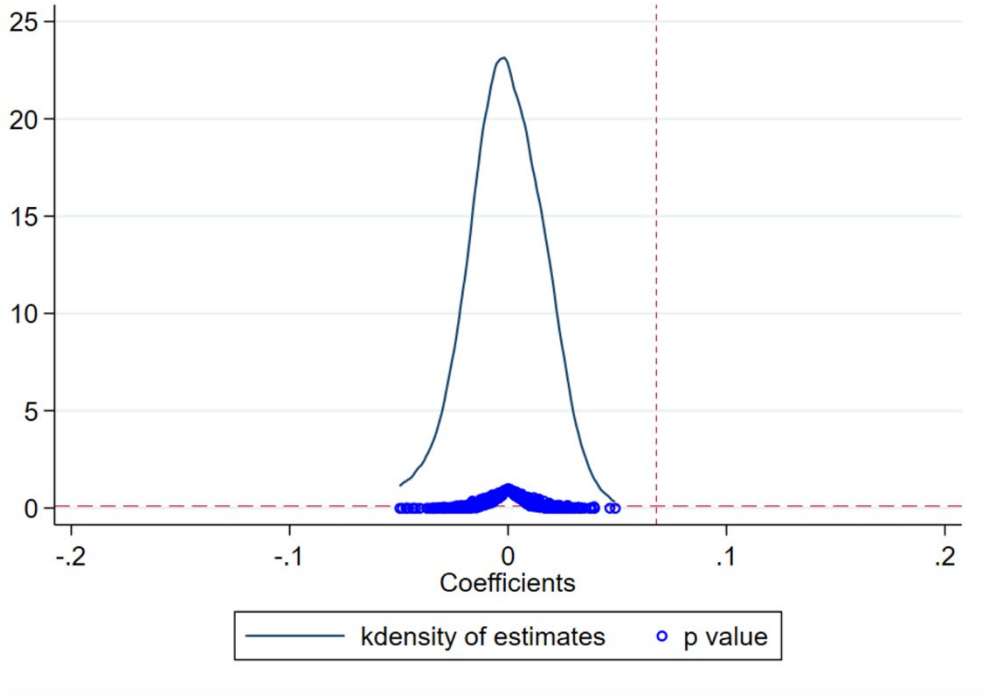
(a) Likelihood of a penalty



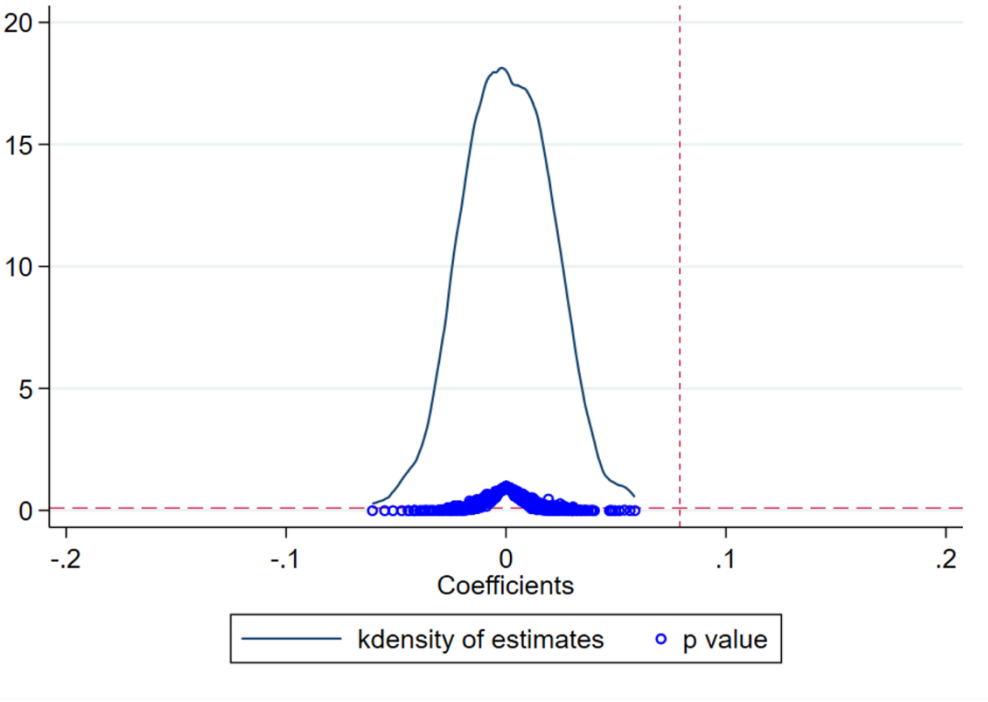
(b) Number of penalties

Note: The figures show the parallel trends for the penaly dummy (Panel A) and number of penalties (log) (Panel B) over our the period surrounding the 2015 decentralization reform. Year 0 refers to year 2015.

Figure 4. Distribution of placebo estimates



(a) Likelihood of a penalty



(b) Number of penalties

Note: The figures show the empirical distributions of placebo effects for each of the two dependent variables of interest as descibred in Sub-section 4.3. The vertical red dash line is the actual estimated coefficient of specificaiton 4 in Table 4, the horizonal red dash line is p-value of 10%, and the solid blue line (blue circles) is the distribution of coefficients (p-values) resulting from the 500 placebo tests for the penaly dummy (Panel A) and number of penalties (log) (Panel B).

Table 1. Summary statistics for the penalty sample

Note: The table presents summary statistics on penalties imposed on local and national banks. Panel A shows the breakdown by type, Panel B by reason, and Panel C by recipient. All variables are defined in Table A1 of the Appendix.

Panel A: Type of penalties	N	Local banks	National banks
Warning	8,573	3,858	4,715
Fine	4,325	2,320	2,005
Disqualification	360	176	184
Prohibition	371	174	197
License revocation	3	0	3
Panel B: Reason of penalties	**N**	**Local banks**	**National banks**
Loan-related reasons	6,768	3,534	3,234
Deposit-related reasons	815	265	550
Interbank-related reasons	462	282	180
