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THE FEDERAL DEPOSIT INSURANCE FUND THAT DIDN'T BARK IN THE NIGHT

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ABSTRACT

Unlike the Federal Savings and Loan Insurance Corporation and the Bank Insurance Fund, the National Credit Union Share Insurance Fund (NCUSIF) entered the 1990s in a state of accounting solvency. This paper develops evidence to show the more important fact that NCUSIF remained solvent in a market-value sense as well. Differences in institutional product lines and risk-taking opportunities between credit unions and banks and thrifts are not consequential enough to explain the differences in their funds' health. This paper explains how differences in decisionmaking environments made managerial and regulatory risk-taking incentives in the credit-union industry diverge substantially from those governing banks and S&Ls. The differences in incentive structure support the hypothesis that private coinsurance could lessen taxpayer loss exposure elsewhere in the federal deposit insurance system.

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THE FEDERAL DEPOSIT INSURANCE FUND THAT DIDN'T BARK IN THE NIGHT

During the last decade, the United States' two major deposit insurance funds were tested severely. After accumulating a negative net worth of roughly $200 billion in present value, the Federal Savings & Loan Insurance Corporation (FSLIC) became defunct in 1989. Although it has since recovered, at the turn of the decade the Federal Deposit Insurance Corporation's Bank Insurance Fund (BIF) showed a shortfall in the accounting value of its net assets as well.

The question of how these deposit insurance funds become insolvent is hotly disputed. One school of thought blames the accession of incompetent and dishonest managers to positions of control at insured institutions. A second school associates fund losses with unlucky movements in important economic variables: interest rates, federal tax laws, and real-estate prices. A third school blames federal legislation for "deregulating" simultaneously the explicit interest rates deposit institutions could pay on deposits and the range of risky activities in which they could engage. A fourth school of thought fingers politicians and regulators for "desupervising" undercapitalized institutions in an environment that was rich in opportunities to shift risk to their deposit insurance fund.

To account for delays in identifying and adequately disciplining insolvent banks and thrifts, each explanation appeals to information blockages and incentive incompatibilities across an array of deposit-institution stakeholders. So far, little effort has been devoted to studying why these same blockages and incompatibilities failed to force the insolvency of a third federal deposit insurance fund. Just as the other funds, the National Credit Union Share Insurance Fund (NCUSIF) was exposed to managerial turnover, unlucky economic events, and financial deregulation. This paper's title implies that analysis of the incentive structure in which NCUSIF is embedded might give

economist detectives evidence of the type that the fictional Sherlock Holmes gleaned from observing a watchdog that failed to bark during a nocturnal raid by horse thieves.

To establish that NCUSIF remained economically solvent, our paper offers straightforward measures of the market value of the fund's net worth during 1987-1990. Analysis focuses on how managerial and regulatory incentives in the credit union industry differ from those for banks and S&Ls. This analysis of differential incentives sparks a concluding discussion of whether and how increased privatization might improve the federal deposit insurance system for intermediaries of any stripe.

I. Estimating NCUSIF Net Worth

a. Opportunity-Cost versus Accounting Values of Credit-Union Net Worth

Credit unions are tax-exempt deposit institutions that are owned and operated cooperatively by a community of "member" customers. Net earnings from loans that are not distributed to depositors flow into a capital account. As at a bank or S&L, capital is the value of an institution's assets net of its nonownership liabilities.

However, the beneficial ownership of a credit union's net worth is not fixed by contract. At each institution, the flow of benefits depends on how far loan and deposit interest rates vary respectively from members' opportunity costs (Smith, Cargill, and Meyer, 1981). A credit union's interest-rate policies vary dynamically with community politics. Boards and committees are nominated from the membership and elected on a one-member, one-vote basis. Even if each member's influence on loan and deposit pricing varied proportionately with the volume of business each member has currently booked with the credit union, large borrowers may have small deposits and large depositors may have small loans.

In 1970, a system of federal deposit insurance for credit unions was established and assigned to a newly created National Credit Union Administration (NCUA). Until then, federal responsibility for regulating credit unions lacked a permanent home.

