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The Impact of Federal Deposit Insurance on Savings and Loan Failures

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I. Introduction

The failure rate of federally insured Savings and Loans (S&Ls) has reached proportions unprecedented since the Depression years prior to 1934. From the beginning of 1934 through the end of 1979, the S&L industry experienced comparatively few failures. Indeed, there were some 14 years during this period when not a single federally insured S&L failed. In addition, there were some eight years over this time span that witnessed only one failed federally insured S&L. Moreover, the number of failed federally insured S&Ls reached double figures only three times over this entire period: 13 failures in 1941 and ten failures each in 1966 and 1970. Unfortunately, this record became blemished in the turbulent 1980s, when, according to Barth [2], some 525 federally insured S&Ls failed.

Barth [2, 100–101] has argued that federal deposit insurance has encouraged the S&Ls to take on additional risk and that in so doing federal deposit insurance has significantly contributed to the S&L crisis. Barth [2, 100] charges that ". . . the very availability of such insurance enabled many inadequately capitalized savings and loans to engage in high-risk activities and to gamble for resurrection." Barth [2, 101] in fact alleges that ". . . the federal deposit insurance system was the unifying cause of the savings and loan disaster." In point of fact, Barth's arguments are in principle consistent with the arguments in many other studies [4; 21; 23; 24; 33].

The purpose of this paper is to test empirically the hypothesis that federal deposit insurance has in fact acted significantly to raise the S&L failure rate. Section II below develops the basic model. The model includes a variety of factors in addition to federal deposit insurance that are alleged by Barth [2] and others to have induced the S&L failure problem. Section III provides the empirical analysis. The focus is on two measures of the S&L failure rate: (1) the percentage of federally insured S&Ls failing and (2) the number of federally insured S&Ls failing. Given certain limitations on data availability, the time period studied runs from 1965–1989. In addition, of necessity, the basic data used in this study are annual. Conclusions are provided in section IV.

II. The Basic Framework

We begin the analysis by focusing on the potential impact of federal deposit insurance on S&L failures. The basic argument regarding federal deposit insurance and S&L risk-taking incentives is actually a rather simple one. We begin by noting that, in point of fact, S&Ls that are technically

insolvent are oftentimes not closed (or merged with another institution) until their net worth is very significantly negative. For one thing, since it is often very difficult to assess the financial viability of various S&L assets, especially real estate loans, an institution's insolvency is very difficult to determine. In addition, federal agencies, such as the (now-defunct) FSLIC, lack (lacked) the authority to immediately close S&Ls judged to be insolvent. Indeed, the agency that chartered the S&L in question had to determine institutional insolvency before the FSLIC could take action. Clearly, given the existence of federal deposit insurance, S&Ls near insolvency, becoming insolvent, expecting insolvency, or actually insolvent were provided a strong incentive to take greater risks in the pursuit of greater rates of return because they were, in effect, gambling for financial resurrection using the FSLIC's money and little if any of their own [2; 4; 21; 23; 24; 33]. As Kane [24, 219] so clearly points out, ". . . the FSLIC subsidizes its clients' risk-taking . . . ." If the riskier undertakings proved unprofitable or resulted in a major loss, it was the federal insurer's funds, not the S&L's own capital, that was at risk. In other words, federal (FSLIC) deposit insurance enabled and actually encouraged S&Ls that desperately needed profits in order to avoid outright failure to take greater risks in the hope of a greater rate of return; if the venture failed, it was the FSLIC that would be liable for depositor losses, not the S&L. Naturally, by inducing greater risk-taking activities on the part of S&Ls, the federal deposit insurance exposed the S&Ls to a greater probability of failure.