Acceptance-related reasons	1,533	661	872
Credit Card-related reasons	182	27	155
Guarantee-related reasons	347	138	209
Prudential regulation-related reasons	1,562	736	826
Internal control-related reasons	971	287	684
Governance-related reasons	277	248	29
Panel C: Recipient of penalties	**N**	**Local banks**	**National banks**
Individuals	4,649	2,593	2,056
Banks	7,848	3,359	4,489
Both individuals and banks	453	236	217

Table 2. Sample composition

Note: The table presents the composition of national and local banks in our sample and summarizes some information at the branch, bank, and aggregate levels.

Bank type	Local banks	National banks
Branch-level statistics		
Average number of offices per branch	21.23	26.77
Average market share (% offices)	4.99%	6.56%
Average HHI of branches' city (% offices)	0.09	0.1
Average distance of branches' city to Beijing (km)	1098.5	1183.7
Average credit/GDP of branches' city	108.26%	112.79%
Average number of penalties per branch	2.75	1.93
Bank-level statistics		
Average number of branches per bank	2.10	182.56
Average number of penalties per bank	5.76	351.56
Aggregate-level statistics		
Number of banks in the full sample	993	18
Number of penalties in the full sample	5,716	6,328
Total fine amount (million)	1,676.87	3,782.72

Table 3. Summary statistics for the full sample

Note: The table presents summary statistics for the full sample. Panel A reports them for branch-level variables, Panel B for bank-level variables, Panel C for loan-level variables, and Panel D for city- province-level variables. All variables are defined in Table A1 of the Appendix.

