

Ownership Structure, Charter Value, and Risk-Taking Behavior for Thrifts

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This paper investigates the relationships among manager ownership, charter value, and thrift risk-taking for 1986 to 1995, a decade of significant regulatory change. We hypothesize that during periods of regulatory laxity and low charter values, manager-owned thrifts are likely to engage in unprofitable risk-taking. However, for periods of regulatory efficacy and high charter values, manager-owners are likely to engage in profitable risk-taking. In support of these premises, we find that manager-owned thrifts exhibit unprofitable risk-taking in the mid-1980s, years of regulatory laxity and low charter values, but demonstrate profitable risk-taking in the mid-1990s, a period of more stringent regulations and high charter values.

■ In the 1980s, the thrift and banking industries in the United States suffered declining profits, rising systemic risk, and the failure of more than 700 savings and loans (S&Ls) and 1,200 banks. The Government Accounting Office estimates the total resolution cost for S&L failures alone to be almost 0.5 trillion dollars.¹ To forestall future crises, policy-makers are searching for underlying factors that contribute to bank/thrift mismanagement. Since hundreds of S&Ls converted

to stock ownership during the 1980s and stock-chartered S&Ls accounted for 77% of S&L failure-resolution costs, ownership structure is frequently cited as a contributing factor.²

Under a moral-hazard hypothesis, financial economists point out that a fixed-premium deposit insurance system provides bank stockholders with incentives to take on excessive risk to maximize the value of their put-option subsidy on deposit insurance (Marcus and Shaked, 1984; Merton 1977). Regulators restrain such incentives by threatening to interfere in a bank's operations and to revoke a bank's valuable charter (Buser, Chen, and Kane, 1981; Marcus 1984).³ However, when bank charter values fall, such as during the 1980s, as the result of intense nonbank competition

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¹The Government Accounting Office estimated a price tag including interest costs for the crisis to be \$480.9 billion, with total direct bailout costs to taxpayers of \$152.6 billion (*New York Times*, July 15, 1996, BBA; *Baltimore Sun*, July 13, 1996, 17C).

²Cordell, MacDonald, and Wohar (1993), Esty (1997, 1998), and Esty and Baldwin (1992) find evidence of greater risk taking for stock versus mutual thrifts and higher risk for newly converted stock thrifts in the 1980s. Studies also find higher failure resolution costs for stock versus mutual thrifts (see Barth, 1991; Kane, 1989).

³As Galloway, Lee, and Roden (1997) point out, Marcus (1984) demonstrates that bank charter value, which includes the right to continue to operate and enjoy regulatory restrictions on entry and competition, provides a self-disciplinary device against excessive bank risk taking.

and declining profit margins, stockholders have less incentive to act prudently with regard to risk taking (Keeley 1990). If imprudent risk taking results in losses that are ultimately passed on to the deposit insurer, a moral-hazard problem exists.

Taking an alternative corporate-control approach, Gorton and Rosen (1995) argue that the higher risk and declining profitability of banks in the 1980s resulted from the proliferation of *bad managers* in a banking environment characterized by few good investment opportunities, poor corporate-control mechanisms, and information asymmetries that allowed managers to control banks. In such an environment, bad managers can become entrenched by holding low stock ownership with sufficient voting power to prevent their ouster. By engaging in more, but ultimately unprofitable, risks, bad managers try to convince external stockholders that they are good managers taking on good risks. Under a corporate-control hypothesis, banks with entrenched managers at low ownership levels will engage in unprofitable risk taking. But, if managers have large stock holdings and, hence, considerable personal wealth at stake, they will attempt to take on only profitable risks (Jensen and Meckling, 1976).

S&Ls were particularly prone to moral-hazard behavior in the 1980s when regulators practiced policies of laxity and forbearance on capital and closure rules.⁴ Low capital requirements provided manager/owners the potential to make exorbitant returns on small equity stakes, promoting gambling behavior (Barth, 1991; Strunk, 1991). Akerlof and Romer (1993) point out that conditions of poor accounting rules, lax regulation, and low penalties for abuse in the 1980s also encouraged manager/owners to loot at the expense of the deposit insurer: through high-dividend payouts, kickbacks, ingenious side payments, or other forms of fraud. The removal of thrift concentration rules in the 1980s reduced the divergence of interests between managers to keep their jobs and reputations and those of stockholders to undertake such risky strategies (Akerlof and Romer, 1993; Barth 1991; Strunk 1991).⁵

⁴Facing dwindling deposit insurance reserves and hundreds of technically insolvent thrifts, regulators followed a policy of laxity in the 1980s. In 1982, regulators reduced capital requirements to 3%, and used regulatory accounting gimmicks to allow technically insolvent thrifts to continue to operate (see Brickley and James, 1986). The Competitive Equality in Banking Act of 1987, furthermore, permitted regulators to alter minimum capital ratios on an individual basis (see Barth, 1991; Kane, 1989).

⁵Prior to April 1982, regulations required an S&L located in a county with a population greater than 100,000 to have at least 400 stockholders. No individual could own more than 10% of a thrift's stock, and no firm could own more than 25%. Also, 75% of all stockholders had to live or do business in a thrift's market area. These restrictions were eliminated after April of 1982 (Barth, 1991; Strunk, 1991). Brumbaugh

With the implementation of risk-based capital requirements under the Financial Institutions Reform and Recovery Act (FIRREA) in 1989, and risk-based insurance premiums by 1993, such moral hazard incentives may no longer exist.⁶

Results from previous research on managerial ownership and bank risk are mixed. These studies generally examine the relation between ownership and the stock market volatility of bank holding companies (BHCs) during the 1980s. Although this research provides valuable insights, it has some limitations. First, the use of BHC stock market data precludes analysis of smaller more closely held banks. Second, use of a continuous sample over time excludes firms that subsequently fail, are acquired, or become closely held creating a severe survivorship bias. Finally, these studies generally do not control for differences in charter value between banks and, given their age, do not examine recent years after the implementation of risk-based insurance premiums, risk-based capital requirements, and restored regulatory oversight in the 1990s.⁷

In this study, we extend the results of previous research, providing a stronger test for the corporate-control and moral-hazard hypotheses, by analyzing data for S&Ls from 1986 to 1995, including 1,116 observations. The sample encompasses three different regulatory and economic regimes including: 1) an interval of regulatory laxity and forbearance and low S&L charter values (1986 to 1987); 2) a period of regulatory stringency, recession, and rising S&L charter values (1989 to 1993); and 3) years of economic expansion and high charter values (1994 to 1995).

We find strong support for the moral-hazard hypothesis in the mid-1980s. From 1986 to 1988, thrifts with high levels of managerial ownership exhibit increased risk and declining profitability, but only if they have low charter values. This relation disappears during the period of regulatory stringency, 1989 to 1993. However, in 1994 and 1995, years of high charter values, manager-owned S&Ls again take on greater

(1988) points out that S&Ls in liberally regulated states could also engage in very risky activities through service corporations.

⁶As of January 1993, premiums per \$100 of insured deposits ranged from 23 cents for well-capitalized banks to 31 cents for undercapitalized banks with severe supervisory problems. In January 1996, premiums were reduced and range from almost zero to 27 cents per \$100 of insured deposits (see Galloway, Lee, and Roden, 1997). FIRREA of 1989 mandated that a new set of higher risk-based capital requirements be phased in by 1991, with capital requirements for thrifts, equally stringent as those imposed for banks, and mandated closures of significantly undercapitalized S&Ls. Regulators were mandated to close severely undercapitalized thrifts. S&Ls were given asset restrictions, and FIRREA required state S&Ls to abide by the same restrictions as federal S&Ls.

⁷Many of these weaknesses are pointed out in Cebenoyan, Cooperman, and Register (1995).

risk. Contrary to the experience in the mid- to late 1980s, this risk taking appears to be profitable, supporting the corporate-control hypothesis. There is an important caveat. Since loan losses may not appear for several years, this *profit-enhancing risk* interpretation may in time prove to be too optimistic, as regulators recently suggest.

In the remainder of this paper, Section I provides a brief summary of previous studies. Section II presents hypotheses, the empirical model, and data used in the study. Section III contains the empirical results, and Section IV provides conclusions.

I. Brief Summary of Previous Studies

Previous studies of the effect of equity ownership on depository institution behavior generally examine large bank holding companies (BHCs) in the 1980s using stock market risk measures.

Saunders, Strock, and Travlos (SST) (1990) find a positive linear relation between the managerial equity holdings of large BHCs over the period 1978-1985 and their stock price volatility, consistent with moral hazard. Mullins (1991) finds the same relation in 1986 for the 38 very large BHCs that SST examine, but Mullins finds no relation for a larger sample of 78 BHCs. Chen, Steiner, and Whyte (1998) find an insignificant relation between manager ownership and stock market risk measures in more recent years.

