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A note on savings and loan ownership structure and expense preference: A re-examination

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Abstract

This study extends the work of Akella and Greenbaum [Journal of Banking & Finance 12 (1988) 419] through the use of a much larger, nationwide sample of US saving and loan associations and supports their original finding of significant expense-preference behavior in mutual savings and loans during their original study period (1979–80). This study also provides evidence that over the time period of substantial deregulation and changes in the competitive environment in the US financial services industry, expense-preference behavior for savings and loans decreased. The results are consistent with the idea that the removal of barriers that restrict competition should improve managerial efficiency in firms that survive.
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1. Introduction

Akella and Greenbaum (1988) (hereafter AG) examined ownership structure and expense-preference behavior in the savings and loan (S&L) industry. In contrast to a large number of studies which examined the effects of expense-preference behavior on input usage, particularly labor, AG examined the impact of expense-preference

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behavior on S&L output. They found evidence that S&L managers engaged in expense-preference behavior through choice of output levels. This is of particular interest since there is evidence that in the presence of agency costs and/or human capital market imperfections, managerial compensation may be more closely related to firm output or sales than to profits (see Baumol, 1972). Thus, managerial discretion may be manifested by expansion of output beyond the profit maximizing level toward the revenue maximizing level in order to obtain higher managerial compensation levels at present or in the future. Managers may in fact utilize inputs in an efficient manner given the higher output level; the inefficiency is manifested in the output level.

In this paper, the analysis of AG is extended in two ways. First, due to data limitations, AG examined only a relatively small fraction of the US savings and loan industry; 386 S&Ls in three states. By extending the analysis to examine data for several thousand institutions over most of the continental US, we are able to determine whether their results were characteristic of the entire industry at that time. Second, we update and extend their findings by estimating their model on data after the period of deregulation and increased competition in the 1980s (see Barth (1991) for a detailed discussion of this period). We are thus able to draw some conclusions regarding the effects of the changes in the regulatory and overall competitive environment on managerial behavior in the savings and loan industry.

This paper proceeds by reviewing some of the extensive literature on expense-preference behavior, and then providing a brief overview of financial industry developments since the original Akella and Greenbaum study. A description of the data used here and the AG model is provided, followed by a discussion of the results and conclusions.

2. Brief review of models of expense-preference behavior and industry changes

2.1. Models of expense-preference behavior and firm performance

The issues of separation of ownership and control, and managerial incentives and behavior in business firms have generated a substantial literature, with roots tracing back to Williamson (1963) and to Berle and Means (1932). Academic interest in this area, recast in general agency theory terms, surged in the 1970s with important work by Jensen and Meckling (1976). One of the ideas that can be drawn from this work is that agency problems will be inversely related to the degree of competitive pressure faced by the firms; thus managers of firms in less competitive environments will tend to exhibit more expense-preference behavior. Evidence to support this idea has been found in a variety of industries. Studies of the electric power industry (Mixon and Upadhyaya, 1999) and the trucking industry (Mixon and Upadhyaya, 1996) indicate that more heavily regulated firms have more severe principal–agent problems and, consequently, increased expense-preference behavior. Using data on small businesses, Ang et al. (2000) examine how agency costs vary with a firm's management and ownership structures. They find, among other things, that agency costs are higher when an outsider manages the firm, and that external monitoring by banks can reduce agency costs. Overall, this empirical evidence from other industries is consistent with the pre-

dictions of Jensen and Meckling (1976) in that when barriers to monitoring are lowered, management's behavior is more closely aligned with shareholders' interests.