Panel A: Branch-level variables	N	Mean	SD	P1	Median	P99
Local bank	52,089	0.375	0.484	0	0	1
Penalty dummy	52,089	0.111	0.314	0	0	1
Number of penalties	52,089	0.231	1.053	0	0	4
Fine dummy	52,089	0.106	0.308	0	0	1
Fine amount	52,089	104.813	3,387.263	0	0	1,200
Average fine	3,892	676.062	300	26	300	4,450
Warning dummy	52,089	0.035	0.184	0	0	1
Number of warnings	52,089	0.083	0.671	0	0	2
Disqualification dummy	52,089	0.005	0.069	0	0	0
Number of disqualifications	52,089	0.007	0.117	0	0	0
Prohibition dummy	52,089	0.005	0.071	0	0	0
Number of prohibitions	52,089	0.007	0.118	0	0	0
Distance (km)	52,089	1,151.823	603.057	47.225	1,080.204	2,771.434
Distance (log)	52,089	6.845	0.854	3.876	6.986	7.927
Share of offices outside the city	52,089	0.793	0.385	0	0.994	0.999
Panel B: Bank-level variables	N	Mean	SD	P1	Median	P99
Bank size (log)	44,722	7.578	1.923	2.029	8.675	8.981
CAR (%)	43,946	13.222	2.041	8.42	13.14	17.53
NPL (%)	44,608	1.415	0.822	0.16	1.42	4.25
NIM (%)	44,597	2.112	0.582	0.233	2.099	4.066
Loan ratio (%)	44,479	49.487	8.956	25.112	51.812	64.142
Local ownership (%)	37,778	1.503	4.965	0	0	21.03
Panel C: Loan-level analysis	N	Mean	SD	P1	Median	P99
Loan spread (bp)	7,472	26.518	106.112	-150	15	196
Loan amount	13,356	106.185	623.489	2	30	340
Firm size	13,356	8.653	1.15	6.923	8.542	10.722
Firm leverage (%)	13,356	51.25	18.436	19.799	51.239	80.476
Firm tangibility (%)	13,356	20.811	16.265	0.717	17.268	53.408
Firm cash holdings (%)	13,356	15.164	9.591	3.808	13.091	33.608
Firm ROA (%)	13,356	2.352	6.615	-5.066	2.808	9.507
Panel D: City- and province-level variables	N	Mean	SD	P1	Median	P99
Share of local banks	3136	0.381	0.154	0.127	0.382	0.627
Credit/GDP (%)	3136	99.935	57.851	42.006	82.423	219.771
GDP growth (%)	3136	8.704	4.164	2.000	8.400	15.460
Fiscal balance (%)	3136	12.345	10.279	1.395	9.787	32.971
Province NPL (%)	52,089	1.676	0.874	0.54	1.46	4.57

Table 4. Decentralization and penalties: Basic results

Note: The table presents difference-in-differences estimates of the effect of the 2015 decentralization reform on enforcement actions based on the model in equation 1. Columns 1-4 present results using the likelihood of a penalty as dependent variable, while columns 5-8 present results using the number of penalties (log) as dependent variable. Observations are bank-city-years from 2010 to 2020. All variables are defined in Table A1 of the Appendix. Robust standard errors are clustered by city. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Penalty dummy				Number of penalties			
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Local bank	-0.014***				-0.011***			
	(0.003)				(0.002)			
Post	0.109***				0.115***			
	(0.007)				(0.008)			
Local bank × Post	0.060***	0.068***	0.055***	0.082***	0.070***	0.079***	0.062***	0.095***
	(0.007)	(0.008)	(0.008)	(0.008)	(0.009)	(0.010)	(0.010)	(0.011)
Year FE	No	Yes	No	Yes	No	Yes	No	Yes
Bank FE	No	Yes	Yes	No	No	Yes	Yes	No
City FE	No	Yes	No	No	No	Yes	No	No
City × Year FE	No	No	Yes	No	No	No	Yes	No
Bank × City FE	No	No	No	Yes	No	No	No	Yes
Observations	52,089	52,089	52,072	52,085	52,089	52,089	52,072	52,085
R^2	0.046	0.145	0.247	0.216	0.045	0.142	0.241	0.212

Table 5. Decentralization and penalties: Including bank covariates

Note: The table presents difference-in-differences estimates of the effect of the 2015 decentralization reform on enforcement actions based on the model in equation 1 further controlling for bank characteristics. Column 1 presents results using the likelihood of a penalty as dependent variable, while column 2 presents results using the number of penalties (log) as dependent variable. Observations are bank-city-years from 2010 to 2020. All variables are defined in Table A1 of the Appendix. Robust standard errors are clustered by city. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Penalty Dummy	Number of penalties
	(1)	(2)
Local bank × Post	0.021**	0.034***
	(0.009)	(0.010)
Bank size (log)	0.001	-0.010
	(0.009)	(0.009)
CAR	-0.002	-0.002*
	(0.001)	(0.001)
NPL	0.002	0.002
	(0.003)	(0.005)
NIM	-0.012**	-0.013**
	(0.005)	(0.006)
Loan ratio	-0.001	-0.001**
	(0.000)	(0.000)
Year FE	Yes	Yes
Bank × City FE	Yes	Yes
Observations	43,144	43,144
R^2	0.222	0.219

