Bail-ins: Does Assigning Priority to Deposits Affect Bank Conduct?

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Keywords: Depositor preference, cost of funds, market discipline, bank soundness

JEL Classification: G21, G28

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1. Introduction

Conferring priority to some or all deposits in case of bankruptcy of a bank has been one of the early ways of protecting failing banks’ depositors. While this policy tool has received little attention for several decades, the European Central Bank called for the introduction of depositor preference laws in all member states of the European Union in the aftermath of the Cypriot banking crisis. Under this legal framework uninsured depositors’ claims on the assets of failed banks receive priority over claims held by non-depositors. Proponents of the legislation such as EU policymakers and also the Independent Commission on Banking in the U.K. advocate such legislation will prevent bank runs, leading to more stable banking through increased market discipline from non-depositors because their claims are subordinated to those of depositors and stand to lose out in the resolution process. However, the quotes above illustrate that the banking industry is far less convinced of the benefits of such legislation. Bankers hold major concerns that assigning priority to depositors will increase overall funding costs, limit access to non-deposit funds, and, ultimately, undermine financial stability.

In this paper, we exploit a quasi-experimental setting to establish whether the concerns held by the banking industry about the adverse effects of depositor preference laws hold true, and if such legislation indeed yields benefits in terms of increased bank soundness. In addition, we also present complementary evidence about the shareholder wealth effects of such legislation.

At the heart of our identification strategy is the introduction of depositor preference laws by fifteen U.S. states between 1983 and 1993, explained in greater detail in Section 2. Using quarterly data for commercial and savings banks, we employ difference-in-difference estimations that exploit variation across states over time in the introduction of depositor preference laws to examine how depositor preference affects banks’ funding costs, liability structure, profitability, and soundness. The law changes are plausibly exogenous from an individual bank’s perspective: the statements above suggest that banks are unlikely to lobby for depositor preference laws. However, this is not sufficient to establish causality since other coincident developments may also drive changes in funding costs. To account for contemporaneous bank- and state-specific developments, we exploit the fact that the depositor preference laws were applied to state- (treatment) but not nationally-chartered (control) banks. We carefully document that our data satisfy the assumption of parallel trends, and present a battery of tests that show enactment of depositor preference law was orthogonal to the key metrics we are interested in. To the extent that nationally-chartered banks headquartered in the same U.S. state operate in the same environment, this institutional feature allows us to compare how the outcome variables within the treatment group would have evolved in the absence of depositor preference law. Importantly, the panel structure of our data aids construction of the implied counterfactual. We include bank- and state-quarter-fixed effects to rule out unobserved heterogeneity in the cross-section and over time, so that the data enable comparing treatment
and control banks within the same state-quarter. This tight focus ensures that, conditional on additional covariates, the key identifying assumption that banks in the treatment and control groups are only randomly different is met to draw causal inferences.

The point of departure for our research is the irrelevance theorem by Modigliani and Miller (1958). They suggest that, leaving aside taxation effects, the composition of corporate financing has no substantive effects unless it influences either the probability of bankruptcy or the costs of bankruptcy (Modigliani and Miller, 1958; Stiglitz, 1969). This is of relevance because Hardy (2013) predicts that depositor preference laws change the claim structure in the event of bank failure and affect both funding costs and bank profitability. This will ultimately be reflected in bank value, and therefore also affect the probability and the cost of bankruptcy. In his model, claimants to the residual assets of failed banks lobby to assert claims to the share of residual assets, where lobbying is increasing in the volume of residual assets. The lobbying process increases bankruptcy costs as it extends the resolution period. Moreover, if one claimant takes legal action, the Nash equilibrium is for other claimants and the receiver to also take legal action. Since depositors enjoy a preferred status under depositor preference laws, no resources need be deployed to establish this position. In turn, the volume of residual assets non-deposit creditors fight over is reduced and so are bankruptcy costs. Assuming that deposit funding is cheaper than market funding, depositor preference laws reduce funding costs, increase profits, and endogenously lower the probability of failure. Earlier work by Osterberg (1996) allows interest rates to endogenously respond to changes in the claims structure and reaches similar conclusions. Specifically, he uses a cash-flow capital-asset pricing model to demonstrate three key issues. First, uninsured depositors require a lower interest rate because their claims are made senior under depositor preference law. Second, general creditors require at least the same or a higher rate of return as before depositor preference law because they are now senior only to equity holders. Third, the deposit insurer benefits through lower losses. The latter effect is due to how depositor preference law affects the insurer’s claim by changing senior claimants’ probability of loss and altering the deposit insurer’s weight in the pool of senior claimants. Subsequent work by Osterberg and Thomson (1999) confirms these results.

Another benefit of depositor preference laws is discussed by Birchler (2000). He argues that subordinating the claims of general creditors eradicates costly duplication of monitoring effort when investors differ with respect to (privately known) information costs as non-depositors have more efficient monitoring technologies relative to small depositors. By guaranteeing small depositors’ claims, depositor preference reallocates monitoring towards relatively more efficient monitors. As a result, depositors require a lower interest rate which reduces funding costs and translates into higher bank profits. The increase in monitoring will also incentivize bank management to adopt less risky strategies. In short, the introduction of depositor preference laws and the concomitant changes in claim structure give rise to a rich set of empirical predictions for funding costs, liability structure, profitability, soundness, and, ultimately, bank valuation. This is the focus of our study.

1 Where depositor preference law causes changes in the cost of funding, it may increase the probability of bankruptcy as well.
2 This heterogeneity in “types” reflects the different monitoring costs incurred by depositors and non-depositors when monitoring bank performance.
3 This result echoes the argument articulated by Jackson and Kronman (1979).
4 Similar claims are made by Hardy (2013).
Our research is important for three reasons.

First, we shed light on proposed policy interventions in European banking which potentially have far-reaching consequences that are at present not well understood, neither by the policy community nor by the banks themselves. The main findings suggest that bankers’ fears and their lobbying against this legislation are unfounded: we present evidence that depositor preference law reduces overall funding costs by 1.5%. In line with the predictions by Osterberg (1996) and Birchler (2000), we show that this effect is driven by a reduction in the costs of deposit funding, despite an increase in interest expenses on non-deposit funds. Another argument put forward is that depositor preference laws cause non-depositors to collateralize their claims to protect their heightened exposure in case of bankruptcy (Hirschhorn and Zervos (1990); Marino and Bennett (1999)). If they do, more assets become encumbered and this undermines the objective of reducing deposit insurers’ losses as such encumbered assets are not available to the receiver. We show that such concerns are not justified because our two proxies for asset encumbrance, the ratios of Fed funds sold and reverse repos, and pledged securities, both scaled by total liabilities, do not respond to the introduction of depositor preference laws. The findings in this study also suggest that introducing depositor preference laws gives rise to changes in liability structure. Banks become more reliant on non-deposit funds following the introduction of depositor preference laws. Specifically, non-deposit funding increases by 12.4%. This is partly driven by reductions in these banks’ market shares for uninsured deposits. A possible explanation is that uninsured depositors are risk-neutral and seek out higher returns elsewhere.

Second, our research allows us to observe a shock which introduces plausibly exogenous variation in the monitoring incentives of different classes of debt holders. Birchler’s (2000) prediction that depositor preference laws reassign monitoring towards larger and more sophisticated monitors who can exert market discipline more effectively than atomistic depositors provides a setting that enables us to shed fresh light onto the debate about market discipline, a key issue in bank regulation and supervision. In particular, we can empirically establish whether banks with greater dependency on non-deposit funding respond more intensively to the introduction of depositor preference laws. Our work is therefore also related to theories about the relationship between debt seniority and monitoring incentives (Fama (1980, 1985); Rajan and Winton (1995), and the broader literature on market discipline (Flannery and Sorescu (1996); Flannery (1998); Goldberg and Hudgins (2002)). The former strand of literature predicts an inverse relationship between debt seniority and monitoring which we can test empirically. While the latter literature has been successful in documenting that market participants are able to monitor banks’ condition, these studies have so far struggled to furnish convincing evidence that monitoring by market participants can effectively influence bank conduct. As part of our analysis, we present results that support the idea that market discipline indeed triggers changes in bank conduct. In particular, since increased monitoring should affect banks’ propensity to take risk, it is important to establish the effect of depositor preference laws on risk taking. We are the first to show that the lower funding costs also correlate with improved soundness. The average bank’s Z-score increases by 26%, the non-performing loans ratio falls by 0.1%, and leverage decreases by 21%.

Third, this study advances the understanding of how bank capital structure responds to regulation. This debate is useful because bank funding models, in particular in Europe, have been criticized for their vulnerability (Le Lesle (2012)). Moreover, with the exception of Gropp
and Heider (2010), who document that the determinants of non-financial firms’ leverage and bank-fixed effects explain most of the variation in bank capital ratios, the academic literature has paid little attention to capital structure choices in banks.

Our study is therefore also related to the broader literature in corporate finance on capital structure that examines the level, structure, and persistence of firms’ financing choices (Myers (1977); Jensen and Meckling (1976); Myers and Majluf (1984); Jensen (1986); Titman and Wessels (1988); Rajan and Zingales (1995); Lemmon, Roberts, and Zender (2008), Rauh and Sufi (2010)). These studies have emphasized the importance of the institutional environment in determining capital structure, that financing choices remain stable over long periods of time, and that debt priority plays an important financial contracting role in mitigating stockholder-bond-holder conflicts over investment policy (Hackbart and Mauer (2012)). Unlike these studies, however, our paper addresses the consequences of changes to the priority structure. The final strand of literature our work builds on is the earlier research on depositor preference laws. Hirshhorn and Zervos (1990) and Osterberg (1996) quantify the impact of depositor preference laws on bank failure rates, and how such legislation affects the losses incurred by the deposit insurer. Hirshhorn and Zervos (1990) also show that depositor preference laws are associated with an increased use of collateralization by non-deposit creditors. In turn, this increases the costs incurred by the deposit insurer if the bank fails, thus undermining one of the arguments typically invoked by proponents of depositor preference law. Their work also illustrates that the cost of uninsured deposits held by thrifts decreases in response to depositor preference law enactment. In contrast to Hirshhorn and Zervos (1990) who focus on thrifts, our work homes in on commercial and savings banks which differ both in size and in terms of business models.

Are these effects that we attribute to changes in the priority of the claim structure truly causal? Clearly, using time-invariant bank-fixed effects that net out any unobserved bank-specific heterogeneity, while state-quarter-fixed effects capturing time-varying shocks, such as declines in demand and changes to tax rates that are common to both treated and untreated banks but differ across states, mitigate concerns arising from omitted variables. In addition, time-varying bank-specific control variables purge the remaining realistic omitted variable threats. However, identification requires that the changes in bank behavior can only be observed when depositor preference laws are introduced, and, moreover, that no other developments coincide temporarily with the adoption of depositor preference laws that could also trigger adjustments in bank conduct. To alleviate such concerns further, we therefore offer a set of placebo regressions, where we randomly assign placebo depositor preference laws to nationally-chartered banks located in states where state-chartered banks were subject to depositor preference and find indeed that our placebo tests remain statistically indistinguishable from zero. In addition, we present tests that deal with a number of factors that occur simultaneously with the introduction of depositor preference as these other factors could plausibly also trigger the changes in bank conduct we observe. Specifically, we show that banks’ charter changes are not driven by states’ introduction of depositor preference laws. We also document that regionally limited banking problems such as the Texas real estate crisis in the 1980s and the problems in the banking industry in New England, both occur at the same time as Texas and the New England States introduce preference for depositors, do not drive our results.

The final analyses close the loop, and establish the effects on profitability and valuation. We document a positive effect of depositor preference laws on banks’ return on assets and return
Evidence from two complementary event studies based on the introduction of national depositor preference law in the U.S. in 1993 and from the policy debates surrounding possible introduction of depositor preference in Europe in the aftermath of the recent crisis to increase the external validity of our inferences suggests that stock markets also welcomed this legislation. The economic magnitude of the effect on the day President Bill Clinton signed depositor preference into law on 10th August 1993 is large. Investors in bank shares experienced a 0.2% abnormal return on the event day. Likewise, stock markets in the European Union and in the U.K., where the statements by the Independent Commission on Banking allow a separate investigation, also welcomed the idea of assigning priority to depositors. The economic magnitudes for the European Union and the U.K. are very similar to those reported for the U.S.