Other studies do not directly address ownership structure, but rather the relationship between bank risk and charter value. Keeley (1990) reports a negative relation between bank risk and charter value (proxied by market to book values) for 150 large BHCs from 1970 to 1986. He also finds evidence of higher risk levels in the 1980s, a period when charter values fell, supporting the moral-hazard hypothesis. Galloway, Lee, and Roden (1997) find higher-charter-value BHCs to consistently take on lower risk from 1977 to 1994, while low-charter-value BHCs engage in greater risk taking for most years.

In contrast to earlier studies, Brewer and Saidenberg (1996) study the relation between managerial ownership and market risk for large publicly traded thrifts between 1985 and 1989. They find greater stock price volatility for thrifts with ownership of about 30% or higher, with an entrenchment effect at lower ownership levels, consistent with moral hazard. They also report lower risk for thrifts with *high* charter values, but do not examine the interaction between managerial ownership and charter value.

These studies provide valuable insights. However, since they use stock market data, they exclude closely held firms, and often examine very small ranges of managerial stock ownership. For instance, Allen and Cebenoyan (1991), studying 58 BHCs from 1979 to 1986,

report a mean of 3.01% and a maximum of about 4.96% for stock ownership by managers and directors. Similarly, Pi and Timme (1993) report the average ownership by chief executive officers (CEOs) for a sample of 112 BHCs in 1988 to 1990 to be only 1.02%. In contrast, smaller banks and S&Ls offer a wider range of ownership to examine. Further, since the stock of closely held depository institutions is often not traded or is thinly traded, market volatility becomes an unreliable proxy for firm-specific risk. Finally, studies to date have not examined relationships in the mid-1990s, following the implementation of risk-based insurance premiums.

Gorton and Rosen (1995) use balance-sheet risk measures in their test of the corporate-control hypothesis, allowing them to study BHCs in 1984 to 1990 with a wider range of ownership. They find lower credit risk for BHCs with high levels of managerial stock ownership and an entrenchment effect at lower levels of ownership. Each outcome is consistent with the corporate-control hypothesis.

Cebenoyan, Cooperman, and Register (CCR) (1995) examine balance-sheet risk measures for samples of S&Ls in 1988 and 1991 with a wide range of ownership. For 1988, they find greater risk for manager-owned thrifts, with a similar threshold as that found by Brewer and Saidenberg (1996) of 30% ownership. In 1991, after FIRREA, they find that S&Ls exhibit lower risk as managerial ownership rises. Since CCR do not examine the years after 1991 and do not control for charter value, it is uncertain whether this trend persists or if these relations are conditional on charter value as a key variable.

Finally, Pi and Timme (1993) is the only study explicitly addressing the relation between ownership structure and bank efficiency. They examine the effect of CEO ownership on operating efficiency and return on assets for very large BHCs during the 1980s. They find that CEO ownership enhances BHC performance, but only for non-chairman CEOs. By focusing on large BHCs, their study has a small range of ownership.⁸

In this study, we expand upon previous research by testing both the moral-hazard and the corporate-control hypotheses, using samples of S&Ls with a wide range of ownership. We include the effect of charter value and examine a longer time period encompassing

⁸See Subrahmanyam, Rangan, and Rosenstein (1997) and Whidbee (1997) for studies of the effects of bank board composition on, respectively, bank acquisitions and the control of bank shareholder voting rights. Also, see Tufano (1998) for a discussion of agency costs for corporate risk management, Bathala, Moon, and Rao (1994) for a study of the impact of institutional investor holdings on managerial ownership and debt policy, and Gropper and Beard (1995) and Gropper and Oswald (1995) for studies of bank and S&L expense preference behavior in the 1980s.

different regulatory and economic regimes.

II. Hypotheses, the Empirical Model, and Data

We use the following model to examine the relations among RISK and ownership structure and charter values for thrifts over time:

$$\text{RISK} = f(\text{INSIDE}, \text{INSIDESQ}, \text{OUTSIDE}, \text{MKBK}, \text{MKBKIN}) \quad (1)$$

where RISK for each individual S&L is proxied by alternative risk measures. Similar to Saunders, Strock, and Travlos (1990), we assume that in the short term at least the performance of managers can be viewed as an endogenous decision variable for an S&L affected by its ownership structure, charter value, and other control variables.

INSIDE is the percentage of equity held by managers/directors of an S&L. It may be that relatively high levels of managerial ownership are needed to align the interests of shareholders and managers. At low levels of ownership, managers may have sufficient voting power to act in their own utility-maximizing interests, such as preserving their own undiversifiable employment risk (Amihud and Lev, 1981; Demsetz, 1983; and Williamson, 1963). Since a nonlinear relation between managerial ownership and risk-taking behavior may exist, as observed by McConnell and Servaes (1990) and Gorton and Rosen (1995), we include INSIDESQ, the square of INSIDE, in the model. To determine whether a model should be linear or nonlinear, we use Lagrange multiplier tests (see Ramanathan, 1992, p. 313). OUTSIDE is the percentage of equity held by institutional investors.

As a proxy for thrift charter value, we include MKBK, the market-to-book equity ratio for individual S&Ls for each year, as used by Galloway, Lee, and Roden (1997). To examine the interaction between managerial stock ownership and charter value, we include the slope interaction variable MKBKIN, which indicates whether any effect of charter value on risk is increasing or decreasing as managerial ownership rises.

A. Hypothesis Development

We test alternative hypotheses for the risk-taking behavior of thrifts based on charter value and ownership structure.

1. Corporate-Control Hypothesis

Under the corporate-control hypothesis, the interests of managers become aligned with those of external stockholders for value-maximizing behavior

at high levels of stock ownership, whereby managers' stock ownership in the firm is large relative to their personal wealth (Jensen and Meckling, 1976). However, as suggested by Gorton and Rosen (1995), during periods of decline for the banking industry, bad managers become entrenched at low levels of managerial stock ownership. Such bad entrenched managers take on imprudent risks in an attempt to mislead external stockholders into thinking that they are good managers taking on profitable risks. The corporate-control hypothesis holds that thrifts with low levels of ownership will engage in greater unprofitable risk taking and manager-owned thrifts will engage in profitable risk taking. A significant positive coefficient for INSIDE and a significant negative coefficient for INSIDESQ for regressions on risk would support the corporate-control hypothesis.

2. Moral-Hazard Hypothesis

The moral-hazard hypothesis states that stockholders have incentives to maximize their deposit insurance subsidy by taking on excessive levels of risk at the expense of the deposit insurer and ultimately taxpayers (Merton, 1977). Hence, better alignment of interests between managers and stockholders through significant manager ownership is expected to lead to greater risk taking. At low levels of stock ownership, however, an entrenchment effect may exist, whereby managers prefer to protect their jobs and reputations by taking on relatively little risk (Amihud and Lev, 1981). Further, as pointed out by Marcus (1984) and Keeley (1990), the moral-hazard hypothesis should apply only to depository institutions with low charter values. Institutions with high charter values should behave prudently to protect the value of their charter and avoid regulatory closure. Consequently, the moral-hazard hypothesis predicts a nonlinear relation on managerial ownership, with the opposite signs of those expected under the corporate-control hypothesis for regressions on risk, if greater risk-taking is unprofitable. That is, the coefficient on INSIDE is expected to be negative, indicating that thrifts with low levels of manager ownership take on less risk. The coefficient on INSIDESQ is expected to be positive, with manager-owned thrifts taking on greater risk. It is essential to recall that the moral-hazard hypothesis predicts greater unprofitable risk-taking only when thrifts have low charter values. Thus, we would expect moral-hazard relations to appear in the mid-1980s when thrift charter values were low, and the coefficient on MKBK should be significant and negative, indicating lower risk for higher-charter-value thrifts. If manager-owned thrifts with high charter values prefer greater risk taking, the coefficient on MKBKIN should be significant and positive.

3. Hypotheses for the Effect of Institutional Investor Ownership

The corporate-control and moral-hazard hypotheses make no explicit predictions regarding the effect of institutional investor ownership on bank risk. But, under an information-asymmetry hypothesis, suggested by Zeckhauser and Pound (1990) and Ross (1989), external bank stockholders, including institutional investors, have little control over bank managers, because of the *opaque* nature of banking. This hypothesis indicates that the coefficient for OUTSIDE should be insignificant.

Under an alternative prudent-man hypothesis suggested by Pound (1988), institutional investors, as large block-holders with greater expertise, resources, and incentives for monitoring, are less subject to information asymmetries than are other stockholders. As trustees acting under *due-diligence* and *prudent-man* provisions, institutional investors also have a greater duty to ensure the safety of their investments. Because of contractual clauses specifying what types of investments they must hold, institutional investors may in addition have less ability to diversify than other stockholders and stronger incentives to monitor individual investments. Activist institutional investors, such as the California Public Employees Retirement System (CALPERS), may also take a more forceful role in directing management's behavior. The prudent-man hypothesis predicts better monitoring and only profitable risk-taking for thrifts with high institutional investor ownership. A positive relation between OUTSIDE and thrift profitability would be expected, and possibly a negative relation between OUTSIDE and risk measures, if institutional investors have incentives for less risk and are instrumental as monitors.

