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DEPOSIT STRATEGIES FOR MINIMIZING THE INTEREST RATE RISK EXPOSURE OF S&Ls

Harvey Rosenblum

FEDERAL RESERVE BANK OF CHICAGO

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Rate Risk Exposure of S&Ls

Harvey Rosenblum*
Vice President and Economic Advisor
Federal Reserve Bank of Chicago

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Deposit Strategies for Minimizing the Interest Rate Risk Exposure of S&Ls*

In recent years, the problems of thrift institutions have gained widespread recognition. These liquidity and solvency problems stem from a maturity and interest rate imbalance, in part forced upon thrift institutions by a variety of government regulations, tax incentives, and subsidies. This array of government rules has encouraged thrifts to be heavily invested in long-term fixed rate assets that are funded with short-term (and therefore variable rate) liabilities. Most of the proposed solutions to the maturity imbalance and cash flow problems have focused on the asset side of the balance sheet and would shorten the effective maturity of S&L assets by allowing consumer or business loans or by encouraging adjustable rate mortgages.

These asset-side solutions are not likely to help significantly in the short run. The principle of adverse selection is likely to prevail if S&Ls attempt to penetrate saturated markets, such as consumer and business lending, in which industry personnel have little existing expertise. Adjustable rate mortgages (ARMs) will help somewhat because they pass some portion of the interest rate risk from the lender to the borrower. However, the borrower may not be in a position to bear this risk. Consequently, if rates are sufficiently volatile and the particular ARM design does not insulate the borrowers' monthly payments from interest rate movements, it is possible that the borrowers' interest rate risk will be

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translated into credit risk which will, in turn, be shifted back to the lender.

Promising solutions to the maturity and interest rate imbalances and the cash flow problems stemming from the inventory of old, low interest rate mortgages can also be found on the liability side of the balance sheet. These solutions rely upon the traditional deposit-taking function of S&Ls and on the existing knowledge base and marketing expertise of incumbent personnel. Moreover, the federal government and its regulatory agencies are not involved except in an insurance company capacity. The liability side solutions allow (and indeed require) that S&Ls tailor their deposit products to suit the needs of their local market customers. A complete solution to the thrift institution problem requires both asset and liability adjustments; this paper emphasizes those adjustments that can be made on the liability side.

AN OVERVIEW OF LIABILITY STRATEGIES

The essence of the liability strategy is that an S&L can insulate itself against changes in interest rates by closing the excessively large maturity gap that presently exists between its assets and its liabilities. To do this requires marketing deposits with a maturity that is several times that of the deposits most commonly sold in 1981.

Successful Deposit Design Requirements

In the aftermath of the introduction of Money Market Certificates (MMCs) in June 1978, it has become clear that the one thing depositors want most is a market rate of return. Further, not all depositors desire liquidity; if they did, money market mutual funds (MMFs) would have made even greater inroads than they have. The popularity of small saver certificates suggests that depositors are willing to lengthen maturity when

return is adequate; further, many of these depositors are willing to have their interest compound and do not require that it be withdrawn at regular intervals -- in effect, there is no cash outflow until the deposit reaches maturity. Thus a variety of deposit instruments can probably be designed that would have the interest rate and liquidity properties desired by depositors and that would, at the same time, allow an S&L to materially increase the weighted average maturity of its liabilities. Moreover, if the cash outflows associated with these deposits can be deferred for a considerable period of time, the likelihood of survival improves considerably for those institutions with a large proportion of old, low rate mortgages.¹

Deposit Design Problems

There are four minor drawbacks to the liability side solution. First, S&Ls have little expertise in pricing deposits; in the past they merely offered the limited array of deposits permitted by Regulation Q, generally at the ceiling rate. Innovative marketing involved toasters, smiling tellers, stuffed animals, and attractive, convenient office locations. The phase-out of deposit interest ceilings required by the Depository Institutions Deregulation and Monetary Control Act of 1980 (DIDMCA) opens up a new world of pricing and marketing flexibility. In spite of complaints about the phase-out of Regulation Q from some segments of the S&L industry, DIDMCA has given S&Ls an opportunity to compete for the types of deposits they need to reduce their inherent riskiness in a world of rate volatility.