With the bulk of our inferences being based on the U.S. between the 1980s and early 1990s, the question naturally arises as to whether our findings generalize beyond this setting. In addition to an illustration that our sample banks are statistically not different from the population of banks in the U.S., and the event-study evidence from the introduction of national depositor preference laws in the U.S. and the debate in Europe, we believe that there are many other reasons for why our results are useful to inform the recent debate among policy makers about introducing depositor preference. In fact, our experiment sheds light on how a banking system with many small and medium sized banks which operate in relatively small geographic markets on the one hand and a limited number of very large institutions on the other hand responds to an exogenous shock that increases monitoring by non-depositors. Many countries in Europe, primarily Germany, Austria, Switzerland, Italy, and Spain, have similarly structured banking systems with institutions that operate with comparable business models. Moreover, these smaller European institutions, just as their U.S. counterparts, typically do not rely extensively on wholesale funding and are often privately held, suggesting subdued levels of market discipline in general. In short, we believe our conclusions regarding the effect of assigning priority claims to bank depositors in the resolution process carry over to European banks.

The paper proceeds as follows. Section 2 provides an overview about the legislative reforms that underpin our quasi-experiment. Section 3 describes the data and discusses representativeness. Our identification strategy and the main results are presented in Section 4, and Section 5 shows the results using event study methodology. Section 6 concludes.

2. Institutional background: Depositor preference legislation

Unlike bank resolution procedures in many other countries, the regulatory framework in the U.S. requires that the assets of insolvent financial institutions be transferred to a receivership, represented by the Federal Deposit Insurance Corporation (FDIC). The receiver’s task is to maximize the net present value of recoveries for the receivership claimants. Receivership law outlines a ladder of creditor status that determines the priority of claimants to the proceeds.

The claim structure established by the Banking Act of 1935 gave highest priority to the receiver, who obtains part of the proceedings as compensation for administrative expenses. Next in line are secured claimants who have a contract with the failed bank for a specific claim
on assets.\(^5\) They are followed by depositors with account balances below $100,000 whose claims are insured by the FDIC. Next in line are uninsured depositors whose account balances exceed $100,000, and non-depositors who hold equal priority.\(^6\) Last in the queue are holders of subordinated debt, and shareholders.

**[INSERT TABLE 1: DEPOSITOR PREFERENCE LAW STATES AND ADOPTION YEARS]**

Depositor preference laws change the priority structure by elevating the claims of all depositors, both insured and uninsured ones. Prior to the adoption of national depositor preference in 1993, thirty states implemented depositor preference law.\(^7\) Under these regulations all receivership claimants are subject to the following general preference scheme:

1. administrative expenses of the receiver;
2. secured claims;
3. domestic deposits, both insured and uninsured;
4. foreign deposits and other general creditor claims;
5. subordinated creditor claims; and
6. shareholders.

Table 1 shows that these laws were introduced at different points in time, with no obvious geographic clustering of states that are prone to adopt depositor preference laws. Following Nebraska, which assigned preferential treatment to depositors with claims on state-chartered banks in 1909, a further 29 U.S. states introduced such laws prior to 1993. On 10\(^{th}\) August 1993, President Bill Clinton signed the Omnibus Reconciliation and Budget Act into law, a large piece of legislation concerned primarily with budget issues which also introduced depositor preference laws for nationally-chartered banks. The reasons for the introduction of these state-level laws are nowhere systematically documented.

However, it appears plausible that the arguments based on which the FDIC welcomed the introduction of national depositor preference in 1993 also apply to the period prior to 1993. As pointed out in the introduction, depositor preference was not only expected to lower resolution costs, but these laws should also improve market discipline.\(^8\) In particular, the failure of Penn Square in 1982 resulted in what was then the largest payoff in history. This experience motivated the FDIC to lobby for national depositor preference (FDIC (1983a); Marino and Bennett (1999)). Beginning in 1983, the deposit insurer argued that market discipline will increase if bank failures increase greater losses on non-deposit creditors because this enhances their incentives to monitor the condition of a bank. Such transactions were attractive because

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5 Secured claims receive priority only for the value of the collateral securing the claim. If the value of the collateral is less than the amount of the claim, the unsecured portion falls into the priority scheme according to the type of claim (Marino and Bennett (1999)).

6 Non-depositors include: trade creditors, beneficiaries of guarantees, foreign depositors, holders of bankers’ acceptances, unsecured lenders, landlords, suppliers of Fed funds, and counterparties to swaps and other contingent liabilities.

7 The U.S. Congress adopted national depositor preference law as part of the Omnibus Budget Reconciliation Act of 1993. This amended section 11(d)11 of the Federal Deposit Insurance Corporation Act regarding the priority of claims on assets of a failing financial institution. Of those thirty states, fifteen enter our regressions due to a lack of availability of Call Report Data on a quarterly frequency prior to 1983.

8 Marino and Bennett (1999) offer an additional reason that motivated the introduction of depositor preference laws. Depositor preference laws allow the FDIC to use purchase-and-assumption transactions (P&A) to resolve failed banks. P&As allow the assets and liabilities of a failed institution to be transferred to the acquiring entity. This limits disruptions to the local economy where the failed bank operated and reduces government ownership and management of bank assets.
they minimize disruption to the local economy where the bank is located, and because they minimize the role of government in owning and managing bank assets (Bovenzi and Muldoon (1990)).

Clearly, depositor preference laws in the individual states had the same fundamental effect of granting preference to domestic deposits, both insured and uninsured, over non-depositors in the case of the failure of a state-chartered financial institution. National-chartered financial institutions remained unaffected. This sharp asymmetry in treatment status together with the timing of the passage of the state laws forms the backbone of our quasi-experiment.

3. Data description and representativeness

We obtain quarterly data for commercial and savings banks in the U.S. from their Quarterly Report on Condition and Income (Call Report), available from the Federal Reserve Bank of Chicago. Our sample covers the period from the first quarter of 1983 to the second quarter of 1993 because the Omnibus Budget Reconciliation Act was signed into law in the 3rd quarter 1993, resulting in all banks being subject to depositor preference laws. Prior to 1983, banks were not obliged to submit Call Reports on a quarterly basis. The sample therefore excludes banks in states which adopted depositor preference law prior to 1983, and we also exclude banks operating in New York state due to their size and specific regulatory environment (Osterberg (1996)). To ensure that we have a sufficiently large number of observations for each individual bank, we only include institutions that operate in at least four quarters prior to and following the introduction of state depositor preference laws.

Our final sample includes 199,698 observations for 5,506 banks, operating in 15 states which enacted state depositor preference law after 1982 and before passage of the national depositor preference law. Panel A of Table 2 presents summary statistics. The average bank in our sample has 108,969 TUSD total assets, a Z-score of 72.793, and a return on assets of 0.3%.

To establish representativeness, we also compare our sample banks with the average bank in the U.S. using the entire population of banks in 1993. The mean asset size for all banks in the U.S. is 130,943.5 TUSD, with a Z-score 120.6, and return on assets of 0.3%. Panel B of Table 2 presents Wilcoxon rank tests for the equality of means between the banks in the sample and the population of all banks in the U.S. for selected variables about asset size, profitability, and soundness. Except for a weakly significant difference at the ten percent level for bank soundness, these tests suggest that there are no significant differences in terms of asset size and profitability.

[INSERT TABLE 2: SUMMARY STATISTICS]

4. Depositor preference laws and bank behavior

Our empirical tests proceed in two steps. We first document the effects of depositor preference laws on banks’ cost of funds, liability structure, stability, and profitability. In a second step, we present complementary evidence using event study methodology in Section 5.

4.1 Identification strategy

We turn to difference-in-difference estimations which exploit plausibly exogenous variation in depositor preference law legislation across U.S. states and across time. This setup enables us
to retrieve the average treatment effect of depositor preference laws by comparing the evolution of bank funding costs, liability structure, soundness, and profitability between the treatment group (i.e., the state-chartered banks) and the control group (the nationally-chartered banks) within the same operating environment because the state depositor preference laws applied only to state-chartered banks but not to nationally-chartered institutions. In other words, our estimator considers the time difference of the group differences, i.e., it accounts for omitted variables that affect treatment and untreated banks equally. Our empirical tests focus on banks located in states that enacted depositor preference laws between 1983Q1 and 1993Q2. We estimate

\[ y_{ist} = \alpha + \beta DPL_{ist} \times Charter_{i} + \delta X_{ist} + \gamma_{i} + \gamma_{st} + \varepsilon_{ist} \] (1)

where \( y_{ist} \) is a dependent variable for bank \( i \) in state \( s \) at time \( t \), capturing either the cost of funds or liability structure, bank soundness, or profitability; \( DPL_{ist} \) is a dummy variable equal to 1 for all banks in states and years following introduction of depositor preference law or zero otherwise; \( Charter_{i} \) is a dummy variable equal to 1 for all state-chartered banks, 0 for nationally-chartered institutions. \( X_{ist} \) is a vector of bank-time varying control variables defined in Section 4.2 below; \( \gamma_{i} \) and \( \gamma_{st} \) are bank and state-quarter- effects, respectively. This battery of dummy variables allow us to rule out all unobservable time-invariant bank-specific factors, and state-time-varying forces at the state and more aggregate levels, that might drive changes in the dependent variables and coincide with the introduction of depositor preference laws. Moreover, the inclusion of state-quarter-fixed effects provides very clean identification of the average treatment effect as we exploit cross-group variation within the state-quarter dimension of the data set. The term \( \varepsilon_{ist} \) is the error term. Our coefficient of interest is \( \beta \). Its magnitude provides information about the effect of depositor preference laws for state-chartered banks. As is customary when using difference-in-difference regressions, we cluster heteroskedasticity-adjusted standard errors on the bank level to account for serial correlation within each panel (Bertrand, Mullainathan, and Duflo (2004)).

### 4.2 Variable definitions

To establish whether bankers’ and policymakers’ views on the introduction of depositor preference laws are warranted, our empirical tests focus on four key outcomes.

First, we examine different components of banks’ funding costs. Specifically, we use a variable measuring average interest expenses on all liabilities (Total interest expenses), calculated as the ratio of total expenses on liabilities to total liabilities. We also focus on costs of deposits, using the ratio of interest paid on deposits to total deposits held by banks (Interest on deposits). Non-deposit funds (Interest on non-deposits) are captured by the average cost on non-deposits. This variable encompasses both Federal Funds purchased, and other non-deposit funds. The former are computed as expenses on Federal Funds purchased, and the latter are calculated as expenses on other non-deposits.

Our second set of tests considers liability structure. Here, we use the ratio of total liabilities to total assets (Total liabilities) to capture the overall effect of depositor preference laws on banks’ liability structure. In addition, we examine the ratio of total deposits to total liabilities.

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9 Since data on expenses on deposits above $100,000 are not available for our sample period DEP is a measure of average costs of total deposits both secured and unsecured deposits.
(Total domestic deposits), and the ratio of non-deposit funds purchased to total liabilities (Total non-deposits). These two variables measure changes in the use of deposit and non-deposit liabilities relative to all liabilities.

The third set of analyses examines bank soundness, reflected in Z-scores, non-performing loans, and leverage. The Z-score is an accounting-based measure of banks’ distance to default, calculated as the sum of return on assets and the equity-to-asset ratio divided by the standard deviation of the return on assets, calculated over a four-quarter rolling time window. This time window allows for sufficient variation in the denominator of the Z-Score, and avoids that Z-Scores are driven exclusively by variation in the levels of capital and profitability. The skewed distribution of the Z-score necessitates a log transformation, and all tests are based on Z-score (ln). A higher Z-Score (ln) implies a lower probability of insolvency.

Profitability is the subject of our fourth set of tests. We focus on return on assets (ROA), and, in addition, we also examine the ratio of total interest income to total loans (TIINC) which is measured in logarithms, and return on equity (ROE).

4.3 Exogeneity of depositor preference laws and parallel trends

There are two main assumptions which need to be satisfied to ensure the validity of difference-in-difference estimation results. The first assumption requires that treatment is assigned at random. In other words, the individual states’ decisions as to whether to assign preference to depositors by law should not be conditioned on banks’ costs of funds, liability structure, soundness, or profitability. The second assumption requires parallel trends in the evolution of the dependent variables during the pre-treatment era for banks in the treatment and in the control group, i.e., absent treatment the behavior of the state-chartered banks in the treatment group is similar to the behavior of the nationally-chartered banks in the control group. This section provides empirical support for the validity of both assumptions.

