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# The Impact of Depositor Preference Laws

by William P. Osterberg

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## Introduction

On August 10, 1993, Congress passed the Omnibus Budget Reconciliation Act. This legislation contained an amendment to section 11(d)(11) of the Federal Deposit Insurance Corporation Act that changed the priority of claims on failed depository institutions. It gave depositors, and by implication the FDIC, claims on a failed bank's assets that are superior to those of general creditors. The stated objective of this shift was to reduce the FDIC's expected losses from bank failures. Several states had previously passed similar legislation.

There has been little empirical research concerning the impact of depositor preference legislation (DPL), despite repeated claims of its benefits. Arguments that this legislation could reduce the FDIC's exposure are based on the assumption that creditors will make no offsetting responses. The only relevant study, by Hirschhorn and Zervos (1990), found that following the passage of state-level DPL, general creditors of affected savings and loans increased collateralization, and interest rates on uninsured certificates of deposit fell. No analogous study has been conducted for commercial banks.

In this article, I analyze the impact of DPL on commercial banks. I first present a partial equilibrium analysis of its effects on the value and rates of return of various types of bank liabilities when failed banks are assumed to be resolved through liquidation. Next, I discuss creditors' possible responses. (The appendix shows how the FDIC's position would be affected by increased collateralization from general creditors.) In the third section, I give some descriptive statistics from Call Report data on portfolio shares, distinguishing between banks that were subject to state DPL in existence prior to the 1993 legislation and those that were not. In the fourth section, I present a regression analysis of DPL's impact on the costs of resolving bank failures. The fifth section concludes. The finding presented here—that average resolution costs were lower under DPL—is consistent with the view that the legislation has increased the value of the FDIC's claims. However, there is some evidence that creditors' actions may have partially offset the benefit to the FDIC.

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**BOX 1**

### Depositor Preference Legislation and Resolution Type

When bank failures are resolved through liquidation and without DPL, the FDIC shares the assets with uninsured depositors and nondepositors. With DPL, all depositors stand ahead of nondepositors. In an assisted merger, all deposits are covered and, without depositor preference, the nondeposit claims are passed on to the acquiring institution. Under depositor preference, nondeposit claims are de jure subordinate to those of the depositors and the FDIC. However, assisted mergers may continue to provide de facto insurance. Hence, while losses to the FDIC might be lower under depositor preference for either resolution type, costs under liquidation are likely to be reduced more.

As a result, DPL might influence the type of resolution procedure adopted. Bank regulatory agencies are required to utilize the least costly resolution method. Ely (1993) speculated that depositor preference would increase the use of liquidations (or deposit transfers) and reduce the use of assisted mergers (or purchase and assumptions).

## I. DPL and the Values of Bank Claimants: A Basic Framework

This section uses the cash-flow capital-asset pricing model developed by Chen (1978) to examine the impact of DPL on the values and rates of return for uninsured depositors, general creditors, and the FDIC.[1] I assume that the value of the FDIC's position is always negative. If correct pricing is defined as that which maintains the value of the FDIC's position at zero, I assume underpriced deposit insurance. However, correct pricing would imply that DPL could have no impact on the FDIC's position. For simplicity, I assume that the premium is fixed and unrelated to the bank's risk.

A related concern might be how the priority of claims is determined and whether the effects of priority are negated so as to maintain the claims' previous value, but that issue is beyond the scope of this article. The assumption made here is that the priority of claims is exogenous to the determination of values and rates of return. More generally, the framework cannot anticipate general creditors' responses, but it assumes that they correctly foresee regulators' choice of a failure resolution method. Because regulators have a mandate to choose the least costly method (liquidation, assisted merger, or open bank assistance), their choice of resolution type may vary endogenously (see box 1). This article focuses on liquidation, by far the most commonly chosen method.

Total liabilities against the bank (initially $D$, then $K$ with depositor preference) equal the sum of the end-of-period claims of uninsured depositors ($B_u$), insured depositors ($B_i$), general creditors ($G$), and the FDIC ($z$). Defining the fixed insurance premium on each dollar of insured deposits as $\rho$ implies that $z = \rho B_i$. Under depositor preference, the claims of general creditors are subordinated to those of uninsured depositors and the FDIC. The effective bankruptcy threshold is lowered from $D$ to $B = K - G$.

## The Impact on Uninsured Depositors

In the absence of depositor preference, uninsured depositors are paid in full if cash flow to the bank ($X$) exceeds total liability claims ($D$). Otherwise, under liquidation, a positive cash flow will be split proportionately with the other net claimants. The cash flow to uninsured depositors is $Y_{bu}$.

$$\begin{aligned} Y_{bu} &= B_u && \text{if } X > D = B_i + B_u + G + z, \\ &= B_u X/D && \text{if } D > X > 0, \text{ and} \\ &= 0 && \text{if } 0 > X. \end{aligned}$$

With depositor preference, the pecking order of lower claimants is irrelevant to valuing the claims of uninsured depositors.