Table 6. Decentralization and penalties by type and recipient

Note: The table presents difference-in-differences estimates of the effect of the 2015 decentralization reform on enforcement actions based on the model in equation 1. Panel A presents results on each type of penalties, while Panel B presents results on each recipient of penalties. Observations are bank-city-years from 2010 to 2020. All variables are defined in Table A1 of the Appendix. Robust standard errors are clustered by city. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

Panel A: Type of penalties	Fine dummy	Fine amount (log)	Warning dummy	Number of warnings	Disqualification dummy	Number of disqualifications	Prohibition dummy	Number of Prohibitions
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Local bank × Post	0.078***	0.450***	0.045***	0.052***	0.006***	0.005***	0.003*	0.003**
	(0.008)	(0.048)	(0.005)	(0.007)	(0.002)	(0.001)	(0.002)	(0.001)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Bank × City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	52,085	52,085	52,085	52,085	52,085	52,085	52,085	52,085
R^2	0.214	0.225	0.150	0.151	0.102	0.103	0.112	0.113

Panel B: Recipient of penalties	Individual penalty dummy	Number of individual penalties	Bank penalty dummy	Number of bank penalties
	(1)	(2)	(3)	(4)
Local bank × Post	0.045***	0.054***	0.075***	0.063***
	(0.005)	(0.007)	(0.008)	(0.007)
Year FE	Yes	Yes	Yes	Yes
Bank × City FE	Yes	Yes	Yes	Yes
Observations	52,085	52,085	52,085	52,085
R^2	0.157	0.155	0.213	0.215

Table 7. Decentralization and lending: Loan-level analysis

Note: The table presents difference-in-differences estimates of the effect of the 2015 decentralization reform on loan conditions based on the model similar to equation 1. Columns 1-2 present results using loan spreads as dependent variable, while columns 3-4 present results using loan amounts (log) as dependent variable. Observations are loan-branch-years from 2010 to 2020. All variables are defined in Table A1 of the Appendix. Robust standard errors are clustered by firm. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Loan spreads		Loan amounts	
	(1)	(2)	(3)	(4)
Local bank × Post	31.477**	31.257**	-0.385***	-0.329**
	(13.314)	(12.447)	(0.139)	(0.139)
Firm size	4.595	6.563	-0.022	-0.051
	(6.432)	(5.933)	(0.074)	(0.059)
Firm leverage	0.278	0.102	0.002	0.002
	(0.304)	(0.366)	(0.002)	(0.002)
Firm tangibility	-0.388**	-0.523***	0.001	0.000
	(0.193)	(0.183)	(0.003)	(0.002)
Firm cash holdings	0.042	0.095	0.002	-0.001
	(0.344)	(0.406)	(0.003)	(0.003)
Firm ROA	0.040	-0.373	0.001	0.001
	(0.356)	(0.371)	(0.004)	(0.003)
Year FE	Yes	Yes	Yes	Yes
Bank FE	Yes	Yes	Yes	Yes
Firm FE	Yes	Yes	Yes	Yes
City FE	No	Yes	No	Yes
Observations	7,227	7,200	13,010	12,984
R^2	0.601	0.656	0.396	0.458

Table 8. Decentralization and lending: City-level analysis

Note: The table presents difference-in-differences estimates of the effect of the 2015 decentralization reform on loan supply at the city level based on a (OLS and IV) model similar to equation 1. Columns 1-4 present results using credit to GDP at the city level as dependent variable. In columns 2-3, the IV is the predetermined share of local banks in 2010 (as in Gilje et al., 2016). Observations are city-years from 2010 to 2020. All variables are defined in Table A1 of the Appendix. Robust standard errors are clustered by firm. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Credit/GDP			
	OLS		IV	
	(1)	(2)	(3)	(4)
Local bank share	-70.729***	-41.114**	-73.159***	-35.427*
	(17.093)	(18.554)	(17.874)	(20.028)
Local bank share × Post	-31.245**	-35.624***	-43.634***	-32.137**
	(15.558)	(12.240)	(16.437)	(14.063)
GDP growth	-0.427	-0.561	-0.387	-0.572
	(0.706)	(0.349)	(0.706)	(0.350)
Fiscal balance	-0.122	-0.792**	-0.100	-0.824**
	(0.303)	(0.381)	(0.302)	(0.397)
Year FE	Yes	Yes	Yes	Yes
Province FE	No	Yes	No	Yes
Observations	3,136	3,136	3,136	3,136
R^2	0.153	0.440		
Kleibergen-Paap test for weak instruments			201.85	195.47