Call-report data collected by NCUA develops accounting estimates of aggregate credit-union net worth. To translate these book values into opportunity-cost measures of net worth requires follow-up financial analysis. This paper estimates unbooked capital gains and losses for tangible balance-sheet items as a straightforward application of discounted present value.

b. Data Set

Our analysis values the NCUSIF fund in two steps. First, to mark the accounting net worth of individual credit unions to market, we rely on NCUA call-report data for 1987-1990. These data comprise more than 57,500 credit-union years of financial information. Yearend reporting is mandatory for federally insured credit unions and develops data on asset and liability portfolios, income and expenses for the previous year, and interest rates charged on loans and paid on deposits. Our second step is to link these data on individual credit-union condition with data on the determinants of institutional closures and NCUSIF losses. Our purpose in combining the two files is to extract an opportunity-cost measure of the fund's anticipatable loss exposure in operating credit unions.

Data on credit-union closures and closure costs cover 1988-1991. Some observations had to be deleted because we could not generate opportunity-cost measures of capital for the institution being closed. The edited sample includes 324 closures: 61 in 1988, 97 in 1989, 104 in 1990, and 62 during the first three quarters of 1991.

The time frame of the analysis is restricted by secular changes in the categorical format used by NCUA call reports. Formats in use before 1987 are unsuitable for opportunity-cost valuation. Our methods could be used by NCUA both to cover years after 1990 and to adapt reporting formats for future years to improve measurement accuracy.

c. Opportunity-cost estimates of individual credit-union capital

Call report income statements permit future cash flows to be projected and discounted for: loans (real estate, auto, and unsecured loans) and shares (drafts, savings, money market accounts, share certificates, and retirement accounts). Beginning in 1988, market values are reported directly (page 5, item 5 of the call report) for investments: Treasury securities; federal agency securities; and deposits in other institutions.

Variation in categorizations for different years require small adaptations in our methods. For concreteness, we concentrate on the procedure used for the 1990 format.

1) Investments

Table 1 presents average annual rates of return on credit-union investments. Reflecting the short maturity of the securities credit unions hold, realized returns move up and down with the yield on one-year Treasuries. The excess of investment returns over this Treasury yield tracks the extent to which credit-union portfolios include slightly longer and riskier securities.

Assigning a market value to investments took managers as long as two years to master. In 1988 and 1989, enough zeros were reported to force the average ratio of market to book for this item to 72 and 87 percent. When reporting problems resolved themselves in 1990, the market value of investments fell only 1.4 percent below book.

Attempts to "back-cast" the interest-induced losses assignable to prior years produced only a small increase in credit-union capital for 1989 and small decreases for 1987 and 1988. Combined with the arbitrariness of the back-casting assumptions we had to make, the small size of the imputed effects persuaded us to neglect unbooked net gains on investments in 1987-1989.

2) Loans

The market value of a loan portfolio may be conceived to be the discounted present value of well-informed projections of its net future cash flows. This value represents the dollar amount an informed institution would be willing to pay to acquire the loan portfolio.

Discounting seeks to apply an "appropriate" opportunity-cost rate to "appropriate" array of projected returns. We calculate the opportunity cost in each year as the industry-average rate of return quoted for each portfolio type. Returns are projected from observed rates of return and maturities on outstanding instruments.

The call report quotes a credit union's interest income from loans (page 3, item 47), loan servicing expenses (page 3, item 59), and loan portfolio's book value (page 1, item 8). A loan portfolio's projected rate of return, R_{loans}, is defined as the ratio of interest income net of loan servicing expense to the book value of loans. Average annual rates of return for credit-union loan portfolios are given in the second column of Table 1.

The call report quotes the current interest rates (page 4, items 5-9) charged on seven categories of loans: unsecured loans, new auto loans, used auto loans, first mortgages (fixed and adjustable), and second mortgages (fixed and adjustable). For each loan category, the industry average interest rate on new loans is defined to be the opportunity-cost or market rate of return, $E(R_i)$, for that type of loan.

To minimize distortions from outliers and recording errors, the data are passed through screens that eliminate doubtful observations. Any credit union whose loan portfolio returns less than zero or greater than 100% is excluded from opportunity-cost calculation and its loan portfolio is valued at book. This exception develops in 73 cases.

A second screen protects against reporting errors in the book value of loans. Any credit union is excluded from the opportunity-cost routine if the book value of any type of loan proves less than zero or greater than the book value of the firm's total loan portfolio. In the 9 cases in which this exception is triggered, the loan portfolio is valued at book.