4. Akerlof and Romer's Looting Hypothesis for Thrifts in 1988

We also test Akerlof and Romer's (1993) looting hypothesis, which is independent of the analysis above. This hypothesis states that owners of low-capital and low-charter-value S&Ls with little chance of surviving have incentives to maximize the value of their put option on the deposit insurer by engaging in looting behavior, with the intention of bankrupting the S&L and putting the cost on the deposit insurer. In contrast to the moral-hazard hypothesis, whereby manager/owners engage in gambling behavior hoping to win the gamble, manager/owners engaging in looting ultimately desire a thrift's failure, whereby the deposit insurer is left with the bill for their looting. To test for looting behavior for low-capital firms, we estimate a probit model using a maximum likelihood technique (see Judge, Hill, Griffiths, Lutkepohl, and Lee, 1982)

with similar independent variables to the previous models. The dependent variable is LOOT, a dummy variable equal to one if S&Ls are associated with fraud or have exorbitantly high dividend-payout ratios.⁹ The looting hypothesis predicts a positive significant relation between managerial stock ownership and LOOT. The model uses low-capital thrifts in 1988, the peak of the S&L crisis, when fraud convictions began to appear.¹⁰

B. The Empirical Model

The estimation model is written as:

$$\begin{aligned} \text{RISK}_{it} = & \alpha_0 + \beta_1 \text{INSIDE}_{it} + \beta_2 \text{INSIDESQ}_{it} \\ & + \beta_3 \text{OUTSIDE}_{it} + \beta_4 \text{LOGSIZE}_{it} + \beta_5 \text{UNEMP}_{it} \\ & + \beta_6 \text{LIBSTATE}_{it} + \beta_7 \text{MKBK} + \beta_8 \text{MKBKIN} \\ & + \varepsilon_{it} \end{aligned} \quad (2)$$

where for each individual S&L (i), at time (t):

RISK	=	proxy for an S&L's risk
INSIDE	=	the percentage of equity held by managers and directors
INSIDESQ	=	the square of INSIDE, if tests indicate its inclusion
OUTSIDE	=	the percentage of equity held by institutional investors
LOGSIZE	=	the log of asset size of an S&L
UNEMP	=	a control variable for regional economic factors
LIBSTATE	=	a control variable for state regulatory factors in the 1980s
MKBK	=	market-to-book value of equity for an S&L

⁹Extraordinary dividend payouts are defined as payouts that are 75% or more of current earnings, based on a clear cutoff point in our sample, with the next highest payout being 40%. For information on fraud, we obtained the 1991 Department of Justice report on S&L fraud convictions. We also used news announcement sources listing fraud cases for individual S&Ls in the sample from *The Wall Street Journal*, *The New York Times*, and the Resolution Trust Corporation's (RTC) listing of S&L fraud prosecutions, and the RTC's top 100 list of priority cases scheduled for prosecution as of 1991, as listed by Akerlof and Romer (1993). Dividend payout data are taken from the *SNL Quarterly Thrift Digest*.

¹⁰Low-capital thrifts are defined as thrifts with core capital (tangible equity) to asset ratios less than 4%, the current minimum equity capital ratio for adequate capitalization. To determine if a capital ratio turning point exists for looting behavior, we performed a regression using the entire sample with capital interaction terms on independent variables. For this model, interaction variables on ownership and capital were insignificant, indicating no significant turning point on the capital ratio. We also tried a switching regression technique to find a turning point. However, the log likelihood function did not converge, which Greene (1992, p. 659) notes is widely documented in cases in which a sample separation point is unknown.

MKBKIN = an interaction term between
MKBK and INSIDE
 ϵ = zero mean error term.

To control for size, regional economic conditions, and state regulations that previous studies find at times to affect an S&L's performance (see Cebenoyan, Cooperman, and Register, 1993, 1995; Demircuc-Kunt, 1989), we include LOGSIZE, UNEMP, and LIBSTATE. LOGSIZE is the log of asset size in millions. UNEMP is a state's unemployment rate. LIBSTATE is a dummy variable for state-chartered S&Ls operating in more liberally regulated states in the 1980s (California, Florida, Louisiana, Ohio, and Texas) (see Benston, 1985). This variable is excluded for regressions after 1988, since state chartered S&Ls were given the same asset restrictions as federally chartered thrifts with FIRREA of 1989.

We use alternative proxies for risk. The first two are the Sheshunoff national risk ranking (NATION) and regional risk ranking (PEER). These rankings range from 1 (highest risk) to 99 (lowest risk), and are based on capital, earnings, liquidity, and asset quality. The Sheshunoff rankings are similar to unpublished regulatory CAMEL rankings, excluding the management factor.¹¹ The other risk proxies are the percentage of nonperforming and repossessed loans (REP), the percentage of tangible capital to assets (CAPITAL), and the percentage of commercial real estate loans (COMRE), one of the riskier instruments in bank asset portfolios.

C. Data

We collect risk and market to book value measures from *Sheshunoff's S&L Quarterly* for each year, 1986 to 1995, published by Sheshunoff Information Services, Inc., Austin, Texas. Income and balance-sheet data come from the Federal Home Loan Bank Board (FHLBB) call reports, as recorded by Sheshunoff on its Ferguson and Company Analysis and Forecasting System CD for all US thrifts. Our ownership data is from *The SNL Quarterly Thrift Digest, 1987 to 1996* (SNL Securities, Charlottesville, Virginia). Manager and director ownership are based on 13D, 13G, and F11 filings to the SEC, FDIC, or OTS by individuals currently holding more than 5% of an S&L's common stock, supplemented by the beneficial ownership information disclosed in proxy filings. Institutional ownership data are compiled from 13F filings.¹² Unemployment rates are from various

¹¹See *Sheshunoff S&L Quarterly: Ratings and Analysis* for a more detailed description of these ratings. This analysis is published by Sheshunoff Information Services.

¹²Since data on large non-institutional blockholders were not included in the data collected for outside ownership by SNL Securities, OUTSIDE excludes other large blockholders. Most

issues of the US Bureau of the Census, *Statistical Abstract of the US*, Washington, D.C.

The purpose of the study is to examine the aggregate relationship between ownership and risk for all available stock S&Ls for each year from 1986 to 1995. But, we restrict our sample to S&Ls that were stock chartered for at least three years, to avoid any bias associated with three-year limitations placed on managerial ownership for S&Ls converting to stock ownership after 1980.¹³ Our sample encompasses data from 1986 to 1995 for all S&Ls with available data meeting this requirement. The sample begins in 1986, the first year that SNL Securities provided information on thrift managerial ownership. The mid-1980s also represent the period when S&Ls began taking on greater credit risk. The sample consists of 62 S&Ls in 1986, 76 in 1987, 78 in 1988, 143 in 1989, 159 in 1990, 162 in 1991, 135 in 1992, 117 in 1993, 88 in 1994, and 96 in 1995. The larger sample from 1989 to 1991 reflects the fact that about 183 S&L conversions occurred in the mid-1980s (see Cordell, MacDonald, and Wohar, 1993). The diminishing number of thrifts in 1992-1994 reflects additional closures and thrift mergers with banks and other thrifts after 1991. The larger sample in 1995 reflects the addition of thrifts that converted in the early 1990s and, thus, had operated as stock thrifts for three years by 1995.¹⁴

To test the sensitivity of the results, we also examine a small common subsample of 21 to 23 surviving thrifts in 1986 to 1994. By 1991 with regulatory closures and mergers, only 23 of the initial sample in 1988 remained, falling to 21 by 1994, and seven by 1995. One caveat is in order. In addition to being very small, this relatively less risky subsample of surviving thrifts incorporates a severe survivorship bias.

III. Empirical Results

A. Descriptive Statistics

Table 1 reports descriptive statistics for each year. Asset size is in constant dollars based on 1994 dollars.

other papers use 5% blockholders. Consequently, our measure may underestimate the effect of large external shareholders on S&L risk taking.

¹³After 1980, regulations for conversions prevented an alignment of the interests of managers and stockholders for a three-year period by incorporating an anti-takeover rule in which any beneficial ownership by an individual could be no more than 10% for any class of equity security for three years following conversion. Limits were also placed on the amount of stock that could be offered during this period: a) to 5% for any person or identified group and 2) to 15-25% for all officer and directors (see Cordell, MacDonald, and Wohar, 1992).

¹⁴When we included dummy variables for the added thrifts, these were insignificant, indicating that additional thrifts were not driving the sample results.

Table 1. Descriptive Statistics

This table provides the descriptive statistics for the 1986-1995 samples. INSIDE = percentage of stock held by officers and directors. OUTSIDE = percentage of stock held by institutional investors. UNEMP = state unemployment rate. CAPITAL = tangible equity to asset ratio. NATION = Sheshunoff risk rating (similar to CAMEL rating used by regulators). PEER = Sheshunoff regional risk rating. COMRE = percentage of commercial real estate loans to assets. REP = percentage of repossessed assets. MKBK = market to book value of equity. MKBK>1 = dummy variable for S&Ls with MKBK>1. ASSETS = asset size; all figures are in 1994 dollars for comparative purposes.