We argue above that the introduction of depositor preference laws in U.S. states is plausibly exogenous, but we acknowledge that detailed information that provides insights into the driving forces for why several states embarked upon such legislation prior to the enactment of national depositor preference in 1993 are virtually impossible to obtain. We therefore offer formal tests of the exogeneity assumption, and use duration analysis to estimate the conditional probability of the implementation of depositor preference laws. These tests focus on the time from the start of our sample to the enactment of depositor preference law in each individual state. The model takes the following form

\[ h(t/X_s) = h_0(t) \exp(X_s \beta_X), \]  

(2)

where \( h_0(t) \) denotes the baseline hazard, and \( \beta_X \) is the vector of parameters to be estimated from the data. The hazard rate \( h(t) \) represents the likelihood that the depositor preference law is adopted at time \( t \) in state \( s \), given that depositor preference law was not in place until \( t \). In employing duration analysis, we can impose a structure on the hazard function. Since we have
no reason to assume duration dependence in the data, we opt for a Cox model that does not impose a shape on the hazard function.

A positive coefficient for the cost, liability structure, soundness, and profitability measures indicates an increase in the hazard of depositor preference law legislation. Also included in equation (2) is a set of key variables for bank soundness. Specifically, we use total failed bank assets and the number of failures to account for the soundness of the local banking market. The set of covariates further includes the ratio of state-chartered banks to total banks to control for their possible lobbying behavior prior to the introduction of such laws (Kroszner and Strahan (1999)), a Herfindahl-Hirschman Index to capture the competitive environment in the banking market, and we also include the ratio of total banking system assets in the state to GDP. Finally, we control for the unemployment rate on the state level to reflect on the macroeconomic environment. We include quarter-fixed effects, and apply a within-state transformation of all variables to eliminate unobservable time-invariant state specific effects which might otherwise drive the introduction of depositor preference laws. Standard errors are clustered on the state level.

Table 3 presents the results. Across all specifications, the coefficient on the main variables of interest remains statistically indistinguishable from zero. Banks’ cost of funds, liability structure, and health play no role in the adoption of depositor preference law by the states in our sample.

Next, we turn to the parallel trends assumption. Figure 1 graphically examines the extent to which cost of funds, liability structure, soundness, and profitability evolve similarly over the three quarters prior to the introduction of depositor preference laws. State-chartered banks are the treatment group and are represented by a blue triangle, and nationally-chartered banks (the control group) are denoted by a red square. The close fit between the movements in the two groups suggests that nationally-chartered banks appear to represent a good counterfactual.

In addition to illustrating the evolution of bank behavior graphically, we conduct t-tests to verify the assumption of parallel trends. Following Lemmon and Roberts (2010), we examine whether there are significant differences in the quarterly growth rate of each variable between the treatment and control group during each pre-treatment quarter. Note that this assumption does not require identical levels of competition between treatment and control groups, they are differenced out (Lemmon and Roberts (2010)). The diagnostics in Panel A and B of Table 4 support the assumption of parallel trends: the null of equality of means cannot be rejected in any cell in the table.

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10 In Section 4.5.2 we conduct placebo tests to examine whether the path of the dependent variable in the control group changed following treatment to rule out the possibility that our average treatment effect is confounded by bias in the implied counterfactual.
4.4 Empirical results

We first discuss the pricing effects of depositor preference laws on banks’ funding costs, and then present the findings for the quantity effects by focusing on liability structure. Next, we focus on soundness considerations, and the fourth set of analyses examines profitability. Importantly, all these regressions include bank-fixed effects to eradicate time-invariant effects such as individual banks’ risk taking culture, time-varying bank-level control variables, and a set of state-quarter-fixed effects that control for unobservable time-varying common shocks such as contractions in the local economy that may affect the demand for banking services.

4.4.1 Pricing effects: Cost of funds

The difference-in-difference regressions in Table 5 show that the vocal statements by bankers in the media that depositor preference laws will increase their funding costs are unfounded. Column 1 of Table 5 establishes the effect of introducing depositor preference laws for state-chartered banks’ total interest expenses, reflected by the ratio of total interest expenses to total liabilities. We obtain clear evidence that total interest expenses are reduced. The ratio of interest expenses to total loans falls by 0.0002 following enactment of depositor preference: equivalent to a 1.5% decrease in average interest expenses holding total liabilities constant.

Which liability components drive this effect? While Column 2 confirms the prediction by Hardy (2013) that depositor preference laws reduce interest payments to (insured) depositors (t-statistic -4.32), Column 3 highlights that other creditors require compensation in return for having their claims subordinated to the FDIC with higher interest payments (t-statistic 6.48). The coefficient indicates that the increase in interest payments to non-depositors is eleven times larger than the coefficient for the decrease in interest payments to depositors.

Among the control variables, we find that bank size consistently positively correlates with all types of funds, whereas better capitalized banks pay lower interest, except for non-deposits, where we obtain a positive and significant effect.

[INSERT TABLE 5: PRICE AND QUANTITY EFFECTS OF DEPOSITOR PREFERENCE LAWS]

4.4.2 Quantity effects: liability structure

Table 6 focuses on the corresponding quantity effects. Banks chartered in states that adopt depositor preference laws experience contractions on the liability side of the balance sheet (t-statistic -3.38).

Column 1 indicates that the median state-chartered bank reduces total liabilities by 0.2% as a result of depositor preference laws, and Column 2 shows that the funding cost advantages such banks enjoy result in declines in their deposit base. This is intuitive. In equilibrium and assuming risk-neutrality, it is rational for depositors to move their funds towards other banks that pay higher deposit rates. We verify this possible explanation in Section 4.4.3 below in detail. Our tests suggest that state-chartered banks lose out against nationally-chartered banks which were at that time not subject to depositor preference. Banks seek to make up for the loss in deposit funding. Column 3 in Table 6 shows that banks increase non-deposit funding. However, given that the average bank only relies to a limited extent on such non-deposit funding, the increase in non-deposit funds cannot compensate the decline in insured deposits.

[INSERT TABLE 6: BANKS’ LIABILITY STRUCTURE]
4.4.3 Do depositor preference laws affect banks’ market shares?

Despite the increases in non-deposit funding, our results so far point towards a shrinking of state-chartered banks following the introduction of depositor preference laws. If our conjecture that depositors move their funds away from those banks is correct, we should be able to document a decreasing reliance on deposit funding in these banks. Table 7, examines whether our hypotheses are correct. Indeed, the first column in Table 7 shows that state-chartered banks use less insured deposits relative to total liabilities in response to the introduction of depositor preference laws, although the coefficient is not significant at conventional levels. However, we do find a statistically significant reduction of state-chartered banks’ market shares for insured and uninsured deposits, and we also show that uninsured deposits decline significantly. The effect is considerable in terms of its economic magnitude. The market share of the average state-chartered banks in the sample declines by 1% once legislators assign preference to depositors. The fact that uninsured deposits and the corresponding market shares also decline lends more support to our conjecture. Thus, this legislation triggered some potentially unintended competitive consequences by disadvantaging state-chartered banks vis-à-vis their nationally-chartered counterparts.

[INSERT TABLE 7: LIABILITIES, MARKET SHARE, AND ASSET ENCUMBRANCE]

4.4.4 Do non-deposit creditors collateralize their claims?

Another unintended consequence of introducing depositor preference is that general creditors may seek to collateralize their claims. Eventually, if more assets on the balance sheet are encumbered, fewer assets are freely available in a receivership which may increase the losses incurred by the FDIC.

To examine this phenomenon, we use two proxies for asset encumbrance: Federal funds sold and reverse repurchase agreements, and pledged securities, both scaled by total liabilities. Since these two variables only imperfectly reflect the full extent of asset encumbrance on banks’ balance sheets and data availability constraints limit the scope to which we can investigate this phenomenon, caution needs be exercised when drawing inferences. Nevertheless, our analyses in Table 7 offer little support to the claim that generalized creditors significantly increase the extent to which they collateralize claims.

4.4.5 Effects on bank soundness and profitability

A key argument for the introduction of depositor preference laws is that the increase in market discipline will also incentivize banks to operate safe and sound, and therefore reduce the likelihood of failure.

The mechanism works as follows: Private investors, in particular holders of large debt claims have strong incentives to monitor banks’ risk exposure because their claims are not protected by deposit insurance. Consequently, they have more to lose if a bank fails and are therefore more likely to respond to impending problems. Such responses may come in the form of withdrawal of funds, refusing to roll over funds, demanding a higher risk premium, or demanding collateral. Ultimately, these actions put constraints on the risk-taking behavior of banks, in particular asset allocation choices (Goldberg and Hudgins (2002)). Evidence in support of this idea that private investors possess monitoring technologies that enable them to gauge financial firms’ condition is, for instance, reported in by Flannery and Sorescu (1996) and Goldberg and Hudgins (2002). What matters in the context of this research is the prediction by
Birchler (2000) that creditors differ with respect to private information costs. By conferring priority upon small depositors, depositor preference laws reallocate the monitoring effort from potentially inefficient monitors to the larger and more efficient monitors who can exert market discipline more effectively. Market discipline, as defined in Flannery (1998) consists of two dimensions. First, a monitoring dimension which posits private investors’ adequately judge banks’ exposure and incorporate such assessments swiftly into security prices, e.g., bond spreads. Second, and this matters for our empirical strategy, an influencing dimension according to which outside claimants exert pressure on the bank to change conduct as shown, e.g., in Schaeck, Cihak, Maechler, and Stolz (2012).

To test this prediction of whether an increase in monitoring explains the variation in banks’ risk taking, we use the Z-score (ln), defined as the ratio of banks’ equity to total assets plus its return on assets divided by the standard deviation of return on assets, as a dependent variable to test these ideas. Additionally, we also use the ratio of non-performing loans and the leverage ratio as dependent variables in Table 8. Subsequently, we also examine the effect of depositor preference laws on the three components of the Z-score (ln) to understand the driving forces behind the effects we uncover.

[INSERT TABLE 8: BANK HEALTH AND PROFITABILITY]

State-chartered banks’ Z-scores (ln) increase significantly following the announcement of depositor preference laws, supporting the idea that harnessing market discipline improves bank health. The magnitude of this effect is economically large at 26%. The findings for non-performing loans and leverage reinforce the soundness-enhancing effects of depositor preference laws.

Our analysis of the components of the Z-score (ln) shows that this finding is driven by lower volatility of profits (t-statistic -2.11), and increases in profitability (t-statistic 3.85). This increase in profitability ties in with the result for lower levels of non-performing loans and points towards increased asset quality. In sum, these findings constitute suggestive evidence that the introduction of depositor preference laws harnesses market participants’ ability to discipline banks.

4.5 Identification concerns and sensitivity analyses

We have already documented that our data meet the two key identifying assumptions required for the difference-in-difference estimator, i.e., we have shown that treatment is exogenous with respect to the outcomes we study, and both treatment and control groups display parallel trends in the period prior to the enactment of depositor preference. Moreover, all our empirical tests for the effect of depositor preference laws on bank conduct include time-varying bank-level control variables, time-invariant bank-fixed effects, and we also include interactions of state- and quarter-fixed effects to net out any demand effects that may otherwise drive our inferences.

4.5.1 Omitted variables

This section now deals with the only remaining possible concern: omitted variables. If treatment coincides temporarily with other factors that are not accounted for or unobservable to the econometrician, we may mistakenly attribute the change in bank behavior causally to the enactment of depositor preference laws.
Clearly, omitted variable problems cannot be completely ruled out in observational data. However, we can mitigate such omitted variable problems by investigating phenomena where economic institution plausibly suggests either that banks anticipate the introduction of priority for depositors, view it negatively and therefore change the bank charter, or that problems in the banking system coincide with the enactment of depositor preference laws in a selected set of states in the U.S. To preserve space, we relegate the regression tables for the tests in this subsection to our supplementary appendix, and only verbally discuss the results of these tests.

Bank charters are a choice variable. As a first test that deals with possible factors we have so far ignored, we focus on banks changing their charter. Historically, charter changes are a rare event. More recently, however, Rosen (2005) documents that approximately 10% of banks switched their charter at least once between 1977 and 2003, and that switching banks tend to be riskier. As a result, such switches may be motivated by the idea to circumvent the increase in monitoring from non-deposit claimants that is associated with depositor preference. During our sample period 3.8% of banks change charter. Our Supplementary Appendix, Table A.1 presents an auxiliary regression that models the switch of bank charters as a function of the introduction of depositor preference laws, bank-fixed effects, the interaction of state- and quarter-fixed effects, and the time-varying control variables we use for the main regressions above. The key coefficient in these regressions, the dummy for the introduction of depositor preference, remains statistically indistinguishable from zero. Consequently, charter switches are not related to priority for depositors in the resolution process.

