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ABSTRACT

This paper tests the optimal-contracting hypothesis, drawing upon data from a natural experiment that ended during the Great Depression. The subjects of our experiment are bank stockholders. The experimental manipulation concerns the imposition of state or federal restrictions on the contracts they write with bank creditors. We contrast stockholders that were subject to the now-conventional privilege of limited liability with stockholders that faced an additional liability in liquidation tied to the par value of the bank's capital. Our tests show that optimal contracting theory can provide an explanation both for the long survival of extended-liability rules in banking and for why they were abandoned in the 1930s.

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Imbedded in capital-structure theory is the hypothesis that corporations employ an optimally designed set of financial contracts (Allen and Gale, 1988; Calomiris and Kahn, 1991; Harris and Raviv, 1992; Hart and Moore, 1988; and Zender, 1991). Optimal contracting weaves the disparate claims of a corporation's stakeholders into a web of incentive-compatible contracts. Such contracts minimize the agency costs that information asymmetries and opportunistic counterparties might otherwise generate.

This paper tests the optimal-contracting hypothesis, drawing upon data from a natural experiment that ended during the Great Depression. For many years of U.S. banking history, the contracts that governed bank liquidations differed across jurisdictions. In some venues, but not in others, banks faced "wind-up rules" that made stockholders personally responsible in liquidation for a portion of the unpaid debts of an insolvent institution. Our tests show that optimal contracting theory can provide an explanation both for the long survival of extended-liability rules in banking and for why they were abandoned in the 1930s.

I. The Life-Cycle of Double Liability at National Banks

By 1830, most states other than California had adopted limited liability for shareholders in nonbank corporations (Oesterle, 1992). Nevertheless, through the Great Depression, wind-up rules for national banks (and for banks chartered by most individual states as well) assigned contingent obligations to individual shareholders of a liquidating bank. With the exception of Alabama, Connecticut, Delaware, Louisiana, Massachusetts, Missouri, New Jersey, Rhode Island, Vermont, and Virginia, wind-up rules extended the liability of bank stockholders beyond the "par capital" and accumulated surplus of the firm. The wealth of shareholders was subject to an additional assessment whenever a bank receivership could not fully cover creditor claims from the proceeds generated by liquidating corporate assets. The statutory formula governing extended liability for national banks was modelled on prevalent state law at the time the national Banking Act was passed (Macey and Miller, 1992). For national banks and state-chartered banks in most extended-liability states, each stockholder could be assessed personally for additional amounts up to its pro-rata share of the bank's par capital. Until 1927, to discourage low-wealth

individuals from becoming bank stockholders, national banks were not permitted to split up their stocks into shares of less than $100 in par value (Nadler and Bogen, 1933, p. 141).

"Double liability" was intended to curb stockholder incentives to shift risks to informationally disadvantaged depositors. It was understood that risk-shifting would raise the costs of bank debt and increase the incidence of bank failures and the size of losses suffered by depositors and other unsecured creditors. Esty (1996) and Macey and Miller (1992) observe that extended-liability wind-up rules were enforced and resulted in substantial recoveries for depositors and other creditors.

The Banking Act of 1933 is best remembered for introducing federal deposit insurance in 1934 and restricting the intermixture of banking and securities business. But, for national banks, the Act also enacted a phaseout of double liability. Double liability was abolished immediately on new shares and its expiration on outstanding shares was scheduled for July 1, 1937.[1] National banks were required to accumulate on-balance-sheet surplus capital through retained earnings equal to at least the par value of their stock. Legislatures in extended-liability states took longer to act, but most eventually made the same move.

Private-interest theories of bank regulation portray the wind-up rules adopted by a particular polity as quasi-voluntary contracts negotiated between politicians and lobbyists for various banking interests (Stigler 1971; Pelzman 1976; Carr and Matthewson 1988; Winton 1993; Kane 1996). This literature presumes that bankers find ways to share with responsible officials whatever rents they expect regulatory arrangements to generate. From the political-contracting perspective, the supplementation and eventual replacement of double liability by federal deposit insurance for national banks in 1934 implies the testable hypothesis that in the early 1930s extended liability may have ceased to serve the interests of the particular banks that sponsored it as well as it had previously.

This paper sets forth a model and a hand-collected data set by which to test this central implication. Our methods estimate changes during 1927-33 in the value that extended liability delivered to stockholders at samples of small and large banks whose charter status did and did not entail double liability. Parameter estimates imply that the extended-liability bonding mechanism seldom offered significant net benefits or burdens to stockholders of small banks. It did frequently benefit stockholders of large national banks

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[1] In August 1935, the Act was amended to make the expiration for outstanding shares optional after the mid-1937 trigger date. The amendment required a national bank to give its depositors six-months notice of its intention to end double liability. During the rest of the 1930s, most new stock issues consisted of preferred stock sold (along with subordinated notes and debentures) to the Reconstruction Finance Corporation under the terms of the Emergency Banking Act of March 1933.

during the late 1920s, but the provision imposed significant net burdens on large-bank stockholders during most of the early 1930s.

We back up our contracting-theory inference by two further tests. First, we conduct event-study tests of the effects that the introduction and enactment of the Banking Act of 1933 had on the stocks of different classes of national and state banks. These tests --which are crude because they entail an uncomfortable degree of time aggregation-- are unable to reject the hypothesis that stockholders of large national banks benefited more from the passage of the Act than shareholders of smaller and differently chartered types of banks.

Second, we explore the relative plausibility of three complementary explanations for the breakdown of extended liability's bonding benefits. One possibility is an increase in the vulnerability to information risk and opportunistic behavior that outside shareholders felt in a deteriorating economic environment. The second is an increase in depositor information risk or risk aversion (Gorton and Pennachi, 1990). The final possibility is that the collectability of stockholder assessments and other receivership claims were perceived to decline (Jackson, 1993).

The first hypothesis seems less likely than the other two. Far from passively tolerating an increase in information risk, the nation's stronger banks could have expected to benefit competitively from increasing the transparency of their accounts to the community of potential outside investors. Consistent with the forces stressed by the second hypothesis, Calomiris and Wilson (1996) find that, throughout the era we sample, depositors at New York City banks persistently sought to minimize their exposure to default. This abiding concern reinforces the importance for a bank's survival of maintaining efficient disclosure and credit-enhancement schemes.

The third hypothesis relates depositor information concerns to a reduced rate of creditor recovery from 1930-34 receiverships. A receivership's yield turns not just on the success of collections from stockholders, but also on the net value that is recoverable from bank assets and on the extent to which disbursements are delayed. Bank failures and suspensions converted money previously held in highly liquid deposit accounts into slightly smaller --but temporarily inconvertible claims-- on bank assets or receiverships. A substantial reduction in the "moneyness" of bank deposits could be effected by sudden declines in asset quality and/or by collection delays (Jackson, 1993) even if the enforceability of stockholder assessments were stoutly maintained.

We are able here to test directly only the narrow question of whether the enforceability of extended-liability provisions differed for national banks between the late 1920s and early 1930s. We model variation in the rate of creditor recovery in national-

bank liquidations and in the collection rate for stockholder assessments in national-bank failures initiated and resolved during 1926-1936. Data on creditor recoveries, stockholder assessments, and collections are published in the Annual Reports of the Comptroller of the Currency. These data reject the narrow enforceability-breakdown hypothesis and confirm Macey and Miller's contention (1992, p. 34) that the recovery rate for stockholder assessments at national banks "was not significantly lower during the difficult years 1930-34 than it was at other times." What was different about 1930-34 is the increase in depositor risk that Jackson (1993) documents: losses in present value from outsized delays experienced in liquidating the receiverships of some national banks whose assets had experienced nontrivial losses.

Putting the three sets of results together gives a coherent picture of how all banks could support the 1933 Act. Large banks saw no value in preserving double liability, while all banks could see themselves as benefiting from the reduced monitoring responsibility and increased immediacy that low-priced deposit insurance would impart to depositor claims on future bank receiverships.