1986		N=62									
YEAR	ASSETS	INSIDE	OUTSIDE	UNEMP	NATION	PEER	CAPITAL	COMRE	REP	MKBK	MKBK>1
	(mils.)	%	%	%			%	%	%		
Mean	1774.43	18.10	10.77	6.38	40.13	47.36	4.38	10.05	0.76	0.65	0.08
Std. Dev.	(2225.10)	(13.14)	(12.22)	(1.56)	(24.84)	(25.99)	(2.83)	(7.53)	(0.75)	(0.28)	(0.28)
Min.	63.75	1.40	0.00	3.80	5.00	6.00	-2.67	0.00	0.00	0.20	0.00
Max.	12963.81	58.70	50.50	11.70	92.00	94.00	13.26	37.00	4.10	1.60	1.00
1987		N=76									
YEAR	ASSETS	INSIDE	OUTSIDE	UNEMP	NATION	PEER	CAPITAL	COMRE	REP	MKBK	MKBK>1
	(mils.)	%	%	%			%	%	%		
Mean	1934.94	18.09	10.69	5.78	39.79	48.43	4.20	10.57	0.84	0.65	0.09
Std. Dev.	(2441.72)	(13.14)	(12.31)	(1.52)	(23.54)	(23.31)	(2.65)	(7.50)	(0.95)	(0.27)	(0.29)
Min.	54.13	1.40	0.00	3.20	6.00	8.00	-1.76	0.00	0.00	0.20	0.00
Max.	12920.49	58.70	50.50	10.20	99.00	99.00	10.32	41.00	4.41	1.60	1.00
1988		N=78									
YEAR	ASSETS	INSIDE	OUTSIDE	UNEMP	NATION	PEER	CAPITAL	COMRE	REP	MKBK	MKBK>1
	(mils.)	%	%	%			%	%	%		
Mean	2024.89	21.02	11.39	5.16	38.23	48.54	3.60	10.62	0.94	0.62	0.09
Std. Dev.	(2530.19)	(14.18)	(12.36)	(1.35)	(22.99)	(25.32)	(2.97)	(7.59)	(1.11)	(0.37)	(0.28)
Min.	51.05	2.10	0.00	3.00	6.00	9.00	-2.91	0.00	0.00	0.05	0.00
Max.	12218.93	59.30	53.40	8.40	90.00	93.00	12.11	41.00	5.29	2.76	1.00
1989		N=143									
YEAR	ASSETS	INSIDE	OUTSIDE	UNEMP	NATION	PEER	CAPITAL	COMRE	REP	MKBK	MKBK>1
	(mils.)	%	%	%			%	%	%		
Mean	1664.34	17.02	14.54	4.92	52.09	63.22	5.96	7.88	0.88	0.56	0.06
Std. Dev.	(3048.48)	(12.32)	(16.31)	(1.03)	(23.26)	(22.26)	(3.42)	(6.06)	(1.22)	(0.26)	(0.23)
Min.	76.92	0.10	0.00	2.60	4.00	12.00	-2.92	0.00	0.00	0.10	0.00
Max.	25942.00	71.80	76.40	7.10	96.00	98.00	20.53	30.00	6.63	2.03	1.00
1990		N=159									
YEAR	ASSETS	INSIDE	OUTSIDE	UNEMP	NATION	PEER	CAPITAL	COMRE	REP	MKBK	MKBK>1
	(mils.)	%	%	%			%	%	%		
Mean	1494.98	18.04	13.46	5.29	43.14	54.64	5.87	7.76	2.82	0.48	0.03
Std. Dev.	(3139.81)	(11.09)	(14.63)	(0.84)	(25.00)	(24.58)	(3.41)	(5.95)	(3.03)	(0.25)	(0.16)
Min.	76.92	0.26	0.00	2.20	5.00	10.00	-1.44	0.00	0.09	0.10	0.00
Max.	25194.44	70.10	62.80	8.30	99.00	99.00	22.31	34.00	18.66	2.12	1.00
1991		N=162									
YEAR	ASSETS	INSIDE	OUTSIDE	UNEMP	NATION	PEER	CAPITAL	COMRE	REP	MKBK	MKBK>1
	(mils.)	%	%	%			%	%	%		
Mean	1369.75	17.97	12.68	6.56	36.71	47.76	5.80	7.48	3.22	0.65	0.11
Std. Dev.	(2818.01)	(11.82)	(14.74)	(1.06)	(25.80)	(26.84)	(3.05)	(5.62)	(3.24)	(0.31)	(0.32)
Min.	80.16	0.26	0.00	2.70	1.00	2.00	-0.26	0.00	0.09	0.08	0.00
Max.	24671.12	72.49	73.50	10.50	99.00	98.00	21.11	35.00	17.48	2.21	1.00

Table 1. Descriptive Statistics (*Continued*)

1992		N=135									
YEAR	ASSETS	INSIDE	OUTSIDE	UNEMP	NATION	PEER	CAPITAL	COMRE	REP	MKBK	MKBK>1
	(mils.)	%	%	%			%	%	%		
Mean	1434.30	18.12	14.39	7.21	34.83	43.86	6.67	7.43	2.71	0.97	0.37
Std. Dev.	(3028.30)	(12.71)	(15.69)	(1.25)	(25.06)	(27.65)	(2.63)	(5.77)	(2.81)	(0.34)	(0.49)
Min.	91.00	0.91	0.00	3.00	1.00	1.00	-1.12	0.00	0.11	0.27	0.00
Max.	25796.00	72.70	78.30	11.30	99.00	99.00	18.09	35.00	17.94	2.16	1.00
1993		N=117									
YEAR	ASSETS	INSIDE	OUTSIDE	UNEMP	NATION	PEER	CAPITAL	COMRE	REP	MKBK	MKBK>1
	(mils.)	%	%	%			%	%	%		
Mean	1698.94	17.94	18.59	6.62	36.86	46.97	7.64	6.80	1.91	1.08	0.56
Std. Dev.	(3558.94)	(11.66)	(16.97)	(1.34)	(26.24)	(28.96)	(2.60)	(5.38)	(2.02)	(0.30)	(0.50)
Min.	91.62	2.72	0.00	2.60	2.00	1.00	3.70	0.00	0.01	0.29	0.00
Max.	30240.71	73.30	81.20	10.80	99.00	99.00	18.64	29.00	13.87	1.85	1.00
1994		N=88									
YEAR	ASSETS	INSIDE	OUTSIDE	UNEMP	NATION	PEER	CAPITAL	COMRE	REP	MKBK	MKBK>1
	(mils.)	%	%	%			%	%	%		
Mean	1940.98	19.01	19.54	5.87	48.91	56.21	7.87	6.55	2.47	1.11	0.61
Std. Dev.	(4023.83)	(13.31)	(17.02)	(1.27)	(21.46)	(20.82)	(1.27)	(5.41)	(3.05)	(0.28)	(0.49)
Min.	100.00	1.50	0.00	2.90	1.00	1.00	2.90	0.00	0.05	0.47	0.00
Max.	26761.91	66.62	72.60	8.90	91.00	92.00	8.90	26.00	19.55	2.19	1.00
1995		N=96									
YEAR	ASSETS	INSIDE	OUTSIDE	UNEMP	NATION	PEER	CAPITAL	COMRE	REP	MKBK	MKBK>1
	(mils.)	%	%	%			%	%	%		
Mean	1767.35	19.22	18.71	5.38	57.79	63.89	7.84	6.35	1.59	1.42	0.85
Std. Dev.	(3954.47)	(12.94)	(17.01)	(1.14)	(13.96)	(13.36)	(2.46)	(4.97)	(1.51)	(0.41)	(0.36)
Min.	51.16	2.22	0.00	2.60	19.00	25.00	4.81	0.00	0.00	0.59	0.00
Max.	28319.07	70.10	70.90	8.90	88.00	89.00	20.99	22.00	7.02	2.61	1.00
1986-95		N=1,116									
YEAR	ASSETS	INSIDE	OUTSIDE	UNEMP	NATION	PEER	CAPITAL	COMRE	REP	MKBK	MKBK>1
	(mils.)	%	%	%			%	%	%		
Mean	1617.61	18.33	14.57	5.94	42.64	52.29	6.11	7.91	2.00	0.80	0.26
Std. Dev.	(3181.55)	(12.46)	(15.49)	(1.41)	(24.75)	(25.53)	(3.19)	(6.20)	(2.51)	(0.42)	(0.44)
Min.	51.05	0.10	0.00	2.20	1.00	1.00	-2.92	0.00	0.00	0.05	0.00
Max.	30240.71	73.30	81.20	11.70	99.00	99.00	22.31	41.00	19.55	2.76	1.00