Edwards (1977) investigated managerial behavior in the banking industry, and found that firms in less competitive markets showed a greater degree of expense-preference behavior. Models of expense-preference behavior in the financial services industry have generally focused on the level of input usage as proxied by number of employees, employee-related expenses and "occupancy costs" (see e.g., Edwards, 1977; Hannan, 1979; Hannan and Mavinga, 1980; Verbrugge and Jahera, 1981; Smirlock and Marshall, 1983; Blair and Placone, 1988; Gropper and Beard, 1995). Akella and Greenbaum (1988) examined the impact of expense-preference behavior on S&L outputs (rather than inputs) and found evidence that mutual institutions' choice of deposit and loan levels was consistent with expense-preference behavior. [1] An additional thread in the literature has focused on broader measures of cost structure and firm efficiency, using a variety of measures, including econometric and linear programming techniques. [2] For example, Mester (1989) offered a model that utilized total operating costs and found very weak evidence of significant differences in expense-preference activities between stock and mutual ownership forms. In addition, Cebenoyan et al. (1993) utilized a stochastic frontier model, and they found that

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[1] Krinsky and Thomas (1995) (KT) raised questions about the methodology employed by AG in estimation, criticizing the use of total assets as a scale variable, and also criticizing weighted least squares as an appropriate way to control for heteroscedasticity. Akella and Greenbaum (1995) answered these questions, and provided theoretical and empirical evidence to support the appropriateness of their estimation approach. Rather than revisit this discussion, we note that our procedure expands and updates the original AG results in two ways that are neutral to the KT criticisms – we enlarge the dataset at the original point in time and compare the same specification to a later time period.

[2] A voluminous literature has emerged that examines the myriad alternative methodologies and issues relevant for measuring firm efficiency. A necessarily small, illustrative sample of this literature is mentioned below. These alternatives include stochastic cost frontiers (Ferrier and Lovell, 1990), profit functions (Berger et al., 1993a), "thick" frontiers of various types (Berger and Humphrey, 1991, 1992; DeYoung, 1998), "distribution free" techniques (Berger, 1993), and linear programming techniques (Elyasiani and Mehdian, 1992; Ferrier et al., 1993). Econometric problems such as heteroscedasticity can bias standard measures of inefficiency, as noted by Caudill et al. (1995) and Kumbhakar (1996), calling into question the results found in some of the earlier studies. Much of this voluminous literature is reviewed thoroughly in Berger et al. (1993b) and Berger and Mester (1997), and while the findings are obviously not universal, several common themes emerge. First, there is substantial measured firm-level inefficiency found in the literature on the financial services industry. Second, inefficiencies are sometimes found to be related to firm characteristics such as ownership form and ownership dispersion, as well as external market characteristics such as competitive pressures, concentration and regulation. Measured inefficiency is also related to econometric issues, such as functional form choices, input and output measures, and possible specification errors. As noted by Berger and Mester (1997), alternative measures of profit efficiency are correlated with each other, but are not positively correlated with measures of cost efficiency. However, profit efficiency concepts and cost efficiency concepts are positively correlated with the "raw-data" measures of efficiency, return on assets and return on equity. Further, when different measurement techniques and functional forms are utilized for each concept, the results are robust in that average industry efficiency and the ranking of individual firms are not overly sensitive to the exact technique used. Space constraints preclude a complete review of this literature in this paper; we highlight the most closely related work and direct the interested reader to the above review articles, while we update and use the AG methodology to add to the above literature.

operating efficiency was not significantly different between mutual and stock S&Ls. While much of this work has been done on US firms, evidence also exists from other countries. Valnek (1999) found that mutual building societies appear to have outperformed stock retail banks in the UK. In addition, Westley and Shaffer (1999) studied credit unions in three Latin American countries and found that their performance depended in large part on internal price and delinquency control policies.

The above studies generally have used cross-sectional data and thus make no statement as to whether the changes in the institution's competitive operating environment have altered managerial behavior. In addition to examining differences between stock and mutual associations, we are particularly interested in comparing the results across time periods.

Edwards (1977) alludes to the idea that expense-preference behavior by S&L managers might be reduced if many of the competitive barriers in the industry were to be removed. Humphrey and Pulley (1997) explore the adjustments that US commercial banks made in response to the deregulation of the early 1980s. They find that changes in bank profits from the 1977–80 period to the 1981–84 period were largely a result of altering technology (deposit and loan prices and labor, capital and funding inputs) rather than changes in the business environment. Furthermore, changes in bank profits from the 1981–84 period to the 1985–88 period appear more closely related to the changing business environment than to changes in technology. Gropper and Oswald (1996) provide evidence that there has been a decrease in traditional measures of expense-preference behavior for US commercial banks over the 1979–86 time period. Avkiran (1999) examined Australian trading banks, and found that while inefficiencies declined in their post-deregulation time period, there was mixed evidence on the extent to which returns from any efficiency gains were passed on the public. Black and Strahan (2001) found evidence that deregulation increased competition in US banking, and also provide evidence suggesting how some of the rents from regulation affected compensation patterns in the banking industry.