II. Modelling the Net Value of Extended Liability As a Bonding Mechanism

The subjects of our experiment are bank stockholders. The experimental manipulation concerns the imposition of state or federal restrictions on the contracts they write with bank creditors. We contrast stockholders that were subject to the now-conventional privilege of limited liability with stockholders that faced an additional liability in liquidation tied to the par value of the bank's capital. In extended-liability jurisdictions, stockholders had to factor in the cost of servicing possible assessments against their personal wealth.

Provisions that extend a stockholder's liability create an off-balance-sheet fund of assessable stockholder reserves. It is inappropriate to model these contingent stockholder obligations as a unilateral concession to creditors that inevitably reduces stockholder wealth. To cover the costs of establishing the reserve fund, stockholders must anticipate a quid pro quo from creditors for so enhancing the bank's credit.

Informed creditors ought to value this enhancement much as they would value a guarantee that was provided by an equally sized and equally credible third-party deposit-insurance fund. In double-liability jurisdictions, individual creditors contract more freely in deciding to roll over bank debt than stockholders do. With well-informed creditors, politically unconstrained contracting, and competitive markets for bank debt, the net value of extended liability to creditors and stockholders would be zero at the margin of new debt. However, the net ex ante value to stockholders of government-mandated credit support

could prove positive on new debt whenever bankers were able to exploit information asymmetries or monopoly power in deposit pricing or negative when informationally disadvantaged depositors underestimated bank strength or overestimated stockholder assessability.

Nontransparencies in bank loss exposures affect both creditors and outside shareholders, albeit to a different degree. We hypothesize that these parties may underestimate and therefore underprice the risk passed through to them during economic boom times and overestimate and overprice the risk passed through when the economy is troubled.

Of course, the net value of stockholder credit support on outstanding debt is free to move above or below its initial value during the life of the debt with changing circumstances (especially with changes in the information sets available to creditors and inside and outside stockholders). To see this, it is convenient to break the net value of extended liability (E) into two pieces. The evolving value of E is the difference between the capitalized reduction in funding cost that stockholders would enjoy relative to current deals from having personally bonded the bank's repayment capacity (C_F) and the capitalized opportunity costs marginal stockholders expect to face in covering their obligation to creditors (C_C):

$$E = C_F - C_C. \qquad (1)$$

Although one can conceive of C_C as an option value (Esty, 1996), for our purposes, it is more instructive to think of C_C as a capitalized reserve for the bonding expense that the bank's marginal stockholders believe that extended liability imposes on them. Viewed from the stockholder point of view, C_F is the corresponding gross benefit that the enhancement extracts for stockholders from potentially less-informed creditors in exchange.

From the creditor point of view, C_F is the gross value that creditors see themselves to be receiving from the enhancement. This value may be interpreted as their informationally restricted estimate of the risk-adjusted value of collectable stockholder support. In turn, we presume that the risk-adjustment premium creditors demand on new deals increases with creditor risk aversion, bank earnings risk, and estimated collection costs and decreases with bank transparency and creditor estimates of stockholder wealth and bank capital.

If recontracting is not costless for creditors and stockholders, we must expect E to vary over time with market, bank-specific, and stockholder-specific variables that might affect C_F and C_C differently. Whenever a bank or its stockholders can develop losses and loss exposures that creditors observe imperfectly and with a lag or when unanticipated

losses emerge ex post, the value of E may turn against creditors. The extent of ex ante risk shifting depends on the transparency of information flows, how quickly bank liabilities roll over and are repriced, and whether banks and bank stockholders expect to disadvantage creditors by influencing how or how promptly authorities address incipient insolvencies. Whenever bank stockholders can hide risks, losses, or their ability to weasel out of assessment obligations, C_C may (for a time) increase more slowly than C_F.

Favorable wealth transfers from E for stockholders mean unpleasant transfers for creditors. Stockholders can benefit when banks can hide expanding loss exposures or when the market value of accumulated stockholder or bank net worth deteriorates surreptitiously. On the other hand, stockholders would experience "unpleasant transfers" whenever: creditor perceptions of bank riskiness became overstated; creditor estimates of bank capital or stockholder wealth decreased below their true values; collection costs for stockholder assessments became inefficiently high; or creditor risk aversion increased.

Both C_F and C_C increase ex ante and ex post with the assessable "par value" of the bank's capital, the volatility-adjusted wealth of bank shareholders, and the quality of bank supervision. However, in a sharp economic downturn, these three variables and depositor estimates of bank riskiness may deteriorate quickly. The Regulatory Dialectic implies that when banks suffer a widespread deterioration in condition, regulators would find themselves pressured to tolerate increases in bank riskiness, decreases in individual-bank capital, and weaselly sales of stock to low-wealth stockholders that harm creditor interests. When bank and shareholder balance sheets unexpectedly weaken together, political forces may constrain the ability and willingness of bank regulators to monitor bank capital, to close troubled banks before wealthy stockholders can dump their stock, and to collect stockholder assessments efficiently once a bank is declared to be insolvent. If troubled banks receive forbearance, the risk shifting that risk-averse creditors experience ex post may persuade them to hold out in new contracts for information-risk premiums that lower the funding-cost reduction C_F that they offer below the cost to stockholders of continuing to provide extended-liability protection. If adverse creditor assessments were to persist, we would expect banks and their stockholders to lobby to be freed from the contractual constraints imposed by extended liability.

III. Testing the Political-Contracting Hypothesis: Regression Strategy and Results

Kane and Unal's statistical market-value accounting model (1990) provides a direct way to estimate E, the net value of extended liability to a bank's stockholders. According to this model, at any time t the market capitalization of the ith individual bank (MV_{it}) may be

estimated as the sum of its unbookable intangible items (U_{it}) and an appropriate mark-up or mark-down (β_{it}) of the book value shown for its accounting net worth (BV_{it}). In symbols,

$$MV_{it} = U_{it} + \beta_{it}BV_{it} + v_{it}, \qquad (2)$$

where v_{it} is hypothesized to be a statistically well-behaved error term.

During the era of extended liability, it is appropriate to divide BV_{it} into two pieces. The assessable portion is accounted as par capital (PAR_{it}), and conceived as raised directly from shareholders. Par capital is the amount of capital that a jurisdiction mandated a banking corporation to maintain for the protection of its creditors. Nonassessable surplus capital (SUR_{it}) comes from two sources: paid-in capital from the sale of stock that raised more than the par amount and undistributed profits that had not been allocated to the PAR account.

Whenever E has net (positive or negative) value for national banks and for state banks subject to extended liability, the mark-up factors for PAR(β^P_{it}) and for SUR_{it}(β^S_{it}) would not be the same:

$$MV_{it} = U_{it} + \beta^P_{it}PAR_{it} + \beta^S_{it}SUR + v_{it}. \qquad (3)$$

The difference $[\beta^P_{it} - \beta^S_{it}]\ PAR_{it} = E_{it}$, the net capitalized value that stockholders of bank i impute to their extended liability at date t.

We fit an expanded version of equation (3) cross-sectionally quarter by quarter to a hand-collected data set of quarterly observations covering MV, PAR, and SUR from 1927.1 through 1933.4. The data span three NBER reference-cycle turning points: the trough of November 1927; the peak of August 1929; and the trough of March 1933. In each quarter, banks are sampled in cities for which dealer-quoted stock prices appeared fairly consistently across the study period in the Dana Co.'s Bank and Quotation Record.[2] This source contains monthly stock prices and quarterly observations on PAR, SUR, and Deposits. Market capitalization is calculated using the mean of bid and asked quotes.