A second problem arises in that, at least on the surface, the pricing flexibility afforded by the phase-out of Q-ceilings may prove to be an expensive opportunity. Further, given the average return on assets of an

S&L carrying a large inventory of old, low rate mortgages, it would be undesirable to insulate against changes in interest rates given the rates that prevailed on deposits during 1981. Indeed, one would then be locking in a negative spread; the only benefit of such a strategy is that the number of months until liquidation could be calculated precisely.

A third problem is that the phase-out of Q-ceilings is proceeding very slowly and in fits and starts -- the opportunity afforded by flexibility in deposit pricing and design is thus far an illusion and not a reality. But DIDMCA requires that deregulation of deposit interest rate ceilings will become a reality; if they are to survive, S&Ls must learn how to turn this fact of life to their advantage. Fourth, and this is the only potentially serious drawback, the public may not want the kind of deposit designs that S&Ls need to close the maturity and cash flow imbalances inherent in their current balance sheets.

THE THEORY AND APPLICATION OF IMMUNIZATION

Before turning to the details of new deposit designs, it is necessary to discuss the theory on which they are based. In their 1979 paper, Professors Bierwag, Kaufman, and Toevs introduced the theoretical model upon which this paper is based.² The two concepts that are crucial for understanding interest rate risk are immunization and duration.

Immunization involves the elimination of interest rate risk by selecting a portfolio of assets whose maturity and cash inflows match the timing and dollar magnitude of liabilities that need to be discharged. When an institution is immunized, changes in interest rates (in either direction) have no impact upon the institution's net worth. This occurs when the durations of assets and liabilities are equal; only in one polar case would immunization occur when asset and liability maturities are

equal. Duration is a measure that takes into account not only the maturity of a security but the timing of the cash flows associated with it; duration measures the average time at which all payments are made.

It is best to illustrate these concepts by way of a very simple example. Suppose one needs to have on hand a certain amount of money to discharge a known contractual outflow at some future date. Naturally, one would wish to invest the funds currently on hand so as to have at least enough to meet the outflow when it falls due. For example, suppose you owe someone \$10,000 payable in six months. One way to satisfy this obligation would be to purchase a six-month Treasury bill with a maturity value of \$10,000. Regardless of current market interest rates, you would know exactly how much to invest in order to meet your obligation. The solution is greatly simplified by the existence of a debt instrument that first, can be purchased having the same maturity as one's future liability, and second, can be purchased as a discount note, that is, with no coupons that require reinvestment.

To be more realistic, it is necessary to complicate the problem. Suppose that you owe someone \$1 million due five years from today. The solution to the problem of how much to invest today, no more and no less, to have that amount on hand in five years would be very simple if you could purchase a five-year, default-free, discount note. At the present time securities having all three of these properties do not exist.

Other investment strategies must be utilized because of the absence of default-free, zero-coupon securities of the right maturity. At least three other investment strategies may be pursued. First, the rollover strategy is a possibility. Under the rollover strategy, one might choose to invest in one-month CDs, rolling over the investment 59 times (or in three-month

commercial paper rolling over the investment 19 times, or in one-year bonds rolling over the investment four times, etc.). Under this strategy, the investor would be "flying blind" and would not know what sum to place in the initial investment because the interest return for all but the first investment period would be unknown. One could infer the interest rate during each future reinvestment period from the yield curve; however, based on past experience the short-term forward rates embedded in the yield curve would be realized only under fortuitous circumstances. Under the rollover strategy, all the risk is reinvestment risk (abstracting from default possibilities).

As another alternative, one could follow a maturity strategy by buying a five-year bond with a known value at maturity (again assuming no default risk). However, the return from investing the coupon income is not known and some element of reinvestment risk remains; however, there is no price risk under the maturity strategy since the bond's final value will be paid at maturity.