The ceiling on FSLIC insurance per account was $5,000 from 1934 through 1949. The ceiling was then increased to $10,000 in 1950, where it remained through 1965. It was again increased in 1966 to $15,000, and then quickly raised again, effective in 1969, to $20,000. From 1974 through 1979, it was set at $40,000 (for non-government accounts). Finally, as of 1980, it was set at $100,000. Table I provides the ceiling amount per account of FSLIC deposit insurance, expressed in 1982 dollars, for the years 1963 through 1989. The surges in the *real* FSLIC insurance ceiling clearly correspond to the surges in the *nominal* FSLIC insurance ceiling over this period. It is hypothesized here, based on the aforementioned literature and arguments, that the higher the ceiling level of FSLIC deposit insurance, the greater the incentive for S&Ls to take risk and hence the greater the likelihood of S&L failures.

A number of additional factors are also to be included in the analysis. For one thing, there was the 1981–1982 recession. This recession was quite severe as well as protracted [2; 13; 15; 18; 30]. Among others, Barth [2] argues that this recession severely hurt the real estate industry, which was already at the time beleaguered by high mortgage rates. As a consequence, S&L profitability and solvency were both severely compromised. Another potential factor in the S&L crisis was the price of crude petroleum. The decline in crude oil prices from 1981 through 1985, combined with the marked price decline of crude petroleum between 1985 and 1986, appears to have hurt the real estate industry, especially in the Southwest [20; 2], and to have thereby significantly reduced S&L profitability and solvency. The empirical analysis in section III explicitly allows both for the 1981–1982 recession (with a binary variable) and for the price of crude petroleum.

Another set of factors relates to interest rates. Clearly, S&L profitability is significantly tied to the cost of funds and to the mortgage rate, as well as the volatility thereof. As elaborated upon by Carron [12], Barth [2], and others, the higher the cost of funds to S&Ls, the lower the S&L profitability will tend to be and hence the higher the probability of S&L failures will tend to be, *ceteris paribus*. This rudimentary argument of course parallels that applying to commercial banks [8]. On the other hand, it also follows from rudimentary micro-theory that, *ceteris paribus*, the higher the mortgage rate, the higher the S&L profitability and hence the lower the probability of S&L failures. In order to reflect the cost of funds, in section III we use the available annual data

Table I. FSLIC Deposit Insurance Ceiling, 1982 Dollars

Year	Insurance Ceiling per Account	Year	Insurance Ceiling per Account
1963	$ 30864	1977	59435
1964	30395	1978	55402
1965	29586	1979	50891
1966	42857	1980	116686
1967	41782	1981	106383
1968	39788	1982	100000
1969	50251	1983	96246
1970	47619	1984	92851
1971	45045	1985	90171
1972	43011	1986	87796
1973	40404	1987	84962
1974	74074	1988	81367
1975	67453	1989	79365
1976	63391		

on the cost of funds to S&Ls per se; to reflect mortgage rates, we use the available annual data on he S&L mortgage portfolio yield. Naturally, since both of these variables are annual in nature, hey are merely annual averages and hence do *not* fully describe either the maximum or minimum nterest rate levels attained in any year or the true volatility of interest rates over the course of any given year or other time period.

In any event, Barth [2, 38] argues that "In the late 1970s and early 1980s, interest rates ose to unexpectedly high levels and became extremely volatile." Barth [2, 38] further argues hat "Contributing to the large fluctuations in nominal interest rates were inflationary expectations nd actions taken by the Board of Governors of the Federal Reserve System in the fall of 1979 dampen those expectations." The latter policy is of course the well-known Federal Reserve olicy shift of October, 1979; this shift has been examined extensively [1; 2; 9; 15; 16; 17; 32]. s stated by Evans [17, 83], ". . . the Federal Reserve had stabilized interest rates over most of e postwar period . . ." However, Evans [17, 83] observes that, beginning in October of 1979, . . . the Federal Reserve largely freed interest rates to seek their own levels . . ." In evaluating is policy shift, most studies are in agreement with Barth [2, p. 38] that the shift in question d in fact increase interest rate volatility. For instance, Degen [15, 209] observes that "In order show its determination to halt inflation, the Federal Reserve committed itself to targeting the oney supply even if large fluctuations in interest rates would have to be tolerated." And Walsh 2, 133] observes that "One expected result of such a policy shift was an increase in the . . . latility of market interest rates, and this did occur." Indeed, Walsh [32, 133] goes on to add at ". . . the increase in interest rate fluctuations was very large, probably much larger than was ticipated."

