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**A CROSS-SECTIONAL ANALYSIS OF INTEREST-RATE-SWAP AGREEMENTS
AMONG FSLIC-INSURED THRIFT INSTITUTIONS**

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Among FSLIC-Insured Thrift Institutions

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ABSTRACT

The purpose of this study is to examine the characteristics of FSLIC-insured thrift institutions that currently use interest-rate swap agreements. Presently, thrift institutions are allowed to enter swap contracts with the Federal Home Loan Bank System. This paper provides information on the number and type of institutions using swaps from these two sources. The data come from the 1986 June Quarterly Report on thrift institutions and the interest-rate-swap register from the Office of Finance at the Federal Home Loan Bank Board. This investigation shows that in June 1986 about two-thirds of all thrift institutions swaps are developed with outside counterparties other than the District Banks. The institutions engaged in swaps are on average larger and more profitable than the rest of the industry. In addition, those thrift institutions using swaps have a tendency to use other interest-rate-risk management tools, such as futures and options, as well. The results of this initial investigation indicate the need for additional information on the interest-rate-swap activities of FSLIC-insured institutions.

INTRODUCTION

Since passage of the Depository Institutions Monetary Control Act and the Garn-St Germain Act in the early 1980s, thrift institutions have been encouraged to actively reduce interest-rate risk within their asset portfolios. The risk in interest rates in the late 1970s and early 1980s severely hurt many thrift institutions by raising the cost of funds on the liability side of their balance sheet while the return on their assets (primarily fixed-rate mortgages) remained constant. Many remedies were proposed to reduce the effect of rising rates on thrift institution profitability: variable-rate mortgages; asset diversification; and hedging with forwards, futures, options, and financial swaps. During this period, the Federal Home Loan Bank Board developed regulations 12 CFR 563.17-3 through 563.17-6 to monitor and standardize the risks associated with forwards, futures, and options activities.

In a 1982 survey of 238 financial institutions, including both banks and thrift institutions, conducted by Booth, Smith, and Stolz [5], approximately 17 percent of those surveyed were using financial futures to hedge interest-rate risk. In addition, the larger institutions were found to be more likely to use futures than their smaller-asset-sized counterparts were. Thrift institutions appeared to have a higher percentage usage of futures than banks did, which is explained by the authors as being due to the greater maturity gap between assets and liabilities faced by thrift institutions relative to banks. However, 1982 represented the end of a period of rising interest rates. With the steep declines in interest rates, academic research on interest-rate management techniques may have subsided. However, many thrift institutions have begun to make changes in the way they manage their interest-rate risk. In 1986, the interest-rate-swap market in the United

United States reached a volume of \$313 billion. Almost \$190 billion in new swap agreements were developed last year and about half of the participants consisted of non-U.S. institutions. Financial institutions accounted for 60 percent of the interest-rate-swap activity.¹

Of the above-mentioned interest-rate-risk management tools, the use of financial or interest-rate swaps has attracted much attention in both academic and industry circles.² A financial swap is an agreement whereby floating-rate interest payments are exchanged for a fixed-rate payment. The typical thrift institution, with an asset side dominated by fixed-rate mortgages, would be interested in exchanging variable-rate liability payments for a fixed-rate payment in order to lock in a positive interest-rate spread. By locking in this profit margin, the thrift institution is insulating itself against a decline in profitability when rates rise, but also reduces the opportunity to increase profits when rates fall. However, a swap is not an exchange of liabilities and, therefore, does not appear on the thrift institution's balance sheet.

One of the major risks associated with interest-rate swaps is the possibility of default by the counterparty to the swap.³ Many swaps include collateral of 10 to 30 percent of the notional principal to secure the agreement in the event interest rates move dramatically against one of the contractual parties. However, as Homestead Savings and Loan vs. Life Savings USDC, Northern District, Illinois, Western Division, Case No. 86-C-20268 indicates, interest-rate-swap contracts are far from standard and may even involve a telephone agreement. In an effort to overcome these difficulties, thrift institutions may arrange swaps with a District Bank of the Federal Home Loan Bank System, thereby eliminating the default-risk element.⁴