The last possibility involves buying a bond with maturity longer than the holding period, which has sometimes been called the naive strategy. For example, one might purchase a bond with a ten-year maturity, planning to sell it after five years. But this strategy produces both price risk and reinvestment risk because the price at which the bond will be sold at the end of the holding period is unknown, as are the interest rates at which the coupon income can be reinvested. However, the price risk and reinvestment risk are of opposite sign; an increase in interest rates will lower the price of the bond but increase the coupon reinvestment return.

It turns out that there is a special case of the naive investment strategy for which the price risk and the reinvestment risk are equal but

of opposite sign so that they cancel one another. This strategy has come to be known as the immunization strategy because it immunizes the investor against changes in interest rates. The limited meaning of immunization should be noted. Under this strategy, the investor should realize the (before-tax) promised rate of return or yield to maturity, no more and no less. The investor eliminates the downside risk of loss of capital stemming from increases in interest rates but foregoes any profitable opportunities from changes in interest rates. The immunization strategy is equivalent to buying a zero-coupon bond with maturity equal to the holding period--the investor knows exactly how much to invest so as to have the needed amount on hand to discharge the future obligation. (The first example, which involved the purchase of a six-month Treasury bill, was an immunization strategy.) That is, the promised return will equal the realized return regardless of the change in interest rates that takes place following one's investment. For the other strategies, the promised and realized returns will be equal only fortuitously.

Because zero-coupon bonds are not widely available, immunization must be achieved in a round-about manner and will occur when the duration of the investment is equal to the holding period. Duration is a measure of the average life of an income stream, measured in units of time, where each payment is weighted by its present value. The formula commonly given for duration (D) is:

$$(1) \quad D = \frac{\sum_{t=1}^n \frac{C_t(t)}{(1+r)^t}}{\sum_{t=1}^n \frac{C_t}{(1+r)^t}}$$

where C_t = interest and/or principal payment at time t
 (t) = length of time to the interest and/or principal payments
 n = length of time to final maturity
 r = yield to maturity

The denominator is the present value of the interest and principal payments while the numerator is the present value of the payments stream where each payment is weighted by the time at which the payment is expected to be received. It follows that a discount (or zero-coupon) note, with only a final payment, has a duration equal to its maturity. For all coupon bonds, duration is less than maturity and is shorter, the higher is the coupon (since the large early payments are weighted more heavily than the later payments).

Duration has other noteworthy properties. First, it may be used as an index of the variability of the price of a bond in response to a change in interest rates, with price variability being directly proportional to a bond's duration.³ For small changes in interest rates (dr), the percentage change in bond price (dP/P) is a function of duration (D) and is approximated by:

$$(2) \quad \frac{dP}{P} = - D dr$$

Another property of duration is that, as a measure of the average maturity of an income stream, it is an index number, and, as with most index numbers, more than one may be calculated. Different measures of duration have been derived depending on the assumed stochastic process that governs changes in interest rates. The most common measure of duration, that originally stated by Macaulay in 1938 and given above in equation (1), will provide immunization if the yield curve is horizontal and shifts in a parallel or additive fashion. Fisher and Weil showed that bond portfolios could be immunized--that is, the realized yield would be no less than the promised yield--using Macaulay's duration.⁴ For complete immunization--or using the terminology introduced by Bierwag, Kaufman, and Toevs, strong form immunization--it is necessary to correctly specify the stochastic process so that the correct measure of duration can be determined. If the stochastic nature of interest rates is not properly specified, only partial (or weak form) immunization is possible.⁵ This may be particularly important for S&Ls because assets and liabilities may respond to different stochastic processes.