2.2. Changes in the competitive environment

The 1980s were a period in which the competitive environment in the financial services industry of the US went through dramatic changes. Regulation in this industry had effectively served to restrict competition among S&Ls, and between S&Ls and other financial institutions. This was done in part by restricting the ability to pay higher direct interest rates on some deposits, in part by imposing restrictions on the product lines each financial institution could offer, and in part by imposing geographic restrictions on the ability of institutions to set up branching networks. In addition, regulatory restrictions also constrained an S&Ls choice of ownership structure. Between 1972 and 1980 ninety-eight mutual-to-stock conversion applications were approved. [3] During this time federal law permitted federally chartered thrifts to convert only if they were located in a state that permitted stock thrifts.

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[3] See Office of Thrift Supervision 1999 Fact Book.

Over the early to mid 1980s, many regulatory limitations were either eased or eliminated entirely, increasing competition faced by S&Ls. The interest rate limitations imposed by Regulation Q were phased out by the end of 1986. The Depository Institutions Act of 1982 (popularly known as Garn-St Germain) relaxed restrictions on mutual-to-stock conversions and loosened or removed many of the product line restrictions on S&Ls, further blurring the distinctions between S&Ls and other depository institutions. A good detailed review of regulatory changes in the 1980s can be found in Barth (1991). An interesting industry overview is provided by Benston (1994), while further discussion on the dynamics of bank regulation and the generation and dissipation of rents from regulation in banking can be found in Jayaratne and Strahan (1998) and Kroszner and Strahan (1999).

By using the same AG methodology across time periods, and comparing data on US savings and loan associations from 1979–80 to 1987–88, we are able to provide evidence on changes in expense-preference behavior for stock and mutual S&Ls. The overall effect of the changes in the competitive environment over this time period was to remove many of the barriers that may have been conducive to expense-preference behavior by S&L managers; we hypothesize that this removal should lead to a reduction in measured expense-preference behavior. Though the data are not rich enough to unequivocally discern the exact cause of the decrease, we do find evidence to indicate that expense-preference behavior decreased significantly in the later years, after this period of substantial changes in the regulatory and competitive environment facing US savings and loans.

3. Methodological framework

3.1. Sample and data

Nationwide data for US savings and loan associations for 1979–80 and for 1987–88 were used in our empirical analysis. Wage data were obtained from the US Department of Labor's employment and earnings reports for the years given above. In a departure from the approach taken by AG, we use statewide data on wages, rather than SMSA based data. This approach was taken since these wage data were available for nearly every state, [4] allowing the behavior of many more S&Ls to be examined. While this different source of wage data is used, our results from the early period (1979–80) are consistent with those AG obtained using SMSA-wide data.

Consistent with AG, our variables are defined as follows:

L = dollar volume of mortgage loans,
D = dollar volume of deposits,

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[4] Alaska and Hawaii were omitted since their locations are so remote from the contiguous states. Wage data was missing for North Dakota for some years, so observations for that state were omitted. Other models were run using South Dakota wages for North Dakota S&Ls with results essentially similar to those reported here.

T = total assets,
W = annual wage per full time employee, by state,
MUTUAL = 1 if mutual ownership, 0 if stock ownership,
h = MUTUAL × W,
i_L = (interest and fees on mortgages)/total mortgages; expressed as an annual rate,
i_D = (interest and fees on deposits)/total deposits; expressed as an annual rate.