The final panel of the table shows statistics for the entire sample. For the entire sample, the mean asset size is \$1.6 billion, with a wide range of \$51 million to \$30.24 billion. The average for INSIDE is about 18.3%, and for OUTSIDE, 14.6%.¹⁵ The range of ownership is wide, with a maximum of 73% for INSIDE and 81% for OUTSIDE. Looking at the individual year figures for MKBK, graphed in Figure 1, the mean of MKBK is below one from 1986 to 1992, pointing out the relatively low thrift charter values during those years. With an economic recovery and thrift restructuring, the mean on MKBK rose to 1.08 in 1993 and continued to rise in 1994 to 1.11, and to 1.42 in 1995. During 1986 to 1988,

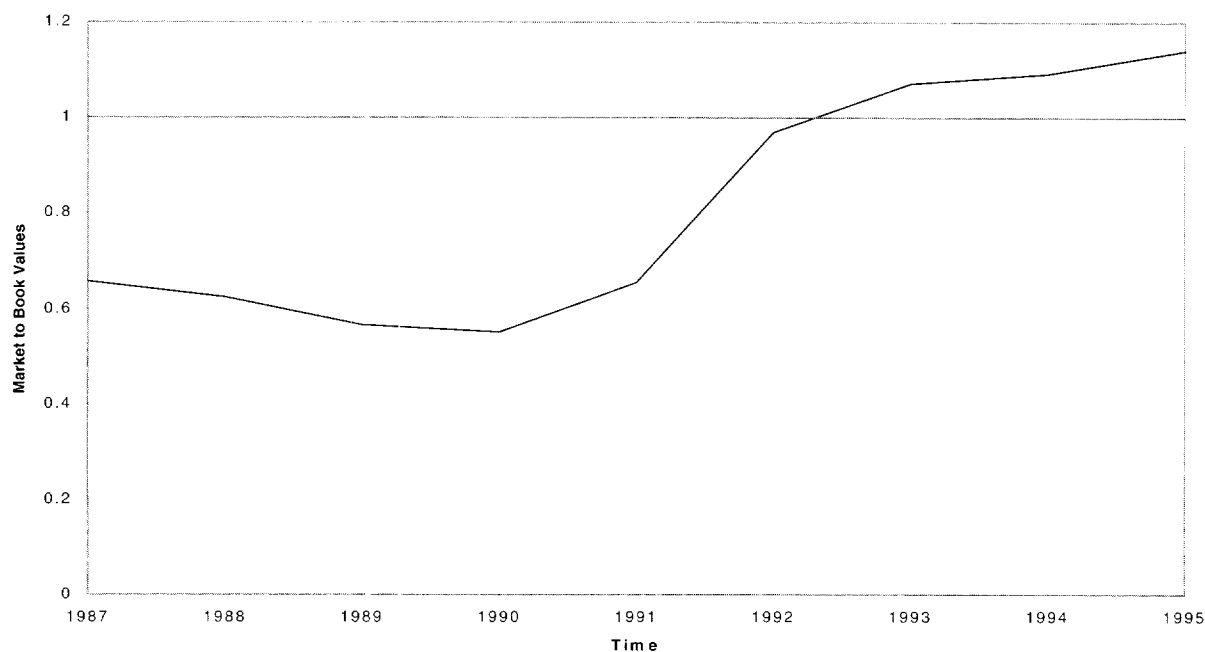
only about 8.5% of thrifts had a MKBK greater than one, and only 11% in 1991. However, by 1992, 37% of the sample thrifts had MKBK values greater than one, and by 1995, 85%. The mean of CAPITAL declined between 1986 and 1988 from 4.38% to 3.60%, but rose dramatically thereafter to 5.96% in 1989, 6.67% in 1992, and about 7.84% in 1994 and 1995. Thrift profitability improved over this period.

B. Cross-Sectional Results

1. Regression Results on Sheshunoff Risk Rankings

Regression results use White's (1980) consistent variance-covariance estimation procedure to adjust for heteroskedasticity. Lagrange multiplier tests indicate whether nonlinear or linear models for INSIDE should

¹⁵Gorton and Rosen's (1995) sample of bank holding companies had an average inside ownership of 15.25% and average outsider holdings of 7.87%.

Figure 1. Market to Book Values for Sample Thrifts Over Time

be estimated for each year's regression.¹⁶

Tables 2 and 3 present the regression results for each year for the respective regressions using NATION and PEER as risk proxies. These rankings range from 1 to 99, with lower risk as rankings rise. The significant Wald chi-squares indicate that the models had a good fit for most years.

For the period 1986 to 1988, a period of regulatory laxity and low charter values, the coefficient for INSIDE is significant and positive, and the coefficient for INSIDESQ is significant and negative. Manager-owned thrifts have greater risk, but only at levels of ownership above a threshold of about 23% to 28% ownership.¹⁷

¹⁶Lagrange multiplier tests indicated that the model specification changes for different years from linear to nonlinear on insider ownership. The LIBSTATE variable is only operative prior to FIRREA of 1989, when different state regulations existed. Because of changes in the model over time, we perform cross-sectional regressions for each year from 1986 to 1995. Tests for structural behavioral differences between low-capital and high-capital firms indicated no significant differences. Hence, regressions are performed each year for the entire sample. Relatively low correlations for the independent variables for the samples in 1986 to 1995 suggest no significant multicollinearity. This was confirmed using an auxiliary regression technique on the independent variables (see Judge, Hill, Griffiths, Lutkepohl, and Lee 1982, 622; Belsley, Kuhn, and Welsch, 1980; and Greene, 1993).

¹⁷The full effect on insider ownership equals the coefficient on INSIDE plus two times the coefficient on INSIDESQ times a given inside ownership level, plus the coefficient on MKBKIN times a given market-to-book value. Turning points are calculated by solving for the unknown level of manager ownership that makes the full effect equal to zero using the mean MKBK value for that year. Lagrange multiplier

The coefficient on MKBK is significant and positive for almost all regressions from 1987 to 1993, with MKBKIN occasionally significant and negative. Higher-charter-value thrifts exhibit lower risk, with a diminishing effect at higher ownership levels. These results are consistent with the moral-hazard hypothesis.

From 1989 to 1992, a period of regulatory stringency and rising charter values, the relations between rankings and manager ownership are linear. For regressions on both NATION and PEER, the coefficient for INSIDE is generally negative, but insignificant. Similar to the mid-1980s, relations become nonlinear from 1993 to 1995, a period of economic prosperity and high charter values. The coefficient for INSIDESQ is significant and negative in 1994 and 1995, suggesting (albeit) weakly higher risk for manager-owned thrifts. OUTSIDE is positive and significant for every year after 1988, consistent with the prudent-man hypothesis. For control variables, LOGSIZE is generally significant and negative, suggesting that larger S&Ls exhibit relatively greater risk. UNEMP is significant, but varies in sign for different periods.

2. Regression Results on Capital

Table 4 presents the regression on CAPITAL. The tests indicated that additional variables, including an interaction between OUTSIDE and INSIDE or OUTSIDESQ, should not be included. We tested for the robustness of our results for different regressions by dropping S&Ls with different levels of insider ownership to see if lower levels of ownership matter. The results using this technique or a piecewise dummy variable technique indicated no significant effect of lower levels of ownership.

Table 2. Cross-Sectional Results on Shehunoff National Risk Ranking (NATION)

NATION is Sheshunoff's national ranking based on Capital, Asset Quality, Liquidity, and Earnings, ranging from one (highest) to 99 (lowest) risk. INSIDE = percentage of stock held by officers and directors. INSIDESQ is the square of INSIDE (if Lagrange multiplier tests indicate it should be included). OUTSIDE = percentage of stock held by institutional investors. LOGSIZE = the log of the assets in millions. UNEMP = state unemployment rate. LIBSTATE = a dummy variable for state-chartered S&Ls operating in liberally regulated states from 1986 to 1988. MKBK = market-to-book value of equity. MKBKIN = interaction variable between MKBK and INSIDE. TURNING POINT INSIDE at mean MKBK values. The Wald Chi-Square provides a test of whether the independent variables are jointly different from zero.