LONG DURATION LIABILITIES: BALANCE SHEET CONSTRAINTS ON DEPOSIT DESIGN

One of the necessary conditions for a financial intermediary to immunize itself against the adverse consequences of volatile interest rates is that its planning horizon be known with certainty. For this condition to obtain, it is necessary that the duration of the institution's liabilities be known exactly. Because a significant portion of the liabilities are payable, de facto, on demand, this condition is not likely to be satisfied. Nevertheless, to the extent that deposit withdrawals and/or mortgage prepayments do not occur in a completely random manner but instead exhibit statistically quantifiable and predictable behavior, the

Table 1

Balance Sheet Composition of a Representative S&L, 1979

<u>Assets</u>	<u>Percent of Assets</u>	<u>Duration (years)</u>
Mortgages	82	5.0
Liquidity Portfolio	7	0.5
Fixed, Long-term Assets	3	10.0
Other Assets	8	(a) one day (b) 40.0 years
Weighted average asset duration:		(a) 4.435 years (b) 7.635 years

<u>Liabilities</u>	<u>Percent of Liabilities</u>	<u>Duration (years)</u>
Savings Accounts		
Passbook	21	.05
Certificates		
MMCs	18	.40
Others of less than \$100,000	34	2.50
Jumbo Certificates	4	.10
FHLB Advances	7	.50
Net Worth	6	5.00
Other Liabilities	10	(a) one day (b) 20 years

Weighted average liability duration: (a) 1.276 years
(b) 3.276 years

SOURCE: United States League of Savings Associations, Savings and Loan Fact Book 1980, Tables 47 and 71. The durations of assets and liabilities are the author's estimates.

duration of an intermediary's assets and liabilities can be approximated fairly closely. Moreover, the extent of immunization which is possible is directly proportional to the absolute difference between the immunizing duration of an institution's assets and liabilities.⁶ Thus, if an institution can closely estimate the duration of either its assets or its liabilities, its ability to achieve or approximate an immunized position depends upon its ability to choose a mix of assets whose duration is equal to that of its liabilities (or vice versa).

Assume that the average S&L has a balance sheet composition similar to that for the S&L industry as shown in Table 1. With 82 percent of assets invested in long-term mortgage loans and about 39 percent of liabilities due in less than six months, this representative S&L obviously can be buffeted about by changing rates because its deposit liabilities are subject to repricing more often than its assets. Making reasonable assumptions about the durations or effective maturities of the various balance sheet components suggests a duration imbalance of at least 3.2 years.

Table 2 shows one possible reconfiguration of the balance sheet that would significantly reduce the interest rate risk exposure of our representative S&L. The duration imbalance has been reduced by decreasing the reliance on short-term deposits and increasing the percentage of long-term certificates. If an S&L could offer a long-duration deposit like a ten-year discount note and if this deposit instrument were to gain acceptance in a competitive marketplace, then the S&L could substantially increase the duration of its liabilities, particularly if passbook savings and MMCs are the deposit categories that were shifted into the long-duration deposit.

Table 2
Hypothetical Redistribution of S&L Assets and Liabilities

<u>Assets</u>	<u>Percent of Assets</u>	<u>Duration (years)</u>
Mortgages	65	5.0
Consumer Loans	20	1.5
Liquidity Portfolio	7	0.5
Fixed Assets	3	10.0
Other Assets	5	one day

Weighted average asset duration: 3.885 years

<u>Liabilities</u>	<u>Percent of Liabilities</u>	<u>Duration (years)</u>
Savings Accounts	82	2.37
Passbook (25%)		0.05
Certificates (72%)		
less than one year (15%)		0.3
1-2 years (10%)		0.9
2-4 years (10%)		1.5
greater than 4 years (37%)*		5.6
Other (3%)		0.1
FHLB Advances	6	0.5
Net Worth	6	5.0
Other Liabilities	6	(a) one day (b) 20 years

Weighted average liability duration: (a) 2.57 years
(b) 3.87 years

*Certificates composed as follows: 40 percent in 6-year, zero-coupon certificates; 30 percent in 8-year zero-coupon certificates; 20 percent in 10-year, zero-coupon certificates; and 10 percent in 12-year, zero-coupon certificates.