Again consistent with AG, the dollar amounts of every regression variable are expressed in millions. A dummy variable $D87\_88$ was set equal to one for the years 1987–88. To investigate the stability of the model coefficients over this time period, this dummy variable was multiplied by all regression variables, so that a fully interactive model was estimated. Before conducting any analyses, all dollar variables were adjusted for the effects of inflation using the GDP implicit price deflator. Our initial analyses were run using the average annual state wage in the finance, insurance and real estate industry, with results very similar to those reported below using the average annual wage for all full-time manufacturing workers. Both of these wage measures are intended to be proxies for the wage rate in the external market from which the S&L would hire potential employees. The manufacturing wage is not likely to be strongly affected by wage distortions from expense-preference behavior in the S&L industry, and so the manufacturing wage rate is used in the regression results reported below.

3.2. Empirical model to test expense-preference behavior

To carry out our empirical test, we employ the theoretical model developed by AG. For the sake of brevity, their model is reviewed only briefly here. Complete derivations of the equations below are presented in their 1988 paper. In sum, a combination of the diffuse ownership of mutual savings and loans and a lack of competition in either the loan market or the deposit market would enable the management of mutual savings and loans to engage in expense-preference behavior. Such a situation would be plausible if either loan or deposit consumers faced significant search costs. Between 1980 and 1987 improvements in technology tended to lower search costs, and changes in regulations and market pressures increased competition among S&Ls and between S&Ls and other financial services firms. These factors tend to lessen the ability of management to engage in expense-preference behavior.

AG delineate two estimation alternatives; first, where firms are price takers in deposit markets and second, where they are price takers in loan markets. If S&Ls are price takers in both deposit and loan markets, then there is no interior solution to the AG model. Fortunately, markets for loans and deposits are both characterized by less than perfect elasticity even though the developments in the 1980s have increased competition in financial services in general.

Repeating the procedures followed by AG, we control for heteroscedasticity by normalizing our regression variables by total assets, under the assumption that the

variance of the regression residuals is proportional to the square of asset size. [5] For AG's Case 1: Market power in loan markets, and competition in deposit markets, the normalized equations for loans and deposits are given by (1) and (2) respectively:

$$L/T = a_4 + a_0(1/T) + a_1(i_D/T) + a_2(W/T) + a_3(h/T) + e, \tag{1}$$

$$D/T = b_4 + b_0(1/T) + b_1(i_D/T) + b_2(W/T) + b_3(h/T) + e. \tag{2}$$

For Case 2: Competition in loan markets, market power in deposit markets:

$$L/T = c_4 + c_0(1/T) + c_1(i_L/T) + c_2(W/T) + c_3(h/T) + e, \tag{3}$$

$$D/T = d_4 + d_0(1/T) + d_1(i_L/T) + d_2(W/T) + d_3(h/T) + e. \tag{4}$$

The prior expectations for Case 1 are that the coefficients of $1/T$ will be positive, and coefficients of i_D/T and W/T will be negative. For Case 2, we expect that coefficients of i_L/T will be positive, and the coefficients of $1/T$ and W/T will be negative. The test of the expense-preference hypothesis is provided by the coefficient of h/T in each equation. The coefficient of h/T captures the difference in the slope of the wage rate, W/T, for mutual versus stock institutions. A positive coefficient indicates that the mutual institutions have higher wages for a given level of production and is support for the expense-preference hypothesis. Lack of statistical significance of the coefficients of h/T would indicate that the discipline of the product and labor markets overcomes the impact diffuse ownership has on managerial behavior.

To determine whether there was any change in expense-preference behavior between the two time periods, we utilize a fully interactive dummy variable approach so that all of the coefficients are allowed to vary across time periods. The regression parameters not multiplied by $D87\_88$ can be compared to those obtained by AG to determine whether their original results are similar to those obtained from estimation of their model over all S&Ls nationwide. The parameters interacted with $D87\_88$ show the changes in the values of the parameters from the early to the later time period. Of primary interest here is the sign of the coefficient for $D87\_88 * h/T$, where a negative sign indicates a decrease in expense-preference behavior. Tests for structural shifts in all regression parameters are also conducted.

4. Results

The estimation results of the sample period 1979–80 are presented in the top half of Table 1 for Case 1 (monopolistic loan and competitive deposit market) and the top half of Table 2 for Case 2 (competitive loan and monopolistic deposit market), with *t*-statistics shown in parentheses.

