A Theoretical and Empircal Analysis of the Effects of Deregulation in the 1980's on S&L Asset Portfolios

by

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Dissertation submitted to the Faculty of the

Virginia Polytechnic Institute and State University

in partial fulfillment of the requirements for the degree of

Doctor of Philosophy

in

Finance

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August, 1987

Blacksburg, Virginia

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(ABSTRACT)

This dissertation is a theoretical and empirical investigation of the actual changes in Federal S&L asset portfolios following the deregulation of the 1980's which loosened the restrictions on the amount of non-housing related lending that Federal S&L's could undertake. In particular the study focuses on the effects of deregulation and the forces promoting and constraining the individual S&L's expansion into non-housing related assets.

The theoretical model provides a framework for the empirical examination of the deregulation in the DIDMCA of 1980 and Garn-St Germain Act of 1982. The theroretical model is an adaptation of the Mingo and Wolkowitz (1977) banking model. The peculiarities of the S&L industry are embodied through adaptations of the Mingo and Wolkowitz (1977) model which emphasize after-tax profit maximization (tax laws reward specialization in housing related assets), constrain diversification into non-housing related assets, and differentiate between mutual and stock associations.

Using the method of Lagrange multipliers, an expression is obtained for the effect of a change in after-tax profits for a relaxation of the constraint on diversification which becomes the focus of the analysis. By integrating the Lagrange multiplier with economic and regulatory controls, systems of regressions are developed which ex-

amine the changes in asset portfolio composition for Federal associations using balance sheet and income statement data between 1979 and 1983.

The findings and implications of the empirical analysis are summarized as follows:

1. The tax laws do not appear to have constrained the diversification.

2. Specialization effects with respect to housing related assets appear to have constrained the diversification into non-housing related assets.

3. Non-housing related assets and liquid assets appear to be substitutes.

4. Stock associations, on average, have expanded into non-housing related assets to a greater extent than mutual associations.

5. The changes in liability legislation appear to have restrained the diversification into non-housing related assets.

6. Large associations appear more able to acquire the expertise needed to diversify.

7. Profitability appears to be correlated with the expansion into "new products."

In memory of my father

Conway Shinault Hudgins

Acknowledgements

I wish to thank all of my committee members and all those who provided me with advice, information, and support through-out the dissertation process. With respect to the data analysis, I would like to acknowledge the contributions of Beverly Hadaway, Tom Gosnell, and Sharon Myers. Beverly Hadaway's programs and Tom Gosnell's programming skills were invaluable in accessing and retrieving the data from the FHLB tapes. Sharon Myers was most gracious in sharing her pertinent SAS programs which saved me from many hours of frustrating programming. I would also like to thank all of those at the FHLBB and the regulatory agencies for state chartered S&Ls for answering my many questions concerning the S&L industry.

I extend special thanks to my Chairman, George Morgan, whose unending patience, thought-provoking questions, encouragement, and shared enthusiasm for this research provided motivation and direction from the development of the topic to the completion of this dissertation. Beyond this, I would like to thank him for sharing his attitude and approaches to research (and the problems which arise). This orientation expanded the scope and potential of research beyond the boundaries I had previously perceived.

Special thanks are extended to my colleagues, Tom Gosnell and John MacDonald for their enduring friendships and votes of of confidence throughout the

program. They made lunch-hours a revitalizing time for three years. I will always value our friendships and remember the "good times".

I express my deep appreciation to my mother, Bertha Hudgins. She has provided moral support and encouragement throughout my years of graduate study. I appreciate her tolerance and the sacrifices she has made in order for me to devote my time and energies to my studies.

Finally, I would like to thank God for giving me the aspirations, opportunities, and abilities to succeed in the Finance program and to complete this research.

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Chapter I

Introduction

1.1 The S&L Industry and the Asset Deregulation

The savings and loan industry has provided residential mortgages to a major portion of homebuyers for over fifty years. Until the 1970's, the traditional view was that a strong industry required an intricate and restrictive regulatory environment combined with various subsidies and taxes. S&Ls evolved in that environment as a major financial institution specializing in home mortgages while promoting the government's goal of "a decent home and suitable living environment for all Americans."(Housing Act of 1948) Extremely high and volatile interest rates in the late seventies and early eighties in concert with the restrictive regulatory environment destroyed the profits and devalued the mortgage portfolios of S&Ls. The industry was in trouble. In response to the situation, Congress sought to enable S&Ls to better compete in the financial services industry by passing legislation to broaden their powers. This trend of deregulation had the potential to change the structure of the S&L institution. (Vartanian (1983),Kaplan (1983), Walker (1983), Balderston (1985), Kaufman (1984))

In the 1980's Congress passed two major deregulatory acts which have the potential to change the composition of the asset portfolios of S&Ls. In March of 1980 the Depository Institutions Deregulation and Monetary Control Act expanded the authority of Federal S&Ls to invest up to 20 percent of assets in consumer loans, commercial paper, and corporate debt securities and to invest in, sell, purchase, participate, or otherwise deal in real estate loans or interests therein without geographic restriction.

The Garn-St Germain Depository Institutions Act signed into law by President Reagan on October 15, 1982, further expanded the authorities of Federal S&Ls. They were allowed to invest up to 5 percent of assets, until January 1, 1984, and up to 10%, thereafter, in commercial, corporate, business or agricultural loans. Federal S&Ls could invest up to 10 percent of assets in obligations of the state or local governments. The limitations on the proportion of total assets invested in nonresidential real estate loans was increased from 20 percent to 40 percent and the limitations on consumer loans were changed from 20 percent to 30 percent of assets. The Act was of such vital importance that on November 4, 1982, twenty days after the President signed the Act, the Federal Home Loan Bank Board (FHLBB) adopted an interim implementing regulation that allowed the S&Ls to immediately enact a major part of the deregulation. (Vartanian (1983); McIntosh, Warner, and Gaines(1983))

1.2 Factors Affecting the Asset Deregulation

The new broader powers would appear to encourage substantial changes on the asset side of the balance sheet. On the other hand, despite the well-publicized deregulation, a large part of the regulatory structure remains intact. If the remaining regulations and subsidies continue to be the effective factors in portfolio decisions,

the deregulation in which so much faith has been placed will not have the desired results. In this dissertation the following controversial issues raised by the deregulation will be addressed:

1. Have the majority of S&L portfolios shown composition changes in response to deregulation?

2. To what extent have portfolio composition changes been constrained and what forces have constrained the changes?

1.2.1 Specialization

If any other financial institutions had been deregulated in the manner described above, the answers to the first and second questions would probably be uninteresting; however, S&Ls have evolved as financial institutions with peculiar characteristics which make the above questions non-trivial. Until the 1980's Federal S&Ls were almost totally confined by regulations to making residential mortgage loans. The heterogeneity of the real estate serving as collateral for these mortgages dictates small segmented markets with high information costs for S&Ls. Geographic and product specializations are therefore reasonable strategies; and given the base of expertise which S&Ls have built up over the past half-century, there is reason to believe that some specialization will continue in the future.(Eisenbeis and Kwast (1986), Eisenbeis (1983))

1.2.2 Taxation

The taxation of S&Ls also differs from that of other financial institutions. An association which has at least 82 percent of its assets in qualifying loans is allowed to claim a bad-debt deduction equal to 40 percent of its taxable income. Qualifying assets include cash, government obligations, residential real-property loans, loans secured by member's deposits, loans secured by church, school, health, and welfare facilities, or concerning property located in an urban renewal area, student loans, and property used in the conduct of the institutions business. (An Analysis of the Proposed Capital Requirements for for Thrift Institutions (1986) p.59) S&Ls with less than 82 percent but at least 60 percent of their assets qualifying, must reduce their deduction rate by .75 percent for each 1 percent they are below the 82 percent standard. Associations with less than 60 percent qualifying assets receive no benefits.[1] Therefore, taxes are a function of residential real estate loans, and there is a tax advantage to holding these loans, regardless of the deregulation which has only recently permitted S&Ls to make other types of loans.(Baer (1983); McCahill, Schmidt, Revell, and Erikson (1983); Simonson (1978))

1.2.3 Organizational Form

A third important difference between commercial banks and most S&Ls is the form of organization. S&Ls usually have the mutual form whereas most financial institutions are owned by stockholders. Several studies have found differences in the risk tolerances, aggressiveness, growth rates, and profit maximizing behavior of mu-

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[1] These were the regulations at the time.

tual versus stock S&Ls. Verbrugge's research finds behavior inconsistent with profit maximization and calls it "expense preference behavior." Thus S&Ls may not react to deregulation in a manner which one would associate with profit maximizing or utility maximizing firms. (Verbrugge, Shick, and Thygerson (1976), Verbrugge and Goldstein (1981), and Verbrugge and Jahera (1981))

1.3 The Theoretical Modelling of the S&L Firm

In this dissertation a theoretical model is developed and an empirical analysis of the portfolio choices of S&Ls is undertaken. The theoretical model is an adaptation of the Mingo and Wolkowitz (1977) banking model which reflects the peculiarities of S&Ls and their environment. Mingo and Wolkowitz modelled the banking firm as a before-tax profit maximizer subject to a constraint on the level of risk. The loan and deposit markets are considered segmented and imperfectly competitive. The focus of the article is the effect of a change in the risk or "soundness" constraint on the optimal lending and borrowing decisions. The basic structure of the Mingo and Wolkowitz framework is particularly appropriate for considering the questions discussed above for S&Ls. The imperfect markets characterization of mortgage markets is a useful description of the geographically segmented residential real estate markets which S&Ls have traditionally served. An upper bound on the level of risk which the institution is allowed to underwrite captures the roles of both risk and return in the face of soundness regulations such as capital adequacy. Of course, the Mingo and Wolkowitz model does not incorporate the influence of taxes, the regulatory constraints on S&L lending, or the important role of specialization in S&L lending.

The theoretical model developed in this dissertation therefore modifies the Mingo and Wolkowitz framework to capture those factors.

The S&L's objective is stated as maximizing after-tax profits subject to a balance sheet constraint, a regulatory constraint on non-housing related loans, and a soundness constraint. The balance sheet is composed of liquid investments, housing-related assets, non-housing related assets, deposits and equity. To incorporate the role of the unique tax advantages of S&Ls, the tax rate for S&Ls will be modelled as a function of the proportion of assets which are in residential mortgages. The further below 82%, the higher the S&L's tax bracket. To incorporate the pre-1980 prohibition on certain types of lending by Federally chartered S&Ls, a constraint on non-residential lending will be included in the model. This formulation will then permit an analysis of the effects of the relaxation of the constraint consistent with the character of the deregulation of S&L's asset choice in the early 1980's. The adaptations necessary for our emphasis has required a nonlinear programming model as compared to the simplicity of the MW classical optimization framework. Despite the necessary changes this S&L model still retains the flavor of MW's model and will establish conditions under which the relaxation of the regulatory constraint will have a large or small effect on S&Ls. Those conditions will involve the risk-return tradeoffs, the tax advantages and the specialization advantages.

1.4 The Empirical Model of the S&L Firm

The S&L model is utilized to propose hypotheses concerning the effects on the asset portfolio of the changes in the regulatory constraints. The empirical part of this dissertation evolves from the theoretical model testing for the effects evident in the

model while also examining to some degree competing documented hypotheses of prior research in this area. This study is intended to test the relative importance of the following:

1. taxation effects: The effects of tax considerations on the incentive to make the changes to the asset portfolio allowed by the deregulation.

2. specialization effects: The effects of product and geographic specializations on the incentive to make the changes to the asset portfolio allowed by the deregulation

3. organizational form effects: This effect of mutual versus stock form of orgainization on the incentive to make the changes to the asset portfolio allowed by the deregulation.

The empirical analysis uses balance sheet data from the FHLBB tapes on Federal S&Ls. Changes in asset portfolio proportions are examined between the pre-deregulation era of the late 1970's and the deregulation era of the early 1980's. The research proposes to answer the questions stated earlier (Section 2) which are of interest to policy maker (FHLBB and Congress). The analysis earmarks areas where regulations should be relaxed or perhaps tightened to accomplish the desired results of the regulators and will be useful in predicting the effects of additional changes in the S&L environment.

The findings of the empirical analysis reported in Chapter 6 can be summarized as follows.

1. The tax laws do not appear to have constrained the expansion into non-housing related assets.

2. Specialization effects with respect to housing related assets appear to exist.

3. Non-housing related assets and liquid assets appear to be substitutes.

4. Stock associations, on average, have expanded into non-housing related assets to a greater extent than mutual associations.

5. The changes in liability legislation appear to have restrained the diversification.

6. Large associations appear more able to acquire the expertise needed to diversify; hence mergers would promote the movement into non-housing related assets.

7. Profitability is correlated with the expansion into "new products."

Further discussion of these findings and conclusions are contained in Chapters 6 and 7.

Chapter II

Literature Review

2.1 Introduction

The purpose of this chapter is to selectively review the literature pertinent to examining the effects of the deregulation of the 1980's on S&L asset portfolios. The first section focuses on the literature attempting to predict or evaluate the effects of the deregulation on the S&L's structure. This discussion emphasizes the changes on the asset side of the balance sheet; although that may not have been the focus of the given study. Boorman and Peterson look at the proposals of the Hunt Commission in the 1970's with respect to deregulation. Baker (1982), Crockett and King (1982), and McCall and Peterson (1980) utilize state S&Ls with expanded powers prior to the 1980's to anticipate the behavior of Federal S&Ls to changes granted by the DIDMCA and/or the Garn-St Germain Act. Eisenbeis and Kwast(1986) depend on the ratios of banks specializing in real estate to give direction to their predictions. Given that these researchers have used proxies to anticipate reactions, Walker(1983) is one of the first researchers to use S&L empirical data to look at the effects of the deregu-

lation. Concluding this section, Kaufman (1984) is important in identifying the motivation for the deregulation and other changes affecting the S&L environment.

The second section surveys research which does not focus on the deregulation of the S&L industry. These studies were selected because they examined S&L behaviors which have the potential to affect how associations have responded to the deregulation. Given the emphasis on maximizing profits in Chapter 3, some of the literature concerning S&Ls' profitabilities will be examined. The papers of Verbrugge, Shick, and Thygerson (1976), Verbrugge and Goldstein (1981) and Verbrugge and Jahera (1981) are concerned with the profit maximizing behaviors of mutual and stock associations.

2.2 Section One: Deregulation and the S&L Industry

2.2.1 (BOORMAN AND PETERSON)

Boorman and Peterson (1972) appraised the Hunt Commission's proposals concerning the mortgage market. The Hunt Commission was appointed by President Nixon in April, 1970 to perform a thorough analysis of the structure and regulation of financial institutions. By December, 1971, the Commission's report was submitted to the President. The recommendations affecting S&L's contain many similarities to the deregulation of the 1980's. The authors express concerns emphasized during an era characterized by "healthy" S&Ls versus the 1980's when S&Ls were "struggling to survive." The specific recommendations as outlined in Boorman and Peterson's paper are found in the Appendix.

Boorman and Peterson stress potential effects of increased diversification envisioned by the Hunt Commission. This same diversification issue is the core of this proposed research some 15 years later. They felt (as did many others) that this increased diversification potential would be detrimental to housing goals. They point to the higher variations in mortgage lending of the more diversified institutions (commercial banks and life insurance companies) compared to less diversified institutions (mutual savings banks and S&Ls) as an indication of the destabilizing effects that these powers would have on the mortgage industry. They use the coefficient of variation in mortgage acquisitions and variation around a time trend in mortgage acquisitions (the standard error of the regression divided by the mean) as measures of variation. The data is quarterly from the second quarter of 1952 through the fourth quarter of 1969. For conventional loans the coefficient of variation is .4596 for S&Ls

compared to .8351 for commercial banks. When adjusted for a trend in time, a similar relationship still exists. The S&L's variation of .30 is significantly smaller than the commercial bank's variation of .69.

Boorman and Peterson were concerned that S&L's would become more like banks and less devoted to suppling home mortgages. Given these types of concerns with respect to an industry in as good of health as the S&L industry was at that time; it comes as no surprise that no action was taken. From 1960 to 1970 the average rate of return for the S&L (5.88 percent) was superior to that of the commercial bank (5.43 percent). It is obvious why the proposals of the Hunt Commission did not become laws in the early 1970's. The interesting question which provoked the present research concerns behavior at the time of deregulation, in the early 1980's, when S&Ls were characterized by negative returns. Having been granted essentially the same expanded asset powers recommended by the Hunt Commission, why have general statistics indicated little diversification of portfolios?

2.2.2 (MCCALL AND PETERSON)

In the 1980's, ten years after the Hunt Commission's proposals, researchers used state chartered S&L's to predict the effects of the new expanded powers of Federal S&Ls. McCall and Peterson (1980) anticipate changes in the financial services industry due to the passing of the DIDMCA in March 1980. They argue that the changes in Maine, where thrifts received similar powers in October, 1975, anticipate the changes in the financial services industry motivated by the new act. McCall and Peterson examine the industry as a whole, including commercial banks, savings banks, and savings and loans. They conclude that commercial banks can expect to face aggressive competition from thrifts in many retail banking services.

State chartered thrifts (S&Ls and mutual savings banks) in Maine received authority in 1975 "to offer personal checking accounts, to issue credit cards, to make secured and unsecured consumer loans up to 10 percent of deposits, to participate in loans with Maine commercial banks for up to 10 percent of total deposits, and to make additional prudent loans including commercial loans for up to 10 percent of total deposits and the authority to make additional commercial loans up to a percentage established by the Superintendent of Banking." (McCall and Peterson (1980), p. 47) Business loan activity for S&Ls may have been constrained by their lack of authority to offer business transaction accounts. State reserve requirements were the same for all types of depository institution. In addition to these powers granted in 1975, in February, 1976, Maine depository institutions were allowed to utilize NOW accounts.

McCall and Peterson emphasize the changes in liabilities. They found evidence that thrifts were more aggressive in advertising and pricing deposit accounts given their new powers. Their aggression in this area provided only modest rewards in the first 15 months. Their personal deposit market share increased only slightly. This behavior with respect to liability management is cited here because of the implications it may have on empirical research emphasizing asset portfolio changes.

In the area of asset acquisition, McCall and Peterson's statistics show little change for S&Ls with respect to market shares. In June, 1975, S&Ls held a 4 percent share of the consumer loan market, a 12 percent share of the 1 to 4 family FHA-VA loan market,and a 24 percent share of the 1 to 4 family conventional loan market. The statistics remained the same in December, 1977, except for a decline in their market share of conventional loans to 23 percent. For the same period mutual savings banks (the most popular thrift in the New England area) which underwent very similar deregulation , increased their market share of consumer loans from 14 percent to 18 percent and their market share of commercial loans from 1 percent to 2 percent.

Maine's predominance of mutual savings banks could suggest that it is a less than perfect predictor for Federal thrift behavior given that mutual savings banks play only a minor role in the national "picture".

McCall and Peterson's research indicates that thrifts in Maine did not utilize their new powers in the 1970's and would suggest that only minor changes for Federal S&Ls would be motivated by the DIDMCA. Our research proposes to analyze the S&L data to see if the same behavior exists for Federal S&Ls in the 1980's and if so, what motivates this behavior.

2.2.3 (BAKER)

Baker (1982) examined the changes of holdings of Florida State S&Ls versus Florida Federal S&Ls in response to changes in Florida laws effective June 30, 1980. The purpose of the analysis was to project how Federal S&Ls may react, at least in the short-run, to the expanded powers proposed by the Garn-St Germain Act.

The laws passed for the Florida State S&Ls were very similar in purpose to those proposed for the Federal S&Ls. A state chartered S&L could invest in secured or unsecured loans for any purpose as long as at least 60 percent of the assets, other than liquid assets, are invested in either real estate, home property or residential property loans. This does not offer the potential for the level of diversification provided by the final form of the Garn-St Germain Act; however, there is a strong resemblance in character. The laws with respect to state and Federal obligations directly paralleled the proposals of the the Garn-St Germain Act. "A Florida Association may invest up to an aggregate limitation of 25 percent of total assets in (a) general revenue obligations of any state, county or municipality of the United States; (b)corporate obligations including commercial paper and ; (c) obligations of Federal

agencies which are not guaranteed by the United States." (Baker, p. 11) A state association can also invest in time deposits of any insured depository institution and may invest up to 5 percent of its assets in service corporation subsidiaries. The similarities also existed with respect to the liability side of the balance sheet.

Given the similarities of Florida's state laws, Baker felt this to be a preview of Federal S&Ls reactions to the Garn-St Germain Act. The analysis covers the Florida associations under their new expanded powers for the first 21 months. Baker initially compared 93 Federal associations to 25 state associations. He found only small differences. The Federal institutions held 1.65 percent of their assets in loans other than mortgages, while the state associations held 3.23 percent of their assets in non-mortgage loans. These very conservative changes indicate that Federal S&Ls would not be aggressive in their expansions. The net incomes of the associations indicate that although the changes were not drastic, the state S&Ls produced a positive net income of .02 percent versus the Federals loss of .09 percent. Although many other factors could have caused the difference, this finding is consistent with the expanded powers giving the state associations a very slight edge. In the short-run their reactions to the deregulation would not drastically change their income.

Indicative of the desirability of the state laws, the majority of newly formed S&Ls in Forida have choosen state charters. Since 1979, 19 new associations formed of which 16 were chartered by the state. Four associations converted from Federal to state charters over the same period. An interesting aspect emerged from analyzing these new state associations. They were not much different in respect to their usage of the new asset powers; however, they were much more liquid than the existing associations. Liquid investments composed 37.37 percent of their assets versus 6.25 percent and 6.57 percent respectively for existing Federal and state S&Ls. It was also indicated that the majority of the home loans of the new associations

conformed to GNMA and FNMA standards. This probably indicates that they were planning on selling these loans rather than holding them for the life of the mortgage. This could mean that these new S&Ls have a stronger emphasis on servicing loans than acquiring a loan portfolio. A positive net income of .29 percent implies that this is a feasible alternative.

Baker found small differences in state and Federal S&L's asset portfolios and only a .11 percent disparity in their net returns. This indicates little change in the short-run for Federal S&Ls due to their expanded powers. The preference for state charters implies a desire for the expanded powers. Baker feels greater benefits may be perceived in the long run.

Baker examines changes in the S&L's balance sheet components versus McCalls and Peterson's emphasis on market share changes. They found consistent results for state S&Ls in Maine and in Florida. Their research emphasized industry averages. We propose to see if these predicted results were realized after the de-regulation. If they were we will emphasize differences and similarities among individual Federal S&Ls to identify contributing factors.

2.2.4 (CROCKETT AND KING)

Crockett and King (1982) utilize the differences in asset powers of Texas state and Federal S&Ls over the period from 1977 to 1981 to address the productiveness of the expanded powers for Federal S&Ls proposed by the Garn-St Germain Act. The state chartered S&Ls were previously granted similar or exceeding powers to those proposed by the 1982 Congressional bills. Crockett and King capitalized on the different asset powers to make conclusions concerning the effectiveness of the new powers.

Ratio analysis is employed to detect differences in state mutual, state stock, and Federal mutual S&Ls. Asset composition ratios indicate that state S&Ls had made use of the authority to hold alternative assets; however, they had not explored this to the limits of their constraints. The stock S&Ls were more adventuresome than the mutual associations. They were also more effective in generating income as indicated by superior return on assets. One problem with ratio analysis is that it fails to control for additional factors. We propose to use regression analysis to correct this problem.

Crockett and King note that although the average S&L has been extremely cautious in its portfolio expansion, some individual S&Ls have made considerable use of the new powers. The authors used an example concerning automobile loans; while the average state stock S&L held .5 percent of their asset portfolio in automobile loans, one S&L held nearly 10 percent of its portfolio in automobile loans. This type of behavior, as documented by Table 8 of Crockett and King's paper, was present for most asset categories. For the Real Estate Owned for Development category, the mean was .56 percent; however, one S&L held nearly 7 percent of its assets in this category. In addition to what appears to be large variances around the means, Crockett and King observed that some individual S&Ls, while investing only a small percentage of their portfolios in alternative assets, have emphasized a few types of assets. This can conceal the effects of deregulation when ratios for the average S&L are employed. The proposed research will attempt to explain effects on individual S&Ls rather than relying on simple industry averages which can hide heterogeneity across S&Ls.

Crockett and King also examined the diversification of the S&Ls by asset size. They found that institutions of all sizes made use of the authority to hold assets other than first mortgages. Twenty-seven percent of the state stock associations with as-

sets under 25 million held business loans while 36 percent of the associations with assets valued between 50 and 500 million held these loans. For automobile loans the percentages for these two asset size groups were 70 percent and 67 percent respectively. This is evidence that all size S&L's have found the expanded powers desirable.

Crockett and King have compared the state and Federal S&Ls of Texas, finding that the state S&Ls are firmly committed to housing (mortgages or mortgage backed securities). Evidence exists that most S&Ls have utilized their powers to some degree. The stock associations have expanded more than the mutuals. Compared to Baker, Crockett and King have found more evidence of S&Ls utilizing their powers. The proposed research will look at data for Federal S&Ls to see if they reacted similarly and foresees incorporating individual differences and differences between groups such as stock versus mutual S&Ls to explain their motivations for changing or not changing their portfolios.

2.2.5 (EISENBEIS AND KWAST)

Looking at the same issues as those discussed above, Eisenbeis and Kwast (1986) use a different type of proxy as an indicator of future S&L behavior. They use a sample of 254 banks which specialize, by choice rather than regulation, in real estate lending as a means of forecasting the behavior of S&Ls with expanded asset and liability powers. They examine and compare the profitability characteristics of this sample of real estate specializing banks (REBs) with less specialized commercial banks and with S&Ls over the period from 1970 to 1979. A REB is defined to have at least 65 percent of their loans in real estate loans for at least 7 of the 10 years ex-

amined. Eisenbeis and Kwast suggested that the behavior of REB's would indicate how S&Ls with expanded powers would have performed in the 1970's.

With respect to profitability, the REB's return on assets is equal to or better than that of the commercial bank's sample. Both real estate banks and commercial banks have superior ROAs to those of the S&Ls over the period from 1970-1979. The stable relationship for the REBs indicates a rationale for their choosing to specialize in real estate. This initial result motivated the authors to explore this more.

Eisenbeis and Kwast break-down the profitability of the institutions into more identifiable components by using ratio analysis. In this manner they are able to attribute the good or bad performance to different areas of management. The ratio of net income to net income plus taxes indicates how well an institution used the tax laws to its advantage. After 1973 the REBs have higher ratios than the S&Ls. This indicates that banks are taxed more favorably than S&L's. Eisenbeis and Kwast thought this to be just the opposite of what the tax laws specify and had no explanation. While commercial banks lack the bad-debt deduction, they have other tax benefits which S&L's do not.

The ratio of total revenue to total assets reveals how well an institution uses its asset portfolio to generate gross income. Given that S&Ls were limited to residential mortgages in the 1970's, it is surprising that they significantly outperform the banks with respect to these ratios. The leverage ratios of total assets to total equity are much higher for S&Ls than for banks. One dollar of net worth supports between 17 and 19.5 dollars of assets for the S&L while a dollar of equity for a bank supports about 12 dollars of assets. The portfolios of S&Ls indicate that they are much less liquid than commercial banks, thus loaning out a greater portion of their assets. S&Ls held only about one quarter of the liquid assets held by banks. Commercial banks and REBs held about 40 percent of their assets in liquid assets.

The net income plus taxes to total revenue ratio is utilized primarily to reflect differences in operating costs. These ratios imply that real estate banks were more efficient than commercial banks and S&Ls were inefficient in comparison with all types of banks for the entire period. Eisenbeis and Kwast feel the major differences in profitability must be found in the differences in the operating costs and portfolio composition of S&Ls and real estate banks. They find interest expenses compared to revenue to be much higher for S&Ls. The non-interest expenses to revenue ratios are much smaller for S&Ls than REBs. Note that the proportion of revenue set aside to cover bad debt is smaller for S&Ls than for banks. This is surprising given that the tax laws encourage S&Ls to increase this bad-debt account. Eisenbeis and Kwast indicate that the greater success of banks specializing in real estate compared to S&Ls from 1970 to 1979 was due to lower interest costs. This disclaims the importance of the increased asset powers given S&Ls in the 1980s. Their analysis takes into consideration that S&Ls have tax benefits that banks lack; however, it ignores the fact that banks have tax benefits that S&Ls do not share.

Eisenbeis and Kwast point out differences between REBs, CBs, and S&Ls in the 1970's. This research proposes to examine changes in the characteristics of S&Ls motivated by the deregulation. In doing this we will see if the S&L's ratios look more like the ratios Eisenbeis and Kwast calculated for REBs and CBs. The proposed study is not a ratio study in itself. It is a regression analysis based on a theoretical model developed in the following chapter using S&L data to see how S&Ls reacted to their expanded powers.

2.2.6 (WALKER)

Walker (1983) examines the potential impacts of the DIDMCA and the Garn-St Germaine Act on S&L balance sheets by using actual S&L data. He quantifies the effects through the use of financial ratios. The ratios he has employed as proxies for the provisions of the new legislation are as follows:

The phase-out of Regulation Q is represented by the ratio of Interest on Accounts at or Below Ceilings to the Deposits in Accounts at or Below Ceilings.

The elimination of State Mortgage Usury Ceilings is represented by the ratio of Income on Mortgages to Mortgage Loans.

The Interest on Transaction Accounts is represented by the ratio of Deposits Not Sensitive to Interest Rates to the Total Funds.

The provision concerning the Federal Reserve Service Access and Pricing is represented by the ratio of Interest on Advances to Total Advances.

The Universal Reserve Requirements are represented by the ratio of Liquid Assets to Total Assets.

The provisions concerning Expanded Consumer Services (loans, credit cards, electronic banking machines) are represented by the ratio of Other Loans to Total Assets.

The provision concerning Other Loans to Total Assets is the focal point of the proposed dissertation. The theoretical model developed in Chapter 3 holds constant other changes in the S&L environment and models the diversification attributed to the expanded asset powers. Walker's empirical analysis suggests other provisions that should be controlled for in the empirical analysis developed in Chapter 5.

The variables listed above are used in multivariate models to identify how S&L's net worth and asset portfolios will change under the expanded powers. The asset portfolio models will be explained below. (For a description of the net worth model see the original article.) The balance sheet components (Mortgage loans/total assets and Liquid assets/total assets) are functions of the legislative changes and other variables. Using Ordinary Least Squares Regression models, the coefficients

of the variables can be interpreted as impact multipliers. Walker uses stepwise regression to order the legislative variables with respect to their effects on the balance sheet. The regression model proposed in Chapter 5 relies on the theoretical microeconomic model to accomplish this. The data for 3,905 insured S&L's over the period from June, 1980 to June, 1981 was utilized in the study.

The allocation of assets to different categories is affected by the different provisions of the deregulation as identified above. Walker analyzes the proportion of Mortgage Loans to Total Assets (MLTA)and the proportion of Liquid Assets to Total Assets(LQTA). His regressions indicate the following relationships:

$$MLTA = .9590 - .9527LQTA - 1.0213OLNTA - .0729RML - .1772ROL - .0013RINV$$

$$.0135SDTD + .1945RUR + .6974NITA - .0822(10^{-8})TA$$

and

$$LQTA = .9178 - .9493MLTA - .9787OLNTA - .0569RML - .1698ROL + .0142SDTD +$$

$$.1875RUR - .0301RADV + .6319NITA + .0376NWTA - .1297(10^{-8})TA$$

where

OLNTA = Other Loans/Total Assets

RML = Rate on Mortgage Loans

ROL = Rate on Other Loans

RINV = Rate on Investments

SDTD = Proportion of Funds Sensitive to Market Rates

RUR = Rate on Unregulated Accounts

NITA = Return on Assets

TA = Total Assets

RADV = Rate on FHLB Advances

NWTA = Net Worth to Total Assets

The above equations have been included to emphasize the order in which variables have entered and their signs. The negative coefficients on RML and ROL indicate that S&Ls will adjust their portfolios by investing more in other loans and less in both mortgages and liquid assets. The positive coefficient on RUR implies that associations will have to fund mortgages and liquid assets with a higher portion of funds in interest sensitive accounts. In comparing the equations one notes that the RADV is significant for liquid assets however, not significant for the mortgage assets.

The "operating environmental factors" that affected asset ratios are size(TA), return on assets(NITA) and net worth to total assets (NWTA). These are some of the same variables that will be identified by our theoretical model. Associations with higher returns increase their proportions in liquid and mortgage loans. The negative coefficient on total assets indicates that larger S&Ls seem to be moving into other assets (allowed by the expanded powers). The greater their net worth, the greater their holdings in liquid assets.

Walker's empirical model could be used to predict the future, as he illustrates with a particular scenario. Feeling the financial positions of individual S&Ls will stabilize as associations take advantage of their expanded powers, Walker foresees a "bright" future for S&L industry.

The proposed empirical analysis will be a cross-sectional regression comparing actual behavior in the pre-deregulation era (1979) to that in the post-deregulation era (1983). Examination of the actual changes is an important contribution of this study given that only Walker has considered actual responses to deregulation and then only examining the post-deregulation levels of asset allocation. Furthermore, the regression model will be developed from a theoretical model of opimizing behavior with other variables entering to control for outside effects not built into the theoretical

model. One such variable would be the growth of the secondary market, given that secondary markets have not been addressed by the theoretical model.

2.2.7 (KAUFMAN)

The research reviewed to this point has looked at how deregulation will effect S&Ls. Kaufman looks behind the scenes at why deregulation was necessary, it's implications, other innovations in the mortgage arena which have potential to cause change, and what he feels is the future of the S&L industry. He cites the forces promoting deregulation as:

1. the higher levels and increased volatility in interest rates that both decreased the profits of traditional mortgage-lending institutions and increased uncertainty and risk; and

2. the advances in telecommunication technology.

The new powers granted to thrifts were intended to provide them with shorter maturity assets, thus allowing them to reduce duration "gaps" between assets and liabilities. The implications of the deregulation is that S&Ls "must choose their product lines, geographical markets, and prices without government assistance" in a more competitive environment.

Kaufman emphasizes that while the S&L has the new opportunity to invest outside of home mortgages, the home mortgage environment is changing. Both the primary and secondary markets are taking new directions. In the primary market, new variable rate mortgages have reduced the durations of loans while increasing

the servicing costs. In the first months of 1984, about 60 percent of the new mortgage loans were varying rate mortgages made by some 80 percent of all S&Ls. While the primary market was changing, the secondary market was also designing new securities and expanding. Such developments were occurring at the same time as the deregulation and and thus have the potential to effect changes.

2.3 Section Two: Profitability of S&Ls:

The studies discussed in this section do not examine deregulation; however, they relate to the dissertation through their focus on the profitability of S&Ls. This is pertinent given that the theoretical model developed in the next chapter assumes that S&Ls maximize after-tax profits within the regulatory environment. The articles considered relevant examine different aspects of profitability. Verbrugge, Shick, and Thygerson examine determinants of profitability. Verbrugge and Goldstein look at the differences between stock and mutual S&Ls with respect to profit, risk, and operating performance. Verbrugge and Jahera examine the differences in personnel expenditures between mutual and stock S&Ls. In each case there is some evidence that value maximizing behavior is not consistent with the behavior of many S&Ls, and therefore, there are other variables beyond those relating to value maximization which must be employed in empirical analysis of S&Ls.

2.3.1 A Function of Organizational Form?

2.3.1.1 (VERBRUGGE, SHICK, AND THYGERSON)

Verbrugge, Shick, and Thygerson (1976) use the Report of Condition data from 1971 and 1972 for 478 S&Ls to explore issues of profitability. They select return on net worth as the most appropriate measure of performance for mutual S&Ls. In 1971 this varied for individual associations from -6.8 percent to 37.7 percent, thus it is evident that there are differences to be explained. The researchers propose three areas of management (asset, liability and operating expense) and the form of organization (stock or mutual) to be important in determining the return on net worth. In each area they choose variables to represent the types of strategic decisions management has the opportunities to make.

Verbrugge, Shick, and Thygerson use analysis of variance to separate the most important factors in determining return on net worth. The most significant variables were interest on mortgage loans/mortgage loans and fee income/total income, indicative of asset management; net worth/savings, indicative of liability management; and operating expenses/average assets indicative of operation expense management.

Having identified the key factors of profitability, they then attempt to isolate the determinants of these key factors. This is accomplished by regressing hypothesized components on the key factors. They find the ratio of loans serviced to total loans, the ratio of loans sold to loans originated per year, and the size of the firm to be significantly positively related to fee income. They find the ratio of conventional loans to total mortgage loans, the ratio of construction loans to construction plus purchases, and mortgage loan turnover to be positively related to mortgage yields. The

regulation of usury laws and competition were negatively related, as would be expected. In states with severe usury laws, S&Ls are forced to purchase loans and therefore are not able to earn fees, thus decreasing yields.

The proportions of conventional and installment loans (mobile homes, home improvement, and consumer loans) are positively related to operating expenses, Since this proportion of conventional loans has positive effects on both yield and operating expenses, it is difficult to say what its overall effect on profitability is. Growth is significantly negative, therefore indicating inefficiencies.

The fourth key factor is deposit structure as proxied by certificate savings to total deposits. An unexplainable finding in this area was that as competition increases associations carry a lower certificate ratio. The second was that as the median income decreases, S&Ls carry a higher certificate ratio. This could be rationalized by retirees dominating an area such as Florida. The third significant result was a positive relationship between high yield loan portfolios and certificates.

The above results have numerous implications. The most important evidence with respect to this dissertation concerns efficiency, loan composition, and imperfect markets. The results indicate that managerial forces are the major determinants of performance because cost control, loan composition, and secondary market operations are significant variables. Although efficiency has a significant impact on profitability it is by far not the only factor. The implication is that for an individual S&L the deposit and acquisition markets are not perfect. Imperfect loan and deposit markets are incorporated in the theoretical model developed in Chapter 3.

2.3.1.2 (VERBRUGGE AND GOLDSTEIN)

Verbrugge and Goldstein(1981) tested hypotheses concerning the differences in profit, risk, and operating performances between stock and mutual S&Ls. They use data from the FHLBB from 1974 to 1976 for a group of S&Ls operating in similar geographic markets. They emphasize that if managers of mutual S&Ls are taking part of the firm's profits in higher operating expenses and selecting a less risky loan portfolio, then profitability is not a good indicator of performance.

The first step in determining a difference in profitability between stock and mutual S&Ls was accomplished using a model where profitability is a function of size, deposit composition, loan quality, variations in return, and the form of the organization. An Ordinary Least Squares regression was performed using two geographic sets of data for California and Los Angeles. The equation explained 29 percent and 34 percent of the variations for the two samples, respectively. It indicated superior profitability for stock associations.

The higher returns for stock S&Ls suggest examinations of the the risk preferences and operating expenses of the associations would be appropriate. To accomplish the first task, Verbrugge and Goldstein use a model where loan quality, as measured by the average rate of scheduled items to total loans, is a function of the S&L's age, size , asset growth, and loan mix. Explaining 20 percent to 30 percent of the variation, the model indicates that managers of stock S&Ls prefer more risk than managers of mutual S&Ls.

They take into consideration the influences of size, output composition, deposit composition, and other portfolio activities, such as loan sales, loan services, and loan purchases to examine differences in operating expenses. Using a log-linear specification, they reject the hypothesis of no differences in operating costs between stock

and mutual S&Ls. Expense preference behavior seems to be more evident in mutual associations than in stock associations. Although expense-prefence behavior is not identifiable in the model presented in Chapter 3, it does have the potential to affect the empirical results.

2.3.1.3 (VERBRUGGE AND JAHERA)

Verbrugge and Jahera (1981) further expand the area of research regarding expense preference behavior in the S&L industry. They concentrate on the hypothesis that mutuals tend to have higher personnel expenditures than stock associations. They also examine the effects of concentrated and competitive markets.

They use data for 1974 to 1976 for 116 S&L's (60 stock and 56 mutuals) in an ordinary least squares regression to test their hypotheses concerning personnel expenses. The adjusted R-square is above 90 percent and the signs of the coefficients appear as expected. A highly significant t-ratio for the mutual to stock dummy variable indicates that mutual managers have a greater tendency to engage in expense preference behavior than the stock managers. This finding further emphasizes the importance of considering the differences between mutual and stock associations. The proposed theoretical model incorporates differences in their abilities to raise capital. The implications of expense preference behavior will be an empirical question.

2.4 Summary

The purpose of this chapter is to discuss the literature pertinent to examining the deregulation of asset portfolios in the 1980's. The research analyzing the actual effects of the deregulation is non-existent to date. Section One recapitulates the research anticipating these effects. Given our intention to analyze actual data based on a theoretical model, Section Two reviews the literature pertinent to the proposed model. This literature examined the profit maximizing behavior of S&Ls, which will be considered in the theoretical model development and in the empirical study.

Chapter III

Theoretical Model Development

3.1 Introduction

The model developed in this chapter is an adaptation of the Mingo and Wolkowitz model of the banking firm. The first section describes their basic model and how it was used to describe changes in balance sheet items motivated by changes of regulations regarding soundness of financial institutions. The second section details how the Mingo and Wolkowitz model is adapted to the S&L environment and utilized to develop a framework for examining the 1980's deregulation. This model will be used in Chapter 5 to develop empirical tests of changes in the asset portfolios of Federal S&Ls from prior to the deregulation (1979) to post-deregulation (1983). Given the time period of the empirical analysis, the model developed will take into account the regulation and changes in regulations between 1979 and 1983.

3.2 Section One: The Mingo and Wolkowitz Model

The Mingo and Wolkowitz emphasis on changes in assets and liabilities dictated the following balance sheet identity as a starting point:

$$A + A' + C = D + K$$

Where A = loans, A′ = government securities, D = total deposits, K = capital, and C = required cash reserves, which is a fixed proportion of deposits. The relationship between cash and deposits was expressed as:

$$C = (1\text{-}v)D$$

where v = (1 - the reserve requirement.) The bank manager was described by Mingo and Wolkowitz as "a risk taker who wishes to earn the greatest possible profit given the regulator's judgement of the bank's 'soundness'," (Mingo and Wolkowitz, p. 1606) although the manager could just as well have been a risk averter facing a binding constraint regarding the allowable level of risk. Therefore, it follows that the objective function was one of profit maximization.

$$(\max)\ \pi = pA + rA' - gK - hD$$

where p = interest rate on loans, r = interest rate on government securities, g = the cost of capital, and h = the cost of deposits. This is a classical maximization problem where profit was maximized subject to the balance sheet identity and the following soundness constraint imposed by the regulators:

$$\lambda = aA + a'A' + cC + kK - cD$$

The lower case letters are weights which were reminiscent of examination, capital adequacy and rating procedures of the Federal regulatory agencies. On the asset side, weights were based on an estimation of realizable value under forced liquidation as well as estimations of possible losses from default. The weights for liability

items were determined by taking into account estimates of maximum possible paydown.

Given that a bank's function as a financial intermediary evolves from imperfections in the market, it is quite appropriate to incorporate aspects of imperfect markets within a banking model. Mingo and Wolkowitz accomplished this with some of their fundamental assumptions. The interest rate on loans (p) was a function of the quantity of loans (A) and of the quality of loans (a). Note that "a" is the same variable found in the soundness constraint. The signs of partial derivatives were determined by the neoclassical properties associated with supply and demand functions. For instance, $p_a < 0$ and $p_A < 0$. Assuming the banker faces a perfectly elastic supply of government bonds, the interest rate (s) was determined exogenously. The cost of capital was a function of the amount of capital (K) and $g_K > 0$. In a similar vein, the supply of deposits was assumed to be less than perfectly elastic and thus a function of the amount of deposits (D).

Mingo and Wolkowitz developed a Lagrangean function from their initial assumptions. By taking total derivatives of the first order conditions with respect to λ they were able to formalize changes in the endogenous variables for changes in soundness regulations. The purpose of the above discussion was to set the stage for the modifications of this model which are developed in the next section.

3.3 Section Two: Theoretical Model

The model developed in this section is an adaptation of the Mingo-Wolkowitz model discussed in Section one. While it has retained the general flavor of their model, this model is also quite unique because it considers the distinguishing char-

acteristics of S&Ls and emphasizes the expanded powers granted by the DIDMCA and the Garn-St Germain Act.

3.3.1 Basic Assumptions and Definitions of Variables

The strong emphasis on asset deregulation in this study and the important continuing tax and regulatory policy related to three major asset categories dictate the construction of the following modified balance sheet identity:

$$A + A' + L = D + K$$

where A = housing related assets, A′ = non-housing related assets, L = required liquid reserves, D = total deposits, and K = capital. Housing related assets (A) include mortgages for the construction and purchase of homes and apartments, mortgage backed securities, and loans for home improvement and mobile homes. The non-residential loans (A′) includes savings account, education, investments in service corporations, and other consumer loans prior to the deregulation. The 1980's deregulation added commercial paper, corporate debt securities, commercial real estate loans, corporate loans, agricultural loans, and assets in obligation of the state and local governments to this diversified category.

The third category of assets is liquid assets which are related to deposits by the following form:

$$L = (1\text{-}v)\ D$$

where v = 1 - (the required liquidity ratio.) This assumes the S&L does not hold excess reserves beyond the requirements. This specification is closely linked to requirements set forth by the Federal Home Loan Bank Board. Since 1950, the Federal Home Loan Banking Act has granted the FHLBB the authority to determine the composition and maturity of legal liquid investments and to specify the required liquidity

ratio. Since 1972, the FHLBB has retained a short-term and an overall liquidity ratio (liquid assets to deposits). The assets which qualify as liquid include: cash, demand deposits, U.S. government and Federal agency securities with remaining terms to maturity of five years or less, commercial bank time deposits with remaining terms to maturity of not more than one-year, bankers acceptances with a remaining maturity of not more than nine months, and state and municipal securities with remaining maturities of not more than two years. Short-term liquid assets include all of the overall qualifying assets except U.S. government and agency issues with maturities longer than 12 months, commercial bank time deposits and banker acceptances with maturities longer than six months, and all state and local government obligations. From this identification of the actual requirements, the level of simplification of this modeling process is revealed.

The right hand side of the balance sheet is composed of deposits and capital. Deposits include not only savings deposits but also borrowings and FHLBB advances. The final item is capital which is very different for the mutual S&L compared to the stock S&L. Mutuals depend on retained earnings (plus small amounts of subordinated debt in recent years) for their net worth while stock S&Ls have the ability to go to the capital markets and sell stock to increase their net worth.