Table I seeks to validate our model by showing that high R^2 values emerged in all but a few subsample regressions. Table II reports the mean values of the balance-sheet variables and the number of observations in subsamples broken down by size and by national (NB) and state charter (SB) for limited-liability and double-liability states. Because of institutional failures and consolidations, the number of banks in the sample varies from quarter to quarter, and declines on average over time, falling overall from about 1200 in 1927 to about 350 in 1933. Although substantial numbers of small banks

[2] A list of the cities selected is available from Berry Wilson.

sometimes drop out of our samples temporarily (e.g., in 1928), the mean deposit size of surviving banks tends to grow over time. Moreover, for both size classes, the number of national and state-chartered banks shrinks more sharply in the double-liability states than in the ten limited-liability venues. Except for Missouri, limited-liability states were concentrated geographically in the East and South.

The wisdom of looking cross-sectionally and across time for different effects on large and small banks can be justified on statistical, economic, and political grounds. Statistically, we expect quoted stock prices for small banks to respond more slowly to changes in market information due to less frequent and thinner trading. Also, across time variation in dealer willingness to supply quotes on individual small banks meant that we experience many more skips in quotes for small banks than for large ones. Economically, the character of information asymmetries in their stock and deposit markets are apt to have differed. Small banks may be presumed to have been easier for their (community-based) depositors to monitor. Depositors knew their bank's principal shareholders and managers personally and could watch their behavior for signs of stresss. Because these institutions were closely held and infrequently traded, it was hard for stockholders to reduce their positions quickly without calling attention to themselves. Klebaner (1990, p. 69) states that stockholders in small banks and even in large state banks were traditionally local, while owners of large national banks were national and international in scope. Finally, because small banks concentrated on local lending, depositors could guess at and respond in rapid order to unbooked declines in asset quality. Politically, during the interwar era small banks focused their lobbying effort on constraining large-bank entry into their geographic markets. The resulting divergence in political goals supported different lobbying structures for small and large banks.

We estimate an expanded model (3) cross-sectionally quarter by quarter --using RATS software (version 4.2) that introduces the White (1980) correction for heteroskedasticity-- for six subsamples cross-classified by size and wind-up rules. The expanded model introduces the lagged value of the endogenous variable ($MV_{i,t-i}$) as an instrument for movements in relevant time-series variables and in the stock market's changing estimate of bank-specific omitted variables such as unbooked loan losses, depositor relationships, and monopoly power. In this way, we hope to strip out any extrapolative effects on expected future earnings that might be impounded in the undistributed-profits portion of SUR.

Within each quarter, we test hypotheses about differences between β^P and β^S for small and large banks under three classes of wind-up rules: national banks (NB), state

banks in extended-liability states (DL), and (as a control group) state banks in limited-liability states (LL)[3]. Within each size class, we focus our tests on how the difference between β^P and β^S changes over time in the NB and DL subsamples as against the benchmark LL banks.

The optimal-contracting hypothesis is tested by examining the time-series behavior of the difference between the "par beta" (β^P) and the "surplus beta" (β^S) found for each of the six subsamples. Our central findings concern the oscillation in significant positive and negative transfers displayed in Chart 1. The t-values reported for the beta difference in 1927-1929 indicate that stockholders of large national banks experienced a predominance of pleasant transfers, while large-double-liability state banks generally fared worse than the limited-liability control group. A predominance of unpleasant transfers occurs for all large banks during the 1930s, but this form of stockholder loss absorption is worse for large banks whose charter entailed double liability. The unpleasant transfers are consistent with the unprecedented loss rates found by Jackson (1993)for the slowest-resolving 1930-34 national-bank receiverships which are not represented in our data set.

In seven of the first nine sample quarters, par betas lie above the surplus betas for large national banks. At 5 percent, six of these seven positive beta differences are significant, as are the two negative surges. Moreover, in each significant case the t-value exceeds the t-value for the benchmark surges observed contemporaneously for the limited-liability control group. At four of the six significant dates, Wald tests show that the corresponding beta differences also differ significantly between large national banks and their limited-liability control group. In the 1930s, large bank shareholders experience few significant favorable surges. The only significant positive surge occurs for large double-liability state banks in the second quarter of 1933 (when the Banking Act of 1933 was enacted). The 1920s surges developed as the 1926-27 recession ended and during the ensuing 1927-29 boom. For large national banks, the 1920s surges are consistent with the hypothesis that loss exposures developed that, on an ex ante basis, creditors underpriced.

As the 1930s unfold, the predominant sign of the differences in large-bank betas reverses for all large-bank classes. During the last 14 quarters of the sample, while benchmark large limited-liability state banks show three significantly negative beta differences, negative differences occur six times for large national banks and five times for large double-liability state banks. The more-frequent significance of negative surges

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[3] Although the results we report set the boundary between small and large banks arbitrarily at two million dollars in book value of equity, the appendix reports sensitivity tests that halve and double size cutoffs to confirm the robustness of the qualitative difference for large banks that we infer.

observed for double-liability banks is backed up by analyzing the beta differences themselves. During the final 14 quarters, the benchmark beta difference for large limited-liability banks differs significantly from the value found for large national banks five times and from the value found for large double-liability state banks eight times. The negative transfers visited on stockholders of large double-liability banks support the hypothesis that the losses and prior risk-shifting revealed in the 1930s increased the perceived riskiness of bank earnings, increased creditor risk aversion, or undermined creditor faith in the extended-liability bonding mechanism. Whatever the ultimate cause, the persistence of unpleasant transfers called into doubt the continued economic efficiency of mandating an extended-liability credit enhancement for large-bank stockholders.

Test results for small banks are shown in Chart 2. For these banks, the bonding mechanism seldom adds significant net value to bank stock in either era. Par betas at extended-liability small banks seldom significantly exceed surplus betas under any wind-up rules, nor does the frequency of significantly negative values increase much in the 1930s. Using chi-square tests, the frequency of positive values for $(\beta^{P}_{it} - \beta^{S}_{it})$ at small banks does not differ significantly across the three charter classes or macroeconomic regimes. This finding is consistent with the presumption that small banks were more transparently managed and monitored more closely by depositors than large ones. Both circumstances would make it hard for small-bank shareholders to persistently shift risk to bank depositors through the extended liability mechanism.

Our findings suggest that, in the boom that immediately preceded the Depression, the cost of PAR to stockholders in bonding contract performance for creditors of large national banks often slipped below the value of the implicit credit-enhancement benefit that stockholders received from creditors. In later years, the PAR beta falls relative to the SUR beta at all large banks. The values of β^{P} in the large-bank NB and DL subsamples end up predominantly further below those of β^{S} than at the control sample of limited-liability banks.

The qualitative movements in E that we estimate support the view that the double liability lasted so long precisely because it served the interests of shareholders in large national banks. It was abandoned when and because it stopped serving these interests.

IV. Event-Study Analysis of the Impact of the Banking Act of 1933

The Bank and Quotation Record collected bank stock prices once a month. Because event-study experiments can dispense with accounting information that is only published quarterly, the number of usable observations in any time span triples.

Still, the time aggregation entailed in using monthly data undermines our ability to isolate the effects of specific information flows. In intervals as rich in economic surprises and policy proposals as Franklin Roosevelt's first few months in office, it is unreasonable to suppose that we can disentangle from monthly movements in bank-stock prices much information about the benefits of a single piece of legislation.

To confront this difficulty, we focus our event-study tests on weekly data reported in the Commercial and Financial Chonicle used by Calomiris and Wilson (1996). This source gives weekly stock quotes for 51 New York City (NYC) banks. This sample includes 9 large and 9 small national banks and 22 large and 11 small banks chartered by the double-liability state of New York.

Table III reports on three event-study experiments analyzing bank stock-price data covering the 51 weeks that the stock exchanges were open in 1933. Each run introduces cross-sectional and event-time dummies into the standard two-parameter market model:

$$R_{it} = a_i + b_i R_{Mt} + u^R_{it}. \qquad (4)$$

In this model, a_i and b_i represent the market-model intercept and slope, respectively. Other symbols are defined as follows:

R_{it}: the percentage price appreciation observed in time interval t for the price of bank i's stock;

R_{Mt}: the percentage price appreciation recorded in time interval t for the Dow Jones industrial average;

u^R_{it}: the residual return on bank i's stock in time interval t.

