Journal of
Risk and Financial Management

MDPI

Article

Does Public Corruption Affect Bank Failures? Evidence from the United States

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Abstract: Corruption influences firm behavior and performance even in relatively transparent countries like the United States. In this paper, we examine whether corruption at the state level affected bank failures during the subprime mortgage crisis. Our measure of corruption is the number of corruption convictions of government employees (adjusted for population) based on the Public Integrity Section (PIN) reports from the Department of Justice, capturing the degree of "public corruption" in the US. After disaggregating the data based on bank size and geography, we find that corruption is associated with more bank failures for smaller banks and fewer bank failures for banks located in the South. This research marks a pioneering attempt to examine the connection between corruption and bank failures while underscoring the significance of political risk for financial institutions. Given the recent setbacks experienced by Silicon Valley Bank, Signature Bank, and First Republic Bank, this research provides valuable recommendations for policymakers. The findings suggest the need for regulators to mandate greater transparency regarding banks' exposure to undisclosed risks, such as political risk. It also advocates for implementing internal control mechanisms to curb corrupt activities.

Keywords: bank failures; corruption; political connections; political risk

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Citation: Karadas, Serkan, and Nilufer Ozdemir. 2023. Does Public Corruption Affect Bank Failures? Evidence from the United States. *Journal of Risk and Financial Management* 16: 451. https://doi.org/10.3390/jrfm16100451

Academic Editor: Artem Durnev

Received: 18 September 2023
Revised: 15 October 2023
Accepted: 17 October 2023
Published: 19 October 2023

1. Introduction

The fears over systemic bank failures receded into the background after the Great Recession. However, the unforeseen failures of Silicon Valley Bank, Signature Bank, and First Republic Bank revived these fears (Narea 2023; Evers-Hillstrom 2023). In this paper, we look at bank failures for a time period when bank failures were more common than the current failures (bank failures during the subprime mortgage crisis) and we examine whether corruption had any effect on bank failures in the United States in that time period. We measure corruption based on the reports produced by the Public Integrity Section (PIN) housed in the Department of Justice (i.e., PIN data). These reports provide a count of "federal prosecutions of corrupt public officials" covering government employees at all levels of the government, namely, federal, state, and local (Department of Justice 2019). We further adjust this measure with state population to account for the possibility that larger states have more corruption counts. Hence, our variable of interest measures public corruption, which we also refer to as corruption for brevity. This variable captures a dimension of political culture in a given state and may also serve as a proxy of political connections and political influences to the extent that firms are impacted by such a climate. However, since political connections and political influences are broad terms covering both legal actions (e.g., lobbying, campaign contributions) as well as illegal actions (e.g., bribery, fraud), we use the term "corruption" to draw attention to illegal aspects of political relationships and the political environment.

Corruption is a complex phenomenon in which private and/or public figures engage in actions to benefit themselves by defrauding the public and government institutions. And corruption displays wide variation across the globe. Transparency International produces a corruption ranking of individual countries called the Corruption Perception Index (CPI). According to the 2022 data, the three countries with the least corruption were Denmark, Finland, and New Zealand, and the three countries with the highest corruption were South Sudan, Syria, and Somalia. In the same year, the United States ranked 24th among 180 countries.[1] This indicates that corruption can be a serious issue even in an advanced country like the United States. In fact, a 2021 survey conducted among Michigan and Ohio voters revealed that more than 85% of the voters classified corruption as a big problem, and more than 60% of them classified it as a very big problem.[2] These survey responses are consistent with the data on the economic harms of corruption. For example, according to the World Bank, corruption causes an estimated annual loss in the global gross domestic product in excess of USD 2.6 trillion.[3]

Corruption might have two competing impacts on banks' chances of survival. The possibility exists that for banks, corruption leads to a less productive and less stable economic environment (e.g., Ben Ali et al. 2020; Johnson et al. 2011) and sub-optimal loan decisions and poor operational outcomes (e.g., Khwaja and Mian 2005; Murdock et al. 2023), contributing to a higher failure rate. On the other hand, given the evidence of political interference in the banks' regulatory environment (Brown and Dinc 2005; Liu and Ngo 2014; Zhou 2022) and in the financial assistance to the banks during times of trouble (Duchin and Sosyura 2012; Vukovic 2021), and the potential benefits of corruption in dealing with the red tape in highly bureaucratic environments (Heckelman and Powell 2010), it is possible that a corrupt environment enables banks to acquire benefits from politicians and subsequently improve their operating performance, contributing to an overall lower failure rate.

Earlier research efforts have explored the influence of corruption on business performance, yet certain vital questions remain unaddressed, including questions such as "What effects does corruption have on bank failures?" and "Do bank size and location matter in terms of the effect of corruption on bank failures?". Our study bridges this gap in the existing literature by merging insights from studies on bank failures and the expanding body of research examining the interplay between politics and finance. Furthermore, our study benefits from focusing on local units (states) operating in the same country under the same federal government, and hence, it is at an advantage relative to international studies that examine countries with different cultures, institutions, and customs, more likely leaving out important variables (Brown et al. 2015; Johnson et al. 2011).[4]

In addition to contributing to the literature on political influences and connections, this study addresses existing gaps in the banking literature through the development of a novel methodology. Building upon Cole and White's (2012) model, which primarily focuses on bank-specific factors to estimate failures within the same period we investigate, our approach introduces a critical variable: corruption. Unlike their study, where bank-specific factors were the sole consideration, our modification incorporates corruption into the model. We start our analysis by exploring the relationship between corruption and bank failures across the entire sample. Subsequently, we break down the data by size, categorizing banks into specific percentiles: the 25th to 50th percentile, less than 50th percentile, 50th to 75th percentile, and 75th percentile and above. We document a positive association between corruption and bank failures for the banks in the 25th to 50th percentile sample (i.e., more corruption implies more failures).[5] In the final phase of our analysis, we break down the data geographically, revealing compelling evidence of a negative association between corruption and bank failures, particularly among banks located in the South (i.e., more corruption implies fewer failures). This novel approach sheds light on the intricate interplay between corruption, bank size, and geographical location, providing valuable insights into the dynamics of bank failures.

Our paper proceeds as follows. In Section 2, we review the related studies, and in Section 3, we present our theoretical analysis and develop the hypotheses. In Section 4, we introduce the data sources and methodology. In Section 5, we present the empirical results.

We provide a discussion in Section 6 and the conclusions, implications, and limitations in Section 7.