3.3.1.1 Objective Function

The S&L manager is assumed to be a profit maximizer operating within the constraints defined by the regulator. In order to take into consideration the predilection of the tax laws, the objective will be to maximize after-tax profits. The objective function is as follows:

$$(\max)\ \pi = (rA + nA' + s(1-v)D - gK - hD)(1 - \tau)$$

where τ is the average tax rate and is a function of the proportion of qualifying assets to total assets. This expresses the essence of the qualification for the bad debt reserve tax deduction which is relevant for S&Ls. A S&L may deduct 40% of its income for tax reasons by making additions to their loan-loss or bad debt reserves if it can pass an asset composition test. This requires that 82 percent of total assets must be in qualifying assets for the association to obtain the full 40 percent of taxable income deduction. Qualifying assets include cash, government obligations, residential real-property loans, loans secured by members' deposits, loans secured by church, school, health, and welfare facilities, or concerning property located in an urban renewal area, student loans, and property used in the conduct of the institutions business. (An Analysis of the Proposed Capital Requirements for Thrift Institutions (1986), p.59) For each 1 percent the proportion of qualifying assets to total assets falls below this 82 percent the S&L loses .75 percent of the bad debt reserve deduction. Below 60 percent no tax deduction is allowed. The tax function is assumed to be continuous over the range from 60 percent to 82 percent of housing related assets plus government securities to total assets as described by Figure 1. which has a slope of $-.75$ between 60 percent and 82 percent and zero slope before 60 percent and after 82 percent. τ_0 is the tax rate without the bad debt reserve deduction.

While it appears the S&L industry has a tax advantage, this is not necessarily true. S&Ls are denied other tax-saving provisions taken advantage of by other financial institutions; such as the 10% investment tax credit, the 85% dividends received exclusion, and the full charitable contribution deduction. All S&Ls are denied these deductions whether they avail themselves of the bad debt reserve deduction or not. The tax treatment for the S&L industry is quite different than for banks; whether it offers a definite advantage is questionable. Given that the bad debt de-

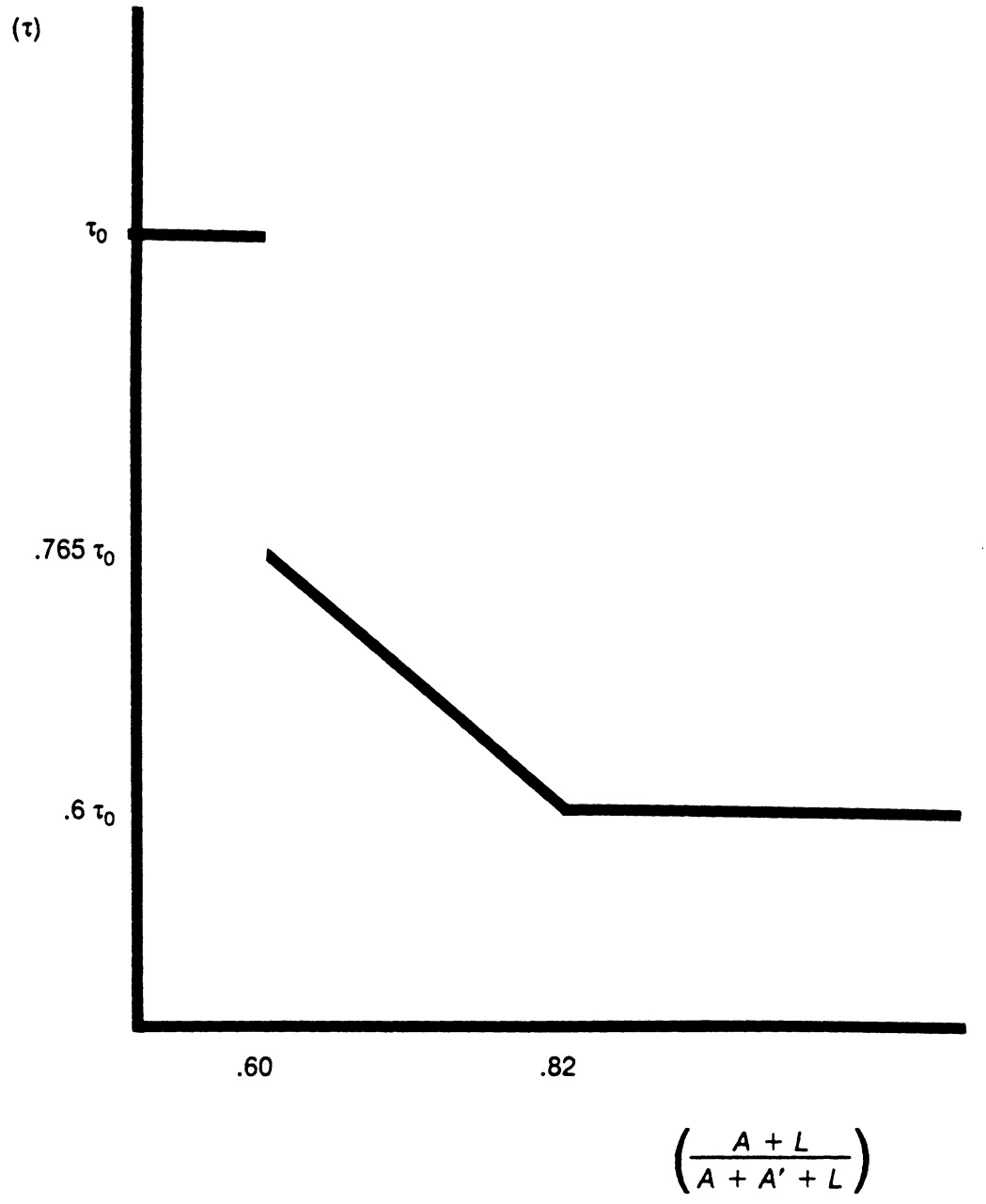

Figure 1. Taxation Function

duction is basically their only deduction, the tax treatment of the model is quite realistic.

The remaining variables in the objective function, not already defined, are rates of return and costs of liabilities. The interest rate on housing related assets (r) is a function of the quantity of loans made in the present period (A) and the quality of these loans (a). The following classical relationships are assumed:

$$r_a < 0 \quad \text{and} \quad r_A < 0$$

The interest rate on non-housing related assets (n) is a function of the quantity of loans made in that period (A') and the quality of these loans (a') with the partial derivatives signed as follows:

$$n_{a'} < 0 \quad \text{and} \quad n_{A'} < 0.$$

The rate of return on liquid assets is assumed to be determined outside the system, assuming the supply is perfectly elastic. For the cost of deposits (h) , any economies of scale have been assumed away and any increase in deposits is accomplished only through increasing costs, such as advertising. The cost of deposits (h) is therefore, a function of the quantity of deposits (D) with $h_D > 0$.

The cost of capital function (g) is one area in which stock and mutual S&Ls can be differentiated. For stock associations, it is assumed that the cost of capital is a function of the amount of capital (K), with $g_K > 0$. This characterization is consistent with the reasoning that a S&L cannot float a new equity issue without at least incurring some increasing costs and that the market for equity in most stock S&Ls is not perfectly competitive. For mutual S&Ls, g is assumed to be a constant and K is not a decision variable so that the inability of mutual S&Ls to issue new equity is reflected. Although subordinated debt can be issued to raise funds and meet regulatory

net worth requirements, that alternative has been used infrequently by S&Ls. Therefore, we feel that the assumption of a fixed amount of equity is an apt characterization of the equity financing available to mutual S&Ls particularly in contrast to the market available to stock S&Ls. These differences could contribute to, although not totally explain, the behavior Verbrugge calls "expense preference behavior."

3.3.1.2 Constraints

The decisions S&L managers make are subject to a wide variety of constraints which form the regulatory environment of S&Ls. The most important regulations relevant to changes in the asset structure of S&Ls are constraints on the level of risk and degree of diversification.

Constraints on the Level of Risk

The level of risk an association is allowed to accept is incorporated in the model through the Mingo and Wolkowitz soundness constraint. For the S&L model developed here it takes the following form:

$$\alpha = aA + a'A' + lL + kK - lD$$

This implicitly incorporates the risk-aversion of the manager, for we implicitly assume that all attainable points on the S&L manager's "(constrained) earnings-risk frontier lie to the left and below what his optimum would be in the absence of regulation." (Mingo and Wolkowitz p.1606) One does not usually expect an unconstrained profit maximization model to account for risk; however, the soundness constraint borrowed from the Mingo and Wolkowitz model incorporates risk. The above constraint indicates that the regulatory agents have dictated the managers of S&Ls to maintain

portfolios with a lower level of risk (higher quality) than those choosen by a utility maximizing manager. This may graphically be viewed in Figure 2.

The consequence of this assumption is that the manager does not consider the risk-return tradeoff as described in portfolio theory, but maximizes profits within the bounds of the soundness constraint maintained by the regulatory agency. The Federal Savings and Loan Insurance Corporation supervises the soundness of Federal S&Ls by monitoring individual associations activities through examinations and required financial reports. Various means are available to enforce soundness including cease and desist orders and even removal of FSLIC insurance. "The Financial Institutions Supervisory Act of 1966 allowed the FHLBB to issue cease and desist orders whenever an insured S&L is engaged in 'unsafe or unsound practices'."(Marvel (1969), p.130) In theory the requirements enforced by regulators are not much different from that expressed by the "soundness" constraint.

Constraints on the Level of Diversification

The regulations which place limits on diversification are expressed in constraint form as:

$$\gamma = \frac{A'}{A + A' + L}$$

Throughout the history of S&Ls, regulations have restricted the volume of non-housing related loans and the above constraint reflects that regulatory policy. This applies even to the deregulation of the 1980's which has retained limits on diversification, but at higher levels than the previous restrictions. Before 1980, the S&L industry was very limited in the assets they could hold. Increases in the types and quantities of non-housing related assets allowed in the 1980's would be interpreted

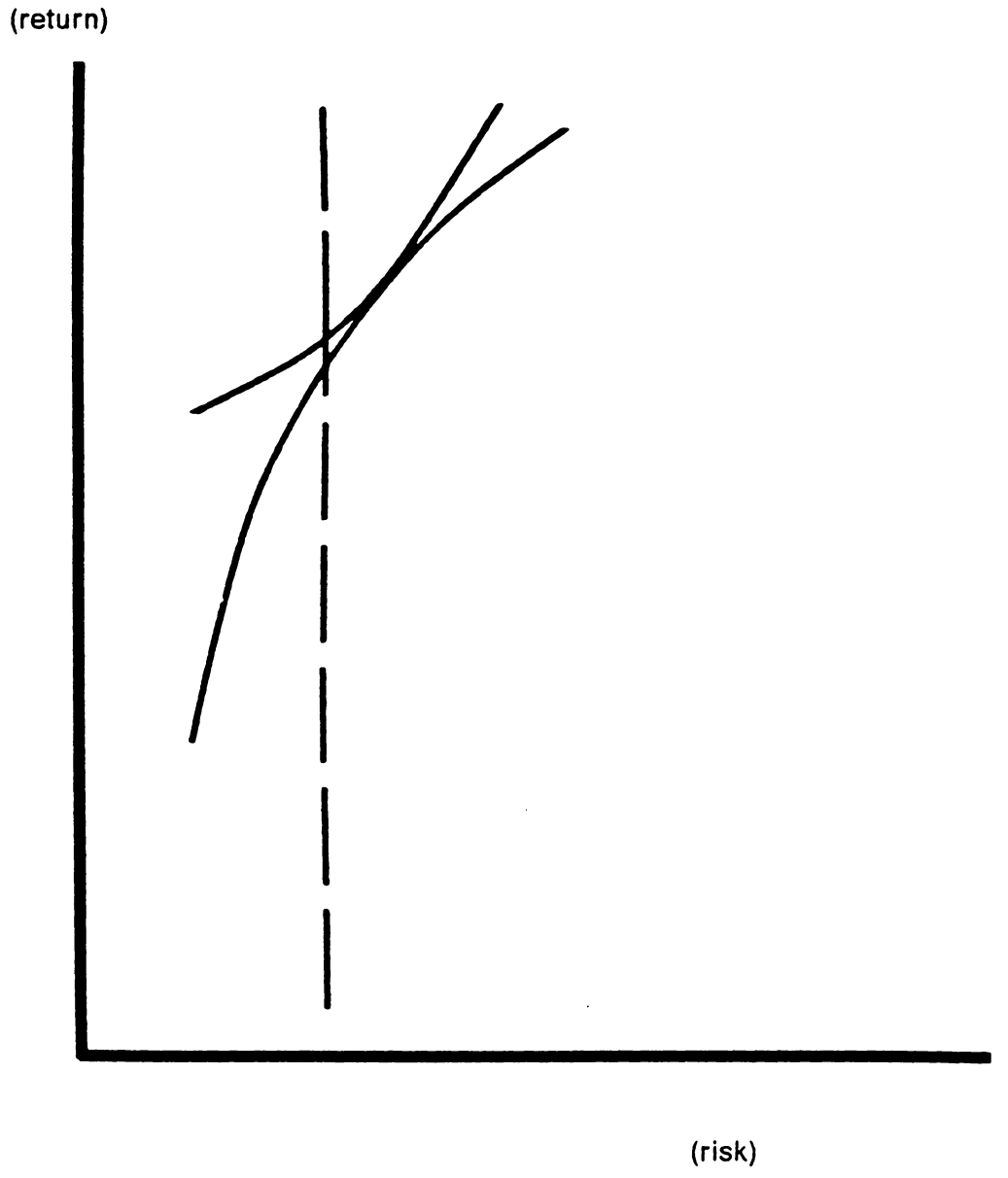

Figure 2. Risk Constraint Described in a Utility Maximization Framework

as an increase in γ. The degree of abstraction for this modelling process is clearly evident in this constraint. A change in the regulations allowing S&Ls to increase their holdings in commercial real estate loans is interpreted as an increase in γ, as are expanded powers regarding corporate loans, consumer loans, agricultural loans, commercial paper, corporate debt and securities, and obligations of state and local governments. The regulations are stated such that a Federal S&L may hold up to a "set" percentage of their assets in the specified category. Given that our intention is to examine changes in portfolios after the deregulation compared to pre-deregulation portfolios, an equality sign in the statement of the constraint is appropriate. This is because prior research has indicated that given expanded powers, almost all S&Ls utilize these powers to some degree. (Crockett and King, 1982) Therefore, prior to the deregulation, the regulations were constraining and an equality sign is appropriate for this particular model of behavior.

3.3.2 Solving the Model: The Method of Lagrange Multipliers

The profit maximization model including the variables and constraints listed above is solved using the method of Lagrange multipliers. The manager must maximize the objective fuction subject to the constraints by choosing the best values of L, A, A′, D, a, and a′ in the case of a mutual S&L. The Lagrangean function is formed from the profit maximization equation incorporating the soundness constraint and the regulatory constraint. The balance sheet identity is incorporated by substituting:

$$D = A + A' + L - K$$

and L is eliminated from the equation by utilizing the following assumed relationship between liquidity and deposits:

$$L = (1 - v)D$$

The Lagrangean expression is as follows:

$$\Pi = \left[A(r + s\frac{1 - v}{v} - \frac{h}{v}) + A'(n + s\frac{1 - v}{v} - \frac{h}{v}) - K(g + s\frac{1 - v}{v} - \frac{h}{v})\right](1 - \tau)$$

$$+ \lambda_1\left[\gamma - \frac{A'}{T}\right] + \lambda_2[\alpha + (l - a)A + (l - a')A' - (k + l)K]$$

where T= total assets= A + A′ + (1-v)D. Prior to obtaining the first- order conditions, it becomes necessary to distinquish between the model appropriate for mutual S&Ls and the model appropriate for stock S&Ls. This necessitates the development of two models. The model for mutual S&Ls follows directly in Section 3.3.3 and the model for stock S&Ls is derived in Section 3.3.4.

3.3.3 Model Appropriate for Mutual S&Ls

As discussed above, capital is assumed to be fixed for mutual S&Ls. Therefore after the various substitutions are made the remaining decision variables are the four endogenous variables (A, A′, a, and a′) and two Lagrange multipliers. The first order conditions are as follows:

$$\frac{\partial \Pi}{\partial A} = \left[r + r_A A + s\frac{1 - v}{v} - \frac{h}{v} - \frac{h_A}{v}(A + A' - K)\right](1 - \tau)$$

$$+ \pi(-\tau_A) + \lambda_1\frac{A'}{vT^2} + \lambda_2(l - a) \overset{\text{set}}{=} 0$$

$$\frac{\partial \Pi}{\partial A'} = \left[n + n_{A'}A' + s\frac{1 - v}{v} - \frac{h}{v} - \frac{h_{A'}}{v}(A + A' - K)\right](1 - \tau) + \pi(-\tau_{A'}) + \lambda_1\frac{A' - vT}{vT^2}$$

$$+ \lambda_2(I - a') \overset{\text{set}}{=} 0$$

$$\frac{\partial \Pi}{\partial a} = r_a A(1 - \tau) - \lambda_2 A \overset{\text{set}}{=} 0$$

$$\frac{\partial \Pi}{\partial a'} = n_{a'} A'(1 - \tau) - \lambda_2 A' \overset{\text{set}}{=} 0$$

$$\frac{\partial \Pi}{\partial \lambda_1} = \gamma - \frac{A'}{T} \overset{\text{set}}{=} 0$$

$$\frac{\partial \Pi}{\partial \lambda_2} = \alpha + (I - a)A + (I - a')A' - (k + I)K \overset{\text{set}}{=} 0$$

To simplify the above equations and express them in a more meaningful manner the following substitutions will be made:

Marginal Revenue of Housing-Related Assets (MR) = $r + r_A A$

Marginal Cost (MC) = $s\frac{1 - v}{v} - \frac{h}{v} - \frac{h_A}{v}(A + A' - K) = s\frac{1 - v}{v} - \frac{h}{v} - \frac{h_{A'}}{v}(A + A' - K)$

Marginal Revenue of Non-Housing-Related Assets (MN) = $n + n_{A'} A'$

The above substitution for marginal costs is correct because h_A equals $h_{A'}$ given that the rate on deposits (h) is a function of the quantity of deposits (D) and deposits can be expressed as:

$$D = \frac{A + A' - K}{v}$$

To create more explicit expressions the following effects have been identified:

The Taxation Effects:

$$TE_A = \pi(-\tau_A) \quad \text{and} \quad \pi(-\tau_{A'}) = TE_{A'}$$

The Regulation Effects:

$$RE_A = \lambda_1 \frac{A'}{vT^2} \quad \text{and} \quad \lambda_1 \frac{A' - vT}{vT^2} = RE_{A'}$$

The Quality-Risk Effects:

$$QE_A = \lambda_2(I - a) \quad \text{and} \quad \lambda_2(I - a') = QE_{A'}$$

The first order conditions can then be rewritten as:

$$MR + TE_A + RE_A + QE_A = MC$$

$$MN + TE_{A'} + RE_{A'} + QE_{A'} = MC$$

$$(I - a)r_a(1 - \tau) = QE_A$$

$$(I - a')n_{a'}(1 - \tau) = QE_{A'}$$

$$\gamma = \frac{A'}{T}$$

$$\alpha = (a - I)A + (a' - I)A' + (k + I)K$$

These equations give the neoclassical relationship of equating marginal revenue and marginal cost with adjustments for the taxation, regulatory, and soundness effects.

In the first equation, marginal revenue to housing related assets plus the quality effect may be viewed as a risk-adjusted return which can be augmented by the taxation effect because over some ranges, an increase in housing related loans decreases the effective tax rate. This can be seen mathematically by the positive sign of the tax effect:

$$TE_A = .75\,\tau_0 \frac{A'}{vT^2}.$$

Regulatory effects may also be lessened by increasing "A" because this will diminish the "bite" of the regulatory constraint. Therefore S&Ls would be expected to make more housing related loans than the neoclassical solution would suggest. In addition it is noted that the benefits to specialization in housing related lending will also increase the marginal return, ceteris paribus, and therefore further promote housing related lending beyond the neoclassical solution.

The second equation indicates that S&Ls would be expected to hold less non-housing related assets than suggested by the neoclassical solution of marginal costs equals marginal revenue. This is evidenced by the negativity of the three effects. The tax effect is:

$$TE_{A'} = .75\,\tau_0 \frac{A' - vT}{vT^2}$$

This denotes that within the range where S&Ls have 60 percent to 82 percent of their assets in housing related and government securities, an increase in non-housing related assets increases the effective tax rate. The regulation effect is negative if the constraint is binding for λ_1 would be positive in the above equation. If the constraint is not binding then λ_1 would equal zero by the Kuhn-Tucker Conditions and the regulatory effect would just disappear.

The quality effect is also negative because if you increase the quality, which is analogous to decreasing the risk, the required rate of return is decreased. This can also be seen by solving the the third and fourth first-order conditions for λ_2 given that:

$$I > a, \quad I > a', \quad r_a < 0 \quad \text{and} \quad n_{a'} < 0$$

Therefore, both quality effects in the above equations are negative.

The last two equations are simply restatements of the soundness and regulatory constraints. To show this is a system of equations with one solution, by using the above relationships, the set of first order conditions have been reduced to four equations with four unknowns (A, A′, a, and a′) as follows:

$$(1 - \tau)\left[(MN - MC) + n_{a'}(l - a') + \{ (MC - MR) - r_a(l - a)\}\left[\frac{(1 - v)K - A}{a'}\right]\right] = 0$$

$$r_a - n_{a'} = 0$$

$$\gamma - \frac{A'}{T} = 0$$

$$\alpha + (l - a)A + (l - a')A' - (k + l)K = 0$$

3.3.3.1 Lagrange Multipliers

The purpose of this study is to examine the changes which have ocurred as a result of asset deregulation. In the model, this corresponds to changing γ. It is well-known that the Lagrange multiplier corresponding to the regulatory constraint gives the value by which the objective function would be changed for a change in the constraint. Therefore, λ_1 gives the amount by which profits would increase for a small change in γ, the proportion of non-housing related lending. The value of λ_1 provides a measure of the incentive which the S&L has to change its portfolio allocation in response to a relaxation of the limits on non-housing related lending. The calculation of λ_1 is therefore the variable of significant relevance to the empirical investigation described in the following sections. It is necessary to distinquish between S&Ls ac-

cording to their tax status. For the moment we will only consider mutual S&Ls with greater than 82% of their assets in housing related assets (the flat portion of Figure 1. The Lagrange multiplier which defines the change in after tax profits for a change in the constant γ is

$$\lambda_1 = [(MC - MR)(1 - \tau) - r_a(1 - \tau)(I - a)]\frac{vT^2}{A'}$$

or with respect to non-housing related assets it may be expressed as

$$\lambda_1 = [(MC - MN)(1 - \tau) - n_{a'}(1 - \tau)(I - a')]\frac{vT^2}{vT - A'}$$

Thus the incentive to change the magnitude of non-housing related lending is a function of the difference between after tax marginal cost and after tax marginal revenue on housing related loans, the marginal return to quality, the reserve requirement, total assets, and the existing proportion of non-housing related loans. These will be important variables used to explain the actual changes observed in the empirical analysis.

The first order conditions can be used to obtain the value of $\frac{dA'}{d\gamma}$ but as will be discussed later, the variable of interest in the empirical study will be related to the change in the proportion of non-housing related lending to assets. From the first order conditions it can be shown that for a small change in γ, $\frac{d\frac{A'}{T}}{d\gamma} = 1$; however, because the actual changes in γ have not been small, higher values of λ_1 appear to be a better indicator of the potential size of the change in $\frac{A'}{T}$. Notice for example, that the higher the degree of returns to specialization in housing related lending, the

lower λ_1 will be. The expression for the $\frac{d\frac{A}{T}}{d\gamma}$ can be calculated from the first-order conditions; however, its complicated nature encourages the use of the Lagrange multiplier.

The appropriate Lagrange multiplier for associations holding between 60 percent and 82 percent of their assets in housing related assets and government securities would be:

$$\lambda_1 = \left[(MC - MR)(1 - \tau) - r_a(1 - \tau)(l - a)\right]\frac{vT^2}{A'} - .75\,\pi\,\tau_0$$

expressing this with respect to non-housing related assets produces:

$$\lambda_1 = \left[(MC - MN)(1 - \tau) - n_{a'}(1 - \tau)(l - a')\right]\frac{vT^2}{vT - A'} + .75\,\pi\,\tau_0$$

From these equations it is evident that the tax effect decreases the effectivenesss of allowing S&Ls to diversify.

3.3.4 Model Appropriate for Stock S&Ls

Having looked at mutual S&Ls, it is now timely to examine the model for stock associations. The Lagrangean function is the same; however, the decision variables have increased in number. The stock S&L manager is assumed to maximize the objective function by choosing the optimum values for L, A, A′, D, K, a, and a′. This indicates that the management may increase or decrease their net worth by going to the capital markets. The following equations and steps parallel those in the previous section; however, they have been included for completeness. The first order conditions are

$$\frac{\partial \Pi}{\partial A} = \left[r + r_A A + s\frac{1-v}{v} - \frac{h}{v} - \frac{h_A}{v}(A + A' - K)\right](1-\tau) + \pi(-\tau_A) + \lambda_1 \frac{A'}{vT^2}$$

$$+ \lambda_2(l - a) \overset{\text{set}}{=} 0$$

$$\frac{\partial \Pi}{\partial A'} = \left[n + n_{A'}A' + s\frac{1-v}{v} - \frac{h}{v} - \frac{h_{A'}}{v}(A + A' - K)\right](1-\tau)$$

$$+ \pi(-\tau_{A'}) + \lambda_1 \frac{A' - vT}{vT^2} + \lambda_2(l - a') \overset{\text{set}}{=} 0$$

$$\frac{\partial \Pi}{\partial K} = \left[-g - g_K K - s\frac{1-v}{v} + \frac{h}{v} - \frac{h_K}{v}(A + A' - K)\right](1-\tau)$$

$$+ \pi(-\tau_K) - \lambda_1 \frac{(1-v)A'}{vT^2} - \lambda_2(l + k) \overset{\text{set}}{=} 0$$

$$\frac{\partial \Pi}{\partial a} = r_a A(1-\tau) - \lambda_2 A \overset{\text{set}}{=} 0$$

$$\frac{\partial \Pi}{\partial a'} = n_{a'}A'(1-\tau) - \lambda_2 A' \overset{\text{set}}{=} 0$$

$$\frac{\partial \Pi}{\partial \lambda_1} = \gamma - \frac{A'}{T} \overset{\text{set}}{=} 0$$

$$\frac{\partial \Pi}{\partial \lambda_2} = \alpha + (l - a)A + (l - a')A' - (k + l)K \overset{\text{set}}{=} 0$$

The addition of the third equation is what differentiates this system of equations from the system provided for mutual S&Ls. To provide equations in a more meaningful form the following substitutions will be made:

Marginal Revenue of Housing-Related Assets (MR) = $r + r_A A$

Marginal Cost of Deposits(MC) $= s\frac{1-v}{v} - \frac{h}{v} - \frac{h_A}{v}(A + A' - K)$

$$= s\frac{1-v}{v} - \frac{h}{v} - \frac{h_{A'}}{v}(A + A' - K)$$

$$= s\frac{1-v}{v} - \frac{h}{v} = \frac{h_K}{v}(A + A' - K)$$

Marginal Revenue of Non-Housing-Related Assets (MN) $= n + n_{A'}A'$

Marginal Cost of Capital (MG) $= g + g_K K$

The above substitution for marginal costs is correct because h_A equals $h_{A'}$ equals $-h_K$, given that the rate on deposits (h) is a function of the quantity of deposits (D) and deposits can be expressed as: $D = \frac{A + A' - K}{v}$. To create more explicit expressions the following effects have been identified:

The Taxation Effects:

$$TE_A = \pi(-\tau_A), \quad \pi(-\tau_{A'}) = TE_{A'}, \quad \text{and} \quad \pi(\tau_K) = TE_K$$

The Regulation Effects:

$$RE_A = \lambda_1\frac{A'}{vT^2}, \quad \lambda_1\frac{A' - vT}{vT^2} = RE_{A'}, \quad \text{and} \quad \lambda_1\frac{(1-v)A'}{vT^2} = RE_K$$

The Quality-Risk Effects:

$$QE_A = \lambda_2(l - a), \quad \lambda_2(l - a') = QE_{A'}, \quad \text{and} \quad \lambda_2(k + l) = QE_K$$

The first order conditions can then be rewritten as:

$$MR + TE_A + RE_A + QE_A = MC$$

$$MN + TE_{A'} + RE_{A'} + QE_{A'} = MC$$

$$MG + TE_K + RE_K + QE_K = MC$$

$$(1 - a)r_a(1 - \tau) = QE_A$$

$$(1 - a')n_{a'}(1 - \tau) = QE_{A'}$$

$$\gamma = \frac{A'}{T}$$

$$\alpha = (1 - a)A + (1 - a')A' - (k + l)K$$

The third equation has been added to those expressed for mutual associations. It indicates that stock associations may raise less capital than expected from the neoclassical solution of all marginal costs being equal. This would be true as long as the tax effect plus the regulation effect is greater in absolute value than the quality effect. (Whether this is true or not is an empirical question.) The tax effect is positive as indicated mathematically:

$$TE_K = \pi \frac{A'(1 - v)}{vT^2} .75\,\tau_0$$

Note that this is smaller than the tax effect with respect to A, for they are related by the following equation:

$$TE_K = (1 - v)TE_A$$

The regulatory effect is also non-negative and is strictly positive assuming the constraint is binding for small changes, which is an appropriate assumption under the circumstances. The quality effect is negative, as it has been with respect to all the variables. This is logical given an increase in quality would decrease the required

rate of return. The other first order conditions are discussed with respect to mutual associations and will not be repeated here.

3.3.4.1 Lagrange multipliers

The Lagrange multipliers are the same as those expressed for mutual associations; although they may also be expressed in terms of the marginal cost of capital as follows:

$$\lambda_1 = [(MC - MG)(1 - \tau) - r_a(1 - \tau)(I + k)]\frac{vT^2}{(1 - v)A'}$$

for stock S&Ls with greater than 82 percent of their assets in housing related assets and government securities. For stock S&Ls with between 60 percent and 82 percent of qualifying assets the appropriate Lagrange multipier expressed in terms of capital would be:

$$\lambda_1 = [(MC - MG)(1 - \tau) - r_a(1 - \tau)(I + k)]\frac{vT^2}{(1 - v)A'} - .75\,\pi\,\tau_0$$

For small changes of γ the change in the proportion of non housing related assets to total assets equals 1. This requires that:

$$\frac{\partial\frac{A}{T}}{\partial\gamma} + \frac{\partial\frac{L}{T}}{\partial\gamma} = -1$$

which can be rearranged to state:

$$\frac{\partial\frac{A}{T}}{\partial\gamma} - (1 - v)\frac{\partial\frac{K}{T}}{\partial\gamma} = -1$$

The expressions for $\frac{\partial \frac{A}{T}}{\partial \gamma}$ and $\frac{\partial \frac{K}{T}}{\partial \gamma}$ can be solved;however, they are so cumbersome that they do not retain any explanatory powers. The variable of interest, as with the model for mutual associations, is the Lagrange multiplier. The methodology using the Lagrange multiplier is developed in Chapter 5.

Chapter IV

Data and Sample Selection

4.1 Introduction

Chapter 4 describes and partitions the data used in the empirical tests developed in Charter 5. The data is characterized and sampling procedures are justified The chapter concludes with some discussion concerning preliminary descriptive statistics in preparation for the analysis directed by the theoretical model. These statistics are presented at this point to provide insight concernig the direction of the models developed in Chapter 5.

4.2 Data and Sample Selection

The theoretical model developed in the previous chapter and the methodology evolving in Chapter 5 focus on the changes in the asset portfolios of Federal S&Ls motivated by the deregulation of the DIDMCA and the Garn-St Germain Act. The theoretical model identifies the balance sheet and income statement components to

be used in the empirical analysis. The data was originally collected by the FHLBB from the semi-annual reports required of its member institutions over the period from June,1979 (pre-deregulation) to December, 1983 (post-deregulation).

Table 1 characterizes the data by the number of FSLIC insured S&Ls reporting for each semi-annual period. All Federally chartered associations must be FSLIC insured and qualifying state chartered associations have the option concerning FSLIC insurance. All FSLIC insured institutions must be members of the FHLBB. This large data set containing all members of the FHLBB will be classified and grouped according to continuity of operation, type of charter and organizational form to create data sets appropriate for the empirical analysis. These groupings are based on the theoretical models developed in Chapter 3.[2]

4.2.1 Data Screened by Continuity of Operation

This study contrasts pre(1979) and post(1983) asset portfolio compositions, therefore it is appropriate to select the data sample from the set of associations reporting over this period. Table I illuminates the downward trend in the number of S&Ls reporting each period. Over four-thousand associations reported for June, 1979; however, the number of associations reporting for December, 1983 decreased to 3183. The dissipated associations either failed or merged with other S&Ls. Much of the current research pertaining to S&Ls has focused on explaining these failures and analyzing the causes. That is not the emphasis of the present study and the issue has only come about due to the effect the eliminations will have on the defined sample. The associations which did not operate over the entire period will be

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[2] The theoretical models differ for the Federal stock S&L versus the Federal mutual S&L.

Table 1. Data Sample Described by Number of Observations per Year

Year	Type of Charter			
	Federal S&Ls	State S&Ls	Federal SBs	Total
June, 1979	1997	2044		4041
December, 1979	1989	2050		4039
June, 1980	1983	2045		4028
December, 1980	1985	2017		4002
June, 1981	1967	1960		3927
December, 1981	1907	1872		3779
June, 1982	1838	1735		3573
December, 1982	1727	1616		3343
June, 1983	1613	1548	87	3248
December, 1983	1553	1487	143	3183

dropped from the sample, leaving a sample of 2935 state and Federal S&Ls and Federal Savings Banks. (See Table 2) The shrinking figure appears to exclude more information than it really does. With respect to failures, no data exists to calculate the changes in targeted assets, therefore the information is lost and the associations must be dropped from the sample.[3] When an association merges with another, as a result of a regulatory work-out or otherwise, there is a reduction in the sample size; however, the assets of the firm being acquired have been incorporated in the acquirer's portfolio, thus the information has only changed form. Although the data set has been reduced in the number of observations, the loss of information is not perfectly correlated with the reduction in size.

4.2.2 Data Screened by Type of Charter

Of the 2935 insured associations having data for both the pre-and post-deregulation years, 1336 held Federal charters over the entire period. Table 2 documents the break-down of associations according to the type of charter. One hundred and seventy-four associations converted from state charters to Federal charters while only 15 traded Federal charters for state charters. This would at least indicate that the Federal Deregulation was perceived as a positive measure by the management of the associations.

The DIDMCA and Garn-St Germain Act expanded the powers of Federal associations. Given the legislation is directed to those with Federal charters it is obvious that the observations within the sample must have been subject to Federal regulations at the time the expanded powers were granted. This excludes all S&Ls which

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[3] The discarding of failed associations provides the opportunity for survivor bias; however, this is not considered a problem.

were not Federally chartered in 1979; leaving a potential sample of 1449 observations. (See Table 2)

Figures 3, 4, 5, and 6 depict the distribution of state associations and Federal associations (both S&Ls and Savings Banks) by state both before and after the deregulation. This emphasizes the realization of differences in state regulations versus Federal regulations. The preferences are more pronounced in 1979 (Figures 3 and 4) and the states with significantly more state chartered associations (California and Texas) are those with more liberalized powers. The associations which converted to Federal charters over the test period were excluded because the state chartered associations were subject to different regulations in the pre-deregulation era. For the most part, the state regulations were either the same or more liberal than the Federal regulations. This is suggested graphically by the implied preferences of some states, illustrated by Figures 3 through 6. States having more state versus Federally chartered associations, probably possess more liberal regulations. If a state chartered association had more powers than the Federal association in 1979 and then converted, after the Federal associations received their expanded powers, such associations, if included, have the potential to downwardly bias average changes. Based on this rationale it appears appropriate to limit the sample to the 1449 associations having Federal Charters in 1979.

Fifteen Federal associations traded their charters for state charters over the test period. Given that the majority of states incorporate Federal regulations when the Federal regulations become more lenient than the current state regulations, these Federal associations, with all likelihood had the same or exceeding powers, compared to Federal associations, post-deregulation. Given that after the deregulation, some state chartered associations still had broader powers than the Federal associations, it appears that the inclusion of these observations could inflict an upward bias

Table 2. Sample Described by Type of Charter

S&L Associations (6/79 to 12/83)				
	Federal (12/83)	State (12/83)	FSBs(12/83)	Total
Federal (6/79)	1336	15	98	1449
State (6/79)	174	1284	28	1486
Total	1510	1299	126	2935

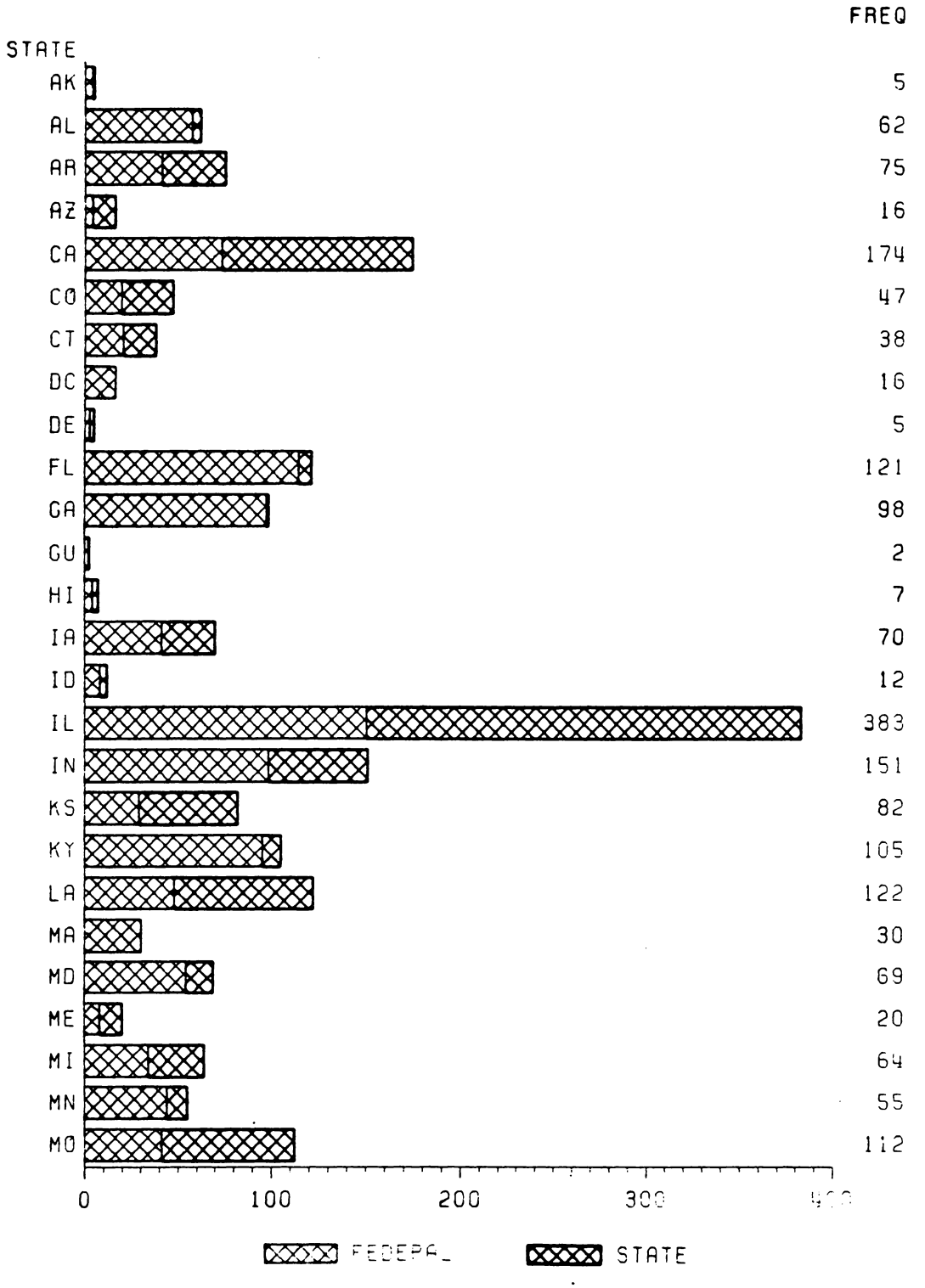

Figure 3. Distribution of Associations by Type of Charter(Ak to MO 1979)

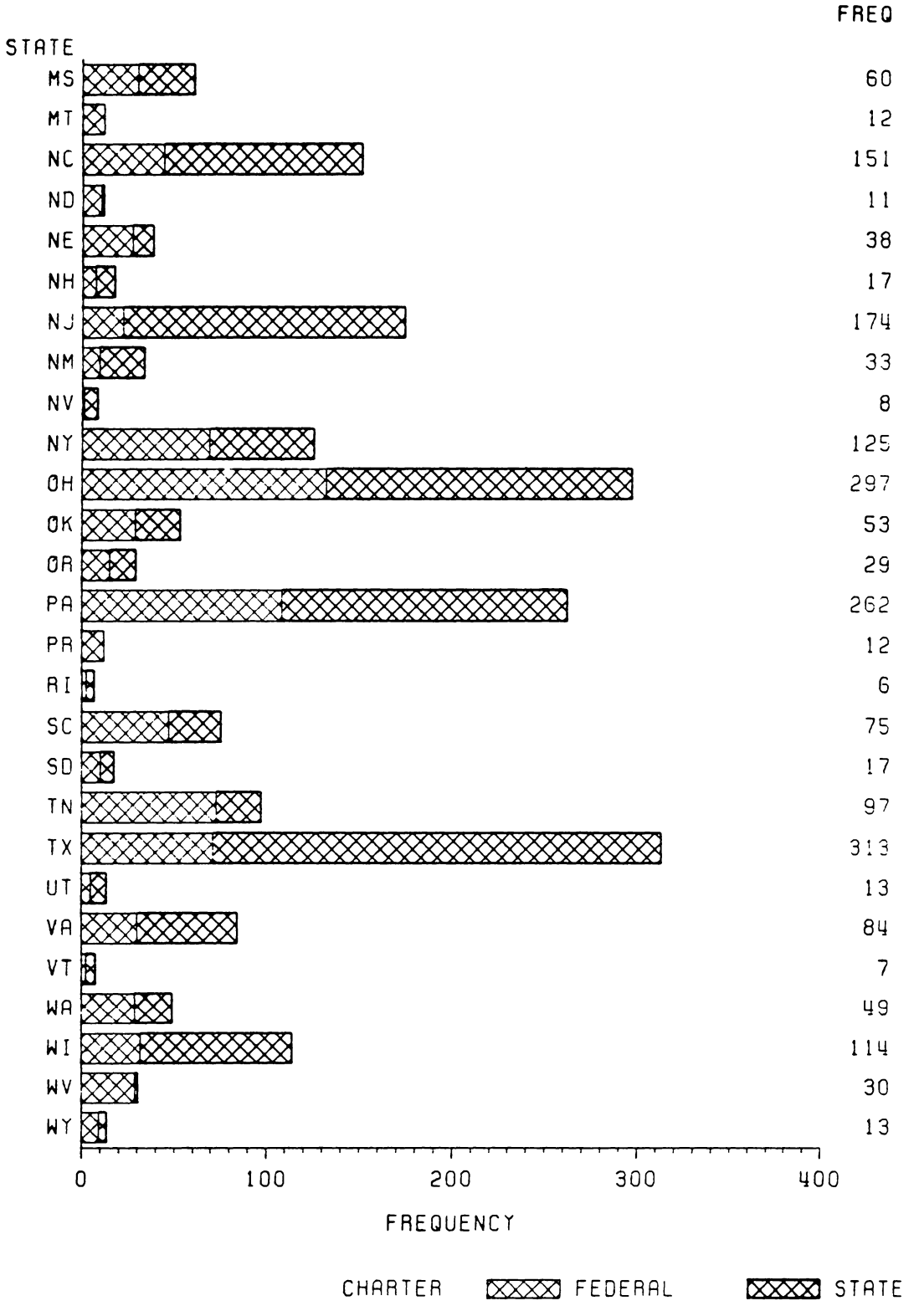

Figure 4. Distribution of Associations by Type of Charter(MN to WY 1979)

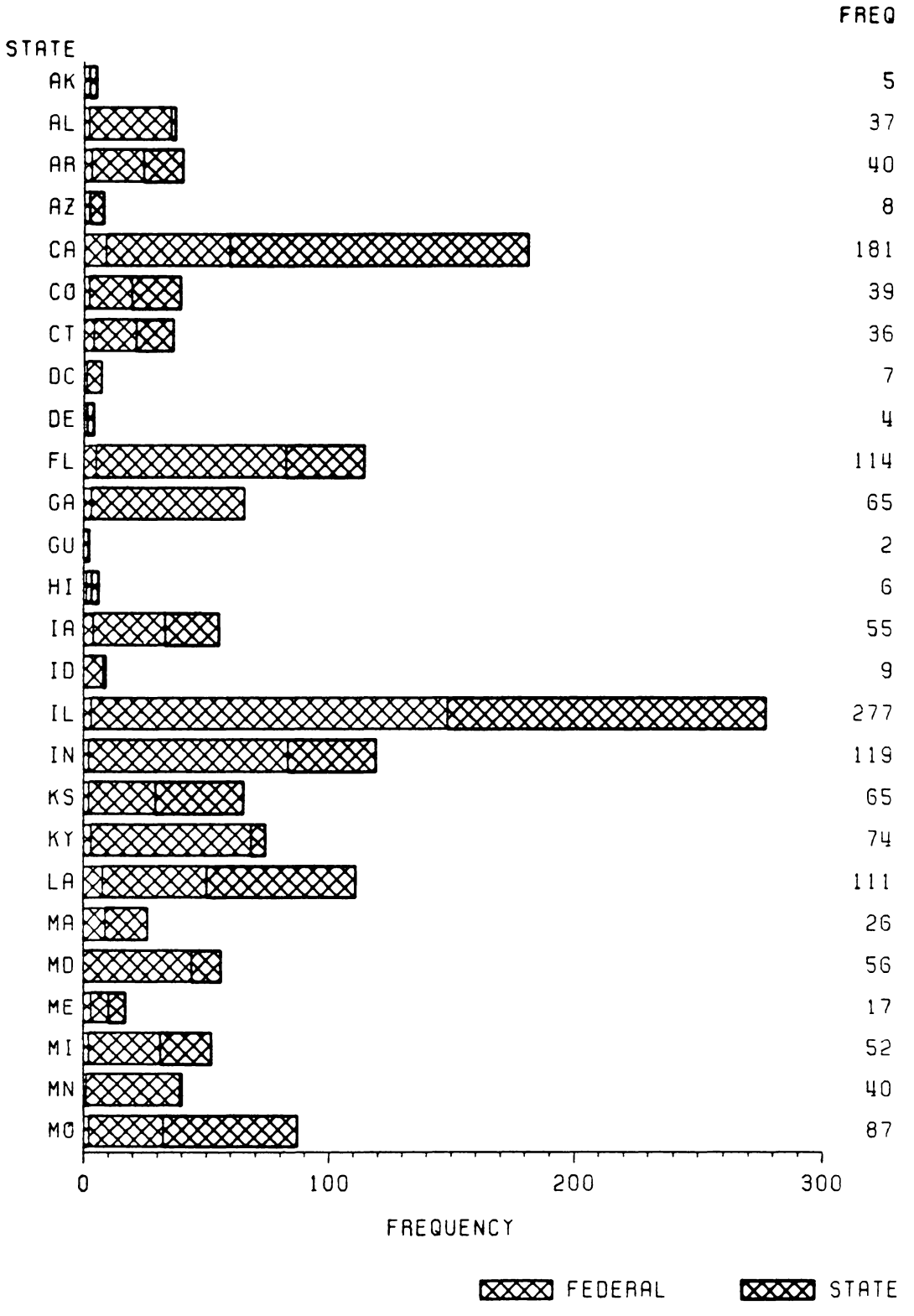

Figure 5. Distribution of Associations by Type of Charter(Ak to MO 1983)

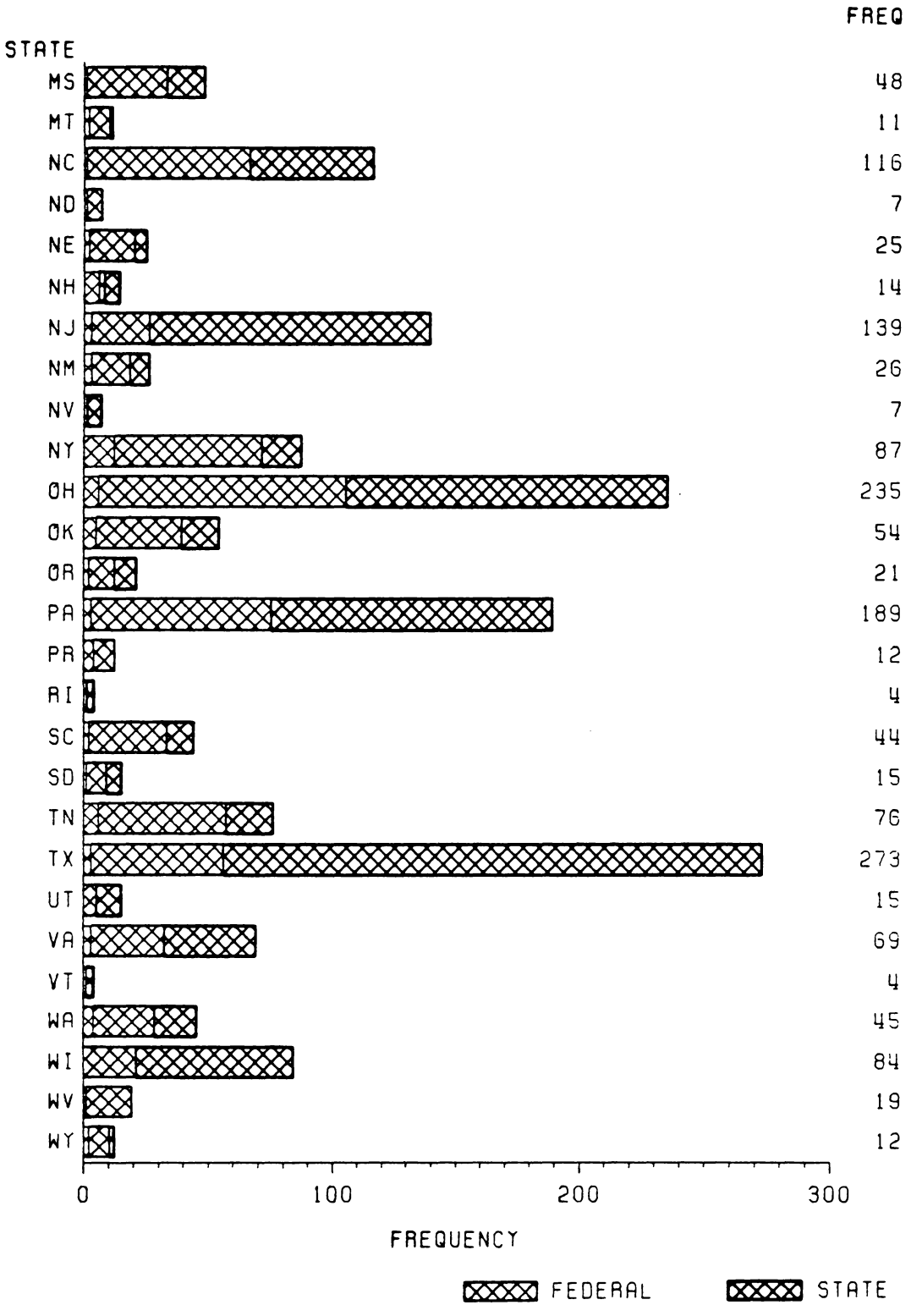

Figure 6. Distribution of Associations by Type of Charter(MN to WY 1983)

on average changes of non-housing related assets. This bias would not be appropriate, thus all Federal to state conversions are eliminated from the primary data sets, leaving a potential sample containing 1434 observations.