For each credit union's loan portfolio, the opportunity-cost rate of return, $E(R_{loans})$, is defined as a weighted average of opportunity-cost interest rates for each category of loan. The weights are taken as the fraction of the book value of the credit union's total loan portfolio that is allocated to each loan type (page 1, items 1-7; page 4, items 18-19):

$$E(R_{loans}) = \sum_{i=1}^{7} w_i E(R_i),$$

$$w_i = \frac{\text{BV of loans of type i}}{\text{BV total loan portfolio}}$$

$E(R_i)$ = opportunity-cost rate of return on loans of type i.

Credit-union loan portfolios are modelled as fixed-annual-payment, T-year annuities. This assumption makes market values equal to:

$$MV_{loans} = [BV_{loans}] \left[\frac{R_{loans}}{E(R_{loans})}\right] \left[\frac{1 - (1+E(R_{loans}))^{-T}}{1 - (1 + R_{loans})^{-T}}\right] . \quad (1)$$

This formula is derived and applied to S&Ls by Yu (1991). Our model assigns the following maturity to each of the seven loan types: 1 year for unsecured loans; 2 years for new auto loans; 1 1/2 years for used auto loans; 15 years for fixed-rate first mortgages; 1/2 year for adjustable-rate mortgages (both firsts and seconds); and 10 years for fixed-rate second mortgages.

Sensitivity experiments were used to investigate the effects of: (1) narrowing the limits of our data screens; (2) lengthening the maturities assumed; and (3) averaging opportunity-cost loan rates over a subsample of strongly capitalized institutions. The values found for NCUSIF net worth prove relatively insensitive to these variations.

iii. Deposits

Credit-union deposits are marked to market value in the same way as loans. Revaluing deposits turns out to have little impact on credit-union capital because most credit-union deposits mature in less than one year (over 95% at yearend 1990).

iv. Market-value capital

The book value of capital shown on the credit-union call report is defined as reserves (page 2, items 43-44) plus retained earnings (page 2, item 45). Opportunity-cost adjustments are made for the difference between book and market values of investment, loans, and deposits, and allowances are added for reserves against investment and loan

losses (page 1, items 9 and 22). We choose not to capitalize fee income into credit-union capital because, during the sample time frame, fee income does is too small even to cover unclassified operating expenses.

The first column of Table 2 gives market-value estimates of aggregate credit-union capital. In each sample year, the credit-union industry as a whole shows positive net worth.

d. Opportunity-cost estimates of NCUSIF's capital position

Barth and Brumbaugh (1991) show that NCUSIF remained solvent on an accounting or book-value basis. However, accounting solvency need not imply economic solvency. The deposit-insurance literature hypothesizes that economic insolvency precedes accounting insolvency, because officials have strong incentives to mask weaknesses in a government fund when it first emerges (Kane, 1989; Office of Management and Budget, 1991). To determine whether NCUSIF's net worth remained positive on an opportunity-cost bases, analysts must look to the present value of projected future cash flows.

Industrial-organization theory implies that the forces of competitor entry and client substitution can be expected to drive the permanent economic value of NCUSIF's net premium income to zero. Invoking this condition makes it simpler to calculate the opportunity cost of NCUSIF net worth. It is necessary only to mark to market NCUSIF's tangible balance sheet and then to deduct its anticipatable exposure to future loss from client operations. We break the anticipatable loss exposure into two components: 1) NCUSIF's exposure to loss in the set of insured credit unions that our calculations assign negative market-value capital and 2) its exposure to loss in other credit unions.

NCUSIF's loss exposure in MV-insolvent credit unions can be conservatively estimated by these institutions' aggregate shortfall in market-value capital (MV shortfall). In open MV-insolvent institutions, NCUSIF is responsible for the downside of all future

returns, although a share of upside returns still promises to accrue to the credit union. The third column of Table 2 reports the MV shortfall.

NCUSIF's complementary exposure in MV-solvent credit unions is estimated in two steps. First, we estimate the probability that each credit union will be closed in the following year. Then, we apply this probability to an estimate of the costs of closure that would conditionally accrue.

The probability of closure is conceived to be a function of the ratio of a credit union's market-value capital to its outstanding shares (MVratio), the ratio of its book-value capital to outstanding shares (BVratio), and the inverse of the book value of shares (1/TotalShares). To estimate this probability, we use a logistic regression. The endogenous variable, CLOSED, takes the value 1 if the credit union is closed and the value 0 if it is not. Table 3 summarizes the regression estimates.