2. Literature Review

Though not all political connections and political influences can be labeled as corrupt, they serve as a conduit through which the act of corruption materializes. However, there is mixed evidence in the literature on how corruption (political connections and influences in general) affects firm performance. The first strand of the literature documents the rewards and benefits firms receive through their engagement with government officials. International evidence suggests that firms benefit from political connections in the form of lower interest rates and easier access to loans. Claessens et al. (2008), examining the role of political connections in Brazil, find evidence of a quid pro quo relationship between politically connected firms and politicians: firms that give campaign contributions ahead of elections are awarded increased financing from banks in the post-election period (i.e., an increase in bank debt), suggesting that politicians exert influence on banks to reward politically connected firms as a way to repay the favors given to them. The studies by Infante and Piazza (2014) and Khwaja and Mian (2005) document similar positive outcomes for politically connected firms (in Italy in the former study and Pakistan in the latter study). In an international study of actual bribery cases, Cheung et al. (2021) find that corruption can be quite beneficial to firms. They present evidence that USD 1 paid in bribes can create benefits as large as USD 9 for bribing firms. This evidence is consistent with a 2014 OECD study showing that in majority of bribery cases, companies bribe with the knowledge of their senior management, and they do so to influence the outcome of government contracts (OECD 2014).

How about the impact of politics on US firms? The share of the public sector in the US stands at 25% of the gross domestic product (GDP) as of the 2022 fiscal year data.[6] This makes the government and, hence, public officials among the key players in the US economy. Therefore, it should not come as a surprise that government policies and decisions create winners and losers in the US economy, as well, including those in the financial sector (Veronesi and Zingales 2010). The existing empirical evidence suggests that the financial markets carefully watch and react to the actions and decisions of the government. Acemoglu et al. (2016), examining the reaction in the financial markets to the news of the appointment of Timothy Geithner as the Treasury Secretary under the Obama administration, find evidence of positive abnormal stock returns as well as reductions in the credit default swap (CDS) spreads for the financial firms with which Mr. Geithner had a prior connection. The authors reason that these findings are likely to be driven by the financial markets, expecting that the connected firms may find sympathetic ears to their problems during one of the most stressful periods for them in recent history.

Elected politicians in the US can also influence financial institutions. Zhou (2022) explores the role of political influence on banks and borrowers using the US data. In particular, he examines whether the chairman of the US Senate Banking Committee influences the borrowing costs of firms that are headquartered in the same state that the senator represents. He finds evidence that these firms enjoy lower rates on bank loans. Further, as a possible realization of a quid pro quo relationship, banks benefit (after delivering favors to the connected firms) by receiving fewer regulatory investigations. Moreover, the connected firms reward their senators with higher campaign contributions following the receipt of preferential treatment from lenders. The results reported by Zhou (2022) align well with earlier studies. For example, Gropper et al. (2013) find that banking committee chairmanship in Congress is positively related to the return on assets for banks headquartered in the state that chairs represent, while a subsequent study documents that this effect is reduced if the economic freedom is high in a given state (Gropper et al. 2015).

Campaign contributions are another tool that firms may deploy to build political connections, and other firms may capitalize on such connections to seek political benefits. For example, Kaviani et al. (2021) use campaign contributions as a measure of political connections (to members of Congress) and find that politically connected firms obtain larger and cheaper loans from banks. The authors assert that banks purposefully offer these attractive terms to connected firms to curry favor with members of Congress, and the more important members of Congress are, the more attractive the terms become. Also, the preferential lending by banks is much more pronounced when they face regulatory actions and during the Troubled Asset Relief Program (TARP) period. To be more specific, Kaviani et al. (2021, p. 7) find that "banks that faced high levels of FDIC enforcement actions and banks that received bailouts extend more loans to firms associated with winning politicians than otherwise similar banks." This finding is consistent with the prior literature linking political connections to bank bailouts (Duchin and Sosyura 2012; Vukovic 2021).

Lobbying is another form of political connection that may bring benefits to firms. For example, by examining the sale of failed banks in the US, Igan et al. (2022) present evidence that banks with political connections (established through lobbying and/or by giving campaign contributions to public officials) are more likely to win the auction of failed banks and that the outcomes of such auctions are not as economically efficient as they could be. Banks can also establish quid pro quo relationships directly with members of Congress. Using a novel dataset, Tahoun and Vasvari (2022) find evidence that banks target the members of Congress serving on the finance committees in the US House and in the US Senate, and they provide them with loans that are longer in maturity and lower in rates compared to what they provide to other members of Congress.

Finally, regulatory capture could be another form of corruption (Stigler 1971; Peltzman 1976; see Bo (2006) for other examples of seminal work on regulatory capture). Carpenter and Moss (2013, p. 13) provide a comprehensive definition of regulatory capture: "Regulatory capture is the result or process by which regulation, in law or application, is consistently or repeatedly directed away from the public interest and toward the interests of the regulated industry, by the intent and action of the industry itself". In an example of the capture of banking regulators, a report by the Office of Inspector General (Office of Inspector General 2009) provides a detailed examination of how the Office of Thrift Supervision (OTS) allowed, and in some cases asked, six financial institutions to backdate their capital contributions (one of those institutions later failed) despite the fact that this was a violation of the Generally Accepted Accounting Principles (GAAP). The report (Office of Inspector General (2009, p. 2)) further explains that in some cases, OTS was against this unapproved accounting treatment, but they did not protest it after it happened. It is important to note that regulatory capture may extend beyond the industry regulators. For example, Bo (2006) views the results of Khwaja and Mian (2005), which show that politically connected firms in Pakistan borrow more and default more (driven mostly by loans from the government banks), as an example of a capture.

The literature on another strand of political connections and influence shows that corruption may have negative consequences for businesses, leading to a sub-optimal operating environment and business failures. For example, based on the PIN data, Brown et al. (2015) measure the effect of corruption on firm value using Tobin's Q and document a destruction of shareholders' wealth in excess of USD 9 million (for the median firm) when their corruption variable moves up by one standard deviation. In a study of municipal bonds in the US using the PIN data, Butler et al. (2009) document a negative relationship between bond ratings and state-level corruption and a positive relationship between yield to maturity and state-level corruption, referring to the latter result as "the corruption penalty". In another US study, Smith (2016) documents a negative relationship between cash holdings and corruption, and a positive relationship between financial leverage and corruption. Firms make these decisions not necessarily because they are the optimal decisions but because they want to lessen the chance of corporate resources being expropriated due to public corruption.

Corruption may hurt economic performance. For example, Johnson et al. (2011) calculate the cost of corruption using the PIN data from the Department of Justice at the individual state level and find that when their population-adjusted corruption measures move up by one standard deviation, the growth rate of average output per worker suffers a 0.19-percentage-point decline. In a study of 38 countries, Ben Ali et al. (2020) present evidence linking corruption to banking crises. This result is not surprising given the evidence in the literature that politically connected firms that borrow more but also default more (Khwaja and Mian 2005). Evidence from the United States also shows that banks that make loan decisions under political influence have worse operating results (Huang and Thakor 2022).