Table 9. Information collection

Note: The table presents difference-in-differences estimates of the effect of the 2015 decentralization reform on enforcement actions based on the model in equation 1. Columns 1-4 present results using either the likelihood of a penalty or the number of penalties (log) as dependent variable and further interacting $Local\ bank_i \times Post_t$ by the log distance (in km) between the city of the branch and Beijing. Columns 5-6 present results using either the likelihood of a penalty or the number of penalties (log) as dependent variable and further interacting $Local\ bank_i \times Post_t$ dummies taking the value of 1 for short, intermediate, and long distance, respectively. Columns 7-8 present results using either the average fine amount or the average fine amount (log) as the dependent variable. Observations are bank-city-years from 2010 to 2020. All variables are defined in Table A1 of the Appendix. Robust standard errors are clustered by city. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Distance (log)				Distance dummies		Fine amount	
	Penalty dummy	Number of penalties	Penalty dummy	Number of penalties	Penalty dummy	Number of penalties	Average fine	Average fine (log)
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Local bank × Post	-0.127*	-0.225***					-455.929*	-0.260**
	(0.067)	(0.069)					(275.350)	(0.118)
Post × Distance	-0.019	-0.022						
	(0.012)	(0.015)						
Local bank × Post × Distance	0.030***	0.047***	0.023***	0.035***				
	(0.010)	(0.010)	(0.005)	(0.007)				
Local bank × Post × Long distance					0.091***	0.122***		
					(0.014)	(0.021)		
Local bank × Post × Intermediate distance					0.085***	0.097***		
					(0.010)	(0.013)		
Local bank × Post × Short distance					0.070***	0.068***		
					(0.011)	(0.014)		
Bank FE	No	No	No	No	No	No	No	No
Year FE	Yes	Yes	No	No	Yes	Yes	Yes	Yes
Bank × Year FE	No	No	Yes	Yes	No	No	No	No

City × Year FE	No	No	Yes	Yes	No	No	No	No
Bank × City FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	52,085	52,085	43,064	43,064	52,085	52,085	3,892	3,892
R^2	0.217	0.213	0.384	0.377	0.216	0.213	0.333	0.540

Table 10. Incentives

Note: The table presents difference-in-differences estimates of the effect of the 2015 decentralization reform on enforcement actions based on the model in equation 1. Columns 1-2 present results using either the likelihood of a penalty or the number of penalties (log) as dependent variable and further interacting $Local\ bank_i \times Post_t$ by the bank-level variable, *Local ownership* (channel "local political interests"). Columns 3-4 present results using either the likelihood of a penalty or the number of penalties (log) as dependent variable and further interacting $Local\ bank_i \times Post_t$ by the province-level variable, *Regional NPL* (channel "local economic interests"). Columns 5-6 present results using either the likelihood of a penalty or the number of penalties (log) as dependent variable and further interacting $Local\ bank_i \times Post_t$ by the branch-level variable, *Share of offices outside the city* (channel "local economic interests"). Observations are bank-city-years from 2010 to 2020. All variables are defined in Table A1 of the Appendix. Robust standard errors are clustered by city. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Local political interests		Local economic interests			
	Penalty dummy	Number of penalties	Penalty dummy	Number of penalties	Penalty dummy	Number of penalties
	(1)	(2)	(3)	(4)	(5)	(6)
Local bank × Post	0.027***	0.037***	-0.007	0.003	-4.684***	-5.012***
	(0.009)	(0.010)	(0.016)	(0.018)	(0.766)	(0.764)
Local ownership	-0.007	-0.008**				
	(0.005)	(0.004)				
Local bank × Local ownership	0.006	0.006				
	(0.005)	(0.004)				
Post × Local ownership	0.000	-0.001				
	(0.001)	(0.001)				
Local bank × Post × Local ownership	-0.003**	-0.003**				
	(0.001)	(0.001)				
Regional NPL			0.011**	0.007		
			(0.005)	(0.005)		
Local bank × Regional NPL			-0.014***	-0.016***		
			(0.003)	(0.004)		
Post × Regional NPL			-0.038***	-0.039***		
			(0.010)	(0.012)		
Local bank × Post × Regional NPL			0.053***	0.055***		
			(0.008)	(0.010)		
Share of offices outside the city					0.165**	0.330***
					(0.069)	(0.095)
Post × Share of offices outside the city					-0.152***	-0.175***
					(0.011)	(0.014)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
City × Bank FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	37,748	37,748	52,085	52,085	19,508	19,508
R^2	0.231	0.232	0.218	0.214	0.238	0.233