These probability estimates are doubly downward-biased if, as agency-cost theory and our market-value capital measures suggest, NCUA practices capital forbearance. First, the closure data are censored. We only classify a credit union as closed if NCUA closes it during a single-year time frame. Second, because we extrapolate from actual closures, our estimates of the probability of closure depend jointly on NCUA's ability to detect and its willingness to tolerate instances of unbooked market-value insolvency.

The statistical analysis shows that the probability of closure increases with the difference between a credit union's book-value and market-value capital ratios. To highlight this finding, Table 3 reports regression coefficients for this difference (β_2) and for the total effect of MVratio ($\beta_1 - \beta_2$). We interpret the coefficient pattern observed as evidence of forbearance. It implies that any leeway in accounting standards that is allowed to conceal an institution's accruing economic losses in the prior year influences significantly this year's odds of closure. This interpretation is supported by alternatively deleting market-value and book-value capital information from the regression. Using only the BVratio and 1/TotalShares as regressors, the influence of the BVratio becomes

negative, but is insignificant. Its coefficient becomes -.726, with a p-value of .257. Using only the MVratio and 1/TotalShares as regressors, the MVratio receives a coefficient of -1.31 and a p-value less than .001.

The logistic regression in Table 3 models the probability of closing an MV-solvent credit union as:

$$\pi_i = \frac{e^{Zi}}{1 + e^{Zi}}, \qquad (2)$$

where $Z_i = -5.35 - 14.94\text{MVratio}_i + 17.56\text{BVratio}_i + 20.6\text{TotalShares}$.

The conditional cost of closing a credit union is estimated from three sources: NCUA's 1988-1991 closure-loss data, our market-value capital figures, and call-report information We portray closure cost as a function of the market value of a credit union's capital (MVcap), the book value of its capital (BVcap), and the book value of its total shares (TotalShares). Table 4 develops the cost function as a heteroskedasticity-adjusted OLS regression (White, 1980). As we observed for the probability of closure, the conditional cost of closure increases with the gap between the book and market values of a credit union's capital. Table 4 reports regression coefficients for this gap (β_2) and for the total effect of the MVcap ($\beta_1 - \beta_2$) by itself. Our model portrays the cost of closing a credit union as:

$$\text{COST}_i = \max(0, -61010 - 1.17\text{MVcap}_i + 7.28\text{BVcap}_i + .05\text{TotalShares}_i). \qquad (3)$$

The expected cost of closing an individual credit union may be represented as the product: $\pi_i \text{COST}_i$. The probability the credit union would be closed comes from equation (2), and while the conditional cost of closure is given by equation (3). NCUSIF's total exposure in MV-solvent credit unions is the sum of the cost expected in each solvent institution. This exposure is given in the fourth column of Table 2.

The fifth column of Table 2 deducts the two categories of loss exposure from NCUSIF's reserves. The resulting measure of NCUSIF's market-value net worth remains positive between 1987 and 1990.

II. The Managerial Environment for Credit Unions

The cooperative structure of a credit union creates sources of firm value and systems for distributing claims on the value an institution accumulates that differ markedly from those of other deposit institutions. These differences make it less feasible for managers to pursue and to benefit from either corrupt lending or go-for-broke strategies of risk-taking.

a. Incentives for Private Monitoring

Three factors intensify the extent and quality of the private monitoring to which the actions and strategies of credit-union managers are subject. First, the economic net worth of the typical credit union includes the present discounted value of time and resources contributed by members and sponsors. Members and sponsors that contribute time and resources have both the incentive and the opportunity to monitor conflicts of interest and risk-taking activities undertaken by professional managers. In cases where the field of membership provides a meaningful link between members (e.g., a common employer or place of residence), sponsors and volunteers have considerable "inside" information about loan applicants' credit history and earnings potential that should make shifts in lending strategies easy for these parties to spot.

Second, the activities of credit-union managers and governing boards are bonded more extensively by outside private "sureties" than the managers of other depositories are. The term surety describes an entity that accepts responsibility for the performance of a designated contract between two other parties. In the credit-union movement, committee members and managers routinely bond themselves not only against fraud but also against failures to perform their duties faithfully and competently. This tradition of extensive bonding is rooted in credit unions' heavy use of volunteer staff, whose financial acumen and background are costly to assess and credibly signal to the membership. Bank and S&L managers are seldom bonded privately for anything but fraud, while

complementary insurance coverage purchased for directors and officers typically excludes all damage claims brought by regulatory agencies. Far more fully than is the case for the other two deposit-insurance funds, comprehensive bonding coverage exposes the industry's private sureties to claims treaceable to managerial mistakes and misbehavior that parallel the sources of liability their federal insurance fund faces. This makes the private surety into a coinsurer that has a strong financial incentive to monitor internal controls and managerial policies to restrain behaviors that threaten the federal fund.