The following section presents the theoretical underpinnings of our study and discusses the hypotheses tested, and it will be followed by the section introducing the data sources and empirical strategy.

3. Theoretical Analysis and Hypothesis Development

This section explains the theoretical analysis and discusses the hypotheses that will be tested in the subsequent section.

Our theoretical model is based on Diamond and Dybvig (1983) and Diamond and Rajan (2005). They illustrate how the combination of banks' illiquid assets (such as long-term loans) and liquid liabilities (such as short-term deposits) can trigger panics in financial markets and lead to bank failures. In their model, banks act as financial intermediaries, creating liquid claims against illiquid assets. Depositors have the right to withdraw their funds anytime, assuming random and unpredictable cash needs. This setup allows banks to lend over extended periods, holding minimal cash reserves for routine withdrawals. However, Diamond and Dybvig's model suggests that a different scenario is also possible due to the maturity mismatch of bank balance sheets. In this scenario, if all depositors demand withdrawals simultaneously, the bank exhausts its funds before meeting all demands.

The Diamond–Dybvig model sees bank runs as self-fulfilling prophecies. Depositors worrying about the health of their bank want to withdraw their money. If they anticipate mass withdrawals, they rush to be first, causing a domino effect. The model predicts that banks lacking strong foundations are more prone to deposit withdrawals and, therefore, failures. That is to say, they see weak bank fundamentals as harbingers of bank failures (see Kashyap (2015) for how the Diamond–Dybvig model explains bank failures during the subprime mortgage crisis).

Empirical studies adopting the Diamond–Dybvig approach estimate the likelihood of bank failures by employing logistic regression, since the dependent variable in these models is binary (fail or survive) (see Cole and White (2012) for the application of the logistic model). These models differ in how they describe the early indicators of bank failures. Below, we will first introduce the logistic regression models and elaborate on how the Diamond–Dybvig approach is integrated into the logistic regression framework.

3.1. Logit Models in the Bank Failure Literature

A logistic model is a nonlinear model with dichotomous outcome variables of failed/nonfailed banks. The use of logit regression in this literature was pioneered by Beaver (1966) and commonly used afterward. The logistic function, given as $f(\theta) = \frac{e^{\theta}}{(1+e^{\theta})}$, varies from 0 to 1. Replacing θ with bank characteristics xb, the logistic model can be used to estimate the likelihood of failure (FC = 1) and survival (FC = 0) as follows:

$$P_{it} = E(FC = 1|X_{i,t-k}) = \frac{1}{1 + e^{-(\beta_0 + \beta_i X_{i,t-k})}}$$

or

$$P_{it} = \frac{1}{1 + e^{-Zit}}$$

and

$$Z_{it} = \beta_0 + \beta_i X_{i,t-k} \quad (1)$$

where P_{it} is the probability that bank i is going to fail (FC = 1) at time t, Z_i is the linear function from the predictor variable, X_i is the predictor variable for bank i, and k is the period before the bank goes bankrupt[7] (for more details on this model, please see Montgomery et al. 2005).

3.2. Hypothesis Development

Previous studies estimating Diamond and Dybvig's theoretical model show variation in the way they define X_i in Equation (1). Early studies defined it as variables representing the health of a bank (Estrella et al. 2000). More recent studies add other characteristics into the mix, such as the characteristics of banks' loan portfolios (Cole and White 2012) and the parent bank holding company's financial health (Ozdemir and Altinoz 2018). However, previous research overlooks the influence of the political environment on bank failures. In our study, we aim to fill this gap by incorporating political factors to better understand and estimate the likelihood of bank failures. Equations (5)–(9) in Section 4.3 show how we estimate this model.

Due to corruption's harmful effects on the economy and economic growth (Shleifer and Vishny 1993; Mauro 1995; Johnson et al. 2011), banks operating in more corrupt states face a more challenging economic environment, which may adversely affect their financial and operational success. Furthermore, a corrupt environment may coerce banks or incentivize them to make sub-optimal financial and operational decisions (e.g., Claessens et al. 2008). Due to these adverse macro-level and micro-level effects, banks operating in more corrupt states may be more likely to fail. On the other hand, there could be positive micro-level and macro-level impacts from corruption. Political influences may help poorly performing banks stay in business by providing them with regulatory relief or other forms of help (e.g., Zhou 2022), by improving the overall operating environment (Heckelman and Powell 2010) or by interfering with the process of bank closures. Though political interference with bank closures may be considered an issue encountered mostly in developing economies (Brown and Dinc 2005), Liu and Ngo (2014) present evidence that governors in the US intervene in bank closing decisions when they are up for an election. The outcome of such interventions is drastic: "Bank failure is approximately 45% less likely in the year leading up to an election" (Liu and Ngo 2014, p. 2).

We argue that such political influences could be stronger in more corrupt states. We extend the literature on bank failures by introducing political influence into the model. Below, Equation (2) modifies Equation (1) by incorporating the corruption variable into the equation.

$$Z_{it} = \beta_0 + \beta_1 X_{i,t-k} + \beta_2 Corruption_{i,t-k} \quad (2)$$

where X includes variables representing the health indicators and other indicators that the literature agrees on (see Equations (5)–(9) in Section 4.3 for the equations we estimated). We use the general setup in Equation (2) to test our first hypothesis:

Hypothesis 1. *There is a statistically significant relationship between corruption and bank closures.*

Previous studies suggest that determinants of bank failures vary depending on bank size (see Alzugaiby et al. (2021), Berger et al. (2021), and De Haan and Poghosyan (2012) and others for reasons behind this variation). Therefore, for our next hypothesis, we consider the potential role of bank size in how corruption may affect bank closures. The possibility exists that larger banks, due to their size and relative importance in a given state's economy, obtain higher "returns" on the favors they make to politicians or receive more favors from politicians in general (Liu and Ngo 2014). Furthermore, due to their better ability to diversify, they might be better positioned to reduce the harmful effects of "favored loans" on their balance sheet. Hence, collectively, larger banks may experience more tailwinds than headwinds from corruption. On the other hand, smaller banks may not be able to obtain as many political favors and may not be able to diversify away the harmful effects of "favored loans" as larger banks do, and as a result, the cost of corruption may exceed the benefits of corruption for them. In light of these potential mechanisms, we formulate our second hypothesis as follows:

Hypothesis 2. *The size of banks plays a role in how corruption affects bank closures.*

To test this hypothesis, we will reorganize Equation (2) below:

$$Z_{it,\ j} = \beta_{0j} + \beta_{1j} X_{ij,t-k} + \beta_{2j} Corruption_{ij,t-k} \tag{3}$$

where j represents the bank size (see Section 5.2 for the bank sizes we estimate).