Second, collapsing oil prices and changes in federal tax laws in Texas in the 1980s resulted in a rapid decline in the demand for real estate. The reliance of the economy on the oil industry resulted in a massive demand shock which triggered a collapse in real estate markets. In some areas, real estate prices for commercial property dropped by 30% between 1985 and 1987, and prices for residential real estate in Houston in 1987 were more than 30% below the prices fetched in 1984. The economic malaise was aggravated by the Tax Reform Act of 1986 which eradicated incentives to hold real estate (Gan (2004)). In the midst of this crisis, Texas introduced depositor preference in 1985. Banks are highly likely to be affected by these adverse macroeconomic developments which overlap with the introduction of depositor preference. We therefore remove in Tables A.2a) – A.2e) in the Supplementary Appendix Texan banks from the sample. Our main findings remain unchanged in these tests. The exception is the effect on overall funding costs, whose t-statistic is far from conventional levels of significance (-1.09), and pledged securities now even shrink in response to priority for depositors (t-statistic -2.48), casting even more doubt on bankers concerns that depositor preference increases encumbrance of banks' assets.

Third, several failures of banks in the Northeast of the U.S., in particular in New Hampshire, Connecticut, and Massachusetts figured prominently between 1990 and 1992 as a result of a real estate boom and bust cycle. In New England, 16 banks failed in 1990, 52 in 1991, and 43 in 1992. These failures accounted for a large proportion of failed bank assets at the time, resulted in massive losses to the FDIC, and culminated in the failure of three subsidiaries of the Bank of New England Corporation, the most significant failure of a bank in that period (FDIC (1993b)). This New England banking crisis, as it became known subsequently, coincides with the signing of

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13 During the sample period, 118 banks switch from state to national charters (77 after depositor preference), and 92 banks change charter from national to state charters (77 after depositor preference).
into law of depositor preference laws in 1991 in Connecticut, Maine, New Hampshire, and Rhode Island (see Table 1). To rule out that the behavior of banks from these New England states drives our inferences, we replicate all our regressions excluding these four states in Tables A.3a) – A.3j in our Supplementary Appendix. These tests again confirm our key results. The effect of depositor preference on overall funding costs is rendered insignificant with a t-statistic of -1.34, and one of the two proxies for asset encumbrance, pledged securities, now displays a positive sign (t-statistic 2.69).

4.5.2 Further sensitivity checks

We now present further robustness tests. A key condition to be able to draw causal inferences is the random assignment of depositor preference laws. The next two tests reiterate this point. First, Whited and Roberts (2012) argue that the magnitudes of the coefficients in difference-in-difference estimation should remain unaffected irrespective of the inclusion of control variables. Otherwise, random assignment for the treatment variable should be called into question. We therefore replicate our main regressions in Tables A.4a)-A.4e) without the time-varying bank-specific control variables. The magnitudes of the key coefficients remain virtually unchanged in these tests.

Second, we revisit the validity of the parallel trends assumption and present in Tables A.5.a)-A.5e) placebo regressions. The intuition is that the changes in bank conduct we have documented so far can only be observed when depositor preference affects state-chartered banks but they can neither be observed at other points in time, nor can they be observed in other types of banks which are not subject to treatment. To this end, we randomly assign placebo treatments to nationally-chartered banks that operate in states where depositor preference was enacted to ensure that the economic environment remains comparable. The placebo tests remain insignificant in all instances, showing that our results are not confounded by the reaction within the control group.

So far, we clustered heteroskedasticity-adjusted standard errors on the bank level to account for the structure of the serial correlation within each bank in our tests. The final sensitivity check deals more specifically with serial correlation in the regression residuals within U.S. states which could be the result of spatial correlation of macroeconomic developments. Table A.6a-A.6e) demonstrates that our findings remain very similar.

5. How do market participants perceive depositor preference laws?

The results so far indicate positive associations between depositor preference laws and bank profitability. We now offer complementary evidence using two event studies to establish the effects on banks' shareholders. The intuition is to show that market participants also viewed the introduction of depositor preference laws positively which should have resulted in positive abnormal returns for bank shares. Our first event study exploits the introduction of national depositor preference laws in the U.S. in 1993, and the second event study closes the loop by returning to the debate about depositor preference in Europe.

5.1 Event study evidence from the U.S

In contrast to the previous tests, we now use the introduction of national depositor preference laws on 10th August 1993 because the individual announcements from the
introduction of depositor preference law in individual states prior to 1993 cannot be exploited for this purpose. Stock price data prior to 1990 is scarce, and matching stock price data with data on the bank charter is not feasible even after 1990. Moreover, details about the debates in the run-up to the introduction of depositor preference laws in the individual U.S. states are not documented. The results from this event study should therefore be interpreted with some caution as the findings are based on a different sample. However, exploiting the introduction of national depositor preference gives rise to the additional benefit that our inferences gain more external validity if this sample yields results that support the view that stock markets responded positively to the announcement of depositor preference.

The introduction of national depositor preference in 1993 received very little attention. It was buried in a large and complex law which focused on deficit reduction and taxation, the Omnibus Budget and Reconciliation Act. This Act was passed with almost no debate by Congress. The law became effective immediately and did not allow the FDIC to issue a rule. Instead, the FDIC had to issue an interim rule to interpret the new legislation (Thomson (1994)).

The sample for this event study includes all listed bank holding companies in the U.S. in 1993. We obtain data from Datastream and use portfolio-time series methodology to allow for cross-sectional heteroskedasticity and cross-security dependence as the event dates and event windows are the same across sample units (Sefcik and Thompson (1986)). We run the following time-series regressions

\[ \text{RET}_t = \alpha + \Sigma \beta_j I_{jt} + \gamma \text{Mkt}_t + \varepsilon_t \] (3)

where RET is the return on the equally-weighted portfolio of banks, Mkt is the return on the proxy for the market portfolio (Dow Jones Industrial Average); I is a dummy variable that equals 1 if at date t an announcement relating to depositor preference law was made and 0 otherwise; and \( \varepsilon \) is a stochastic error term. To allow for AR(1) autocorrelation, we apply the Prais-Winsten adjustment prior to estimation, and we adjust standard errors for heteroskedasticity. We focus on the event-day abnormal returns.

Our tests in Panel A of Table 9 are based on three different event dates because national depositor preference’s introduction was largely unnoticed. We first focus on the effective date, 10th August 1993 in Column (1), the day when Bill Clinton signed depositor preference into law. Columns (2) and (3) include additional event dates to examine anticipation effects. On 27th May, and on 25th June, the bill passed the House and the Senate, respectively. In addition to assessing the event day abnormal return for each one of the three event dates, we also assess the overall impact of the regulation (i.e. cumulative shareholder value effects) for these regressions and calculate the cumulative abnormal returns for all events (Wagster (1996)). We use F-tests to assess the significance of the CARs. In other words, we test the hypotheses:

\[ H_0: \beta_j = 0 \quad \forall j = \{1,2,3\} \] (4a)

\[ H_0: \Sigma \beta_j = 0 \quad \forall j = \{1,2,3\} \] (4b)

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12 The remarks by President Bill Clinton upon signing the law contain no reference to depositor preference (http://www.presidency.ucsb.edu/ws/?pid=46972).
The results support the idea that stock market participants expected increases in bank profitability in reaction to the introduction of depositor preference law for all three events. Moreover, the F-tests for all events also suggest bank shares experienced highly significant cumulative wealth gains. As an indication of the economic significance of these results, on the event dates the unexpected portion of the return on the equally weighted portfolio (between 0.001 and 0.003) is very large as compared to the overall average return over the sample period (0.001). In other words, if over the sample period the average daily return was 0.1%, on the event dates investors achieved returns at least twice as large. In line with the bank level evidence in Section 4 above about the positive effects on profitability, the event study results highlight that market participants anticipated improved bank profitability.

5.2 Event study evidence from Europe

Our final test brings the focus back on Europe to shed light onto the intensive debate about assigning priority to depositors in the European Union. While the absence of existing depositor preference laws in the European Union renders difference-in-difference tests impossible, we are able to examine several event dates at which policymakers in Europe, in particular from the European Commission, from the European Central Bank, and experts from the Independent Commission on Banking in the U.K., announced proposals to introduce such laws.

For this event study, we retrieve stock price data for all listed banks in Europe for the period from 1st January 2010 to 31st December 2012 from Datastream. Next, we manually collect information from the websites of the Financial Times, the European Commission, the European Central Bank, the Independent Commission on Banking in the U.K., and from Lexis Nesis to identify key dates for the debate in the European Union about such legislation using the following search terms: depositor preference, priority for deposits, preferred treatment for bank depositors. Our search identifies the following key dates for Europe:

12 July 2010  Consultative document by the European Commission contains proposals to introduce depositor preference.\(^{13}\)

10 October 2010  European Commission suggests modification of deposit guarantees to include depositor preference.\(^{14}\)

21 October 2010  Financial Times mentions European Commission's publication suggesting the possibility of depositor preference in Europe.\(^{15}\)

11 April 2011  European Commission issues a summary on the consulting activities for bank resolution frameworks, including depositor preference.\(^{16}\)

5 October 2012  ECB representative argues for the introduction of depositor preference.\(^{17}\)

19 October 2012  ECB opinion piece discusses the idea of introducing depositor preference.\(^{18}\)

A separate debate with particular focus on the U.K. identifies the following announcement dates:

\(^{13}\) http://ec.europa.eu/smart-regulation/impact/ia_carried_out/docs/ia_2010/sec_2010_0834_en.pdf


11 April 2011  UK Independent Commission on Banking contains proposals to introduce depositor preference.19

13 September 2011  Financial Times reports that U.K. Independent Commission on Banking intends to introduce depositor preference.20

7 May 2012  Reuters reports that U.K. government will publish detailed proposals to ensure better protection for depositors.21

11 June 2012  Bankers raise concerns about the introduction of depositor preference laws publicly.22

13 June 2012  Financial Times reports intention by George Osborne to commit to implementation of measures recommended by Sir John Vickers, including introduction of depositor preference.23

12 September 2012  Financial Services Authority issues consultation paper with reference to the introduction of depositor preference.24

The empirical tests proceed in the same way as do the event study tests for the introduction of national depositor preference in the U.S., except for replacing the DJIA with the MSCI Europe as a market index, and using different event dates.

Our results for the European Union, presented in Panel B of Table 9, confirm the overall positive reaction of stock market participants to the intention to introduce priority for bank deposits. Of the six events we study, five display a positive and significant coefficient, and only the event on 11 April 2011 points in the opposite direction. As before, the positive abnormal returns for the events considered (between 0.001 and 0.007) are very large as compared to the average return on the equally weighted portfolio during the sample period (-0.0008). Likewise, the separate analysis for the U.K., also shown in Panel B of Table 9, also suggests a positive market reaction. Four of the individual event dates triggered positive abnormal returns for bank shares, and only one of the six events suggests otherwise. The four positive abnormal returns (which range between 0.002 and 0.013) are economically significant as compared to the average return on the equally-weighted portfolio over the sample period (0.0003).

[INSERT TABLE 9: EVENT STUDY EVIDENCE]

6. Conclusions

The effects of changes in the regulatory environment on bank conduct are often not clear ex ante. In this paper, we exploit a plausibly exogenous shock arising from the introduction of depositor preference laws in 15 different states in the U.S. which affect state-chartered but not nationally-chartered banks. This setting allows us to document that changes in the priority of debt claims following enactment of depositor preference laws have wide-ranging implications

20 http://www.ft.com/intl/cms/s/0/15432d9e-de05-11e0-a391-00144feabdc0.html#axzz2qYU3MNIA
21 http://uk.reuters.com/article/2012/05/07/uk-britain-bank-reform-idUKBRE8450CG20120507
23 http://www.ft.com/intl/cms/s/0/64286760-6577-11e1-ab92-00144feabdc0.html#axzz2qYU3MNIA
for the banking sector in terms of bank funding cost, liability structure, soundness, and bank profitability.

Bearing in mind the intensive and controversial debate between policymakers and representatives from the banking industry in Europe about the introduction of laws that assign priority to depositors in case of a bank failure, this research is both timely and important from a policy perspective. While the proponents of such legislation argue that such legislation will increase market discipline exerted by non-deposit claimants, increase bank soundness, and reduce the cost of bank failures, the banking industry has lobbied intensively against assigning depositors a priority claim on failed banks' assets. These opponents argue that priority for bank depositors will increase banks' cost of funds, result in more assets being encumbered as non-deposit claimants seek to collateralize their claims, and, ultimately, this would also undermine soundness.