Inference focuses on the significance of coefficients c_{jk} found for the product of particular bank-classification dummy variables (D_{jk}) and a zero-one event-time dummy ($D_T = D_w$ or D_m). The bank-classification dummies are zero except that they become unity when a bank's "size index" is j and its "charter index" is k. Index j is either L (large) or S (small). The charter index k takes on one of three values: N (for national banks); DL (for banks chartered by a double-liability state which reduces to New York State in the weekly data set); LL (for banks chartered by a limited-liability jurisdiction). The event-time dummy D_T is zero except that it assumes the value of unity for observations occurring in the week (T=w) or month (T=m) that includes June 12, 1933 --the date on which Franklin Roosevelt signed the Banking Act into law.

Panel A contrasts the inferences that can be drawn with weekly and monthly data for NYC banks. Coefficient estimates from the weekly data presented in the lefthand column provide evidence consistent with our contention that the Act benefited large national banks more than other banks. The coefficients of $D_{LN} \cdot D_w$ and $D_{LS} \cdot D_w$ --c_{LNw} and c_{LSw}-- are

positive and significant. Also, c_{LNw} is greater than c_{LSw}, and both values are well above the coefficients for smaller banks. The smaller coefficients for small banks have mixed signs and do not differ significantly from zero.

We interpret c_{LSw} as benchmarking the value conferred on large double-liability banks by federal deposit insurance plus the value to state-chartered large banks of whatever pressure the Act generated on authorities in New York State to jettison double liability. Adopting this interpretation, the difference (c_{LNw} - c_{LSw}) estimates the incremental value to large national banks of having the end of double liability firmly enacted. The standard error of this difference is 4.83 percent, which implies a t-value of 1.65.

The monthly analogue of event-study model for NYC banks shows positive t-values for all of the event-time variables, but only the dummy for small New York-chartered banks is even barely significant at 5 percent. The differences in coefficient values between the two panels are consistent with the suspicion that additional and confounding information is introduced by time aggregation.

Panel B applies two versions of the event-study model to 1933 observations from the monthly Bank and Quotation Record data set. The negative beta found in these runs contrasts with the positive beta found for NYC banks. This and the greatly increased standard error suggest the value of introducing geographic dummies and other parameter nonstationarities to polish our estimates of the market model. However, the issue is whether the pattern of event-time dummies found for these data parallel the findings in monthly tests using data for NYC banks. The results reported suffice to establish a parallel event-time shift in the two data sets in June 1933. All bank classes experienced positive abnormal June 1933 returns. The magnitude of abnormal returns increases and becomes statistically significant with the large sample size utilized in Panel B. Although it is rash to attribute the pattern of event-time findings predominantly to pressures introduced by the Banking Act, it is intriguing to note that smallest June 1933 abnormal returns were experienced by small banks chartered by limited-liability states.

Time aggregation limits the reliability of event-study inferences about differences in the stock-price effects that the Banking Act of 1933 had on banks in different size and charter classes. While the data do not contradict our two principal hypotheses, at the same time they cannot always reject the alternative view.

Our strongest finding is that the weekly data indicate that, in the double-liability state of New York, large banks derived significantly more benefit from the passage of the Act than small banks did. Monthly Bank and Quotation Record data do show the hypothesized sign pattern of coefficient differences, but the t-values of the differences are too small to earn significance.

The weakest evidence comes from tests of differences between charter classes. With weekly data, large national NYC banks are affected significantly more than large state-chartered (double-liability) NYC banks, but the monthly coefficient differences do not achieve significance. With either data set, when event time is measured monthly, charter differences prove small and at times show the wrong sign. Although a substantially lower impact is estimated for state-chartered small banks in limited-liability states, the difference between this coefficient and that for the other charter dummies never achieves statistical significance.

V. Testing the Enforceability-Breakdown Hypothesis

This section states and estimates ad hoc regression equations for two variables: assessments collected ($ASCOL_i$) from assessments imposed ($STAS_i$) on stockholders of the ith national bank and for liquidation proceeds paid to creditors from sales of the bank's assets ($RECOV_i$). Our sample covers all national banks that failed between 1926 and 1936 whose insolvencies were resolved by 1936.

Two types of regressors are included in these equations: dummy variables for the year in which the bank was failed and constraint variables that control for the size of the insolvency, the character of the failed bank's balance sheet, and lags in completing liquidations. Each yearly dummy (Y1927, Y1928, ..., Y1936) allows us to test for a significant shift during that year in the intercept of the equation, using 1926 as the benchmark year. The constraint variables are defined as follows:

X_{1i} = NW: Accounting net worth, which equals "doubtful assets" plus $X_5+X_6-X_4-X_7$;

$X_{2i} = STAS_i$: Stockholder assessment set by the OCC;

$X_{3i} = YRSREC_i$: Years the receivership took to complete the liquidation;

$X_{4i} = PROVED_i$: Value of proven unsecured creditor claims against the bank;

$X_{5i} = BASSETS_i$: Value of the ith bank's assets classified as worthless by the OCC;

$X_{6i} = GASSETS_i$: Value of the ith bank's assets classified as good by the OCC;

$X_{7i} = SECUR_i$: Value of the ith bank's secured liabilities which were paid in full from the collateral pledged.

We conduct sensitivity experiments that focus on the following two linear regression equations:

$$ASCOL_i = a^A_{1926} + \sum_{t=1927}^{1936} b^A_t(Yt_i) + c^A_1 X_{1i} + \sum_{k=2}^{7} c^A_k X_{k,1} + e^A_i. \qquad (5)$$

$$\text{RECOV}_i = a^R_{1926} + \sum_{t=1927}^{1936} b^R_t(Yt_i) + c^R_1 X_{1i} + \sum_{k=3}^{7} c^R_k X_{k,1} + e^R_i. \qquad (6)$$

In these equations, e^A_i and e^R_i are assumed to be well-behaved error terms. However, to allow for possible heteroskedasticity and to experiment with a yearly slope dummy, we also run (5) and (6) in deflated forms. Table IV reports estimates of both versions of the two models. In the deflated versions, the endogenous variable, the intercept and all X terms in (5) are deflated by the endogenous variable's most natural constraint variable STAS_i, while the same terms in (6) are deflated by RECOV's counterpart natural restraint variable PROVED_i. STAS_i represents the maximum amount a shareholder was asked to remit. PROVED_i represents the maximum value of creditor claims that a successful liquidation would have to discharge.

The maintained hypothesis in each run is that the intercept and natural constraint variable --STAS_i in (5) and PROVED_i in (6)-- along with information on balance-sheet composition explain the lefthand variables by themselves. The enforceability-breakdown hypothesis asserts that coefficient for at least some of the 1930s dummy variables should be significantly negative. Finance theory offers some additional sign constraints. First, SECUR_i might be expected to evidence the extent to which a silent run in the bank's final weeks was conducted by better-informed creditors that disadvantaged other claimants and bought time for stockholders to reduce the exposure of their wealth to collections by the receivership. Second, the 1930s dummies would be expected to become positive if banks whose solvencies were promptly resolved failed at shallower levels of insolvency because authorities postponed the resolution of deeply insolvent cases (Jackson, 1993). The dummies could also become positive if depositors were quicker than they were in 1926 to cash out when their bank showed signs of weakness. We call the latter possibility the hypothesis of increasing depositor vigilance.

Both versions of equation (5) indicate that baseline collections from stockholders ran about 50 percent of assessments, with collections improved slightly by increases in proven unsecured claims and deflected lower as secured liabilities increased. Relative to STAS, other constraint variables show economically minor effects. Contrary to the narrow enforceability-breakdown hypothesis, the only significant yearly dummy (for 1935) proves to be positive. Nevertheless, an evident trend in the dummy coefficients between 1927 and 1935 provides support for the delayed-resolution and depositor-vigilance views.