The Credit Union Mutual Insurance Society (CUMIS, 1991) writes about 98 percent of credit union bonds and liability insurance. CUMIS focuses its audits on fraud and internal management controls. It reports that it targets a good portion of its audits each year as followups to tips it receives from government examiners and third-party credit-union managers.

Agency theory suggests that the monitoring done by a private surety whose profitability and survival are at risk may be expected to be superior to the quality and frequency of the monitoring done by federal employees. Shirking ought to be less, because the jobs and future incomes of the surety's employees would be contingent on the joint success of employee loss-control efforts. But even if private monitoring were merely of equal quality, complementary monitoring activity by independent private sureties that accept parallel exposures to loss-control events may be expected to reduce the federal insurer's loss exposure.

Third, since 1985 credit unions have faced what can be considered a deposit insurance premium "prepayment" system. Insured credit unions are required to hold one percent of their shares on deposit with NCUSIF. The Deposit is adjusted annually to reflect growth. Income from this "Capitalization Deposit" is assigned to meet NCUSIF's operating expenses and to cover the costs of closing insolvent credit unions. To supplement this income, NCUA can and does levy additional assessments as it deems

necessary. (As recently as September 1991, NCUA levied a special .0083-percent premium assessment on credit-union shares.) A fund of prepaid premiums better aligns credit unions' loss exposure with that of NCUSIF than the pay-as-you-go systems that has been used by other federal funds. Credit-union managers have strong incentives to alert private and federal monitors to corrupt, incompetent, or highly speculative activity at other credit unions when and as they learn of it. This is because each credit union's full Capitalization Deposit is at risk when other credit unions fail. The Deposit is permanent capital that cannot be removed from a credit union. This Deposit must be used up before the implicit taxpayer guarantees NCUSIF may be presumed to enjoy could be explicitly drawn upon.

Finally, in the face of widespread weakness NCUSIF cannot be pressured into reducing its monitoring effects by Congressional manipulation of budget appropriations or Treasury lines of credit. Even in emergencies, the Capitalization Deposit affords NCUSIF enough liquidity to close insolvent credit unions in timely fashion. In contrast, FSLIC was --and its successor fund and the Bank Insurance Fund remain-- dependent on Congress for emergency funding.

b. Opportunities for Managers to Benefit from Strategic Risk-Taking

Opportunities to bet the future of a credit union on large risky projects is limited not only by the monitoring system, but also by the field-of-membership requirement. This requirement has three effects.

First, it limits the firm's product line to contracts and activities that demonstrably serve its traditional customer base. For instance, Tripp and Smith (1993) find that, along with institutional size, a full-service orientation and a residential type of membership bond serve to distinguish credit unions that decided to offer first mortgage loans from those that did not. Second, field-of-membership limitations inhibit rapid growth by restricting the deposit base on which an aggressive credit-union manager might draw. Third, attempts to distribute a firm's surplus disproportionately to lenders, depositors, or

managers generate countervailing political pressures to protect the stakes of other members.

Smith, Cargill, and Meyer (1981) and Smith (1984) emphasize that the political nature of claims on accumulating credit-union capital makes value maximization an unattractive objective for credit-union managers. Moreover, unlike the carryover of net worth allowed in converting mutual S&Ls and savings banks into stockholder-owned institutions (Maksimovic and Unal, 1993), the cooperative structure of claims on a credit union must be explicitly resolved before the institution can be rechartered and reorganized in a stockholder form. This lessens incentive incompatibility vis-a-vis private sureties and federal insurers by making it difficult for managers to extract personal rewards from activities designed to increase the value of their institution's deposit insurance guarantee. In a stockholder organization, the capitalized value of the deposit guarantee is a component of its stock-market capitalization. Increases in guarantee value may be partitioned among managers, shareholders, and uninsured creditors by implicit and explicit forms of performance contracting.