Surprisingly, it seems bankers themselves are struggling to adequately gauge the ramifications of such legislation. Our results challenge bankers' claims that funding costs will increase if depositor preference laws are introduced. Instead, overall funding costs decline, but non-deposit funds become more expensive supporting the idea that depositor preference increases market discipline. We also document a shift away from non-deposit financing. While we remain cautious assigning much weight to our tests that examine whether depositor preference increases asset encumbrance, our findings indicate that such concerns are not warranted. Another key result that strengthens the case for assigning depositors a preferential claim is that risk taking by banks declines following enactment of depositor preference laws. This piece of evidence highlights that the increase in market discipline that arises from assigning a lower priority to non-deposit claimants is consistent with theories by Fama (1980, 1985), and Rajan and Winton (1995) that predict an inverse association between seniority of debt claims and debtholders incentives to monitor. To the extent that such increases in market discipline effectively change banks' conduct, our paper is one of the few in the literature that offers evidence for the influencing dimension of market discipline. The lower bank funding costs ultimately increase banks' profitability. Our final set of tests, based on event study methodology, documents cumulative abnormal returns. Shareholders are the ultimate beneficiaries from the new legislation. Using the signing into law of national depositor preference by President Bill Clinton on 10th August 1993 to increase the external validity of our inferences, to analyze stock market participants' reactions to the introduction of depositor preference, we show that market participants welcomed this legislation. The event-day abnormal return is economically large at 0.2%. To close the loop, we then refocus our analysis to Europe and examine a variety of different announcements by policymakers between 2010 and 2013 about the intention to assign priority claims to depositors in the European Union, and separate tests also offer such analyses for the U.K. These analyses confirm the positive reactions of stock markets with similar economic magnitudes.

In conclusion, we interpret our results as supportive evidence for the introduction of depositor preference laws. In fact, other countries like Australia, Switzerland, and also several emerging market economies such as Hong Kong, Malaysia, Argentina already have some form of depositor preference law in place. Protecting depositors without shifting the burden of bank bailouts to taxpayers and thus avoiding moral hazard on the one hand but increasing market discipline on the other hand are appealing features of depositor preference laws that help improve the health of the banking system.
References


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Jackson, T. H., and A. T. Kronman (1979) Secured financing and priorities among creditors. Yale Law School Faculty Scholarship Series 1-1-1979


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Notes: This table presents the date of depositor preference law enactment in each state. The information is taken from Marino and Bennett (1999). * indicates that the legislation became effective on either January 1 or July 1. ** indicates passed by both houses on July 1, but that enactment date is unclear. Where only the year is indicated, neither the month nor the day of enactment is available. *** Texas amended its law in 1993Q2 and did not have depositor preference until national depositor preference was enacted in August 1993. Utah enacted depositor preference law legislation during 1983Q1.
Table 2
Summary statistics and sample representativeness

Panel A: Summary Statistics

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<td>Interest expenses on deposits</td>
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<td>0.014</td>
<td>0.004</td>
<td>0.005</td>
<td>0.081</td>
</tr>
<tr>
<td>Interest expenses on non-deposits</td>
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<td>0.006</td>
<td>0.011</td>
<td>0</td>
<td>0.002</td>
</tr>
<tr>
<td>Total liabilities</td>
<td>199,698</td>
<td>0.913</td>
<td>0.033</td>
<td>0.763</td>
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<td>Total domestic deposits</td>
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<td>0.973</td>
<td>0.040</td>
<td>0.713</td>
<td>0.999</td>
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<td>Total non-deposits</td>
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<td>0.027</td>
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<td>Insured deposits</td>
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<td>0.032</td>
<td>0.088</td>
<td>0.501</td>
<td>0.998</td>
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<td>Market share of insured deposits</td>
<td>199,698</td>
<td>0.000</td>
<td>0.000</td>
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<td>0.001</td>
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<td>Uninsured deposits</td>
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<td>Federal funds sold and repos</td>
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<td>Pledged securities</td>
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<td>0.083</td>
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<tr>
<td>Zscore (ln)</td>
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<td>1.351</td>
<td>4.887</td>
<td>-6.908</td>
<td>10.618</td>
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<td>Standard deviation of ROA (ln)</td>
<td>199,698</td>
<td>-6.685</td>
<td>0.839</td>
<td>-12.714</td>
<td>-2.124</td>
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<td>Standard deviation of ROA</td>
<td>199,698</td>
<td>0.002</td>
<td>0.003</td>
<td>0.000</td>
<td>0.119</td>
</tr>
<tr>
<td>Return on assets (ln)</td>
<td>199,698</td>
<td>-6.129</td>
<td>0.721</td>
<td>-12.619</td>
<td>-1.506</td>
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<tr>
<td>Equity to total assets (ln)</td>
<td>199,698</td>
<td>0.085</td>
<td>0.034</td>
<td>0.001</td>
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<td>Equity to total assets</td>
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<td>0</td>
<td>0.107</td>
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<tr>
<td>Non-performing loans to total loans</td>
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<td>-3.486</td>
<td>1.204</td>
<td>-6.908</td>
<td>6.353</td>
</tr>
<tr>
<td>Leverage ratio (Debt to equity ratio)</td>
<td>199,698</td>
<td>11.645</td>
<td>4.849</td>
<td>0</td>
<td>30.985</td>
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<td>Return on equity (ln)</td>
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<td>1.802</td>
<td>-9.399</td>
<td>4.984</td>
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<td>Return on equity</td>
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<td>0.039</td>
<td>0.489</td>
<td>0.000</td>
<td>14.600</td>
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<tr>
<td>Total interest income to total loans</td>
<td>199,698</td>
<td>-3.486</td>
<td>1.204</td>
<td>-6.908</td>
<td>6.353</td>
</tr>
<tr>
<td>Total interest income to total loans</td>
<td>199,698</td>
<td>0.043</td>
<td>0.022</td>
<td>0.001</td>
<td>0.128</td>
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<tr>
<td>Treatment*Charter</td>
<td>199,698</td>
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<td>0.483</td>
<td>0</td>
<td>1</td>
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<tr>
<td>Bank size (ln)</td>
<td>199,698</td>
<td>10.635</td>
<td>1.183</td>
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<td>18.591</td>
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<td>Total assets</td>
<td>199,698</td>
<td>108969.1</td>
<td>324164.4</td>
<td>4825</td>
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</table>

Panel B: Sample representativeness

<table>
<thead>
<tr>
<th>Variable</th>
<th>Difference means</th>
<th>Wilcoxon p-value</th>
<th>Difference means</th>
<th>Wilcoxon p-value</th>
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<tr>
<td>Total interest expenses</td>
<td>0.000</td>
<td>0.961</td>
<td>0.000</td>
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<td>Interest expenses on deposits</td>
<td>0.000</td>
<td>0.936</td>
<td>0.000</td>
<td>0.804</td>
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<tr>
<td>Interest expenses on non-deposits</td>
<td>0.000</td>
<td>0.619</td>
<td>0.000</td>
<td>0.984</td>
</tr>
<tr>
<td>Total liabilities</td>
<td>-0.009</td>
<td>0.052</td>
<td>-0.007</td>
<td>0.052</td>
</tr>
<tr>
<td>Total domestic deposits</td>
<td>-0.009</td>
<td>0.328</td>
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<td>0.535</td>
</tr>
<tr>
<td>Total non-deposits</td>
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<td>0.312</td>
<td>0.005</td>
<td>0.535</td>
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<td>Federal funds sold and repos</td>
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<td>0.761</td>
<td>-0.003</td>
<td>0.679</td>
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<td>0.451</td>
<td>-0.004</td>
<td>0.649</td>
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<tr>
<td>Zscore (ln)</td>
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<td>0.183</td>
<td>0.342</td>
<td>0.193</td>
</tr>
<tr>
<td>Non-performing loans to total loans</td>
<td>-0.005***</td>
<td>0.001</td>
<td>-0.003</td>
<td>0.045</td>
</tr>
<tr>
<td>Leverage ratio (Debt to equity ratio)</td>
<td>-1.093*</td>
<td>0.028</td>
<td>-0.767*</td>
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<td>0.026</td>
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<td>0.183</td>
<td>0.082</td>
<td>0.066</td>
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<td>0.028</td>
<td>0.936</td>
<td>0.034</td>
<td>0.994</td>
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</table>
Table 3

Exogeneity Tests: Cox Proportional Hazards Model

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<thead>
<tr>
<th>Coefficient</th>
<th>Expenses on deposits</th>
<th>Expenses on non-deposits</th>
<th>Total Liabilities</th>
<th>Total deposits</th>
<th>Total non-deposits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total liabilities</td>
<td>1.001</td>
<td>1.001</td>
<td>1.001</td>
<td>1.001</td>
<td>1.001</td>
</tr>
<tr>
<td>Z-stat</td>
<td>(0.99)</td>
<td>(1.27)</td>
<td>(0.34)</td>
<td>(0.86)</td>
<td>(0.93)</td>
</tr>
<tr>
<td>Controls</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>State FE</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Year FE</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Observations</td>
<td>1196</td>
<td>1196</td>
<td>1196</td>
<td>1196</td>
<td>1196</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Coefficient</th>
<th>Z-score (ln)</th>
<th>Non-performing loans</th>
<th>Leverage Ratio</th>
<th>Return on assets (ln)</th>
<th>Return on equity (ln)</th>
<th>Interest income (ln)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z-stat</td>
<td>(1.37)</td>
<td>(1.64)</td>
<td>(0.89)</td>
<td>(0.39)</td>
<td>(-0.37)</td>
<td>(1.19)</td>
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<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>State FE</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Year FE</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Observations</td>
<td>1196</td>
<td>1196</td>
<td>1196</td>
<td>1196</td>
<td>1196</td>
<td>1196</td>
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</table>

Federal funds sold and reverse repo

Pledged securities

<table>
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<tr>
<th>Coefficient</th>
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<th>1</th>
</tr>
</thead>
<tbody>
<tr>
<td>Z-stat</td>
<td>(1.19)</td>
<td>(1.46)</td>
</tr>
<tr>
<td>Controls</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>State FE</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Year FE</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Observations</td>
<td>1196</td>
<td>1196</td>
</tr>
</tbody>
</table>