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[5] We also tried an alternative procedure of normalization by total income rather than total assets. The results obtained were essentially similar to those reported here except that normalizing by total income was not as effective in reducing the heteroscedasticity problems. The conclusion that expense-preference behavior decreased over the period remained intact.

Table 1
Case 1: Monopolistic loan and competitive deposits markets – Coefficient estimates for models of dollar volume of mortgage loans, L, and the dollar volume of deposits, D with t-statistics in parentheses

	Equation	
	$L/T = a_4 + a_0(1/T) + a_1(i_D/T) + a_2(W/T) + a_3(h/T) + e$	$D/T = b_4 + b_0(1/T) + b_1(i_D/T) + b_2(W/T) + b_3(h/T) + e$
Intercept	0.8621	0.8616
	(441.03)	(558.47)
l/T	−0.0003	0.0008
	(1.05)	(2.99)
i_D/T	0.0083	0.0060
	(5.65)	(5.16)
W/T	−0.0682	−0.1022
	(3.72)	(7.07)
h/T	0.0283	0.0503
	(8.32)	(18.74)
$D87\_88$	−0.2401	0.0203
	(74.98)	(8.05)
$D87\_88 * i_D/T$	0.0026	0.0125
	(0.62)	(3.72)
$D87\_88 * W/T$	0.0258	0.0928
	(1.12)	(5.09)
$D87\_88 * h/T$	−0.0346	−0.0414
	(4.82)	(7.35)
$D87\_88 * l/T$	0.0009	−0.0018
	(1.72)	(4.50)
F	791.3	62.1
Adj. R^2	0.3634	0.0423

The explanatory variables are total assets, T; annual wage per full time employee, by state, W; a dummy variable which equals 1 if mutual ownership, 0 otherwise; MUTUAL, the interaction between MUTUAL and W, h; i_D is (interest and fees on deposits)/total deposits, expressed as an annual rate; and $D87\_88$ is a dummy variable set equal to 1 for the years 1987–88, 0 otherwise. A statistically positive coefficient on h/T is interpreted as evidence that mutual institutions exhibit expense preference behavior, and the coefficient of $D87\_88 * h/T$ indicates whether the degree of expense preference behavior is different in the later period.

Similar to the AG study, for Case 1 the sign of the coefficient on wages for mutual institutions, h/T, in both the loan and deposit equations is positive and statistically significant, indicating greater expense-preference behavior by mutual S&Ls, compared to stock S&Ls of similar size and output mix. While statistically significant only in the present study, the sign on the coefficient on wages, W/T, is negative for both equations and consistent with the sign prediction in the model, as was found in the AG study. Likewise, the coefficient on $1/T$ in both studies is positive for deposits according to the model prediction, but negative for loans. [6]

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[6] While deregulation is an enormously important factor in this industry over this time period, it is not the only factor which can explain shifts in these coefficients. Increased competitive pressure from a variety of sources is also critical. But most analysts point to deregulation and increased competition as the key factors affecting change in this industry over this time period. And while dummy variables are somewhat limited, they are often used to econometrically capture differences in regulatory regimes (e.g., Barth et al., 1996).

Table 2
Case 2: Competitive loan and monopolistic deposit markets – Coefficient estimates for models of dollar volume of mortgage loans, L, and the dollar volume of deposits, D with t-statistics in parentheses

	Equation	
	$L/T = c_4 + c_0(1/T) + c_1(i_L/T) + c_2(W/T) + c_3(h/T) + e$	$D/T = d_4 + d_0(1/T) + d_1(i_L/T) + d_2(W/T) + d_3(h/T) + e$
Intercept	0.8639	0.8630
	(479.78)	(567.14)
l/T	0.0001	0.0013
	(0.45)	(5.11)
i_L/T	0.0052	0.0002
	(5.47)	(0.29)
W/T	−0.0756	−0.1105
	(4.44)	(7.67)
h/T	0.0287	0.0517
	(9.05)	(19.28)
$D87\_88$	−0.2388	0.0197
	(80.22)	(7.85)
$D87\_88 * i_L/T$	−0.0591	−0.0055
	(37.20)	(4.14)
$D87\_88 * W/T$	0.0920	0.1001
	(4.27)	(5.51)
$D87\_88 * h/T$	−0.0364	−0.0432
	(5.43)	(7.62)
$D87\_88 * l/T$	0.0066	−0.0004
	(16.7)	(1.18)
F	1102.9	57.9
Adj. R^2	0.4432	0.0395