Estimates of equation (6) show similar results. The extent of creditor recoveries tends to be principally a function of the size of proven liabilities being resolved and various components of net worth. The large negative coefficient of STAS in the undeflated model

is anomalous, but its value and sign straightens out in the deflated specification. Recoveries fall with the extent of bad assets and secured liabilities and do not increase with the duration of the recovery process. Moreover, as predicted by the delayed-resolution and depositor-vigilance hypotheses, recovery rises in both specifications during the depression's final years of 1933, 1934, and 1935.

VI. Summary Discussion

This paper clarifies that information asymmetries and information surprises can push the value of extended liability to bank stockholders (E) above or below zero at different times. Data on individual-bank stock prices in 1927-1933 are used to test hypotheses about whether and how E behaved differently in the years immediately before and after the onset of the Great Depression.

The estimates of E that we develop support optimal contracting theory, in that they offer an explanation for the long survival of double liability on bank stock and for its abandonment in the 1930s. We find that, during the late 1920s, extended liability delivered positive transfers to stockholders of large national banks and large state-chartered banks in double-liability states, but the windfalls dried up and reversed themselves in the early 1930s.

We back up this analysis with two types of supplementary tests. First, we develop crude event-study estimates of the impact that the Banking Act of 1933 had on banks in different size and charter classes. The weekly evidence supports the hypothesis that the elimination of double liability benefited stockholders in large national and double-liability banks. Second, we test and reject the hypothesis that in national-bank failures the collection rate on stockholder assessments declined in 1930-34.

Table I

$\bar{R}$-SQUARED FOR INDICATED BANK SUBSAMPLES IN CROSS-SECTIONAL RUNS OF THE REGRESSION EQUATION:

$$MV_{it} = U_{it} + \beta_{it}^{P} PAR_{it} + \beta_{it}^{S} SUR_{it} + \beta_{it}^{L} MV_{i,t-1} + w_{it} \ .$$

Year	1927				1928				1929				1930				1931				1932				1933			
Quarter	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4
Large-Bank Sample																												
Limited-Liability State Banks	...	.99	.86	.68	.99	.98	1.0	.98	.98	.99	.93	.77	.99	.97	.99	.98	.99	.98	.98	.97	.97	.94	.93	.98	.91	.94	.97	.85
Double-Liability State Banks	...	.98	.95	.99	.98	.95	.98	.97	.94	.99	.99	.97	.94	.99	1.0	.99	1.0	.86	.96	.99	.97	.97	.99	1.0	.65	.95	1.0	.98
National Banks	...	1.0	1.0	1.0	1.0	.99	.93	.99	.99	1.0	1.0	.99	.96	.99	1.0	1.0	1.0	.99	.99	.99	.98	.98	.99	1.0	.96	.99	.99	.98
Small-Bank Sample																												
Limited-Liability State Banks	...	.99	.98	.92	.98	.94	.95	.97	.97	.97	.98	.99	.94	.97	.98	.97	.99	.98	.98	.98	.99	.78	.94	.98	.95	.89	.99	.98
Double-Liability State Banks	...	.96	.91	.92	.97	.92	.93	.97	.97	.84	.93	.84	.77	.95	.98	.97	.72	.92	.93	.95	.95	.88	.96	.92	.79	.98	.91	.97
National Banks	...	.99	.94	.74	.97	.97	.99	.99	.97	.98	.66	.75	.60	.80	.71	.73	.99	.97	.98	.84	.83	.95	.96	.98	.90	.97	1.0	.94

TABLE II: SUMMARY STATISTICS FOR LARGE-BANK SAMPLE

		Limited-Liability States				Double-Liability States			
		N	Mean Value (in $Millions) of PAR	SURP	DEPOSITS	N	Mean Value (in $Millions) of PAR	SURP	DEPOSITS
2Q27	SB	28	2.523	3.379	41.574	104	4.204	6.089	70.699
	NB	18	3.850	4.813	60.424	74	5.154	7.492	81.260
3Q27	SB	29	2.502	3.474	41.694	103	4.248	6.218	73.752
	NB	19	4.121	4.911	62.042	76	5.130	7.514	80.046
4Q27	SB	29	2.629	3.582	43.995	105	4.365	6.661	74.943
	NB	19	4.384	4.915	61.806	78	5.311	7.810	84.113
1Q28	SB	31	2.703	3.771	41.816	111	4.535	6.954	71.972
	NB	20	3.955	4.817	57.049	75	4.988	7.671	76.005
2Q28	SB	32	2.666	3.821	41.076	114	4.641	7.299	73.755
	NB	20	3.983	4.877	55.816	76	5.204	7.738	77.666
3Q28	SB	32	2.666	3.841	41.112	119	4.604	8.261	73.851
	NB	21	3.850	4.813	54.582	79	5.334	8.392	75.848
4Q28	SB	30	2.822	4.112	44.350	125	4.644	8.613	76.986
	NB	21	4.160	5.071	54.680	80	5.607	9.044	78.786
1Q29	SB	53	2.299	3.356	34.597	137	5.301	8.856	75.917
	NB	39	2.942	3.778	41.111	86	5.505	8.662	77.476
2Q29	SB	51	2.300	3.438	34.822	136	5.447	9.584	70.287
	NB	40	3.131	3.591	37.953	83	5.067	7.569	68.351
3Q29	SB	49	2.636	3.937	38.454	135	5.720	10.438	75.818
	NB	35	3.427	3.860	44.486	86	5.033	7.447	70.353
4Q29	SB	51	2.402	3.536	34.791	139	5.844	10.720	78.132
	NB	35	3.986	4.278	51.410	91	6.244	8.843	81.041
1Q30	SB	60	2.273	3.327	32.669	101	6.049	13.031	88.844
	NB	37	3.803	4.299	49.344	80	6.543	9.535	81.742
2Q30	SB	60	2.312	3.379	33.997	118	6.221	12.600	87.632
	NB	40	3.923	4.159	47.760	84	6.927	10.105	89.710
3Q30	SB	52	2.472	3.650	35.848	120	6.115	11.534	82.059
	NB	36	4.050	4.424	52.640	87	6.791	9.958	89.393
4Q30	SB	49	2.619	3.638	38.423	117	6.113	11.940	89.426
	NB	34	4.210	4.476	55.511	84	6.958	9.875	93.411
1Q31	SB	53	2.447	3.539	37.099	118	6.225	11.713	85.952
	NB	33	4.268	4.633	55.277	90	7.059	10.003	96.848
2Q31	SB	51	2.485	3.520	37.410	115	6.886	11.745	91.733
	NB	30	4.605	4.883	57.494	89	7.066	9.470	96.369
3Q31	SB	50	2.499	3.405	33.659	104	6.716	12.602	94.630
	NB	29	4.729	5.233	56.665	83	6.797	9.625	86.019
4Q31	SB	46	2.545	3.236	32.559	97	6.648	11.910	89.468
	NB	30	4.471	4.183	51.814	75	7.402	9.309	85.776
1Q32	SB	25	3.225	3.902	39.966	59	4.961	7.047	62.221
	NB	17	6.447	5.288	77.586	53	4.527	4.781	66.904
2Q32	SB	26	2.994	3.920	35.098	53	4.536	6.825	51.028
	NB	15	6.693	5.495	75.844	49	4.148	4.849	56.275
3Q32	SB	40	2.598	3.395	32.407	69	8.009	13.592	102.543
	NB	24	4.595	3.778	55.878	53	8.985	9.848	102.724
4Q32	SB	42	2.652	3.207	33.531	71	8.374	13.423	108.086
	NB	27	4.515	3.899	57.292	56	8.796	9.259	101.911
1Q33	SB	22	3.302	3.836	37.972	40	3.879	5.269	62.672
	NB	16	6.450	4.651	80.063	30	5.803	5.146	86.761
2Q33	SB	21	3.213	3.866	40.226	36	5.496	6.455	70.395
	NB	13	7.415	5.369	87.531	27	6.071	5.451	88.718
3Q33	SB	31	2.867	3.492	35.934	70	7.983	13.204	107.939
	NB	18	5.951	4.600	73.465	43	11.205	8.558	127.949
4Q33	SB	29	2.874	3.148	34.235	66	7.466	11.857	113.396
	NB	16	6.435	4.825	83.247	37	11.614	8.885	143.261