Notes. This table presents Cox proportional hazard (Cox PH) models to verify that adoption of depositor preference law is exogenous with respect to banks’ costs of funds, liability structure and health. In the Cox proportional hazard models, the dependent variable denotes the hazard of observing depositor preference law enactment. The main explanatory variables include totals of interest expenses, interest expenses on deposits, interest expenses on non-deposits, liabilities, deposits, non-deposits, the Z-score, non-performing loans, the leverage ratio, return on equity, interest income, total loans, Federal funds sold and reverse repurchase agreements, and pledged securities of all banks operating in the state. A state is dropped from the analysis once it adopts depositor preference law. The vector of control variables includes the amount of failed banks’ deposits, estimated losses resulting from bank failures, number of bank failures, the concentration ratio of bank deposits (log of HHI), the ratio of total bank assets to GDP, and the logarithm of the unemployment rate. All control variables are aggregated at the state level. State and year dummies are included. Robust z-statistics are reported in parentheses. *** p<0.01, ** p<0.05, * p<0.1. Standard errors are clustered on the state level.
<table>
<thead>
<tr>
<th>Variable</th>
<th>t-1 to t-3</th>
<th>t-1</th>
<th>t-2</th>
<th>t-3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Δ Total interest expenses</td>
<td>-0.002</td>
<td>0.702</td>
<td>-0.003</td>
<td>0.819</td>
</tr>
<tr>
<td>Δ Interest expenses on deposits</td>
<td>0.000</td>
<td>0.945</td>
<td>0.000</td>
<td>0.984</td>
</tr>
<tr>
<td>Δ Interest expenses on non-deposits</td>
<td>-0.015</td>
<td>0.984</td>
<td>0.047</td>
<td>0.724</td>
</tr>
<tr>
<td>Δ Total liabilities</td>
<td>0.000</td>
<td>0.907</td>
<td>-0.001</td>
<td>0.756</td>
</tr>
<tr>
<td>Δ Total domestic deposits</td>
<td>0.001</td>
<td>0.267</td>
<td>0.001</td>
<td>0.443</td>
</tr>
<tr>
<td>Δ Total non-deposits</td>
<td>-0.025</td>
<td>0.575</td>
<td>0.025</td>
<td>0.724</td>
</tr>
<tr>
<td>Δ Insured deposits</td>
<td>-0.008</td>
<td>0.581</td>
<td>-0.006</td>
<td>0.663</td>
</tr>
<tr>
<td>Δ Market share of insured deposits</td>
<td>0.011</td>
<td>0.707</td>
<td>-0.003</td>
<td>0.373</td>
</tr>
<tr>
<td>Δ Uninsured deposits</td>
<td>0.000</td>
<td>0.977</td>
<td>-0.029</td>
<td>0.439</td>
</tr>
<tr>
<td>Δ Market share of uninsured deposits</td>
<td>-0.001</td>
<td>0.884</td>
<td>-0.048</td>
<td>0.439</td>
</tr>
<tr>
<td>Δ Federal funds sold and repos</td>
<td>-0.153</td>
<td>0.913</td>
<td>3.432</td>
<td>0.958</td>
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<tr>
<td>Δ Pledged securities</td>
<td>1.257</td>
<td>0.952</td>
<td>1.118</td>
<td>0.797</td>
</tr>
<tr>
<td>Δ Zscore (ln)</td>
<td>-0.128</td>
<td>0.308</td>
<td>-0.072</td>
<td>0.263</td>
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<tr>
<td>Δ Non-performing loans to total loans</td>
<td>0.552</td>
<td>0.977</td>
<td>0.239</td>
<td>0.513</td>
</tr>
<tr>
<td>Δ Leverage ratio (Debt to equity ratio)</td>
<td>0.001</td>
<td>0.818</td>
<td>-0.023</td>
<td>0.548</td>
</tr>
<tr>
<td>Δ Return on equity (ln)</td>
<td>-0.003</td>
<td>0.268</td>
<td>0.001</td>
<td>0.967</td>
</tr>
<tr>
<td>Δ Total interest income to total loans (ln)</td>
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<td>0.501</td>
<td>0.007</td>
<td>0.101</td>
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<tr>
<td></td>
<td>Total interest expenses</td>
<td>Interest on deposits</td>
<td>Interest on non-deposits</td>
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</tr>
<tr>
<td>------------------------</td>
<td>-------------------------</td>
<td>----------------------</td>
<td>--------------------------</td>
<td></td>
</tr>
<tr>
<td>Charter*depositor preference law</td>
<td>-0.0002***</td>
<td>-0.0002***</td>
<td>0.0012***</td>
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</tr>
<tr>
<td></td>
<td>(-3.88)</td>
<td>(-4.32)</td>
<td>(6.48)</td>
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<tr>
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<td>0.0015***</td>
<td>0.0012***</td>
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<tr>
<td></td>
<td>(11.83)</td>
<td>(12.53)</td>
<td>(5.11)</td>
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<tr>
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<td>-0.0004***</td>
<td>0.0001</td>
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<td></td>
<td>(-10.92)</td>
<td>(-10.07)</td>
<td>(1.40)</td>
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<tr>
<td>Bank FE</td>
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<td>YES</td>
<td></td>
</tr>
<tr>
<td>State*Quarter FE</td>
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<td>YES</td>
<td>YES</td>
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<tr>
<td>Observations</td>
<td>199,698</td>
<td>199,698</td>
<td>199,698</td>
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<tr>
<td>R-squared</td>
<td>0.7533</td>
<td>0.7675</td>
<td>0.3052</td>
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</table>

Notes. This table presents the results of difference-in-difference regressions examining the effect of state depositor preference law enactment on cost of banks’ funds. We estimate following model \( y_{ist} = \alpha + \beta DPL_{ist} \times Charter_{i} + \delta X_{ist} + \gamma_{1} + \gamma_{st} + \epsilon_{ist} \), where \( y \) denotes the dependent variable of bank \( i \) in state \( s \) at time \( t \), which include ratios of: total interest expenses to total liabilities (Total interest expenses), interest on deposits to total deposits (Interest on deposits), and interest on other non-deposits to total other non-deposits (Interest on non-deposits). The main explanatory variable is an interaction between the depositor preference law dummy and Charter dummy variable. Depositor preference law is a dummy variable equal to 1 for all banks in states and years following introduction of state depositor preference law, and 0 otherwise; Charter is a dummy variable equal to 1 for all state-chartered banks, and 0 for nationally-chartered institutions. The coefficient \( \beta \) provides information about the effect of state depositor preference law adoption. The set of bank-time varying control variables \( X \) include the logarithm of banks’ total assets (Bank size), and the ratio of equity capital to total assets (Equity). Additionally, regressions include state-quarter-fixed effects (\( \gamma_{st} \)) and bank-fixed effects (\( \gamma_{i} \)). Robust \( t \)-statistics are reported in parentheses and standard errors are clustered on bank level. *** p<0.01, ** p<0.05, * p<0.1.
Table 6
Banks’ liability structure

<table>
<thead>
<tr>
<th></th>
<th>State banks vs. National banks in treatment state</th>
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<tbody>
<tr>
<td></td>
<td>Total liabilities</td>
<td>Total domestic deposits</td>
<td>Total non-deposits</td>
<td></td>
</tr>
<tr>
<td>Charter*depositor preference law</td>
<td>-0.0020***</td>
<td>-0.0034***</td>
<td>0.0034***</td>
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<td></td>
<td>(-3.38)</td>
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<td>(4.49)</td>
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<tr>
<td>Bank size</td>
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<td>0.0100***</td>
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<td></td>
<td>(17.81)</td>
<td>(-7.74)</td>
<td>(7.75)</td>
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<td>-0.0008*</td>
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<td>(-31.65)</td>
<td>(1.85)</td>
<td>(-1.85)</td>
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</tr>
<tr>
<td>State*Quarter FE</td>
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<td>YES</td>
<td>YES</td>
<td></td>
</tr>
<tr>
<td>Observations</td>
<td>199,698</td>
<td>199,698</td>
<td>199,698</td>
<td></td>
</tr>
<tr>
<td>R-squared</td>
<td>0.8060</td>
<td>0.6705</td>
<td>0.6704</td>
<td></td>
</tr>
</tbody>
</table>

Notes. This table presents results of difference-in-difference regressions examining the effect of state depositor preference law enactment on banks’ liability structure. We estimate following model $y_{ist} = \alpha + \beta DPL_{ist} \times Charter_i + \delta X_{ist} + \gamma_i + \eta_{st} + \epsilon_{ist}$, where $y$ denotes dependent variable of bank $i$ in state $s$ at time $t$, which includes ratios of: total liabilities to total assets (Total liabilities), total domestic deposits to total liabilities (Total domestic deposits), total non-deposit liabilities to total liabilities (Total non-deposits). The main explanatory variable is an interaction between depositor preference law and Charter. Depositor preference law is a dummy variable equal to 1 for all banks in states and years following introduction of state depositor preference law, and 0 otherwise; Charter is a dummy variable equal to 1 for all state-chartered banks, and 0 for nationally-chartered institutions. The coefficient $\beta$ provides information about the effect of state depositor preference law adoption. The set of bank-time varying control variables $X$ include the logarithm of banks’ total assets (Bank size), and the ratio of equity capital to total assets (Equity). Additionally, the regressions include state-quarter-fixed effects ($\eta_{st}$) and bank-fixed effects ($\gamma_i$). Robust t-statistics are reported in parentheses and standard errors are clustered on bank level. *** p<0.01, ** p<0.05, * p<0.1.
### Table 7

**Liabilities, Market Share, and Asset Encumbrance**

<table>
<thead>
<tr>
<th>State banks vs. National banks in treatment state</th>
<th>Insured deposits</th>
<th>Market share insured deposits</th>
<th>Uninsured Deposits</th>
<th>Market share uninsured deposits</th>
<th>Federal funds sold and reverse REPO</th>
<th>Pledged securities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charter*depositor preference law</td>
<td>-0.0014</td>
<td>-0.0000***</td>
<td>-0.0026***</td>
<td>-0.0004***</td>
<td>-0.0010</td>
<td>0.0002</td>
</tr>
<tr>
<td></td>
<td>(-1.23)</td>
<td>(-2.76)</td>
<td>(-3.09)</td>
<td>(-7.01)</td>
<td>(-0.80)</td>
<td>(0.15)</td>
</tr>
<tr>
<td>Bank size</td>
<td>-0.0274***</td>
<td>-0.0000***</td>
<td>0.0162***</td>
<td>0.0007***</td>
<td>-0.0195***</td>
<td>0.0050***</td>
</tr>
<tr>
<td></td>
<td>(-14.35)</td>
<td>(-8.54)</td>
<td>(14.91)</td>
<td>(8.76)</td>
<td>(-13.07)</td>
<td>(3.39)</td>
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<td>Equity</td>
<td>-0.0035***</td>
<td>-0.0000**</td>
<td>0.0038***</td>
<td>0.0001*</td>
<td>0.0022***</td>
<td>0.0065***</td>
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<td></td>
<td>(-5.42)</td>
<td>(-2.04)</td>
<td>(9.70)</td>
<td>(185)</td>
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<td>(9.76)</td>
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<td>Bank FE</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>State*Quarter FE</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Observations</td>
<td>199,698</td>
<td>199,698</td>
<td>199,698</td>
<td>199,698</td>
<td>199,698</td>
<td>199,698</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.6965</td>
<td>0.9949</td>
<td>0.6728</td>
<td>0.5120</td>
<td>0.4930</td>
<td>0.7289</td>
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</table>

**Notes.** This table presents the results of difference-in-difference regressions examining effect of state depositor preference law enactment on banks’ liability structure, market share and encumbrance. We estimate the model $y_{it} = \alpha + \beta DPL_{it} \cdot Charter_{it} + \delta X_{it} + \gamma_1 + \gamma_2 + \varepsilon_{it}$, where $y$ denotes dependent variable of bank $i$ at time $t$, which includes ratios of insured deposits to total liabilities (Insured deposits), market share of insured deposits (Market share insured deposits), uninsured deposits to total liabilities (Uninsured deposits), market share of uninsured deposits (Market share uninsured deposits), ratio of Federal funds sold and securities purchased under agreements to resell to total liabilities (Federal funds sold and reverse REPO), and pledged securities to total liabilities (Pledged securities). The main explanatory variable is an interaction between depositor preference law and Charter. Depositor preference laws is a dummy variable equal to 1 for all banks in states and years following introduction of state depositor preference law, and 0 otherwise; Charter is a dummy variable equal to 1 for all state-chartered banks, and 0 for nationally-chartered institutions. The coefficient $\beta$ provides information about the effect of state depositor preference law adoption. The set of bank-time varying control variables $X$ include logarithm of banks’ total assets (Bank size), and ratio of equity capital to total assets (Equity). Additionally, regressions include state-quarter-fixed effects ($\gamma_1$) and bank-fixed effects ($\gamma_2$). Robust t-statistics are reported in parentheses and standard errors are clustered on bank level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. **
# Table 8
State depositor preference law and banks' health and profitability

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Panel A: Banks' risk and decomposed Z-Score (ln)</th>
<th>Panel B: Banks' profitability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charter*depositor preference law</td>
<td>0.2615*** -0.0413** 0.0491*** 0.1097*** -0.0010** -0.2063*</td>
<td>0.0481** 0.0111*</td>
</tr>
<tr>
<td></td>
<td>(5.97) (-2.11) (3.85) (7.83) (-1.97) (-1.93)</td>
<td>(2.29) (1.88)</td>
</tr>
<tr>
<td>Bank size</td>
<td>0.2156*** -0.1630*** 0.2273*** -0.2853*** -0.0029*** 2.7675***</td>
<td>0.5242*** -0.0185</td>
</tr>
<tr>
<td></td>
<td>(2.63) (-7.68) (11.81) (-11.78) (-6.09) (13.07)</td>
<td>(12.33) (-1.23)</td>
</tr>
<tr>
<td>Bank FE</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>State*Quarter FE</td>
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<td>YES</td>
</tr>
<tr>
<td>Observations</td>
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<td>199,698</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.9328</td>
<td>0.4745</td>
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</table>