Previous studies looking at bank failures also find a geographical trend in bank failures. There is evidence that bank failures are clustered in certain geographic regions, with the South having the highest concentration of bank failures (Alston et al. 1994; Aubuchon and Wheelock 2010; Liu and Ngo 2014; Davison and Ramirez 2014; Federal Deposit Insurance Corporation 2020). Therefore, for our last hypothesis, we consider the potential interaction between bank location and corruption:

Hypothesis 3. *There is geographic variation in the effect of corruption on bank closures.*

We modify Equation (2) to test our final hypothesis as follows:

$$Z_{it,\ r} = \beta_{0r} + \beta_{1r} X_{ir,t-k} + \beta_{2r} Corruption_{ir,t-k} \tag{4}$$

where r represents the bank location (see Section 5.2 for the locations we estimate).

4. Methodology

4.1. Corruption Data

The source of the corruption data was the Public Integrity Section (PIN) under the Department of Justice. The PIN data present an aggregate number of corruption convictions involving government officials ("federal public corruption convictions") at the federal district level. The corruption data covered the 2006–2007 period to match the period over which the other explanatory variables were determined (please see Section 4.3. for more details). Even though convictions are pursued at the federal level, the PIN data cover illegal acts committed by government officials at the federal, state, and local levels. To be more precise, the corruption count in these PIN reports (i.e., PIN data) tracks "[t]he number of government officials convicted for corrupt practices through the Federal justice department (Glaeser and Saks 2006, p. 1054)". Corrupt practices include a wide range of illegal acts such as bribery, fraud, and violating rules governing political campaigns (Glaeser and Saks 2006). The PIN data are referred to as corruption in Glaeser and Saks (2006), political corruption in Smith (2016), and the inverse of political integrity in Butler et al. (2009) among others in the literature.

The Department of Justice presents data at the federal district court level (please see the partial image in this section, which is taken from The Department of Justice (2010, p. 31)). We summed up the number of convictions at the state level to produce state-level public corruption convictions. We then adjusted the state-level corruption data with the state-level population data that we obtained from the National Bureau of Economic Research (NBER) and US Census. This adjustment allowed us to account for the possibility that larger states may have larger corruption cases. Our population-adjusted corruption variable (ADJCOR) is the number of corruption convictions per 100,000 residents. We present a map of the average ADJCOR over our sample period in Figure 1 (the raw data for the map are available in Appendix A). The map demonstrates that there are states with high corruption scores across all the regions.

U.S. Attorney's Office	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	Totals
Alabama, Middle	9	7	6	7	9	11	8	3	5	1	66
Alabama, Northern	15	11	6	4	17	33	39	17	18	11	171
Alabama, Southern	2	10	2	2	0	7	5	0	5	3	36
Alaska	6	5	0	0	1	3	15	8	1	9	48
Arizona	1	4	10	9	48	16	32	20	19	16	175
Arkansas, Eastern	0	0	18	18	4	8	8	4	2	11	73
Arkansas, Western	0	3	1	0	0	2	0	1	1	6	14
California, Central	33	35	45	22	42	36	55	41	43	29	381
California, Eastern	18	20	20	39	30	18	13	9	15	12	194
California, Northern	3	4	5	14	3	4	2	3	2	3	43
California, Southern	12	5	5	2	10	7	6	5	9	0	61

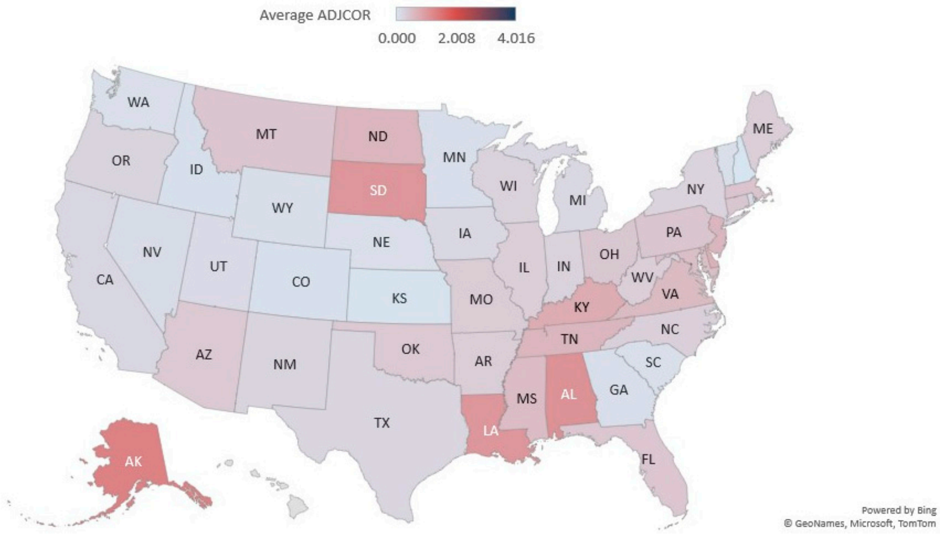

Figure 1. Average ADJCOR over 2006–2007 Source: Authors' own chart.

Corruption cases involve multiple parties in quid pro quo relationships. Though it involves a non-profit, not a bank, the following case (partial excerpt), United States v. Jonathan E. Woods and Randell G. Shelton, Jr., illustrates the intricate web of connections that underline PIN corruption cases (Department of Justice 2018, pp. 17–18).

> According to the evidence presented at trial, Woods served as an Arkansas State Senator from 2013 to 2017. Between approximately 2013 and 2015, Woods used his official position as a senator to appropriate and direct state government money, known as General Improvement Funds (GIF), to two non-profit entities by, among other things, directly authorizing GIF disbursements to the non-profits and advising other Arkansas legislators, including former State Representative Micah Neal, to do the same. Specifically, Woods and Neal authorized and directed the Northwest Arkansas Economic Development District, which was responsible for disbursing GIF money, to award a total of approximately $600,000 in GIF money to the two non-profit entities. The evidence further showed that Woods and Neal received bribes from officials at both non-profits, including Oren Paris III, who was the president of a college. Woods initially facilitated $200,000 of GIF money to the college and later, together with Neal, directed another $200,000 to the college, all in exchange for kickbacks. To pay and conceal the kickbacks to Woods and Neal, Paris paid a portion of the GIF money to Shelton's consulting company. Shelton then kept a portion of the money and paid the other portion to Woods and Neal. Paris also bribed Woods by hiring Woods's friend to an administrative position at the college.