$$\begin{aligned} Y_{bu} &= B_u && \text{if } X > B = B_i + B_u + z, \\ &= B_u X/B && \text{if } B > X > 0, \text{ and} \\ &= 0 && \text{if } 0 > X. \end{aligned}$$

To calculate the impact of DPL, I control for possible changes in the level of total promised payments. The expected cash flow to an uninsured deposit with one-dollar par value is separated into one part that equals the cash flow in the no-DPL case and one that has the following value:

■ **1** Osterberg and Thomson (1991) use the same framework to analyze the impact of subordinated debt and surety bonds.

$$\Delta Y_{bu} = 0 \quad \text{if} \quad X > D,$$
$$= 1 - X/D \quad \text{if} \quad D > X > B,$$
$$= X/B - X/D \quad \text{if} \quad B > X > 0, \text{ and}$$
$$= 0 \quad \text{if} \quad 0 > X.$$

The change in the value of uninsured deposits due to depositor preference is thus

$$(1) \quad \Delta V_{bu} = R^{-1}[F(D) - F(B) + \frac{(D-B)}{B(D)} CEQ_0^B(X) - \frac{1}{D} CEQ_B^D(X)] > 0.$$

In this case, $F(\cdot)$ is the cumulative distribution function defined over the uncertain cash flow $X$. The certainty equivalent of $X$ when it lies between 0 and $D$, $CEQ_0^D(X)$, is equal to $E_0^D(X) - \lambda COV(X, R_M)$, where $\lambda$ is the market price of risk and $R_M$ is the return on the market. As long as $D > B$, $V_{bu}$ increases with DPL. For a given distribution of $X$ and level of $B_u$, uninsured depositors are paid over a greater range of possible outcomes for $X$.

## The Impact on General Creditors

Without depositor preference, general creditors have the same priority of claims as uninsured depositors:

$$Y_G = G \quad \text{if} \quad X > D = B_i + B_u + G + z,$$
$$= GX/D \quad \text{if} \quad D > X > 0, \text{ and}$$
$$= 0 \quad \text{if} \quad 0 > X.$$

With depositor preference, general creditors' claims are senior only to equityholders', and their cash flows become

$$Y_G = G \quad \text{if} \quad X > K = B_i + B_u + G + z,$$
$$= X - B \quad \text{if} \quad K > X > B, \text{ and}$$
$$= 0 \quad \text{if} \quad B > X.$$

The value of general credit behaves like that of subordinated debt, except for the protection afforded by the latter. However, when $B < X < K$, general credit behaves like equity.

The impact of depositor preference on $V_G$ depends on whether $K \geq D$ or $D \geq K$. I assert that $K$ is at least as large as $D$, or else stockholders would choose to issue debt subordinate to deposits. Following the procedure utilized for uninsured depositors to calculate the change that depositor preference makes in cash flows to general creditors and in the value of their claims, we have:

$$\Delta Y_G = 0 \quad \text{if } X > K,$$
$$= (X - B)/G - 1 \quad \text{if } K > X > D,$$
$$= (X - B)/G - X/D \quad \text{if } D > X > B,$$
$$= -X/D \quad \text{if } B > X > 0, \text{ and}$$
$$= 0 \quad \text{if } 0 > X.$$

Then

$$(2) \quad \Delta V_G = R^{-1}\{-[F(K) - F(D)] - (B/G)[F(K) - F(B)] + (1/G) CEQ_B^K(X) - (1/D) CEQ_0^D(X)\} \leq 0.$$

Since total liability claims do not decrease ($K \geq D$), DPL cannot increase the values of general creditors' claims.

## The Impact on the FDIC

The value of the FDIC's claim is the net value of deposit insurance. Without depositor preference, the net cash flow to the FDIC is

$$Y_{FDIC} = z \quad \text{if} \quad X > D,$$
$$= (B_i + z)X/D - B_i \quad \text{if} \quad D > X > 0,$$
$$= -B_i \quad \text{if} \quad 0 > X.$$

Depositor preference affects the net value of the FDIC's claim by changing senior claimants' probability of loss and by altering the FDIC's weight in the pool of senior claims.

$$Y_{FDIC} = z \quad \text{if} \quad X > B,$$
$$= (B_i + z)X/B - B_i \quad \text{if} \quad B > X > 0, \text{ and}$$
$$= -B_i \quad \text{if} \quad 0 > X.$$

**BOX 2**

## State Depositor Preference Legislation for Banks

| State | Date Effective |
|---|---|
| Alaska | October 15, 1978 |
| Arizona | September 21, 1991 |
| California | June 27, 1986 |
| Colorado | May 1, 1987 |
| Connecticut | May 22, 1991 |
| Florida | July 3, 1992 |
| Georgia | 1974[a] |
| Hawaii | June 24, 1987 |
| Idaho | 1979[b] |
| Iowa | January 1, 1970 |
| Kansas | July 1, 1985 |
| Louisiana | January 1, 1985 |
| Maine | April 16, 1991 |
| Minnesota | April 24, 1990 |
| Missouri | September 1, 1993 |
| Montana | 1927[c] |
| Nebraska | 1909[c] |
| New Hampshire | June 10, 1991 |
| New Mexico | June 30, 1963 |
| North Dakota | July 1, 1987 |
| Oklahoma | May 26, 1965 |
| Oregon | January 1, 1974 |
| Rhode Island | February 8, 1991 |
| South Dakota | July 1, 1969 |
| Tennessee | 1969[c] |
| Utah | 1983[c] |
| Virginia | July 1, 1983 |
| West Virginia | May 11, 1981 |

a. Legislation became effective on either January 1 or July 1.
b. Passed by both houses of the state legislature on July 1; enactment date is unclear.
c. Neither the month nor the day of enactment is available.
SOURCE: Compiled from state statistics.