In Table 2 it is assumed that passbook accounts comprise 25 percent of savings accounts and that certificates due in less than one year comprise only 15 percent of savings accounts, not a substantially different configuration from that shown in Table 1. It is further assumed that certificates of four years or longer are almost as important (37 percent as compared to 40 percent) as savings of less than one year maturity. Furthermore, it is assumed that the S&L is able to successfully offer ten-year and twelve-year, zero-coupon certificates which make up 20 percent and 10 percent, respectively, of deposits in the over four-year category. On the basis of these assumptions, the weighted average duration of deposits is 2.37 years. Moreover, to the extent that an S&L has some flexibility in choosing the duration of the "other liability" category, ranging from 0-20 years, the weighted average duration of the liability side of the balance sheet may fall between 2.57-3.87 years. While a liability duration of 3.87 years is still below the minimum asset duration of 4.44 years shown in Table 1, the asset-liability duration gap is, nevertheless, narrowed considerably.

Accomplishing such a redirection of savings flows would be a Herculean feat unless an upward sloping yield curve persisted for several years. Nevertheless, if asset duration could be reduced by the introduction of consumer lending and increased acceptance of adjustable rate mortgages, then immunization may be feasible. Indeed, even without allowing for reducing mortgage duration through ARMs, S&L weighted asset duration could be reduced considerably, as shown in Table 2, by devoting 20 percent of S&L assets to consumer lending. In fact, if "other assets" are invested in securities with very short maturity, the weighted asset duration approaches the upper limit of the weighted liability duration given in

Table 2. Thus the duration imbalance may disappear, particularly if mortgage durations are shortened by widespread acceptance of flexible rate mortgages. It should be noted, however, that 20 percent of S&L assets would comprise about \$116 billion of consumer loans at year-end 1979. This was about 65 percent of the amount of consumer loans that commercial banks had on their books at that time. Clearly, S&Ls cannot gain market penetration of this magnitude without a struggle.

The previous examples are based upon the average balance sheet makeup of all S&Ls. Clearly there is a great deal of variability across S&Ls in general and across specific geographic groups of S&Ls in terms of their ability to immunize. Immunization of S&Ls in geographic regions with high mortgage turnover rates may be particularly feasible if they could successfully offer long-term, discount savings certificates. Of course, it is possible that those S&Ls with the shorter asset durations may be among those that would encounter a difficult time marketing long-term, discount savings certificates.

An exact matching of asset and liability durations may not be possible since depositors and borrowers have the option to withdraw their funds or prepay their loan obligations. The price of exercising these options has typically not been very high and has been outside the control of S&Ls, being set by law, regulation or customary industry practice. Complete immunization may be very difficult but partial immunization is still possible. The smaller the duration gap between assets and liabilities, the smaller is an institution's exposure to changes in interest rates.

In addition to not always being feasible, immunization is not always a desirable strategy. Immunizing a balance sheet will lock in the spread between the return on assets and the cost of liabilities. In 1981 this

spread was negative--clearly a bad time to follow an immunization strategy. Had an immunization strategy been followed in 1978, however, many of the earnings difficulties that haunted the S&L industry in 1981 would not have materialized. The choice of when and to what extent to immunize is clearly a difficult management choice. The phase-out of Q-ceilings has given S&L managements discretion over the immunization decision. In 1978, immunization was not feasible for three reasons: Regulation Q dictated the menu of possible savings deposits instruments; diversification into consumer lending was allowed in only a few states; and federally chartered S&Ls were not allowed to issue variable rate mortgages.

The Necessity for Zero-Coupon Deposits

To achieve immunization, an S&L must be able to drastically increase its reliance on long duration liabilities. It may be necessary, as well, that the duration of assets be shortened at the same time. Clearly, the problem that must be addressed by the Depository Institutions Deregulation Committee (DIDC) in establishing Q-ceilings, if immunization is to be at all possible, is the redirection of deposit flows from MMCs to certificates with four-year, six-year, eight-year and even longer maturities.