Year	Intercept	INSIDE	INSIDESQ	OUTSIDE	LOGSIZE	UNEMP
1986	23.004 (0.761)	1.291 (1.791)*	-0.037 (-2.995)***	0.254 (1.034)	-1.786 (-0.575)	-0.574 (-0.303)
1987	11.644 (0.400)	1.976 (3.080)***	-0.032 (-2.988)***	0.409 (1.901)*	1.474 (-0.483)	-2.076 (1.386)
1988	28.578 (1.196)	1.463 (3.019)***	-0.017 (-2.064)**	0.386 (1.582)	-3.832 (-1.515)	-1.620 (-1.053)
1989	111.66 (8.208)***	-0.450 (-1.455)		0.506 (4.308)***	-10.993 (-6.708)***	-0.956 (-0.591)
1990	73.423 (5.466)***	-0.345 (-1.198)		0.453 (3.23)***	-11.554 (-7.088)***	3.912 (2.448)**
1991	64.392 (3.775)***	0.145 (0.610)		0.539 (3.286)***	-11.382 (-5.952)***	2.061 (1.296)
1992	72.555 (3.423)***	-0.356 (-0.578)	0.005 (0.664)	0.362 (2.176)**	-11.286 (-5.363)***	0.231 (-0.174)
1993	82.257 (3.372)***	1.178 (1.270)	0.002 (0.308)	0.765 (3.753)***	-13.613 (-5.300)***	3.014 (1.937)*
1994	75.331 (2.741)***	1.750 (1.698)*	-0.019 (-1.963)**	0.574 (3.062)***	-6.547 (-2.745)***	-3.080 (-2.046)**
1995	102.320 (5.671)***	-0.029 (-0.050)	-0.008 (-1.947)*	0.356 (2.405)**	-5.424 (-2.545)***	-3.647 (-3.078)***

Year	LIBSTATE	MKBK	MKBKIN	Wald Chi Square	Predicted R Square	N	TURNING POINT INSIDE
1986	10.280 (1.271)	23.887 (1.562)	0.668 (0.810)	51.451 ***	0.317	62	23.31%
1987	5.616 (0.694)	45.959 (2.899)***	-0.383 (0.479)	76.900 ***	0.373	76	26.99%
1988	-2.819 (-0.428)	51.509 (3.507)***	-0.840 (2.990)**	65.730 ***	0.368	78	27.71%
1989		16.897 (2.107)**	0.663 (1.416)	86.147 ***	0.349	143	NONE
1990		38.974 (4.068)***	0.467 (0.947)	124.598 ***	0.481	159	NONE
1991		35.634 (4.81)***	-0.101 (-0.462)	134.64 ***	0.421	162	NONE
1992		35.141 (3.29)***	0.071 (0.112)	99.601 ***	0.386	134	INSIG
1993		49.856 (3.381)***	-1.362 (-1.834)*	47.004 ***	0.301	117	INSIG
1994		15.437 (0.723)	-0.585 (-0.708)	26.542 ***	0.217	88	28.96%
1995		-1.166 (-0.148)	0.400 (1.29)	44.176 ***	0.227	96	33.69%

***Significant at the 0.01 level.

**Significant at the 0.05 level.

*Significant at the 0.10 level.

Table 3. Cross-Sectional Results on Shehunoff Regional Risk Ranking (PEER)

PEER is Sheshunoff's regional ranking based on Capital, Asset Quality, Liquidity, and Earnings, ranging from one (highest) to 99 (lowest) risk. INSIDE = percentage of stock held by officers and directors. INSIDESQ is the square of INSIDE (if Lagrange multiplier tests indicate it should be included). OUTSIDE = percentage of stock held by institutional investors. LOGSIZE = the log of the assets in millions. UNEMP = state unemployment rate. LIBSTATE = a dummy variable for state-chartered S&Ls operating in liberally regulated states from 1986 to 1988. MKBK = market-to-book value of equity. MKBKIN = interaction variable between MKBK and INSIDE. TURNING POINT INSIDE at mean MKBK values. The Wald Chi-Square provides a test of whether the independent variables are jointly different from zero.

Year	Intercept	INSIDE	INSIDESQ	OUTSIDE	LOGSIZE	UNEMP
1986	6.592 (0.216)	1.607 (2.087)*	-0.045 (-3.557)***	0.330 (1.235)	0.999 (0.304)	-0.462 (-0.238)
1987	-0.435 (-0.130)	1.965 (2.507)**	0.036 (-2.780)***	0.541 (2.108)**	1.857 (0.547)	-2.204 (-1.307)
1988	1.285 (0.046)	1.753 (2.955)***	-0.020 (1.870)*	0.429 (1.448)	1.074 (0.372)	-2.134 (1.807)
1989	77.216 (5.201)***	-0.450 (-1.178)		0.590 (4.948)***	-3.888 (2.177)**	-0.798 (-0.475)
1990	31.851 (2.00)**	-0.439 (-1.263)		0.490 (3.404)***	-3.835 (-2.353)**	4.463 (2.852)***
1991	23.768 (1.220)	0.131 (0.463)		0.713 (4.383)***	-4.438 (-2.266)**	2.718 (1.747)*
1992	32.839 (1.380)	-0.081 (-0.111)	0.000 (0.049)	0.560 (2.821)***	-4.249 (-1.756)*	-0.634 (-0.451)
1993	31.586 (1.137)	1.851 (1.786)*	0.000 (0.035)	0.889 (4.046)***	-6.213 (-2.090)**	-3.940 (-2.276)**
1994	69.669 (2.475)**	1.099 (1.022)	-0.019 (1.878)*	0.579 (3.117)***	-1.783 (-0.815)	-4.491 (-2.536)***
1995	82.647 (4.657)***	-0.102 (-0.184)	-0.010 (-2.444)**	0.319 (2.316)**	-0.695 (-0.337)	-3.821 (-4.130)***

Year	LIBSTATE	MKBK	MKBKIN	Wald Chi Square	Predicted R Square	N	TURNING POINT INSIDE
1986	9.629 (1.313)	23.699 (1.562)	0.868 (1.109)	68.436 ***	0.315	62	24.12%
1987	6.727 (0.797)	41.338 (2.057)**	-0.158 (-0.156)	62.635 ***	0.300	76	25.87%
1988	-5.79 (-0.750)	59.490 (3.248)***	-1.016 (-2.795)***	49.96 ***	0.294	78	28.08%
1989		10.744 (1.061)	0.802 (1.447)	63.143 ***	0.238	143	NONE
1990		40.019 (2.53)***	0.651 (1.106)	116.218 ***	0.437	159	NONE
1991		35.067 (3.475)***	0.824 (0.071)	145.995 ***	0.407	162	NONE
1992		34.690 (2.871)***	0.145 (0.205)	126.303 ***	0.351	134	INSIG
1993		63.106 (4.669)***	-1.841 (-2.403)**	97.591 ***	0.289	117	INSIG
1994		0.790 (0.363)	0.079 (0.097)	23.007 ***	0.195	88	INSIG
1995		-4.744 (-0.654)	0.535 (1.889)*	45.992 ***	0.229	96	32.89%

***Significant at the 0.01 level.
 **Significant at the 0.05 level.
 *Significant at the 0.10 level.

Table 4. Cross-Sectional Results on Tangible Equity Capital to Assets (CAPITAL)

INSIDE = percentage of stock held by officers and directors. INSIDESQ is the square of INSIDE (if Lagrange multiplier tests indicate it should be included). OUTSIDE = percentage of stock held by institutional investors. LOGSIZE = the log of the assets in millions. UNEMP = state unemployment rate. LIBSTATE = a dummy variable for state-chartered S&Ls operating in liberally regulated states from 1986 to 1988. MKBK = market-to-book value of equity. MKBKIN = interaction variable between MKBK and INSIDE. TURNING POINT INSIDE at mean MKBK values. The Wald Chi-Square provides a test of whether the independent variables are jointly different from zero.

Year	Intercept	INSIDE	INSIDESQ	OUTSIDE	LOGSIZE	UNEMP
1986	0.141 (3.696)***	0.189 (1.799)*	-0.002 (-1.682)*	0.013 (0.485)	-0.386 (-1.277)	0.262 (1.450)
1987	2.417 (0.912)	0.166 (2.044)*	-0.003 (-2.446)**	0.029 (1.287)	-0.570 (-2.329)**	0.255 (1.772)*
1988	7.394 (2.564)***	0.093 (1.050)	-0.001 (-0.775)	0.038 (1.333)	-1.065 (-3.773)***	-0.034 (-0.200)
1989	19.14 (10.720)***	-0.140 (-3.009)***		0.069 (4.735)***	-2.083 (-9.188)***	-0.139 (-0.700)
1990	15.036 (8.330)***	-0.087 (-2.311)**		0.065 (2.283)**	-1.972 (-7.706)***	0.326 (1.934)*
1991	12.701 (7.313)***	-0.013 (-0.498)		0.066 (3.170)***	-1.724 (-7.761)***	0.264 (1.936)*
1992	11.366 (4.422)***	-0.011 (-0.155)	0.001 (0.862)	0.035 (2.146)**	-1.089 (-4.144)***	-0.038 (-0.272)
1993	12.761 (4.418)***	0.111 (1.143)	0.001 (0.957)	0.058 (2.765)**	-1.211 (-4.401)***	-0.219 (-1.345)
1994	15.547 (3.674)***	0.142 (0.115)	0.260 (0.275)	0.047 (1.908)*	-0.931 (3.139)**	-0.444 (-2.162)**
1995	18.483 (4.730)***	-0.177 (-1.548)	0.000 (0.148)	0.047 (1.943)*	-1.170 (-2.970)***	-0.038 (-0.156)