It follows that the change in the value of the FDIC guarantee on a one-dollar par-value deposit is the value of a security that has the following cash flows:

$$\Delta Y_{FDIC} = 0 \quad \text{if} \quad X > D,$$

$$= \rho - (1+\rho)[X/D] + 1 \quad \text{if} \quad D > X > B,$$

$$= (1+\rho)X/B - (1+\rho)X/D \quad \text{if} \quad B > X > 0, \text{ and}$$

$$= 0 \quad \text{if} \quad 0 > X.$$

Then

$$(3)\quad \Delta Y_{FDIC} = \frac{(1+\rho)}{R}\left[F(D) - \frac{1}{D}CEQ_B^D(\tilde{X}) - \frac{1}{D}CEQ_0^B(\tilde{X}) + \frac{1}{B}CEQ_0^B(\tilde{X}) - F(B)\right].$$

The FDIC's subsidy must be reduced by DPL because 1) if $D > X > B$, then $X/D < 1$, and the FDIC's cash flow increases; and 2) if $D > B > 0$, then $1/B > 1/D$, and the FDIC's cash flow increases. Thus, $\Delta V_{FDIC} > 0$.

## II. Possible Impacts of DPL on Bank Portfolios

Many of the possible effects of depositor preference could have the unintended result of decreasing the benefit to the FDIC, thus potentially invalidating the result on $V_{FDIC}$ in the partial equilibrium analysis above. The appendix presents an analytical exposition of how increased collateralization by general creditors would affect the FDIC's claims.[2] General creditors include trade creditors, beneficiaries of guarantees, foreign depositors (to the extent that their treatment differs from that accorded domestic depositors), holders of bankers' acceptances, unsecured lenders, landlords, suppliers of fed funds, and counterparties to swaps and other contingent liabilities. In the event of failure, collateralization would give such secured lenders priority over all depositors. Other possible responses include increases in interest rates on general credit, adjustment of maturities, or the introduction of accelerator clauses.

It has been asserted that depositor preference would harm smaller community banks and thrifts. Banks with less capital would supposedly have a harder time floating debt, borrowing federal funds, leasing computers, and renting space. Some banks might be shut out of the derivatives markets or see their credit rating on bankers' acceptances or letters of credit downgraded (see Rehm [1993]). Mutual funds and large banks, particularly those seen as "too-big-to-let-fail," would have an enhanced advantage in attracting deposits over $100,000, which might not be seen as being at risk.

■ **2** Hirschhorn and Zervos (1990) claim that DPL increases the incentive to collateralize and that the damage to the insurer and to the uninsured depositor increases with the degree of collateralization of non-deposit claims and the extent of insolvency.

**BOX 3**

## Variable Definitions

| | |
|---|---|
| *FFSOLD* | Federal funds lent/total assets |
| *FFPURCH* | Federal funds borrowed/total assets |
| *FORDEP* | Foreign deposits/total assets |
| *OBSLNS* | Off-balance-sheet loans and letters of credit/total assets |
| *OBSOTH* | Other off-balance-sheet items/ total assets |
| *OBS* | Total of *OBSLNS* and *OBSOTH* items/ total assets |
| *UNCOL* | Loan interest earned but not collected/ total assets |
| *EQCAP* | Equity capital |
| *CAP* | (Equity capital + loan-loss reserves + allocated risk transfer reserves)/ total assets |
| *PDNA* | Loans 90 days past due or nonaccruing/ total assets |
| *OREO* | Other real estate owned/total assets |
| *INSLNS* | Loans to insiders/total assets |
| *COREDEP* | Domestic deposits under $100,000/ total assets |
| *ICORE* | Equals *COREDEP* if bank resolved via payout, otherwise equals 0 |
| *BRKDEP* | Brokered deposits/total assets |
| *NCRASST* | (Risky assets not included in *PDNA*, *OREO*, or *INSLNS*)/total assets |
| *DUMNE* | Equals 1 if bank is in Boston, New York, or Philadelphia Federal Reserve Districts |
| *DUMSW* | Equals 1 if bank is in Dallas Federal Reserve District |
| *DPL* | Equals 1 if bank is a state bank in a state with depositor preference legislation |
| *CAPDPL* | *CAP* ∗ *DPL* |
| *UNCOLDPL* | *UNCOL* ∗ *DPL* |
| *PDNADPL* | *PDNA* ∗ *DPL* |
| *OREODPL* | *OREO* ∗ *DPL* |
| *INSLNSDPL* | *INSLNS* ∗ *DPL* |
| *NCRASSTDPL* | *NCRASST* ∗ *DPL* |
| *OBSDPL* | *OBS* ∗ *DPL* |
| *FFSOLDDPL* | *FFSOLD* ∗ *DPL* |
| *FFPURCHDPL* | *FFPURCH* ∗ *DPL* |
| *COREDEPDPL* | *COREDEP* ∗ *DPL* |
| *ICOREDPL* | *ICORE* ∗ *DPL* |
| *LNASSTDPL* | Logarithm of total assets ∗ *DPL* |
| *BRKDEPDPL* | *BRKDEP* ∗ *DPL* |
| *DUMNEDPL* | *DUMNE* ∗ *DPL* |
| *DUMSWDPL* | *DUMSW* ∗ *DPL* |