Notes. This table presents the results of difference-in-difference regressions examining the effect of state depositor preference law enactment on banks' health and profitability. We estimate the model \( y_{ist} = \alpha + \beta DPL_{st} \ast Charter_i + \delta X_{ist} + \gamma_{it} + \epsilon_{ist} \), where \( y \) denotes the dependent variables of bank \( i \) in state \( s \) at time \( t \). In panel A the dependent variables that proxy for banks' health are: the logarithm of the Z-score, the components of the Z-score measure (ZSCORE(ln)), the ratio of equity capital to total assets (ETA(ln)), the logarithm of return on assets (ROA(ln)), the logarithm of the standard deviation of return on assets (ROASD(ln)), the ratio of non-performing loans to total loans (NPL), and the debt to equity leverage ratio (LEV). In panel B the dependent variables proxy for banks' profitability: the logarithm of return on equity (ROE(ln)), and the logarithm of total interest income to total loans (TIINC). The main explanatory variable is an interaction between the depositor preference law and Charter dummy variables. Depositor preference law is a dummy variable equal to 1 for all banks in states and years following introduction of state depositor preference law, and 0 otherwise; Charter is a dummy variable equal to 1 for all state-chartered banks, and 0 for nationally-chartered institutions. The coefficient \( \beta \) provides information about the effect of state depositor preference law adoption. The set of bank-time varying control variables \( X \) include the logarithm of banks' total assets (Bank size). Additionally, the regressions include state-quarter-fixed effects (\( \gamma_{st} \)) and bank-fixed effects (\( \gamma_{i} \)). Robust t-statistics are reported in parentheses and standard errors are clustered on bank level. *** p<0.01, ** p<0.05, * p<0.1
Table 9
Valuation effects: Event study evidence

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<th>Region</th>
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<td>(equally</td>
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<td>(equally</td>
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<td>portfolio of</td>
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<td>portfolio of</td>
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<td>banks)</td>
<td>banks)</td>
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<td>Region</td>
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<td>U.S.</td>
<td>European</td>
<td>U.K.</td>
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<td>DJIA</td>
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<td>0.235***</td>
<td>0.234***</td>
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<tr>
<td></td>
<td>(4.101)</td>
<td>(4.092)</td>
<td>(4.060)</td>
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<tr>
<td>Event dummy (27th May 1993)</td>
<td>0.003***</td>
<td>0.003***</td>
<td>(7.734)</td>
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<tr>
<td>Event dummy (25th June 1993)</td>
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<td>0.001***</td>
<td>(2.979)</td>
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<tr>
<td>Event dummy (10th August 1993)</td>
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<td>0.002***</td>
<td>0.002***</td>
<td>(6.376)</td>
<td>(6.362)</td>
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<td>MSCI Europe</td>
<td>0.598***</td>
<td>0.815***</td>
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<tr>
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<td>(32.015)</td>
<td>(33.770)</td>
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<tr>
<td>Event dummy (12 July 2010)</td>
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<td></td>
<td>(4.393)</td>
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<tr>
<td>Event dummy (10 October 2010)</td>
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<td>Event dummy (21 October 2010)</td>
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<td>(-1.278)</td>
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<td></td>
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<tr>
<td>Event dummy (5 October 2012)</td>
<td>0.007***</td>
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<tr>
<td>Event dummy (29 November 2012)</td>
<td>0.003***</td>
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<tr>
<td>Event dummy (11 April 2011)</td>
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<td></td>
<td>(17.233)</td>
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<td></td>
</tr>
<tr>
<td>Event dummy (13 September 2011)</td>
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<tr>
<td></td>
<td>(3.062)</td>
<td></td>
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<td>Event dummy (7 May 2012)</td>
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</tr>
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<td>Event dummy (11 June 2012)</td>
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<td></td>
<td>(-1.442)</td>
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<td></td>
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<tr>
<td>Event dummy (13 June 2012)</td>
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<tr>
<td>Event dummy (12 September 2012)</td>
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<td>(20.946)</td>
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</table>

Notes. This table shows the event study results for the introduction of national depositor preference law in the U.S. We regress the return of an equally weighted portfolio of banks on the market return of the Dow Jones Industrial Average (DJIA) and dummy variables that take the value of one if relating to national depositor preference law on 27th May (when the bill passed the House), 25th June (when it passed the Senate), or on 10th August 1993 (when it was signed into law). Panel B presents such regressions for banks in the European Union and in the U.K, respectively. The market portfolio is proxied by the MSCI Europe. The event days for Europe are listed in the main body of the text. Event-day abnormal returns are reported. All regressions use the Prais-Winsten adjustment to allow for AR(1) autocorrelation, and the standard errors are adjusted for heteroskedasticity.
Figure 1
Development of state depositor preference laws in the U.S.
Figure 2: Parallel trends

Notes: Figure 2 illustrates the behavior of quarterly changes in the dependent variables, for three quarters preceding depositor preference law enactment. State-chartered banks (the treatment group) are represented by a triangle, whereas national-chartered banks (the control group) are depicted by a square.
SUPPLEMENTARY APPENDIX

Does Assigning Priority to Deposits Affect Bank Conduct? Evidence from a Quasi-Experiment
### Supplementary Appendix

#### Table A.1  
**Switch of bank charter**

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Panel A: Linear probability model</th>
<th>Panel B: Probit model</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charter* Depositor preference law</td>
<td>$0.0009$ (1.11)</td>
<td>$-0.0177$ (-0.33)</td>
</tr>
<tr>
<td>Bank size</td>
<td>$0.0009**$ (2.12)</td>
<td>$0.0968***$ (-5.67)</td>
</tr>
<tr>
<td>Equity</td>
<td>$0.0002$ (1.37)</td>
<td>$-0.0204$ (-0.96)</td>
</tr>
<tr>
<td>Bank FE</td>
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<td>NO</td>
</tr>
<tr>
<td>State*Quarter FE</td>
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<td>NO</td>
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<tr>
<td>State FE</td>
<td>NO</td>
<td>YES</td>
</tr>
<tr>
<td>Quarter FE</td>
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<td>YES</td>
</tr>
<tr>
<td>Observations</td>
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<td>192,207</td>
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<tr>
<td>R-squared</td>
<td>0.0348</td>
<td>-</td>
</tr>
<tr>
<td>Pseudo R-squared</td>
<td>-</td>
<td>0.0624</td>
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</table>

**Notes:** This table presents results for regressions where our dependent variable is a dummy variable equal to 1 when bank switches charter and 0 otherwise. The main explanatory variable is an interaction between the depositor preference law and Charter dummy variables. Deppositor preference law is a dummy variable equal to 1 for all banks in states and years following introduction of state depositor preference law, and 0 otherwise; Charter is a dummy variable equal to 1 for all state-chartered banks, and 0 for nationally-chartered institutions. The set of bank-time varying control variables $X$ includes the logarithm of banks’ total assets (Bank size), and the ratio of equity capital to total assets (Equity). Panel A presents results obtained using a linear probability model, which additionally includes, state-quarter-fixed effects and bank-fixed effects. Panel B presents probit model results, which include state-fixed effects and quarter-fixed effects. Robust t-statistics are reported in parentheses and standard errors are clustered on bank level. *** $p<0.01$, ** $p<0.05$, * $p<0.1$. 

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### Supplementary Appendix

#### Table A.2a) – A.2.e) Sample excluding Texas

<table>
<thead>
<tr>
<th>Panel A: Banks’ cost of debt</th>
<th>Panel B: Banks’ liability structure</th>
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<tr>
<td><strong>VARIABLES</strong></td>
<td><strong>Total interest</strong></td>
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<td>Bank size</td>
<td>0.0013***</td>
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<tr>
<td>Equity</td>
<td>-0.0003***</td>
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<td>Bank FE</td>
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</tr>
<tr>
<td>State*Quarter FE</td>
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<tr>
<td>Observations</td>
<td>142,608</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.8685</td>
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</table>

**Panel C: Liabilities, Market Share, and Asset Encumbrance**

<table>
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<th><strong>VARIABLES</strong></th>
<th><strong>Insured deposits</strong></th>
<th><strong>Market share insured deposits</strong></th>
<th><strong>Uninsured deposits</strong></th>
<th><strong>Market share uninsured deposits</strong></th>
<th><strong>Federal funds sold and reverse REPO</strong></th>
<th><strong>Pledged securities</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Charter*DPL</td>
<td>0.0012</td>
<td>-0.0000**</td>
<td>-0.0054***</td>
<td>-0.0006***</td>
<td>-0.0017</td>
<td>-0.0040**</td>
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<td>Bank size</td>
<td>(0.73)</td>
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<td>(1.22)</td>
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</tr>
<tr>
<td>Equity</td>
<td>-0.0027***</td>
<td>-0.0000</td>
<td>0.0031***</td>
<td>0.0002</td>
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<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>State*Quarter FE</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Observations</td>
<td>142,608</td>
<td>142,608</td>
<td>142,608</td>
<td>142,608</td>
<td>142,608</td>
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<td>R-squared</td>
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<td>0.9939</td>
<td>0.6898</td>
<td>0.5085</td>
<td>0.4770</td>
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#### Panel D: Banks’ risk and decomposed Z-Score (In)

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<tr>
<th><strong>VARIABLES</strong></th>
<th><strong>ZSCORE(ln)</strong></th>
<th><strong>ROA(ln)</strong></th>
<th><strong>ROA(R)(ln)</strong></th>
<th><strong>ETA(ln)</strong></th>
<th><strong>NPL</strong></th>
<th><strong>LEV</strong></th>
<th><strong>ROE(ln)</strong></th>
<th><strong>TIINC(ln)</strong></th>
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</thead>
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<tr>
<td>Charter*DPL</td>
<td>0.1599***</td>
<td>-0.0259</td>
<td>-0.0024</td>
<td>0.0331**</td>
<td>0.0003</td>
<td>0.0060</td>
<td>0.0028</td>
<td>0.0006</td>
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<td>(0.05)</td>
<td>(0.11)</td>
<td>(0.08)</td>
</tr>
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<td>Bank FE</td>
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<td>YES</td>
<td>YES</td>
<td>YES</td>
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<td>YES</td>
</tr>
<tr>
<td>State*Quarter FE</td>
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<td>YES</td>
<td>YES</td>
<td>YES</td>
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<td>YES</td>
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<td>R-squared</td>
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#### Panel E: Banks’ profitability

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<th><strong>ZSCORE(ln)</strong></th>
<th><strong>ROA(ln)</strong></th>
<th><strong>ROA(R)(ln)</strong></th>
<th><strong>ETA(ln)</strong></th>
<th><strong>NPL</strong></th>
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<th><strong>ROE(ln)</strong></th>
<th><strong>TIINC(ln)</strong></th>
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<tr>
<td>Charter*DPL</td>
<td>0.1599***</td>
<td>-0.0259</td>
<td>-0.0024</td>
<td>0.0331**</td>
<td>0.0003</td>
<td>0.0060</td>
<td>0.0028</td>
<td>0.0006</td>
</tr>
<tr>
<td>Bank size</td>
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<td>(-1.06)</td>
<td>(-0.15)</td>
<td>(2.19)</td>
<td>(0.46)</td>
<td>(0.05)</td>
<td>(0.11)</td>
<td>(0.08)</td>
</tr>
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<tr>
<td>State*Quarter FE</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Observations</td>
<td>142,608</td>
<td>142,608</td>
<td>142,608</td>
<td>142,608</td>
<td>142,608</td>
<td>142,608</td>
<td>142,608</td>
<td>142,608</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.9389</td>
<td>0.4870</td>
<td>0.5219</td>
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<td>0.4473</td>
<td>0.6547</td>
<td>0.7382</td>
<td>0.9469</td>
</tr>
</tbody>
</table>

**Notes:** This table presents results of tests replicating the results reported in Table 5 to Table 8 but with banks located in Texas excluded from the sample.
## Supplementary Appendix

### Table A.3a) – A.3e) Sample excluding New England states (CT, RI, ME, NH)

#### Panel A: Banks’ cost of debt

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Total interest expenses</th>
<th>Interest on deposits</th>
<th>Interest on non-deposits</th>
<th>Total liabilities</th>
<th>Total domestic deposits</th>
<th>Total non-deposits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charter*DPL</td>
<td>-0.0001***</td>
<td>-0.0001**</td>
<td>0.0011***</td>
<td>-0.0022***</td>
<td>-0.0034***</td>
<td>0.0034***</td>
</tr>
<tr>
<td>Bank size</td>
<td>0.0013***</td>
<td>0.0014***</td>
<td>0.0013***</td>
<td>0.00265***</td>
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<td>0.0098***</td>
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<tr>
<td>Equity</td>
<td>-0.0003***</td>
<td>-0.0003***</td>
<td>0.0000</td>
<td>-0.0261***</td>
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<td>(-2.51)</td>
</tr>
<tr>
<td>Bank FE</td>
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<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
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<tr>
<td>State*Quarter FE</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Observations</td>
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<td>194,045</td>
<td>194,045</td>
<td>194,045</td>
<td>194,045</td>
<td>194,045</td>
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<tr>
<td>R-squared</td>
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<td>0.8642</td>
<td>0.3559</td>
<td>0.8081</td>
<td>0.6606</td>
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</table>