Statistics regarding state associations have been included to provide a complete picture of the S&L environment and to develop the groundwork for some of the methodology to follow. A selected sample of state chartered S&Ls will be used to control for economic and managerial discretions not incorporated in the theoretical model of Chapter 3. The "particulars" of the roles for state associations will be provided as the methodology unfolds in Chapter 5.

Ninety-eight associations changed their charters from Federal S&Ls to Federal Savings Banks. Prior to the Garn-St Germain Act(1982), the only Federal insurance agency for savings banks was the Federal Deposit Insurance Corporation (FDIC). The legislation of 1982 allowed saving banks to choose between the FSLIC and the FDIC. With this change, 98 S&Ls chose to convert to FSBs during 1983. Prior to the deregulation, savings banks had broader powers than S&Ls; however, after the passing of the Garn-St Germain Act their differences in opportunities were minor. Taking this into consideration, it was decided that the inclusion of associations changing from Federal S&Ls to FSBs probably has no effect on the data averages. This logic is empirically examined in Chapter 6.

4.2.3 Data Partitioned by Organizational Form

The discussion to this point has emphasized associations which have operated throughout the period, thus narrowing the primary data set to Federal S&Ls operating under Federal charters in 1979 which are still in operation at the year-end of 1983. The theoretical model emphasized the differences in abilities to raise capital between

mutual and stock associations. The mutual S&Ls must rely on retained earnings for equity where stock associations can also go to the capital markets. Table 3 shows the break-down with respect to organizational form for both state and Federal associations. The numbers reflect that Federal associations have only been allowed to convert to stock associations since 1976. This change in regulation was allowed due to capital adequacy problems; however, it appears the Federal S&Ls were slow to change.

The major difference in mutual and stock associations concerns their abilities to raise capital, with respect to the theoretical model.[4] In regards to asset portfolio composition changes, it would appear that stock associations would have greater facilities for change than mutual associations. The subset of mutual S&Ls include associations which held mutual charters in both periods. This sample has 1271 observations. When the associations which changed their charters from mutual S&Ls to FSBs are included, this primary subset has 1367 observations.[5]

The sample of S&Ls which were organized as stock associations over the test period has 14 observations; however 50 associations changed from mutual to stock associations over the period. Given that they had capital market opportunities during the period, these are included in the sample to test the stock model in Chapter 3.

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[4] Verbrugge et al (1976,1981a, and 1981b) has documented other differences in the area of expense preference behavior which may affect results.

[5] The effect of the sampling choice is validated empirically.

Table 3. Sample Described by Organizational Form

Federal Chartered Associations			
	Mutual (12/83)	**Stock (12/83)**	**FSB (12/83)**
Mutual (6/79)	1271	50	96
Stock (6/79)	1	14	2

At this point, the data set has been divided into two samples for the purpose of testing two models. The sample of stock associations without FSB conversions contains 64 observations. When the FSB conversions are included, the size of the sample increases to 66 observations.

The data sets containing 1367 mutual Federal associations and 66 stock Federal associations provide the two primary samples for the empirical analysis. The large sample of mutual S&Ls is ideal for the analysis which is described in Chapter 5. The data set of stock Federal S&Ls is much smaller and incorporates the potential for a large amount of noise. Fifty of the 66 associations converted from mutual S&Ls to stock S&Ls over the period. This transition has the potential to obscure the effect of the deregulation.

4.3 Section Two: Descriptive Data of Asset Changes.

Given the set of S&Ls partitioned in a manner relevant to the theoretical model it is approporiate to look at the data in respect to asset changes. The average change in the proportion of non-housing related assets-to-total assets for the sample of mutual associations is .99 percent. This change, taken alone, would indicate that the expanded asset powers have not been used. The range of changes (-6.77 percent to 27.67 percent) indicate that individual S&Ls are responding in vastly different manners to the deregulation.

The average change in the proportion of housing related assets-to-total assets from 1979 to 1983 is a decrease of 4.37 percent. This finding indicates that on average the mutual association are decreasing their proportions of housing related assets-to-total assets more than they are increasing their proportions of non-housing related

assets-to-total assets. Therefore, the average S&L is increasing its liquid assets-to-total assets by 3.38 percent.

The Federal stock associations show an average reduction in their housing related assets-to-total assets (-4.01 percent) which does not differ greatly from that of the mutual associations. However, the averages indicate that the stock associations are more aggressive in their expansions with respect to non-housing related assets than the mutuals. The average change in the proportion of non-housing related assets-to-total assets for Federal stock associations is 1.53 percent. This average is calculated from a sample which ranges in changing proportions from -8.25 percent to 12.83 percent.

The emphasis of the present research is to determine the factors which are constraining and promoting the expansion into non-housing related assets while examining their effects on the S&L's commitments to home mortgages. The system of regressions developed in Chapter 5 based on the theoretical model of Chapter 3 provide the framework for this analysis.

Chapter V

Development of the Empirical Models

5.1 Introduction

Chapter 5 develops empirical models from the theoretical models developed in Chapter 3 and describes the methodologies used in the analysis. The objective of the empirical analysis is to explain the changes in the composition of S&L portfolios motivated by the deregulation of the 1980's while identifying factors constraining or replacing the non-housing related diversification allowed by the legislation. The theoretical models combined with the orientation of the research indicate multiple regression to be the appropriate econometric modelling technique to answer the questions proposed. Regression analysis has the ability to incorporate the factors from the theoretical models and to control for factors other than the expanded asset powers, which have the potential to affect the changes of asset portfolios.

The emphasis of the deregulation and the specialization of S&Ls with regard to housing related assets prior to the deregulation, indicate the variables of greatest interest to be the changes in housing related assets (A) and the changes in non-housing related assets (A'). The non-housing related assets include real estate held

for development and investment, investments in service corporations, loans for education, loans on savings accounts, consumer auto loans, consumer loans, credit cards, and commercial real estate. These categories include the areas the legislators identified for diversification by the DIDMCA and the Garn-St Germain Act. The S&Ls ability to move into new assets (non-housing related assets) and what happened to their traditional emphasis on home loans (housing related assets) are the targeted areas of interest. Changes in liquid assets are not the focus of the theoretical model; however, they may provide important implications concerning the S&L environment.

5.2 Theoretical Basis for the General Empirical Model

The theoretical chapter concluded that assuming S&L managers are after-tax profit maximizers, λ_1 ,the change in after tax profits for a small change in γ, would be an important factor in motivating changes in the composition of S&L asset portfolios. The variables contributing to a large change of γ, such as occurred in the deregulation of the eighties, would be very similar to, although they may differ in form from those identified for an infinitesimal change. Intuitively the size of the change of non-housing related assets would also be related to the derivative, $\frac{\partial \pi(1-\tau)}{\partial A'}$; because individual associations having the same λ_1 should react differently for the different effects a change in non-housing related assets has on profits. Characteristics accounting for these differences may include economies of scale, quality of loans, and localities of the S&Ls. The same rationale would apply with respect to housing related assets and liquid assets, thus their changes could be expressed as follows:

$$\Delta A' = f(\lambda_1, \frac{\partial \pi(1-\tau)}{\partial A'}), \qquad \Delta A = f(\lambda_1, \frac{\partial \pi(1-\tau)}{\partial A}),$$

and $\Delta L = f(\lambda_1, \frac{\partial \pi(1-\tau)}{\partial L})$

In a model with a single decision variable, such as non-housing related assets, this interaction would be given by the following definitive equation:[6]

$$\lambda_1 = \frac{\partial \pi(1-\tau)}{\partial \gamma} = \frac{\partial \pi(1-\tau)}{\partial A'} \frac{\partial A'}{\partial \gamma} \qquad [5.1]$$

The above equation may be rearranged with respect to non-housing related assets to provide an approximate expression as follows:

$$\frac{\partial A'}{\partial \gamma} = \frac{\lambda_1}{\frac{\partial \pi(1-\tau)}{\partial A'}} \qquad [5.2]$$

Using the same type of approximation, expressions for the other asset categories are:

$$\frac{\partial A}{\partial \gamma} = \frac{\lambda_1}{\frac{\partial \pi(1-\tau)}{\partial A}} \quad \text{and} \quad \frac{\partial L}{\partial \gamma} = \frac{\lambda_1}{\frac{\partial \pi(1-\tau)}{\partial L}}$$

Recognizing that these only provide approximations, the more general form is proposed to represent the relationship between the decision variables and the shadow price as follows:

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[6] For a system with more than one variable the equation may appear as $\lambda_1 = \frac{\partial \pi(1-\tau)}{\partial \gamma} = \frac{\partial \pi(1-\tau)}{\partial A'} \frac{\partial A'}{\partial \gamma} + \frac{\partial \pi(1-\tau)}{\partial A} \frac{\partial A}{\partial \gamma} + \frac{\partial \pi(1-\tau)}{\partial L} \frac{\partial L}{\partial \gamma} + \frac{\partial \pi(1-\tau)}{\partial D} \frac{\partial D}{\partial \gamma} + \frac{\partial \pi(1-\tau)}{\partial K} \frac{\partial K}{\partial \gamma}$

$$\Delta A = f\left(\frac{\lambda_1}{\left[\frac{\partial \pi(1-\tau)}{\partial A}\right]}\right) \qquad [5.3]$$

$$\Delta A' = f\left(\frac{\lambda_1}{\left[\frac{\partial \pi(1-\tau)}{\partial A'}\right]}\right) \qquad [5.4]$$

and

$$\Delta L = f\left(\frac{\lambda_1}{\left[\frac{\partial \pi(1-\tau)}{\partial L}\right]}\right) \qquad [5.5]$$

The above equations are transformed from identities to functional forms because equation 5-1 is used as an approximation of the situation at hand, and while the derivatives are focusing on a very small instantaneous change in γ, the effects of a quite large change over a five year period are being analyzed in the present study. Equations 5.3, 5.4, and 5.5 provide very generalized expressions explaining the changes of the composition of asset portfolios attributed to the deregulation. When substitutions from the theoretical models of chapter 3 are incorporated in the above equations it becomes necessary to distinguish between the model for mutual associations and the model for stock associations. The evolution of each of these models will be discussed in turn, beginning with the development of the empirical model for mutual S&Ls.

5.3 The Empirical Model for Mutual S&Ls.

Equations 5.3, 5.4, and 5.5 may be rewritten as follows for the mutual associations implicitly incorporating the assumption that mutuals are constrained in their means for raising capital.

$$\Delta A = f\left(\frac{\lambda_1}{\left[\frac{\partial \pi(1-\tau)}{\partial A}\right]}\right) \qquad [5.6]$$

$$\Delta A' = f\left(\frac{\lambda_1}{\left[\frac{\partial \pi(1-\tau)}{\partial A'}\right]}\right) \qquad [5.7]$$

and

$$\Delta L = \frac{v}{1-v} f\left(\frac{\lambda_1}{\left[\frac{\partial \pi(1-\tau)}{\partial A}\right] + \left[\frac{\partial \pi(1-\tau)}{\partial A'}\right]}\right) \qquad [5.8]$$

Employing substitutions, from the theoretical model of Chapter 3, for the numerators and denominators and assuming only non-negative arguments in the functions yield the following expressions:

$$\Delta A = f\left(\left[1 + \frac{QE_A}{MR - MC}\right] \frac{vT^2}{A'}\right) \qquad [5.9]$$

$$\Delta A' = f\left(\left[1 + \frac{QE_{A'}}{MN - MC}\right] \frac{vT^2}{vT - A'}\right) \qquad [5.10]$$

and

$$\Delta L = f\left(\left[\frac{(MC - MR) + QE_A}{(MR - MC) + (MN - MC)}\right]\frac{vT^2}{A'}\right) \qquad [5.11]$$

These expressions are appropriate for S&Ls with greater than 82 percent of their assets in qualifying assets. S&Ls with between 60 to 82 percent of their assets qualifying require an additional tax effect term. This issue will be resolved later, resulting in one model for the two cases with a dummy variable accounting for the differences. Prior to further discussion concerning the appropriate functional form, it becomes timely to consider the appropriate dependent variables.

5.3.1 Appropriate Dependent Variables

The assumptions of multiple regression require a constant variance of the residual term across the S&Ls in the sample. If heteroscedasticity exists the parameter estimates will be inefficient, therefore indicating that important variables are insignificant. The dependent variables as expressed by the theoretical model would be positively correlated with the size of the association, thus the variances of the residuals would increase as the size of the association increases. It is believed that the best way to alleviate a size effect is to use dependent variables expressed as changes in proportions, rather than changes in quantities as expressed by the theoretical model. Given equations 5-9,5-10, and 5-II, it would seem appropriate to divide the "independent variable" by T also. When the right-hand sides of equations 5-9, 5-10, and 5-11 are divided by total assets (T), the following equations evolve:

$$\Delta\frac{A}{T} = f\left(\left[1 + \frac{QE_A}{MR - MC}\right]\frac{vT}{A'}\right) \qquad [5.12]$$

$$\Delta\frac{A'}{T} = f\left(\left[1 + \frac{QE_A}{MR - MC}\right]\frac{vT}{vT - A'}\right) \qquad [5.13]$$

and

$$\Delta\frac{L}{T} = f\left(\left[\frac{(MC - MR) + QE_A}{(MR - MC) + (MN - MC)}\right]\frac{vT}{A'}\right) \qquad [5.14]$$

These equations express the theoretical model in a form which is more likely to be homoscedastic, thus providing efficient estimators if other assumptions concerning regression and functional forms are appropriate.

5.3.2 The Question Concerning Functional Form.

The variables indicated in the above function are logical explanatory variables for the changes that occurred in response to the expanded asset powers granted S&Ls. The functional form of the relationship has been left unspecified up to this point because of the degree of approximation related to the large changes which have occurred in the 1980's. Rather than presume a functional form, it would seem most appropriate to "estimate" the form. The Box-Tidwell estimation technique and transformation allows the data to determine the most appropriate form. This transformation of the explanatory variables is of the following form:

$$x^{\sigma} = \frac{x^{\sigma} - 1}{\sigma}$$

where x is an explanatory variable. The method determines maximum likelihood estimates of σ, thus transforming the variables such that a linear regression is ap-

propriate in cases where without the transformation, the researcher might need to utilize a non- linear method.[7] A wide variety of functional forms can be modelled by the Box-Tidwell method. For example, a linear function determines σ to be equal to one and a quadratic function determines σ to be equal to two. The semi-log model is the special case where σ is zero for all explanatory variables.

5.3.2.1 Functional Form: Semi-log Model

The semi-log transformation may be the appropriate functional form, although this is only one of many choices, as a result of the highly multiplicative nature of the theoretical results. The Box-Tidwell transformation will determine the form of the variables to be used; however, a detailed description of the semi-log model is included to provide insight into what is theoretically happening and to set the stage for the discussion of variables and proxies. The rationale behind choosing the semi-log transformation is evident in the transformation's properties and the implicit theoretical signs it confers on the regression coefficients. Figure 7 provides a logical and intuitive rationale for using the semi-log form. A specified unit increase of λ_1 would be expected to have a greater effect at lower levels of λ_1 than at higher levels of λ_1. Figure 7 illustrates this relationship.

Using the semi-log transformation the following regression equations appear to be appropriate assuming all other factors outside of the model are held constant. These factors external to the theoretical model will be included later.

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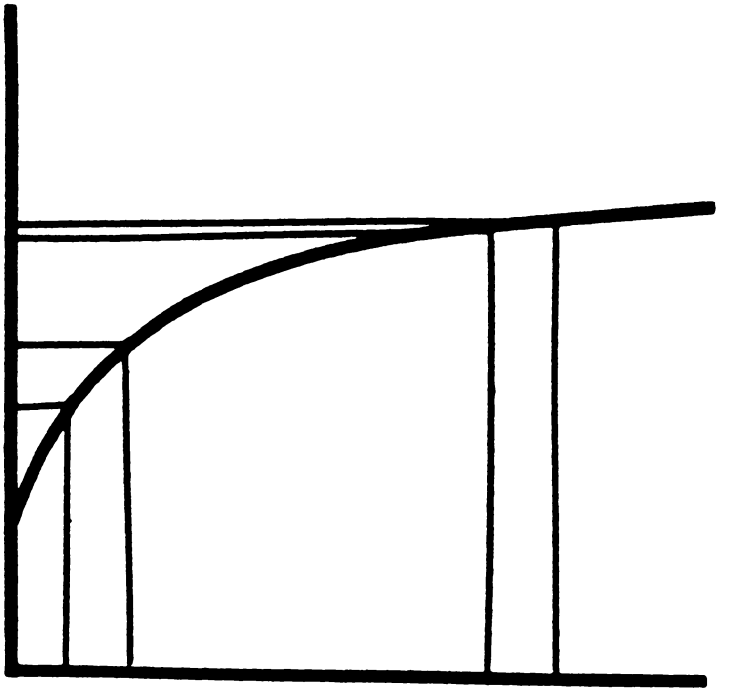
[7] For a more detailed description see Maddala (1977), Myers (1987), Box and Tidwell (1962), or Judge et al (1985).

$\Delta \frac{A}{T}$



λ_1

Figure 7. The Semi-Log Transformation

$$\Delta\frac{A}{T} = \beta_0 + \beta_1 \ln\ QE_A + \beta_2 \ln\ (MR - MC) + \beta_3 \ln\ v + \beta_4 \ln\ \frac{T}{A'} \qquad [5.15]$$

$$\Delta\frac{A'}{T} = \beta_0 + \beta_1 \ln\ QE_{A'} + \beta_2 \ln\ (MN - MC) + \beta_3 \ln\ v + \beta_4 \ln\ \frac{T}{vT - A'} \qquad [5.16]$$

and

$$\Delta\frac{L}{T} = \beta_0 + \beta_1 \ln\ (MR - MC + QE_A) + \beta_2 \ln\ ((MR - MC) + (MN - MC)) \qquad [5.17]$$

$$+ \beta_3 \ln\ v + \beta_4 \ln\ \frac{T}{A'}$$

These equations were obtained by the following approximations:

$$\ln\left[1 + \frac{r_a(l - a)}{MR - MC}\right] \cong \ln\left[\frac{r_a(l - a)}{MR - MC}\right]$$

and

$$\ln\left[1 + \frac{n_{a'}(l - a')}{MN - MC}\right] \cong \ln\left[\frac{n_{a'}(l - a')}{MN - MC}\right]$$

which are appropriate for $\left[\frac{r_a(l - a)}{MR - MC}\right]$ and $\left[\frac{n_{a'}(l - a')}{MN - MC}\right]$ large.

5.3.3 Variables and Proxies

Given the above equations it is timely to discuss the variables and proxies for variables which propose to explain the behavior of S&L managers with respect to

asset portfolio composition changes allowed by the DIDMCA (1980) and the Garn-St Germain Act(1982). The dependent variables are the change in the proportion of housing- related assets-to-total assets, the change in the proportion of non- housing related assets-to-total assets, and the change in the proportion of liquid assets-to-total assets between 1979 (pre-deregulation) and 1983 (post-deregulation). The independent variables explaining these changes include the quality and tax effects discussed in the previous chapter. The derivatives provided by the theoretical model are descriptive of an instantaneous change; and a change over a five year period is the variable of interest in this research. Over five years, there exists ten balance sheets and ten income statements provided by ten semi-annual reports to the FHLBB from which data may be collected. The averages over 1979 and 1983 are used for calculations, for it is believed that these averages provide a "good" overall description of the entire period from 1979 to 1983.

5.3.3.1 Explanatory Variables and Proxies for Equation 5.15

The explanatory variable, QE_{A_i} is a quality variable, the marginal interest rate on housing related loans with respect to the quality of these loans times the quality differential between liquid assets and housing related assets ($r_s(l - a)$). The quality of liquid assets (l) is not a decision variable for the association manager. Assets which qualify as liquid assets are so designated by the regulators. The S&L manager has no control over the quality of these assets, thus l is not a decision variable and would not differ across associations.[8] The portion of this term requiring a proxy is $r_s a$, where r_s is the sensitivity of interest rates to different qualities of housing related

[8] In the context of regression, if this is not adjusted for it will just be incorporated in the intercept term.

assets (shown as the slope on Figure 8) and a is the quality of housing related assets(shown on the horizontal axis of Figure 8). It is felt that the difference between the average rate earned on conventional loans and the FHA rate may capture the emphasis of this variable. The FHA interest rate ceilings were set by the FHA and were the same for all associations, thus the explanatory variable will simply be the interest earned on mortgage loans, $QUAL_H$.[9] The coefficient β_1 would be expected to be negative (by the model), thus the more elastic the function the greater the change in the proportion of housing related assets-to-total assets.[10] The regression equation appears as follows after the proxy for the quality variable is substituted in.

$$\Delta\frac{A}{T} = \beta_0 + \beta_1 \ln\ QUAL_H + \beta_2 \ln\ (MR - MC) + \beta_3 \ln\ v + \beta_4 \ln\ \frac{T}{A'}$$

The differential term of marginal return minus marginal cost of housing related assets (MR - MC) depends on the shape of the two curves involved. If these functions are linear then the difference between the functions could be expressed linearly and "A" would be an appropriate variable. This is shown graphically in Figure 9. If marginal revenue and marginal costs are best described by convex functions then $A^{-\alpha}$ is a reasonable approximation of the functions. This form seems rational given the first derivative would be negative as indicated by:

$$\frac{\partial MR - MC}{\partial A} = -\alpha A^{(-\alpha-1)}$$

and total revenue minus total cost would be positive for an α less than one as indicated by:

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[9] The ceilings were removed as of December, 1983.

[10] Note that in discussing the meaning of the sign of a coefficient, it is assumed that the change in the proportion of housing related assets-to- total assets is negative.

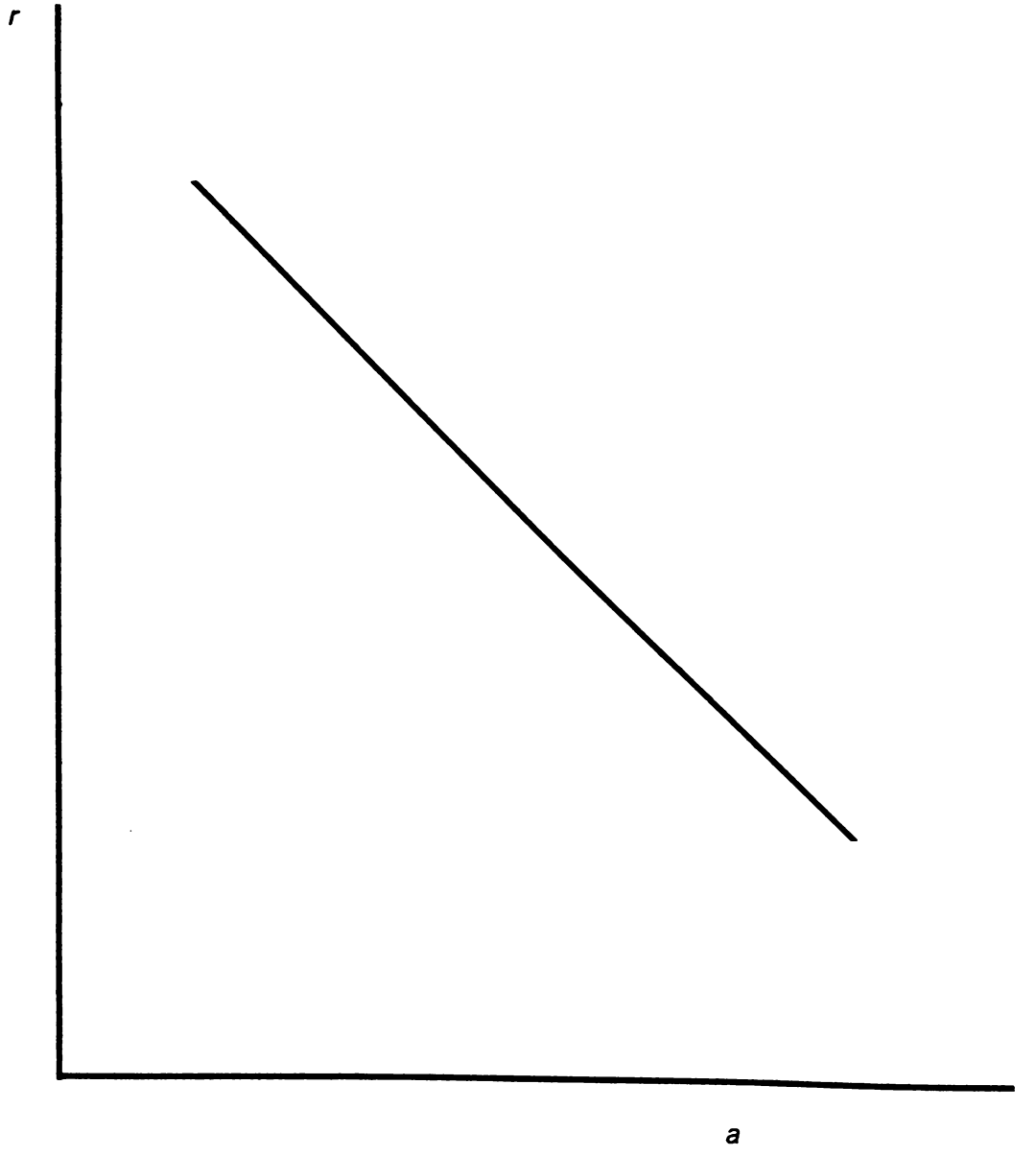

Figure 8. The Quality Effect Illustrated as a Linear Function

$$TR - TC = \frac{A^{(-\alpha+1)}}{(1-\alpha)}.$$

At this point the following regression has been described:

$$\Delta\frac{A}{T} = \beta_0 + \beta_1 \ln\ QUAL_H + \beta_2 \ln\ A + \beta_3 \ln\ v + \beta_4 \ln\ \frac{T}{A'}$$

The next two variables do not need proxies. The variable, *v*, is defined by 1 minus the reserve requirement. Given that the reserve requirement will not vary across firms, this variable has no explanatory power and will be eliminated from the group of independent variables. The constant effect becomes included in the intercept.

The final variable, the ratio of total assets-to-non-housing related assets is the inverse of γ, the regulatory constraint when binding. The smaller γ, the smaller the absolute change in the proportion of housing related assets. This ratio can be calculated directly from the semi-annual balance sheets provided by the FHLBB. From the descriptive data it has been noted that a few S&Ls have not diversified at all, which results in total assets being divided by zero for these firms. This being the case, the inverse of $\frac{T}{A'}$ is the variable used in the regressions. Given that the Box-Tidwell technique provides transformations, based on the data, this change in the variable is considered appropriate.

The variable, $\frac{A'}{T}$, captures whether the S&L has developed their expertise, as the management deems necessary, to expand to areas beyond home mortgages. If the coefficient proves to be significantly negative, it indicates that once the management has taken the first step in this direction it is ready "to walk" (to diversify even more).[11] In concluding the discussion for mutual S&Ls with greater than 82

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[11] Note that a negative coefficient indicates a greater absolute change.

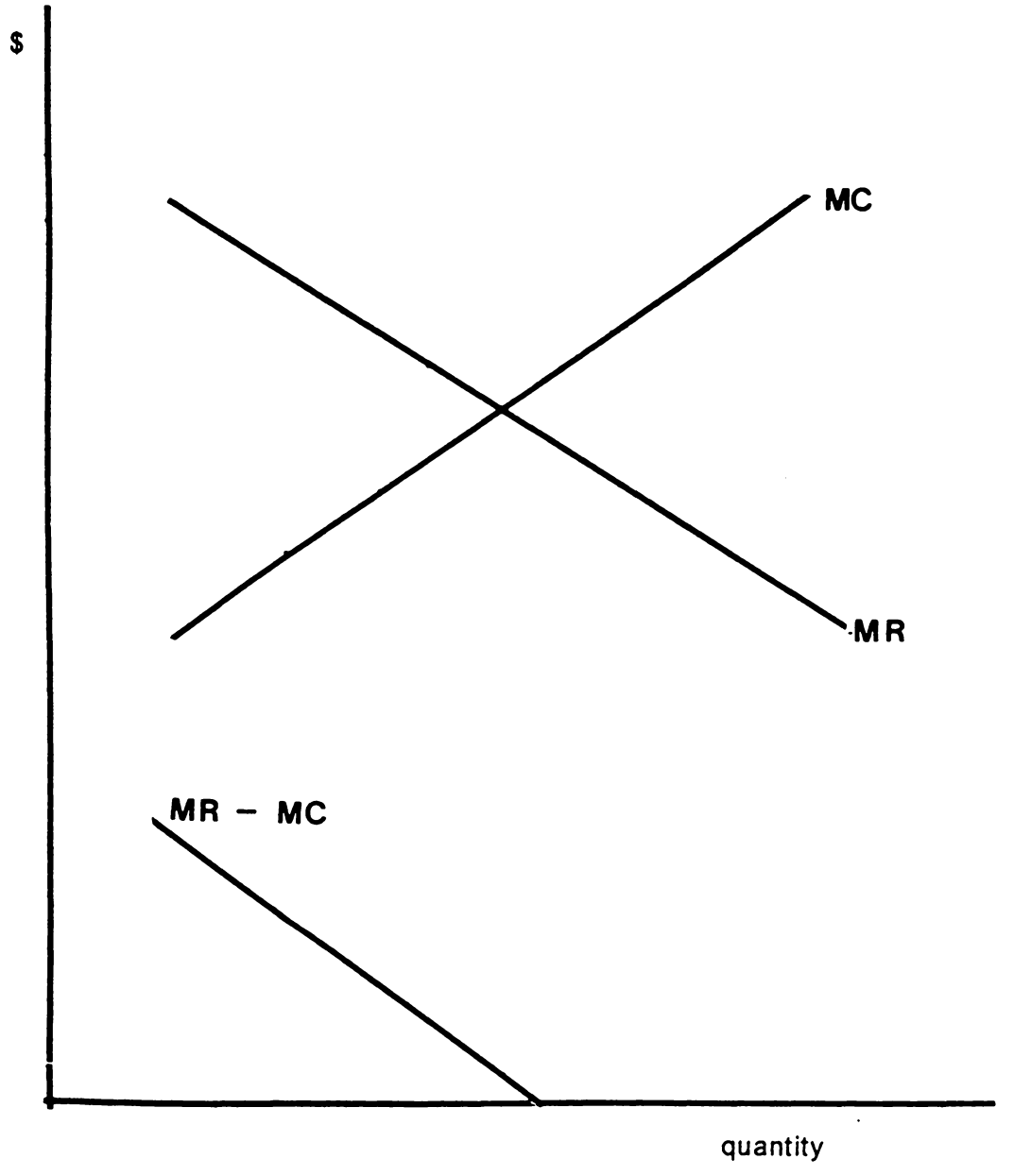

Figure 9. The Differential Function Illustrated as Linear Functions of Marginal Revenue and Marginal Cost

percent of their assets qualifying for the bad debt reserve deduction, we anticipate the following regression to be appropriate in a world where all other factors are held constant:

$$\Delta\frac{A}{T} = \beta_0 + \beta_1 \ln\ QUAL_H + \beta_2 \ln\ A + \beta_3 \ln\ \frac{A'}{T} \qquad [5.18]$$

The model for mutual S&Ls with between 60 percent and 82 percent of their assets qualifying for the bad-debt reserve deduction would necessitate adding an additional variable for the theoretical tax effect term, $.75\pi\tau_0$ This variable is proxied by net income before taxes. The regression equation appears as follows:

$$\Delta\frac{A}{T} = \beta_0 + \beta_1 \ln\ QUAL_H + \beta_2 \ln\ A + \beta_3 \ln\ \frac{A'}{T} + \beta_4\ \pi \qquad [5.19]$$

Theoretically β_4 would be positive indicating that the greater the profits, the greater the tax effect and the smaller the absolute change in the proportion of housing related assets-to-total assets held. In principle, β_4 should be zero for firms which held more than 82 percent of their assets in qualified assets. This is indicated by the absense of a profit term in Equation 5.18. Prior to the deregulation there would be no firms in this group, because Federally chartered S&Ls were not allowed to hold as much as 18 percent of their assets in categories which did not qualify. After the deregulation, some such firms did exist as evidenced by Figure 10. Figure 10 indicates that a few S&Ls diversified to the point where they lost potential tax breaks.

The associations with less than 82 percent of their assets qualifying for the deduction would obviously have been subject to the higher marginal tax rates. S&Ls may use a percentage higher than 82 percent as an internal minimum to allow some flexibility in the face of uncertain loan demand, and the role of a tax effect may differ

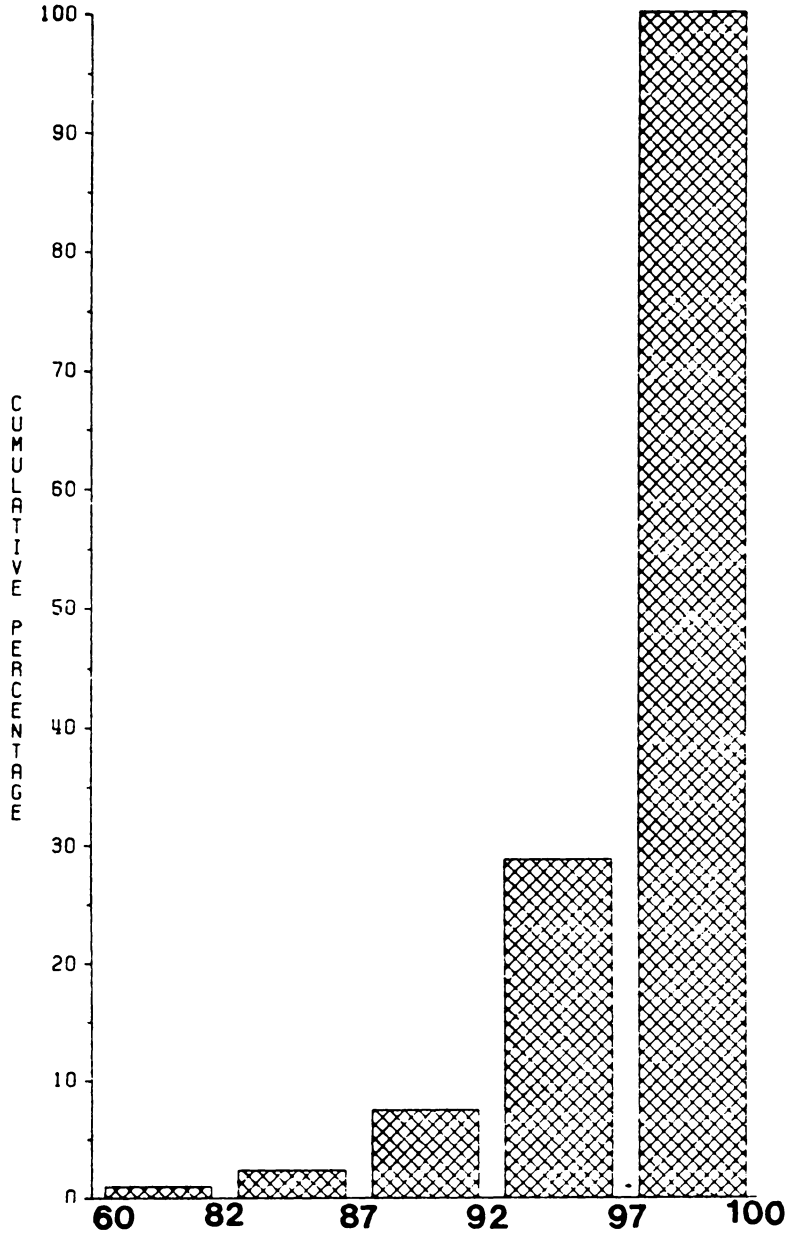

Figure 10. Cumulative Distribution of Associations Based on Qualified Assets (1983)

across S&Ls. Based on this it would appear appropriate to include the profit term in all regressions and to account for the differential effect by including a dummy term defined by a criterion of some number greater than 82 percent on the post deregulation balance sheets. This logic motivated the regression, for all mutual associations, which follows:

$$\Delta\frac{A}{T} = \beta_0 + \beta_1 \ln\ QUAL_H + \beta_2 \ln\ A + \beta_3 \ln\ \frac{A'}{T} + \beta_4\ \pi D \qquad [5.20]$$

where D is a dummy variable based on some benchmark criterion for the percent of tax qualified assets. Different benchmarks will be tested to examine the sensitivity of the results to the criterion and the validity of the use of the dummy variable.

5.3.3.2 Explanatory Variables and Proxies for Equation 5.16

The variables in equation 5.15 describing changes in the proportion of housing related assets-to-total assets are analogous to those in equation 5.16 describing changes in the proportion of non- housing related assets-to-total assets. Given that the rationales for the variables are the same as above, the discussion will be limited to the identification of proxies and variables. The semi-log transformation provides an equation for the change in non-housing related assets to total assets as follows:

$$\Delta\frac{A'}{T} = \beta_0 + \beta_1 \ln\ QUAL_{NH} + \beta_2 \ln\ A + \beta_3 \ln\ \frac{A'}{T} + \beta_4\ \pi D \qquad [5.21]$$

The first proxy, $QUAL_{NH}$, for the quality effect with respect to non-housing related assets relies on the rate of interest on other loans. This is analogous to using the rate on mortgage loans for the quality effect with respect to housing related assets.

The proxy will be an average from the income statements of June, 1979; December, 1979; June, 1983; and December, 1983.

The theoretical variable of the difference in marginal revenue and marginal cost of non-housing related assets(MR - MC) will be proxied by A′. The logic is exactly the same as that provided for using A as a proxy for the difference of marginal revenue and marginal cost of housing related assets.

The third variable is the ratio of non-housing related assets-to-total assets. This variable is identical to the variable used in Equation 5.18. The theoretical model indicates that the appropriate variable is expressed as:

$$\frac{T}{vT - A'}$$

This can also be expressed as:

$$\left[\frac{vT - A'}{T}\right]^{-1} = \left[v - \frac{A'}{T}\right]^{-1}.$$

Based on this expression and the Box-Tidwell's ability to detect needs for transformations, the variable, $\frac{A'}{T}$, is considered appropriate for the regression.

The remaining variable comprises the tax effect. This is identical to the proxy used in the equation explaining the change in the proportion of housing related assets-to-total assets. The expected sign of the coefficent is negative, indicating that the greater the tax effect the smaller the movement into non-housing related assets.

5.3.3.3 Explanatory Variables and Proxies for Equation 5.17.

The variables and proxies for the residual equation explaining $\Delta\frac{L}{T}$ have all been included in either the equation explaining the change in the proportion of housing-related assets to total assets or the equation explaining the change in the proportion of non-housing related assets to total assets. As the Chapter progresses it will become evident why further discussion of this equation is not necessary.

The semi-log transformation has provided regression equations for mutual associations with coefficients whose theoretical signs are intuitively appealing; however, the functional forms of these equations are unknown. The Box-Tidwell transformation and estimation procedure will determine statistically whether the semi-log transformation is supported by the data. Beyond this it becomes important to examine the implications of running individual regressions as implied above.

5.4 The Complete System of Equations

The regressions explaining the changes in the proportion of housing related assets-to-total assets, the proportion of non-housing related assets-to-total assets, and the proportion of liquid assets-to-total assets allow analysis of the diversification S&Ls have undertaken given their expanded asset powers and the factors which have played a role in the magnitude of that diversification. OLS regressions provide consistent unbiased parameter estimates; however, by utilizing the information provided by the balance sheet constraint, the efficiency of the parameter estimates may be improved. The balance sheet shows that:

$$A + A' + L = T$$

thus

$$\Delta\frac{A}{T} + \Delta\frac{A'}{T} + \Delta\frac{L}{T} = 0 \qquad [5.22]$$

indicating a system of equations is appropriate. When only one of these equations ($\Delta\frac{A}{T}$) is estimated or the system of the above equations is estimated using single equation estimation (OLS), the parameter estimates are inefficient. The information provided by the balance sheet has been ignored. The inefficiency occurs because the correlation between error terms is not accounted for. If the variables, $\Delta\frac{A}{T}$ and $\Delta\frac{A'}{T}$, include positive errors then the residual equation for $\Delta\frac{L}{T}$ must have a negative error associated with it, in order for the sum of the changes to be zero. Therefore, the error terms are correlated.