## III. Descriptive Measures of Portfolio Impacts

The partial equilibrium framework described above implies that DPL affects the values and rates of return for certain categories of bank creditors. However, given the short time since national DPL was passed and the lack of data on values and rates, I choose instead to study the impact of state DPL that was in effect prior to 1993, using bank balance sheet data (quarterly reports of the Federal Financial Institutions Examination Council, or Call Reports) and FDIC resolution cost estimates for failed banks. The states that passed DPL and the years the legislation became effective are listed in box 2, while the variable definitions are shown in box 3.

Table 1 presents portfolio measures from pooled Call Reports for 1984–92. DPL might affect bank behavior either in a cross-section or through time. Totals for general credit (federal funds, foreign deposits, and off-balance-sheet items) might decline as a share of total assets. As a link to our subsequent examination of DPL and closed-bank resolution costs, we also examine variation in portfolio measures that have been shown to affect resolution costs.

One immediately apparent difference between banks subject to state DPL and others is that only state-chartered banks—which are generally smaller than national banks—are affected by DPL. I compare state-chartered banks in states where they are subject to DPL with national banks in the same states, and also contrast state-chartered banks located in DPL states versus non-DPL states. New York banks are excluded because of their size and unique regulatory status.

DPL has no statistically significant impact on borrowing or lending of federal funds, foreign deposits, or off-balance-sheet sources of funding.[3] State banks that are subject to this legislation utilize federal funds somewhat less than do national banks in the same states or state banks not subject to it. Foreign deposits are utilized somewhat more by state banks subject to DPL than by national banks in the same states. However, foreign deposits are utilized more by state banks than national ones. Off-balance-sheet borrowing is somewhat lower at state banks under DPL than national banks in the same states.

■ **3** The t-test results are available from the author upon request.

**TABLE 1**

**Sample Statistics on the Impact of State DPL**

| | DPL | | Non-DPL | |
|---|---|---|---|---|
| | State Banks | National Banks | State Banks | National Banks |
| *LNASST* | 10.377 | 10.917 | 10.709 | 11.182 |
| | (1.050) | (1.281) | (1.117) | (1.358) |
| *FFSOLD* | 0.056 | 0.067 | 0.060 | 0.070 |
| | (0.064) | (0.090) | (0.074) | (0.093) |
| *FFPURCH* | 0.006 | 0.018 | 0.012 | 0.019 |
| | (0.026) | (0.053) | (0.042) | (0.044) |
| *FORDEP* | 0.090 | 0.031 | 0.078 | 0.050 |
| | (0.122) | (0.054) | (0.105) | (0.073) |
| *OBSLNS* | 0.053 | 0.120 | 0.047 | 0.116 |
| | (0.210) | (3.450) | (0.161) | (4.473) |
| *OBSOTH* | 0.002 | 0.008 | 0.004 | 0.016 |
| | (0.053) | (0.140) | (0.039) | (0.200) |
| *UNCOL* | 0.010 | 0.008 | 0.008 | 0.007 |
| | (0.006) | (0.005) | (0.005) | (0.017) |
| *EQCAP* | 0.094 | 0.091 | 0.093 | 0.086 |
| | (0.050) | (0.065) | (0.052) | (0.059) |
| *PDNA* | 0.009 | 0.010 | 0.007 | 0.009 |
| | (0.015) | (0.016) | (0.012) | (0.014) |
| *OREO* | 0.007 | 0.007 | 0.005 | 0.006 |
| | (0.013) | (0.013) | (0.011) | (0.017) |
| *INSLNS* | 0.005 | 0.005 | 0.006 | 0.006 |
| | (0.010) | (0.011) | (0.011) | (0.017) |
| *COREDEP* | 0.809 | 0.790 | 0.782 | 0.752 |
| | (0.119) | (0.141) | (0.136) | (0.155) |
| *BRKDEP* | 0.003 | 0.002 | 0.002 | 0.003 |
| | (0.026) | (0.016) | (0.020) | (0.022) |

NOTE: Banks in New York are excluded from the last two columns. DPL/non-DPL refer to whether or not banks operated in states where depositor preference legislation was in effect.
SOURCE: Author's calculations.