Because credit-union members cannot freely convey to other parties their share of the institution's capital, the near-permanence of the cooperative form discourages rapid institutional growth. Taking additional deposits dilutes existing members' capital stakes. At economically solvent institutions, dilution makes rapid growth costly to informed old members, while credit unions that are known to be insolvent offer losses to informed new members. For example, let us assume a credit union that finances $120 worth of marketable assets by raising $10 each from 10 depositor-members in deposits. If this institution uses an additional $100 in deposits from new members to buy $100 in new assets, its original members' capital stakes halve, falling from (120 - 100)/10 = $2 to (220 - 200)/20 = $1. On the other hand, if the credit union's assets were worth only $80, each new $10 deposited would accrue a negative capital stake of $1. The inability either to liquify the value of their organization's deposit guarantee or to withdraw

straightforwardly their claim on organizational capital makes credit-union managers and members either less willing or less able to support the high-risk investment strategies and high rates of asset growth that many deeply troubled banks and S&Ls have pursued.

III. Implications for Improving Federal Deposit Insurance Loss Exposure

Throughout 1987-1990, the National Credit Union Share Insurance Fund remained market-value solvent. We show that NCUSIF's ability to stay solvent while the deposit insurance funds for both banks and S&Ls slid underwater may be attributed to better incentives for maintaining solvency imparted by more and better private monitoring and by managers' lesser capacity to appropriate institutional capital for themselves.

Focusing on 19th century and early 20th century experience, Calomiris (1992) similarly demonstrates that agency theory can explain historically which of 14 state-sponsored deposit-insurance schemes did and did not go broke. Agency theory can also explain how Denmark avoided the banking disaster that overtook Norway and Sweden in 1992 (Bernard, Merton, and Palepu, 1992) Across these samples, agency theory not only serves to explain why particular government-sponsored deposit insurance funds became insolvent, it serves to explain how and why others resisted insolvency.

In any government insurance fund, hard-to-resolve conflicts of interest exist both for incumbent politicians and for the officials they appoint to administer it. The better authorities can conceal instances of fund insolvency, the more strongly they are tempted to defer loss-control actions that threaten to prove politically and reputationally costly to them. Loss-control deferral need not prove self-defeating for authorities because inadequacies in loss control have little effect on the value of government guarantees. The value of government guarantees is rooted in authorities' ability to force taxpayers and well-capitalized institutions to bail out the fund when and if it serves their interest to do so.

To reduce the scope for self-serving procrastination by regulatory officials, the FDIC Improvement Act of 1991 recognizes that action-forcing pressure is required. Agency theory clarifies that this pressure might more appropriately come from resolving and pricing agency costs across the full chain of deposit-insurance stakeholders. Opportunities for pricing and resolving agency costs can be expanded by making conflicted behavior easier to observe. One way to do this is to develop private coinsurance and subordinated-debt arrangements that make the consequences of loss-control behavior register straightforwardly in financial markets (Barth, Bartholomew, and Bradley, 1991; Wall, 1989).

A carefully designed partnership between private sureties and federal deposit insurers can persist without taxpayer bailouts. Our analysis of NCUSIF experience shows that combining a private surety with prepayment of government insurance premiums creates incentives that reduce opportunities for officials to shift deposit-institution losses implicitly to federal taxpayers. The June 1993 entry of USF&G Corp. into credit-union bonding confirms the instinctive academic presumption that, thanks to its ability to reduce agency costs, new capital can anticipate earning an attractive return in a private surety that seeks to coinsure federal deposit-insurance loss exposure.

REFERENCES

Barth, James R., Philip Bartholomew, and Michael Bradley. "Reforming Federal Deposit Insurance: What Can Be Learned from Private Insurance Practices?," Consumer Finance Quarterly Report 45(1991), pp. 140-147.

Barth, James R. and R. Dan Brumbaugh. The Credit Union Industry: Financial Condition and Policy Issues. California Credit Union League, 1991.

Bernard, Victor, Robert Merton, and Krishna Palepu. "Market-to-Market Accounting for U.S. Banks and Thrifts: Lessons from the Danish Experience," presented at the Accounting Research Colloquium, Ohio State University (May 8, 1992).

Calomiris, Charles W. "Getting the Incentives Right in the Current Deposit Insurance System: Successes from the Pre-FDIC Era," in James R. Barth and R. Dan Brumbaugh, Jr. (ed.), The Reform of Federal Deposit Insurance: Disciplining Government and Protecting Taxpayers. New York: Harper-Collins, 1992.

CUMIS Insurance Society, Inc. "The CUMIS Directors and Officers Endorsement and the Regulatory Exclusion." Madison, WI (April 4, 1991), unpublished.