Off-balance sheet items, such as interest-rate swaps, have received regulatory scrutiny because of the effect these instruments may impose on the risk profile of financial institutions.⁵ A recent proposal made jointly by the Federal Deposit Insurance Corporation, Comptroller of the Currency, Federal Reserve Board, and the Bank of England recommends a risk-based capital framework for banks and bank holding companies that use swap arrangements.⁶ Under this proposal, the regulators would assign risk weightings to most bank activities, both on and off balance sheet. The Federal Home Loan Bank Board has already implemented, on a phase-in basis, risk-based capital requirements.⁷ However, neither bank nor thrift institution proposals at this time specifically includes interest-rate swaps in their weighted off-balance sheet items, though there is some discussion on bringing these instruments under federal guidelines.

Despite all the research on financial forwards, futures, and options, very little is known about recent use of swaps by thrift institutions. The FHLBB has collected data on swaps by thrift institutions since March 1985 on the Quarterly Financial Report. Information specifically related to swaps guaranteed by the Federal Home Loan District Banks is available through the Office of Finance. This study analyzes the financial and operating characteristics of thrift institutions by combining data from these two sources of information for the June 1986 quarterly reporting period.

DATA AND ANALYSIS

Using the June 1986 Quarterly Financial Report, data for the variables listed in Table 1 were collected for 3,297 thrift institutions; 204 of these

TABLE 1

Variable Definitions from the FHLBB June 1986 Quarterly Report

Variable	Definition
A020	Conventional Mortgage Loans on 1- to 4-family dwelling units
A070	Mortgage-Backed Securities Insured or Guaranteed by an Agency or Instrument of the United States
A800	Total Assets
C800	Total Regulatory Net Worth
TANNW	Tangible Net Worth = Preferred Stock & Common and Reserve Stock & Paid-in Surplus & Reserves + Retained Earnings + Net Undistributed Income - Deferred Loan Losses - Deferred Loan Losses on other Assets - goodwill and other intangible assets
D138	Net income or loss for the period from matched interest-rate swaps
E810	Current net income
F260	Net unrecognized gain (loss) on all open futures contracts
F372	Underlying Notional Principal of Interest-Rate Swaps in Effect
H030	Total Balloon and Adjustable-Rate Mortgages
H070	Total Fixed-Rate Mortgages on 1- to 4-family dwelling units

were using swaps as of June 1986. Seventeen of the 204 were excluded from the study because they were non-FSLIC-insured institutions, and one other thrift was excluded as a current FSLIC case in resolution.

Table 2 gives the average asset size, net income, and location by FHLB district of both swap and nonswap thrift institutions for the June 1986 quarter. In the aggregate, the average thrift institution using swaps is approximately 10 times as large as the average nonswap thrift institution. This confirms Booth, Smith, and Stolz's [5] finding on financial institution use of futures mentioned earlier; that is, larger-size institutions may perceive a greater dollar maturity risk and have the sophistication to better manage this risk with swaps. Eleven of the 186 swap thrift institutions have less than \$100 million in total assets, indicating that large size is not necessarily a prerequisite to using swaps. However, ten of those eleven smaller thrift institutions are doing their swaps with the FHLB, perhaps indicating a lack of entry into the outside, and often more complex, market for swaps. Those thrift institutions doing swaps also are more profitable than nonswap thrift institutions, with the average swap thrift institution showing a positive net income, while nonswap thrift institution net income is slightly negative. This profitability difference will be discussed later when financial ratios are calculated.

Table 3 gives a breakdown, for thrift institutions doing swaps, by counterparty to the swap: either an FHLB district bank or an outside party. For those swaps done through an FHLB district bank, data are also available on the position of the thrift institution in the swap agreement; that is, whether the thrift institution is a fixed- or variable-rate payer. As the numbers in Table 3 demonstrate, 48 out of 49 thrift institutions doing swaps with the district bank are fixed-rate payers. Given the conventional

TABLE 2

A Comparison of Income and Asset Size for Swap
and Nonswap Thrift Institutions Across Districts