The bottom half of table 1 compares asset shares of some items with predictive power for resolution costs. Higher levels of income earned but not collected (*UNCOL*), loans past due or nonaccruing (*PDNA*), other real estate owned (*OREO*), and insider loans (*INSLNS*) are expected to increase costs.[4] Core deposits (*COREDEP*), equity capital (*EQCAP*), and brokered deposits (*BRKDEP*) tend to be associated with lower costs. None of the items differs significantly according to DPL status. However, the lower levels of *EQCAP*, *COREDEP*, and *BRKDEP* would imply higher costs when DPL is in effect.

Table 2 focuses on failed banks and compares movements in portfolio shares during the five quarters prior to failure for banks that are subject to DPL and those that are not.[5] The portfolio measures for the five quarters before failure are able to predict resolution costs.[6] DPL has no significant effect on these shares.

## IV. Does DPL Affect Resolution Costs?

Other things being equal, DPL's impact on the value of the FDIC's claim should be reflected in FDIC losses resulting from resolution of bank failures. An increase in $V_{FDIC}$ should be reflected in less costly resolutions.[7] I focus here on failed banks and analyze resolution-cost data from the FDIC (1993) and balance-sheet data from Call Reports (table 2). The sample includes all commercial banks insured by the FDIC and the Bank Insurance Fund that were closed or required FDIC assistance between January 1, 1986 and December 31, 1992. The quarterly balance-sheet data for these banks cover the period from March 31, 1984 to December 31, 1992.

I estimate the resolution-cost equation using weighted least squares, with all variables being divided by the square root of total assets. Several categories of variables appear on the right-hand side. First, I list balance-sheet measures elsewhere shown to have predictive power for resolution costs (see Osterberg and Thomson [1995]). *CAP* proxies for unbooked gains or losses and is expected to have a coefficient equal to (–1) in the absence of gains or losses. Income earned but not collected (*UNCOL*) may represent hidden problem assets expected to increase resolution costs. *PDNA*, *OREO*, and *NCRASST* each proxy for categories of problem assets and raise costs. Insider loans (*INSLNS*) may be associated with relaxed credit standards and thus with higher costs. Core deposits (*COREDEP*) represent the unbooked gains associated with franchise value and should reduce

■ **4** These findings are detailed in Osterberg and Thomson (1995).

■ **5** A preferable way to gauge the impact of introducing DPL would be to examine portfolios before and after such legislation was passed, but passage dates were too close to either the beginning or the end of the sample period to permit such a comparison.

■ **6** This can be interpreted as evidence of regulatory forbearance. See the discussion and references in Osterberg and Thomson (1995).

■ **7** An important caveat is that failure, as a regulatory decision, might be influenced by the same factors that determine costs. Resolution type might also be affected.

**TABLE 2**

## Sample Statistics for Failed Banks Prior to Failure

**Panel A: Banks in States without DPL**

| | Number of Call Reports Prior to Failure (Mean) | | | | |
|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 |
| *LNASST* | 10.704 | 10.761 | 10.823 | 10.812 | 10.726 |
| | (1.310) | (1.310) | (1.298) | (1.285) | (1.333) |
| *FFSOLD* | 0.103 | 0.093 | 0.087 | 0.072 | 0.074 |
| | (0.144) | (0.133) | (0.116) | (0.089) | (0.087) |
| *FFPURCH* | 0.010 | 0.010 | 0.012 | 0.013 | 0.014 |
| | (0.035) | (0.033) | (0.038) | (0.036) | (0.033) |
| *OBSLNS* | 0.056 | 0.057 | 0.065 | 0.074 | 0.081 |
| | (0.076) | (0.073) | (0.082) | (0.106) | (0.113) |
| *OBSOTH* | 0.008 | 0.009 | 0.011 | 0.014 | 0.004 |
| | (0.053) | (0.066) | (0.092) | (0.076) | (0.036) |
| *UNCOL* | 0.009 | 0.009 | 0.010 | 0.011 | 0.011 |
| | (0.006) | (0.005) | (0.006) | (0.006) | (0.006) |
| *EQCAP* | –0.001 | 0.019 | 0.047 | 0.088 | 0.088 |
| | (0.064) | (0.049) | (0.046) | (0.061) | (0.061) |
| *PDNA* | 0.055 | 0.049 | 0.035 | 0.012 | 0.012 |
| | (0.042) | (0.038) | (0.031) | (0.015) | (0.015) |
| *OREO* | 0.050 | 0.044 | 0.031 | 0.009 | 0.009 |
| | (0.050) | (0.046) | (0.037) | (0.016) | (0.016) |
| *INSLNS* | 0.010 | 0.011 | 0.013 | 0.014 | 0.014 |
| | (0.017) | (0.017) | (0.023) | (0.024) | (0.024) |
| *COREDEP* | 0.828 | 0.794 | 0.730 | 0.628 | 0.628 |
| | (0.151) | (0.148) | (0.146) | (0.155) | (0.155) |
| *BRKDEP* | 0.022 | 0.019 | 0.013 | 0.007 | 0.007 |
| | (0.065) | (0.060) | (0.047) | (0.024) | (0.024) |