Before proceding, it is appropriate to note the observation by Abell [1, 67] that ". . . the deral Reserve in October, 1982 abandoned its non-borrowed reserves operating procedure in or of what was equivalent to an interest rate targeting procedure again." Moreover, this Octo-, 1982 Federal Reserve policy shift has been similarly characterized by others as well [19]. To lect the impact of such policy shifting (*as well as other factors*) on interest rate volatility during entire 1965–1989 period studied, we adopt the variable VOL_t. Using the 12 average monthly lds on new home mortgages in each year t (FHLBB series), VOL_t is the variance of that yield year t.

Next, we address the issue of S&L capital requirements. It has been argued by Barth [2], Kaufman and Kormendi [25], and others that, as the regulators reduced the S&L capital requirement over time, the thinning capital "cushion" exposed S&Ls to a higher risk of failure. In other words, it is hypothesized here that, as a practical matter, we would expect that the S&L failure rate would be a decreasing function of the S&L capital requirement. To test this part of the model, section III uses the actual regulatory capital requirement at S&Ls over the time period studied.

Finally, we note that a number of studies have argued that the Tax Reform Act of 1986 adversely impacted upon the real estate industry [2; 7; 26; 29]. Through a variety of provisions, dealing with such items as depreciation allowances, capital gains taxation, and limitations on the tax deductibility of losses on "passive" investments, this statute reduced the attractiveness of real estate purchases and ownership. All things considered, as Sanger, Sirmans, and Turnbull [29, 421] observe, "For the 1986 Tax Reform Act, the results indicate that the market assessed the changes to be detrimental to the owners of real estate assets." In turn, as argued by Barth [2], since the Tax Reform Act of 1986 was detrimental to the real estate industry, it also adversely impacted upon the profitability of and solvency of the S&Ls. In the empirical estimates below, we adopt a dummy variable to capture the alleged effects of this tax statute on the S&L crisis.

III. Empirical Findings

We begin our empirical analysis with the observation that there are at least two ways to measure the extent of S&L failures: (1) the *percentage* of federally insured S&Ls that failed over a given time period; and (2) the *number* of federally insured S&Ls that failed over a given time period. Arguably, the former may be a superior measure of the S&L problem since it provides a *relative* measure of the extent of the S&L crisis. Nevertheless, in order to provide a broader perspective on the issue at hand, we provide empirical evidence on both of these measures of the S&L crisis. Next, we also observe that the impact of many of the hypothesized causal variables on S&L failures is unlikely to be instantaneous, suggesting that time lags must be built into the equations to be estimated.

Based upon the analysis provided in section II above, we initially estimate the following two reduced-form equations:

$$\begin{aligned} PSL_t = {} & a_0 + a_1 RINS_{t-2} + a_2 REC_{t-2} + a_3 RP_{t-2} + a_4 COST_{t-1} \\ & + a_5 MORT_t + a_6 VOL_t + a_7 CAP_{t-2} + a_8 TXR_{t-2} + u_1 \end{aligned} \tag{1}$$

$$\begin{aligned} NSLt = {} & b_0 + b_1 RINS_{t-2} + b_2 REC_{t-2} + b_3 RP_{t-2} + a_4 COST_{t-1} \\ & + b_5 MORT_t + b_6 VOL_t + b_7 CAP_{t-2} + b_8 TXR_{t-2} + u_2 \end{aligned} \tag{2}$$

where:

PSL_t = the percentage of federally insured S&Ls that failed in year t;
NSL_t = the number of federally insured S&Ls that failed in year t;
a_0, b_0 = constants;
$RINS_{t-2}$ = the FSLIC insurance ceiling per account on deposits at S&Ls in year $t - 2$, expressed in thousands of 1982 dollars (1982 = 100.0);
REC_{t-2} = a dummy (binary) variable indicating whether the U.S. economy was in the 1981–1982 recession in year $t - 2$; $REC_{t-2} = 1$ for such years and $REC_{t-2} = 0$ otherwise;