District	<u>Nonswap Thrift Institutions (in thousands)</u>			<u>Swap Thrift Institutions (in thousands)</u>		
	<u>No. Thrift Institutions</u>	<u>Avg. Net Income</u>	<u>Avg. Asset Size</u>	<u>No. Thrift Institutions</u>	<u>Avg. Net Income</u>	<u>Avg. Asset Size</u>
1	91	119	136,412	11	2234	1,047,652
2	228	893	322,258	11	5264	2,539,147
3	190	311	159,408	7	1649	1,293,061
4	577	352	231,334	30	1605	1,516,231
5	362	186	146,144	12	3142	1,393,070
6	149	170	128,365	20	2739	1,366,125
7	343	508	206,948	4	1783	1,934,755
8	183	(80)	172,143	9	3448	2,353,071
9	469	(1441)	195,563	19	(10,634)	1,994,105
10	157	(774)	203,882	15	(1786)	1,196,223
11	206	38	504,857	33	11,212	5,458,709
12	107	(363)	230,040	15	(360)	1,022,674
Industry	3,062	(33)	220,939	186	1679	2,248,699

TABLE 3

Counterparty Relationships to the Thrift Institution Swaps

Counterparty to the Swap Agreement	No. Thrift Institutions	Fixed-Rate Payer	Variable-Rate Payer
FHLB District Bank	49	48	1
Outside Party	137	*	*

* Represents information that is currently unavailable.

fixed-rate asset funded by a variable-rate liability structure of most thrift institutions, this finding is not unexpected. Furthermore, given the large decline in the general level of interest rates, it is not surprising to find that only 14 of the 186 thrift institutions using matched interest-rate swaps reported gains (item D138 in Table 1) on those swaps in June 1986.⁸

Twenty-four of the 186 thrift institutions using swaps were also using futures to hedge. Since only 81 thrift institutions out of the total of 3,297 in the United States are using financial futures, there appears to be a small number of institutions using these interest-rate-risk management techniques; however, 30 percent of those that are using swaps or futures are using them together.

Table 4 gives the financial ratios that were calculated for swap and nonswap thrift institutions using the data described in Table 1, with the results of those calculations given in Table 5. Mortgage-backed securities appear to be a larger component of the asset structure of the swap thrift institutions than of the nonswap thrift institutions (A070/A800), with conventional mortgages on 1- to 4-family dwelling units being a smaller percentage (A020/A800) for swap thrift institutions. There is little difference between swap and nonswap thrifts as to the tangible net worth to total assets ratio (TANNW/A800).

However, based on an examination of in-house FHLBB data, only 8 percent of the swap thrift institutions in this data set are considered to be institutions with low tangible net worth, compared with 20 percent of thrift institutions nationwide. In line with this fact, return on tangible net worth (CITN) is positive (7.1 percent) for swap thrift institutions, while it is negative (1.3 percent) for nonswap thrift institutions. This corresponds to the result mentioned earlier for average net income.

TABLE 4

Financial Ratios Used in the Analysis of Thrift Institution Swaps

<u>Definition</u>		<u>Quarterly Report Items</u>
<u>Conventional Loans 1-4 Units</u> Total Assets	(CLTA)	A020 A800
<u>Mortgage-Backed Securities</u> Total Assets	(MBSTA)	A070 A800
<u>Regulatory Net Worth</u> Total Assets	(RAPTA)	C800 A800
<u>Tangible Net Worth</u> Total Assets	(TANTA)	TANNW A800
<u>Adj.-Rate Mortgages</u> Total Assets	(ADMTA)	H030 A800
<u>Fixed-Rate Mortgages</u> Total Assets	(FRMTA)	H070 A800
<u>Net Income from Swaps</u> Total Assets	(NISCI)	D138 E810
<u>Current Net Income</u> Tangible Net Worth	(CITN)	E810 TANNW
<u>Notional Principal of Swaps</u> Total Assets	(NPSTA)	F372 A800