If the duration of S&L liabilities is to be increased, then, for any given promised yield (yield to maturity), savings deposits or other liabilities of longer maturity or lower coupon need to be sold. In order to maximize the duration of a financial instrument, the mathematics of duration requires that the instrument have a zero coupon, in which case the instrument's duration equals its maturity. In the case of coupon securities, duration can be lengthened--for any given yield to maturity, coupon, and maturity--by decreasing the frequency of coupon payments.

Again, a zero-coupon security provides the upper limit to spreading out coupon payments and maximizing duration.

If S&Ls could sell, for example, a ten-year, zero-coupon deposit, that deposit would have a duration of ten years (regardless of the promised yield). If an S&L were to sell a ten-year savings certificate paying 8 percent semi-annually, that deposit would have a duration of 7.067 years. Deposits with coupons less than the promised yield to maturity would provide some income stream to the saver prior to maturity and would have a duration of less than the instrument's maturity, but greater than the duration of a deposit that has a coupon equal to the promised yield (see Table 3). Zero-coupon liabilities, if they can be marketed successfully, seem to offer the greatest potential for increasing liability duration.

Table 3
Duration of Ten-Year Savings Accounts
With Promised Yield of 8 Percent
(and Semiannual Coupons)

<u>Coupon Rate</u> (percent)	<u>Duration</u> (years)
0	10.000
2	8.762
4	7.986
6	7.454
8	7.067

Source: Fisher and Weil, "Coping with the Risk of Interest Rate Fluctuations," Table 4.

The ability to find a market for long duration deposits has been greatly enhanced by the early actions of the DIDC. Beginning in December 1981, S&Ls were allowed to offer Individual Retirement Accounts (IRAs) and Keogh accounts having a minimum maturity of 1½ years and with no

restrictions on the allowable interest rate. Since IRA and Keogh accounts are typically very long term in nature and interest is not really paid out until maturity (or withdrawal of full principal), the deregulation of Q-ceilings on these accounts provided an opportunity to increase average deposit duration. Because of intense competition from other financial institutions for these kinds of accounts, S&Ls have had to promise IRA and Keogh account holders attractive rates of return. S&Ls have one principal advantage over many of their competitors in attracting IRA and Keogh accounts; they have a greater need for long-term funds than many of their competitors. As a result, many competitors will drop out of the bidding race for these funds and concentrate on shorter-term funding. Another DIDC decision (overturned by the courts) to eliminate rate ceilings on deposits with four years or longer maturity also would have been a boon to extension of liability duration.

ADVANTAGES AND DISADVANTAGES OF LONG DURATION LIABILITIES

To achieve an immunized position, S&Ls may increase the average duration of their liabilities by increasing the duration of their deposit and/or nondeposit liabilities. Both types of liabilities share many common characteristics; consequently, the advantages and disadvantages of deposit and nondeposit liabilities will be examined together.

Advantages

1. **ABSENCE OF COUPON REINVESTMENT RISK.** Because they generate no cash payments to be reinvested, one principal advantage of all zero-coupon instruments is that reinvestment risk disappears. The initial discount on the instrument accrues to capital at the promised rate of return--no more and no less. Consequently, the realized rate of return will equal the

promised rate of return when the instrument's maturity equals the planning period.

Coupon instruments, on the other hand, offer no such guarantee. An investor's realized return will equal the promised rate only if all coupons are received on time and are immediately and fully reinvested at the initial promised rate. Given the volatility of interest rates during the last 20 years, only under fortuitous circumstances would the average return from investment of the coupons equal the initial promised rate of return. Coupon securities will generate realized returns above, at, or below the promised yield depending on the average reinvestment rate that is achieved. Risk averse investors may attach a high cost to earning less than the promised yield and may find zero-coupon securities appealing.