RP_{t-2} = the average price per barrel of imported crude oil in year $t-2$, expressed in 1982 dollars;

$COST_{t-1}$ = the average cost of funds to S&Ls in year $t-1$, expressed as a percent per annum;

$MORT_t$ = the average S&L mortgage portfolio yield in year t, expressed as a percent per annum;

VOL_t = the variance in year t of the yield (using monthly data expressed as a percent, to compute the variance) on new home mortgages (FHLBB series);

CAP_{t-2} = the average required S&L capital-to-asset ratio in year $t-2$; this ratio of required capital to assets is expressed as a percent;

TXR_{t-2} = a dummy (binary) variable indicating whether year $t-2$ was a full year during which the 1986 Tax Reform Act was in effect; $TXR_{t-2} = 0$ for such years and $TXR_{t-2} = 1$ otherwise;

u_1, u_2 = stochastic error terms.

The data for variables $MORT_t$ and $COST_{t-2}$ are unavailable for the years prior to 1965. Consequently, our empirical estimates are for the period 1965–1989.[1]

The data sources are, as follows: PSL_t, NSL_t, and CAP_{t-2} are from Barth [3]; the *current dollar* price of imported crude oil is from the *Statistical Abstract of the United States*, various issues; $MORT_t$, $COST_{t-2}$, and the *current dollar* FSLIC deposit insurance ceiling per account are from the *1989 Savings & Home Financing Source Book*; the GNP deflator used to convert the current dollar price per barrel of imported crude petroleum into *real* terms (1982 dollars), RP_{t-2}, and to convert the FSLIC deposit insurance ceiling into *real* terms (1982 dollars), $RINS_{t-2}$, was obtained from the *Economic Report of the President, 1990*; the data to compute VOL_t were obtained from the *Annual Statistical Digest* of the Federal Reserve System.

Based upon the arguments summarized in section II above, we expect the following signs on the coefficients in equations (1) and (2):

$$a_1, b_1 > 0, \quad a_2, b_2 > 0, \quad a_3, b_3 < 0, \quad a_4, b_4 > 0,$$
$$a_5, b_5 < 0, \quad a_6, b_6 > 0, \quad a_7, b_7 < 0, \quad a_8, b_8 < 0.$$

Estimating equations (1) and (2) by OLS, using the Cochrane-Orcutt procedure to correct for first-order serial correlation, yields equations (3) and (4), respectively:

$$\begin{aligned} PSL_t = {} & 33.47 + \underset{(+4.61)}{0.08RINS_{t-2}} + \underset{(+3.18)}{2.53REC_{t-2}} - \underset{(-6.50)}{0.57RP_{t-2}} \\ & + \underset{(+3.17)}{1.81COST_{t-1}} - \underset{(-4.87)}{2.72MORT_t} + \underset{(+2.12)}{2.96VOL_t} - \underset{(-6.54)}{3.50CAP_{t-2}} \\ & - \underset{(-5.76)}{5.84TXR_{t-2}}, \quad DW = 2.01, \quad Rho = -0.03, \quad R^2 = 0.90 \end{aligned} \tag{3}$$

$$\begin{aligned} NSL_t = {} & 987.7 + \underset{(+4.56)}{2.33RINS_{t-2}} + \underset{(+3.04)}{71.86REC_{t-2}} - \underset{(-6.40)}{16.6RP_{t-2}} \\ & + \underset{(+3.22)}{54.6COST_{t-1}} - \underset{(-4.85)}{81.2MORT_t} + \underset{(+2.16)}{89.3VOL_t} - \underset{(-6.42)}{103.1CAP_{t-2}} \end{aligned}$$

1. However, estimates of $COST_{t-2}$ are available for the years 1963 and 1964 and were in fact used in this study.

$$- \underset{(-5.85)}{174.2TXR_{t-2}}, \quad DW = 1.96, \; Rho = -0.01, \quad R^2 = 0.90 \tag{4}$$

where terms in parentheses beneath coefficients are t-values.