**Panel B: Banks in States with DPL**

| | | | | | |
|---|---|---|---|---|---|
| *LNASST* | 10.154 | 10.199 | 10.259 | 10.307 | 10.277 |
| | (1.140) | (1.147) | (1.157) | (1.172) | (1.182) |
| *FFSOLD* | 0.051 | 0.050 | 0.045 | 0.051 | 0.043 |
| | (0.052) | (0.048) | (0.045) | (0.064) | (0.043) |
| *FFPURCH* | 0.004 | 0.004 | 0.006 | 0.006 | 0.009 |
| | (0.012) | (0.011) | (0.016) | (0.014) | (0.022) |
| *OBSLNS* | 0.042 | 0.048 | 0.047 | 0.053 | 0.052 |
| | (0.050) | (0.056) | (0.057) | (0.084) | (0.069) |
| *OBSOTH* | 4.2E-6 | 0.000 | 0.000 | 0.005 | 0.000 |
| | (3.1E-5) | (0.000) | (0.000) | (0.024) | (0.000) |
| *UNCOL* | 0.012 | 0.012 | 0.013 | 0.015 | 0.014 |
| | (0.008) | (0.008) | (0.009) | (0.011) | (0.009) |
| *EQCAP* | 0.013 | 0.025 | 0.046 | 0.067 | 0.077 |
| | (0.049) | (0.038) | (0.029) | (0.026) | (0.028) |
| *PDNA* | 0.052 | 0.046 | 0.039 | 0.028 | 0.021 |
| | (0.049) | (0.041) | (0.032) | (0.024) | (0.020) |
| *OREO* | 0.044 | 0.040 | 0.033 | 0.023 | 0.017 |
| | (0.037) | (0.033) | (0.029) | (0.028) | (0.023) |
| *INSLNS* | 0.010 | 0.010 | 0.010 | 0.011 | 0.012 |
| | (0.015) | (0.013) | (0.013) | (0.013) | (0.017) |
| *COREDEP* | 0.887 | 0.861 | 0.804 | 0.738 | 0.680 |
| | (0.137) | (0.144) | (0.144) | (0.144) | (0.157) |
| *BRKDEP* | 0.026 | 0.025 | 0.019 | 0.012 | 0.012 |
| | (0.119) | (0.113) | (0.082) | (0.052) | (0.049) |

NOTE: Standard errors are in parentheses.
SOURCE: Author's calculations.

resolution costs. However, *ICORE*, the product of core deposits and a dummy variable for resolution type, accounts for the loss of franchise value to the acquirer under liquidation. The logarithm of total assets captures the impact of size. Higher levels of brokered deposits (*BRKDEP*), by which troubled banks often staged last-ditch efforts to stave off failure, may lower costs.

Second, I include measures of general credit.[8] The partial equilibrium analysis suggests that higher levels of general credit imply a greater increase in the value of the FDIC's claim.[9] On the other hand, off-balance-sheet liabilities (*OBS*), one item included in general credit, might allow a reduction in resolution costs by hedging on-balance-sheet risk. Thus, if DPL discourages the use of such items, resolution costs could be higher. I include two other measures of general credit—federal funds borrowed (*FFPURCH*) and federal funds lent (*FFSOLD*). Since federal funds are highly liquid, one would expect that failing banks which can borrow would have lower costs and lenders would have higher ones.

Third, intercept and interactive slope dummies allow DPL to affect both the average resolution cost and the impact of each balance-sheet item on cost. The DPL dummy is equal to one only for state banks operating under state DPL. A finding that the intercept is significantly less than zero would be consistent with the views of DPL's proponents. On the other hand, finding that the interactive terms differed with DPL but not with the average costs would be consistent with general creditors' offsetting the impact of DPL. The interactive terms *COREDPL* and *ICOREDPL* give some indication of the role played by resolution type. *ICORE* is intended to capture the loss of franchise value, proxied by *CORE*, under liquidation. If DPL encouraged deposit transfers, then *COREDPL*, the differential impact under DPL, would be negative. However, one would expect *ICOREDPL* to equal zero, since it is conditioned on resolution type. If general creditors did not adjust to DPL, then general credit that tended to increase resolution costs would have less effect under DPL, since it would be less likely that such claims would be paid off.

■ **8** Hirschhorn and Zervos (1990) analyze data on collateralization for savings and loan associations. Such data are not readily available for commercial banks.

■ **9** The relevant comparison is between total liabilities before DPL ($D$) and $K–G$, where $K$ is the new level of total liabilities and $G$ is the level of general credit.