The advantage of zero reinvestment risk is important for depositors with a long time horizon. Deposit contracts generally specify that the principal will compound at exactly the promised rate for the full maturity of the deposit. In a world without taxes, the depositor's promised and realized returns are equal. However, depositors with an investment horizon of five years who invest in six month MMCs incur considerable reinvestment risk once their initial investment reaches maturity. Similarly, investors in money market funds must infer the promised rate of return from previous yields and they are heavily burdened with reinvestment risk. Holders of an S&L's nondeposit liabilities also have little reinvestment risk protection. For them, the absence of reinvestment risk may be a particularly valuable feature that would, other things equal, make an S&L's long-term, zero-coupon capital notes an attractive investment vehicle.

2. ABSENCE OF COUPON REINVESTMENT COSTS. In addition to the uncertainty surrounding the interest rate at which coupon payments can be

invested, coupon securities suffer from another problem--their net yield is reduced by the transactions costs and search costs associated with investment of the proceeds from the coupon payments. Search and transactions costs may be significant relative to the amount to be reinvested, particularly for small savers. Because a zero-coupon security has no coupon payments that require reinvestment, its owner is neither faced with the costs of searching for the best coupon reinvestment alternative nor any transactions costs for such investment.

Again, the nature of current day deposit instruments offered by federally insured depository institutions renders academic the reinvestment cost aspect of zero-coupon deposits. Depositors are guaranteed that all interest (i.e., coupon) payments will be compounded (i.e., reinvested) without charge at the initial promised rate until maturity. Holders of a financial institution's long-term capital notes, however, are faced with coupon reinvestment costs and might find that zero-coupon capital notes would increase their net return by eliminating search and transactions costs.

3. LONGER EFFECTIVE LIFE. Zero-coupon securities have a longer effective life than a coupon security with the same maturity because they involve a single payment at maturity. For savers and investors who desire a security with a longer effective life than is available from a coupon security (and who do not wish to invest in a security having a maturity longer than the desired holding period), a zero-coupon security may fill an existing void in the range of available investment vehicles.

At the present time there are only two zero-coupon securities that are readily available to small investors--Treasury bills and U.S. Savings Bonds. Treasury bills have a minimum denomination of \$10,000 and are

available in a very limited range of maturities ranging up to one year. For someone seeking an investment with a ten-year effective life, Treasury bills do not represent a satisfactory investment vehicle.

U.S. Savings Bonds are also not suitable investment alternatives for someone with a ten-year time horizon. Prior to 1980, savings bonds were available in denominations that were multiples of \$25, were sold with only one maturity (five years), and there was a limitation of \$7,500 on the amount of savings bonds that could be purchased per year. Since 1980, savings bonds have been available in denominations that are in \$25 multiples (minimum denomination, \$50) originally with a maturity of 11 years and nine months and with an annual purchase limitation of \$15,000. The maturity has been reduced somewhat from increases by Congress in the rate paid on savings bonds. The maturity has never been known with certainty. For savings bonds as for Treasury bills, the ability of a saver to achieve the desired effective maturity is very limited. For such savers, a zero-coupon deposit available in a wide range of maturities and denominations might be an attractive savings vehicle.

For example, take the case of someone with an eight-year old child wishing to set aside several thousand dollars to pay for the child's college education. During the forthcoming ten-year period, no cash flow from coupons is needed. Other things being equal, such an investor would prefer a ten-year, zero-coupon security to a coupon security offering the same promised yield. However, ten-year, zero-coupon securities are not available.⁷ This hypothetical saver would likely find a ten-year discount savings certificate an attractive investment.

Unfortunately, the saver in our hypothetical example cannot turn to his friendly S&L or commercial bank to purchase a financial instrument that

satisfies his needs. Our hypothetical desired savings account is not on the menu of savings accounts that are specified in Regulation Q. Another side effect of Q-ceilings is that it prevents financial intermediaries from performing their essential function of issuing liabilities that are tailored to the needs of savers and, hence, are more desirable to savers than the primary securities issued by ultimate borrowers and available on the open market.