The explanatory variables are total assets, T; annual wage per full time employee, by state, W; a dummy variable which equals 1 if mutual ownership, 0 otherwise; MUTUAL, the interaction between MUTUAL and W, h; i_L is (interest and fees on mortgages)/total mortgages, expressed as an annual rate; and $D87\_88$ is a dummy variable set equal to 1 for the years 1987–88, 0 otherwise. A statistically positive coefficient on h/T is interpreted as evidence that mutual institutions exhibit expense preference behavior, and the coefficient of $D87\_88 * h/T$ indicates whether the degree of expense preference behavior is different in the later period.

For Case 2, the coefficient on h/T is also positive and significant in both equations, again supporting the hypothesis of expense-preference behavior among mutual savings and loans. Again, the sign of the coefficient on W/T (significant only in the present study) is negative for both equations in accordance with the model predictions and the AG study.

These results generally confirm the findings of AG on a nationwide sample of several thousand savings and loan associations. While in some cases the direction of the sign of the coefficient differs from the AG study (as is the case, for example, with I_D/T for both equations in Case 1), these differences only occur when statistical significance is not attained in either study. Our findings suggest that the evidence of expense-preference behavior found among the 386 savings and loans examined in the original AG study appears indeed to be characteristic of the entire industry in our 1979–80 dataset.

The coefficients on the variables multiplied by $D87\_88$ shown in the bottom half of Tables 1 and 2 provide the empirical results for the later time period. Those coefficients show the changes in the parameter estimates from the 1979–80 time period. The primary test of interest here, the test of the change in expense-preference behavior, is provided by the sign of the coefficient on $D87\_88 * h/T$. As hypothesized, in all four equations in Tables 1 and 2 this coefficient is both negative and statistically significant, indicating that expense-preference behavior by managers of mutual savings and loans has decreased. Thus, over this time period, the indicator of expense-preference behavior has changed in the way that was hypothesized, given the changes in regulation and increased competition in the overall environment.

To further examine the stability of the all parameter estimates in each model, a Chow test was performed to determine whether all parameters in each model were the same in the two periods. In all four cases the null hypothesis that all variables are the same across periods was rejected at the 1% level, indicating a statistically significant change in the estimated coefficients of the models.

5. Summary and conclusions

AG examined the ownership structure of savings and loan associations as a determinant of managerial expense-preference behavior. In contrast to most previous empirical work that focused on the effects of expense-preference behavior on input usage, AG focused on output. This study extends the work of AG through the use of a much larger, nationwide sample of saving and loan associations and shows that AG's finding of significant evidence of expense-preference behavior in mutual savings and loans for one US District were also found nationwide during the 1979–80 time period.

This study further adds to the literature by providing evidence that over the time period that coincided with substantial deregulation of the financial services industry, expense-preference behavior for savings and loans decreased. These findings are consistent with Edwards' (1977) conclusion that managers of regulated firms are likely to decrease expense-preference behavior when faced with increased competition, and Gropper and Oswald (1996) who found such a decrease in the US commercial banking industry.

The 1980s were characterized by significant regulatory change. Though some changes were deregulatory and others reregulatory, on net, the barriers faced by S&Ls were much lower at the end of the 1980s than they were at the beginning. The lowering of regulatory barriers should promote competition and force greater managerial efficiency. This, coupled with the blurring of lines of business in the financial services industry, and increased competitive pressure, should greatly diminish the ability of managers to engage in expense-preference behavior. This implies that the firms that remain in the financial services industry will be providing services more efficiently than during the earlier period. The results of this update are consistent with theoretical expectations regarding industry and firm adaptations to the removal of regulations that restrict competition, in that such removal should improve

managerial efficiency in firms that survive in the increasingly competitive environment.

Acknowledgements

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