Appendix

Table A1. Variable definitions and sources

Variable name	Definition	Source
Branch-level variables		
Local bank	Dummy variable equals to one if a bank is not a state-owned bank or joint-stock bank.	CBRC/CBIRC
Penalty dummy	Dummy variable equals to one if a bank receives a penalty. A penalty is punitive measure on a bank enforced by a supervisor as a consequence of significant non-compliance with laws or regulations.	CBRC/CBIRC, authors' calculation
Number of penalties	Log of 1 plus number of penalties.	CBRC/CBIRC, authors' calculation
Fine dummy	Dummy variable equals to one if a bank receives a fine. A fine includes a monetary penalty imposed on a bank and confiscation of its illegal proceeds.	CBRC/CBIRC, authors' calculation
Fine amount	Log of 1 plus fine amount (in thousand RMB).	CBRC/CBIRC, authors' calculation
Average fine	Aggregate fine amount divided by the number of fine incidences.	CBRC/CBIRC, authors' calculation
Warning dummy	Dummy variable equals to one if a bank receives a warning. A warning is a formal notification letter issued by a supervisor, alerting a bank of its non-compliance with laws or regulations.	CBRC/CBIRC, authors' calculation
Number of warnings	Log of one plus number of warnings.	CBRC/CBIRC, authors' calculation
Disqualification dummy	Dummy variable equals to one if a bank receives a penalty that its manager is disqualified and barred from holding positions of senior managers in the banking industry for a specified period or permanently.	CBRC/CBIRC, authors' calculation
Number of disqualifications	Log of 1 plus number of disqualifications.	CBRC/CBIRC, authors' calculation
Prohibition dummy	Dummy variable equals to one if a bank receives a penalty that its staff is prohibited or banned from working in the banking industry for a specified period or indefinitely.	CBRC/CBIRC, authors' calculation
Number of prohibitions	Log of 1 plus number of prohibitions.	CBRC/CBIRC, authors' calculation
Distance	Log of distance (in kilometers) between the bank branch and Beijing.	Baidu Map, authors' calculation
Share of offices outside the city	The proportion of the number of bank offices located outside the city where the bank branch operates.	CBRC/CBIRC, authors' calculation

Bank-level variables		
Bank size	Log of a bank's total assets (in billion RMB).	CNRDS
CAR	Capital adequacy ratio (%).	CNRDS
NPL	Non-performing loans to total assets (%).	CNRDS
NIM	Net interest margin (%).	CNRDS
Loan ratio	Gross loans to total assets (%).	CNRDS
Local ownership	The sum of equity ownership (%) by local (provincial-level or prefecture-level) governments in top three shareholders.	CNRDS
Loan-level variables		
Loan spread	Loan spread over the benchmark interest rate in basis points.	Authors' collection
Loan amount	Log of loan amount (in million RMB).	Authors' collection
Firm-level variables		
Firm size	Log of total assets (in million RMB) of a borrower.	CNRDS
Firm leverage	Total liabilities to total assets (%) of a borrower.	CNRDS
Firm tangibility	Total property, plant, and equipment to total assets (%) of a borrower.	CNRDS
Firm cash holdings	Cash holdings to total assets (%) of a borrower.	CNRDS
Firm ROA	Return on assets (%) of a borrower.	CNRDS
City-level variables		
Share of local banks	Share of local banks in terms of number of bank offices in a city.	CBRC/CBIRC, Authors' collection
Credit/GDP	Private credit to GDP (%) of a city.	CNRDS
GDP growth	Growth rate of GDP (%) of a city.	CNRDS
Fiscal balance	A municipal (city) government's revenue minus its expenditure, divided by its GDP.	CNRDS
Province-level variables		
Regional NPL	Province-level nonperforming loan ratios (%).	CSMAR