For efficient estimation one must account for this correlation by using a systems method of estimation such as seemingly unrelated equations. When using a system of equations, the above identity (equation 5.22) dictates that the sum of the intercept coefficients for the equations of the three asset proportions must sum to zero, thus the sum of the slope coefficients for each explanatory variable must also be zero. Given these parameter restrictions, it is appropriate to estimate two of the three equations, for the coefficients for the residual equation may be obtained directly from the two estimated equations. The equation for the change in proportion of housing related assets and the equation for the change in the proportion of non-housing related assets will be estimated using Zellner's method.[12] The method devised by Zellner is appropriate when the variance covariance matrix is unknown. Zellner es-

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[12] This justifies why the residual equation was not discussed in greater detail in Section 4.3.2.3

timation improves upon the efficiency of the parameter estimates by explicitly accounting for "the fact that the cross equation error correlations may not be zero." (Pindyck and Rubinfeld p.333)

The prior discussion emphasizes the appropriateness of estimating a system of two equations. Equations 5-15 and 5-16 contain a distinctive set of variables where each equation contains some unique variables. Given the balance sheet constraint it was noted that the sum of the slope coefficients for an explanatory variable equals zero. If an explanatory variable has a positive coefficient in the equation explaining the change in the ratio of housing related assets-to-total assets then if must be offset in the remaining two equations. Given that the dependent variables are proportions, if an explanatory variable affects the change in one dependent variable it would also affect the changes in the other dependent variables. This would be true even if the explanatory variable only effects the quantity of one category of assets such as housing related assets, because it would still change the quantity of total assets, the denominator of all the dependent variables. If a specific explanatory variable such as $QUAL_H$ is entered into only one of the two equations being estimated then the offsetting effect is implicitly assigned to the residual equation explaining the change in the proportion of liquid assets-to-total assets.[13] The following two equations, with all the variables accounted for in each equation, evolve from the adjustment for this type of misspecification assuming a semi-log model:

$$\Delta\frac{A}{T} = \beta_0 + \beta_1 \ln\ QUAL_H + \beta_2 \ln\ QUAL_{NH} + \beta_3 \ln\ A + \beta_4 \ln\ A' \qquad [5.23]$$

$$+ \beta_5 \ln\ \frac{A'}{T} + \beta_6\ \pi D$$

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[13] This type of misspecification is addressed by Brainard and Tobin (1968).

and

$$\Delta\frac{A'}{T} = \beta_0 + \beta_1 \ln\ QUAL_H + \beta_2 \ln\ QUAL_{NH} + \beta_3 \ln\ A + \beta_4 \ln\ A' \qquad [5.24]$$

$$+ \beta_5 \ln\ \frac{A'}{T} + \beta_6\ \pi D$$

These equations are appropriate for mutual associations assuming the semi-log form is appropriate and assuming away all external variables which will be discussed later in the Chapter.

5.5 The Empirical Model of Stock S&Ls

The model for stock S&Ls differs from the model for mutual S&Ls because the stock associations have the option to go to the capital markets and raise funds. Referring back to Section 5.2.1, equations 5.3, 5.4, and 5.5 may be rewritten incorporating the assumption concerning capital as follows:

$$\Delta A = f\left(\frac{\lambda_1}{\left[\frac{\partial\pi(1-\tau)}{\partial A}\right]}\right) \qquad [5.25]$$

$$\Delta A' = f\left(\frac{\lambda_1}{\left[\frac{\partial\pi(1-\tau)}{\partial A'}\right]}\right) \qquad [5.26]$$

and

$$\Delta L = \frac{v}{1 - v} f\left(\frac{\lambda_1}{\left\{\left[\frac{\partial \pi(1 - \tau)}{\partial A}\right] + \left[\frac{\partial \pi(1 - \tau)}{\partial A'}\right] - \left[\frac{\partial \pi(1 - \tau)}{\partial K}\right]\right\}}\right) \quad [5.27]$$

Note the additional term in the denominator of equation 5.27.

When capital becomes and additional decision variable in the stock model it adds an addition equation to the first-order conditions. Based on this it is appropriate to include an equation for the change in capital analogous to the above equations as follows:

$$\Delta K = f\left(\frac{\lambda_1}{\left[\frac{\partial \pi(1 - \tau)}{\partial K}\right]}\right) \quad [5.28]$$

Substitutions and adjustments consistent with those for the mutual model provide the following functions:

$$\Delta \frac{A}{T} = f\left(\left[1 + \frac{QE_A}{MR - MC}\right] \frac{vT}{A'}\right) \quad [5.29]$$

$$\Delta \frac{A'}{T} = f\left(\left[1 + \frac{QE_A}{MR - MC}\right] \frac{vT}{vT - A'}\right) \quad [5.30]$$

and

$$\Delta \frac{L}{T} = f\left(\left[\frac{(MC - MR) + QE_A}{(MR - MC) + (MN - MC) + (MG + MC)}\right] \frac{vT}{A'}\right) \quad [5.31]$$

comparable to equations 5.12, 5.13, and 5.14 for mutual associations. Equations 5.29 and 5.30 are identical to 5.12 and 5.13. This indicates that the different assumptions

concerning capital will enter through the residual equations for the change in the proportion of liquid assets to total assets and the equation for the $\Delta\frac{K}{T}$ which appears as follows after the appropriate substitutions are made:

$$\Delta\frac{K}{T} = \frac{1}{1-v} f\left(\left[1 + \frac{r_a(l+k)}{MC - MG}\right]\frac{vT}{A'}\right) \qquad [5.32]$$

The additional term noted in equation 5.31 and Equation 5.32 is the marginal cost of capital. The proxy for this is the amount of capital (K), based on the same logic used to derive the proxies for the marginal revenues of housing related and non-housing related assets. Taking into consideration the Brainard and Tobin argument, this term is added to equations 5.23 and 5.24 to adjust for the Federal stock S&Ls' ability to raise equity through the capital markets.[14] The system of equations for the stock associations appear as follows:

$$\Delta\frac{A}{T} = \beta_0 + \beta_1 \ln QUAL_H + \beta_2 \ln QUAL_{NH} + \beta_3 \ln A + \beta_4 \ln A' \qquad [5.33]$$

$$+ \beta_5 \ln \frac{A'}{T} + \beta_6 \pi D + \beta_7 \ln K$$

and

$$\Delta\frac{A'}{T} = \beta_0 + \beta_1 \ln QUAL_H + \beta_2 \ln QUAL_{NH} + \beta_3 \ln A + \beta_4 \ln A' \qquad [5.34]$$

$$+ \beta_5 \ln \frac{A'}{T} + \beta_6 \pi D + \beta_7 \ln K$$

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[14] It is assumed that the portion of the quality term (l+k) does not differ across firms.

with respect to the asset side of the balance sheet and the following equation with respect to capital:[15]

$$\Delta\frac{K}{T} = \beta_0 + \beta_1 \ln\ QUAL_H + \beta_2 \ln\ QUAL_{NH} + \beta_3 \ln\ A + \beta_4 \ln\ A' \qquad [5.35]$$

$$+ \beta_5 \ln\ \frac{A'}{T} + \beta_6\ \pi D + \beta_7 \ln\ K$$

The differences in the two models necessitate dividing the data set according to organizational form and the estimation of two regressions.

To this point we have discussed the regression models as if there were no changes in the S&L environment other than expanded asset powers and that all S&Ls operated in the same environment. The literature review emphasized that there were other changes occurring in the environment which may be just as important as the expanded asset powers. The variables which need to be included will be considered external variables.

5.6 External Variables

The previous sections developed regression models motivated by the partial equilibrium theoretical models of Chapter 3. These models are concerned with the deregulation of S&Ls, while emphasizing the changing structure of their asset portfolios. The theoretical models describe the effects of the asset deregulations on the asset portfolios in an environment where all other factors are held constant. In reality

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[15] This is included in the examination of the change in the proportion of targeted assets-to-total assets, based on its potential to increase the explanatory power of the system of equations.

S&Ls were operating in a very dynamic environment. Changes in their regulatory environment (other than regulations relating to assets) and economic environments could influence the S&L's reactions to their expanded asset powers and should be controlled for in the regressions.

5.6.1 Economic Variables

In trying to isolate the effects of the expanded powers on the asset portfolios it is necessary to control for the changing economic environments of the S&Ls.[16] The ideal control would be to have a S&L which is exposed to the same economic forces, but has received identical expanded asset powers prior to the Federal S&Ls to pair with each Federal S&L. By subtracting the change in the ratio of targeted assets to Total Assets from 1979 to 1981 for the paired S&L, the portion of the change attributed to the deregulation could be isolated. The ideal comparison does not exist; however, the state chartered S&Ls of California, Texas, and Maine had liberalized powers prior to the passing of the DIDMCA and Garn- St Germain Acts and could serve in this capacity.

In Maine, state chartered S&Ls have been operating in very liberal environments since October 1, 1975. "State chartered thrifts in Maine received authority to offer personal checking accounts, to issue credit cards, to make secured and unsecured consumer loans up to 10 percent of total deposits, to participate in loans with Maine commercial banks up to 10% of total deposits, to make additional prudent loans including commercial loans up to 10 percent of total deposits, and the authority to make additional commercial loans up to a percentage established by the Super-

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[16] Note the plural of environments is used to emphasize the segmented and localized markets in which S&Ls operate.

intendent of Banking."(McCall and Peterson (1980), p.47) Thrifts were allowed to branch statewide and to establish satellite facilities. State reserve requirements were made uniform for all types of depository institutions. Then on February 28, 1976 Maine received NOW account privileges. Given that Maine's state chartered S&Ls received these powers in the mid '70's, the state provides the "best" set of control institutions available. The major drawback concerning Maine, is that only nine state chartered associations operated over the entire period (1979 to 1983); therefore, it was deemed necessary to identify an additional state to provide an adequately large control data set.

In Texas, state chartered S&Ls had even broader powers than those provided by the Garn-St Germain Act and the DIDMCA. However, questions existed concerning whether the Texas economic environment, with the strong influence of the oil industry, provided a good control for Federal S&Ls across the nation. The data confirmed the concerns and it was decided that Texas associations should not be included in the control data set.

The state chartered S&Ls in California possessed some of the more liberal regulations in contrast to other states. When the group of California state chartered associations are combined with the group of Maine state chartered associations the combined data set contains 9 associations. The preliminary data set containing the state chartered S&Ls of Maine and California is used to develop control variables for the economy.

The state chartered S&Ls of Maine and California provide imperfect substitutes for the ideal, but they can be used to obtain predictions (based on the characteristics of the S&Ls and their environments) of the changes in $\frac{A}{T}$ and $\frac{A'}{T}$ that would have occurred at Federally chartered S&Ls in the absence of regulations constraining portfolio choices. A preliminary model of changes at those state chartered S&Ls is

developed to obtain a formula for an "index' of the changes that would have occurred at Federally chartered S&Ls. As the theory of previous chapters does not apply to the preliminary model, logical and intuitively appealing explanatory variables are used to estimate the weights on fundamental factors which are included in the index. Once the significant factors and their weights are identified by this preliminary regression, the specific characteristics of each Federal S&L can be used in the index formula to obtain the predicted changes in $\frac{A}{T}$ and $\frac{A'}{T}$, and the index value can be used as a control variable in the primary model of the effects of deregulation.

The preliminary regressions have the changes in the proportions of housing related assets-to-total assets and non-housing related assets-to-total assets as the independent variables.[17] The data for the state chartered S&Ls of California and Maine is partitioned according to organizational form and equations are estimated to explain the following:

1. The change in the proportion of housing related assets-to-total assets for mutual S&Ls
2. The change in the proportion of non-housing related assets-to-total assets for mutual S&Ls
3. The change in the proportion of housing related assets-to-total assets for stock S&Ls
4. The change in the proportion of non-housing related assets-to-total assets for stock S&Ls

The estimated equations provide a framework to develop control variables using the data for the Federal associations.

The logical explanatory variables proposed by the researcher are association size, growth rate, changes in the degree of competition in the market, changes in the activity in the secondary markets, changes in interest rate risk, and the degree of

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[17] These are the same independent variables found in the primary regressions using the data sets containing Federal S&Ls.

intra-diversification undertaken by the S&L. These variables are proposed to capture the discretions of management and the constraints imposed by the local environment on the management of the S&L.

The two variables related to size include the size of the association (TA_{1983}) and the growth in assets of the association (*GROWTH*). The size of the association is measured by the average of the total assets for 1983. The growth of the association is calculated as the difference between the total assets in 1983 and the total assets in 1979 , divided by the total assets in 1979. This variable indicates whether changes in the compositions of asset portfolios were significantly affected by the rate of growth of the association. Both size related variables have the potential to be influenced by the economy of the locality and the choices of the management.

The change in the degree of competition ($\Delta COMP$) is descriptive of the environment in which the association operates as defined by SMSAs. This variable is measured by the change in the ratios of total assets of the largest S&L-to-the sum of all assets for all associations in that particular SMSA. This variable has the potential to vary from -1 to 1. Zero indicates that the competition has not changed over the time period from 1979 to 1983.

The remainder of the variables are strongly tied to the managers' discretion. These include changes in direction with respect to function, controlling interest rate risk, and intra-diversification.

The changes with respect to function address the manager's choice to operate as a traditional S&L, making and holding home mortgages, versus performance as a mortgage banker, making, selling , and servicing home mortgages. The variable, ΔFCN, is measured by the ratio of loans serviced-to-total mortgage loans held in 1983 minus the ratio of loans serviced-to-total mortgage loans held in 1979.

The second variable considered to be within the discretion of the management concerns interest-rate risk. Interest rate risk is the motivation behind the expanded asset powers. The use of adjustable rate mortgages (ARMs) would lower the interest rate risk, without diversifying into non-housing related assets. (This is not indicating that the two choices are mutually exclusive.) ARMs were introduced to Federal S&Ls in the early eighties, thus information concerning ARMs has only been collected since 1981. Taking this into account, the proportion of conventional adjustable interest rate mortgages-to-total mortgage loans in 1983 (ΔADJ_RSK) is used to capture the effect.

The changes with respect to choices concerning intra-diversification have increased with the growth of the secondary markets. Intra-diversification includes diversification within home mortgages, but across different localities. The managers can accomplish this by buying loans in the secondary markets and adding these to their S&L's portfolio. This variable (INT_DIV) is captured by the differences in the ratios of loans and participations sold to FHMLC minus loans purchased from FHLMC-to-total assets between 1979 and 1983. As with the other variables considered to be under the discretion of the management, the managements choices are probably highly correlated with the economic activity of the locality.

The above variables are based on conjecture therefore, statistical criteria for choosing the "best" model are based on model performance. OLS equations are estimated for $\Delta\frac{A}{T}$ for both stock and mutual associations and $\Delta\frac{A'}{T}$ for stock and mutual associations of Maine and California to obtain estimates of coefficients necessary to develop an explanatory economic variable for the primary regressions. Equations containing all the combinations of variables are estimated. The choice of the "best" model is based on the residual mean square, the press statistic, R-squared

and Mallow's Cp Statistic.[18] Given the "best " model, the appropriate data for each Federal S&L is substituted into the estimated equation to calculate one economic variable for each observation. This variable (ECON) is proposed to capture the portion of asset composition changes attributable to other changes in the economic environment.

5.6.2 Regulatory Variables

After separating the changes due to the regulatory environment from the changes due to the economic environments, it becomes necessary to partition the changes due to the new expanded asset powers from the changes attributable to other regulations initiated between 1979 and 1983. In the regulatory environment, S&Ls were enabled to change both the structure of their assets and liabilities. Within our theoretical model it has been shown that the changes to the asset directed regulations have the potential to change the proportion of liabilities-to-total assets and the proportion of capital-to-total assets; thus it is rational to expect that changes in regulations concerning liabilities and net worth would have the potential to change the proportions of housing related assets-to-total assets, non-housing related assets-to-total assets, and liquid assets-to-total assets.

Controls for changes in regulations directed at the liability side of the balance sheet are based heavily on the research of Walker. The major changes consist of the phase-out of ceilings on deposit interest rates (Regulation Q) and permitting interest on transaction accounts (N.O.W. accounts). Walker used the interest rate on regulated accounts (the ratio of the interest on accounts below ceiling to the deposits in

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[18] See Myers (1987) Chapter 4 for additional information on the merits of these mearsures.

accounts below ceilings) as a proxy for the potential cost of the Regulation Q phase-out. In his OLS regressions with respect to assets, where the dependent variables were mortgage loans-to-total assets and liquid assets -to-total assets, the variable of interest rates on regulated accounts is significant in explaining both proportions. (See Chapter 2 for more details) The present research is searching for a proxy to control for the effects of this phase-out on the changing composition of the asset portfolio. Therefore, the change of the interest rate on regulated accounts (REG_Q) appears to be the appropriate variable. This captures the cost of the phase-out and the change in the structure of deposits from low cost regulated deposits to higher priced non-regulated deposits.

The DIDMCA allows N.O.W. accounts nationwide. This also has the potential to change the make-up of the S&L's balance sheet. The ability to offer interest on transaction accounts should increase the proportion of deposits sensitive to interest rates to total deposits, thus possibly changing the composition of assets held by associations. Walker feels that with this leniency consumers will become more concerned with returns and the opportunity costs of idle balances. He utilizes Deposits Sensitive to Interest Rates-to-Total Funds to proxy this. As with the explanatory variable, Interest Rate on Regulated Accounts, the Deposits Sensitive to Interest Rates-to-Total Funds ratio was significant in the equation explaining the proportion of Liquid Assets- to-Total Assets and the equation explaining the proportions of Mortgage Loans-to-Total Assets. Given that the dependent variable in the present study is the change in the proportion of the target ratio from 1979 to 1983, the appropriate variable appears to be the change in the ratio of Deposits Sensitive to the Interest Rate to Total Funds(NOW).

5.7 Empirical Models with External Variables Included

Having discussed the transitions from the theoretical models to the empirical models and the necessity to control for extermal forces, it is appropriate to present the two systems of equations as they are estimated. For Federal mutual associations the following system of equations is estimated.

$$\Delta\frac{A}{T} = \beta_0 + \beta_1\ QUAL_H^{\sigma} + \beta_2\ QUAL_{NH}^{\sigma} + \beta_3\ A^{\sigma} + \beta_4\ A'^{\sigma} + \beta_5\ \left(\frac{A'}{T}\right)^{\sigma} \qquad [5.36]$$

$$+ \beta_6\ \pi D + \beta_8\ ECON_H + \beta_9\ ECON_{NH} + \beta_{10}\ REG\_Q + \beta_{11}\ NOW$$

and

$$\Delta\frac{A'}{T} = \beta_0 + \beta_1\ QUAL_H^{\sigma} + \beta_2\ QUAL_{NH}^{\sigma} + \beta_3\ A^{\sigma} + \beta_4\ A'^{\sigma} + \beta_5\ \left(\frac{A'}{T}\right)^{\sigma} \qquad [5.37]$$

$$+ \beta_6\ \pi D + \beta_8\ ECON_H + \beta_9\ ECON_{NH} + \beta_{10}\ REG\_Q + \beta_{11}\ NOW$$

For stock associations, the equations have an additional term to capture their abilities to raise capital. The system for Federal stock S&Ls consists of the following equations:

$$\Delta\frac{A}{T} = \beta_0 + \beta_1\ QUAL_H^{\sigma} + \beta_2\ QUAL_{NH}^{\sigma} + \beta_3\ A^{\sigma} + \beta_4\ A'^{\sigma} + \beta_5\ \left(\frac{A'}{T}\right)^{\sigma} \qquad [5.38]$$

$$+ \beta_6\ \pi D + \beta_7\ K^{\sigma} + \beta_8\ ECON_H + \beta_9\ ECON_{NH} + \beta_{10}\ REG\_Q + \beta_{11}\ NOW$$

and

$$\Delta\frac{A'}{T} = \beta_0 + \beta_1\ QUAL_H^{\sigma} + \beta_2\ QUAL_{NH}^{\sigma} + \beta_3\ A^{\sigma} + \beta_4\ A'^{\sigma} + \beta_5\ \left(\frac{A'}{T}\right)^{\sigma} \qquad [5.39]$$

$$+ \beta_6\ \pi D + \beta_7\ K^{\sigma} + \beta_8\ ECON_H + \beta_9\ ECON_{NH} + \beta_{10}\ REG\_Q + \beta_{11}\ NOW$$

for assets and the following for capital:

$$\Delta\frac{A'}{T} = \beta_0 + \beta_1\ QUAL_H^{\sigma} + \beta_2\ QUAL_{NH}^{\sigma} + \beta_3\ A^{\sigma} + \beta_4\ A'^{\sigma} + \beta_5\ \left(\frac{A'}{T}\right)^{\sigma} \qquad [5.40]$$

$$+ \beta_6\ \pi D + \beta_7\ K^{\sigma} + \beta_8\ ECON_H + \beta_9\ ECON_{NH} + \beta_{10}\ REG\_Q + \beta_{11}\ NOW$$

The equations are first run individually using the Box-Tidwell procedure to estimate the σ's for the theoretical-based variables as discussed earlier.[19] Once the powers are estimated and the transformations performed, the system of equations is estimated using Zellner's method. The estimated coefficients indicate the importance of factors contributing to and constraining the asset portfolio changes motivated by the Garn-St Germain Act and the DIDMCA.

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[19] A σ for each theoretical-based variable, except the profit variable, is estimated. The σ's are not the same.

Chapter VI

Empirical Results

6.1 Introduction

The purpose of Chapter 6 is to present and analyze the results of the regressions developed in the previous chapter. The order of presentation is dictated by the progression of tests. The results evolving from the model of Federal mutual associations are discussed first; followed by an analogous discussion of the model for Federal stock associations.

6.2 Results Relevant to Federal Mutual S&Ls

A sample of 1367 Federal mutual S&Ls is used in the primary regressions for the following system of equations:

$$\Delta\frac{A}{T} = \beta_0 + \beta_1\ QUAL_H^{\sigma} + \beta_2\ QUAL_{NH}^{\sigma} + \beta_3\ A^{\sigma} + \beta_4\ A'^{\sigma} + \beta_5\ \left(\frac{A'}{T}\right)^{\sigma} \qquad [6.1]$$

$$+ \beta_6\ \pi D + \beta_8\ ECON_H + \beta_9\ ECON_{NH} + + \beta_{10}\ REG\_Q + \beta_{11}\ NOW$$

and

$$\Delta\frac{A'}{T} = \beta_0 + \beta_1\ QUAL_H^{\sigma} + \beta_2\ QUAL_{NH}^{\sigma} + \beta_3\ A^{\sigma} + \beta_4\ A'^{\sigma} + \beta_5\ \left(\frac{A'}{T}\right)^{\sigma} \qquad [6.2]$$

$$+ \beta_6\ \pi D + \beta_8\ ECON_H + \beta_9\ ECON_{NH} + \beta_{10}\ REG\_Q + \beta_{11}\ NOW$$

These are reiterations of equations 5.36 and 5.37 developed in Chapter 5. Given the variables deemed important on the basis of the theoretical model ($QUAL_H$, $QUAL_{NH}$, A, A', $\frac{A'}{T}$, and πD) and the control variables based on Walker's results (REG_Q and NOW) , it is appropriate to estimate the equations which calculate the economic variables(explanatory variables for the primary regressions).

6.2.1 Preliminary Regressions for the Development of Economic Indices

The preliminary regressions are performed as a step in the development of indices designed to capture the economic components of change for the ratios of housing related assets-to-total assets and non-housing related assets-to-total assets. Regressions for all possible combinations of variables are estimated using the state chartered S&Ls from Maine and California partitioned by organizational form (stock versus mutual). The variables selected are designed to capture the different economic environments, with respect to housing and non-housing related assets, encountered by the associations based on the locality and discretions of the

management. The motivation and methodologies involved in creating these economic variables are discussed in greater detail in Chapter 5. The choice of equations based on performance criterion indicates the "best" equations to be as follows:

$$ECON_H = -.0117 + 1.8068\ \Delta INT\_DIV - 1.8869\ GROWTH \qquad [6.3]$$

$$+ (5.6073 \times 10^{-12})\ TA_{1983} + .9516\ \Delta ADJ\_RSK$$

and

$$ECON_{NH} = .0045 + .0365\ \Delta COMP - 1.4891 \times 10^{-10}\ TA_{1983} + .3531\ \Delta ADJ\_RSK \qquad [6.4]$$

The above equations are estimated using very small sample sizes, for the exclusive purpose of developing economic indices for the primary regressions. The methodology is designed to provide the "best" proxies for the changes in S&L environments. Given the small sample size and the lack of theory surrounding these equations, it would be inappropriate to draw conclusions from the variables selected or the coefficients estimated.

The equations are utilized to create economic indices by substituting the analogous data for Federal mutual associations into the appropriate equations. For housing related assets, the average estimated economic variable for the sample of 1367 mutual associations is -6.31 percent. For non-housing related assets, the average estimated economic variable is -.56 percent. Theoretically these indices are designed to capture the changes in the targeted proportions related to changes in their economic environments. This indicates that assuming S&Ls already possessed expanded powers, on average, the environments they experienced from 1979 through 1983 would motivate decreases in their proprotions of housing related assets-to-total assets and non-housing related assets-to-total assets. The implication being that

associations, on average, would have increased their liquid holdings over the test period if the changing environments had been the only motivating factors present.

6.2.2 The Box-Tidwell Procedure as Used to Determine Functional Form

Having calculated the economic index variables, the next step is to estimate the fuctional forms (the σ's found in Equations 6.1 and 6.2) for the theoretical variables. This estimation requires the Box-Tidwell procedure as described in Section 5.3.2. The Box-Tidwell procedure is run for each equation (OLS) providing maximum likelihood estimates for the σ's. The resulting regression coefficient estimators are unbiased, but inefficient.[20]

In the housing related assets equation, the Box-Tidwell procedure indicated that A and A′ require no tranformations. The estimate of σ for $QUAL_H$ would not converge, indicating its "poor" explanatory power; however, given the theoretical basis for this variable, it was not discarded, but included with no transformation.[21] The inclusion of the variable appears to be appropriate in light of the significant coefficient for $QUAL_H$ evident in the following final form of the equation produced by the Box-Tidwell Procedure:

$$\Delta\frac{A}{T} = 1.9360 - 1.6373\ QUAL_H - .0006\ QUAL_{NH}^{2.7264} + (4.8749 \times 10^{-5})\ A \qquad [6.5]$$

$$- (4.2322 \times 10^{-4})\ A' + .1983 \left(\frac{A'}{T}\right)^{.7940} + (3.6123 \times 10^{-6})\ \pi D$$

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[20] These estimates are inefficient because a system of equations is appropriate.

[21] A partial plot also indicated the explanatory power of the variable to be quite small.

$$- .0203\ ECON_H + .2015\ ECON_{NH} + .1080\ REG\_Q + .0681\ NOWS$$

Table 4 provides T statistics for the coefficients.

The σ of the quality variable for the housing related assets equation converged to 2.7264 indicating a power transformation. The proportion, $\frac{A'}{T}$, is used instead of $\frac{T}{A}$ as indicated appropriate by the theoretical model.[22] The σ estimated by Box-Tidwell of .7940 indicates that this appears to be appropriate. Having concluded the discussion of transformations performed with respect to equation 6.5, explaining the change in the proportion of housing related assets-to-total asset, it becomes timely to look at the transformations performed with respect to the equation explaining the changes in the proportion of non-housing related assets-to- total assets.

The Box-Tidwell procedure indicates, as it did for equation 6.5, that transformations are not needed for A and A′ for the equation modelling the change in the proportions of non-housing related assets-to-total assets. The procedure provides maximum likelihood estimates of σ and OLS estimates of the coefficients as follows: (See Table 5 for t-statistics.)

$$\Delta\frac{A'}{T} = -2.4129 - (1.6274 \times 10^{-9})\ QUAL_H^{11.2647} + .0006\ QUAL_{NH}^{2.5100} \qquad [6.6]$$

$$+ (8.3136 \times 10^{-6})\ A + (5.8559 \times 10^{-5})\ A' + .3317\ \frac{A'}{T}^{1.3712} + (1.0184 \times 10^{-6})\ \pi D$$

$$+ .0025\ ECON_H + .0331\ ECON_{NH} - .1696\ REG\_Q + .0006\ NOWS$$

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[22] This inversion is made because a few S&Ls held no non-housing related assets, thus making the theoretical proportion undefinable for these associations.

Table 4. Box-Tidwell: The Change in A/T for Mutual S&Ls

Dependent Var: $\Delta\frac{A}{T}$	R^2: .0344	F Statistic: 4.826	PROB>F: .0001
Independent Variable	**Parameter Est**	**T value**	**PROB>|T|**
intercept	1.9360	.561	.5749
$QUAL_H$	-1.6373	-2.205	.0276*
$QUAL_{NH}^{2.7264}$	-.0006	-1.294	.1958
A (housing related assets)	4.8749×10^{-5}	3.310	.0010**
A'(non-housing related assets)	4.2322×10^{-4}	-1.956	.0506*
$\left(\frac{A'}{T}\right)^{.7940}$	.1983	1.086	.2777
πD	3.6123×10^{-6}	2.173	.0299*
$ECON_H$	-.0203	-3.723	.0002**
$ECON_{NH}$	.2015	3.575	.0004**
REG_Q	.1080	.789	.4302
NOW	.0681	3.430	.0006**
Number of observations: 1367			

** significant at 1 percent
* significant at 5 percent

Table 5. Box-Tidwell: The Change in A′/T for Mutual S&Ls

Dependent Var: $\Delta\frac{A'}{T}$	R^2: .6976	F Statistic: 312.812	PROB>F: .0001
Independent Variable	**Parameter Est**	**T value**	**PROB>|T|**
intercept	-2.4129	-22.856	.0001**
$QUAL_H^{11.2647}$	-1.6274×10^{-9}	-1.683	.0926
$QUAL_{NH}^{2.5100}$	.0002	.870	.3844
A (housing related assets)	8.3136×10^{-6}	2.625	.0088 **
A′(non-housing related assets)	5.8559×10^{-5}	1.278	.2015
$\left(\frac{A'}{T}\right)^{1.3712}$	.3317	51.510	.0001**
πD	1.0184×10^{-6}	2.849	.0045**
$ECON_H$	.0025	2.138	.0327*
$ECON_{NH}$	.0331	2.747	.0061**
REG_Q	-.1696	-5.626	.0001**
NOW	.0006	.149	.8816
Number of observations: 1367			

** significant at 1 percent
* significant at 5 percent

The Box-Tidwell procedure raised the quality variable for non-housing related assets, in the above equation, to the power of 2.5100. The Box-Tidwell procedure raised the same variable in Equation 6.5 to the power of 2.7264, indicating consistancy and lending confidence to the validity of the transformations and the model.

With respect to the proportional variable of non-housing related assets-to-total assets, the Box-Tidwell procedure converged to a positive number reiterating the appropriateness of the inversion of this variable. The power of 1.3712 is much larger than the power of .7940 found in Equation 6.5. This at first seems to be inconsistent with the model because $\frac{A'}{T}$ was deemed the appropriate variable for the equation explaining the changes in housing related assets-to-total assets and the equation explaining the changes in non-housing related assets-to-total assets in Chapter 5. However, the expressions contained in the theoretical model from which the empirical expressions are derived were not identical. Referring back to Equations 5.12 and 5.13, it is seen that the empirical variable, $\frac{A'}{T}$ came from the theoretical expression, $\frac{vT}{A'}$, for housing related assets and from the expression, $\frac{vT}{vT - A'}$, for non-housing related assets. Given these differences, it appears appropriate to expect both variables to be functions of $\frac{A'}{T}$; however, there is no indication that they should be the same function. The different transformations provided by the two independent equations, indicate two different functions of $\frac{A'}{T}$.

The final transformation for Equation 6.6 involves the quality variable for housing related assets. The transformation for this variable would not converge in Equation 6.5; however, for the above equation the power transformation is rather large (11.2647). No relevance is assigned to this pecularity, other than it may be an indication of a "poor" proxy for the variable capturing the marginal quality of housing related assets with respect to interest rates.

All discussion of coefficients and their meanings is deferred until the presentation of the Zellner Estimation of equations. However, at this point, what the Box-Tidwell procedure accomplished can be examined. Compared to an ordinary linear model, the Box-Tidwell procedure contributed a small increase in explanatory power without changing the signs of any coefficients. See Table 6. The linear model for housing related assets appears as follows:

$$\Delta\frac{A}{T} = 3.1639 - 1.6223\ QUAL_H - .1636\ QUAL_{NH} + (4.9721 \times 10^{-5})\ A \qquad [6.7]$$

$$- (4.2216 \times 10^{-4})\ A' + .1026\ \frac{A'}{T} + (3.6239 \times 10^{-6})\ \pi D$$

$$- .0202\ ECON_H + .2039\ ECON_{NH} + .1091\ REG\_Q + .0685\ NOWS$$

The linear model has a R-square of 3.42 percent (Adjusted R-square of 2.70 percent) versus the transformed model which constitutes a R-square of 3.44 percent (Adjusted R-square of 2.72 percent). The comparisons between root mean squared errors of 6.7364 (linear) versus 6.7357 (transformed) also indicate that very little is accomplished by the transformations.

The linear model for the changes in the proportion of non-housing related asset-to-total assets "tells much the same story" as the above equation, this is illustrated by the following equation:

$$\Delta\frac{A'}{T} = -3.1388 - .3423\ QUAL_H + .0358\ QUAL_{NH} \qquad [6.8]$$

$$+ (7.9657 \times 10^{-6})\ A + (-1.0112 \times 10^{-5})\ A' + 1.0251\ \frac{A'}{T} + (9.6026 \times 10^{-7})\ \pi D$$

$$+ .0026\ ECON_H + .0251\ ECON_{NH} - .1847\ REG\_Q - .0031\ NOWS$$

Table 6. Linear Regression: The Change in A/T for Mutual S&Ls

Dependent Var: $\Delta\frac{A}{T}$	R^2: .0342	**F Statistic: 4.797**	**PROB > F: .0001**
Independent Variable	**Parameter Est**	**T value**	**PROB > |T|**
intercept	3.1639	.867	.3861
$QUAL_H$	-1.6223	-2.188	.0289*
$QUAL_{NH}$	-.1636	-1.194	.2326
A (housing related assets)	4.9721×10^{-5}	3.373	.0008**
A'(non-housing related assets)	4.2216×10^{-4}	-1.961	.0501*
$\left(\frac{A'}{T}\right)$	.1026	1.092	.2751
πD	3.6239×10^{-6}	2.180	.0294*
$ECON_H$	-.0202	-3.705	.0002**
$ECON_{NH}$	.2039	3.618	.0003**
REG_Q	.1091	.797	.4253
NOW	.0685	3.447	.0006**
Number of observations: 1367			

** significant at 1 percent
* significant at 5 percent

Table 7. Linear Regression: The Change in A′/T for Mutual S&Ls

Dependent Var: $\Delta\frac{A'}{T}$	R^2: .6834	F Statistic: 292.658	PROB > F: .0001
Independent Variable	**Parameter Est**	**T value**	**PROB > |T|**
intercept	-3.1388	-2.907	.0001**
$QUAL_H$	-.3423	-2.097	.0362*
$QUAL_{NH}$	.0358	1.189	.2348
A (housing related assets)	7.9657×10^{-6}	2.455	.0142*
A′(non-housing related assets)	-1.0112×10^{-5}	-.213	.8311
$\left(\frac{A'}{T}\right)$	1.0251	49.576	.0001**
πD	9.6026×10^{-7}	2.624	.0088**
$ECON_H$	.0026	2.190	.0287*
$ECON_{NH}$	.0251	2.022	.0433*
REG_Q	-.1847	-6.133	.0001**
NOW	-.0031	-.706	.4802
Number of observations: 1357			

** significant at 1 percent
* significant at 5 percent

As shown in Table 7, Equation 6.8 boasts a R-square of 68.34 percent (Adjusted R-square 68.10 percent) slightly smaller than the transformed model's R-square of 69.76 percent (Adjusted R-square of 69.54 percent). The linear model has a mean square error of 1.4830 compared to the mean squared error for the transformed model of 1.4493. The signs of the significant coefficients are the same in both models, but the Box-Tidwell procedure substantially altered the significance levels for many of the coefficients. The transformations largely increased the significance levels so that more variables are significant at the 1 percent level. The p-values for housing related assets, profits, and economic indices were generally halved. The housing quality coefficient's significance level changed from 3 percent to 9 percent due to the transformations and the insignificant NOW account variable was also made even "less significant" by the transformations. Altogether, Box-Tidwell added litle explanatory power, but generally increased the confidence which is attached to the role of many of the explanatory variables.

6.2.3 The Suitability of OLS Assumptions

After determining the appropriate transformations, prior to running the seemingly unrelated system of equations, it is appropriate to examine the assumptions of homoscedastic variances and independent regressor variables implicit in OLS regressions. Violations of these assumptions have the potential to "inflate" the variances of the estimated coefficients, hence indicating that important variables are insignificant.

If the regressor variables are not independent, multicollinearity exists and the individual roles of the variables may be clouded by these interdependencies. The variance inflation factors and the eigenvalues of the above equations are examined

to identify pronounced multicollinearity. Based on these statistics multicollinearity does not appear to be a problem. The largest variance inflation factor for Equation 6.5 is 7.8745. For Equation 6.6 the largest variance inflation factor is 7.8639. These variance inflation factors in combination with relatively large eigenvalues (none approaching 0) indicate that multicollinearity is not detrimental to the testing of the significance of the variables.[23]

The assumptions of OLS regression require that all observations have the same variances. Deviations from this assumption result in inefficient estimates of variances. The variables which are indicated, based on their nature, to have the potential to inflict heteroscedasticity are A, A', and πD. The Park-Glejser Test is used to detect deviations from the assumptions of a common variance. These tests involve the regression of the absolute value of the residuals on the variables in question. For the equation explaining the change in housing related assets-to-total assets, the slope coefficients are insignificant. This result indicates the model does not deviate from the assumption of homoscedasticity. Figure 11 supports this with its random "shot gun" pattern. For the equation for non-housing related assets, all three coefficients are significant, indicating the model is afflicted with heteroscedasticity. A plot of the residuals against the predicted values also indicate heterscedasticy by virtue of the approximately wedge-shaped graph. See Figure 12. Small changes in non-housing related assets were much more accurately predicted than larger changes. Institutions who increased their proportion of non-housing related assets to 15 percent larger than pre-deregulation were much more volatile.

The textbook solution to this problem is to transform the variables by the variable which is causing the heteroscedasticity. Numerous transformations were tried

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[23] For the much smaller data set of stock S&Ls, the multicollinearity proves to be very damaging.

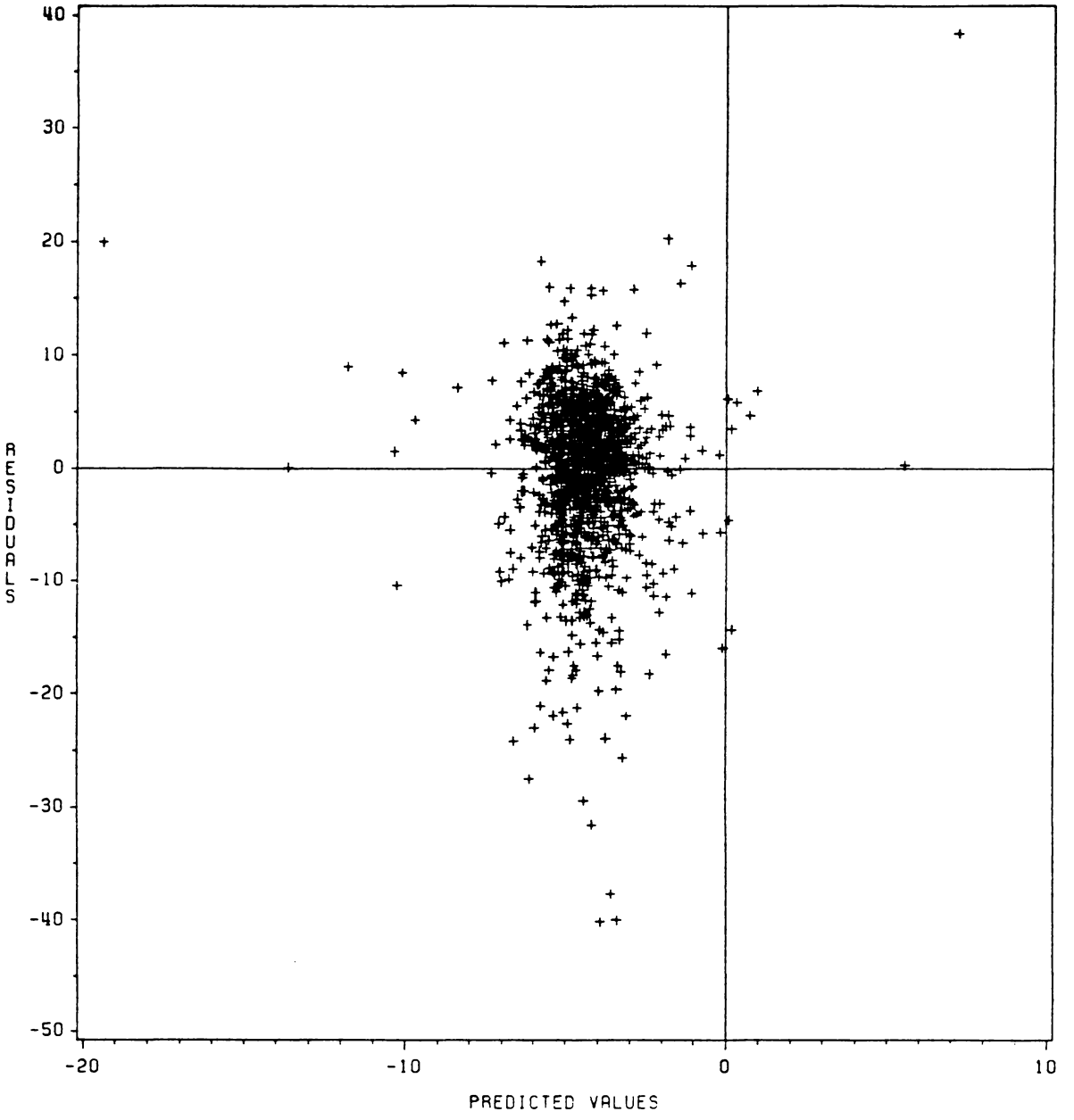

Figure 11. The Plot of the Residuals against the Predicted Values for Equation 6.9

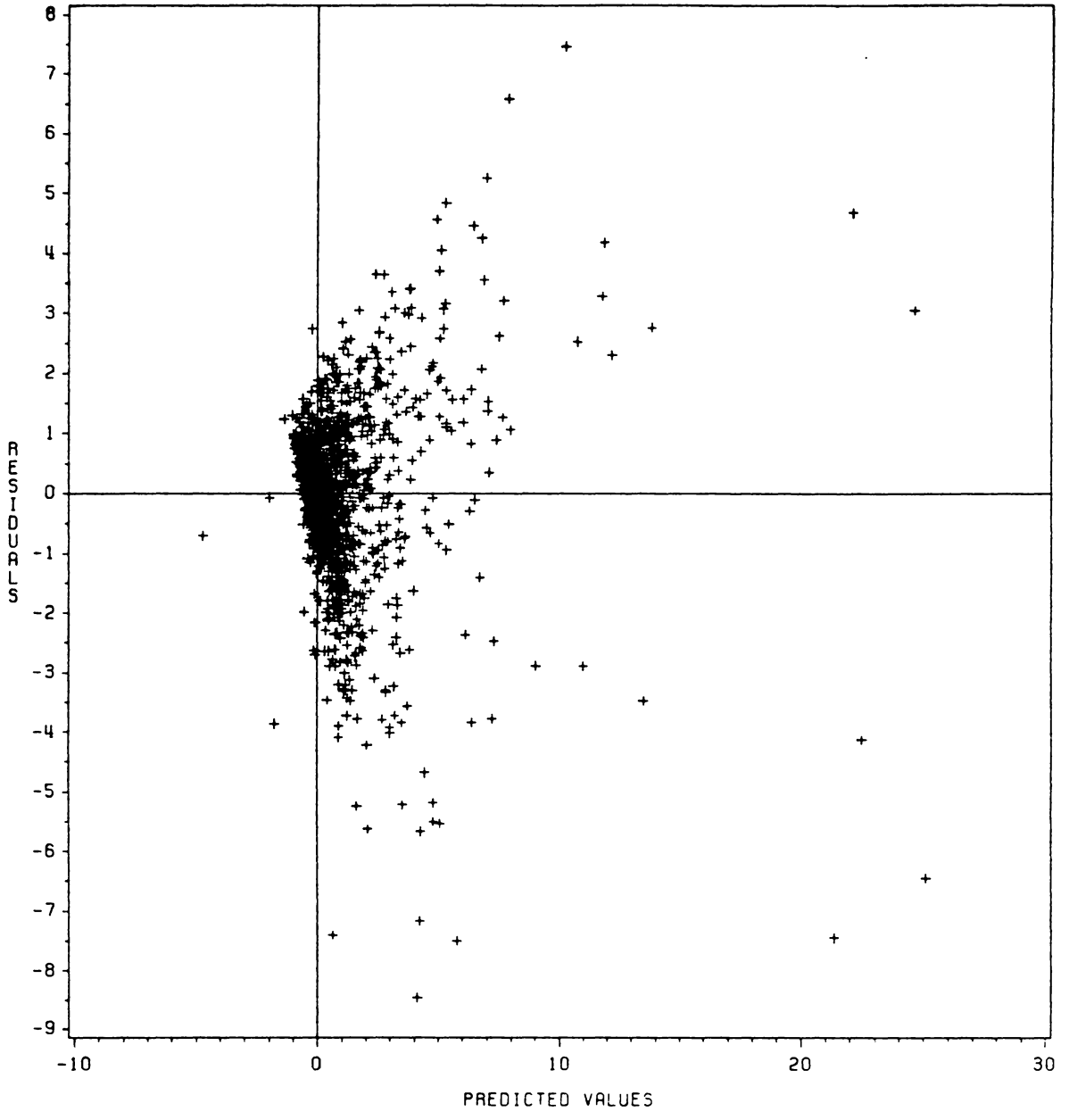

Figure 12. The Plot of the Residuals against the Predicted Values for Equation 6.10

to alleviate the problem; however, they all made the heteroscedasticity appear worse. Given that heteroscedasticity could only affect the three insignificant coefficients and a correction could not be found, no adjustment was made.