TABLE II: SUMMARY STATISTICS FOR SMALL-BANK SAMPLE

		Limited-Liability States				Double-Liability States			
			Mean Value (in $Millions) of				Mean Value (in $Millions) of		
		N	PAR	SURP	DEPOSITS	N	PAR	SURP	DEPOSITS
2Q27	SB	36	0.442	0.391	5.063	158	0.449	0.422	6.093
	NB	28	0.525	0.596	7.244	82	0.523	0.545	7.997
3Q27	SB	35	0.426	0.365	4.820	158	0.447	0.436	6.189
	NB	28	0.525	0.624	7.635	81	0.520	0.573	8.077
4Q27	SB	36	0.444	0.398	5.240	157	0.463	0.430	6.190
	NB	28	0.532	0.622	7.984	80	0.524	0.566	8.212
1Q28	SB	41	0.426	0.379	4.847	144	0.478	0.446	6.259
	NB	26	0.523	0.627	6.978	72	0.522	0.576	8.000
2Q28	SB	40	0.423	0.366	4.680	141	0.481	0.456	6.446
	NB	28	0.539	0.632	6.898	72	0.524	0.566	7.835
3Q28	SB	41	0.428	0.368	4.654	147	0.470	0.451	6.132
	NB	27	0.533	0.594	6.926	78	0.515	0.561	7.963
4Q28	SB	42	0.427	0.395	5.470	151	0.459	0.435	5.785
	NB	26	0.541	0.570	7.313	81	0.515	0.532	7.762
1Q29	SB	150	0.316	0.367	4.724	204	0.410	0.389	4.855
	NB	96	0.367	0.442	5.449	99	0.514	0.532	7.285
2Q29	SB	151	0.321	0.361	4.686	204	0.420	0.383	4.793
	NB	96	0.376	0.446	5.443	91	0.526	0.534	7.513
3Q29	SB	148	0.324	0.356	4.475	198	0.414	0.389	4.781
	NB	93	0.383	0.471	5.672	85	0.533	0.514	7.173
4Q29	SB	145	0.311	0.356	4.423	198	0.421	0.398	4.721
	NB	91	0.388	0.475	5.778	92	0.504	0.457	6.537
1Q30	SB	127	0.297	0.377	4.116	174	0.362	0.412	4.644
	NB	84	0.366	0.481	5.397	79	0.461	0.531	6.399
2Q30	SB	168	0.302	0.369	4.109	238	0.383	0.377	0.412
	NB	94	0.375	0.458	5.178	101	0.463	0.453	6.093
3Q30	SB	144	0.309	0.368	4.157	189	0.393	0.413	4.229
	NB	80	0.394	0.474	5.547	89	0.463	0.452	5.885
4Q30	SB	137	0.321	0.387	4.438	187	0.403	0.421	4.398
	NB	75	0.399	0.480	5.361	90	0.460	0.456	6.114
1Q31	SB	140	0.310	0.366	4.006	165	0.421	0.425	4.301
	NB	86	0.388	0.465	5.326	84	0.477	0.477	6.036
2Q31	SB	117	0.315	0.368	4.044	150	0.424	0.434	4.201
	NB	74	0.373	0.428	5.081	79	0.479	0.473	6.042
3Q31	SB	98	0.318	0.388	4.144	124	0.453	0.445	4.172
	NB	63	0.388	0.452	5.396	76	0.493	0.535	5.872
4Q31	SB	85	0.315	0.375	4.037	131	0.436	0.419	4.017
	NB	64	0.399	0.457	5.326	74	0.529	0.508	5.941
1Q32	SB	21	0.433	0.411	4.055	63	0.437	0.452	4.261
	NB	17	0.587	0.482	6.178	45	0.586	0.515	6.049
2Q32	SB	14	0.421	0.405	3.312	46	0.531	0.538	4.878
	NB	14	0.598	0.574	5.979	37	0.576	0.498	5.513
3Q32	SB	58	0.331	0.344	3.314	30	0.574	0.513	5.054
	NB	39	0.459	0.448	5.278	30	0.644	0.454	5.164
4Q32	SB	64	0.330	0.331	3.284	32	0.574	0.497	5.107
	NB	45	0.419	0.411	4.908	30	0.644	0.426	5.327
1Q33	SB	21	0.512	0.330	4.062	31	0.459	0.426	4.599
	NB	16	0.624	0.442	5.864	27	0.606	0.465	5.892
2Q33	SB	15	0.515	0.396	3.120	29	0.534	0.461	4.284
	NB	15	0.599	0.473	5.816	22	0.665	0.551	6.676
3Q33	SB	43	0.314	0.304	2.991	53	0.444	0.420	3.570
	NB	35	0.464	0.424	5.069	36	0.622	0.456	6.470
4Q33	SB	44	0.342	0.275	4.110	43	0.515	0.396	4.655
	NB	33	0.537	0.424	5.674	36	0.616	0.478	6.983

Table III
EVENT-STUDY EXPERIMENTS
(Return Data in Percent)

Panel A (Weekly Returns on NYC Banks in 1933):

$$R_{it} = a_i + b_i R_{Mt} + c_{LNT} D_{LN} \cdot D_T + c_{LST} D_{LN} \cdot D_T + c_{SNT} D_{SN} \cdot D_T + c_{SST} D_{SS} \cdot D_T + u^R_{it}.$$

Parameter	Runs in which $D_T = D_w$		Runs in which $D_T = D_m$	
	Parameter Estimate	t-value	Parameter Estimate	t-value
a_i	-.53	-2.30	-.55	-2.26
b_i	.23	5.72	.24	5.96
c_{LNT}	17.28	4.10	1.67	.88
c_{LST}	9.33	3.90	1.17	1.06
c_{SNT}	-.58	-.15	.83	.47
c_{SST}	4.10	1.10	3.32	1.97
R^2	.029		.018	
standard error	11.13		11.19	
N	2,391		2,391	

Data Source: Commercial and Financial Chronicle

Table III (cont.)

Panel B: (Monthly Returns on Dana Co. Banks in 1933):

$$R_{it} = a_i + b_{it}R_{Mt} + c_{LN}D_{LN}\cdot D_m + c_{LDL}D_{LDL}\cdot D_m + c_{LL}D_{LLL}D_m + c_{SN}D_{SN}\cdot D_m + c_{SDL}D_{SDL}\cdot D_m + c_{SLL}D_{SLL}\cdot D_m + u_{it}^{R}.$$

Parameter	c_{jk} constrained to equal c_m		c_{jk} not constrained	
	Parameter Estimate	t-value	Parameter Estimate	t-value
a_i	-2.36	-4.82	-2.36	-4.81
b_{it}	-.41	-2.79	-.41	-2.79
c_m	8.99	4.12	...	
c_{LN}	...		8.08	2.00
c_{LDL}	...		11.11	2.64
c_{LLL}	...		11.83	1.98
c_{SN}	...		7.73	1.76
c_{SDL}	...		9.48	2.02
c_{SLL}	...		3.61	.50
R^2	.070		.072	
standard error	26.93		26.93	
N	3,688		3,688	

Data Source: Bank and Quotation Record

TABLE IV

TESTS OF THE ENFORCEABILITY-BREAKDOWN HYPOTHESIS

Panel A: Regression Estimates of Undeflated and Deflated Models of Assessments Collected (ASCOL) at Failed National Banks, 1926-1936

Parameter	Undeflated Model (4)		Model (4) with Everything but YRSREC and Yearly Dummies Deflated by STAS	
	parameter estimate	t-value	parameter estimate	t-value
a_{1926}	$2,459	0.74	-$2,217	-3.96
c_{NW}	.021	4.10	.003	.77
c_{STAS}	.425	32.28	.544	12.87
c_{YRSREC}	-$413	-.90	-.001	-.26
c_{PROVED}	.012	3.33	.018	6.45
$c_{BASSETS}$	.054	7.90	-.023	-3.44
$c_{GASSETS}$	.012	3.39	.008	1.75
c_{SECUR}	-0.31	-5.98	-0.19	-4.27
b_{1927}	-$4,841	-1.50	-0.36	-1.06
b_{1928}	-$2,170	-.60	-.039	-1.01
b_{1929}	$1,532	.42	-0.23	-.59
b_{1930}	-$3,977	-1.31	-.043	-1.33
b_{1931}	-$2,979	-1.11	-.029	-.99
b_{1932}	$1,124	.40	-.024	-.81
b_{1933}	$1,786	.64	.002	.06
b_{1934}	$3,656	1.09	.035	.94
b_{1935}	$32,472	2.51	.292	2.16
b_{1936}	$14,614	.84	-.034	-.20
R^2	.835		.119	
N	1,213		1,210	

TABLE IV (cont.)