4.2. Banking Data

The quarterly commercial bank data used in our analysis came from the Call Reports of Income and Condition. These are regulatory reports that banks in the US must file on a quarterly basis. They provide information gathered from banks' balance sheets and income statements. We first extracted the Call Reports data at an individual bank level. Next, we combined each commercial bank's data with their parents' data if they were owned by a bank holding company, referred to as BHC hereafter. BHC-level data came from the FR Y-9LP and 9SP reports, and they provide information on BHCs' capital stock. Finally, we merged these individual bank-level data with the bank failure data downloaded from the Federal Deposit Insurance Corporation (FDIC). Our data covered the 2006 to 2010 period. We report the descriptive statistics in Table 1 (please see Appendix B for the variable definitions). The table lists the variables representing the health of banks and their loan portfolios. The last variable in the table is the corruption variable.

Table 1. Descriptive Statistics.

Variable	Mean	Std. Dev.	Min	Max
TIER1	0.30	0.72	0.07	6.32
BHCTIER1	0.12	0.04	0.01	0.34
LLR	0.01	0.01	0.00	0.06
ROA	0.01	0.03	−0.08	0.46
NPA	0.01	0.01	0.00	0.11
SEC	0.17	0.15	0.00	0.95
BD	0.04	0.07	0.00	0.49
LNSIZE	12.60	1.87	7.43	20.92
CASHDUE	0.05	0.12	0.00	0.97
GOODWILL	0.02	0.05	0.00	0.82
RER14	0.12	0.11	0.00	0.79
REMUL	0.02	0.03	0.00	0.48
RECON	0.11	0.10	0.00	0.62
RECOM	0.17	0.11	0.00	0.68
CI	0.10	0.08	0.00	0.80
CONS	0.05	0.09	0.00	1.01
ADJCOR	0.31	0.25	0.00	2.20

4.3. Econometric Framework

Judging the safety and health of banks is a difficult task. Regulators in the US use a summary measure called the CAMELS rating to evaluate banks. Bank regulators assign each bank a CAMELS score based on six factors: capital adequacy, asset quality, management quality, earnings, liquidity, and sensitivity to market risk. The literature has extensively analyzed the role of the CAMELS variables in explaining bank failures. Cole and White (2012) find that the traditional proxies for the CAMELS variables and loan portfolio indicators do a good job in explaining these failures. Wheelock and Wilson (2000) analyze bank failures for an earlier period and find that banks with lower capitalization, lower profitability and poorer asset quality are more likely to fail than other banks. Estrella et al. (2000) compare the effectiveness of various capital ratios. They find that risk-weighted ratios tend to perform better only over longer horizons.

In calculating the independent variables, we used pre-crisis average figures to measure the average effect of bank characteristics. Similar to Berger and Bouwman (2009) and others, we took the averages of figures from eight periods prior to the crisis by using observations between 2006Q1 and 2007Q4. Our sample excluded some of the banks operating in the US in our time period. The banks that had one or more missing values in the 2006Q1 and 2007Q4 periods were excluded. Second, we lost observations since our sample included banks whose parents' capital information was provided in the FR Y-9LP and 9SP reports.[8]

Equation (5) below is in line with Equation (2), and it represents the model used by Cole and White (2012) and Ozdemir and Altinoz (2018). FC_i is a dummy variable that takes a value of 1 if a bank failed between 2008Q1 and 2010Q4 and zero otherwise. LP in this equation represents the different types of loans banks made. Variables such as RER14, REMUL, RECON, RECOM, CI and CONS are followed under this category (please see Appendix B for variable definitions). We modified their analysis in Equation (6) by introducing the role of corruption, ADJCOR, as in Equation (2). Equations (7)–(9) represent different variations of these models that will be estimated below.

$$FC_i = \alpha_0 + \alpha_1 CAMELS_i + \alpha_2 LP_i + \alpha_3 BHCcap_i + \varepsilon_i \quad (5)$$

$$FC_i = \alpha_0 + \alpha_1 CAMELS_i + \alpha_2 LP_i + \alpha_3 BHCcap_i + \alpha_4 ADJCOR_i + \varepsilon_i \quad (6)$$

$$FC_i = \alpha_0 + \alpha_1 CAMELS_i + \alpha_2 LP_i + \alpha_3 ADJCOR_i + \varepsilon_i \quad (7)$$

$$FC_i = \alpha_0 + \alpha_1 BHCcap_i + \alpha_2 ADJCOR_i + \varepsilon_i \quad (8)$$

$$FC_i = \alpha_0 + \alpha_1 ADJCOR_i + \varepsilon_i \quad (9)$$

5. Result Analysis

5.1. Full Sample

Table 2 provides the regression results of Equations (5)–(9) for the entire sample. Column (1) in this table presents the regression results for Equation (5), including the bank indicators and BHC capital. Column (2) estimates Equation (6), by adding ADJCOR to the regression. The results in Column (3) include all of the variables except for the BHC capital, and those in Column (4) include the results with just the BHC capital and ADJCOR as in Equations (7) and (8), respectively. Finally, Column (5) includes only ADJCOR.

Table 2. Effect of Corruption on Bank Closures.

	(1)	(2)	(3)	(4)	(5)
TIER1	−1.74	−1.63	−2.38		
	(1.73)	(1.61)	(2.32)		
BHCTIER1	−32.69 ***	−33.01 ***		−24.36 ***	
	(10.54)	(10.94)		(8.15)	
LLR	−13.03	−13.98	−51.66		
	(120.43)	(124.16)	(127.21)		
ROA	11.77	10.48	15.54		
	(8.17)	(7.59)	(9.66)		
NPA	14.66	14.15	18.94		
	(16.80)	(17.01)	(14.61)		
SEC	−0.73	−0.79	−2.50		
	(4.34)	(4.29)	(3.12)		
BD	5.22 ***	5.13 ***	6.14 ***		
	(2.02)	(1.96)	(1.80)		
LNSIZE	0.04	0.04	0.17		
	(0.17)	(0.17)	(0.17)		
CASHDUE	−0.27	−0.14	−0.87		
	(3.33)	(3.29)	(3.25)		
GOODWILL	−5.97	−5.94	−5.87		
	(8.82)	(8.74)	(9.36)		
RER14	−2.16	−2.00	−2.02		
	(4.37)	(4.27)	(3.88)		
REMUL	9.60 *	9.73 *	8.41		
	(5.53)	(5.72)	(6.95)		