6.2.4 The System of Equations: Zellner Estimation

Having explored the question concerning functional form and possible deviations from assumptions implicit with OLS regressions, the system of equations is estimated using Zellner (Seemingly Unrelated) estimation. This form of estimation improves upon the efficiency of estimated coefficients by taking into account the correlation between equations.[24] The Zellner regression provides the following estimated equations.

$$\Delta\frac{A}{T} = 1.9863 - 1.6522\ QUAL_H - .0006\ QUAL_{NH}^{2.7264} + (4.8803 \times 10^{-5})\ A \qquad [6.9]$$

$$+ (5.8536 \times 10^{-5})\ A' + .2035\ \frac{A'}{T}^{.7940} + (3.6087 \times 10^{-6})\ \pi D$$

$$- .0203\ ECON_H + .2016\ ECON_{NH} + .1082\ REG\_Q + .0681\ NOW$$

and

$$\Delta\frac{A'}{T} = -2.4069 - (1.8000 \times 10^{-9})\ QUAL_H^{11.2647} + .0002\ QUAL_{NH}^{2.5100} \qquad [6.10]$$

$$+ (8.3296 \times 10^{-6})\ A + (5.8536 \times 10^{-5})\ A' + .3318\ \frac{A'}{T}^{1.3712} + (1.0182 \times 10^{-6})\ \pi D$$

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[24] For a more detailed description of Zellner regression, see Pindyck and Rubinfeld.(1981)

$$+ .0025\ ECON_H + .0332\ ECON_{NH} - .1682\ REG\_Q + .0007\ NOW$$

Tables 8 and 9 describe the significance of the coefficients. Comparisons of the coefficients and their significances estimated using Zellner estimation versus those determined by OLS differ only slightly. The variances appear to be only slightly smaller (more efficient) when the system of equations is estimated. This finding is expected, given OLS regressions and Zellner estimation provides identical coefficient estimates when each equation contains all the same variables. The only differences evident in comparing the variables are the unique transformations provided by the Box-Tidwell procedure. Therefore, the coefficients appear to be only slightly more efficient.

6.2.5 Coefficients and their Implications

The discussion of coefficients, is directed such that the coefficients of variables based on the theoretical model are examined first, independently and then in concert with their parallel variables which entered on the basis of the Brainard and Tobin paper. The discussion concludes with indications provided by the coefficients on the control variables.

6.2.5.1 Discussion of Coefficients for Equation 6.9

For the equation explaining the change in the proportion of housing related asset-to-total assets, seven of ten coefficients are significant at the .05 level. Of the four model based variables, ($QUAL_H$, A, $\frac{A'}{T}$, and, πD) three are significant and one

Table 8. Zellner Estimation: The Change in A/T for Mutual S&Ls

Dependent Var: $\Delta\frac{A}{T}$	R^2 **Sys.: .5422**		
Independent Variable	**Parameter Est**	**T value**	**PROB>|T|**
intercept	1.9863	.5777	.5636
$QUAL_H$	-1.6522	-2.233	.0257*
$QUAL_{NH}^{2.7264}$	-.0006	-1.294	.1960
A (housing related assets)	4.8803×10^{-5}	3.314	.0009**
A'(non-housing related assets)	-4.2521×10^{-4}	-1.966	.0495*
$\left(\frac{A'}{T}\right)^{.7940}$	.2035	1.115	.2651
πD	3.6087×10^{-6}	2.171	.0301*
$ECON_H$	-.0203	-3.721	.0002**
$ECON_{NH}$	.2016	3.577	.0004**
REG_Q	.1082	.791	.4292
NOW	.0681	3.431	.0006**
Number of observations: 1367			

** significant at 1 percent
* significant at 5 percent

Table 9. Zellner Estimation: The Change in A′/T for Mutual S&Ls

Dependent Var: $\Delta\frac{A'}{T}$	R^2 Sys.: .5422		
Independent Variable	**Parameter Est**	**T value**	**PROB> |T|**
intercept	-2.4069	-22.811	.0001**
$QUAL_H^{11.2647}$	-1.8000×10^{-9}	-1.868	.0619
$QUAL_{NH}^{2.5100}$	.0002	.863	.3884
A (housing related assets)	8.3296×10^{-6}	2.631	.0086**
A′(non-housing related assets)	5.8536×10^{-5}	1.278	.2016
$\left(\frac{A'}{T}\right)^{1.3712}$	.3318	51.546	.0001
πD	1.0182×10^{-6}	2.848	.0045**
$ECON_H$	.0025	2.131	.0333*
$ECON_{NH}$	.0332	2.761	.0058**
REG_Q	-.1682	-5.581	.0001**
NOW	.0007	.161	.8718
Number of observations: 1367			

** significant at 1 percent
* significant at 5 percent

of the two parallel variables are significant. Brainard and Tobin address the necessity of including parallel variables; however, they do not suggest that each parallel variable should be significant. For example, the variable A may be significant in explaining the change in the proportion of housing related assets-to-total assets; however, its offsetting effect may be absorbed by the explanation of the change in the proportion of liquid assets-to-total assets, hence there would no expectations of A being signficant in the equation explaining the change in proportion of non-housing related assets-to-total assets.

Model Based Variables and their Coefficients

The quality effect with respect to housing related assets ($QUAL_H$) as proxied by the average interest rate on real estate loans is determined to be significantly negative. This sign indicates that the greater the average interest rate, the greater the absolute change in the proportion of housing related assets-to-total assets. In terms of quality this could be interpreted as the lower the quality of loans the more the S&Ls moved out of housing-related assets. When this is viewed in combination with the negative sign on ($QUAL_H$) found in Equation 6.10, it indicates that the more risky the housing related assets of the average association, the more the association will increase its proportion of liquid holdings.

The coefficient for the quantity of housing related assets (A) is significantly positive. The variable "A" is proposed to capture the differential term (MR-MC) from the theoretical model. The first-order conditions indicate that in the marginal revenue-marginal cost framework, the pre-deregulatory profit maximizing S&L lies to the right of the equilibrium point with respect to housing related assets due to the positive tax effect and regulatory effect. This relationship is illustrated graphically in Figure 13. Based on theory, the sign of the estimated coefficient should be negative,

indicating the further to the right, in terms of the graphical representation, the greater the motivation to reduce the proportion of housing related assets-to-total assets.

The empirical model contradicts the theoretical logic, suggesting that "other" factors are captured by this variable. The positive sign indicates the more housing related assets held, the smaller the decrease in the proportion of housing related assets-to-total assets. This is consistent with associations reaping benefits from specialization. The quantity of housing related assets appears to capture the management's dedication to the home-buyers market. When analyzed in alliance with the significantly positive coefficient on "A" in Equation 6.10, it indicates that on average the association with larger quantities of housing-related assets diversified more into non-housing related assets. This is indicative of a size effect, the larger associations (those holding more housing-related assets) diversified more than the smaller associations.

Based on the two significantly positive signs on "A" in Equations 6.9 and 6.10 it can be inferred that the average larger association (as judged by their housing related assets) substituted non-housing related assets for liquid assets. This implication is logical with respect to maturity; non-housing related assets are expected to have shorter maturities than home mortgages, hence they could be viewed as subsitutes for liquid assets if risk is not considered relevant.

The proportional variable, $\frac{A'}{T}$ in Equation 6.9 is not significant; however, its positive sign is consistent with the behavior indicated by the coefficients on "A", discussed above. Just as larger associations increased their proportions of non-housing related assets-to-total assets without decreasing their proportions of housing related assets, the coefficients on $\frac{A'}{T}$ in Equations 6.9 and 6.10 indicate that expertise acquired in the non-housing areas does not affect their dedication to housing related assets, rather their holdings of liquid assets.

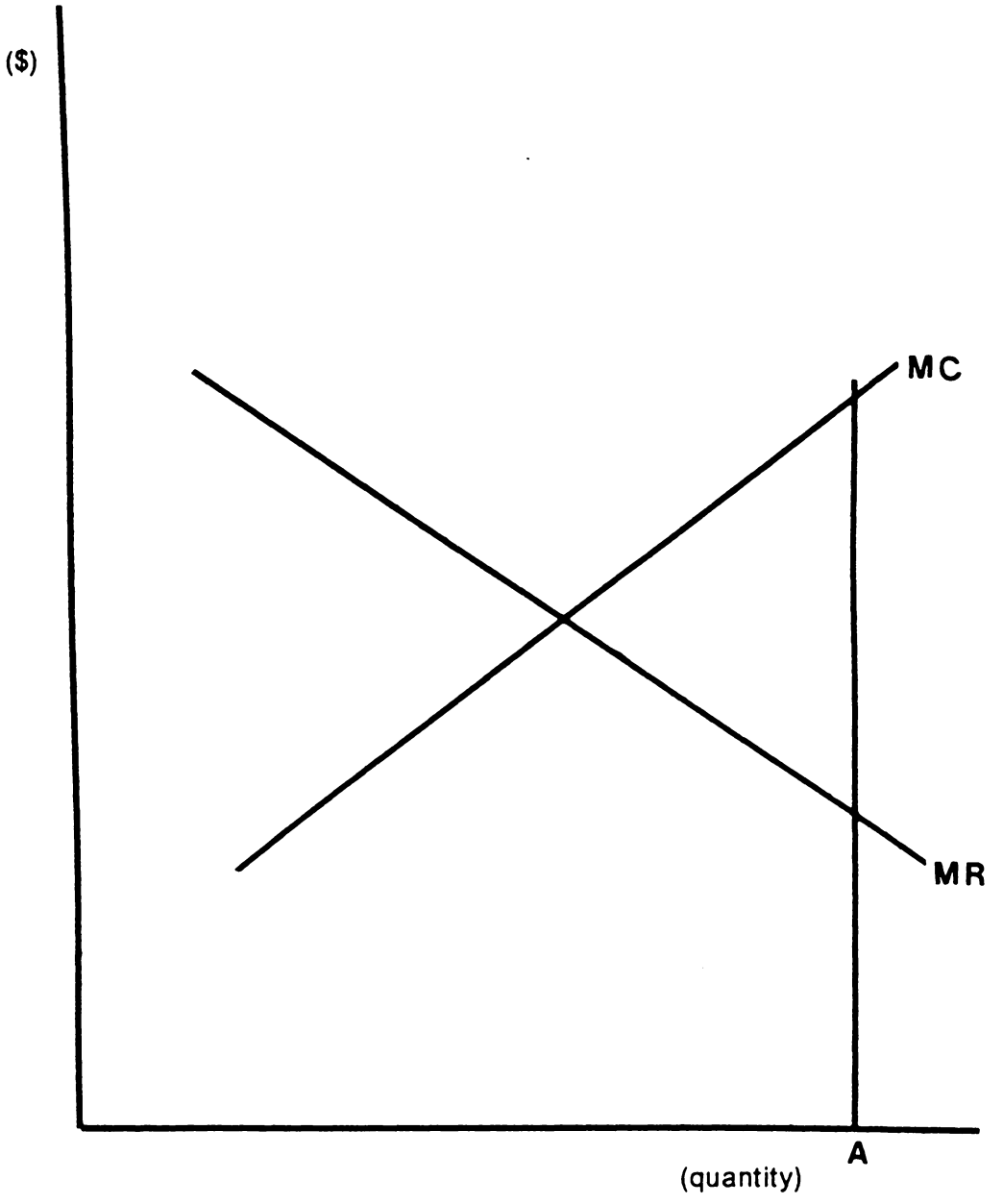

Figure 13. The Theoretical Basis for the Negative Sign on A

The significant coefficient on πD, the tax effect, is significantly positive as suggested by the theoretical model. On average, for S&Ls with less than 92 percent of their assets qualifying, the greater their profits the smaller the absolute change in the housing related proportion. A discussion of the rationality of the 92 percent benchmark and the inter-relationship between the variables in Equation 6.9 and 6.10 is deferred to Section 6.2.5.2.

Control Variables and their Coefficients

Having examined the implications of the theoretical based coefficients, it is timely to discuss the implications of the coefficients of the control variables with reference to changes in the proportions of housing related assets-to-total assets.

The regulatory control variables, adapted from Walker's research(1983) are deemed important by their significant coefficients within the system of equations.[25] Their significance indicates that liability regulations affect the changes in composition of the asset portfolio. The phase-out of Regulation Q (REG_Q), as proxied by the change of the interest rate on regulated accounts, has an insignificant coefficient. The insignificance indicates that the removal of the ceilings on interest rates paid for time deposits has no effect on the changing proportions of housing related assets-to-total assets. The significantly positive sign of the coefficient on the change of the ratios of deposits sensitive to the interest rates-to-total funds (NOWS) indicates that on average, the more an association has increased its interest sensitive deposits the less it has decreased its housing related assets-to-total assets. This result as first appears counter-intuitive, because while associations' funds are being more closely

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[25] These two variables, expressed as stocks rather than changes, appear significant in Walker's equations explaining Mortgage Loans-to-Total Assets and Liquid Assets-to-Total. It is not possible to compare results since Walker used stocks and the present research uses changes as both dependent and independent variables.

tied to the volatile market interest rates, managers should be trying to decrease the maturities of their asset portfolios and shifting out of housing. On the other hand, the increasing usage of adjustable rate mortgages could be reflected in the positive coefficient these housing related assets which have interest rates tied to market rates and thus have effective maturities much shorter than fixed rate mortgages.[26] In this scenario, the S&L manager can remain a specialist in the housing area while effectively shortening his asset maturity structure without using the new powers authorized in the deregulation acts.

6.2.5.2 Discussion of Coefficient Estimates for Equation 6.10

Equation 6.10, explaining changes in non-housing related assets , contains four variables based on the theoretical model. Only two of these model based variables are found to be significant. However, the R-square of the system of 54.22 percent and the R-square of Equation 6.6 when estimated using OLS regression of 69.76 percent (Adjusted R-square 69.54 percent), appear to indicate the system has a "good" degree of explanatory power due to this equation.[27]

Model Based Variables and their Coefficients

The two variables yielding insignificant coefficients pertain to non-housing related assets. These variables, A' and $QUAL_{NH}$, are proxies for the differential of

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[26] The change in the composition of the mortgage loan portfolio with respects to ARMs is incorporated in the economic indices (Equations 6.3 and 6.4). The change in the proportion of ARMs-to-mortgage loans was designated as important in the preliminary regressions for constructing the economic indices, and this is consistent with the above findings.

[27] Later in this section the sensitivity of Equation 6.10 with respect to the calculation of some of the explanatory variables is discussed.

marginal cost and marginal revenue and the quality effect with respect to non-housing related assets.[28]

The insignificance of the quality variable may reflect the appropriateness of the proxies used rather than the accuracy of the model. The model designated a variable to describe the marginal interest rates with respect to quality. The proxy used is an average interest rate for the firm on non-housing related loans held over the period. If an association did not hold any non-housing related loans, the average interest rate for the associations in that particular state is used.

The variable "A'" is descriptive of the theoretical term, MN - MC, analogous to the variable "A" appearing in Equation 6.9 providing a proxy for MR - MC. The first order conditions indicate that in the marginal revenue-marginal cost framework, S&Ls were operating to the left of the equilibrium point illustrated in Figure 14 due to the negative tax and regulatory effects. Theoretically, the sign on A' should be negative, indicating the further to the left, the more the S&L will increase its proportion of non-housing related assets-to-total assets.

Empirically, the variable for the quantity of non-housing related assets, A', proves to be insignificant. This finding is inconsistant with theory and with the significant negative sign on "A'" found in Equation 6.9. "A'" entered equation 6.9 only on the basis of the Brainard and Tobin argument for offsetting bias, thus there is only weak evidence that the level of "A'" plays a role. Given that $\frac{A'}{T}$ and A' are present in the same equation, it is conceivable that the former is "stealing the show."[29]

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[28] Together they provide a term reminiscent of a risk-adjusted rate of return, hence their insignificance is consistent with Verbrugge's argument that mutual managers may not be profit maximizers or that the control of risky assets is not enforced by the S&L examiners and mutual managers ignore it with respect to non-housing related assets.

[29] This would be evident in the collinearity diagnostics if their relationship is linear; however, a nonlinear relationship could go undetected by the diagnostics.

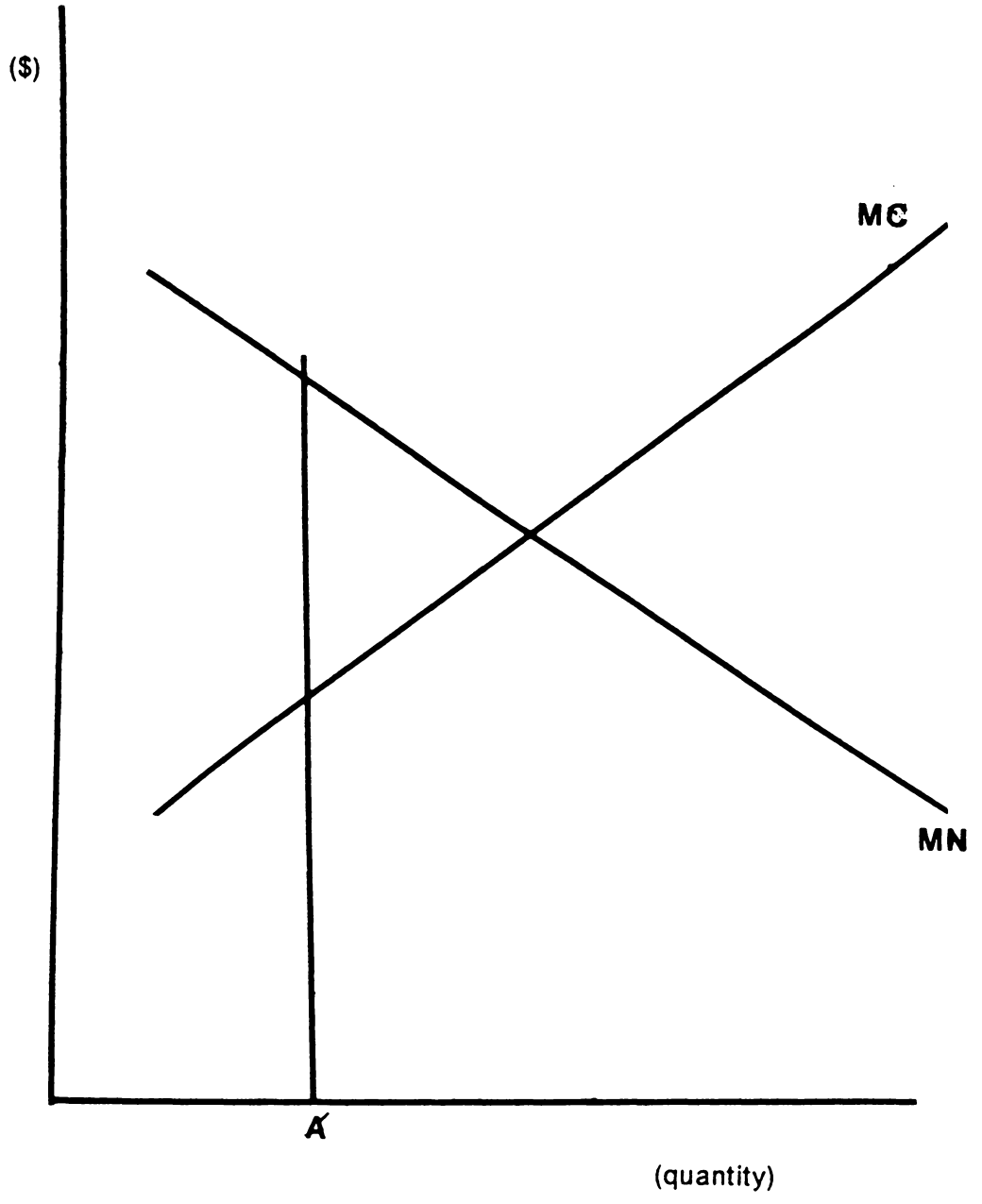

Figure 14. The Theoretical Basis for the Positive Sign on A′

The coefficient on $\frac{A'}{T}$ is significant at the .0001 level of significance. On the basis of the highly significant coefficient for $\frac{A'}{T}$; the insignificance of "A'" (just discussed); the Large R-square for Equation 6.10, in comparison to the R-square for Equation 6.9; and the calculation of $\frac{A'}{T}$, the sensitivity of this variable to different calculations is analyzed. It is possible that spurious high correlation betweeen the change in proportion of $\frac{A'}{T}$ between 1983 and 1979 and the variable, $\frac{A'}{T}$ is created because the latter is calculated as an average over the four semi-annual periods of 1983 and 1979. The theoretical model is based on derivatives which are instantaneous changes; therefore the model lends no guidance concerning the correct calculations for variables. The averages for the four semi-annual periods of 1979 and 1983 appear to be appropriate as discussed in Chapter 4. The extreme difference in R-squares between the OLS regressions explaining the change in the proportion of housing related assets-to-total assets (3.44 percent) and the change in the proportion of non-housing related assets-to-total assets (69.76 percent) when both equations have about the same number of significant coefficients, indicates that some variable may be highly correlated with the $\Delta\frac{A'}{T}$ The correlation is calculated to be .679 between the $\Delta\frac{A'}{T}$ and A' which shows a significant deviation from a perfect relationship, but there is no way to prove if this correlation is spurious.

When the system of regressions are run with $\frac{A'}{T}$ calculated as the average proportion for 1981, the R-square for the system drops to 10.72 percent. The drop in the R-square could be indicative of the suprious correlation created by the calculation of the variable or evidence of the theoretical correlation of the effects of the Garn-St Germain Act with the calculation of the variable over 1979 and 1983. A consistent explanation being that the DIDMCA (1980) affected asset portfolio changes to a limited degree and the Garn-St Germain Act served as the "real catalyst."

For the equation explaining the change in the proportion of non-housing related asssets-to-total assets, the sensitivity to the definition of $\frac{A'}{T}$ is very evident.[30] The variable, "A" becomes insignificant and "A'" becomes very significant, while $\frac{A'}{T}$ remains significant. Although the quantity of housing related assets (A') has become significant, the sign is positive, not negative as indicated by the theoretical model. The positive sign is consistent with the account that once the management acquires the expertise they deem necessary to expand beyond housing related assets, the cost of the knowledge has been borne and the managers move further in that direction.[31]

The variable, πD is designed to capture the tax effect as discussed in Section 5.3.3.1. The tax effect term is profit times a dummy variable based on a benchmark determined ex-post. Regressions were run using 82 percent (as defined by the tax laws) 87 percent, 92 percent, and 97 percent as the cut-offs. For the 82 percent benchmark the signs of the coefficient were as the model described, positive for the equation explaining the change in the proportion of housing related assets-to-total assets and negative for the equation explaining the change in non-housing related assets-to-total assets. Neither coefficient appears significant, hence it would not be appropriate to consider this evidence of the tax effect, in itself. The fact that only 6 of the 1367 associations fell below the 82 percent benchmark lends support to the tax effect and lends some explanation to the insignificant coefficients.

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[30] Equation 6.10 is the equation in which heteroscedasticity appeared to be present.

[31] Using the 1981 calculation, the coefficients for $\Delta\frac{A}{T}$ and their significance levels show limited changes. The only variable which changes from being significant to being insignificant is "A'". The change was from .0495 (barely significant at the .05 level of significance) to .0869. All the signs of coefficients remain the same with the different calculation for $\frac{A'}{T}$ Several other calculations were tried and the results reported for Equation 6.9 appear to be relatively insensitive to these.

The comparisons of the different systems defined by the ex-post benchmark (i.e., 87 percent) indicates the 92 percent benchmark produced the highest R-square. This is the basis for reporting the results for this particular set of equations. The coefficient on πD is significantly positive.[32] This positive coefficient indicates when an association holds qualifying assets-to-total assets in a ratio less than 92 percent, the higher the profits the greater the change in the proportion of non-housing related assets to-total asset. This is counter to what our theoretical model indicated. The theoretical model indicated that, as profits increased, the motivation to hold qualifying assets increased. In addition to capturing tax effects, the coefficient on after tax profits has the potential to capture the correlation between profitability and the ability or desire to expand the asset portfolio with non-housing related assets. The more aggressive S&Ls diversifying into "the new products" appear to be the more profitable associations. These results could be indicating that only the profitable mutuals would have the capital to expand or that capital adequacy constraints (or soundness regulations) may prevent those without earnings from expanding.

Control Variables and their Coefficients

For the equation explaining the change in the proportion of non-housing related assets-to-total assets, the importance of changes in liability regulations were reversed in comparison to Equation 6.9. The phase-out of Regulation Q appeared to have a constraining effect on the diversification into non-housing related assets. The coefficient on REG_Q is significantly negative. When viewed in context with the insignificant positive sign on this variable in Equation 6.9, there are indications that the phase-out of Regulation Q promotes an increase in the proportion of liquid holding for

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[32] The coefficients on this variable for the 87 percent, 92 percent, and 97 percent cutoffs are all positive, and significant for the 87 percent and 92 percent benchmarks.

the average S&L. This implication is logical, given the potential for the competition for funds to increase after the phase-out, associations would want to hold more liquid assets. While the expanded powers motivated diversification into non-housing related asets, the phase-out of Regulation Q appears to have motivated the increase of the proportion of liquid assets -to-total assets, hence constraining the diversification.

6.2.6 Implications Concerning the Sample Selection

Given the judgements concerning sample selection discussed in Chapter 4, it is appropriate to examine the results' sensitivity to the definition of the sample. As discussed in Chapter 4, the sample for mutual S&Ls to this point included associations which were mutual Federal S&Ls in 1979 and either mutual Federal S&Ls or Federal Savings Banks in 1983. To test the validity of adding the 96 S&Ls which became Federal Savings Banks, the system of equations was run minus this subset. The estimated system using the 1271 associations which were Federal Mutual S&Ls in both 1979 and 1983 provide the following equations:

$$\Delta\frac{A}{T} = .6068 - 1.2972\ QUAL_H - 6.0965 \times 10^{-4}\ QUAL_{NH}^{2.7264} + (4.7998 \times 10^{-5})\ A \quad [6.11]$$

$$- (4.3365 \times 10^{-4})\ A' + .1579\ \frac{A'}{T}^{.7940} + (3.6727 \times 10^{-6})\ \pi D$$

$$- .0212\ ECON_H + .19346\ ECON_{NH} + .0797\ REG\_Q + .0721\ NOW$$

and

$$\Delta\frac{A'}{T} = -2.2758 - (1.7717 \times 10^{-9})\ QUAL_H^{11.2647} + 1.6326 \times 10^{-4}\ QUAL_{NH}^{2.5100} \quad [6.12]$$

$$+ (7.8114 \times 10^{-6})\ A + (1.2718 \times 10^{-4})\ A' + .3148\frac{A'}{T}^{1.3712} + (9.0413 \times 10^{-7})\ \pi D$$

$$+ .0021\ ECON_H + .0364\ ECON_{NH} - .1690\ REG\_Q - .0003\ NOW$$

The results appear to collaborate the appropriateness of adding the Federal Saving Banks to the data set.[33] The signs of all the significant variables remained the same, the coefficients changing only slightly. See Tables 10 and 11. For the equation explaining the changes in housing related assets, the quality variable for housing maintained it's negative sign; however, became insignificant. With respect to Equation 6.12, $QUAL_H$ became significant at the .05 level where in Equation 6.10 it appeared insignificant. The coefficients on $QUAL_H$ in both equations were border-line with respect to significance, therefore the differences are not surprising.

The interesting change occurred with the variable of non-housing related assets, "A'". This theoretically based variable appeared very insignificant in Equation 6.10; however in Equation 6.12, "A'" is significant. Its positive sign indicates that the more non-housing related assets an association holds, on average, the more they would increase these holdings over the 1979 to 1983 period. This is consistant with the idea that once an association's management has acquired the knowledge, they deem necessary, the association would diversify even more. Using the sample containing only associations which were mutual in both periods, the model based variables show "strong" explanatory powers with the exception of the quality variables, which is not surprising given that they are proxies.

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[33] The sample of 96 associations changing from mutual S&Ls to Federal Savings Banks was run separately; however, the sample was inflicted with multicollinearity and no conclusions could be drawn.

Table 10. Zellner Estimation: The Change in A/T for Mutual S&Ls

Dependent Var: $\Delta\frac{A}{T}$	R^2 **Sys.: .4944**		
Independent Variable	**Parameter Est**	**T value**	**PROB>|T|**
intercept	.6068	.1685	.8663
$QUAL_H$	-1.2972	-1.675	.0942
$QUAL_{NH}^{2.7264}$	-6.0965×10^{-4}	-1.295	.1957
A (housing related assets)	4.7998×10^{-5}	3.240	.0012**
A′(non-housing related assets)	-4.3365×10^{-4}	-1.753	.0799
$\left(\frac{A'}{T}\right)^{.7940}$	.1579	.8034	.4219
πD	3.6727×10^{-6}	2.139	.0326*
$ECON_H$	-.0212	-3.891	.0001**
$ECON_{NH}$	.1936	3.403	.0007**
REG_Q	.0797	.587	.5574
NOW	.0721	3.552	.0004**
Number of observations: 1271			

** significant at 1 percent
* significant at 5 percent

Table 11. Zellner Estimation: The Change in A′/T for Mutual S&Ls

Dependent Var: $\Delta\frac{A'}{T}$	R^2 **Sys.: .4944**		
Independent Variable	**Parameter Est**	**T value**	**PROB>** $\lvert T \rvert$
intercept	-2.2758	-21.126	.0001**
$QUAL_H^{11.2647}$	-1.7717×10^{-9}	-1.8469	.0650
$QUAL_{NH}^{2.5100}$	1.6326×10^{-4}	.800	.4237
A (housing related assets)	7.8114×10^{-6}	2.475	.0134*
A′(non-housing related assets)	1.2718×10^{-4}	2.446	.0146*
$\left(\frac{A'}{T}\right)^{1.3712}$	.3148	44.357	.0001**
πD	9.0413×10^{-7}	2.470	.0136*
$ECON_H$	.0021	1.806	.0711
$ECON_{NH}$	.0364	3.019	.0026**
REG_Q	-.1690	-5.699	.0001**
NOW	-.0003	-.067	.9470
Number of observations: 1271			

** significant at 1 percent
* significant at 5 percent

6.3 Results Relevant to Federal Stock S&Ls

A sample of 66 Federal mutual S&Ls comprise the primary data set used in the regressions for the following system of equations:

$$\Delta\frac{A}{T} = \beta_0 + \beta_1\ QUAL_H^{\sigma} + \beta_2\ QUAL_{NH}^{\sigma} + \beta_3\ A^{\sigma} + \beta_4\ A'^{\sigma} + \beta_5\ \left(\frac{A'}{T}\right)^{\sigma} \qquad [6.13]$$

$$+ \beta_6\ \pi D + \beta_7\ K + \beta_8\ ECON_H + \beta_9\ ECON_{NH} + + \beta_{10}\ REG\_Q + \beta_{11}\ NOW$$

$$\Delta\frac{A'}{T} = \beta_0 + \beta_1\ QUAL_H^{\sigma} + \beta_2\ QUAL_{NH}^{\sigma} + \beta_3\ A^{\sigma} + \beta_4\ A'^{\sigma} + \beta_5\ \left(\frac{A'}{T}\right)^{\sigma} \qquad [6.14]$$

$$+ \beta_6\ \pi D + \beta_7\ K + \beta_8\ ECON_H + \beta_9\ ECON_{NH} + \beta_{10}\ REG\_Q + \beta_{11}\ NOW$$

and

$$\Delta\frac{K}{T} = \beta_0 + \beta_1\ QUAL_H^{\sigma} + \beta_2\ QUAL_{NH}^{\sigma} + \beta_3\ A^{\sigma} + \beta_4\ A'^{\sigma} + \beta_5\ \left(\frac{A'}{T}\right)^{\sigma} \qquad [6.15]$$

$$+ \beta_6\ \pi D + \beta_7\ K + \beta_8\ ECON_H + \beta_9\ ECON_{NH} + + \beta_{10}\ REG\_Q + \beta_{11}\ NOW$$

These are reiterations of equations 5.38, 5.39, and 5.40 developed in Chapter 5.

The logic and progression of tests concerning the stock S&Ls is analogous to the previous discussion of mutual S&Ls. The differences, which require the partitioning of stock and mutual associations evolved from the different assumptions with respect to capital in the theoretical model. For stock S&Ls, capital is considered a decision variable. Chapter 5 illustrates how capital enters the asset equations through the expression of $\Delta\frac{L}{T}$. Given that the system of equations' framework is based on the balance sheet, the equation for the change in the proportion of capital-

to-total assets is added to the system because it has the potential to provide information to improve the estimation.

The sample of stock associations is much smaller and "weaker" than the data set for mutual associations, and these weaknesses manifest themselves in the results. The evidence of these weaknesses can be seen through-out the progression of tests and are explicit in the coefficients and their levels of significance. The results are presented in an analogous fashion to the presentation of results for the mutual associations to promote comparisons.

6.3.1 Preliminary Regressions for the Development of Economic Indices

Prior to performing regressions applicable to Federal associations, the preliminary regressions are run (as discussed in Section 1.2.1) to develop economic indices. The regressions use 49 state chartered associations in California and Maine to estimate the following equations:

$$ECON_H = -.0409 - .0348\ \Delta FCN - .0484\ \Delta INT\_DIV + .0723\ \Delta COMP \qquad [6.16]$$

and

$$ECON_{NH} = .0278 - .0219\ \Delta INT\_DIV - 8.1143 \times 10^{-12}\ TA_{1983} + .0039\ GROWTH \qquad [6.17]$$

By substituting the data identified by the above equations into the framework developed using California and Maine's state stock associations, the economic indices are created for the Federal Stock S&Ls. For the change in the proportion of housing related assets to total assets the average estimated economic variable is -4.10%. For non-housing related assets, the average estimated economic variable is 2.54 percent.

Thus on average in the absence of regulatory constraints, stock S&ampLs would have decrease the proportion of housing related assets by approximately 4 percent while increasing non-housing related by 2.5 percent (and liquid assets by somewhat less). This contrasts with the average mutual S&L which would have also decreased non-housing related assets. The data has the opportunity to direct the choice of variables to those which are the most relevant for the above equations. The combination of variables identified with respect to stock associations (Equations 6.16 and 6.17) is different than the combination of variables found in the economic indices for mutual associations (Equations 6.3 and 6.4) This option is designed with the primary regressions in mind; however it limits any comparisons between economic indices for stock versus mutual associations.

6.3.2 The Box-Tidwell Procedure as Used to Determine Functional Form

After the economic indices are determined for the primary data set, the Box-Tidwell procedure is utilized to allow the data to determine the appropriate functional form. The results are much the same as those indicated for the Federal mutual associations. The procedure indicated that no transformations are appropriate for A, A′, and K in any of the three equations.

For housing-related asets, the estimate of σ for $\frac{A'}{T}$ does not converge. Given it is a theoretical model based variable, $\frac{A'}{T}$ is retained without a transformation. The transformations on $QUAL_H$ and $QUAL_{NH}$ appear in the following equation as follows:

$$\Delta\frac{A}{T} = 8.5686 - 2493.9412\ QUAL_{Hsup} - 3.3802 + 4.4445 \times 10^{-9}\ QUAL_{NH}^{7.1419} \qquad [6.18]$$

$$- (2.0305 \times 10^{-5})\ A + (1.6748 \times 10^{-4})\ A' + .0857\ \frac{A'}{T} + (3.9272 \times 10^{-7})\ \pi D$$

$$+ (6.1925 \times 10^{-5})\ K - .5278\ ECON_H + .0980\ ECON_{NH} - 1.6551\ REG\_Q$$

$$+ .0214\ NOW$$

See Table 12 for T-statistics.

$QUAL_H$ would not converge in the model for mutual associations; however, in Equation 6.18 it converges to an inverse power transformation. This could be interpreted as a difference between the mutual and stock data or another manifestation of the "poor" proxies for the marginal qualities with respect to interest rates. The Box-Tidwell procedure suggests positive power transformations for the non-housing related quality variables with respect to the mutual and stock data set. For the stock model the power transformation is smaller than that suggested for the mutual model (2.7264 versus 7.1419).

For the equation explaining changes in the proportions of non-housing related asets-to-total assets, $QUAL_H$ will not converge. This evidence, once again, is consistent with the "poor proxy" argument. The Box-Tidwell procedure did perform transformations on the $QUAL_{NH}$ and $\frac{A'}{T}$ as indicated in the following equation.

$$\Delta\frac{A'}{T} = -7.8917 + 1.0325\ QUAL_H + 13.8590\ QUAL_{NH}^{.7499} \qquad [6.19]$$

$$+ (3.3915 \times 10^{-6})\ A + (4.5312 \times 10^{-5})\ A' + .2066\ \frac{A'}{T}^{1.5438} - (1.3157 \times 10^{-7})\ \pi D$$

Table 12. Box-Tidwell: The Change in A/T for Stock S&Ls

Dependent Var: $\Delta\frac{A}{T}$	R^2: .1889	F Statistic: 1.144	PROB > F: .3474
Independent Variable	**Parameter Est**	**T value**	**PROB > |T|**
intercept	8.5686	1.059	.2941
$QUAL_H^{-3.3802}$	-2493.9412	-2.807	.0069**
$QUAL_{NH}^{7.1419}$	4.4445×10^{-9}	.339	.7356
A (housing related assets)	-2.0305×10^{-5}	-.469	.6413
A'(non-housing related assets)	1.6748×10^{-4}	.599	.5514
$\left(\frac{A'}{T}\right)$	-.0857	-.193	.8481
πD	3.9272×10^{-7}	.455	.6508
K(capital	6.1925×10^{-5}	.163	.8715
$ECON_H$	-.5278	-.775	.4420
$ECON_{NH}$	.0980	.072	.9427
REG_Q	-1.6551	-1.579	.1201
NOW	.0214	.225	.8226
Number of observations: 66			

** significant at 1 percent
* significant at 5 percent

Table 13. Box-Tidwell: The Change in A′/T for Stock S&Ls

Dependent Var: $\Delta\frac{A'}{T}$	R^2: .6299	F Statistic: 8.355	PROB>F: .0001
Independent Variable	**Parameter Est**	**T value**	**PROB>|T|**
intercept	-7.8917	-1.302	.1984
$QUAL_H$	1.0325	.949	.3467
$QUAL_{NH}^{-.7499}$	13.8590	1.140	.2592
A (housing related assets)	3.3915×10^{-6}	.244	.8078
A′(non-housing related assets)	4.5312×10^{-5}	.508	.6139
$\left(\frac{A'}{T}\right)^{1.5438}$	.2066	7.059	.0001**
πD	-1.3157×10^{-7}	-.475	.6368
K (capital)	-1.6215×10^{-4}	-1.332	.1883
$ECON_H$	-.0641	-.297	.7676
$ECON_{NH}$	-.3430	-.792	.4318
REG_Q	-1.1468	-3.427	.0012**
NOW	-.0101	-.328	.7445
Number of observations: 66			

** significant at 1 percent
* significant at 5 percent

$$- .0002\ K - .0641\ ECON_H - .3430\ ECON_{NH} - 1.1468\ REG\_Q - .0101\ NOW$$

See Table 13 for T-statistics.

The power transformation for $\frac{A'}{T}$ (1.5438) appears reasonable when compared to the transformation for $\frac{A'}{T}$ (1.3712) in the analogous equation for mutual associations. The transformation on the quality variable with respect to non-housing related assets is much different than its counterpart in Equation 6.6. For the mutual associations, the data indicates a power transformation of 2.5100 versus the inverse transformation indicated appropriate for stock associations. Given that the coefficients for both transformations of $QUAL_{NH}$ appear insignificant, little relevance can be attached to the different transformations.

When the Box-Tidwell procedure is used to estimate Equation 6.15, the procedure performs transformations on the two quality variables as indicated by the following equation:

$$\Delta\frac{K}{T} = -6.0556 + 1.3707\ QUAL_H^{.9595} + 3.3113 \times 10^{-6}\ QUAL_{NH}^{4.8739} \qquad [6.20]$$

$$- (3.6174 \times 10^{-5})\ A - (1.6748 \times 10^{-4})\ A' + .0447\ \frac{A'}{T} + (3.7675 \times 10^{-7})\ \pi D$$

$$+ (4.2882 \times 10^{-4})\ K + .1682\ ECON_H - .1187\ ECON_{NH} + .4247\ REG\_Q$$

$$+ .0226\ NOW$$

See Table 14 for T-statistics

Table 14. Box-Tidwell: The Change in K/T for Stock S&Ls

Dependent Var: $\Delta\frac{K}{T}$	R^2: **.2188**	**F Statistic: 1.375**	**PROB > F: .2113**
Independent Variable	**Parameter Est**	**T value**	**PROB > |T|**
intercept	-6.0556	-.918	.3629
$QUAL_H^{.9595}$	1.3707	.976	.3333
$QUAL_{NH}^{4.8739}$	3.3113×10^{-6}	1.237	.2215
A (housing related assets)	-3.6174×10^{-5}	-2.278	.0267*
A'(non-housing related assets)	-4.1364×10^{-5}	-.405	.6872
$\left(\frac{A'}{T}\right)$	.0447	.275	.7842
πD	3.7675×10^{-7}	1.196	.2367
K(capital)	4.2882×10^{-4}	3.077	.0033**
$ECON_H$	.1682	.674	.5033
$ECON_{NH}$	-.1187	-.239	.8122
REG_Q	.4247	1.109	.2724
NOW	.0226	.648	.5198
Number of observations: 66			

** significant at 1 percent
* significant at 5 percent

Analogous to the evidence of the mutual model, the Box-Tidwell transformations only increased the explanatory power of the OLS regressions marginally, changing the significances of some of the estimated coefficients. This is evident in the small differences between the R-squares of the Box-Tidwell Regressions and the linear regressions reported in Tables 15,16, and 17.

For the equations explaining the change in housing related asset-to-total assets, the R-square acctually decreased from the linear regression to the Box-Tidwell regression, from 19.17 percent to 18.89 percent. For the equation regarding non-housing related asset the R-square increased slightly from 62.13 percent for the linear regression to 62.99 percent for the Box-Tidwell regression. The final pair of R-squares for the capital equation show an increase in explanatory powers from 20.97 percent (linear) to 21.88 percent (Box-Tidwell). Corresponding to the evidence with respect mutual associations, the Box-Tidwell transformations contributed only marginally to the explanatory power of the regressions.

6.3.3 The Suitability of OLS Assumptions

Subsequent to determining the transformations deemed appropriate by the Box-Tidwell procedure, deviations from assumptions implicit with OLS regressions are examined. As with the regressions for Federal mutual associations, independent explanatory variables and homogeneous variances constitute the ideal conditions.

Table 15. Linear Regression: The Change in A/T for Stock S&Ls

Dependent Var: $\Delta\frac{A}{T}$	R^2: .1917	**F Statistic: 1.164**	**PROB>F: .3332**
Independent Variable	**Parameter Est**	**T value**	**PROB>|T|**
intercept	-52.7146	-3.012	.0039**
$QUAL_H$	9.4869	2.760	.0079**
$QUAL_{NH}$	.3807	.713	.4791
A (housing related assets)	-2.0305×10^{-5}	-.495	.6226
A'(non-housing related assets)	1.7790×10^{-4}	.635	.5279
$\left(\frac{A'}{T}\right)$	-.0867	-.197	.8447
πD	3.0467×10^{-7}	.353	.7251
K(capital	8.0807×10^{-5}	.212	.8333
$ECON_H$	-.4170	-.611	.5441
$ECON_{NH}$	.1554	.114	.9093
REG_Q	-1.5732	-1.500	.1394
NOW	.0361	.212	.8333
Number of observations: 66			

** significant at 1 percent
* significant at 5 percent

Table 16. Linear Regression: The Change in A′/T for Stock S&Ls

Dependent Var: $\Delta\frac{A'}{T}$	R^2: .6299	F Statistic: 8.355	PROB>F: .0001
Independent Variable	**Parameter Est**	**T value**	**PROB>|T|**
intercept	-6.7675	-1.202	.2346
$QUAL_H$	1.1707	1.059	.2943
$QUAL_{NH}$	-.1603	-.933	.3550
A (housing related assets)	2.6474×10^{-6}	.189	.8508
A′(non-housing related assets)	4.8912×10^{-5}	.543	.5893
$\left(\frac{A'}{T}\right)$	.9701	6.847	.0001**
πD	-3.9256×10^{-8}	-.142	.8879
K (capital)	-1.6295×10^{-4}	-1.326	.1904
$ECON_H$	-.0955	-.435	.6654
$ECON_{NH}$	-.3620	-.829	.4107
REG_Q	-1.1724	-3.476	.0010**
NOW	-.0099	-.318	.7516
Number of observations: 66			

** significant at 1 percent
* significant at 5 percent

Table 17. Linear Regression: The Change in K/T for Stock S&Ls

Dependent Var: $\Delta\frac{K}{T}$	R^2: .2097	F Statistic: 1.303	PROB>F: .2481
Independent Variable	**Parameter Est**	**T value**	**PROB>|T|**
intercept	-7.6387	-1.185	.2413
$QUAL_H$	1.3362	1.055	.2959
$QUAL_{NH}$	.1861	.945	.3486
A (housing related assets)	-3.7597×10^{-5}	-2.343	.0229*
A'(non-housing related assets)	-3.1304×10^{-5}	-.303	.7627
$\left(\frac{A'}{T}\right)$	.0236	.145	.8850
πD	3.6921×10^{-7}	1.163	.2501
K(capital)	4.4017×10^{-4}	3.128	.0028**
$ECON_H$	.1659	.659	.5124
$ECON_{NH}$	-.0964	-.193	.8479
REG_Q	.4488	1.162	.2505
NOW	.0227	.635	.5280
Number of observations: 66			

** significant at 1 percent
* significant at 5 percent

The diagnostic tools for multicollinearity conclude the stock data is "diseased". The R-squares are relatively high (18.89 percent, 62.99 percent, and 21.88 percent) and consistent with the R-squares for the mutual sample; however, only a few variables have significant coefficients.Only 1 of 11 explanatory variables is found significant in explaining the change in the proportion of housing related assets-to-total assets. The remaining two equations, which explain changes in the proportions of non-housing related assets-to-total assets and capital-to-total assets have two significant explanatory variables. See Tables 18, 19, and 20 for eigenvalues and variance inflation factors. The small eigenvalues indicate the multicollinearity is severe and the large variance inflation factors testify that the linear dependencies are between the quantities of housing related assets, non-housing related assets, and capital. Housing related assets and non-housing related assets are important variables based on the the theory and supported by the empirical results for mutual S&Ls. Given the following balance sheet constraint:

$$A + A' + L = K + D$$

it is not surprising that these variables are linearly related.

Several corrections for multicollinearity have been tested to no avail.[34] The most apparent tactic is to drop the capital variable, for the mutual regressions appear very "healthy" with respect to multicollinearity, and this is the only variation between the two models. The results indicate the collinearity is still affecting the regressions and the smaller sample size appears to increase the potential for multicollinearity to afflict the regressions.

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[34] These included dropping a variable and combining variables.