TABLE 3

## The Impact of Depositor Preference Legislation on Resolution Costs

| Variable | Osterberg and Thomson (1995) | Basic Model | With DPL Dummies | Variable | With DPL Dummies |
|---|---|---|---|---|---|
| constant | 69,842<br>(13,394)[a] | –8,030.7<br>(10,310) | –1,267.4<br>(12,670.0) | *DPL* | –48,034<br>(26,740)[b] |
| *CAP* | –1.165<br>(0.0720)[a] | –1.1820<br>(0.2222)[a] | –1.2516<br>(0.2306)[a] | *CAPDPL* | –0.7300<br>(1.3260) |
| *UNCOL* | 4.376<br>(0.893)[a] | 5.0136<br>(2.520)[a] | 4.1047<br>(2.807) | *UNCOLDPL* | 6.1371<br>(7.700) |
| *PDNA* | 0.786<br>(0.049)[a] | 1.0893<br>(0.1713)[a] | 1.1824<br>(0.1822)[a] | *PDNADPL* | –0.2377<br>(0.6672) |
| *OREO* | 0.453<br>(0.0560)[a] | 0.5222<br>(0.1593)[a] | 0.5135<br>(0.1655)[a] | *OREODPL* | –1.5992<br>(1.120) |
| *INSLNS* | 1.775<br>(0.276)[a] | 2.4643<br>(0.7712)[a] | 2.3718<br>(0.8193)[a] | *INSLNSDPL* | –3.1048<br>(2.871) |
| *NCRASST* | 0.202<br>(0.020)[a] | 0.3128<br>(0.0572)[a] | 0.3467<br>(0.0600)[a] | *NCRASSTDPL* | –0.5785<br>(0.2970)[b] |
| *OBSLNS* | –0.158<br>(0.016)[a] | | | *OBSDPL* | 1.7027<br>(0.9482) |
| *OBSOTH* | –0.038<br>(0.007)[a] | | | *FFSOLDDPL* | –1.1600<br>(1.018) |
| *OBS* | | –0.0167<br>(0.0219) | –0.0573<br>(0.0266)[a] | *FFPURCHDPL* | 1.2378<br>(1.3460) |
| *FFSOLD* | | 0.3045<br>(0.0609)[a] | 0.3256<br>(0.625)[a] | *COREDPL* | 0.1554<br>(0.1609) |
| *FFPURCH* | | –0.3486<br>(0.0708)[a] | –0.3358<br>(0.0744)[a] | *ICOREDPL* | 0.2209<br>(0.1216)[b] |
| *COREDEP* | –0.088<br>(0.010)[a] | –0.2011<br>(0.0370)[a] | –0.2128<br>(0.0390)[a] | *LNASSTDPL* | 5,769.5<br>(2,943.0)[a] |
| *ICORE* | 0.062<br>(0.010)[a] | 0.0369<br>(0.0241) | 0.0311<br>(0.0251) | *BRKDEPDPL* | –0.3151<br>(0.2495) |
| *LNASST* | | 1,048.3<br>(1,097.0) | 170.01<br>(1,333.0) | *DUMNEDPL* | –9,546.4<br>(12,100) |
| *BRKDEP* | –0.095<br>(0.034)[a] | –0.0793<br>(0.0952) | 0.2777<br>(0.1675)[b] | *DUMSWDPL* | –158.91<br>(6,715.0) |
| *DUMNE* | 5,856.9<br>(1,692.8)[a] | 5,111.8<br>(4,996.0) | 6,856.6<br>(5,740.0) | | |
| *DUMSW* | 1,345.0<br>(593.1)[a] | –1,133.8<br>(1,802.0) | 577.21<br>(2,092.0) | | |
| Number of observations | | 1,240 | 1,240 | | |
| Adjusted $R^2$ | | 0.3692 | 0.3727 | | |

a. Significant at the 5 percent level.
b. Significant at the 10 percent level.
NOTE: Standard errors are in parentheses. Observations are weighted by one divided by the square root of total assets. Results in the first column are from Osterberg and Thomson (1995), table 2, column 1.
SOURCE: Author's calculations.

The second column of table 3 adds federal funds categories to the specification of Osterberg and Thomson (1995).[10] *ICORE* (the loss of franchise value associated with liquidations) no longer increases resolution costs, and neither off-balance-sheet items nor brokered deposits seem to reduce them. The dummy variable for the Southwest region likewise has no substantial effects. The significantly positive coefficient on *FFSOLD* and the significantly negative sign on *FFPURCH* are consistent with the view that liquidity assessments influence closure decisions. Banks liquid enough to lend (sell) federal funds are not closed as quickly as

10 We also substituted *LNASST* for separate size categories, and imposed the restriction that the coefficients on *OBSLNS* and *OBSOTH* are equal. The latter restriction was not rejected by a standard F-test.

net borrowers, and the delay in closure may be associated with increased resolution costs.[11] The findings for the Southwest dummy and *ICORE* are consistent with anecdotal evidence about regulators' practice of lending to major subsidiaries who borrowed federal funds from minor subsidiaries who borrowed from outside the holding company.

The third column of table 3 shows the results of adding intercept and slope dummies to capture any differences in average costs or in the impacts of the cost determinants. An F-test implies that we cannot reject the hypothesis that the DPL intercept and slope differences sum to zero (F[16,1209] = 1.42). The DPL intercept in the second column indicates that depositor preference is associated with significantly lower resolution costs. However, the F-test for the addition of that term is only 2.064 (F[1,1024]).[12] Few of the interactive terms are significantly different from zero. This implies that any decrease in resolution costs from DPL results from lower totals of balance-sheet items that increase costs or from higher levels of items that reduce costs. The impacts of other risky assets, off-balance-sheet financing, size, and *ICORE* are all affected by DPL. Since *OBS* activity decreases resolution costs, the finding here is that one dollar of *OBS* activity decreases FDIC costs somewhat less for banks operating under DPL. The result for *ICOREDPL* is also paradoxical, since the loss of franchise value associated with liquidation should not be affected by any shift toward assisted mergers induced by DPL.