As shown in equations (3) and (4), all 16 of the estimated coefficients exhibit the expected signs. In addition, 14 of the 16 estimated coefficients are statistically significant at the one percent level, and the remaining two are significant at the five percent level. The coefficient of determination in both estimates is 0.90, so that the model explains roughly 90 percent of the variation in the dependent variables.

The results provided in equations (3) and (4) imply, among other things, that S&L failures (whether measured by PSL_t or NSL_t) are (as expected) an increasing function of REC_{t-2}, $COST_{t-1}$, and VOL_t, whereas they are a decreasing function of $MORT_t$, RP_{t-2}, CAP_{t-2}, and TXR_{t-2}. Perhaps most relevantly, in terms of the basic objective of this study, the evidence indicates that S&L failures (PSL_t and NSL_t) are an increasing function of the real ceiling (per account) on federal deposit insurance. This finding strongly supports the aforementioned arguments by Barth [2], Barth and Bradley [4], Kane [23; 24], Jaffee [21], and White [33].

Moreover, this same basic conclusion is generated even if we substitute the *current dollar* value of the FSLIC insurance ceiling per account (INS_{t-2}, expressed in thousands of current dollars) for $RINS_{t-2}$ in equations (1) and (2). To illustrate, we now estimate equations (1) and (2), given this substitution; the OLS results, after having used the Cochrane-Orcutt procedure to correct for first-order serial correlation, are given by equations (5) and (6):

$$\begin{aligned} PSL_t = {} & 14.37 + \underset{(+6.92)}{0.085INS_{t-2}} + \underset{(+4.01)}{2.34REC_{t-2}} - \underset{(-6.43)}{0.44RP_{t-2}} \\ & + \underset{(+1.97)}{0.93COST_{t-1}} - \underset{(-3.14)}{1.42MORT_t} + \underset{(+2.37)}{2.26VOL_t} - \underset{(-2.21)}{1.14CAP_{t-2}} \\ & - \underset{(-5.91)}{4.54TXR_{t-2}}, \quad DW = 2.01, \; Rho = -0.04, \; R^2 = 0.93; \end{aligned} \tag{5}$$

$$\begin{aligned} NSL_t = {} & 432.6 + \underset{(+7.04)}{2.53INS_{t-2}} + \underset{(+3.95)}{67.6REC_{t-2}} - \underset{(-6.41)}{12.71RP_{t-2}} \\ & + \underset{(+1.99)}{27.9COST_{t-1}} - \underset{(-3.28)}{43.6MORT_t} + \underset{(+2.59)}{72.3VOL_t} - \underset{(-2.24)}{33.7CAP_{t-2}} \\ & - \underset{(-6.09)}{136.0TXR_{t-2}}, \quad DW = 2.00, \; Rho = -0.04, \; R^2 = 0.93. \end{aligned} \tag{6}$$

The results shown in equations (5) and (6) are entirely compatible with those in the estimated equations (3) and (4) above. Perhaps of greatest relevance, given the objective of this study, is the fact that S&L failures (PSL_t and NSL_t) are an increasing function of the federal deposit insurance ceiling per account. Based on equations (3), (4), (5), and (6), this finding apparently obtains whether that ceiling is expressed in real terms or in nominal terms.

It should be noted that a variety of alternative lag structures within the same basic model also yield the above conclusion. In addition, it should be noted that variations on the basic model yield the aforementioned conclusion as well.[2] For example, consider the following variation on equations (1) and (2):

2. We have experimented with a number of different variables to reflect Regulation Q, which Ritter and Silber [28, 97] view as causing ". . . financial disintermediation during the tight money episodes of the 1960s and 1970s, and

$$PSL_t = c_0 + c_1 RINS_{t-2} + c_2 VOL_t + c_3 RP_{t-2} + c_4 COST_{t-2} + c_5 MORT_t + c_6 CAP_{t-2} + u_3 \quad (7)$$

$$NSL_t = d_0 + d_1 RINS_{t-2} + d_2 VOL_t + d_3 RP_{t-2} + d_4 COST_{t-2} + d_5 MORT_t + d_6 CAP_{t-2} + u_4 \quad (8)$$

where:

c_0, d_0 = constants;
u_3, u_4 = stochastic error terms.