Table 18. Multicollinearity Diagnostics: The Change in A/T for Stock S&Ls

Dependent Var: $\Delta\frac{A}{T}$	R^2: .1889	F Statistic: 1.144	PROB>F: .3474
Independent Variable	**Parameter Est**	**VIF**	**Eigenvalue***
intercept	8.5686		5.9791
$QUAL_H^{-3.3802}$	-2493.9412	1.1454	2.9181
$QUAL_{NH}^{7.1419}$	4.4445×10^{-9}	1.0856	.9726
A (housing related assets)	-2.0305×10^{-5}	54.5453	.9199
A'(non-housing related assets)	1.6748×10^{-4}	11.6026	.5644
$\left(\frac{A'}{T}\right)$	-.0857	1.5394	.3753
πD	3.9272×10^{-7}	2.5645	.1056
K(capital)	6.1925×10^{-5}	35.1235	.0592
$ECON_H$	-.5278	1.1270	.0562
$ECON_{NH}$	.0980	9.4849	.0314
REG_Q	-1.6551	1.1813	.0109
NOW	.0214	1.2202	.0073
Number of observations: 66			

* ranked from largest to smallest

Table 19. Multicollinearity Diagnostics: The Change in A′/T for Stock S&Ls

Dependent Var: $\Delta\frac{A'}{T}$	R^2: .6299	F Statistic: 8.355	PROB > F: .0001
Independent Variable	**Parameter Est**	**VIF**	**Eigenvalue***
intercept	-7.8917		6.766
$QUAL_H$	1.0325	1.1212	2.9512
$QUAL_{NH}^{-.7499}$	13.8590	1.1812	.9594
A (housing related assets)	3.3915×10^{-6}	55.5075	.5736
A′(non-housing related assets)	4.5312×10^{-5}	11.7590	.3946
$\left(\frac{A'}{T}\right)^{1.5438}$	.2066	1.5891	.1791
πD	-1.3157×10^{-7}	2.6251	.0746
K (capital)	-1.6215×10^{-4}	35.5785	.0562
$ECON_H$	-.0641	1.1237	.0260
$ECON_{NH}$	-.3430	9.5632	.0108
REG_Q	-1.1468	1.1959	.0072
NOW	-.0101	1.2692	.0011
Number of observations: 66			

* ranked from largest to smallest

Table 20. Multicollinearity Diagnostics: The Change in K/T for Stock S&Ls

Dependent Var: $\Delta\frac{K}{T}$	R^2: .2188	F Statistic: 1.375	PROB>F: .2113
Independent Variable	**Parameter Est**	**VIF**	**Eigenvalue***
intercept	-6.0556		6.1226
$QUAL_H^{.9595}$	1.3707	1.1431	2.9310
$QUAL_{NH}^{4.8739}$	3.3113×10^{-6}	1.0989	.9234
A (housing related assets)	-3.6174×10^{-5}	54.7869	.8771
A'(non-housing related assets)	-4.1364×10^{-5}	11.6052	.5498
$\left(\frac{A'}{T}\right)$	.0447	1.5319	.3493
πD	3.7675×10^{-7}	2.5544	.1042
K(capital)	4.2882×10^{-4}	35.1624	.0564
$ECON_H$	.1682	1.1314	.0537
$ECON_{NH}$	-.1187	9.4976	.0217
REG_Q	.4247	1.1805	.0096
NOW	.0226	1.2368	.0011
Number of observations: 66			

* ranked from largest to smallest

The size of the sample, the balance sheet constraint, and the definition of the sample have the potential to contribute to the condition. The sample is defined to include S&Ls which converted from mutual to stock organizations over the period from 1979 to 1983.[35] The majority of the associations (50) converted during the test period, hence the effects of the conversions are incorporated in the data. In a comparison of the performance of converted S&Ls with mutual and stock S&Ls, Hadaway and Hadaway ( ) document overall significant differences between stock and converting S&Ls for the pre-conversion period and note that the converting S&Ls resemble the stock S&Ls in the post-conversion period. The study examined operating efficiency, profitability, risk tolerance, aggressiveness and growth. Based on their results these changes could be affecting the multicollinearity.[36]

Having concluded that the models for stock associations are overcome with multicollinearity which appears to be incurable, but that provides unbiased estimates of the coefficients, it is important to discuss the ramifications. The multicollinearity inflates the variances of the regression coefficients (as indicated by the variance inflation factors reported in Tables 18, 19, and 20) therefore indicating coefficients are insignificant. When multicollinearity is present the coefficients become very dependent on the particular data set used for the regressions. A slightly different data set has the potential to change the magnitude and the signs of the coefficients.

The heteroscedasticity appears to be of the same form exhibited by the mutual associations. The plots of residuals against predicted values produce similar implications to those of the mutual samples. See Figures 15 and 16. For the change in the

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[35] The sample definition is based on necessity, for only 14 associations operated as stock S&Ls over the entire period.

[36] This could also be changing the signs of the coefficients.

proportion of housing-related assets-to-total assets, the scattering appears to be totally random, indicating common variances for the observations. The model of changes in the proportion of non-housing related assets-to-total assets plots as a wedge shape, indicating the same form of heteroscedasticity which appears to be present in the mutual model. The form of the heteroscedasticity could not be identified, hence no corrections are performed.

6.3.4 The System of Equations: Zellner Estimation

Having stressed the implications of multicollinearity, the system of equations is estimated using Zellner estimation. This form of estimation improves upon the efficiency of estimated coefficients by taking into account the correlation between equations. The Zellner regression provides the following estimated equations.

$$\Delta\frac{A}{T} = 9.9958 - 2638.3300\ QUAL_H^{-3.3802} + 3.7293 \times 10^{-10}\ QUAL_{NH}^{7.1419} \qquad [6.21]$$

$$- (2.1190 \times 10^{-5})\ A + (1.8009 \times 10^{-4})\ A' - .1761\ \frac{A'}{T} + (4.4763 \times 10^{-7})\ \pi D$$

$$+ (6.6732 \times 10^{-5})\ K - .5248\ ECON_H + .1102\ ECON_{NH} - 1.6615\ REG\_Q$$

$$+ .0155\ NOW$$

$$\Delta\frac{A'}{T} = -19.8616 + 1.3542\ QUAL_H - 4.1758\ QUAL_{NH}^{-.7499} \qquad [6.22]$$

$$+ (1.6625 \times 10^{-6})\ A + (5.4753 \times 10^{-5})\ A' + 15.208\ \frac{A'}{T}^{1.5438} + (9.5305 \times 10^{-8})\ \pi D$$

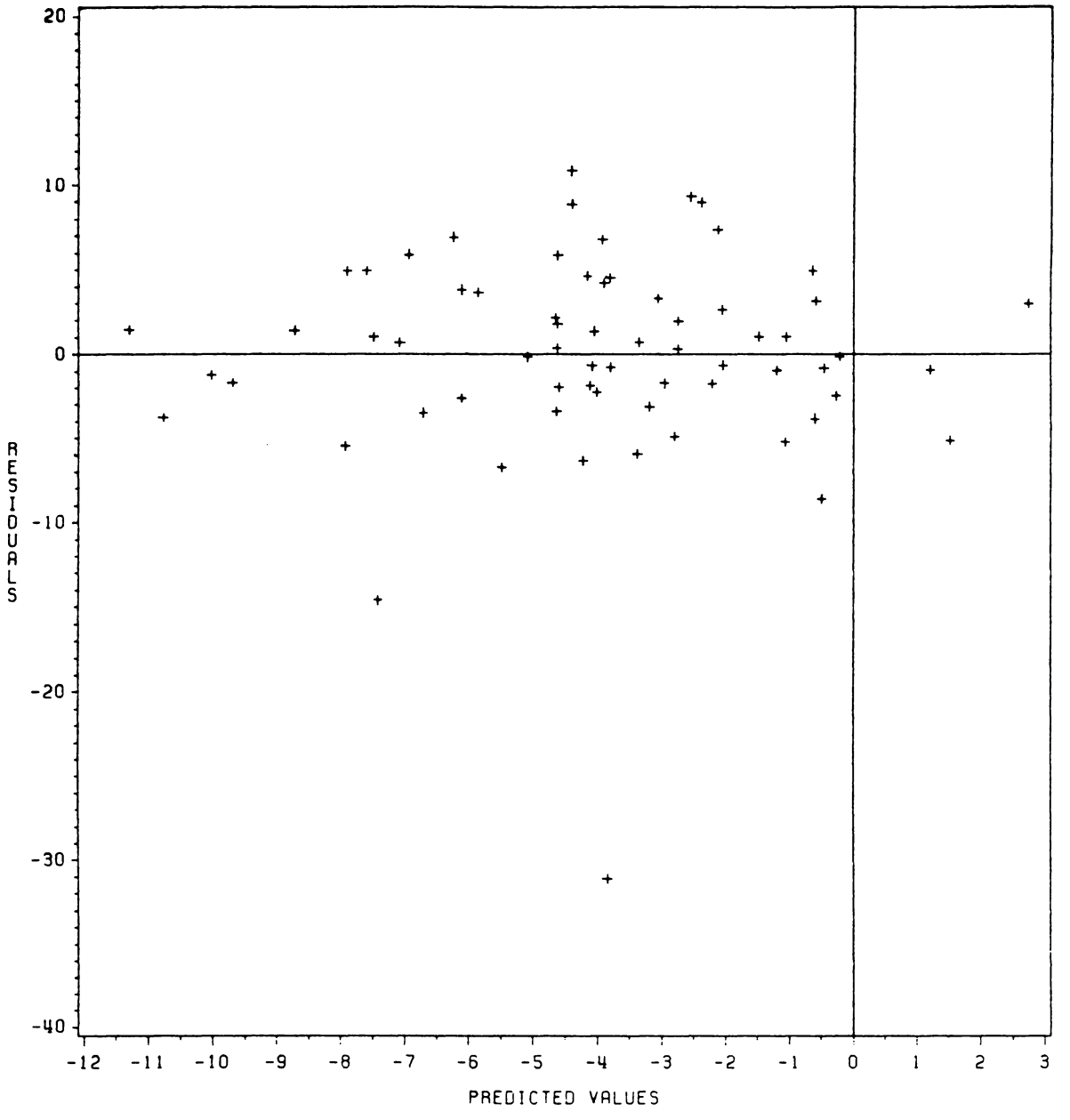

Figure 15. The Plot of the Residuals against the Predicted Values for Equation 6.21

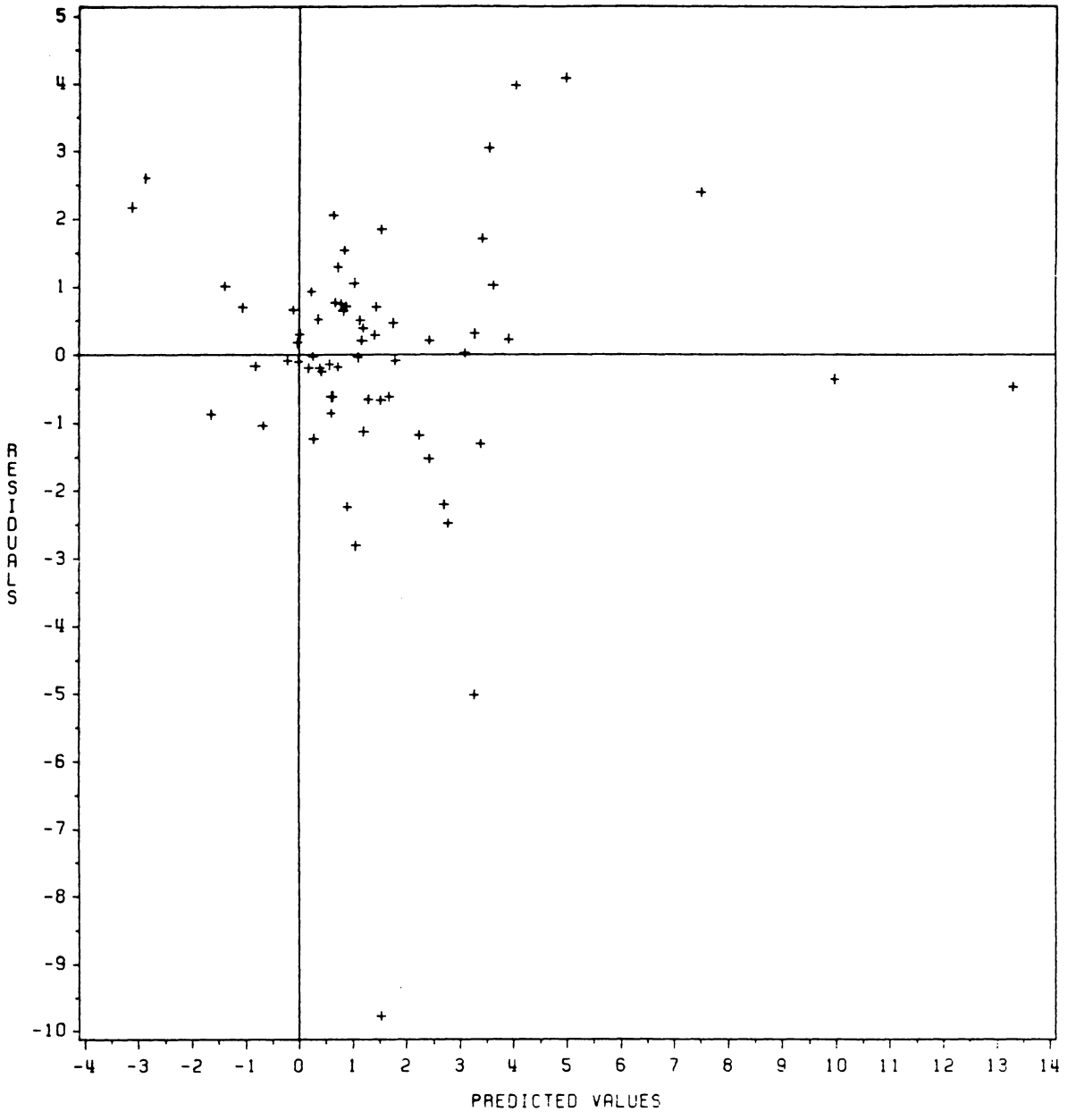

Figure 16. The Plot of the Residuals against the Predicted Values for Equation 6.22

$$- 1.7003 \times 10^{-4}\ K - .1331\ ECON_H - .4475\ ECON_{NH} - 1.2287\ REG\_Q$$

$$- .0125\ NOW$$

and

$$\Delta\frac{K}{T} = -6.0536 + 1.3797\ QUAL_H^{.9595} + 3.2108 \times 10^{-6}\ QUAL_{NH}^{4.8739} \qquad [6.23]$$

$$- (3.6247 \times 10^{-5})\ A - (4.0599 \times 10^{-5})\ A' + .0394\ \frac{A'}{T} + (3.7925 \times 10^{-7})\ \pi D$$

$$+ (4.2921 \times 10^{-4})\ K + .1687\ ECON_H - .1188\ ECON_{NH} + .4244\ REG\_Q$$

$$+ .0225\ NOW$$

See Tables 21, 22, and 23 for T-statistics.

6.3.5 Coefficients and their Implications

The discussion concerning the coefficients, their signs and significances, is brief and to the point. The severe interdependencies between explanatory variables appears to have "diluted" the strength of the modelled system. A discussion of insignificant variables is meaningless and any implications of significant variables should be taken

Table 21. Zellner Estimation: The Change in A/T for Stock S&Ls

Dependent Var: $\Delta\frac{A}{T}$	R^2 **Sys.: .4517**		
Independent Variable	**Parameter Est**	**T value**	**PROB>|T|**
intercept	9.9958	1.241	.2201
$QUAL_H^{-3.3802}$	-2638.3300	-2.986	.0042**
$QUAL_{NH}^{7.1419}$	3.7293×10^{-10}	.031	.9756
A (housing related assets)	-2.1190×10^{-5}	-.489	.6267
A'(non-housing related assets)	1.8009×10^{-4}	.645	.5218
$\left(\frac{A'}{T}\right)$	-.1761	-.399	.6919
πD	4.4763×10^{-7}	.519	.6059
K(capital)	6.6732×10^{-5}	.175	.8616
$ECON_H$	-.5248	-.771	.4442
$ECON_{NH}$	.1102	.081	.9357
REG_Q	-1.6615	-1.586	.1187
NOW	.0155	.164	.8701
Number of observations: 66			

** significant at 1 percent
* significant at 5 percent

Table 22. Zellner Estimation: The Change in A′/T for Stock S&Ls

Dependent Var: $\Delta\frac{A'}{T}$	R^2 Sys.: .4517		
Independent Variable	**Parameter Est**	**T value**	**PROB> |T|**
intercept	-19.8616	-2.250	.0286*
$QUAL_H$	1.3542	1.191	.2391
$QUAL_{NH}^{-7499}$	-4.1758	-1.216	.2293
A (housing related assets)	1.6625×10^{-6}	.115	.9092
A′(non-housing related assets)	5.4753×10^{-5}	.587	.5594
$\left(\frac{A'}{T}\right)^{1.5438}$	15.208	6.467	.0001**
πD	9.5305×10^{-6}	.335	.7387
K (capital)	-1.7003×10^{-4}	-1.331	.1881
$ECON_H$	-.1331	-.582	.5630
$ECON_{NH}$	-.4475	-.988	.3275
REG_Q	-1.2287	-3.510	.0009**
NOW	-.0125	-.390	.6984
Number of observations: 66			

** significant at 1 percent
* significant at 5 percent

Table 23. Zellner Estimation: The Change in K/T for Stock S&Ls

Dependent Var: $\Delta\frac{K}{T}$	R^2 Sys.: .4517		
Independent Variable	**Parameter Est**	**T value**	**PROB> |T|**
intercept	-6.0536	-.917	.3631
$QUAL_H^{.9595}$	1.3797	.983	.3301
$QUAL_{NH}^{4.8739}$	3.2108×10^{-6}	1.201	.2349
A (housing related assets)	-3.6247×10^{-5}	-2.283	.0264*
A'(non-housing related assets)	-4.0599×10^{-5}	-.397	.6927
$\left(\frac{A'}{T}\right)$	.0394	.243	.8092
πD	3.7925×10^{-7}	1.204	.2337
K(capital)	4.2921×10^{-4}	3.080	.0033**
$ECON_H$	.1687	.676	.5021
$ECON_{NH}$	-.1188	-.239	.8121
REG_Q	.4244	1.108	.2728
NOW	.0225	.643	.5230
Number of observations: 66			

** significant at 1 percent
* significant at 5 percent

cautiously given the strong dependency of results on the particular sample used to derive them.

6.3.5.1 Discussion of Coefficients for Equation 6.21

Only one coefficient appears significant for the equation explaining the change in the proportion of housing related assets-to-total assets. The sign and significance of the coefficient on $QUAL_H$ agree with the sign and coefficient for this variable in the mutual model, thus lending credence to the finding. The negative sign indicates the greater the average interest rate on conventional loans (theoretically the lower the quality), the more the S&L will move out of housing related assets.

6.3.5.2 Discussion of Coefficients for Equation 6.22

Equation 6.22 establishes significant coefficients for $\left(\frac{A'}{T}\right)^{1.5348}$ and *REG_Q*. Once again the signs are in agreement with those estimated for the mutual associations. The positive sign on the proportion of non-housing related assets-to-total assets is consistent with the reasoning that once an association acquires the expertise the management deems necessary to move into non-housing related assets, the S&L will continue in that direction. The negative coefficient for REG_Q indicates the phase-out of Regulation Q constrained Federal associations movements into non-housing related assets. The signs for both mutual and stock associations imply that as the market for deposits becomes more competitive the average association will desire to hold a greater proportion of liquid assets-to-total assets.

6.3.5.3 Discussion of Coefficients for Equation 6.23

The final equation of the system, explains the change in the proportion of capital-to-total assets. The equation evolved from the ability of stock associations to raise raise capital in the markets; hence there does not exist analogous equations for mutual S&Ls which could lend support to the signs of the coefficients. Equation 6.23 has two significant coefficients. The quantity of housing related assets has a significantly negative coefficient and the quantity of capital has a significantly positive coefficient. The capital equation is included to provide what information it contains to improve the efficiency of the Zellner system of equations. Taking this into consideration, no further discussion of the variables is ventured.

The comparisons between the results for the model for mutual associations and the model for stock associations appear to be very dependent on the data available for the regressions. The results for the Federal mutual associations are much stronger than those for the Federal stock associations. The limitations to the research, the conclusions based on the results presented in this chapter, and and implications for further research are discussed in the final chapter, Chapter 7.

Chapter VII

Summary and Conclusions

7.1 Summary

This dissertation represents the first theoretical and empirical investigation of the actual changes in Federal S&L asset portfolios allowed by the 1980's deregulation.

The analysis begins in Chapter 3 with the development of a theoretical model for the S&L firm emphasizing the deregulation. The motivation for the theoretical model is to provide a framework for the empirical examination of the deregulation of the 1980's, its effects, and the forces promoting and constraining the individual S&Ls expansion into non-housing related assets. This model is an adaptation of the Mingo and Wolkowitz (1977) banking model. Their banking model is a before-tax, imperfect markets, profit maximization model with a constraint on the level of risk the manager may incorporate in the portfolio. The S&L model evolves as an after-tax profit maximization model retaining the constraint on risk and introducing a constraint on the diversification with regard to non-housing related assets. The peculiarities of the S&L industry are embodied through the definitions of assets (housing related assets,

non-housing related assets, and liquid assets), the emphasis on after-tax maximization (tax laws reward specialization in housing related assets), and the differentiation between mutual and stock associations (organizational forms). Mutual associations are viewed as being more limited in their abilities to raise capital relative to stock associations.

The model developed in Chapter 3 provides first-order conditions for both mutual and stock associations which dictate the equations included in the systems developed in Chapter 5 for the empirical analysis.[37] With respect to housing related assets for Federal associations, the model indicates that greater proportions of housing related assets-to-total assets are held by Federal S&Ls due to positive tax and regulatory effects. With respect to non-housing related assets the holdings are decreased due to negative tax and regulatory effects.

Using the first-order conditions, an expression for the Lagrange multiplier with respect to the constraint on diversification is derived. This expression describes the change in after tax profits for a relaxation of the constraint on diversification (as allowed by the DIDMCA and Garn-St Germain Act) and becomes the focus for the analysis. Capitalizing on the Lagrange multiplier, Chapter 5 develops regressions to examine the changes in asset portfolio composition for Federal associations.

Prior research (McCall and Peterson (1980), Baker (1982), and Crockett and King (1982)) used averages for state chartered association to predict the effects of the deregulation on Federal associations. McCall and Peterson (1980) and Baker (1982) foresaw that the expanded asset powers would not affect the composition of asset portfolios very much. The average changes in the proportion of non-housing related assets-to-total assets for the data used in the present study are .99 percent for Fed-

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[37] Note the additional equation included in the system for Federal stock S&Ls.

eral mutual S&Ls and 1.53 percent for Federal stock associations. On average, these results support the predictions of McCall and Peterson (1980) and Baker (1982). However, the range of changes (-6.77 percent to 27.67 percent for mutual associations and -8.25 percent to 12.83 percent for stock associations) indicate, as did Crockett and King's data for state chartered S&Ls in Texas, that there is a wide variety of reactions by individual S&Ls to the expanded powers.

The variation in responses provides the opportunity for regression analysis to identify factors which have promoted or constrained the diversification of Federal S&L asset portfolios (the objective of the dissertation). The regression models developed in Chapter 5 evolve from the theoretical models of Chapter 3. These empirical models are developed from a different vantage point and provide more discriminating information than Walker's regressions discussed in Chapter 2. The primary regressions for which results are reported in Chapter 6 resemble Walker's regressions with respect to the dependent variables. Walker regresses his explanatory variables on Mortgage Loans-to-Total Assets and Liquid Assets-to-Total Assets, with his residual equation reflecting the ratio of other assets-to-total assets. The present research employs the change (pre versus post deregulation) in the proportions of housing related assets-to-total assets and the change in the proportions of non-housing related assets-to-total assets as the dependent variables for the two systems (mutual and stock).[38] This is the first research to use data after the Garn-St Germain Act to look at actual changes in the composition of Federal S&L portfolios. Walker used the averages at three semi-annual time points, June 1980, December 1980, and June 1981 (pre-Garn-St Germain Act), for all insured S&Ls, both state chartered and Federally chartered associations, to explain the stock proportion (i.e.,

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[38] The change in the proportion of liquid assets-to-total assets is the residual equation within the system.

the proportion at a point in time) rather than the change in the targeted proportion over a time period.

Beyond the theoretical framework, a succession of preliminary steps are integral to obtaining the final system of primary regressions. These steps begin with the addition of external variables (variables which were considered exogenous in the partial equilibrium theoretical model). Two types of external control variables are deemed necessary; the first controls for the changing local and national economic environments encountered by S&Ls, and the second incorporates the effects of changes in deposit-liability regulations which were judged important on the basis of Walker's research.

Economic indices are designed to capture changes in the economic environment with respect to housing and non-housing related assets. Four separate indices (housing related and non-housing related indices for both mutual and stock associations) are formed using the data for state chartered S&Ls in Maine and California. State chartered S&Ls in Maine and California possessed some of the more liberal regulations prior to the Federal deregulation, thus they provided the best economic controls available.[39] The equation for each index is chosen from a set of 48 regressions which were run using all combinations of the proposed variables. The logical explanatory variables proposed by the researcher include association size, growth rate, changes in the degree of competition in the market, changes in the activity in the secondary markets (changes in the function of S&Ls), changes in interest rate risk (the growth in adjustable rate mortgages), and changes in the degree of intra-diversification undertaken by the S&L. All the proposed variables are included in at least one of the four indices. Having determined the most appropriate variables

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[39] Maine's state chartered associations have been operating in very liberal environments since 1975.

for the index based on performance criteria, the data for the Federal associations is substituted in the equation to develop an index to be used as an explanatory variable for the primary regressions.

The second type of external control variables is designed to capture the effects of the phase-out of Regulation Q and the use of NOW accounts. Those features of deregulation could have effects on the asset portfolio composition of S&Ls. Their importance, as noted in Walker's results, is confirmed by their significant coefficients in the present research.

Having developed external variables, the next step leading to the system of primary equations uses the Box-Tidwell procedure to develop transformations on the theoretical variables. The rationale for the use of this procedure is that the changes in the proportions of housing-related assets-to-total assets and non-housing related assets-to-total assets could be considered a function of the Lagrange multiplier; however, the functional form could not be inferred. The Box-Tidwell procedure performs transformations dictated by the data to allow linear estimation of, perhaps, non-linear functional forms. Although a commercially available Box-Tidwell routine did not converge, another routine was obtained and modified to produce convergence of the estimators. In actuality, as discussed in Chapter 6, the Box-Tidwell transformations improved the significance levels of many significant variables; however they did not affect the explanatory power to a great degree.

Once the external control variables were developed, the transformations estimated, and deviations from OLS assumptions (multicollinearity and heteroscedasticity) examined, Zellner Regression was used to estimate the system of equations from which conclusions were drawn.

7.2 Conclusions

The Zellner regressions provide estimates for two systems of equations, the system for mutual associations and the system for stock associations. The signs and significance levels of individual coefficients were discussed in Chapter 6 and the prominent conclusions are reiterated in this section.

In regard to stock versus mutual associations the average change in the proportion of non-housing related assets-to-total assets indicate that stock associations (1.53 percent) have been more aggressive than mutual associations (.99 percent). The system of regressions for stock associations provide estimates of coefficients which are difficult to interpret given their low significance levels and the high R-squares. The data set is afflicted with multicollinearity which destroys the significance levels of coefficients in a nearly textbook fashion. The results may also be capturing conversion effects given that the majority of the sample are Federal associations which converted from mutual organizations to stock organizations over the period. The coefficients which are significant have the same signs as the coefficients determined for the system of Federal mutual S&Ls. This consistency is encouraging; however the multicollinearity appears to be "fatal" concerning interpretation of coefficient estimates for stock associations.

Given the effects of the multicollinearity on the Federal stock S&L sample, the important conclusions from this study are based on the system of regressions applied to the sample of Federal mutual associations. This is a large sample consisting of 1367 S&Ls with little indication of destructive multicollinearity. The equation explaining changes in the proportion of non-housing related assets-to-total assets exhibits evidence of heteroscedasticity; however, given the number of highly significant

coefficients, its effects appear to be limited. The conclusions based on the system of equations for Federal mutual S&Ls contain implications concerning tax effects, specialization with respect to housing related assets, size, organizational form, and deposit-liability legislation.

The tax laws do not appear to have constrained the diversification. The results indicate that the more profitable the association, the greater the increase in non-housing related assets-to-total assets. This result is counter to the tax effect; however, the evidence is not conclusive. Only 6 of the 1367 S&Ls allowed their proportion of qualifying assets to drop below the level of 82 percent which is critical in the tax laws. This is consistent with a tax effect, but also consistent with, and more likely evidence of a pure specialization effect. This conclusion agrees with Eisenbeis and Kwast's results. They found no evidence of a tax effect; however they did find evidence of specialization effects in their analysis of real estate specializing banks and S&Ls. The expertise the managers have built up over the years of providing home mortgages to buyers in their segmented markets appear to be restraining their movements out of this market. The more housing related assets the S&L held over the test period, the less the S&L decreased its proportion of housing related assets-to-total assets between 1979 and 1983.

When the coefficients are examined in the context of a system, there is strong evidence that liquid assets and non-housing assets are imperfect substitutes. This indicates that the maturity is a much more important consideration to the S&L manager than the risk involved. This inference is consistent with the insignificant coefficients on the quality variables and indicates that the regulatory agencies should be monitoring this behavior with respect to diversification and potential problems concerning default risk.

The larger associations appear to have diversified more than the smaller associations. This indicates that the mergers of smaller S&Ls with larger associations could promote diversification. It appears the larger associations have been better able to acquire the expertise needed for the diversification. Once the expertise is developed, associations seem to continue to increase their proportions of non-housing related assets-to-total assets, suggesting that time is an important factor. If the test period is extended beyond 1983, the changes may be more prominent. It appears that the larger associations are substituting non-housing related assets for excess liquid assets, this would suggest that larger S&Ls take on more risk. This behavior could exist because the FSLIC is more likely to bail out a large S&L.

The major constraint to diversification appears to have been the liability regulations. The phase-out of Regulation Q and the movement to NOW accounts seem to have limited the diversification into non-housing related assets and the movement out of housing related assets. Instead a significant re-allocation of portfolios has been directed to liquid assets. This is sensible given the potential for greater volatility of deposits in a deregulated environment. In the period studied here, the desire to increase holdings of liquid assets appears to have restrained the increase in non-housing related assets even though the deregulation allowed such increases. As the S&Ls adapt to the new deposit-liability legislation these effects may disappear.

The results indicate that different changes within the S&L environment are working in different directions. While the liability legislation and specialization effects appear to have constrained the diversification, the stock conversions and mergers appear to promote diversification. The changes will take time; however this research indicates that the S&L industry is changing its profile somewhat, while remaining dedicated to the home mortgage market. If the S&Ls continue to merge and convert to stock associations, the diversification into non-housing related assets will probably

continue, based on the results of the present research. These larger associations would not be expected to hold large quantities of excess liquid assets, but would substitute non-housing related assets for the liquid assets. Within this scenario the S&L may be increasing its risk beyond what the regulatory agencies deem appropriate. If the regulators change directions with respect to mergers and a return of the smaller associations is evidenced, these associations, as indicated by the present research, would not acquire the knowledge necessary for diversification into non-housing related assets, but would substitute liquid holdings.

7.3 Extensions and Future Research

Although this study has provided numerous insights into the constraining influences which affect the reactions of S&Ls to asset deregulation, the research results suggest a number of issues which may be worth pursuing in future research. Some issues concern the sensititvity of the results to alternative specifications while other issues relate to unexpected phenomena uncovered in this research.

The first and most obvious extension of this study would be to lengthen the test period. There exist strong indications that S&Ls need time to incorporate changes in the compositions of their asset portfolios. In fact in this study, the results for mutuals who converted to stocks may be reflecting exactly this situation. The time period of 1979 to 1983 limits the period over which S&Ls could adjust to the deregulation passed by the Garn-St Germain Act of 1982. A longer time period would have the potential to capture more of the adjustments.

In addition to a lengthened test period, a comparison of changes within shorter sub-periods may provide enlightening evidence. The change in the results which

occurred when the calculation periods for some of the explanatory variables was altered suggested that the Garn-St Germain Act may have triggered more changes than the DIDMCA. A better understanding of which of the deregulation acts was more stimulative would provide direction for regulators and legislators in the future.

The strong suggestion in the results that larger associations increased their levels of risk and diversified more than smaller associations in response to deregulation has potential implications for S&L mergers. Given the large number of mergers taking place in the mid 1980's, research which considers only merged S&Ls has the potential to provide information concerning the effects of mergers on diversification and also additional information concerning the size effects noted in the present research.

Two other topics which may warrant further research, but could not be investigated here, it is believed, because of small sample sizes are (1) whether Federal Savings Banks responded to the deregulation in a manner similar to that of Federal mutual S&ls and (2) whether stock S&Ls have responded similarly to mutuals. In the first case, the results of such a study could shed light on whether savings banks are different in name only and in the second case whether the role of stockholders affects managerial decisions as hypothesized in the expense preference literature. On the latter point, some evidence on the lack of a role of expense preference behavior was found in this study, but given the small sample size and multicollinearity, the evidence would be considered relatively weak.

Finally given the apparent significance of the various proxies for quality, economic environment, and other changes in regulations in the results reported here, there may be valuable gains to refining those measures. In particular, a stronger theoretical basis for modelling the economic environment of comparable state chartered S&Ls could provide a better understanding of the effects of deregulation and the

factors which limit or constrain the implementation of legislatively sanctioned expansions of S&L powers.

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Appendix A

Proposals of Hunt Commission

A. Asset Diversification. The Commission Recommends that:

1. S&Ls and MSBs be granted a widened range of loan and investment powers, including authority to:

   Make mortgage loans on all types of residential and non-residential properties without statutory or regulatory restrictions;

   make construction loans in the same manner as commercial banks;

   make loans on mobile homes, without restrictions on sizes and types;

   make direct investment in real estate and participate directly with other organizations in the ownership of real estate, including participation through stock ownership, subject to certain quantitative restrictions;

   participate directly in real estate through loan agreements to receive rental and other non-interest income, whether or not the institution holds an equity interest in the same property;

   make secured and unsecured consumer loans in amounts not to aggregate in excess of 10 percent of total assets:

   invest in a full range of investment grade U.S. Government, state and municipal , and private debt instruments of all maturities;

   invest in equity securities, subject to certain quantitative and qualitative restrictions;

   invest, via a "leeway provision" in any assets, except equity securities of commercial banks, S&Ls and holding companies of commercial banks and S&Ls subject to quantitative restrictions

2. S&Ls and MSBs be permitted to make equity investments in community rehabilitation and development corporation engages in providing housing and employ-

ment opportunities for low and moderate income persons, subject to quantitative restrictions.

3. S&Ls and MSBs be permitted to make loans anywhere within any state of the United States, the District of Columbia, any territory of the United States, Puerto Rico, Guam, American Samoa or the Virgin Islands.

B. Liability Reform. The Commission Recommends That:

1. S&Ls and MSBs be permitted to offer a wider variety of time and savings deposits and certificates of deposit, varying with respect to interest rate, withdrawal power and maturity.

2. Under specified conditions, S&Ls and MSBs be permitted to provide third party payment services, including checking accounts and credit cards, to individuals and non-business entities only.

3. S&Ls and MSBs be permitted to issue subordinated debt instruments of all maturities provided that maturities and yields, conditions of subordination, the lack of insurance and other differences between the debt instruments and deposit liabilities are clearly and fully disclosed to all purchasers, and provided that these issues be evaluated and approved as bona fide capital prior to issue by the appropriate supervisory authority.

4. S&Ls and MSBs, and subsidiaries of S&Ls and MSBs and holding company affiliates of S&Ls be permitted to manage and sell mutual funds, including commingled agency accounts, subject to regulation by the Securities and Exchange Commission.

5. Interest rate ceilings on time and savings deposits be phased out, with the Board of Governors of the Federal Reserve System retaining standby authority to reimpose rate ceilings.

6. Reserve requirements on time and savings deposits be removed.

Appendix B

Mutual S&Ls Comprising Primary Sample and Their Proportional Changes of Non-Housing Related Assets-to-Total Asset

Name	City	State	$\Delta\frac{A'}{T}$
ALASKA FS & LA	JUNEAU	AK	3.45
FIRST FS & LA	ANCHORAGE	AK	-0.46
BIRMINGHAM FS & LA	BIRMINGHAM	AL	-0.10
ALABAMA FS & LA	TUSCALOOSA	AL	-0.63
JEFFERSON FS & LA	BIRMINGHAM	AL	1.48
FIRST SOUTHERN FS & LA	MOBILE	AL	4.16
FIRST FS & LA	ANDALUSIA	AL	3.26
VALLEY FS & LA	SHEFFIELD	AL	-0.47
FIRST FS & LA	FLORENCE	AL	-0.98
FIRST AMERICAN FS & LA	HUNTSVILLE	AL	-0.06
FIRST FS & LA OF RUSSELL CO	PHENIX CITY	AL	3.22
FIRST FS & LA	JASPER	AL	0.29
FIRST FS & LA	GADSDEN	AL	-1.95
FIRST FS & LA	BESSEMER	AL	-0.65
FIRST FS & LA	DECATUR	AL	-0.62
TUSKEGEE FS & LA	TUSKEGEE INSTITUTE	AL	-0.71
FIRST FS & LA OF CULLMAN	CULLMAN	AL	1.42
CITY FS & LA	BIRMINGHAM	AL	1.97
FIRST FS & LA	SYLACAUGA	AL	0.52
ANNISTON FS & LA	ANNISTON	AL	1.56
FIRST FEDERAL BANK, FSB	OPELIKA	AL	4.91
CITIZENS FS & LA	BIRMINGHAM	AL	0.01
ST CLAIR FS & LA	PELL CITY	AL	0.27
FIRST FS & LA OF THE WIREGRASS	ENTERPRISE	AL	-0.48
COOSA FS & LA	GADSDEN	AL	-0.10
HOME FS & LA	LAFAYETTE	AL	2.17

FIRST SAVINGS BANK OF ALABAMA, FA	HAMILTON	AL	0.64
FIRST FS & LA OF CHILTON COUNTY	CLANTON	AL	-0.81
AUBURN FS & LA OF LEE CO	AUBURN	AL	-2.78
GULF FS & LA	MOBILE	AL	10.02
FIRST FS & LA OF DEKALB COUNTY	FORT PAYNE	AL	2.33
SECURITY FS & LA	TUSCALOOSA	AL	-2.51
FIRST FS & LA OF MONROE COUNTY	MONROEVILLE	AL	-0.13
SECURITY FS & LA	JASPER	AL	-0.65
PHENIX FS & LA	PHENIX CITY	AL	-2.34
TALLADEGA FS & LA	TALLADEGA	AL	-0.08
FIRST FS & LA	TEXARKANA	AR	-0.94
TEXARKANA FS & LA	TEXARKANA	AR	0.46
FIRST AMERICA FEDERAL SAVINGS BANK	FORT SMITH	AR	-0.71
WEST MEMPHIS FS & LA	WEST MEMPHIS	AR	0.07
FIRST FS & LA	CAMDEN	AR	-1.38
FIRST FEDERAL OF ARKANSAS, FA	LITTLE ROCK	AR	-0.56
UNITED FS & LA	JONESBORO	AR	1.64
FIRST FEDERAL SAVINGS BANK	ROGERS	AR	3.47
SUPERIOR FEDERAL BANK, FSB	FORT SMITH	AR	0.78
FIRST FS & LA OF HARRISON	HARRISON	AR	-0.42
FIRST SOUTH FS & LA	PINE BLUFF	AR	4.00
WYNNE FS & LA	WYNNE	AR	-3.03
FIRST FS & LA	HOT SPRINGS	AR	0.30
POCAHONTAS FS & LA	POCAHONTAS	AR	0.58
SAVERS FS & LA	LITTLE ROCK	AR	-0.82
NEWPORT FS & LA	NEWPORT	AR	-0.97
FIRST FS & LA	FAYETTEVILLE	AR	0.98
FIRST FS & LA	MALVERN	AR	0.39
HOME FS & LA	JONESBORO	AR	7.95
GREAT AMERICAN FEDERAL SAVINGS BANK	SAN DIEGO	CA	3.44
FIRST FS & LA	BAKERSFIELD	CA	1.60
CAPITAL FS & LA	SACRAMENTO	CA	0.76
WATSONVILLE FS & LA	WATSONVILLE	CA	-1.08
QUAKER CITY FS & LA	WHITTIER	CA	-0.56
POMONA FIRST FS & LA	POMONA	CA	-0.98
CENTURY FS & LA	PASADENA	CA	-0.29
FIRST F S BANK OF CALIFORNIA	SANTA MONICA	CA	0.42
PACIFIC FS & LA	SAN BERNARDINO	CA	-1.70
THE HEART FS & LA	AUBURN	CA	1.52
FIRST FS & LA	SAN BERNARDINO	CA	-0.17
EUREKA FS & LA	SAN CARLOS	CA	1.55
HEMET FS & LA	HEMET	CA	0.20
REPUBLIC FS & LA	ALTADENA	CA	-0.08
UNION FS & LA	LOS ANGELES	CA	-1.01
SAN FRANCISCO FS & LA	SAN FRANCISCO	CA	-0.44
WESTERN FS & LA	MARINA DEL REY	CA	-2.20
LOS ANGELES FEDERAL SAVINGS BANK	LOS ANGELES	CA	-0.78
HOME FS & LA	SAN FRANCISCO	CA	0.87
FIRST FS&LA OF SAN GABRIEL VALLEY	COVINA	CA	1.64
REDLANDS FS & LA	REDLANDS	CA	0.54
BROADWAY FS & LA	LOS ANGELES	CA	3.07
PROVIDENT FEDERAL SAVINGS BANK	RIVERSIDE	CA	1.29
SECURITY FS & LA	GARDEN GROVE	CA	-1.05
FIRST FS&LA OF REDDING	REDDING	CA	7.59
FIRST FS & LA	SAN RAFAEL	CA	-2.77
HIGHLAND FS & LA OF LOS ANGELES	LOS ANGELES	CA	-2.05

FIRST FS & LA	RIDGECREST	CA	-0.49
EAST-WEST FEDERAL BANK, FSB	LOS ANGELES	CA	3.27
CITY FEDERAL S & LA	OAKLAND	CA	1.18
SAN LUIS VALLEY FS & LA	ALAMOSA	CO	6.32
MESA FS & LA	GRAND JUNCTION	CO	-0.33
VALLEY FS & LA	GRAND JUNCTION	CO	1.51
CAPITOL FS & LA	AURORA	CO	1.45
FIRST FSB OF COLORADO	LAKEWOOD	CO	-0.00
WESTERN FS & LA	DENVER	CO	2.95
FIRST FS & LA	COLORADO SPRINGS	CO	-0.23
DEL NORTE FS & LA	DEL NORTE	CO	-0.44
ROCKY FORD FS & LA OF COLORADO	ROCKY FORD	CO	-0.89
FIRST FS & LA	CRAIG	CO	1.29
BRIGHTON FS & LA	BRIGHTON	CO	1.17
MORGAN COUNTY FS & LA	FORT MORGAN	CO	-1.95
MIDLAND FS & LA	DENVER	CO	4.82
SIERRA FS & LA	DENVER	CO	-5.63
FIDELITY FS & LA	NEW HAVEN	CT	-0.19
JEFFERSON FS & LA	MERIDEN	CT	-0.31
ENFIELD FS & LA	ENFIELD	CT	-0.50
FIRST FS & LA	TORRINGTON	CT	-1.12
BRISTOL FEDERAL SAVINGS BANK	BRISTOL	CT	0.42
CONSTITUTION FS & LA	STAMFORD	CT	1.27
DANIELSON FS & LA	DANIELSON	CT	0.58
NORTH EAST SAVINGS, F. A.	HARTFORD	CT	0.72
GREENWICH FS & LA	GREENWICH	CT	1.78
FIRST FEDERAL BANK OF CONNECTICUT	NEW HAVEN	CT	1.73
FIRST FS & LA	EAST HARTFORD	CT	0.83
THE FEDERAL SAVINGS BANK	NEW BRITAIN	CT	0.37
NEW LONDON FS & LA	NEW LONDON	CT	3.84
FIRST FS & LA	WATERBURY	CT	0.62
WINDSOR FS & LA	WINDSOR	CT	0.50
FIRST FEDERAL SAVINGS BANK	NORWALK	CT	-0.73
COMMUNITY FS & LA	BRIDGEPORT	CT	13.89
NUTMEG FS & LA	DANBURY	CT	-0.79
WASHINGTON FS & LA	WASHINGTON	DC	0.32
CAPITAL CITY FS & LA	WASHINGTON	DC	-0.25
NATIONAL PERMANENT BANK, FSB	WASHINGTON	DC	8.75
OBA FS & LA	WASHINGTON	DC	-0.04
COLUMBIA FS & LA	WASHINGTON	DC	0.02
HOME FS & LA	WASHINGTON	DC	-0.19
INDEPENDENCE FS & LA	WASHINGTON	DC	0.05
FIRST FS & LA OF DELAWARE	WILMINGTON	DE	6.30
FIRST FS & LA	LAKE WALES	FL	-0.81
FLORIDA FS & LA	ST PETERSBURG	FL	7.44
MID-STATE FS & LA	OCALA	FL	2.74
AMERIFIRST FS & LA	MIAMI	FL	2.39
THE FIRST, FEDERAL ASSOCIATION	ORLANDO	FL	0.79
FIRST FS & LA OF FLORIDA	LAKELAND	FL	0.63
FIRST FS & LA	WINTER HAVEN	FL	6.27
FIRST FS & LA OF LAKE CO	LEESBURG	FL	-0.00
FINANCIAL FS & LA OF DADE COUNTY	MIAMI BEACH	FL	-0.27
FIRST FS & LA OF HENDRY COUNTY	CLEWISTON	FL	2.39
FIRST FS & LA OF PUTNAM COUNTY	PALATKA	FL	0.21
FIRST FS & LA OF THE PALM BEACHES	WEST PALM BEACH	FL	0.68
FIRST FS & LA	PANAMA CITY	FL	2.07