#### Panel B: Banks’ liability structure

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Insured deposits</th>
<th>Market share insured deposits</th>
<th>Uninsured Deposits</th>
<th>Market share uninsured deposits</th>
<th>Federal funds sold and reverse repo</th>
<th>Pledged Securities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charter*DPL</td>
<td>-0.0021*</td>
<td>-0.0000***</td>
<td>-0.0019**</td>
<td>-0.0003***</td>
<td>-0.0008</td>
<td>0.0002</td>
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<td>Bank size</td>
<td>-0.0280***</td>
<td>-0.0000***</td>
<td>0.0169***</td>
<td>0.0006***</td>
<td>-0.0189***</td>
<td>0.0057***</td>
</tr>
<tr>
<td>Equity</td>
<td>-0.0030***</td>
<td>-0.0000</td>
<td>0.0038***</td>
<td>0.0000</td>
<td>0.0020***</td>
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<td>(-4.97)</td>
<td>(-1.06)</td>
<td>(9.37)</td>
<td>(1.45)</td>
<td>(3.34)</td>
<td>(9.50)</td>
</tr>
<tr>
<td>Bank FE</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
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<tr>
<td>State*Quarter FE</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Observations</td>
<td>194,045</td>
<td>194,045</td>
<td>194,045</td>
<td>194,045</td>
<td>194,045</td>
<td>194,045</td>
</tr>
<tr>
<td>R-squared</td>
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<td>0.6736</td>
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#### Panel C: Liabilities, Market Share, and Asset Encumbrance

<table>
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<tr>
<th>VARIABLES</th>
<th>ZSCORE(ln)</th>
<th>ROASD(ln)</th>
<th>ROA(ln)</th>
<th>ETA(ln)</th>
<th>NPL</th>
<th>LEV</th>
<th>ROE(ln)</th>
<th>TINV(ln)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charter*DPL</td>
<td>0.2089***</td>
<td>-0.0441**</td>
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<td>0.1141***</td>
<td>-0.0013**</td>
<td>-0.2606**</td>
<td>0.0275</td>
<td>0.0044</td>
</tr>
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<td>(4.95)</td>
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<td>(3.36)</td>
<td>(8.22)</td>
<td>(-2.44)</td>
<td>(-2.44)</td>
<td>(1.34)</td>
<td>(0.75)</td>
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<td>0.2269***</td>
<td>-0.2740***</td>
<td>-0.0031***</td>
<td>2.7698***</td>
<td>0.5215***</td>
<td>-0.0034</td>
</tr>
<tr>
<td></td>
<td>(3.20)</td>
<td>(-0.26)</td>
<td>(11.84)</td>
<td>(-11.06)</td>
<td>(-0.29)</td>
<td>(12.66)</td>
<td>(11.68)</td>
<td>(-0.29)</td>
</tr>
<tr>
<td>Bank FE</td>
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<td>YES</td>
<td>YES</td>
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<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>State*Quarter FE</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
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</tr>
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<td>194,045</td>
<td>194,045</td>
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<tr>
<td>R-squared</td>
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<td>0.4729</td>
<td>0.5123</td>
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<td>0.4425</td>
<td>0.5654</td>
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<td>0.9662</td>
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</table>

**Notes:** This table presents the results of replicating the results in Table 5 to Table 8, where banks located in New England region (Connecticut, Rhode Island, Maine and New Hampshire) are excluded from the sample.
## Supplementary Appendix

### Table A.4a) – A.4.e) Regressions excluding time-varying bank-level control variables

#### Panel A: Banks' cost of debt

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Total interest expenses</th>
<th>Interest on deposits</th>
<th>Interest on non-deposits</th>
<th>Total liabilities</th>
<th>Total domestic deposits</th>
<th>Total non-deposits</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charter*DPL</td>
<td>-0.0003***</td>
<td>-0.0004***</td>
<td>0.0012***</td>
<td>-0.0077***</td>
<td>-0.0025***</td>
<td>0.0025***</td>
</tr>
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<td>YES</td>
<td>YES</td>
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<td>YES</td>
</tr>
<tr>
<td>State*Quarter FE</td>
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<td>199,698</td>
<td>199,698</td>
<td>199,698</td>
<td>199,698</td>
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<tr>
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<td>0.3046</td>
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<td>0.6668</td>
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#### Panel B: Banks' liability structure

<table>
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<tr>
<th>VARIABLES</th>
<th>Insured deposits</th>
<th>Market share insured deposits</th>
<th>Uninsured Deposits</th>
<th>Market share uninsured deposits</th>
<th>Federal funds sold and reverse REPO</th>
<th>Pledged securities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charter*DPL</td>
<td>0.0003</td>
<td>-0.0000*</td>
<td>-0.0035***</td>
<td>-0.0004***</td>
<td>0.0009</td>
<td>0.0007</td>
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<td>(-7.68)</td>
<td>(0.70)</td>
<td>(0.48)</td>
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<tr>
<td>Bank FE</td>
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<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>State*Quarter FE</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Observations</td>
<td>199,698</td>
<td>199,698</td>
<td>199,698</td>
<td>199,698</td>
<td>199,698</td>
<td>199,698</td>
</tr>
<tr>
<td>R-squared</td>
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#### Panel C: Liabilities, Market Share, and Asset Encumbrance

#### Panel D: Banks' risk and decomposed Z-Score (ln)

<table>
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<tr>
<th>VARIABLES</th>
<th>ZSCORE(ln)</th>
<th>ROASD(ln)</th>
<th>ROA(ln)</th>
<th>ETA(ln)</th>
<th>NPL</th>
<th>LEV</th>
<th>ROE(ln)</th>
<th>THINC(ln)</th>
</tr>
</thead>
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<tr>
<td>Charter*DPL</td>
<td>0.2438***</td>
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<td>0.0304**</td>
<td>0.1332***</td>
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<td>-0.4338***</td>
<td>0.0050</td>
<td>0.0127**</td>
</tr>
<tr>
<td></td>
<td>(5.51)</td>
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<td>(2.34)</td>
<td>(9.07)</td>
<td>(-1.52)</td>
<td>(-3.97)</td>
<td>(0.23)</td>
<td>(2.18)</td>
</tr>
<tr>
<td>Bank FE</td>
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<td>YES</td>
<td>YES</td>
<td>YES</td>
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<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>State*Quarter FE</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Observations</td>
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<td>199,698</td>
<td>199,698</td>
<td>199,698</td>
<td>199,698</td>
<td>199,698</td>
</tr>
<tr>
<td>R-squared</td>
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#### Panel E: Banks' profitability

<table>
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<tr>
<th>VARIABLES</th>
<th>TIINC(ln)</th>
<th>ROASD(ln)</th>
<th>ROA(ln)</th>
<th>ETA(ln)</th>
<th>NPL</th>
<th>LEV</th>
<th>ROE(ln)</th>
<th>THINC(ln)</th>
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<tr>
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</tr>
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</table>

**Notes:** This table presents the results of tests replicating results in Table 5 to Table 8 without including control variables.
**Supplementary Appendix**

**Table A.5a) – A.5e) Placebo tests**

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Panel A: Banks’ cost of debt</th>
<th>Panel B: Banks’ liability structure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total interest expenses</td>
<td>Interest on deposits</td>
</tr>
<tr>
<td>Placebo treatment</td>
<td>-0.0000</td>
<td>-0.0000</td>
</tr>
<tr>
<td>Bank size</td>
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<td>0.0014***</td>
</tr>
<tr>
<td>Equity</td>
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<td>-0.0003***</td>
</tr>
<tr>
<td>Bank FE</td>
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<td>YES</td>
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<tr>
<td>Observations</td>
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<td>69,854</td>
</tr>
<tr>
<td>R-squared</td>
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<td>0.7800</td>
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</table>

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Panel C: Liabilities, Market Share, and Asset Encumbrance</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Insured deposits</td>
</tr>
<tr>
<td>Placebo treatment</td>
<td>-0.0004</td>
</tr>
<tr>
<td>Bank size</td>
<td>-0.0025***</td>
</tr>
<tr>
<td>Equity</td>
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<td>Observations</td>
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</tr>
<tr>
<td>R-squared</td>
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</table>

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Panel D: Banks’ risk and decomposed Z-Score (ln)</th>
<th>Panel E: Banks’ profitability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ZSCORE(ln)</td>
<td>ROASD(ln)</td>
</tr>
<tr>
<td>Placebo treatment</td>
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<td>YES</td>
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<tr>
<td>State*Quarter FE</td>
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<td>YES</td>
</tr>
<tr>
<td>Observations</td>
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<td>69,854</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.5995</td>
<td>0.4453</td>
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</table>

**Notes:** This table presents results of test replicating results in Table 5 to Table 8, where our main explanatory variable is a placebo treatment. Placebo treatment is an interaction between depositor preference law, which is a dummy variable equal to 1 for all banks in states and years following introduction of state depositor preference law, and 0 otherwise; and a randomly assigned dummy variable equal to 1 for a number of Nationally chartered banks, and 0 otherwise. State banks are excluded from the sample. Regressions include a set of control variables as in Table 5 to Table 8, and additionally include state-quarter-fixed effects and bank-fixed effects. Robust t-statistics are reported in parentheses and standard errors are clustered on bank level. *** p<0.01, ** p<0.05, * p<0.1.
Supplementary Appendix

Table A.6a) – A.6e) Regressions with standard errors clustered on the state level

### Panel A: Banks’ cost of debt

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Panel A: Banks’ cost of debt</th>
<th>Panel B: Banks’ liability structure</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Total interest expenses</td>
<td>Interest on deposits</td>
</tr>
<tr>
<td>Charter*DPL</td>
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<td>-0.0002***</td>
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<td>-0.0004 ***</td>
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<td>(-10.53)</td>
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<td>Bank FE</td>
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<td>Observations</td>
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<td>199,698</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.7533</td>
<td>0.7675</td>
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</table>

### Panel C: Liabilities, Market Share, and Asset Encumbrance

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Insured deposits</th>
<th>Market share insured deposits</th>
<th>Uninsured Deposits</th>
<th>Market share uninsured deposits</th>
<th>Federal funds sold and reverse REPO</th>
<th>Pledged securities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Charter*DPL</td>
<td>-0.0014</td>
<td>-0.0000</td>
<td>-0.0026</td>
<td>-0.0004**</td>
<td>-0.0010</td>
<td>0.0002</td>
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<td>(15.58)</td>
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<td>0.0001</td>
<td>0.0022</td>
<td>0.0065***</td>
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<tr>
<td></td>
<td>(-4.21)</td>
<td>(-1.42)</td>
<td>(7.20)</td>
<td>(1.13)</td>
<td>(1.07)</td>
<td>(18.76)</td>
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<tr>
<td>Bank FE</td>
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<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>State*Quarter FE</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Observations</td>
<td>199,698</td>
<td>199,698</td>
<td>199,698</td>
<td>199,698</td>
<td>199,698</td>
<td>199,698</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.6965</td>
<td>0.9949</td>
<td>0.6728</td>
<td>0.5120</td>
<td>0.4930</td>
<td>0.7289</td>
</tr>
</tbody>
</table>

### Panel D: Banks’ risk and decomposed Z-Score (ln)

<table>
<thead>
<tr>
<th>VARIABLES</th>
<th>Panel D: Banks’ risk and decomposed Z-Score (ln)</th>
<th>Panel E: Banks’ profitability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ZSCORE(ln)</td>
<td>ROA(Ln)</td>
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<tr>
<td>Charter*DPL</td>
<td>0.2615**</td>
<td>-0.0413</td>
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<tr>
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<td>(2.50)</td>
<td>(-1.74)</td>
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<tr>
<td>Bank size</td>
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<td>-0.1630**</td>
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<tr>
<td></td>
<td>(1.24)</td>
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<td>YES</td>
</tr>
<tr>
<td>State*Quarter FE</td>
<td>YES</td>
<td>YES</td>
</tr>
<tr>
<td>Observations</td>
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<td>199,698</td>
</tr>
<tr>
<td>R-squared</td>
<td>0.9328</td>
<td>0.4745</td>
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Notes: This table presents the results of tests replicating results in Table 5 to Table 8 where standard errors are clustered on the state level.