CUNA. Comments on the U.S. Treasury Department's Study on the Federal Deposit Insurance System. Credit Union National Association, Inc., 1990.

Fama, Eugene and Michael Jensen. "Separation of Ownership and Control," Journal of Law and Economics 26 (1983), 301-325.

Kane, Edward J. "Changing Incentives Facing Financial-Services Regulators," Journal of Financial Services Research, 2(1989), pp. 263-272.

Office of Management and Budget. Budgeting for Federal Deposit Insurance, Office of Management and Budget, Washington, D.C., 1991.

Smith, Donald J. "A Theoretic Framework for the Analysis of Credit Union Decision Making," Journal of Finance, 39(1984), pp. 1155, 1168.

Smith, Donald J., Thomas Cargill, and Robert Meyer. "An Economic Theory of a Credit Union," Journal of Finance, 36(1981), pp. 519-528.

Tripp, James D., and Stanley Smith. "U.S. Credit Union Motivation for Involvement in the First-Mortgage Market," Journal of Real Estate Finance and Economics, 7(1993) pp. 229-236.

Wall, Larry D. "A Plan for Reducing Future Deposit Insurance Losses: Puttable Subordinated Debt," Economic Review, Federal Reserve Bank of Atlanta, pp. 2-17.

White, Halbert. "A Heteroskedasticity-Consistent Covariance Matrix Estimator and a Direct test for Heteroskedasticity, "Econometrica 48 (1980), 817-838.

Yu, Min-Teh. Taxpayer Losses in the S&L Insurance Fund, 1985-1989, unpublished Ph.D. dissertation, Columbus: The Ohio State University, 1991.

Table 1: Average Annual Rates of Return on Credit-Union Assets, 1987-1990 (in percent per annum)

Year	Investments	Loans	One-Year Rate on U.S. Treasuries*
1987	8.43	11.79	6.77
1988	9.50	11.34	7.65
1989	9.87	11.78	8.53
1990	8.20	12.07	7.89

* U.S. Treasury series of yields on actively traded issues adjusted to constant maturities (taken from Federal Reserve Bulletins)

Table 2: Opportunity-Cost (MV) Estimates of Credit-Union Capital and the Net Worth of The National Credit Union Share Insurance Fund (Yearend, in $billions).

Year	Aggregate MV of CU Capital	NCUSIF's Reserves *	MV Capital Shortfall in Insolvent CUs	NCUSIF's Exposure in MV-Solvent CUs	NCUSIF's MV Net Worth **
1987	4.37	1.60	1.02	.37	.21
1988	7.88	1.86	.43	.69	.74
1989	11.95	1.97	.03	.73	1.21
1990	13.53	2.05	.90	.88	.27

* Source: NCUSIF Financial Highlights, 5/31/93.

** column 2 minus columns 3 and 4.

Table 3: Logistic Regression Estimating the Probability that a Credit Union is Closed

$$CLOSED = \beta_0 + \beta_1 MVratio_i + \beta_2 (BVratio_i - MVratio_i) + \beta_3 (1/TotalShares_i) + \epsilon_i,$$

CLOSED	= 1 if a credit union was closed 0 if it was not
MVratio	= market value of capital divided by total shares
BVratio	= book value of capital divided by total shares
TotalShares	= total outstanding shares.

	Estimated coefficient	Standard error	x^2
β_0	-5.35*	.16	1109
$\beta_1 - \beta_2$	-14.94*	2.15	49
β_2	17.56*	2.91	37
β_3	20.60	26.10	2

model loglikelihood = 1151
covariate Score x^2 = 139*
correct predictions = 72.1%
N = 42968

* $p < .0001$

Table 4: OLS Regression Estimates of the Cost of Closure, Using White's Adjustment for Heteroskedasticity

$$COST_i = \beta_0 + \beta_1 MVcap_i + \beta_2 (BVcap_i - MVcap_i) + \beta_3 TotalShares_i + \epsilon_i ,$$

COST	= NCUSIF's closure cost
MVcap	= market value of closed credit union's capital
BVcap	= book value of closed credit union's capital
TotalShares	= closed credit union's total outstanding shares.

	Estimated coefficient	Standard error	t-stat
β_0	-61010	159210	.38
$\beta_1 - \beta_2$	-1.17 *	.51	2.30
β_2	7.28 **	1.76	4.12
β_3	.051	.043	1.18

model F = 23.23 **
adj. R^2 = .18
N = 324

** $p < .0001$
* $p < .01$