CORAL GABLES FS & LA	CORAL GABLES	FL	-0.07
CHASE FS & LA	MIAMI	FL	0.08
HOLLYWOOD FS & LA	HOLLYWOOD	FL	1.81
FORTUNE FS & LA	CLEARWATER	FL	0.72
FIRST FS & LA	FORT MYERS	FL	-0.33
SECURITY FIRST FS & LA	DAYTONA BEACH	FL	1.89
FIRST FS & LA	JACKSONVILLE	FL	-0.60
FIRST FS & LA	MARIANNA	FL	-0.49
HERITAGE FS & LA	DAYTONA BEACH	FL	2.51
HARBOR FS & LA	FORT PIERCE	FL	0.34
FIRST FS & LA OF OSCEOLA CO	KISSIMMEE	FL	0.67
FIRST FS & LA OF CHARLOTTE CO	PUNTA GORDA	FL	0.34
UNITED FIRST FS & LA	SARASOTA	FL	0.46
FIRST FS & LA OF SEMINOLE CO	SANFORD	FL	-0.31
ST PETERSBURG FS & LA	ST PETERSBURG	FL	0.52
FIRST FS & LA OF NEW SMYRNA	NEW SMYRNA BEACH	FL	-0.17
FIRST FAMILY FS & LA	EUSTIS	FL	0.39
FIRST FS & LA OF LAKE WORTH	LAKE WORTH	FL	0.84
FIRST FS & LA OF BREVARD CO	MELBOURNE	FL	1.68
JACKSONVILLE FS & LA	JACKSONVILLE	FL	0.54
FIRST FS & LA OF OKALOOSA COUNTY	FORT WALTON BEACH	FL	0.59
ATLANTIC FS & LA	FORT LAUDERDALE	FL	-0.21
FIRST FS & LA OF THE FLORIDA KEYS	KEY WEST	FL	-0.05
COAST FS & LA	SARASOTA	FL	1.12
SECURITY FS & LA	PANAMA CITY	FL	4.45
SUN FS & LA	TALLAHASSEE	FL	-0.50
FIDELITY FEDERAL SAVINGS BANK OF FL	WEST PALM BEACH	FL	1.16
DUVAL FS & LA	JACKSONVILLE	FL	-0.90
HOME FEDERAL BANK OF FLORIDA, F.S.B.	ST PETERSBURG	FL	0.69
PENINSULA FS & LA	MIAMI	FL	-0.39
SUNSHINE STATE FS & LA	PLANT CITY	FL	-0.17
COMMUNITY FS & LA OF PALM BEACHES	RIVIERA BEACH	FL	1.01
PIONEER FS & LA	CLEARWATER	FL	0.83
FLAGLER FS & LA	MIAMI	FL	-0.16
HOME FS & LA	HOLLYWOOD	FL	-0.94
CITIZENS FS & LA	JACKSONVILLE	FL	-1.35
SECURITY FS & LA	SOUTH MIAMI	FL	-0.22
FIRST HOME FS & LA	SEBRING	FL	-0.34
CITIZENS FS & LA	PORT ST JOE	FL	-0.50
FIRST FEDERAL OF TITUSVILLE	TITUSVILLE	FL	1.97
FIRST SAVINGS BANK OF FLORIDA, F.S.B.	TARPON SPRINGS	FL	1.68
FIRST FS & LA	BROOKSVILLE	FL	0.25
FIRST FS & LA OF ENGLEWOOD	ENGLEWOOD	FL	1.13
FIRST FS & LA	PERRY	FL	2.20
FIRST FS & LA	LARGO	FL	0.59
FIRST FS & LA	LIVE OAK	FL	2.18
AMERICAN FS & LA OF DUVAL CO	JACKSONVILLE	FL	0.71
WASHINGTON SHORES FS & LA	ORLANDO	FL	-0.24
FIRST FS & LA OF CITRUS COUNTY	INVERNESS	FL	0.50
FIRST FS & LA	DE FUNIAK SPRINGS	FL	-1.85
FIRST CITIZENS FS & LA	FORT PIERCE	FL	0.54
COMMUNITY FS & LA	TAMPA	FL	11.05
SECURITY FS & LA OF INDIAN RIVER CO	VERO BEACH	FL	-0.29
BROWARD FS & LA	SUNRISE	FL	2.53
FIRST FS & LA	ATLANTA	GA	0.45
HOME FS & LA	ATLANTA	GA	5.46

CITIZENS FS & LA	ROME	GA	1.28
MUTUAL FS & LA	ATLANTA	GA	0.56
CARROLLTON FS & LA	CARROLLTON	GA	1.27
MOULTRIE FS & LA	MOULTRIE	GA	5.80
HABERSHAM FS & LA	CORNELIA	GA	-2.11
ATHENS FS & LA	ATHENS	GA	3.13
GEORGIA FEDERAL BANK, FSB	ATLANTA	GA	-0.27
FULTON FS & LA	ATLANTA	GA	2.16
BANKERS FIRST FS & LA	AUGUSTA	GA	7.01
ELBERTON FS & LA	ELBERTON	GA	-1.25
FIRST FS & LA	GRIFFIN	GA	-0.43
CARTERSVILLE FEDERAL SB OF GEORGIA	CARTERSVILLE	GA	6.97
FIRST FS & LA	VALDOSTA	GA	4.59
FIRST FS & LA	BRUNSWICK	GA	-0.75
RANDOLPH COUNTY FS & LA	CUTHBERT	GA	-0.53
SOUTHEAST FS & LA	ROSSVILLE	GA	1.83
BAXLEY FS & LA	BAXLEY	GA	8.91
THOMAS COUNTY FS & LA	THOMASVILLE	GA	-0.03
FIRST FS&LA OF BAINBRIDGE	BAINBRIDGE	GA	-0.08
MITCHELL COUNTY FS & LA	PELHAM	GA	-1.23
FIRST FS & LA	COLUMBUS	GA	0.78
FIRST FS & LA OF DONALSONVILLE	DONALSONVILLE	GA	6.84
GREAT SOUTHERN FEDERAL SAVINGS BANK	SAVANNAH	GA	3.02
ALBANY FIRST FS & LA	ALBANY	GA	-0.62
NEWTON FS & LA	COVINGTON	GA	-0.16
STEPHENS FS & LA	TOCCOA	GA	0.17
LIBERTY FS & LA	MACON	GA	3.95
HOME FS & LA	ROME	GA	4.09
GWINNETT FS & LA	LAWRENCEVILLE	GA	0.35
DECATUR FS & LA	DECATUR	GA	1.17
QUITMAN FS & LA	QUITMAN	GA	-5.43
SOUTHERN FS & LA OF GEORGIA	ATLANTA	GA	-1.48
VIDALIA FS & LA	VIDALIA	GA	-0.98
FIRST FS & LA	LA GRANGE	GA	-0.42
FIRST FS & LA	WINDER	GA	10.13
DE KALB FS & LA	DECATUR	GA	-0.11
FIRST FS & LA	CALHOUN	GA	-2.07
FIRST FS & LA	AMERICUS	GA	1.72
THOMASTON FS & LA	THOMASTON	GA	1.84
CHARTER FS & LA	WEST POINT	GA	-1.88
NEWNAN FS & LA	NEWNAN	GA	7.21
FIRST FS & LA	CEDARTOWN	GA	0.42
CLAYTON COUNTY FS & LA	JONESBORO	GA	0.33
FIRST FS & LA	SUMMERVILLE	GA	0.55
TUCKER FS & LA	TUCKER	GA	-0.98
HOME FS & LA	GAINESVILLE	GA	2.33
FIRST FS & LA	SWAINSBORO	GA	1.06
VALDOSTA FS & LA	VALDOSTA	GA	2.52
DOUGLAS COUNTY FS & LA	DOUGLASVILLE	GA	-3.22
CHEROKEE FS & LA	CANTON	GA	2.30
FIRST PAULDING FS & LA	DALLAS	GA	2.38
GRIFFIN FS & LA	GRIFFIN	GA	0.70
FIRST FS & LA	WARNER ROBINS	GA	0.18
FIRST FS & LA OF TURNER CO	ASHBURN	GA	-0.03
UNITED FS & LA	SMYRNA	GA	0.75
UNITED FS & LA	WAYCROSS	GA	-0.52

FIRST FS & LA	THOMSON	GA	0.17
FIRST FS & LA	MILLEDGEVILLE	GA	2.25
FIDELITY FS & LA	DALTON	GA	18.35
SOUTHERN FS & LA OF THOMAS COUNTY	THOMASVILLE	GA	7.13
COMMUNITY FS & LA	FT OGLETHORPE	GA	16.60
FIRST FS AND LA OF AMERICA	HONOLULU	HI	-0.91
HONOLULU FS & LA	HONOLULU	HI	0.84
PIONEER FEDERAL SAVINGS BANK	HONOLULU	HI	-0.54
HOME FS & LA OF SIOUX CITY	SIOUX CITY	IA	0.93
FIRST FS & LA OF SIOUX CITY	SIOUX CITY	IA	-0.72
STATE FS & LA OF DES MOINES	DES MOINES	IA	0.02
POLK COUNTY FS & LA OF DES MOINES	DES MOINES	IA	-0.10
CLINTON FS & LA	CLINTON	IA	3.93
MIDWEST FS & LA OF EASTERN IOWA	BURLINGTON	IA	-0.22
FIRST FEDERAL SAVINGS BANK	WATERLOO	IA	0.48
FIRST FS & LA OF DAVENPORT	DAVENPORT	IA	-0.22
CITIZENS FS & LA OF DAVENPORT	DAVENPORT	IA	0.07
FIRST FS & LA OF CRESTON	CRESTON	IA	1.97
WASHINGTON FS & LA	WASHINGTON	IA	0.13
WEBSTER CITY FS & LA	WEBSTER CITY	IA	0.07
OELWEIN FS & LA	OELWEIN	IA	-0.35
HOME FS & LA OF HARLAN	HARLAN	IA	2.14
UNITED FEDERAL SAVINGS BANK OF IOWA	DES MOINES	IA	1.72
GRINNELL FS & LA	GRINNELL	IA	3.50
1ST FS&LA OF ESTHERVILLE & EMMETSBURG	ESTHERVILLE	IA	2.08
INDEPENDENCE FS & LA	INDEPENDENCE	IA	0.85
PIONEER FS & LA	MASON CITY	IA	-0.34
INTERSTATE FS & LA OF MCGREGOR	MCGREGOR	IA	-0.36
HOME FS & LA	ALGONA	IA	0.02
NORTHWEST FS & LA OF SPENCER	SPENCER	IA	-0.06
AMERICAN FS & LA OF IOWA	DES MOINES	IA	-0.52
FIRST FS & LA OF CARROLL	CARROLL	IA	2.92
WESTERN FS & LA	COUNCIL BLUFFS	IA	-0.32
FIRST FS & LA OF COUNCIL BLUFFS	COUNCIL BLUFFS	IA	0.19
HOME FS & LA OF SPENCER	SPENCER	IA	0.09
KEOKUK FS & LA	KEOKUK	IA	-0.27
FIRST FS & LA OF FORT DODGE	FORT DODGE	IA	0.63
FIRST FS & LA OF STORM LAKE	STORM LAKE	IA	-0.05
FIRST FS & LA	IDAHO FALLS	ID	0.04
FIRST FS & LA	COEUR DALENE	ID	1.97
HOME FS & LA	NAMPA	ID	0.45
UNITED FIRST FS & LA	BOISE	ID	1.21
FIRST FS & LA	LEWISTON	ID	-0.71
FIRST FS & LA	TWIN FALLS	ID	-0.30
PROVIDENT FS & LA	BOISE	ID	2.40
BELL FS & LA	CHICAGO	IL	-0.44
IRVING FS & LA	CHICAGO	IL	1.06
ST PAUL FS & LA OF CHICAGO	CHICAGO	IL	0.49
BUSHNELL FS & LA	BUSHNELL	IL	-0.13
LIBERTYVILLE FS & LA	LIBERTYVILLE	IL	0.01
STERLING FS & LA	STERLING	IL	0.21
KANKAKEE FS & LA	KANKAKEE	IL	2.08
CIVIC FS & LA	CHICAGO	IL	6.38
BROOKFIELD FS & LA	BROOKFIELD	IL	0.15
FIRST FS & LA OF SPARTA	SPARTA	IL	2.52
SECURITY FS & LA	SPRINGFIELD	IL	0.32

FIRST FS & LA OF WAUKEGAN	WAUKEGAN	IL	0.06
MADISON COUNTY FS & LA	GRANITE CITY	IL	-0.01
CITIZENS FS & LA OF MATTESON	MATTESON	IL	-0.20
UNION FS & LA	KEWANEE	IL	0.09
FIDELITY FS & LA	GALESBURG	IL	1.68
A J SMITH FS & LA OF CHICAGO	MIDLOTHIAN	IL	0.79
FIRST FS & LA OF MATTOON ILLINOIS	MATTOON	IL	-0.45
PEERLESS FS & LA OF CHICAGO	CHICAGO	IL	-0.48
CALUMET FS & LA	CHICAGO	IL	1.33
HERITAGE FS & LA	SPARTA	IL	0.65
HOME FS & LA OF COLLINSVILLE	COLLINSVILLE	IL	-0.44
SECURITY FS & LA OF CHICAGO	CHICAGO	IL	4.00
SECOND FS & LA OF CHICAGO	CHICAGO	IL	-0.00
SUBURBAN FS & LA	FLOSSMOOR	IL	-0.58
OTTAWA FS & LA	OTTAWA	IL	0.01
HOMEWOOD FS & LA	HOMEWOOD	IL	0.15
CHARLESTON FS & LA	CHARLESTON	IL	-0.28
PROSPECT FS & LA OF NOTHERN ILLINOIS	LOMBARD	IL	0.52
FREEDOM FS & LA	BERWYN	IL	1.93
STANDARD FS & LA OF CHICAGO	CHICAGO	IL	0.13
AMITY FS & LA	TINLEY PARK	IL	-0.27
PEOPLE FS & LA OF CHICAGO	CHICAGO	IL	0.18
CAPITOL FEDERAL SAVNGS OF AMERICA	EVERGREEN PARK	IL	0.10
FIRST FS & LA OF WESTCHESTER	WESTCHESTER	IL	-0.02
FIRESIDE FS & LA	CICERO	IL	-0.30
FIRST FS & LA OF EAST ALTON	EAST ALTON	IL	-0.16
LIBERTY FS & LA OF CHICAGO	CHICAGO	IL	-0.04
THE TALMAN HOME FS & LA OF ILLINOIS	CHICAGO	IL	0.50
CHESTERFIELD FS & LA OF CHICAGO	CHICAGO	IL	0.66
MUTUAL FS & LA OF CHICAGO	CHICAGO	IL	-0.12
ARCHER FS & LA	CHICAGO	IL	1.07
CENTRAL FS & LA	CICERO	IL	-0.08
FIRST FS & LA OF MOLINE	MOLINE	IL	-0.14
FIRST FS & LA OF CHAMPAIGN	CHAMPAIGN	IL	0.23
FAMILY FEDERAL SAVINGS OF ILLINOIS	CICERO	IL	0.76
FIDELITY FS & LA OF BERWYN	BERWYN	IL	2.85
FORT DEARBORN FS & LA	CHICAGO	IL	-0.20
NORWOOD FS & LA	CHICAGO	IL	-0.12
MID AMERICA FS & LA	CICERO	IL	0.52
FIRST FS & LA OF BLOOMINGTON	BLOOMINGTON	IL	1.51
LA GRANGE FS & LA	LA GRANGE	IL	-0.24
HOME FS & LA OF CENTRALIA	CENTRALIA	IL	1.23
FINANCIAL FSB OF OLYMPIA FIELDS	OLYMPIA FIELDS	IL	-0.29
FIRST FS & LA OF CHICAGO	CHICAGO	IL	1.82
FIRST FS & LA OF ELGIN	ELGIN	IL	0.58
HINSDALE FS & LA	HINSDALE	IL	2.27
GREAT AMERICAN FS & LA	OAK PARK	IL	-0.33
FIRST FS & LA OF OTTAWA	OTTAWA	IL	-0.27
HARVARD FS & LA	HARVARD	IL	-0.62
HORIZON FEDERAL SAVINGS BANK	WILMETTE	IL	0.67
KING CITY FS & LA	MT VERNON	IL	10.15
FIRST FS & LA OF DES PLAINES	DES PLAINES	IL	-0.54
SUMMIT FIRST FS & LA	SUMMIT	IL	0.99
FIRST FS & LA OF BARRINGTON	BARRINGTON	IL	-0.23
AURORA FS & LA	AURORA	IL	0.38
BLACK HAWK FS & LA	ROCK ISLAND	IL	0.23

MARENGO FS & LA	MARENGO	IL	3.20
LAWRENCEVILLE FS & LA	LAWRENCEVILLE	IL	2.62
FIRST FS & LA OF COLCHESTER	COLCHESTER	IL	-0.05
FIRST FS & LA OF STREATOR	STREATOR	IL	0.02
JOLIET FS & LA	JOLIET	IL	0.87
CRAGIN FS & LA	CHICAGO	IL	-0.57
FIRST FS & LA OF TUSCOLA	TUSCOLA	IL	2.63
MATTOON FS & LA	MATTOON	IL	-0.90
FIRST FS & LA OF ROCKFORD	ROCKFORD	IL	1.06
CONCORDIA FS & LA	EVERGREEN PARK	IL	3.42
PERU FS & LA	PERU	IL	0.31
HEMLOCK FS & LA	OAK FOREST	IL	0.44
FIRST FS & LA OF BELVIDERE	BELVIDERE	IL	1.33
ILLINOIS-SERVICE FS & LA	CHICAGO	IL	-0.12
CHILLICOTHE FS & LA	CHILLICOTHE	IL	1.92
SOUTHWEST FS & LA OF CHICAGO	CHICAGO	IL	-0.81
FAIRBURY FS & LA	FAIRBURY	IL	0.07
NORTH SIDE FS & LA OF CHICAGO	CHICAGO	IL	-0.25
DE WITT COUNTY FS & LA	CLINTON	IL	-0.51
NORTH FS & LA OF CHICAGO	CHICAGO	IL	-0.47
FIRST FS & LA OF KEWANEE	KEWANEE	IL	-0.05
ELGIN FEDERAL FINANCIAL CENTER A FA	ELGIN	IL	0.08
FIRST FS & LA OF PARIS	PARIS	IL	-0.97
FIRST FS & LA OF SHELBYVILLE	SHELBYVILLE	IL	-1.30
IROQUOIS FS & LA	WATSEKA	IL	1.77
GALVA FS & LA	GALVA	IL	-0.48
COOK COUNTY FS & LA	CHICAGO	IL	-0.09
FIRST FS & LA OF TAYLORVILLE	TAYLORVILLE	IL	-1.69
FIRST FS & LA OF PEKIN	PEKIN	IL	-1.17
BLOOMINGTON FS & LA	BLOOMINGTON	IL	1.38
FIDELITY FS & LA OF CHICAGO	CHICAGO	IL	0.91
HOME FS & LA OF ELGIN	ELGIN	IL	-0.25
HOME FS & LA OF PEORIA	PEORIA	IL	0.92
FIRST FS & LA OF EDWARDSVILLE	EDWARDSVILLE	IL	0.75
PANA FS & LA	PANA	IL	-1.68
MORTON FS & LA	MORTON	IL	-0.51
FIRST FS & LA OF HERRIN	HERRIN	IL	-0.44
ILLINI FS & LA	FAIRVIEW HEIGHTS	IL	0.62
RANTOUL FIRST FS & LA	RANTOUL	IL	1.45
LINCOLN PARK FS & LA	CHICAGO	IL	0.11
ARLINGTON HEIGHTS FS & LA	ARLINGTON HEIGHTS	IL	1.15
FIRST FS & LA OF MACON CO	DECATUR	IL	-0.49
ELMHURST FS & LA	ELMHURST	IL	-1.08
FIRST FS & LA OF PROVISO TOWNSHIP	HILLSIDE	IL	0.34
FIRST FS & LA OF MASCOUTAH	MASCOUTAH	IL	0.02
HOME FS & LA OF ROCKFORD	ROCKFORD	IL	1.70
SALINE VALLEY FIRST FS & LA	HARRISBURG	IL	1.69
HOME FS & LA OF CARBONDALE	CARBONDALE	IL	0.10
MUNCIE FS & LA	MUNCIE	IN	-0.71
UNION FS & LA OF EVANSVILLE	EVANSVILLE	IN	-0.22
WORKINGMENS FS & LA	BLOOMINGTON	IN	-0.49
MUTUAL HOME FS & LA OF MUNCIE	MUNCIE	IN	1.13
PERMANENT FS & LA OF EVANSVILLE	EVANSVILLE	IN	0.47
RAILROADMENS FS & LA OF INDIANAPOLIS	INDIANAPOLIS	IN	-0.15
AMERICAN FS & LA	ANDERSON	IN	-0.46
FIRST FS & LA OF TIPTON COUNTY	TIPTON	IN	-0.58

FIRST FS & LA OF RUSHVILLE	RUSHVILLE	IN	-0.36
OWEN COUNTY FS & LA	SPENCER	IN	-1.14
FOUNTAIN FS & LA	BLOOMINGTON	IN	-0.07
MISHAWAKA FS & LA	MISHAWAKA	IN	0.82
HOME FS & LA	SEYMOUR	IN	1.83
FIRST FS & LA OF LAFAYETTE	LAFAYETTE	IN	1.46
FARMERS AND MECHANICS FS & LA	BLOOMFIELD	IN	-0.80
FIRST FS & LA OF KENDALLVILLE	KENDALLVILLE	IN	6.74
VALLEY FS &LA	TERRE HAUTE	IN	1.07
FIRST FS & LA OF RICHMOND	RICHMOND	IN	-0.17
MADISON FIRST FS & LA	MADISON	IN	-0.75
PIONEER FS & LA	PLYMOUTH	IN	2.94
LINCOLN FS & LA	PLAINFIELD	IN	-0.30
PERPETUAL FS & LA	LAWRENCEBURG	IN	1.70
HOMETOWN FS & LA	DELPHI	IN	0.14
FIRST FS & LA	ANGOLA	IN	0.35
INDIANA FS & LA	VALPARAISO	IN	3.75
FIRST FS & LA OF PERU	PERU	IN	1.55
FIRST FS & LA OF LOGANSPORT	LOGANSPORT	IN	0.87
MOORESVILLE FS & LA	MOORESVILLE	IN	1.10
COMMUNITY FIRST FS & LA	NEW ALBANY	IN	-0.25
SHELBY FS & LA	INDIANAPOLIS	IN	0.69
FIRST FS & LA OF HAMMOND	HAMMOND	IN	-0.30
FIRST FS & LA OF KOKOMO	KOKOMO	IN	2.41
BEDFORD FS & LA	BEDFORD	IN	-1.62
FIRST FEDERAL SAVINGS BANK OF INDIANA	GARY	IN	-0.15
HOBART FS & LA	HOBART	IN	0.08
FIRST FS & LA OF EVANSVILLE	EVANSVILLE	IN	-0.17
FIRST INDIANA FEDERAL SAVINGS BANK	INDIANAPOLIS	IN	0.38
FIRST FS & LA OF LA PORTE CO	MICHIGAN CITY	IN	1.06
CITIZENS FS & LA	HAMMOND	IN	0.07
UNION FS & LA	LEBANON	IN	-0.66
CALUMET FS & LA	HAMMOND	IN	-0.79
UNION FS & LA	INDIANAPOLIS	IN	0.64
PEOPLES FS & LA	EAST CHICAGO	IN	2.86
TOWER FS & LA	SOUTH BEND	IN	1.30
EVANSVILLE FS & LA	EVANSVILLE	IN	1.20
SECURITY FS & LA OF LAKE CO	EAST CHICAGO	IN	-0.39
MUTUAL FS & LA	TERRE HAUTE	IN	-0.08
HERITAGE FS & LA	ELWOOD	IN	-0.23
UNITED FS & LA OF VINCENNES	VINCENNES	IN	1.65
MID-WEST FS & LA	EVANSVILLE	IN	-0.34
FIRST FS & LA OF VINCENNES	VINCENNES	IN	1.47
REGIONAL FS & LA	NEW ALBANY	IN	0.04
FIDELITY FS & LA OF INDIANA	MARION	IN	-0.19
PERU FS & LA	PERU	IN	2.17
FORT BRANCH FS & LA	FORT BRANCH	IN	-0.55
FAYETTE FS & LA OF CONNERSVILLE	CONNERSVILLE	IN	1.62
SOBIESKI FS & LA OF SOUTH BEND	SOUTH BEND	IN	0.10
FIRST FS & LA OF HUNTINGTON	HUNTINGTON	IN	0.74
FIRST FS & LA OF WASHINGTON	WASHINGTON	IN	0.46
FIRST FS & LA OF MARION	MARION	IN	-0.90
CITIZENS FS & LA OF NEW CASTLE	NEWCASTLE	IN	2.64
FIRST FS & LA OF SHELBYVILLE	SHELBYVILLE	IN	-0.00
PEOPLES FS & LA OF DEKALB COUNTY	AUBURN	IN	1.87
WARREN COUNTY FS & LA	WILLIAMSPORT	IN	0.11

UNION FS & LA OF SHELBYVILLE	SHELBYVILLE	IN	-0.48
GRIFFITH FS & LA	GRIFFITH	IN	-0.46
FIRST FS & LA OF WABASH	WABASH	IN	6.48
FIRST FS & LA OF CLARK CO	JEFFERSONVILLE	IN	4.23
FIRST FS & LA OF GREENSBURG	GREENSBURG	IN	-0.05
GREENCASTLE FS & LA	GREENCASTLE	IN	1.12
UNION FS & LA	CRAWFORDSVILLE	IN	-0.44
KOKOMO FS & LA	KOKOMO	IN	-1.03
FIDELITY FS & LA OF SEYMOUR	SEYMOUR	IN	6.94
LAKE FS & LA	HAMMOND	IN	-0.27
MITE FS & LA	MADISON	IN	-0.97
FIRST FS & LA OF CORYDON	CORYDON	IN	9.50
FIRST UNITED FS & LA	JASPER	IN	4.79
FIRST COMMUNITY FS & LA	WINFIELD	KS	2.27
HOME FS & LA	MANHATTAN	KS	1.01
FIRST FS & LA	OSAWATOMIE	KS	-0.36
FIRST FS & LA	INDEPENDENCE	KS	1.31
CAPITOL FS & LA	TOPEKA	KS	-0.33
EUREKA FS & LA	EUREKA	KS	0.23
MID-AMERICA FS & LA	PARSONS	KS	-0.13
FIRST FS & LA	OLATHE	KS	-0.01
LANDMARK FEDERAL SAVINGS ASSOCIATION	DODGE CITY	KS	0.56
SHAWNEE FS & LA	TOPEKA	KS	2.69
MID-CONTINENT FS & LA	EL DORADO	KS	3.47
FIRST FS & LA	PITTSBURG	KS	0.04
MID KANSAS FS & LA	WICHITA	KS	0.80
WICHITA FS & LA	WICHITA	KS	-0.63
FIRST FS & LA	WAKEENEY	KS	0.30
FIRST FS & LA	HUTCHINSON	KS	-0.84
MANHATTAN FS & LA	MANHATTAN	KS	-0.51
FIRST FS & LA	COFFEYVILLE	KS	-0.20
INTER-STATE FS & LA	KANSAS CITY	KS	-0.65
FIRST FSB OF NEWTON, KANSAS	NEWTON	KS	0.97
CORONADO FS & LA	KANSAS CITY	KS	1.71
CARDINAL FS & LA	OWENSBORO	KY	-0.42
GREAT FINANCIAL FEDERAL	LOUISVILLE	KY	1.99
THE CUMBERLAND FS & LA	LOUISVILLE	KY	1.17
COLUMBIA FS & LA	FORT MITCHELL	KY	-0.53
SOUTH GATE FS & LA	FT MITCHELL	KY	-0.39
CITIZENS FS & LA	COVINGTON	KY	-0.36
FUTURE FS & LA	LOUISVILLE	KY	1.84
LINCOLN FS & LA	LOUISVILLE	KY	3.57
KENTUCKY FS & LA	COVINGTON	KY	1.34
HENDERSON HOME FS & LA	HENDERSON	KY	1.52
FIRST FS & LA	MAYFIELD	KY	1.44
SUBURBAN FS & LA	COVINGTON	KY	-0.28
JESSAMINE FIRST FS & LA	NICHOLASVILLE	KY	0.95
ROSEDALE FS & LA OF COVINGTON	ERLANGER	KY	0.02
FIRST FS & LA	COVINGTON	KY	1.17
LEXINGTON FS & LA	LEXINGTON	KY	-0.10
FIRST FS & LA	RICHMOND	KY	3.11
RUSSELL FS & LA	RUSSELL	KY	-0.56
LINCOLN COUNTY FS & LA	STANFORD	KY	0.28
FIRST FS & LA	ELIZABETHTOWN	KY	1.61
FIRST FS & LA	BOWLING GREEN	KY	-0.70
MIDDLESBORO FS & LA	MIDDLESBORO	KY	0.29

FIRST FS & LA	RUSSELLVILLE	KY	-0.44
FIRST FS & LA	CENTRAL CITY	KY	3.28
LARUE FS & LA	HODGENVILLE	KY	0.01
LONDON FS & LA	LONDON	KY	15.06
FIRST FS & LA	PINEVILLE	KY	6.69
OHIO COUNTY FS & LA	HARTFORD	KY	0.01
SUNRISE FS & LA	NEWPORT	KY	-0.12
KENTUCKY ENTERPRISE FS & LA	NEWPORT	KY	-0.69
WINCHESTER FS & LA	WINCHESTER	KY	-1.62
PRINCETON FS & LA	PRINCETON	KY	14.46
FIRST FS & LA	HOPKINSVILLE	KY	0.76
CATLETTSBURG FS & LA	CATLETTSBURG	KY	-0.28
FIRST FS & LA	LEXINGTON	KY	-0.43
FAMILY FS & LA	PAINTSVILLE	KY	-1.10
FIRST FS & LA	ASHLAND	KY	-0.17
FIRST FS & LA	PADUCAH	KY	1.33
CARROLLTON FS & LA	CARROLLTON	KY	-0.51
HOME FS & LA	ASHLAND	KY	-0.14
ASHLAND FS & LA	ASHLAND	KY	-1.18
FIRST FS & LA	FRANKFORT	KY	-0.78
FIRST FEDERAL SAVINGS BANK	CAMPBELLSVILLE	KY	6.06
HOPKINSVILLE FEDERAL SAVINGS BANK	HOPKINSVILLE	KY	-0.29
PEOPLES FS & LA	BELLEVUE	KY	0.07
MUTUAL FS & LA	SOMERSET	KY	3.29
PIONEER FS & LA OF WINCHESTER	WINCHESTER	KY	2.14
HOME FS & LA	PADUCAH	KY	0.48
UNITED FS & LA	PRESTONSBURG	KY	-0.30
FIRST FS & LA OF HOPKINS COUNTY	MADISONVILLE	KY	0.07
BLUE GRASS FS & LA	PARIS	KY	-0.55
FIRST FS & LA	CYNTHIANA	KY	0.71
CENTRAL KENTUCKY FS & LA	DANVILLE	KY	-0.55
FIRST FS & LA	HAZARD	KY	-0.40
HOME FS & LA	MIDDLEBORO	KY	-1.17
COMMONWEALTH BANK, FSB	MT STERLING	KY	-0.01
FIRST FS & LA	LEITCHFIELD	KY	-0.42
HARRODSBURG FIRST FS & LA	HARRODSBURG	KY	-0.37
FIRST FS & LA	MOREHEAD	KY	-1.01
PENDLETON FS & LA	FALMOUTH	KY	-0.41
BULLITT FS & LA	SHEPHERDSVILLE	KY	-1.04
FIRST LANCASTER FS & LA	LANCASTER	KY	-0.11
ESTILL FS & LA	IRVINE	KY	0.33
NELSON COUNTY FS & LA	BARDSTOWN	KY	-1.10
HARLAN FS & LA	HARLAN	KY	2.95
FIRST FS & LA	SHREVEPORT	LA	0.91
HOME FS & LA	SHREVEPORT	LA	4.77
DESOTO FS & LA	MANSFIELD	LA	2.58
FIRST FS & LA	NATCHITOCHES	LA	2.04
JONESBORO FS & LA	JONESBORO	LA	8.59
SUN BELT FEDERAL BANK, FSB	LAKE PROVIDENCE	LA	-0.40
TECHE FS & LA	FRANKLIN	LA	0.70
FIRST FS & LA	WINNFIELD	LA	0.74
JENNINGS FS & LA	JENNINGS	LA	0.13
FIRST FS & LA	ALEXANDRIA	LA	2.29
FIRST FS & LA	LAKE CHARLES	LA	-0.00
FIRST FS & LA	THIBODAUX	LA	-0.21
FIRST FS & LA	BATON ROUGE	LA	-0.24

FIRST FS & LA	OPELOUSAS	LA	-0.45
UNION FS & LA	LAFAYETTE	LA	0.04
FIRST FS & LA	NEW IBERIA	LA	-0.51
UNITED FS & LA	VIDALIA	LA	0.47
FIRST FS & LA OF ALLEN PARISH	OAKDALE	LA	10.44
UNITED FS & LA	NEW ORLEANS	LA	1.45
NEW ORLEANS FS & LA	NEW ORLEANS	LA	8.07
CITIZENS FS & LA OF RICHLAND PARISH	RAYVILLE	LA	9.03
GULF FS & LA OF JEFFERSON PARISH	METAIRIE	LA	14.48
FIRST FS & LA	BREAUX BRIDGE	LA	-1.73
FIRST FEDERAL SAVINGS BANK	SLIDELL	LA	26.76
TWIN CITY SAVINGS BANK, FSB	WEST MONROE	LA	-2.51
FIRST FS & LA	EUNICE	LA	1.62
PEOPLES FS & LA OF THIBODAUX	THIBODAUX	LA	5.30
FIRST FS & LA	NEW ORLEANS	LA	-1.08
AUDUBON FS & LA	NEW ORLEANS	LA	0.35
THE FEDERAL SAVINGS BANK	VILLE PLATTE	LA	27.67
ELMWOOD FS & LA	HARAHAN	LA	-0.50
FOXBORO FS & LA	FOXBOROUGH	MA	-0.27
WALTHAM FS & LA	WALTHAM	MA	-0.48
WINTER HILL FS & LA	SOMERVILLE	MA	-0.52
SECURITY FS & LA	BROCKTON	MA	-0.09
MIDDLESEX FS & LA	SOMERVILLE	MA	-0.27
NATICK FS & LA	NATICK	MA	-0.58
REVERE FS & LA	REVERE	MA	-0.49
COLONIAL FS & LA	QUINCY	MA	0.77
BOSTON FEDERAL SAVINGS BANK	BOSTON	MA	-0.54
LEADER FS & LA	LEXINGTON	MA	1.22
UNION FS & LA	BOSTON	MA	-0.94
COMMONWEALTH FEDERAL SAVINGS BANK	LOWELL	MA	-0.98
PLYMOUTH FEDERAL SAVINGS BANK	PLYMOUTH	MA	3.02
HOME OWNERS FS & LA	BOSTON	MA	0.24
SECOND FEDERAL SAVINGS BANK	BOSTON	MA	-0.27
BAY STATE FEDERAL SAVINGS BANK	BROOKLINE	MA	-0.19
MUTUAL FSB OF PLYMOUTH COUNTY	WHITMAN	MA	-0.58
EDWARD EVERETT FEDERAL SAVINGS BANK	BOSTON	MA	2.48
MILFORD FS & LA	MILFORD	MA	-0.45
PEOPLES FEDERAL SAVINGS BANK	BOSTON	MA	-0.49
FAMILY FS & LA	FITCHBURG	MA	-0.33
FIRST FEDERAL SAVINGS BANK OF AMERICA	FALL RIVER	MA	-0.10
HOME FS & LA	WORCESTER	MA	-0.60
SCITUATE FS & LA	SCITUATE	MA	-2.22
FIRST FS & LA	HYANNIS	MA	2.02
FIRST FS & LA	CUMBERLAND	MD	0.74
MARYLAND FS & LA	HYATTSVILLE	MD	0.21
LEEDS FS & LA	BALTIMORE	MD	-0.00
FRATERNITY FS & LA	BALTIMORE	MD	-0.08
BRADFORD FS & LA	BALTIMORE	MD	-0.53
FIDELITY FS & LA	BALTIMORE	MD	4.30
FIRST FS & LA	ANNAPOLIS	MD	3.20
ANNAPOLIS FS & LA	ANNAPOLIS	MD	1.18
BALTIMORE FS & LA	BALTIMORE	MD	1.77
IRVINGTON FS & LA	BALTIMORE	MD	1.43
HAMILTON FS & LA	BALTIMORE	MD	-0.21
ROYAL OAK FS & LA	BALTIMORE	MD	-0.02
CHESAPEAKE FS & LA	BALTIMORE	MD	0.52

LOYOLA FS & LA	BALTIMORE	MD	4.70
FAIRVIEW FS & LA	ELLICOTT CITY	MD	2.08
DRUID HILL FS & LA	BALTIMORE	MD	0.26
STATE-SUN FS & LA	BALTIMORE	MD	0.17
ARUNDEL FS & LA	BALTIMORE	MD	-0.55
ROSEDALE FS & LA	BALTIMORE	MD	-0.42
WYMAN PARK FS & LA	LUTHERVILLE	MD	0.02
FIRST FEDERAL OF MD, FSA	HAGERSTOWN	MD	0.50
VERMONT FS & LA	BALTIMORE	MD	0.98
HOME FS & LA	HAGERSTOWN	MD	-0.04
LIBERTY FS & LA	BALTIMORE	MD	1.93
ATLANTIC FS & LA	BALTIMORE	MD	0.19
HARBOR FS & LA	BALTIMORE	MD	8.47
FIRST SHORE FS & LA	SALISBURY	MD	-0.41
SUBURBAN FS & LA OF LANHAM	LANDOVER HILLS	MD	-0.14
GERMANIA FS & LA	BALTIMORE	MD	0.39
PATAPSCO FS & LA	DUNDALK	MD	-0.06
TRI-COUNTY FS & LA	WALDORF	MD	1.54
JARRETTSVILLE FS & LA	JARRETTSVILLE	MD	-0.15
WESTVIEW FS & LA	BALTIMORE	MD	-0.98
REISTERSTOWN FS & LA	REISTERSTOWN	MD	0.60
NORTH ANNE ARUNDEL FS & LA	PASADENA	MD	2.63
CECIL FS & LA	ELKTON	MD	-0.02
GARIBALDI FS & LA	BALTIMORE	MD	-1.80
ODENTON FS & LA	ODENTON	MD	2.22
ADVANCE FS & LA	BALTIMORE	MD	3.72
FIRST FS & LA	BATH	ME	-1.37
FIRST FS & LA	LEWISTON	ME	-1.93
KENNEBEC FS & LA	WATERVILLE	ME	0.21
AROOSTOOK COUNTY FS & LA	CARIBOU	ME	1.12
CALAIS FS & LA	CALAIS	ME	1.03
FIRST BRUNSWICK FS & LA	BRUNSWICK	ME	1.47
FIRST FS & LA OF OLD TOWN	OLD TOWN	ME	0.48
FAMILY FS & LA	SAGINAW	MI	-0.56
STANDARD FS & LA	TROY	MI	4.62
GRAND RAPIDS MUTUAL FS & LA	GRAND RAPIDS	MI	1.19
FIRST FS & LA OF KALAMAZOO	KALAMAZOO	MI	0.55
GREAT LAKES FS & LA	ANN ARBOR	MI	4.26
FIDELITY FS & LA	KALAMAZOO	MI	0.65
MUTUAL HOME FS & LA	GRAND RAPIDS	MI	0.40
FIRST FS & LA OF LENAWEE COUNTY	ADRIAN	MI	0.12
WOLVERINE FS&LA	MIDLAND	MI	1.28
FIRST FEDERAL OF MICHIGAN	DETROIT	MI	-0.16
BRANCH COUNTY FS & LA	COLDWATER	MI	0.75
PEOPLES SAVINGS BANK, FSB	MONROE	MI	2.18
MUSKEGON FS & LA	MUSKEGON	MI	0.63
DOWN RIVER FS & LA	TAYLOR	MI	0.50
FIRST FEDERAL SAVINGS BANK & TRUST	PONTIAC	MI	1.84
FIRST DEARBORN, FA	DEARBORN	MI	0.51
LUDINGTON FS & LA	LUDINGTON	MI	-0.03
EATON FS & LA	CHARLOTTE	MI	0.91
DEARBORN FS & LA	DEARBORN	MI	-0.00
WEST SIDE FS & LA OF GRAND RAPIDS	GRAND RAPIDS	MI	0.00
LA SALLE FS & LA OF BUCHANAN	BUCHANAN	MI	0.19
DETROIT FS & LA	DETROIT	MI	17.70
CITIZENS FS & LA OF PORT HURON	PORT HURON	MI	1.08

EMPIRE OF AMERICA FSA	SOUTHFIELD	MI	8.84
HOME FS & LA	DETROIT	MI	0.60
COLONIAL FS & LA	GROSSE POINTE WOODS	MI	0.19
FIRST FS & LA OF ALPENA	ALPENA	MI	0.69
FIRST FS & LA OF LIVINGSTON CO	HOWELL	MI	-0.60
WASHINGTON FS & LA OF STILLWATER	STILLWATER	MN	-0.45
FIRST FS & LA OF BEMIDJI	BEMIDJI	MN	1.59
FAIRMONT FS & LA	FAIRMONT	MN	1.73
TWIN CITY FS & LA	MINNEAPOLIS	MN	5.54
MINNESOTA FS & LA	ST PAUL	MN	1.99
FIRST FS & LA OF MINNEAPOLIS	MINNEAPOLIS	MN	1.25
FIRST FS & LA OF DULUTH	DULUTH	MN	0.69
SECURITY FS & LA	ST CLOUD	MN	1.72
FIRST STATE FS & LA	HUTCHINSON	MN	0.95
FIRST FS & LA OF THEIF RIVER FALLS	THIEF RIVER FALLS	MN	0.20
HOME FEDERAL SAVINGS BANK	SPRING VALLEY	MN	0.56
LAKE CITY FS & LA	LAKE CITY	MN	-0.38
LAKELAND FS & LA OF DETROIT LAKES	DETROIT LAKES	MN	1.10
AMERICAN FS & LA OF EAST GRAND FORKS	EAST GRAND FORKS	MN	1.81
WELLS FS & LA	WELLS	MN	0.32
COMMUNITY FS & LA OF LITTLE FALLS MN	LITTLE FALLS	MN	-0.22
WINDOM FS & LA	WINDOM	MN	1.98
ST LOUIS COUNTY FS & LA	DULUTH	MN	0.98
WORTHINGTON FS & LA	WORTHINGTON	MN	2.92
FIRST FS & LA OF BRAINERD	BRAINERD	MN	7.24
FIRST FS & LA OF HIBBING	HIBBING	MN	4.71
MIDWEST FS & LA OF MINNEAPOLIS	MINNEAPOLIS	MN	3.76
MIDLAND FS & LA	MOORHEAD	MN	3.69
UNITED FINANCIAL, F.A.	ROCHESTER	MN	2.08
FIRST FS & LA OF GRAND RAPIDS	GRAND RAPIDS	MN	3.47
MID-CENTRAL FS & LA	WADENA	MN	0.83
FIRST FS & LA OF MORRIS-BRECKENRIDGE	MORRIS	MN	1.25
ST JAMES FS & LA	ST JAMES	MN	0.09
QUEEN CITY FS & LA	VIRGINIA	MN	0.20
FARIBAULT FS & LA	FARIBAULT	MN	12.22
FALLS FS & LA	INTERNATIONAL FALLS	MN	-1.58
FIRST FS & LA OF HASTINGS	HASTINGS	MN	0.88
SAFETY FS & LA OF KANSAS CITY	KANSAS CITY	MO	-0.14
NEW AGE FS & LA OF ST LOUIS	ST LOUIS	MO	-0.12
FIRST FS & LA OF SOUTHEAST MO	CAPE GIRARDEAU	MO	0.25
BLUE VALLEY FS & LA	KANSAS CITY	MO	-0.52
OZARKS FS & LA	FARMINGTON	MO	-0.79
ROOSEVELT FS & LA	CHESTERFIELD	MO	0.98
WASHINGTON 1ST FS & LA OF GR ST LOUIS	NORMANDY	MO	-0.62
SENTINEL FS & LA OF KANSAS CITY	KANSAS CITY	MO	-0.22
GUARANTY FS & LA OF SPRINGFIELD	SPRINGFIELD	MO	-0.26
ECONOMY FS & LA OF ST LOUIS	ST LOUIS	MO	0.05
MIDWEST FS & LA OF ST JOSEPH	ST JOSEPH	MO	0.06
CONSERVATIVE FS & LA	ST LOUIS	MO	0.16
CLAYTON FS & LA	CLAYTON	MO	2.17
COMMUNITY FS & LA	ST LOUIS	MO	1.54
ST LOUIS COUNTY FS & LA OF FERGUSON	FERGUSON	MO	0.00
BROOKFIELD FS & LA	BROOKFIELD	MO	0.22
BOONE COUNTY FS & LA OF CENTRALIA	CENTRALIA	MO	1.27
CASS FS & LA OF ST LOUIS	FLORISSANT	MO	-0.24
FIRST FS & LA OF KANSAS CITY	KANSAS CITY	MO	-0.10