Table 2. *Cont.*

	(1)	(2)	(3)	(4)	(5)
RECON	5.83 **	5.72 **	5.49 **		
	(2.72)	(2.72)	(2.55)		
RECOM	0.77	0.70	−0.22		
	(2.75)	(2.77)	(2.64)		
CI	−9.23	−9.25	−8.62 *		
	(5.69)	(5.78)	(4.94)		
CONS	−7.58	−7.36	−7.93		
	(8.51)	(8.57)	(8.41)		
ADJCOR		−0.81	−0.88	−1.92	−1.64
		(1.02)	(1.05)	(1.20)	(1.07)
CONSTANT	−0.47	−0.21	−4.56	−0.21	−2.89
	(2.90)	(2.92)	(2.94)	(1.01)	(0.47)
N	977.00	976.00	976.00	1019.00	1019.00
Loglikelihood	−102.42	−102.09	−107.60	−143.22	−150.53
AIC	238.84	240.18	249.19	292.44	305.05
Pseudo R2	32.12%	32.12%	28.67%	6.01%	1.00%

* significant at 1% level, ** significant at 5% level, *** significant at 10% level.

The signs and the significance of the regression coefficients in Column (1) are in line with Ozdemir and Altinoz (2018). BHC capital, brokered deposits, multifamily mortgages, and real estate construction and development loans are among the significant determinants of bank failures. Similarly, these coefficients continue to be significant in Column (2) with the same signs. However, the addition of ADJCOR does not improve the model, as seen from the AIC and Loglikelihood values at the bottom of the table. Columns (3) to (5) present the regression coefficients for different variable combinations. ADJCOR is found to be insignificant in all three combinations.

5.2. Size Regressions

To test Hypothesis 2, we broke our full sample into smaller samples based on the bank size while maintaining a sufficient size in each sample. The following are the samples that we constructed: the 25th to 50th percentile, less than 50th percentile, 50th to 75th percentile, 75th percentile and above. We do not provide the results for the smallest sample, less than 25th percentile, since we do not have a sufficient number of observations to construct this sample. We present the regression results in Table 3. We find a statistically significant (albeit marginally) positive association between corruption and bank failures in the 25th to 50th percentile sample. The association between corruption and bank failures is negative for the largest banks. This relationship is not statistically significant, but it is still consistent with the prior literature. For example, Liu and Ngo (2014) find that bank failures are less common for larger banks prior to the gubernatorial election years, possibly because the failure of larger banks is more costly to the politicians running for election. Overall, our empirical results provide only partial support for Hypothesis 2, but they are in line with the literature presenting evidence on the harmful effects of corruption on firms (e.g., Butler et al. 2009).

5.3. Geographical Regressions

To test our third hypothesis, we separated our full sample into US census regions: the Northeast, Midwest, South, and West (please see Appendix C for the list of states in each census region). Liu and Ngo (2014) use the same approach in their regressions and divide their geographical regressions into the same regions. Table 4 presents the results for the regressions based on the geographical location for all the regions except the Northeast. Though it is another census region, we are not able to report our results for this region due to insufficient sample size.

Table 3. Effect of Corruption on Bank Closures Contingent on Bank Size.

	25 to 50 Percentile	Less than 50 Percentile	50 to 75 Percentile	75 Percentile and Above
TIER1	−7.20	−11.15	−2.72	−7.60
	(6.63)	(11.90)	(2.57)	(13.04)
BHCTIER1	−92.38 **	−42.78 ***	−41.37 ***	−16.10
	(44.69)	(15.67)	(11.50)	(18.43)
LLR	352.93 **	102.07	−113.31	71.05
	(179.03)	(141.82)	(158.70)	(124.13)
ROA	76.61	43.29	11.33	−2.04
	(64.62)	(64.58)	(9.52)	(65.26)
NPA	−49.21	9.58	3.40	60.20 ***
	(67.96)	(45.28)	(21.88)	(21.45)
SEC	4.10	5.13	1.76	−8.07
	(6.93)	(4.88)	(5.46)	(6.16)
BD	−6.55	−2.29	3.65	10.91 ***
	(4.07)	(4.66)	(2.73)	(3.94)
LNSIZE	−5.34 **	−0.02	−0.25	0.54 **
	(2.09)	(1.68)	(0.40)	(0.26)
CASHDUE	11.96	2.02	3.70	−21.43
	(16.95)	(18.80)	(4.23)	(26.74)
GOODWILL	4.81	13.97	3.19	−33.37
	(35.05)	(17.98)	(5.65)	(20.56)
RER14	−18.61 *	−13.58 *	2.06	−11.11 *
	(11.25)	(7.68)	(4.32)	(6.30)
REMUL	134.25 ***	57.56 *	18.70 **	3.40
	(48.42)	(29.91)	(7.68)	(5.87)
RECON	43.70 ***	18.57 ***	9.71 ***	1.64
	(16.76)	(5.80)	(2.90)	(3.86)
RECOM	−28.24	−7.66	2.09	0.63
	(20.79)	(8.26)	(3.89)	(4.68)
CI	25.93 **	10.55 *	−0.51	−28.28 ***
	(11.19)	(6.03)	(6.51)	(9.71)
CONS	−15.38	−3.31	2.15	−21.15
	(13.03)	(8.87)	(5.71)	(17.48)
ADJCOR	5.18 *	1.66	−1.51	−1.22
	(3.00)	(1.42)	(1.60)	(1.58)
CONSTANT	57.60 **	−2.06	2.25	−4.23
	(24.47)	(20.90)	(5.38)	(6.23)
N	204.00	343.00	640.00	336.00
Wald test	36.90	71.84	97.70	43.70
Pseudo R2	60.09%	47.92%	33.56%	45.99%

* significant at 1% level, ** significant at 5% level, *** significant at 10% level.

We find a statistically significant negative association between corruption and bank failures in the South region.[9] This result suggests that corruption has a positive effect on banks in the South region since higher corruption scores are associated with lower probabilities of bank failures. Liu and Ngo (2014) present evidence that the South accounts for 46.01% of the bank failures in their sample. This is followed by the Midwest (26.57%), West (17.11%), and Northeast (10.31%). Our study adds to this body of knowledge, showing that the South is the only region where corruption has a significant impact on bank failures. This result is in line with the studies documenting positive impacts of corruption on firms (e.g., Cheung et al. 2021).

Table 4. Effect of Corruption on Bank Closures Contingent on Geography.