Panel B: Regression Estimates of Undeflated and Deflated Models of Liquidation Proceeds (RECOV) at Failed National Banks, 1926-1936

Parameter	Undeflated Model (5)		Model (5) with Everything but YRSREC and Yearly Dummies Deflated by PROVED	
	parameter estimate	t-value	parameter estimate	t-value
a_{1926}	$20,503	1.02	$8,016	3.19
c_{NW}	.798	25.41	.264	17.30
c_{STAS}	-.748	-9.36	.097	2.44
c_{YRSREC}	$15,389	-5.56	-$2,973	-4.33
c_{PROVED}	.653	30.80	.429	12.14
$c_{BASSETS}$	.255	6.12	.123	3.62
$c_{GASSETS}$	.330	14.75	.474	20.75
c_{SECUR}	-.321	-10.06	-.317	-20.13
b_{1927}	-$11,177	-.57	.053	1.22
b_{1928}	-$3,812	-.17	.092	1.88
b_{1929}	$9,155	.42	.033	.68
b_{1930}	-$2,845	-.16	-.003	-.07
b_{1931}	$9,556	.59	.058	1.60
b_{1932}	$36,900	2.18	.115	3.06
b_{1933}	$68,501	4.06	.179	4.79
b_{1934}	$60,427	2.96	.140	3.14
b_{1935}	$112,285	1.43	.331	1.91
b_{1936}	$154,268	1.46	-0.33	-.16
R^2	.946		.470	
N	1,216		1,216	

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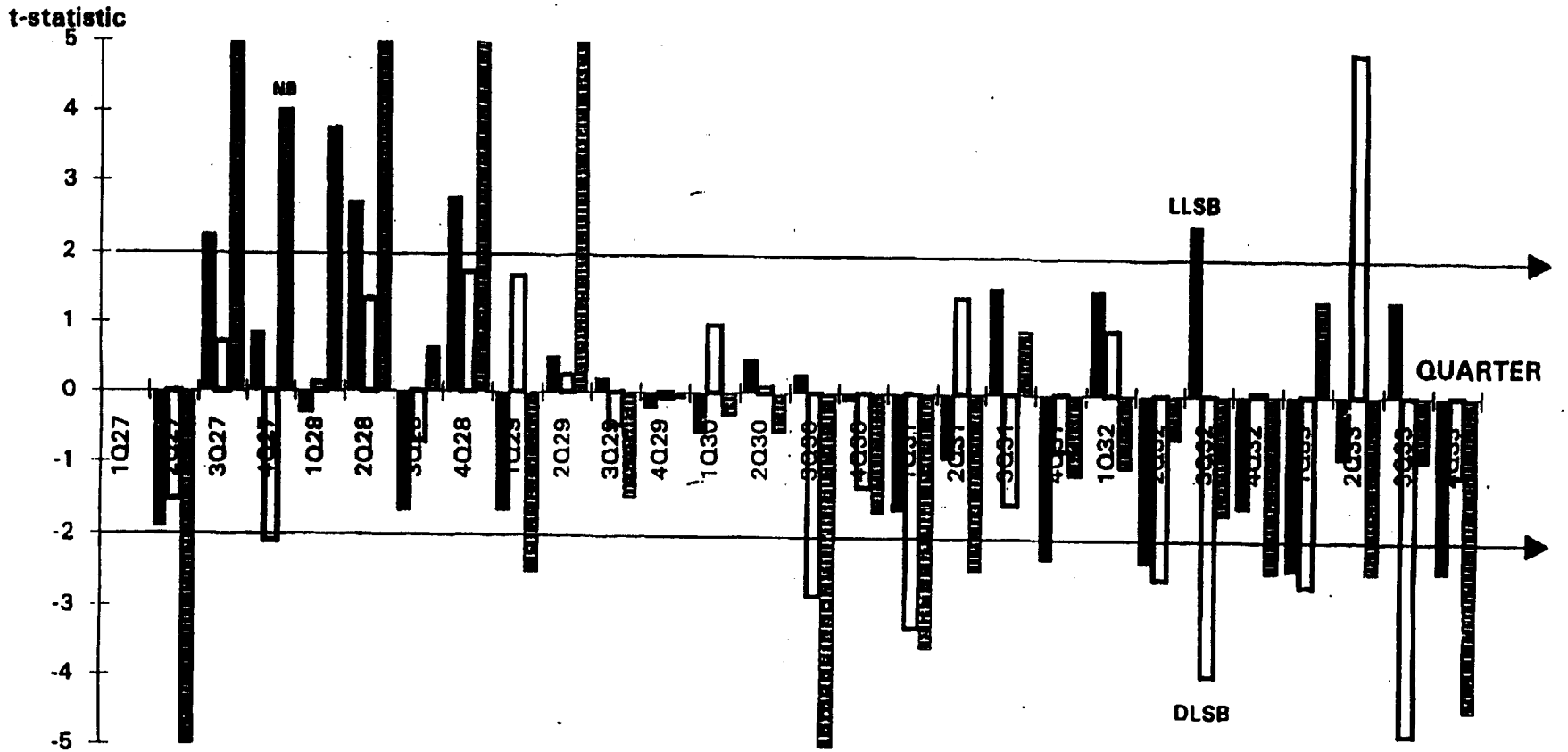
APPENDIX