INVESTORS FS & LA	CHILLICOTHE	MO	2.65
ST LOUIS FS & LA	CLAYTON	MO	0.39
RELIANCE FS & LA OF ST LOUIS CO	ST LOUIS	MO	0.14
FINANCIAL FS & LA	JOPLIN	MO	-0.65
COLONIAL FS & LA	CAPE GIRARDEAU	MO	0.39
HOME FS & LA OF ST LOUIS COUNTY	ST LOUIS	MO	0.18
CENTRAL FS & LA OF ROLLA	ROLLA	MO	-1.12
AMERICAN FS & LA OF SULLIVAN	SULLIVAN	MO	-0.34
OZARK RIVERS FS & LA	SALEM	MO	-0.73
PROGRESSIVE FEDERAL SAVINGS BANK	HOUSTON	MO	7.17
CLEVELAND FS & LA	CLEVELAND	MS	-0.56
NATCHEZ FIRST FS & LA	NATCHEZ	MS	-0.44
COMMUNITY FS & LA	TUPELO	MS	-0.11
INTER-CITY FS & LA	LOUISVILLE	MS	-1.66
FIRST FS & LA	BELZONI	MS	0.28
FIRST FS & LA	STARKVILLE	MS	-0.49
AMORY FS & LA	AMORY	MS	-0.31
FIRST FS & LA	COLUMBUS	MS	4.67
FIRST MAGNOLIA FS & LA	HATTIESBURG	MS	-0.77
FIRST FS & LA	MCCOMB	MS	1.32
UNIFIRST FS & LA	JACKSON	MS	-0.52
PANOLA COUNTY FS & LA	BATESVILLE	MS	-1.17
FIRST FS & LA	ABERDEEN	MS	-0.75
FIRST FS & LA	BILOXI	MS	-1.19
LAUREL FS & LA	LAUREL	MS	0.97
PEOPLES FS & LA	BAY ST LOUIS	MS	-0.17
FIRST FS & LA	PASCAGOULA	MS	-0.80
FIRST FS & LA	GREENWOOD	MS	0.17
FIDELITY FS & LA	CORINTH	MS	2.07
FIRST FS & LA OF MARION CO	COLUMBIA	MS	4.93
STATE MUTUAL FS & LA	JACKSON	MS	6.16
SECURITY FS & LA	BILLINGS	MT	0.53
UNITED SAVINGS BANK, FA	GREAT FALLS	MT	0.55
EMPIRE FS & LA	LIVINGSTON	MT	0.26
FIRST FS & LA	MISSOULA	MT	1.29
GREAT FALLS FS & LA	GREAT FALLS	MT	0.66
WESTERN FS & LA	MISSOULA	MT	1.53
PIONEER FS & LA	DEER LODGE	MT	0.31
FIRST FS & LA	BILLINGS	MT	1.48
AMERICAN FS & LA OF HELENA	HELENA	MT	3.22
FIRST FEDERAL SAVINGS BANK OF MONTANA	KALISPELL	MT	8.29
PIEDMONT FS & LA	WINSTON-SALEM	NC	-0.73
RALEIGH FS & LA	RALEIGH	NC	0.27
FIRST FS & LA	BURLINGTON	NC	-0.47
FIRST FS & LA	DURHAM	NC	-0.08
HOME FS & LA	FAYETTEVILLE	NC	-2.32
HOME FS & LA	CHARLOTTE	NC	-0.25
FIRST FS & LA	REIDSVILLE	NC	-0.65
FIRST FS & LA	FOREST CITY	NC	-3.05
FIRST FS & LA	SOUTHERN PINES	NC	-1.30
FIRST HOME FS & LA	GREENSBORO	NC	0.45
WORKMENS FS & LA	MOUNT AIRY	NC	0.52
FIRST FS & LA	WINSTON-SALEM	NC	0.02
COMMUNITY FS & LA	BURLINGTON	NC	-0.13
FIRST FS & LA	HENDERSONVILLE	NC	0.50
ROSEMARY FS & LA	ROANOKE RAPIDS	NC	-2.17

TRYON FS & LA	TRYON	NC	0.58
FIRST AMERICAN FS & LA	GREENSBORO	NC	0.40
ASHEVILLE FS & LA	ASHEVILLE	NC	-0.17
MOORESVILLE FS & LA	MOORESVILLE	NC	0.14
BREVARD FS & LA	BREVARD	NC	0.06
FIRST FS & LA OF CATAWBA CO	CONOVER	NC	2.66
CITIZENS FS & LA	RUTHERFORDTON	NC	-2.26
FIRST FS & LA	CHARLOTTE	NC	0.08
FIRST FS & LA	LINCOLNTON	NC	-0.36
FIRST FEDERAL SAVINGS BK OF NC, FSB	SHELBY	NC	-2.12
FIRST FS & LA	SANFORD	NC	-0.23
FIRST FS & LA	ROANOKE RAPIDS	NC	-3.62
AMERICAN FS & LA	GREENSBORO	NC	1.69
MIDWEST FEDERAL SAVINGS BANK	MINOT	ND	0.86
FIRST FS & LA OF FARGO	FARGO	ND	0.31
NORTHWESTERN FS & LA OF FARGO	FARGO	ND	4.10
FIRST FS & LA OF BISMARCK	BISMARCK	ND	-0.55
FIRST FS & LA OF GRAND FORKS & MINOT	GRAND FORKS	ND	2.36
CUSTER FS & LA	BROKEN BOW	NE	1.54
MIDWEST FS & LA	NEBRASKA CITY	NE	0.79
FIRST FS & LA	OMAHA	NE	3.82
FIRST FS & LA	LINCOLN	NE	1.39
SIDNEY FS & LA	SIDNEY	NE	-0.35
PLATTE VALLEY FS & LA	GERING	NE	0.89
HOME FS & LA	GRAND ISLAND	NE	5.24
LINCOLN FS & LA	LINCOLN	NE	-0.11
HOME FS & LA	HASTINGS	NE	0.31
COLUMBUS FEDERAL SAVINGS BANK	COLUMBUS	NE	0.90
AMERICAN CHARTER FS & LA	LINCOLN	NE	-0.41
EQUITABLE FS & LA	FREMONT	NE	0.52
PIONEER FS & LA	PLATTSMOUTH	NE	-0.69
COMMERCIAL FS & LA	OMAHA	NE	1.25
NILE VALLEY FS & LA	SCOTTSBLUFF	NE	-0.22
HOME FS & LA	LEXINGTON	NE	0.56
FIRST FS & LA	YORK	NE	1.85
UNITED FEDERAL BANK, FSB	MANCHESTER	NH	3.80
PROFILE BANK, FSB	ROCHESTER	NH	-0.95
NASHUA FS & LA	NASHUA	NH	-0.49
LACONIA FS & LA	LACONIA	NH	4.17
FEDERAL SAVINGS BANK	DOVER	NH	1.54
FIRST FEDERAL SAVINGS BANK FSB	NASHUA	NH	1.10
GLOUCESTER COUNTY FS & LA	WASHINGTON TOWNSHIP	NJ	-0.41
CRESTMONT FS & LA	MAPLEWOOD	NJ	0.86
OCEAN FS & LA	BRICK TOWN	NJ	0.12
COLLECTIVE FS & LA	EGG HARBOR CITY	NJ	-2.16
LINCOLN FS & LA	WESTFIELD	NJ	1.57
FIRST FS&LA OF MONTCLAIR	MONTCLAIR	NJ	-0.70
AXIA FS & LA	RAHWAY	NJ	0.73
KEARNY FS & LA	KEARNY	NJ	-0.54
FIRST FS&LA OF HAMMONTON	HAMMONTON	NJ	2.92
FIRST FS & LA	PATERSON	NJ	-0.54
COMMUNITY FS & LA	RAMSEY	NJ	-0.62
SUMMIT FS & LA	SUMMIT	NJ	-0.00
MAINSTAY FS & LA	RED BANK	NJ	-0.09
BERKELEY FS&LA OF NEW JERSEY	MILLBURN	NJ	16.04
MONARCH FS & LA	KEARNY	NJ	0.09

METROPOLITAN FS & LA	DENVILLE	NJ	-0.17
CENTURY FS & LA OF BRIDGETON	BRIDGETON	NJ	-0.02
TUCUMCARI FS & LA	TUCUMCARI	NM	-0.08
ALAMOGORDO FS & LA	ALAMOGORDO	NM	0.62
FIRST FS & LA	CLOVIS	NM	0.63
HOME FS & LA OF DEMING	DEMING	NM	0.90
GALLUP FS & LA	GALLUP	NM	-0.98
ALBUQUERQUE FS & LA	ALBUQUERQUE	NM	2.34
FIRST FS & LA	LAS VEGAS	NM	3.37
SECURITY FS & LA	ALBUQUERQUE	NM	10.92
FIRST FS & LA OF NEVADA	RENO	NV	-0.38
FIDELITY NEW YORK, FA	FLORAL PARK	NY	5.19
GENEVA FS & LA	GENEVA	NY	-0.39
GLOVERSVILLE FS & LA	GLOVERSVILLE	NY	2.92
HAMILTON FS & LA	BROOKLYN	NY	1.08
CHAMPLAIN VALLEY FS&LA OF PLATTSBURGH	PLATTSBURGH	NY	1.85
WALDEN FS & LA	WALDEN	NY	-1.20
SARANAC LAKE FS & LA	SARANAC LAKE	NY	2.02
HIGHLAND FALLS FS & LA	HIGHLAND FALLS	NY	-0.49
SOUND FS & LA	MAMARONECK	NY	1.43
FLUSHING FS & LA	FLUSHING	NY	7.65
CENTURY FS & LA OF LONG ISLAND	CEDARHURST	NY	-0.33
LARCHMONT FS & LA	LARCHMONT	NY	0.97
FIRST FS&LA OF ROCHESTER	ROCHESTER	NY	-0.92
FIRST FS&LA OF MIDDLETOWN	MIDDLETOWN	NY	0.52
FIRST FS&LA OF SUFFERN	SUFFERN	NY	-0.66
SUBURBIA FS & LA	GARDEN CITY	NY	-0.56
SUNNYSIDE FS&LA OF IRVINGTON	IRVINGTON	NY	-0.17
WALLKILL VALLEY FS & LA	WALLKILL	NY	0.13
BAYSIDE FS & LA	BAYSIDE	NY	0.79
BEACON FS&LA	BALDWIN	NY	0.58
THE LONG ISLAND S/B OF CENTEREACH FSB	CENTEREACH	NY	-1.69
BANKERS FS & LA	NEW YORK	NY	0.50
FOURTH FS&LA OF NEW YORK	NEW YORK	NY	0.02
RELIANCE FEDERAL SAVINGS BANK	GARDEN CITY	NY	2.22
WESTCHESTER FEDERAL SAVINGS BANK	NEW ROCHELLE	NY	5.22
SUNRISE FS & LA	FARMINGDALE	NY	-0.38
BROOKLYN FS & LA	BROOKLYN	NY	0.04
WESTBURY FS & LA	WESTBURY	NY	0.52
ALBION FS & LA	ALBION	NY	-0.90
FLATBUSH FS&LA OF BROOKLYN	BROOKLYN	NY	0.52
SALAMANCA FS & LA	SALAMANCA	NY	0.22
SENECA FS & LA	BALDWINSVILLE	NY	-0.17
EASTERN FS&LA OF SAYVILLE	SAYVILLE	NY	1.84
HOME FEDERAL SAVINGS BANK	RIDGEWOOD	NY	0.63
AMSTERDAM FS & LA	AMSTERDAM	NY	1.53
ASTORIA FS & LA	LONG ISLAND CITY	NY	-0.09
CENTRAL FEDERAL SAVINGS FSB	LONG BEACH	NY	3.04
FIRST FS&LA OF PEEKSKILL	PEEKSKILL	NY	1.34
MASPETH FS & LA	MASPETH	NY	-0.01
CARVER FS&LA	NEW YORK	NY	0.22
PONCE DE LEON FS & LA	BRONX	NY	0.05
FIRST FS & LA	GALION	OH	2.53
FIRST FS & LA	AKRON	OH	-0.26
FIRST FS & LA	CINCINNATI	OH	-0.93
SPRINGFIELD FS & LA	SPRINGFIELD	OH	-0.55

MERCHANTS AND MECHANICS FS & LA	SPRINGFIELD	OH	0.18
CONTINENTAL FS & LA	CLEVELAND	OH	1.07
FAIRFIELD FS & LA	LANCASTER	OH	-0.55
BRAMBLE FS & LA	CINCINNATI	OH	0.00
FIRST FS & LA	MT VERNON	OH	1.81
FREEDOM FS & LA	COLUMBUS	OH	-0.10
FIRST FS & LA OF WOOD COUNTY	BOWLING GREEN	OH	1.71
HIGHLAND FS & LA	MARIEMONT	OH	0.02
GATEWAY FS & LA	CINCINNATI	OH	0.35
LAWRENCE FS & LA	IRONTON	OH	-0.39
DOLLAR FEDERAL SAVINGS BANK	HAMILTON	OH	0.80
FIDELITY FS & LA	CINCINNATI	OH	0.69
GREENVILLE FS & LA	GREENVILLE	OH	-0.18
BUSINESS MENS FS & LA	CINCINNATI	OH	-0.93
ENTERPRISE FS & LA	LOCKLAND	OH	0.81
FIRST FS & LA	WASHINGTON C H	OH	0.06
COMMUNITY FS & LA	HAMILTON	OH	2.71
CITIZENS FS & LA	BELLEFONTAINE	OH	-0.15
PEOPLES FS & LA	WOOSTER	OH	0.51
FIRST FS & LA	WARREN	OH	-0.28
WARSAW FS & LA	CINCINNATI	OH	-0.10
PARK VIEW FS & LA	CLEVELAND	OH	3.67
CENTRAL FS & LA	WELLSVILLE	OH	-0.13
SUBURBAN FS & LA	CINCINNATI	OH	-0.26
HOME FS & LA	HAMILTON	OH	1.52
MCKINLEY FS & LA	NILES	OH	-0.58
CITIZENS FS & LA	CLEVELAND	OH	0.24
CINCINNATI FS & LA	CINCINNATI	OH	-0.45
COLUMBIA FS & LA	HAMILTON	OH	0.10
BELMONT FS & LA	BELLAIRE	OH	1.31
HOME FS & LA	NILES	OH	-0.38
CENTURY FS & LA	PARMA	OH	-1.47
COLONIAL FS & LA OF BELLEFONTAINE	BELLEFONTAINE	OH	1.41
FIRST FS & LA	LIMA	OH	0.52
LIBERTY FS & LA	IRONTON	OH	0.32
THRIFT FS & LA	CLEVELAND	OH	2.10
MIDDLETOWN FS & LA	MIDDLETOWN	OH	1.07
SECURITY FS & LA	CLEVELAND	OH	0.95
DEER PARK FS & LA	DEER PARK	OH	3.01
HOME CITY FS & LA	SPRINGFIELD	OH	0.20
CARDINAL FS & LA	CLEVELAND	OH	-0.12
FIRST FS & LA	ZANESVILLE	OH	3.91
EQUITABLE FS & LA	LANCASTER	OH	2.49
HOME FS & LA	XENIA	OH	2.23
INDIAN VILLAGE FS & LA	GNADENHUTTEN	OH	-0.83
MID-AMERICA FS & LA	COLUMBUS	OH	-0.24
THE FIRST FEDERAL SAVINGS BANK	CLEVELAND	OH	2.96
PERPETUAL FS & LA	URBANA	OH	0.62
FIRST FS & LA	CENTERBURG	OH	-3.55
FIRST FS & LA	NEWARK	OH	-0.10
CITIZENS FS & LA	DAYTON	OH	0.30
FIRST FS & LA	VAN WERT	OH	0.93
FIRST FS & LA OF ST BERNARD	ST BERNARD	OH	1.26
NEW CARLISLE FS & LA	NEW CARLISLE	OH	0.41
HAWTHORNE FS & LA	CINCINNATI	OH	2.74
FIRST FS & LA	KENT	OH	0.75

RIPLEY FS & LA	RIPLEY	OH	-1.79
FIRST FS & LA	DELTA	OH	7.21
FIRST FS & LA	YOUNGSTOWN	OH	0.23
FIRST FS & LA	ASHTABULA	OH	0.66
FIRST FS & LA	WOOSTER	OH	-0.60
UNITED HOME FEDERAL	TOLEDO	OH	1.24
FIRST FS & LA	TOLEDO	OH	0.12
FIRST FS & LA	IRONTON	OH	-0.30
FIRST FS & LA	CANTON	OH	1.07
FIRST FS & LA	LAKEWOOD	OH	-0.28
WOMEN'S FSB	CLEVELAND	OH	1.27
VAN WERT FS & LA	VAN WERT	OH	0.29
MILTON FS & LA	WEST MILTON	OH	0.03
FIDELITY FS & LA	DELAWARE	OH	-0.07
HOME FS & LA	LAKEWOOD	OH	3.59
MUTUAL FS & LA	ZANESVILLE	OH	3.30
MONROE FS & LA	TIPP CITY	OH	-0.04
MUTUAL FS & LA	MIAMISBURG	OH	0.47
MIDLAND-BUCKEYE FS & LA	ALLIANCE	OH	6.83
PEOPLES FS & LA	SIDNEY	OH	0.60
FIRST FS & LA	BUCYRUS	OH	4.65
ARCANUM FS & LA	ARCANUM	OH	0.03
CITIZENS FS & LA	DELPHOS	OH	0.55
LEESBURG FS & LA	LEESBURG	OH	0.15
FIRST FEDERAL SAVINGS BANK OF DOVER	DOVER	OH	0.62
FIRST FS & LA	LORAIN	OH	-0.00
FIRST FS & LA	DEFIANCE	OH	0.45
GENEVA FS & LA	GENEVA	OH	7.05
GERMANTOWN FEDERAL SAVINGS BANK	GERMANTOWN	OH	1.94
MUTUAL FS & LA	SIDNEY	OH	-0.43
THIRD FS & LA	CLEVELAND	OH	-0.49
HOMESTEAD FS & LA	DAYTON	OH	0.97
HOME FS & LA	MARION	OH	0.88
FIRST FS & LA	PORTSMOUTH	OH	-0.48
PEOPLES FS & LA	MASSILLON	OH	0.17
BELPRE FIRST FS & LA	BELPRE	OH	1.97
MAJOR FS & LA	CINCINNATI	OH	-0.36
CONTINENTAL FS & LA	OKLAHOMA CITY	OK	4.00
MUTUAL FS & LA	OKLAHOMA CITY	OK	1.64
STATE FS & LA	TULSA	OK	2.25
OSAGE FS & LA	PAWHUSKA	OK	-1.58
LIBERTY FS & LA	ENID	OK	5.73
FIRST FS & LA	SHAWNEE	OK	-0.25
FAMILY FEDERAL SAVINGS BANK	SAPULPA	OK	6.41
HOME FS & LA	ADA	OK	-0.24
FIRST FS & LA	ELK CITY	OK	1.59
MIDAMERICA FS & LA	TULSA	OK	-0.56
PEOPLES FS & LA	ARDMORE	OK	1.83
KINGFISHER FS & LA	KINGFISHER	OK	3.93
HOME FS & LA	OKLAHOMA CITY	OK	0.33
FIDELITY FS & LA	CLAREMORE	OK	-0.22
FIRST FS & LA	WEWOKA	OK	-1.13
FIRST FS & LA	SEMINOLE	OK	-0.26
OK FS & LA	EL RENO	OK	13.28
CAPITOL FEDERAL SAVINGS BANK	OKLAHOMA CITY	OK	4.56
BROKEN ARROW FS & LA	BROKEN ARROW	OK	6.60

PHOENIX FS & LA	MUSKOGEE	OK	2.72
FRONTIER FS & LA	PONCA CITY	OK	0.22
AMERICAN FS & LA	ADA	OK	-0.45
WASHINGTON FEDERAL SAVINGS BANK	HILLSBORO	OR	-0.45
PIONEER FS & LA	BAKER	OR	1.98
JACKSON COUNTY FS & LA	MEDFORD	OR	0.58
FAMILY FS & LA	DALLAS	OR	-0.51
HOME FS & LA	ALBANY	OR	1.30
EVERGREEN FS & LA	GRANTS PASS	OR	0.46
WESTERN HERITAGE FS & LA	PENDLETON	OR	2.42
AMERICAN FS & LA	SALEM	OR	1.06
FAR WEST FEDERAL BANK,S B	PORTLAND	OR	6.18
KLAMATH FIRST FS & LA	KLAMATH FALLS	OR	-0.17
FIRST FS & LA	MCMINNVILLE	OR	1.43
GREAT AMERICAN FS & LA	PITTSBURGH	PA	0.04
VALLEY FS & LA	EASTON	PA	0.52
FIRST FS & LA	CARNEGIE	PA	-0.95
ELLWOOD FS & LA	ELLWOOD CITY	PA	1.72
ALTOONA FS & LA	ALTOONA	PA	0.36
FIRST FS & LA	INDIANA	PA	0.00
SECURITY FIRST FS & LA	PITTSBURGH	PA	4.71
COLONY FIRST FS & LA	MONACA	PA	1.51
MALVERN FS & LA	PAOLI	PA	-0.50
PROGRESSIVE-HOME FS & LA	PITTSBURGH	PA	1.75
FIRST FS & LA	NEW CASTLE	PA	0.68
ABINGTON FS & LA	JENKINTOWN	PA	-0.51
BRENTWOOD FS & LA	PITTSBURGH	PA	-0.30
FOUNDERS FS & LA	WILLIAMSPORT	PA	-0.22
CAMBRIA COUNTY FS & LA	CRESSON	PA	0.22
EUREKA FS & LA	PITTSBURGH	PA	0.30
WEST END FS & LA	PITTSBURGH	PA	0.10
OLNEY FS & LA	ABINGTON	PA	-0.04
ROXBOROUGH MANAYUNK FS & LA	PHILADELPHIA	PA	-0.50
KEYSTONE FS & LA	SHARPSBURG	PA	-0.77
BELL FS & LA	SEWICKLEY	PA	-0.04
COLLINGDALE FS & LA	COLLINGDALE	PA	-0.46
FIRST FS & LA	POTTSTOWN	PA	-0.08
FIRST FS & LA OF GREENE CO	WAYNESBURG	PA	-0.40
FIDELITY FS & LA	PHILADELPHIA	PA	0.63
FIRST FS & LA OF BUCKS CO	BRISTOL	PA	-1.41
NORTH EAST FS & LA	SOUTHAMPTON	PA	-0.05
ATLANTIC FINANCIAL FEDERAL	BALA CYNWYD	PA	-0.41
FOX CHASE FS & LA	PHILADELPHIA	PA	-0.12
ABRAHAM LINCOLN FS & LA	DRESHER	PA	-0.57
FIRST FS & LA OF PHILADELPHIA	FLOURTOWN	PA	0.54
THIRD FS & LA OF PHILADELPHIA	KULPSVILLE	PA	-0.19
FRANKLIN FIRST FS & LA	WILKES-BARRE	PA	1.07
FIRST FS & LA	PITTSBURGH	PA	-0.24
GREATER POTTSVILLE FS & LA	POTTSVILLE	PA	2.03
POLONIA FS & LA	PHILADELPHIA	PA	-0.16
FIRST KEYSTONE FS & LA	CHESTER	PA	-0.20
CHELTENHAM FS & LA	PHILADELPHIA	PA	0.72
COMPASS FS & LA	WILMERDING	PA	-0.75
FIRST FEDERAL OF WESTERN PENNSYLVANIA	SHARON	PA	0.81
VANGUARD FEDERAL SAVINGS BANK	VANDERGRIFT	PA	2.85
FIRST FS & LA OF MT OLIVER	MT OLIVER	PA	0.73

FIRST FS & LA	HAZLETON	PA	2.06
WASHINGTON FS & LA	WASHINGTON	PA	0.48
SECOND FS & LA OF PHILADELPHIA	PHILADELPHIA	PA	-0.30
MAIN LINE FS & LA	ARDMORE	PA	0.12
PEOPLE FS & LA OF TARENTUM	TARENTUM	PA	3.34
CHARLEROI FS & LA	CHARLEROI	PA	-0.05
FIRST FS & LA	HANOVER	PA	3.31
HORIZON FINANCIAL, FA	SOUTHAMPTON	PA	1.39
FIRST FS & LA OF KANE	KANE	PA	5.83
ELMWOOD FEDERAL SAVINGS BANK	PHILADELPHIA	PA	0.27
FIRST FS & LA	MONESSEN	PA	-0.20
NEW HOME FS & LA	WYOMISSING	PA	0.65
TOWER FS & LA	NEW BRIGHTON	PA	-0.36
ROCHESTER FS & LA	ROCHESTER	PA	0.77
PHOENIXVILLE FS & LA	PHOENIXVILLE	PA	0.55
COMMONWEALTH FS & LA	NORRISTOWN	PA	0.63
COATESVILLE FS & LA	COATESVILLE	PA	-0.10
WILLOW GROVE FS & LA	MAPLE GLEN	PA	0.43
HATBORO FS & LA	HATBORO	PA	-0.07
TROY HILL FS & LA	PITTSBURGH	PA	-0.11
LIBERTY FS & LA	PHILADELPHIA	PA	0.75
FIRST FS & LA	HARRISBURG	PA	0.85
AMERICAN FEDERAL SAVING	FRANKLIN	PA	1.57
FIRST FS & LA	LANCASTER	PA	-0.16
FIRST FS & LA	PERKASIE	PA	-0.46
UNITED FS & LA	STATE COLLEGE	PA	1.29
HUNTINGDON VALLEY FS & LA	HUNTINGDON VALLEY	PA	-0.17
DOYLESTOWN FS & LA	DOYLESTOWN	PA	5.09
PROGRESS FEDERAL SAVING BANK	BRIDGEPORT	PA	4.32
SPRINGFIELD FS & LA	SPRINGFIELD	PA	-0.84
WESTMORELAND FS & LA	LATROBE	PA	-0.97
STANTON FS & LA	PITTSBURGH	PA	-0.84
YORK FS & LA	YORK	PA	4.59
FIRST FEDERAL SAVINGS BANK	SANTURCE	PR	0.85
WESTERN FS&LA OF PUERTO RICO	MAYAGUEZ	PR	-1.11
CENTRAL FEDERAL SAVINGS BANK	ARECIBO	PR	-2.95
PONCE FS&LA OF PUERTO RICO	PONCE	PR	2.55
CAGUAS FS&LA OF PUERTO RICO	CAGUAS	PR	0.76
ORIENTAL FEDERAL SAVINGS BANK	HUMACAO	PR	4.39
HOME FS&LA OF PUERTO RICO	PONCE	PR	18.66
FAJARDO FS&LA OF PUERTO RICO	FAJARDO	PR	1.19
CARRIBBEAN FS&LA OF PUERTO RICO	CAROLINA	PR	-0.51
RHODE ISLAND FS & LA	PROVIDENCE	RI	2.53
HOME FS & LA	ROCK HILL	SC	-0.43
FIRST FS & LA	CHERAW	SC	-0.81
FIRST FS & LA	ROCK HILL	SC	-0.40
SOUTH CAROLINA FS & LA	COLUMBIA	SC	2.17
AMERICAN FEDERAL BANK, FSB	GREENVILLE	SC	8.41
FIRST FS & LA	GREENVILLE	SC	2.86
COOPER RIVER FS & LA	CHARLESTON HEIGHTS	SC	0.47
FIRST PIEDMONT FS & LA OF GAFFNEY	GAFFNEY	SC	4.40
FIRST FS & LA	CHARLESTON	SC	0.64
UNION FS & LA	UNION	SC	4.68
SECURITY FS & LA	COLUMBIA	SC	1.77
FIRST FS & LA	CAMDEN	SC	6.58
COMMUNITY FS & LA	WINNSBORO	SC	0.16

FIRST FS & LA	DARLINGTON	SC	-1.22
WOODRUFF FS & LA	WOODRUFF	SC	-0.98
FIRST FS & LA	SPARTANBURG	SC	-0.45
KINGSTREE FS & LA	KINGSTREE	SC	-0.85
NEWBERRY FS & LA	NEWBERRY	SC	-0.54
PEE DEE FS & LA	MARION	SC	-1.52
FIRST FS & LA	ANDERSON	SC	1.20
FIRST FS & LA	GEORGETOWN	SC	0.72
HERITAGE FS & LA	LAURENS	SC	-0.32
PALMETTO FS & LA OF SOUTH CAROLINA	AIKEN	SC	-0.11
HOME FS & LA	CHARLESTON	SC	0.57
COASTAL FS & LA	MYRTLE BEACH	SC	1.30
POINSETT FS & LA OF TRAVELERS REST	TRAVELERS REST	SC	1.02
SECURITY FS & LA	AIKEN	SC	-0.38
FIRST FS & LA	WALTERBORO	SC	0.62
FIRST FS & LA OF RAPID CITY	RAPID CITY	SD	5.61
HOME FS & LA OF SIOUX FALLS	SIOUX FALLS	SD	-1.88
UNITED FS & LA	ABERDEEN	SD	0.81
AMERICAN FS & LA OF MADISON	MADISON	SD	-0.13
FIRST FS & LA OF WATERTOWN	WATERTOWN	SD	-0.49
FIRST FS & LA OF CANTON	CANTON	SD	1.59
FIRST FS & LA OF BERESFORD	BERESFORD	SD	-0.62
FIRST FEDERAL BANK FSB	HURON	SD	0.40
VALLEY FS & LA	ERWIN	TN	1.14
LEADER FS & LA	MEMPHIS	TN	1.64
HOME FS & LA OF UPPER EAST TENNESSEE	JOHNSON CITY	TN	-0.09
HOME FS & LA	MEMPHIS	TN	0.46
HERITAGE FS & LA	KINGSPORT	TN	1.09
SECURITY FS & LA	NASHVILLE	TN	0.09
MAURY FEDERAL SAVINGS BANK	COLUMBIA	TN	-0.14
FIRST FS & LA	CHATTANOOGA	TN	0.39
FIRST FSB OF LA FOLLETTE	LA FOLLETTE	TN	0.20
CHEROKEE VALLEY FEDERAL SAVINGS BANK	CLEVELAND	TN	10.90
ATHENS FS & LA	ATHENS	TN	-1.15
NEWPORT FS & LA	NEWPORT	TN	5.58
CITIZENS FS & LA	ROCKWOOD	TN	2.87
COOKEVILLE FS & LA	COOKEVILLE	TN	0.07
FIRST FS & LA	MEMPHIS	TN	0.04
LAWRENCEBURG FS & LA	LAWRENCEBURG	TN	-0.08
TRI-COUNTY FS & LA	COVINGTON	TN	3.06
LIBERTY FS & LA	PARIS	TN	2.28
MORRISTOWN FS & LA	MORRISTOWN	TN	4.17
FRONTIER FEDERAL SAVINGS BANK	DYERSBURG	TN	4.97
FIRST FS & LA	MARYVILLE	TN	-0.83
FIRST FS & LA	WAYNESBORO	TN	0.98
MURFREESBORO FS & LA	MURFREESBORO	TN	-0.65
HOME FEDERAL SAVINGS BANK OF TENNESSE	KNOXVILLE	TN	1.84
CENTURY FS & LA	TRENTON	TN	0.40
FIRST FS & LA	DICKSON	TN	0.28
FIDELITY FS & LA OF TENNESSEE	NASHVILLE	TN	0.53
ELIZABETHTON FS & LA	ELIZABETHTON	TN	0.34
INTER FS & LA	CHATTANOOGA	TN	0.40
METROPOLITAN FS & LA	NASHVILLE	TN	5.51
FAYETTEVILLE FIRST FS & LA	FAYETTEVILLE	TN	1.27
FIRST FEDERAL SAVINGS BANK	CLARKSVILLE	TN	1.91
FIRST FS & LA	COLUMBIA	TN	0.78

FIRST FS & LA	TULLAHOMA	TN	3.43
FIRST FS & LA	LEWISBURG	TN	2.90
KNOX FS & LA	KNOXVILLE	TN	0.46
TWIN CITY FS & LA	BRISTOL	TN	0.70
SECURITY FS & LA	MCMINNVILLE	TN	-2.17
GREENEVILLE FS & LA	GREENEVILLE	TN	-0.70
HIGHLAND FS & LA	CROSSVILLE	TN	-0.67
LEXINGTON FIRST FS & LA	LEXINGTON	TN	-0.59
COMMUNITY FS & LA	NASHVILLE	TN	-6.77
JEFFERSON FS & LA	MORRISTOWN	TN	4.10
FIRST FS & LA OF GILES CO	PULASKI	TN	5.37
SECURITY FS & LA	ELIZABETHTON	TN	1.68
FIRST FS & LA OF HARDIN COUNTY	SAVANNAH	TN	-4.32
FIRST FS & LA OF MCNAIRY COUNTY	SELMER	TN	-1.32
MAGNOLIA FS & LA	KNOXVILLE	TN	1.52
VOLUNTEER FS & LA OF MADISONVILLE	MADISONVILLE	TN	5.30
FIRST FS & LA	BEAUMONT	TX	1.88
DALLAS FS & LA	DALLAS	TX	0.86
CENTENNIAL SAVINGS BANK, FSB	GREENVILLE	TX	0.05
EL PASO FS & LA	EL PASO	TX	1.27
FIRST FS & LA	PARIS	TX	0.91
SECURITY FS & LA	PAMPA	TX	1.30
FIRST FS & LA	WACO	TX	1.59
TEXAS FS & LA	DALLAS	TX	-1.15
CUERO FS & LA	CUERO	TX	-0.32
NORTH TEXAS FS & LA	WICHITA FALLS	TX	2.21
FORT BEND FS & LA	ROSENBERG	TX	-0.45
FIRST FS & LA	NACOGDOCHES	TX	-1.57
MINEOLA FS & LA	MINEOLA	TX	0.53
GLADEWATER FS & LA	GLADEWATER	TX	-2.20
FIRST FS & LA	LULING	TX	0.06
FIRST FS & LA	LAREDO	TX	5.99
BAY CITY FS & LA	BAY CITY	TX	2.19
LUFKIN FS & LA	LUFKIN	TX	2.20
RUSK FS & LA	RUSK	TX	0.49
FIRST FS & LA	AUSTIN	TX	0.93
LAMPASAS FS & LA	LAMPASAS	TX	0.34
KILGORE FS & LA	KILGORE	TX	0.80
VALLEY FS & LA	MCALLEN	TX	-1.10
FIRST FEDERAL SAVINGS BANK	LUBBOCK	TX	0.19
LIBERTY COUNTY FS & LA	LIBERTY	TX	-1.46
DALHART FS & LA	DALHART	TX	7.20
TERRELL FS & LA	TERRELL	TX	-0.93
FIRST FS & LA	LONGVIEW	TX	-0.74
FIRST FS & LA	CHILDRESS	TX	-0.20
JASPER FS & LA	JASPER	TX	6.40
FIRST FS & LA	AMARILLO	TX	0.11
FIRST FS & LA	NEW BRAUNFELS	TX	-0.28
LAMESA FS & LA	LAMESA	TX	0.40
FIRST FS & LA	TEMPLE	TX	0.30
COMMERCE FS & LA	COMMERCE	TX	-2.38
FIRST FS & LA	WICHITA FALLS	TX	0.68
YOAKUM FS & LA	YOAKUM	TX	1.57
MARSHALL FS & LA	MARSHALL	TX	3.96
ATLANTA FS & LA	ATLANTA	TX	0.93
FIRST FS & LA	BIG SPRING	TX	3.99

COLORADO COUNTY FS & LA	COLUMBUS	TX	-0.94
FIRST FS & LA	SAN ANTONIO	TX	-0.36
GARLAND FS & LA	GARLAND	TX	1.83
GUARANTY FS & LA	GALVESTON	TX	1.03
FIRST FS & LA	TYLER	TX	-0.83
FIRST FS & LA	LITTLEFIELD	TX	-0.84
SHELBY-PANOLA FS & LA	CARTHAGE	TX	3.30
LANCASTER FIRST FS & LA	LANCASTER	TX	0.72
FIRST FS & LA	BRYAN	TX	-0.82
PADRE FS & LA	CORPUS CHRISTI	TX	8.11
FIRST FS & LA	SALT LAKE CITY	UT	2.10
OGDEN FIRST FS & LA	OGDEN	UT	0.58
DESERET FS & LA	SALT LAKE CITY	UT	-0.86
FIRST FS & LA	LOGAN	UT	-0.02
FIRST FS & LA	LYNCHBURG	VA	1.43
CHARTER FS & LA	BRISTOL	VA	-0.95
MUTUAL FS & LA	NORFOLK	VA	2.11
FIRST FS & LA OF MONTGOMERY COUNTY	BLACKSBURG	VA	3.87
AMERICAN FS & LA OF LYNCHBURG	LYNCHBURG	VA	-0.53
EMPORIA FS & LA	EMPORIA	VA	-1.88
FRANKLIN FS & LA	RICHMOND	VA	-0.18
PIEDMONT FS & LA	MANASSAS	VA	0.09
PIONEER FS & LA	HOPEWELL	VA	2.01
VIRGINIA FS & LA	RICHMOND	VA	-0.47
BEDFORD FS & LA	BEDFORD	VA	2.55
CONTINENTAL FS & LA	FAIRFAX	VA	2.85
LIFE FS & LA	NORFOLK	VA	3.48
FIRST FS & LA OF NORTHERN VIRGINIA	ALEXANDRIA	VA	2.64
FIRST FS&LA OF MARTINSVILLE	MARTINSVILLE	VA	-0.57
FIRST FSB OF VIRGINIA	PETERSBURG	VA	1.22
HOME FS & LA	NORFOLK	VA	-0.75
FIRST FS & LA	DANVILLE	VA	3.56
COMMUNITY FS & LA	STAUNTON	VA	-0.08
SECURITY FS & LA	RICHMOND	VA	1.24
BAY SAVINGS BANK FSB	NEWPORT NEWS	VA	-1.46
VERMONT FEDERAL BANK, FSB	BURLINGTON	VT	5.02
LEWIS FS & LA	CHEHALIS	WA	-1.27
COLUMBIA FS & LA	WENATCHEE	WA	-0.48
VANCOUVER FS & LA	VANCOUVER	WA	0.32
YAKIMA FS & LA	YAKIMA	WA	-0.04
WESTSIDE FS & LA	SEATTLE	WA	-0.50
PACIFIC FIRST FEDERAL SAVINGS BANK	TACOMA	WA	1.34
RAYMOND FS & LA	RAYMOND	WA	-0.96
GREAT NORTHWEST FS & LA	BREMERTON	WA	0.03
FIRST FS & LA	LONGVIEW	WA	4.43
CENTRAL EVERGREEN FS & LA	CHEHALIS	WA	0.30
FIRST FS & LA	PORT ANGELES	WA	-0.02
TIMBERLAND FS & LA	HOQUIAM	WA	0.22
ABERDEEN FS & LA	ABERDEEN	WA	-0.05
FRONTIER FS & LA	WALLA WALLA	WA	-0.44
FIRST FS & LA	WALLA WALLA	WA	0.31
OLYMPIA FS & LA	OLYMPIA	WA	0.29
EVERETT FS & LA	EVERETT	WA	0.03
CITIZENS FS & LA	SEATTLE	WA	2.31
HERITAGE FS & LA	OLYMPIA	WA	0.04
PIONEER FIRST FS & LA	EVERETT	WA	-0.17

FIRST FS & LA	RENTON	WA	-0.01
COMMUNITY FIRST FEDERAL SAVINGS	VANCOUVER	WA	0.17
GREAT WESTERN UNION FS & LA	SEATTLE	WA	0.85
METROPOLITAN FS & LA	SEATTLE	WA	-1.10
UNIVERSITY FEDERAL SAVINGS BANK	SEATTLE	WA	0.33
KINNICKINNIC FS & LA	MILWAUKEE	WI	0.19
RIPON FS & LA	RIPON	WI	1.25
WESTERN FS & LA OF SPARTA	SPARTA	WI	1.84
FIRST FS & LA OF LACROSSE	LA CROSSE	WI	1.63
LADYSMITH FS & LA	LADYSMITH	WI	-0.63
VIROQUA FS & LA	VIROQUA	WI	-0.31
FIRST FS & LA OF MADISON	MADISON	WI	3.75
RICHLAND CENTER FS & LA	RICHLAND CENTER	WI	-0.32
CUMBERLAND FS & LA	CUMBERLAND	WI	-0.23
TIME F S & L A	MEDFORD	WI	-0.34
BARRON COUNTY FS & LA	BARRON	WI	1.35
DURAND FS & LA	DURAND	WI	9.19
BARABOO FS & LA	BARABOO	WI	0.73
DE PERE FS & LA	DE PERE	WI	2.74
COLUMBUS FS & LA	COLUMBUS	WI	0.15
BAY VIEW FS & LA	MILWAUKEE	WI	-0.49
NORTHWEST FS & LA	AMERY	WI	-0.19
MERRILL FS & LA	MERRILL	WI	0.03
FIRST FS & LA OF EAU CLAIRE	EAU CLAIRE	WI	-0.20
FIRST FS & LA OF WAUKESHA	WAUKESHA	WI	0.45
FARMERS FS & LA	RAVENSWOOD	WV	2.04
POINT PLEASANT FS & LA	POINT PLEASANT	WV	-0.21
HUNTINGTON FS & LA	HUNTINGTON	WV	0.07
FIRST FS & LA	BLUEFIELD	WV	-0.25
FIRST FS & LA	CHARLESTON	WV	-0.44
FIRST FS & LA	SISTERSVILLE	WV	-0.29
HANCOCK COUNTY FS & LA	CHESTER	WV	0.43
FED ONE, F A	WHEELING	WV	0.92
TRADERS FS & LA	PARKERSBURG	WV	1.65
MAGNET BANK, F. S. B.	CHARLESTON	WV	6.42
FIRST EMPIRE FS & LA	CHARLESTON	WV	2.54
ADVANCE FS & LA	WELLSBURG	WV	3.77
FIRST FS & LA	RAVENSWOOD	WV	0.00
DOOLIN FS & LA	NEW MARTINSVILLE	WV	2.81
FIRST FS & LA	MORGANTOWN	WV	-0.23
BECKLEY FS & LA	BECKLEY	WV	0.08
FIRST STANDARD SAVINGS FA	FAIRMONT	WV	-0.23
MOUNTAIN STATE FS & LA	CLARKSBURG	WV	0.21
SHENANDOAH FS & LA	MARTINSBURG	WV	8.28
PROVIDENT FS & LA	CASPER	WY	2.77
ROCKY MOUNTAIN FS & LA	CHEYENNE	WY	-0.01
WESTLAND FS & LA	RAWLINS	WY	1.91
SWEETWATER FS & LA	ROCK SPRINGS	WY	0.59
FIRST FS & LA	SHERIDAN	WY	-0.08
TRI-COUNTY FS & LA	TORRINGTON	WY	2.72
BIG HORN FS & LA	GREYBULL	WY	-2.17
GUARANTY FEDERAL BANK FSB	CASPER	WY	4.41
BUFFALO FS & LA	BUFFALO	WY	0.52

Appendix C

Stock S&Ls Comprising Primary Sample and Their Proportional Changes of Non-Housing Related Assets-to-Total Assets

Name	City	State	$\Delta\frac{A'}{T}$
FIRST FS & LA	EL DORADO	AR	-1.75
FIRST FS & LA	PARAGOULD	AR	1.06
HOME FS & LA	TUCSON	AZ	3.38
GLENDALE FS & LA	GLENDALE	CA	-0.99
HOME FS & LA	SAN DIEGO	CA	-2.52
CALIFORNIA FS & LA	LOS ANGELES	CA	4.14
FIDELITY FS & LA	GLENDALE	CA	1.38
HACIENDA FS & LA	OXNARD	CA	-1.35
HERITAGE FS & LA	OAKLAND	CA	2.63
UNITED BANK, FSB	SAN FRANCISCO	CA	1.06
AMERICAN FS & LA OF COLORADO	DENVER	CO	-0.38
HOME FS & LA OF THE ROCKIES	FORT COLLINS	CO	3.12
ALPINE FS & LA	OAK CREEK	CO	-0.03
FIRST FS & LA	MADISON	CT	2.07
COUNTY FS & LA	WESTPORT	CT	9.89
FIRST CITY FS & LA	BRADENTON	FL	2.01
EMPIRE OF AMERICA FSA	DELAND	FL	2.14
CITIZENS FS & LA	MIAMI	FL	0.87
NAPLES FS & LA	NAPLES	FL	1.69
PALMETTO FS & LA	PALMETTO	FL	5.12
HAVEN FS & LA	WINTER HAVEN	FL	1.43
MIAMI FS & LA	MIAMI	FL	-0.11
INTERAMERICAN FS & LA	MIAMI	FL	-0.31
UPTOWN FS & LA OF CHICAGO	CHICAGO	IL	0.01
GERMANIA FS & LA	ALTON	IL	0.89
SKOKIE FS & LA	SKOKIE	IL	2.69

FIRST FS & LA OF FULTON CO	ROCHESTER	IN	1.53
FIRST FS & LA	BELOIT	KS	0.08
VALLEY FS & LA	HUTCHINSON	KS	2.08
FIRST FSB OF KANSAS	WELLINGTON	KS	0.29
LIBERTY FS & LA	LEESVILLE	LA	12.83
METROPOLITAN FS & LA	BETHESDA	MD	0.19
KEY FS & LA	RANDALLSTOWN	MD	0.86
STANDARD FS & LA	GAITHERSBURG	MD	1.15
GUARANTY FS & LA	TAYLOR	MI	2.37
HOME FS & LA	MERIDIAN	MS	-0.28
FIRST FS & LA OF BROOKHAVEN	BROOKHAVEN	MS	0.50
BUILDERS FS & LA	ROCKY MOUNT	NC	-0.95
UNITED FS & LA	ROCKY MOUNT	NC	-0.27
FIDELITY FS & LA	HICKORY	NC	3.58
FIRST FS & LA	HIGH POINT	NC	-0.02
FIRST FS & LA OF PITT COUNTY	GREENVILLE	NC	0.54
FIRST FS & LA	RALEIGH	NC	4.64
FIRST FS & LA	DUNN	NC	0.64
NORTH CAROLINA FS & LA	ALBEMARLE	NC	1.71
METROPOLITAN FS & LA OF FARGO	FARGO	ND	1.64
CITY FS & LA	ELIZABETH	NJ	9.61
CITIZENS FS & LA OF BERLIN	BERLIN	NJ	1.59
BUCKEYE FS & LA	COLUMBUS	OH	-0.96
LOCAL FS & LA	OKLAHOMA CITY	OK	1.58
FIRST FS & LA OF CHICKASHA	CHICKASHA	OK	6.59
SOONER FS & LA	TULSA	OK	0.41
GREAT PLAINS FS & LA	WEATHERFORD	OK	9.05
BAYAMON FS&LA OF PUERTO RICO	BAYAMON	PR	-1.74
GUARANTY FS & LA	CLARKSVILLE	TN	1.47
FIRST FS & LA OF CONROE	CONROE	TX	0.54
TEXAS WESTERN FS & LA	PASADENA	TX	-0.37
FIRST FS & LA	BRECKENRIDGE	TX	8.01
MURRAY SAVINGS, A FEDERAL ASSN	SAN ANTONIO	TX	-8.25
PRUDENTIAL FS & LA	SALT LAKE CITY	UT	0.22
FIRST FS & LA	ROANOKE	VA	0.16
VIRGINIA BEACH FS & LA	VIRGINIA BEACH	VA	-1.72
FIRST FS & LA	FRONT ROYAL	VA	1.06
DOMINION FS & LA	MC LEAN	VA	0.31
WASHINGTON FS & LA	SEATTLE	WA	0.14
FIRST FS & LA OF PLATTEVILLE	PLATTEVILLE	WI	2.21

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