Estimating the reduced-form equations (7) and (8) by OLS, using the Cochrane-Orcutt procedure to correct for first-order serial correlation, yields equations (9) and (10), respectively:

$$\begin{aligned} PSL_t = {} & 16.99 + \underset{(+3.35)}{0.07 RINS_{t-2}} + \underset{(+2.87)}{4.12 VOL_t} - \underset{(-3.75)}{0.31 RP_{t-2}} \\ & + \underset{(+2.64)}{1.32 COST_{t-2}} - \underset{(-3.07)}{1.79 MORT_t} - \underset{(-2.80)}{1.33 CAP_{t-2}}, \\ & DW = 2.12, \quad Rho = -0.12, \quad R^2 = 0.79 \end{aligned} \quad (9)$$

$$\begin{aligned} NSL_t = {} & 423.2 + \underset{(+3.36)}{1.96 RINS_{t-2}} + \underset{(+3.03)}{129.21 VOL_t} - \underset{(-3.68)}{9.04 RP_{t-2}} \\ & + \underset{(+2.68)}{39.85 COST_{t-2}} - \underset{(-3.15)}{54.67 MORT_t} - \underset{(-2.77)}{39.38 CAP_{t-2}}, \\ & DW = 2.11, \quad Rho = -0.11, \quad R^2 = 0.78. \end{aligned} \quad (10)$$

In estimates (9) and (10), all 12 of the estimated coefficients exhibit the expected signs and are significant at the two percent level or better. Indeed, ten of these estimated coefficients are significant at the one percent level. Of greatest relevance to the objectives of this paper are the signs and significance levels of the estimated coefficients on the variable $RINS_{t-2}$. In both of these estimations, the coefficients on variable $RINS_{t-2}$ are positive and statistically significant at the one percent level. These results are consistent with the earlier findings in this paper and imply, as Barth [2], Barth and Bradley [4], Kane [23; 24], and others have so vehemently argued, that the federal deposit insurance system has significantly contributed to the S&L crisis.[3]

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again in 1981." Others make similar arguments [11]. In the various estimates generated, we found no substantive support for the idea that Regulation Q per se induced significant S&L failures.

3. One alternative formulation to equation (7) is illustrated by the OLS estimation below, where the Cochrane-Orcutt procedure was used (once again). In this case, the variables $COST_{t-2}$ and $MORT_t$ in (7) are replaced by the ratio $(COST_{t-2}/MORT_t)$, which is expressed as a percent per annum. The results are, as follows:

$$\begin{aligned} PSL_t = {} & -5.98 + \underset{(+2.59)}{0.14(COST_{t-2}/MORT_t)} + \underset{(+2.59)}{0.05 RINS_{t-2}} - \underset{(-1.94)}{0.57 CAP_{t-2}} \\ & + \underset{(+1.99)}{2.27 VOL_t} - \underset{(-4.08)}{0.33 RP_{t-2}}, \quad DW = 1.99, \quad Rho = -0.09, \quad R^2 = 0.62. \end{aligned}$$

Yet again, federal deposit insurance is shown to raise the S&L failure rate (PSL_t). The same conclusion can be shown to apply for NSL_t.

IV. Conclusion

Barth [2; 3], Barth and Bradley [4], Jaffee [21], Kane [23; 24], White [33], and others have argued that the federal deposit insurance system has adversely impacted upon the economic health of the S&L industry. The empirical findings provided in this paper have generated strong empirical support for this argument. Correspondingly, our empirical findings are strong evidence of a need for a major reform of the existing system. The literature on reforming the federal deposit insurance system is well developed [2; 4; 10; 14; 21; 22; 23; 33]. On the basis of our findings, we would argue that at least one part of said reform would seem to be a limitation on the ceiling on federal deposit insurance per account or per depositor; perhaps even a cut in that ceiling would be beneficial. In any event, given the variety of sensible reforms that have been proposed in the literature, it clearly is time for meaningful action on federal deposit insurance reform!

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