## V. Summary

This paper presents the basic theory of how the 1993 national depositor preference legislation might reduce the FDIC's exposure to commercial bank failure by improving the priority of uninsured depositors. The appendix analyzes the impact of increased collateralization by general creditors in response to deterioration in their status. The results are similar to those of Hirschhorn and Zervos (1990), who analyzed data on collateralization by savings and loan associations.

This paper's empirical section utilizes FDIC resolution costs and commercial bank balance-sheet data from Call Reports to examine the impact of state DPL in effect prior to 1993. Portfolio shares did not seem affected by whether banks were operating under depositor preference. On the other hand, failed-bank resolution costs during the 1986–92 period were significantly lower for banks subject to such legislation, although the impacts of only a few portfolio share items differ with depositor preference status. It is notable that the role played by non-depositor claims, such as federal funds and off-balance-sheet items, is not consistent with the purported mechanism for reducing the FDIC's costs. One possible extension of this result, to be explored in future work, is that DPL affects the FDIC's choice of resolution type. However, the evidence given here does not provide strong proof that DPL is achieving its intended benefits.

**11** See Thomson (1992) for more detail regarding this point.

**12** The other regression necessary for the comparison (omitting only the DPL dummy from the list of variables in column 2) is not shown but is available from the author.

## Appendix

### The Impact of Increased Collateralization on the FDIC's Claim

To illustrate how an arbitrary increase in collateralization would affect the value of the FDIC's claim, I recalculate the impact of DPL, making the assumption that collateralized claims increase from zero to $C$. In the event of failure, such claims (which belong to the category of nondeposit claims) are first in line and can take their collateral from the overall pool of assets. The cash flows to the FDIC become

$$
\begin{aligned}
Y_{FDIC} &= z && \text{if } X > B + C,\\
&= -B_i + (B_i + z)(X - C)/B && \text{if } B + C > X > C,\\
&= -B_i && \text{if } C > X.
\end{aligned}
$$

Comparison with the case prior to DPL and increased collateralization implies that the change in the cash flows to a one-dollar par-value claim are

$$
\begin{aligned}
\Delta Y_{FDIC} &= 0 && \text{if } X > D > B + C,\\
&= \rho - (1+\rho)(X/D) + 1 && \text{if } D > X > B + C,\\
&= (1+\rho)[(X-C)/B - X/D] && \text{if } B + C > X > C,\\
&= -(1+\rho)[X/D] && \text{if } C > X > 0.
\end{aligned}
$$

Here, we have assumed that $D > B + C > C$. The decrease in the value of the FDIC's position can be expressed as

$$
\begin{aligned}
\text{(1A)}\quad \Delta V_{FDIC} &= R^{-1}(1+\rho)\{F(D) - \frac{1}{D} CEQ_0^D(\tilde{X})\\
&\quad - [F(B + C) - \frac{1}{B} CEQ_B^{B+C}]\\
&\quad - \frac{C}{B}[F(B + C) - F(C)]\}.
\end{aligned}
$$

## References

**Chen, A.H.** "Recent Developments in the Cost of Debt Capital," *Journal of Finance*, vol. 33, no. 3 (June 1978), pp. 863–77.

**Ely, B.** "Surprise Congress Just Enacted the Core Banking System," *American Banker*, vol. 158, no. 181 (September 21, 1993), p. 24.

**Federal Deposit Insurance Corporation.** *Failed Bank Cost Analysis: 1986–1992*. Washington, D.C.: FDIC, 1993.

**Hirschhorn, E., and D. Zervos.** "Policies to Change the Priority of Claimants: The Case of Depositor Preference Laws," *Journal of Financial Services Research*, vol. 4, no. 2 (July 1990), pp. 111–25.

**Osterberg, W.P., and J.B. Thomson.** "The Effect of Subordinated Debt and Surety Bonds on the Cost of Capital for Banks and the Value of Federal Deposit Insurance," *Journal of Banking and Finance*, vol. 15, nos. 4–5 (September 1991), pp. 939–53.

_____ **, and** _____ **.** "Underlying Determinants of Closed-Bank Resolution Costs," in F. Cottrell, M.S. Lawlor, and J.H. Wood, eds., *The Causes and Costs of Depository Institution Failures*. Boston: Kluwer Academic Publishers, 1995, pp. 75–92.

**Rehm, B.A.** "Budget Provision Threatens Credit of Weak Banks," *American Banker*, vol. 158, no. 148 (August 4, 1993), p. 1.

**Thomson, J.B.** "Modeling the Bank Regulator's Closure Option: A Two-Step Logit Regression Approach," *Journal of Financial Services Research*, vol. 6, no. 1 (May 1992), pp. 5–23.