	Midwest	South	West
TIER1	−5.25	−25.33	−2.93
	(11.85)	(33.82)	(2.95)
BHCTIER1	−73.73 ***	7.70	−54.94
	(27.66)	(14.56)	(39.36)
LLR	63.83	−425.52 **	125.94
	(136.57)	(197.57)	(165.44)
ROA	2.27	−14.77	99.80
	(74.74)	(80.67)	(92.67)
NPA	97.41 **	−36.15	−141.66 **
	(38.25)	(49.00)	(59.47)
SEC	6.50	−13.61	−1.68
	(9.37)	(13.10)	(3.42)
BD	3.63	14.66 *	−3.33
	(4.20)	(8.42)	(4.92)
LNSIZE	0.14	0.17	−0.16
	(0.34)	(0.47)	(0.45)
CASHDUE	−0.81	4.21	−7.23
	(4.94)	(28.03)	(7.13)
GOODWILL	−50.27	12.72	−6.43
	(42.22)	(9.59)	(10.07)
RER14	−0.42	−0.70	0.48
	(4.97)	(14.15)	(2.24)
REMUL	9.24	38.90 **	28.14 *
	(7.76)	(17.62)	(16.90)
RECON	6.14 **	16.79 ***	11.16 ***
	(2.78)	(5.98)	(4.25)
RECOM	−11.22 **	27.67 ***	−4.96
	(4.69)	(9.76)	(3.70)
CI	−10.25 *	−25.59	−3.67
	(6.03)	(20.57)	(4.48)
CONS	−25.72	19.64 ***	−426.84
	(18.44)	(7.33)	(282.35)
ADJCOR	2.70	−8.53 ***	−0.35
	(2.68)	(2.42)	(2.46)
CONSTANT	1.97	−7.78	6.04
	(6.19)	(15.09)	(11.77)
N	357.00	368.00	177.00
Wald test	143.60	172.47	110.52
Pseudo R2	50.56%	61.85%	64.19%

* significant at 1% level, ** significant at 5% level, *** significant at 10% level.

6. Discussion

In analyzing the aggregated data, our results show that there is no evidence of the impact of corruption on bank failures. Nonetheless, previous studies suggest a more intricate narrative, indicating that aggregated data might mask crucial interactions among bank characteristics. They show that determinants of bank failures vary depending on specific factors such as bank size and location, as highlighted by Laeven et al. (2016). Alzugaiby et al. (2021) demonstrate that determinants of failures differ across specific size categories. Larger banks, as explained by Berger et al. (2021) and De Haan and Poghosyan (2012), possess a greater capacity to absorb risk and maintain stable earnings. Bertay et al. (2013) attribute this variation to large banks' exposure to market discipline, while Bhagat et al. (2015) show that risk-taking attitudes change based on bank sizes. Furthermore, the existing literature reveals a geographic pattern in bank failures. Davison and Ramirez (2014) attribute this pattern to the differences in state regulations, whereas the Federal Deposit Insurance Corporation (2020) links it to variations in the strength of local economic shocks.

These findings in the literature suggest that looking at all of the banks at the same time may obscure valuable insights. Therefore, following the literature's lead, we categorized banks based on their size and geographical location and presented our empirical results based on these characteristics in Tables 3 and 4. Our results in Table 3 demonstrate a positive association between bank failures and corruption (i.e., more corruption is associated with more failures), which is consistent with our prior expectations. On the other hand, the results in Table 4 indicate a negative association between corruption and bank failures in the South region (i.e., more corruption is associated with fewer failures), a relationship that warrants further explanation.

What sets the Southern states apart from the rest? Although our corruption data do not allow us to answer this question, the literature delves extensively into the distinctions between these states. One potential factor could be the prevalence of judicial corruption in this region. A study by Dincer and Johnston (2015) supports this notion, revealing that 9 out of 20 states with mild or severe judicial corruption are located in the South, with 5 Western states following them. Therefore, the possibility exists that it is the type of corruption that matters for bank failures, with judicial corruption playing a key role.[10]

Another possibility lies in the banking practices specific to the South, which might differ from the rest of the nation. Although existing studies are dated, they suggest unique operational methods in Southern banks. Bodenhorn (2002) highlighted that banks in the South and West received substantial state subsidies, participated in infrastructure projects, and were mandated to promote social welfare. This might have caused these banks to be open to more political pressures.

A more recent study by CFPB (2023a) discovered that the banking sector in the South is less competitive, evidenced by a comparatively low number of branches per person. Additionally, consumer behavior in the South is found to exhibit distinct traits. CFPB's 2023 (CFPB 2023b) report indicates that the Southern region of the US harbors a significant rural population and experiences higher rates of unbanked households compared to the national average. Moreover, the Southern states suffer from banking deserts, where communities lack sufficient banking services. In some areas, there are credit deserts, where fair and competitive credit terms are scarce, even in the presence of a bank branch. The lack of competition in the Southern banking sector may be another factor driving our results.

7. Conclusions, Implications, and Limitations

The banking literature relates bank failures to banks' fundamental characteristics and uses indicators such as the CAMELS indicators as the basis of early warning systems. Political factors such as corruption are not seen as factors that can cause failures in this literature. However, political corruption can cause two issues in banks' decision-making processes: it can lead to resource misallocation that could cause lower-quality assets and eventual failures, or political connections could cause unhealthy banks to be kept in business and threaten the safety of the financial system.

In this study, we examine the potential effect of corruption on bank failures in the United States. We created a database that modifies the data used in the bank failure literature. We combine the state-level corruption data from the Department of Justice with bank-level CAMELS indicators from the call reports and BHC indicators from FR Y-9LP and 9SP reports. Additionally, we employ a methodology that allows us to study whether the determinants of failures might differ depending on bank sizes and locations.

Separating banks by size and location, we find that corruption is associated with more bank failures for small banks and fewer bank failures for banks located in the South region. This proves that bank failures are more complicated than standard models suggest, and it further highlights the need for more advanced models to understand the sources of these failures.

Our findings have significant policy implications. First, the current regulations mainly focus on banks' activities reported on their balance sheets and stipulate regulations based on these reported activities. What this approach is missing is banks' exposure to unreported risk categories such as political risk. Our results suggest that regulators should require further information disclosure on banks' exposure to political risk. Tighter information requirements could make it more difficult for officials to hide their activities and therefore improve transparency and accountability. This seems to be especially important for small banks since they are known to be more loosely regulated and corruption is found to be associated with a higher likelihood of failures. Second, regulators could build internal control mechanisms designed to prevent corrupt activities, such as regular audits of bank records, employee training programs, and the use of technology to monitor transactions for suspicious activities. Finally, regulators could scrutinize the financial institutions in the South more closely as they seem to benefit from corruption.