Year	LIBSTATE	MKBK	MKBKIN	Wald Chi Square	Predicted R Square	N	TURNING POINT INSIDE
1986	0.868 (1.126)	5.866 (2.206)**	-0.092 (-0.991)	57.133 ***	0.377	62	32.30%
1987	0.760 (1.328)	3.770 (2.529)***	-0.020 (-0.384)	11.790 ***	0.425	76	25.50%
1988	-0.786 (-0.871)	5.291 (3.360)***	-0.086 (-2.840)***	85.513 ***	0.477	78	INSIG
1989		0.923 (0.832)	0.175 (2.767)***	121.514 ***	0.490	143	NONE
1990		3.203 (3.317)***	0.096 (1.914)*	99.512 ***	0.490	159	NONE
1991		2.562 (2.831)***	0.008 (0.309)	106.70 ***	0.405	162	NONE
1992		2.548 (1.604)	-0.030 (-0.391)	34.783 ***	0.202	134	INSIG
1993		3.661 (2.097)**	-0.161 (-2.068)**	27.919 ***	0.192	117	INSIG
1994		0.357 (0.142)	-0.040 (-0.454)	23.614 ***	0.177	88	INSIG
1995		-2.216 (-1.720)*	0.104 (2.019)*	17.748 ***	0.163	96	INSIG

***Significant at the 0.01 level.
**Significant at the 0.05 level.
*Significant at the 0.10 level.

results from 1986 and 1987 are similar to the previous regressions. The coefficient for INSIDE is significant and positive, and that for INSIDESQ is significant and negative, with a threshold ranging from 26% to 32% ownership. Suggesting moral hazard, thrifts with manager ownership above 26% to 32% ownership had greater financial leverage. The coefficient for MKBK is again generally significant and positive, with higher risk for S&Ls with low charter values. In 1995, however, the coefficient for MKBK is significant and negative, and that for MKBKIN, significant and negative. Higher-charter-value S&Ls in 1995 took on more financial leverage, with a diminishing effect at higher ownership levels. As in previous regressions the significant, positive coefficient on OUTSIDE supports the prudent-man hypothesis.

3. Regression Results on Commercial Real Estate

Before examining the results for COMRE, note that the returns on commercial real estate varied over the sample period. As Gorton and Roser (1995) point out, commercial real estate loans were generally unprofitable during the late 1980s and early 1990s. Yet in 1994 and 1995, years of economic expansion, returns on commercial real estate loans were generally high, making COMRE a profitable investment in bank/thrift portfolios.

Table 5 presents the regression results for COMRE, which are linear on manager ownership for each year. The coefficient for INSIDE is significant and negative in 1993. As manager ownership rose, thrifts took on fewer commercial real estate loans. In 1995, the coefficient is significant and positive, indicating the opposite. Based on the significance and signs for MKBK and MKBKIN, higher-charter-value thrifts made fewer commercial real estate loans in 1991 and 1993, but more of these loans in 1995, with a diminishing effect as ownership rose. The coefficient for OUTSIDE is negative each year, and occasionally significant, again supporting the prudent-man hypothesis.

4. Regression Results on Repossessed Assets

Table 6 presents the regression results on REP. Similar to previous regressions, in 1986 and 1987, a nonlinear relation appears on ownership, with a negative coefficient for INSIDE and a positive coefficient for INSIDESQ. The threshold point ranges from 23% to 32% ownership. Manager-owned thrifts had a larger percentage of repossessed assets, while thrifts at low-manager-ownership levels had a smaller percentage as ownership rose. Similar to previous regressions, the coefficient for MKBK is significant and negative for most years, with an occasional diminishing effect at higher ownership levels. The results in the mid-1980s again support moral hazard.

During the intervening years, 1989 to 1991, the relations between INSIDE and REP are insignificant. However, from 1992 to 1995, the nonlinear relation of the mid-1980s reappears, with a negative coefficient for INSIDE and a positive coefficient for INSIDESQ. The coefficients for INSIDESQ are significant in 1994 and 1995, with a threshold point at about 31% manager ownership. As in previous models, manager-owned thrifts in the mid-1990s took on greater risk. The coefficient for OUTSIDE is generally significant and negative after 1989, supporting the prudent-man hypothesis.

5. Results for Probit Regression on LOOT in 1988

Table 7 presents the results for the probit regression on LOOT in 1988 for thrifts with capital ratios less than 4%, the current cutoff for adequate capitalization. Lagrange multiplier tests indicate a linear relation on managerial ownership. The coefficient for INSIDE is insignificant. S&L stockholders do not seem to have had stronger incentives than managers for looting behavior. The coefficient for MKBK is significant and negative, and the coefficient for MKBKIN is significant and positive. Higher-charter-value thrifts had a lower probability of engaging in looting behavior, with a diminishing effect as manager ownership rose. Thus, the results on charter value weakly support the looting hypothesis. The coefficient for LOGSIZE is significant and positive, indicating greater looting behavior for larger thrifts.¹⁸

6. Additional Results on Profitability

Taken together, the results for the entire sample strongly support the existence of moral-hazard behavior by thrifts in years of regulatory laxity and low charter values, 1986 to 1988. Low-charter-value thrifts engaged in greater risk-taking behavior, as did thrifts with substantial manager ownership. In 1994 and 1995, a period of high charter values and expansion, a similar but weaker positive relation between manager ownership and risk appears. In 1995, thrifts with high charter values took on greater risk.

The moral-hazard hypothesis predicts that risk taking will be generally unprofitable. To determine whether this was the case, we perform additional regressions on Equation (1) using return on assets (ROA), a proxy for profitability, as the dependent variable. For the sake of brevity, these results are not tabled, but are available from the authors.

For 1986 to 1988, we find a nonlinear relation on managerial ownership. The coefficient for INSIDE is significant and positive, while the coefficient for

¹⁸When we used a full capital interaction model for the entire sample to determine a capital ratio turning point for looting behavior, the coefficients for the managerial stock ownership and capital interaction variables were insignificant.

Table 5. Cross-Sectional Results on Commercial Real Estate Loans (COMRE)

INSIDE = percentage of stock held by officers and directors. INSIDESQ is the square of INSIDE (if Lagrange multiplier tests indicate it should be included). OUTSIDE = percentage of stock held by institutional investors. LOGSIZE = the log of the assets in millions. UNEMP = state unemployment rate. LIBSTATE = a dummy variable for state-chartered S&Ls operating in liberally regulated states from 1986 to 1988. MKBK = market-to-book value of equity. MKBKIN = interaction variable between MKBK and INSIDE. TURNING POINT INSIDE at mean MKBK values. The Wald Chi-Square provides a test of whether the independent variables are jointly different from zero.

Year	Intercept	INSIDE	INSIDESQ	OUTSIDE	LOGSIZE	UNEMP
1986	17.302 (2.270)**	0.074 (0.317)		-0.088 (-1.337)	-1.251 (-1.708)*	0.544 (0.701)
1987	24.794 (3.526)***	-0.072 (-0.498)		-0.046 (-0.759)	-1.888 (-2.624)***	0.289 (0.422)
1988	25.647 (4.141)***	-0.083 (-1.438)		-0.042 (-0.581)	-1.892 (-2.519)***	0.316 (0.418)
1989	12.035 (3.004)***	0.082 (0.855)		-0.022 (0.503)	-0.327 (-0.648)	-0.589 (-1.514)
1990	16.213 (3.879)***	0.035 (0.443)		-0.066 (-1.432)	-0.252 (-0.580)	-1.053 (-2.198)**
1991	15.339 (3.753)***	-0.053 (-0.922)		-0.088 (-2.073)**	-0.148 (-0.333)	-0.588 (-1.447)
1992	14.705 (3.162)***	0.032 (0.260)		-0.042 (-0.780)	-0.224 (-0.424)	-0.355 (-0.808)
1993	15.452 (3.195)***	-0.313 (-2.136)**		-0.093 (-1.899)*	-0.011 (-0.019)	-0.300 (-0.069)
1994	6.383 (0.998)	0.032 (0.155)		-0.107 (-1.858)*	-0.106 (-0.163)	0.180 (0.342)
1995	-1.295 (-0.258)	0.271 (2.249)**		-0.090 (-1.599)	-0.442 (-0.618)	0.390 (1.098)

Year	LIBSTATE	MKBK	MKBKIN	Wald Chi Square	Predicted R Square	N	TURNING POINT INSIDE
1986	1.467 (0.529)	-5.962 (-1.071)	0.071 (0.197)	25.242 ***	0.175	62	NONE
1987	0.275 (0.119)	-5.514 (-1.247)	0.174 (0.738)	13.434 *	0.128	76	NONE
1988	-0.646 (0.232)	-5.570 (-1.245)	0.136 (1.713)*	20.744 ***	0.116	78	NONE
1989		4.022 (1.477)	-0.249 (-1.942)**	19.569 ***	0.054	143	NONE
1990		1.393 (0.703)	-0.191 (-1.920)*	35.231 ***	0.089	159	NONE
1991		-0.105 (-1.990)*	-0.027 (-0.458)	39.938 ***	0.106	162	NONE
1992		-1.665 (-0.663)	-0.087 (-0.728)	16.291 ***	0.084	134	NONE
1993		-5.361 (-1.923)*	0.244 (1.681)*	28.050 ***	0.104	117	NONE
1994		2.966 (0.666)	-0.094 (-0.501)	14.861 **	0.115	88	NONE
1995		7.418 (3.420)***	-0.203 (2.411)**	25.024 ***	0.144	96	NONE

***Significant at the 0.01 level.

**Significant at the 0.05 level.

*Significant at the 0.10 level.