COVERAGE OF BANKS BY STATE FOR THE BANK AND QUOTATION RECORD SAMPLE IN THE FIRST AND LAST QUARTERS WE OBSERVE

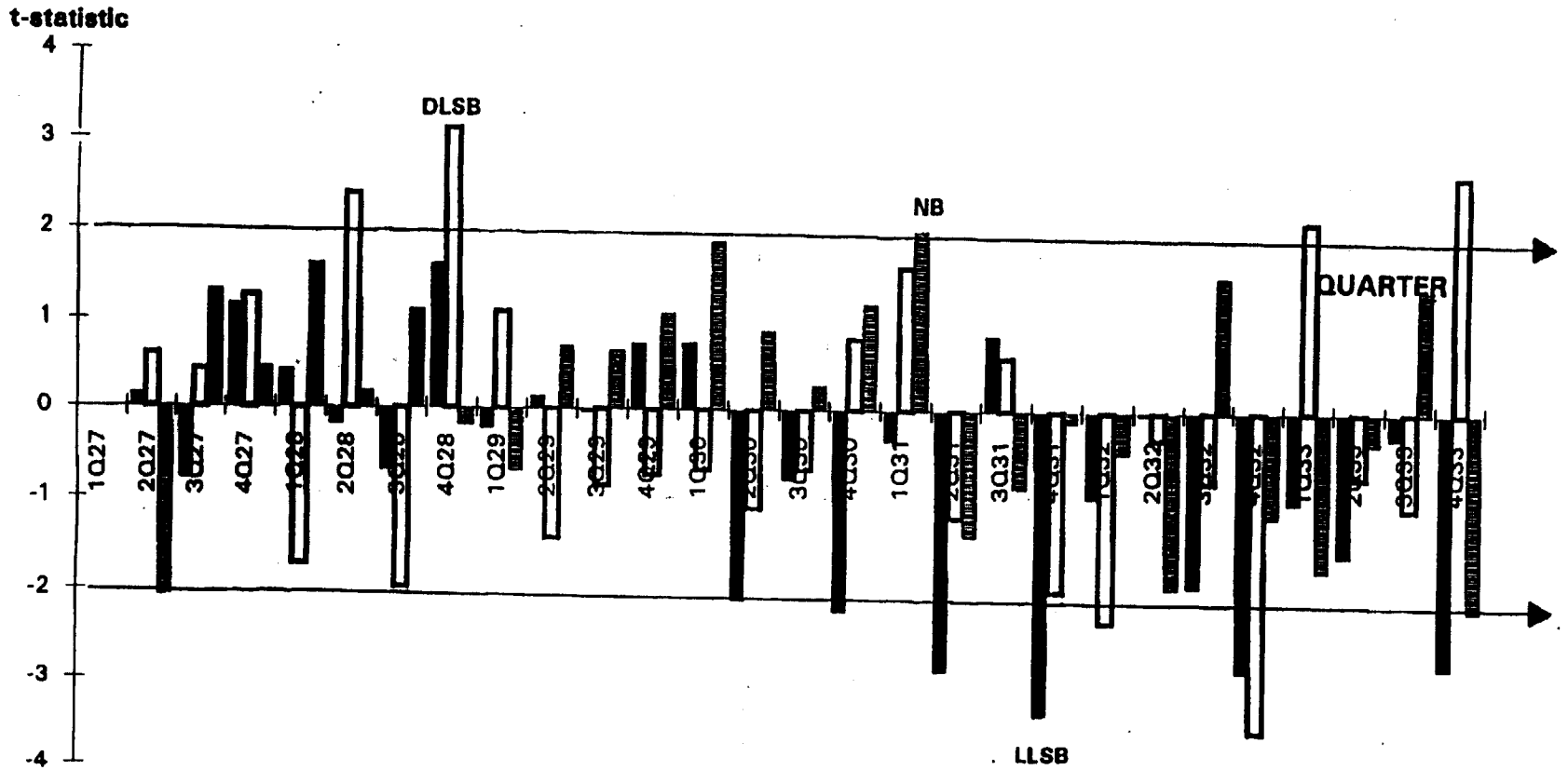
State	Number of Banks Observed	
	In First Quarter of 1927	In Last Quarter of 1933
Alabama	5	...
California	13	8
Connecticut	8	20
District of Columbia	19	...
Delaware	7	7
Georgia	4	3
Illinois	95	30
Indiana	6	3
Kentucky	7	4
Louisiana	10	3
Massachusetts	20	25
Maryland	18	10
Michigan	15	3
Minnesota	4	...
Missouri	5	25
North Carolina	2	...
Nebraska	1	...
New Jersey	34	30
New York	88	47
Ohio	19	11
Oregon	3	0
Pennsylvania	74	39
Rhode Island	6	9
South Carolina	3	2
Tennessee	10	7
Texas	17	4
Utah	8	6
Virginia	15	3
Vermont	0	...
Washington	4	2
Wisconsin	8	3
TOTAL:	**528**	**304**

Note: The shrinkage in coverage reflects not only banks that failed or merged, but also those that stopped trading in tough economic times.

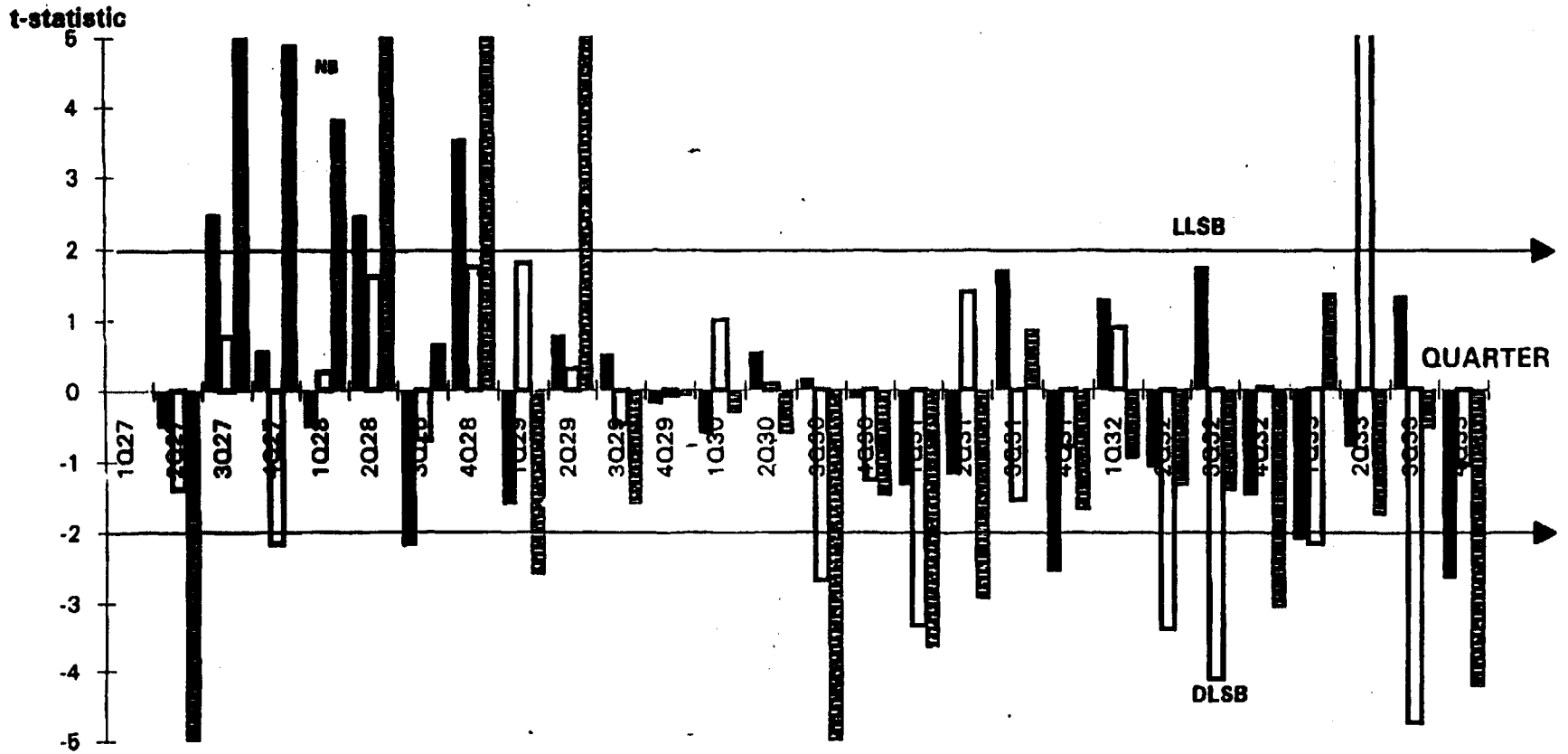
APPENDIX CHART 1: T-STATISTICS FOR DIFFERENCE BETWEEN COEFFICIENTS FOR PAR AND SURPLUS CAPITAL AT BANKS WHOSE NW EXCEEDS $4 MILLION



APPENDIX CHART 2: T-STATISTICS FOR DIFFERENCE BETWEEN COEFFICIENTS FOR PAR AND SURPLUS CAPITAL AT BANKS WHOSE NW IS LESS THAN $4 MILLION



APPENDIX CHART 3: T-STATISTICS FOR DIFFERENCE BETWEEN COEFFICIENTS FOR PAR AND SURPLUS CAPITAL AT BANKS WHOSE NW EXCEEDS $1 MILLION



APPENDIX CHART 4: T-STATISTICS FOR DIFFERENCE BETWEEN COEFFICIENTS FOR PAR AND SURPLUS CAPITAL AT BANKS WHOSE NW IS LESS THAN $1 MILLION