TABLE 5

Financial Ratios for June 1986 on Swap and Nonswap Thrift Institutions

	<u>CLTA</u> <u>(A020/A800)</u>	<u>MBSTA</u> <u>(A070/A800)</u>	<u>RAPTA</u> <u>(C800/A800)</u>	<u>TANTA</u> <u>(TANNW/A800)</u>	<u>ADMTA</u> <u>(H030/A800)</u>	<u>FRMTA</u> <u>(H070/A800)</u>	<u>NISCI</u> <u>(D138/E810)</u>	<u>CITN</u> <u>(E810/TANNW)</u>	<u>NPSTA</u> <u>(F372/A800)</u>
Swap Thrift Institutions	0.354	0.164	0.047	0.010	0.306	0.331	-0.235	0.071	0.071
Nonswap Thrift Institutions	0.429	0.079	0.044	0.011	0.286	0.328	0	-0.013	0

A somewhat unexpected finding concerns the proportion of variable-rate and fixed-rate mortgages by swap and nonswap thrift institutions. One would anticipate that those institutions using swaps might perceive a greater interest-rate-risk exposure due to having a large fixed-rate asset portfolio. However, the results for the ratios comparing fixed-rate mortgages (H070) and variable-rate mortgages (H030) as a percentage of total assets shows virtually no difference between swap and nonswap thrift institutions. Both groups have approximately 33 percent of their assets in fixed-rate mortgages (or fixed-rate mortgage-backed securities) and 30 percent in variable rate. However, even for those institutions that are using swaps, their average swap usage is only 6.2 percent of total assets, a small percentage, though not surprising given the downward movement in interest rates in recent years. As mentioned earlier, the downward movement in rates did generate losses for the typical fixed-rate payer thrift institution (-23.5 percent of net income).

CONCLUSIONS AND SUGGESTIONS FOR FUTURE RESEARCH

This study has examined the financial and operating characteristics of the 187 thrift institutions using interest-rate swaps as of June 30, 1986. In general, the average swap thrift institution is larger and more profitable than the average nonswap thrift institution. The majority of swap thrift institutions are using an outside counterparty to the swap as opposed to engaging in the swap with the FHLB District Banks. There appears to be no difference in the use of fixed- or variable-rate mortgages by swap and nonswap thrift institutions. However, those thrift institutions using swaps do have a higher percentage of mortgage-backed securities in their portfolio.

The work done thus far on this data set represents a preliminary analysis of the use of financial swaps by thrift institutions. Possible extensions include, a study of the performance of thrift institutions before and after swap usage. Also a matched-pair multiple discriminant analysis would help to distinguish the operating and financial characteristics of, for example, a large swap thrift institution from a large nonswap thrift institution. Perhaps the results found in this study may be due solely to size differences, not due to swap usage. With the increased use of interest-rate swaps in the so-called "risk-controlled arbitrage" being undertaken by some thrift institutions [7], who is doing swaps and what are the risk characteristics of these instruments will take on greater significance.

FOOTNOTES

1. See, "Interest-Rate Swap Market Rose to \$313 Billion in 1986," The Wall Street Journal, May 5, 1987, p. 27.
2. For further information on interest-rate swaps, their pricing, and industry uses, see Bicksler and Chen [4], Beidleman [3], and Smith, Smithson, and Wakeman [9].
3. A recent case of default on a swap agreement between Homestead S&LA of California and Life Savings of Rockford, Illinois was settled in February 1987. The court affirmed a telephone agreement between the two institutions involving an interest-rate swap; for more information see "Life Savings Ordered to Pay Out \$6.2 million," National Thrift News, February 9, 1987.
4. See, "Federal Home Loan Banks Interest Rate Swap, Cap, Collar and Floor Policy Guidelines," Federal Home Loan Bank Board, Office of Finance, March 10, 1987.
5. See, Bicksler and Chen [4] for the risk implications of swap agreements on financial intermediaries.
6. See, "Federal Reserve System Capital Maintenance; Revision to Capital Adequacy Guidelines," 12 CFR Part 225, Federal Register, Vol. 52, No. 33 (February 19, 1987), pp. 5119-5139.
7. See, Donald J. Bisenius and Robert J. Sahadi, "An Analysis of the Proposed Capital Requirements for Thrift Institutions: A Staff Economic Study," Office of Policy and Economic Research, Federal Home Loan Bank Board, Washington, D.C., August 15, 1986.
8. See, S. Bartlett [2].

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