Table 6. Cross-Sectional Results on Percentage of Repossessed Assets (REP)

INSIDE = percentage of stock held by officers and directors. INSIDESQ is the square of INSIDE (if Lagrange multiplier tests indicate it should be included). OUTSIDE = percentage of stock held by institutional investors. LOGSIZE = the log of the assets in millions. UNEMP = state unemployment rate. LIBSTATE = a dummy variable for state-chartered S&Ls operating in liberally regulated states from 1986 to 1988. MKBK = market-to-book value of equity. MKBKIN = interaction variable between MKBK and INSIDE. TURNING POINT INSIDE at mean MKBK values. The Wald Chi-Square provides a test of whether the independent variables are jointly different from zero.

Year	Intercept	INSIDE	INSIDESQ	OUTSIDE	LOGSIZE	UNEMP
1986	2.679 (2.144)**	-0.039 (-1.744)*	0.001 (3.155)***	0.001 (0.129)	-0.178 (-1.447)	-0.048 (-0.839)
1987	2.000 (1.666)	-0.044 (-1.246)	0.001 (2.200)**	-0.013 (-1.145)	-0.158 (-1.313)	0.114 (1.444)
1988	2.469 (2.491)**	-0.074 (-1.970)*	0.001 (1.315)	-0.015 (-1.290)	-0.077 (-0.971)	0.187 (2.099)**
1989	1.466 (1.959)*	-0.056 (-1.681)*		-0.142 (-1.679)*	0.167 (1.541)	-0.119 (-1.258)
1990	4.752 (2.135)**	-0.023 (-0.521)		-0.052 (-2.941)***	0.530 (2.496)***	-0.489 (-1.699)*
1991	2.733 (0.893)	-0.017 (-0.404)		-0.058 (-2.194)**	0.692 (2.310)**	-0.184 (-0.805)
1992	2.962 (1.106)	-0.046 (-0.576)	0.000 (0.670)	-0.018 (-1.159)	0.469 (0.197)	0.141 (0.941)
1993	3.282 (1.690)*	-0.166 (2.323)**	0.001 (1.342)	-0.037 (-2.206)**	0.341 (2.029)**	0.273 (2.557)***
1994	5.080 (1.230)	-0.425 (2.912)***	0.005 (2.614)***	-0.106 (-0.407)***	0.589 (3.168)***	0.539 (3.168)***
1995	-2.869 (-1.724)*	-0.035 (-0.572)	0.001 (2.497)***	-0.042 (-2.769)***	0.369 (1.721)*	0.474 (4.430)***

Year	LIBSTATE	MKBK	MKBKIN	Wald Chi Square	Predicted R Square	N	TURNING POINT INSIDE
1986	-0.555 (-3.065)***	0.100 (0.192)	-0.032 (-1.343)	28.357 ***	0.195	62	29.90%
1987	-0.269 (-0.041)	-0.397 (-0.495)	-0.018 (-0.460)	34.843 ***	0.168	76	27.85%
1988	0.178 (0.488)	-2.186 (-2.590)***	0.042 (2.713)***	21.264 ***	0.222	78	23.98%
1989		-1.348 (-1.540)	0.085 (0.137)	7.859	0.079	143	NONE
1990		-3.176 (-1.945)*	-0.010 (-0.157)	36.461 ***	0.189	159	NONE
1991		-2.284 (-1.364)	-0.017 (-0.350)	36.838 ***	0.170	162	NONE
1992		-3.796 (-2.988)***	0.017 (0.288)	37.663 ***	0.221	133	INSIG
1993		-3.939 (-3.838)***	0.167 (2.314)***	52.458 ***	0.202	117	INSIG
1994		-3.890 (2.230)***	0.107 (1.748)*	59.983 ***	0.311	88	30.62%
1995		0.558 (0.774)	-0.021 (-0.680)	58.177 ***	0.274	96	32.41%

***Significant at the 0.01 level.

**Significant at the 0.05 level.

*Significant at the 0.10 level.

Table 7. Probit Results for LOOT for 1988

LOOT is a dummy variable for thrifts engaging in looting behavior (fraud, exorbitant expenses, or excessively high dividend payouts). INSIDE = percentage of stock held by officers and directors. INSIDESQ is the square of INSIDE (if Lagrange multiplier tests indicate it should be included). OUTSIDE = percentage of stock held by institutional investors. LOGSIZE = the log of the assets in millions. UNEMP = state unemployment rate. LIBSTATE = a dummy variable for state-chartered S&Ls operating in liberally regulated states from 1986 to 1988. MKBK = market-to-book value of equity. MKBKIN = interaction variable between MKBK and INSIDE. TURNING POINT INSIDE at mean MKBK values. The Wald Chi-Square provides a test of whether the independent variables are jointly different from zero.

Year	Intercept	INSIDE	OUTSIDE	LOG SIZE	UNEMP	LIB STATE	MK BK	MK BKIN	Wald	Predicted	N
									Chi Square	R Square	
1988	-4.405 (-1.242)	-0.005 (-0.225)	-0.002 (-0.067)	0.594 (1.703)*	0.039 (0.182)	0.078 (0.316)	-4.833 (-1.700)*	0.090 (1.756)*	10.292	0.324	78

*Significant at the 0.10 level.

INSIDESQ is significant and negative, indicating a threshold of about 24% ownership. Manager-owned thrifts, with manager ownership above 24%, are less profitable than other thrifts during the period. These results, combined with the earlier results on risk in the mid-1980s, suggest unprofitable risk-taking for manager-owned thrifts. That is, the predictions of the moral-hazard hypothesis for greater unprofitable risk-taking by manager-owned thrifts during a period of low charter values and regulatory laxity are supported.

In contrast, between 1989 and 1995, years following the recapitalization of the thrift industry, the relation between INSIDE and profitability is linear and positive. As manager ownership rises, thrifts become more profitable. Hence, manager-owned thrifts in 1994 and 1995 seem to have engaged in profitable risk-taking, as expected under the corporate-control hypothesis. However, since losses on risky activities may not appear for several years, the increased risk-taking by manager-owners in 1994 to 1995 may turn out to have been overly optimistic risk-taking, as regulators have recently suggested.¹⁹ Time will determine the more correct interpretation.

7. Results for the Surviving Subsample

To test the sensitivity of the outcomes, we also estimate models on risk for the 23 surviving thrifts

¹⁹See Schlesinger (1998) and Skidmore (1998). We also performed supplementary regressions between ROA and risk measures. These models, unfortunately, had to be estimated without managerial ownership measures since these were highly collinear with the risk measures. These regressions indicated a negative significant relation from 1986 to 1988 between ROA and risk proxied by the fraction of commercial real estate loans (COMRE), supporting unprofitable risk-taking during this period. In 1989 to 1993, relations continued to be negative but were less significant or insignificant. In 1994 and 1995, however, we found a positive relation between ROA and CRE, which was significant in 1994, supporting the interpretation of profitable risk-taking in these years.

from 1986 to 1991, and 21 surviving thrifts in 1992 to 1994. For sake of brevity, these results are not tabled, but are available from the authors. In the PEER, NATION, and CAP regressions in 1988, the coefficients for INSIDESQ are significant and positive and the coefficients for INSIDE, significant and negative. Thrifts with high managerial ownership had lower risk, with an entrenchment effect at lower ownership levels. In 1994, the coefficient for INSIDE is significant and positive for the regressions for NATION and CAP, and significant and negative for the regression on REP. Risk falls as manager stock ownership rises. In 1994, the coefficient for OUTSIDE is significant and negative, consistent with the prudent man hypothesis. MKBK is also significant and negatively related to risk for most years. The results generally support the corporate-control hypothesis for all periods for surviving thrifts. However, analysis of these healthier, surviving thrifts incorporates a severe survival bias.

IV. Summary and Conclusion

This study examines the relation between equity ownership structure, charter value, and risk-taking behavior for thrifts between 1986 and 1995, a decade of significant regulatory change. We find strong support for the moral-hazard hypothesis between 1986 and 1988, a period of regulatory laxity and low charter values. High levels of managerial stock ownership are associated with greater unprofitable risk-taking and, with an entrenchment effect at lower ownership levels. Thrifts with higher charter values, as proxied by market-to-book values, took on lower risk between 1986 and 1993.

During 1994 and 1995, a period of expansion, restored regulatory oversight, and increasing charter values, we find a similar nonlinear relation, with higher risk-taking for manager-owned thrifts, at least above a threshold of ownership. However, during 1989 to 1995, we also find a

generally significant linear relation between managerial ownership and profitability. This modest evidence of profitable risk-taking for manager-owned thrifts during 1994 and 1995 is consistent with the corporate-control hypothesis. However, since losses may not appear for

several years, the later results could also be interpreted as being indicative of overly optimistic risk-taking during a period of prosperity, as recently suggested by federal regulators. Future research is needed to determine which interpretation is more accurate. ■

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