Table A2. Additional robustness checks

Note: The table presents difference-in-differences estimates of the effect of the 2015 decentralization reform on enforcement actions based on the model in equation 1. Columns 1-2 present results using either the likelihood of a penalty or the number of penalties (log) as dependent variable and excluding from the sample state-owned banks. Columns 3-4 present results using either the likelihood of a penalty or the number of penalties (log) as dependent variable and excluding from the sample penalties issued by the local offices of the CBRC in Beijing. Observations are bank-city-years from 2010 to 2020. All variables are defined in Table A1 of the Appendix. Robust standard errors are clustered by city. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Excluding state-owned banks		Excluding penalties in Beijing	
	Penalty dummy	Number of penalties	Penalty dummy	Number of penalties
	(1)	(2)	(3)	(4)
Local bank × Post	0.062***	0.085***	0.084***	0.098***
	(0.012)	(0.014)	(0.008)	(0.010)
Year FE	Yes	Yes	Yes	Yes
City × Bank FE	Yes	Yes	Yes	Yes
Observations	31,230	31,230	51,755	51,755
R-squared	0.222	0.216	0.214	0.210

Table A3. Poisson regressions

Note: The table presents Poisson estimates of the effect of the 2015 decentralization reform on enforcement actions based on the model in equation 1. Columns 1-8 present results using the number of each type or recipient of penalties as dependent variable and implementing Poisson pseudomaximum likelihood regressions with (multiple levels of) fixed effects as described by Correia et al. (2020). Observations are bank-city-years from 2010 to 2020. All variables are defined in Table A1 of the Appendix. Robust standard errors are clustered by city. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Number of penalties	Number of warnings	Number of disqualifications	Number of prohibitions	Number of individual penalties	Number of bank penalties
	(1)	(2)	(3)	(4)	(5)	(6)
Local bank × Post	1.082***	1.431***	1.076***	1.464	1.040***	0.951***
	(0.141)	(0.281)	(0.410)	(1.215)	(0.382)	(0.129)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes
Bank × City FE	Yes	Yes	Yes	Yes	Yes	Yes
Observations	33,372	15,476	2,515	2,073	14,697	32,219
Pseudo-R^2	0.323	0.349	0.129	0.287	0.392	0.243

Table A4. Decentralization and penalties: Dynamic effects

Note: The table presents difference-in-differences estimates of the effect of the 2015 decentralization reform on enforcement actions based on the model in equation 1 with $Local\ bank_j$ interacted with $Year_{2015-[+]1}$, that is, each year before and after 2015 (excluding 2015). Column 1 presents results using the likelihood of a penalty as dependent variable, while column 2 presents results using the number of penalties (log) as dependent variable. Observations are bank-city-years from 2010 to 2020. All variables are defined in Table A1 of the Appendix. Robust standard errors are clustered by city. ***, **, and * denote statistical significance at the 1%, 5%, and 10% levels, respectively.

	Penalty dummy	Number of penalties
	(1)	(2)
Local bank × year2010	-0.004	-0.008
	(0.015)	(0.014)
Local bank × year2011	-0.004	-0.008
	(0.014)	(0.013)
Local bank × year2012	0.015	0.007
	(0.014)	(0.013)
Local bank × year2013	0.015	0.012
	(0.014)	(0.013)
Local bank × year2014	0.009	0.008
	(0.015)	(0.013)
Local bank × year2016	0.050***	0.048***
	(0.014)	(0.014)
Local bank × year2017	0.117***	0.124***
	(0.016)	(0.018)
Local bank × year2018	0.149***	0.157***
	(0.018)	(0.019)
Local bank × year2019	0.097***	0.113***
	(0.015)	(0.017)
Local bank × year2020	0.120***	0.148***
	(0.019)	(0.023)
Year FE	Yes	Yes
Bank × City FE	Yes	Yes
Observations	52,085	52,085
R^2	0.220	0.216