Corruption in this paper is quantified using a collective count of convictions related to government officials at the federal district court level. However, our dataset limitations prevent us from identifying the exact sources and types of corruption, such as fraud. When we think of fraud, we may instantly think about embezzlement by corporate insiders. For example, Novak and Herguth (2022) shed light on the failure of the Washington Federal Bank of Savings and tie the demise of the bank to the embezzlement of the funds by the CEO (who later committed suicide) and to the loans that were made in schemes to defraud the bank. However, government employees can also be involved in bank fraud. For example, the Tallahassee City Commissioner was involved in bank fraud exceeding a quarter of a million dollars (Department of Justice 2019). Unfortunately, the PIN data do not allow us to identify corruption-induced bank fraud or bank fraud in general. Consequently, our findings reveal a broad connection between corruption and bank failures rather than a specific cause. We hope that future research can use more granular data on the type of corruption (e.g., judicial versus non-judicial) if such data become available. Also, our paper focuses on bank failures during the subprime mortgage crisis. We encourage future research to explore recent bank failures, particularly those in the Spring of 2023, once data for this period become accessible. We also hope that future research sheds light on the potential mechanisms behind the differential effect of corruption on bank failures across different regions in the United States.

Author Contributions: Conceptualization, S.K. and N.O.; methodology, S.K. and N.O.; software, N.O.; validation, N.O.; formal analysis, N.O.; investigation, S.K. and N.O.; resources, S.K. and N.O.; data curation, S.K. and N.O.; writing—original draft preparation, S.K. and N.O.; writing—review and editing, S.K. and N.O.; visualization, S.K.; supervision, S.K. and N.O.; project administration, S.K. and N.O. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Data Availability Statement: All the data are available to the public at the respective government websites.

Acknowledgments: The authors are thankful to Matt Brown and the session participants at the 37th Annual Conference of the Pennsylvania Economic Association meetings (held in 2023 in Washington, PA) and at the 2023 Vietnam Symposium in Entrepreneurship, Finance, & Innovation for their comments and helpful suggestions.

Conflicts of Interest: The authors declare no conflict of interest.

Appendix A. Average Corruption Data

Table A1. Average Corruption Scores (ADJCOR).

State Name	State Abbreviation	Average ADJCOR
Alabama	AL	1.115
Alaska	AK	1.321
Arizona	AZ	0.381
Arkansas	AR	0.318
California	CA	0.195
Colorado	CO	0.073
Connecticut	CT	0.401
Delaware	DE	0.699
District of Columbia	DC	4.016
Florida	FL	0.418
Georgia	GA	0.090
Hawaii	HI	0.235
Idaho	ID	0.067
Illinois	IL	0.314
Indiana	IN	0.261
Iowa	IA	0.185
Kansas	KS	0.036
Kentucky	KY	0.778
Louisiana	LA	1.058
Maine	ME	0.304
Maryland	MD	0.507
Massachusetts	MA	0.440
Michigan	MI	0.184
Minnesota	MN	0.087
Mississippi	MS	0.549
Missouri	MO	0.340
Montana	MT	0.423
Nebraska	NE	0.085
Nevada	NV	0.138
New Hampshire	NH	0.000
New Jersey	NJ	0.631
New Mexico	NM	0.231
New York	NY	0.245
North Carolina	NC	0.279
North Dakota	ND	0.627
Ohio	OH	0.400
Oklahoma	OK	0.376
Oregon	OR	0.229
Pennsylvania	PA	0.428
Rhode Island	RI	0.142
South Carolina	SC	0.080
South Dakota	SD	1.075
Tennessee	TN	0.628
Texas	TX	0.220
Utah	UT	0.151
Vermont	VT	0.081
Virginia	VA	0.567
Washington	WA	0.085
West Virginia	WV	0.304
Wisconsin	WI	0.251
Wyoming	WY	0.096

Appendix B. Variable Definitions

All of the variables except for ROA, LNSIZE, BHCTIER1, and ADJCOR are calculated as a share of bank assets. BHCTIER1 is calculated as a share of BHC assets.

ROA	Return on assets.
LNSIZE	Natural logarithm of the total assets.
TIER1	Tier-1 capital.
LLR	Loan loss reserves.
NPA	Non-performing assets.
SEC	Securities held for investment plus for sale.
BD	Brokered deposits.
CASHDUE	Cash and due.
GOODWILL	Goodwill.
BHCTIER1	Tier-1 capital of BHC.
RER14	Real estate residential single-family (1–4) mortgages
REMUL	Real estate multifamily mortgages
RECON	Real estate construction and development loans
RECOM	Real estate nonfarm nonresidential mortgages
CI	Commercial and industrial loans
CONS	Consumer loans
ADJCOR	Corruption per 100,000 residents calculated as = (corruption_sum/statepol) $\times$ 100,000

Appendix C. Location Definitions

The states are grouped into four categories based on their locations.
Northeast: CT, ME, MA, NH, NJ, NY, PA, RI, VT.
Midwest: ND, SD, NE, KS, MN, IA, MO, WI, IL, IN, MI, OH.
South: TX, OK, AR, LA, MS, TN, KY, AL, FL, GA, SC, NC, WV, VA, MD, DC, DE.
West: AK, HI, WA, OR, CA, NV, ID, UT, AZ, MT, WY, CO, NM.

Notes

1. https://www.transparency.org/en/cpi/2022 (accessed on 1 May 2023).
2. https://www.pogo.org/analysis/2021/10/corruption-is-public-enemy-number-1 (accessed on 1 May 2023).
3. https://blogs.worldbank.org/governance/what-are-costs-corruption (accessed on 1 May 2023).
4. For example, Fisman and Gatti (2002, p. 27) discuss the advantages of this approach and conclude single-country studies offer more reliable results.
5. Due to the insufficient sample size, the results are not available for the sample containing 1st to 25th percentile.
6. https://fiscaldata.treasury.gov/americas-finance-guide/federal-spending/ (accessed on 1 May 2023).
7. The research on bank failures adopts an early-warning methodology, assessing the likelihood of bank failures by analyzing past indicators, as in Equation (1). Researchers commonly rely on indicators from the two years leading up to the failure, as earlier indicators may not be informative (See Cheong and Ramasamy (2019), Cole and White (2012), and Berger and Bouwman (2009)). We will adopt the same approach in Section 4.
8. N represents the sample size in Tables 2–4.
9. Our winsorized regression results align with these results.
10. Dincer and Johnston (2015) provide context to judicial misconduct. Berens and Shiffman (2020) show that judicial misconduct is common in the US with most of the wrongdoers still keeping their jobs. Please see The Federal Bureau of Investigations (2013) and Department of Justice (2005, pp. 34, 35) for examples in corruption in the judicial arm of the government.

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