Whether small savers would purchase long-term, zero-coupon deposits in sufficient quantities to make them worth offering is an empirical question. In and of itself, the discount feature of Treasury bills and savings bonds has not hurt their sales. Both of these discount instruments are issued by the U.S. government, have zero credit risk, and have sold well when their rates were competitive with alternative investments. With deposit insurance available to \$100,000, there is no reason to believe that small savers would eschew discount savings certificates that pay competitive rates.

New instruments take time to be understood and accepted. Money market mutual funds took several years to catch on because they required savers to become familiar with a new financial intermediary with which they had never done business. MMCs allowed savers to continue doing business with their traditional financial intermediary and became a household word much more quickly. A zero-coupon (or discount) savings certificate, despite the new name, does have familiar predecessors (Treasury bills and savings bonds) and familiar sales outlets (banks and S&Ls). Thus, unless discount savings certificates become very complex securities because of a need to attach put or call provisions, there is a good chance that their long duration will not hurt their market acceptability with small savers.⁸ Likewise,

investors in long-term capital notes of S&Ls and banks may find a zero-coupon feature attractive.

4. IMMUNIZATION. Another advantage of zero-coupon savings certificates is that their successful introduction may allow some S&Ls to partially or fully immunize against interest rate movements. For other S&Ls, a significant narrowing in the duration of their assets and liabilities will become possible. For all such institutions, one of the major risks of intermediation, that of changes in the level and structure of interest rates, will have been decreased, minimized, or eliminated. This should make the S&L industry less risky overall unless individual S&Ls choose to offset this risk reduction by increasing their exposure to other kinds of risk. Presumably, S&Ls that attempt to immunize will do so in an effort to reduce their overall risk exposure and are not likely to increase other types of risk.

Immunization of a significant portion of the S&L industry will yield additional social benefits. The reduced risk in the industry should be accompanied by a reduced need for regulation and would open the door to a reduction of regulatory administrative and compliance costs. The reduced industry risk should allow a reduction in deposit insurance premiums or the setting of premiums that are inversely proportional to the degree of immunization that is attained by a financial institution. Alternatively, the deposit insurance agency could petition Congress for the power to provide insurance coverage beyond \$100,000 to cover interest payments on discount certificates for institutions that achieve and maintain a given degree of immunization. By their very nature, long-term discount certificates involve more interest than principal. For example, an initial deposit of \$3,855 in a ten-year, zero-coupon savings account promising to

pay 10 percent would have a maturity value of \$10,000. An initial deposit of \$50,000 in this same account would have a value that exceeded the \$100,000 insurance limit prior to the maturity of the deposit. A guarantee of the full interest payment at maturity by the deposit insurance authority would enhance the ability of S&Ls to market these deposits. The insuring authority should be willing to offer extended insurance coverage priced according to degree of immunization.

5. **LOCALLY TAILORED SAVINGS INSTRUMENTS.** The design of savings accounts that satisfies the needs of retail customers has become a lost art in the S&L industry. The phase-out of Q-ceilings enables and requires the design of deposits that meet the needs of diverse sets of individual customers.

Financial markets have become increasingly integrated in recent years; nonetheless, each of the numerous local geographic retail markets for savings in the United States retains some local idiosyncrasies. Savings instruments that would be a flop in Peoria, Illinois, may very well be marketed successfully in Chicago, gain moderate acceptance in New York City, and be marginally worth introducing in Newton, Iowa. Savings institutions can tailor zero-coupon certificates to fit the immunization needs of their balance sheet and the investment desires and needs of their customers, not the desires of customers hundreds of miles away or the savings needs that financial institution regulators in Washington, D.C. perceive that consumers desire. Both parties to the transaction will be better off from this increased freedom.

Disadvantages

1. **NO ANNUAL CASH FLOW.** By definition, zero-coupon financial claims provide no cash flow. Savers and investors that require a steady cash

inflow would find this drawback insurmountable and would continue to demand coupon securities. Those savers such as owners of Individual Retirement Accounts and Keogh Accounts, with little need for continuous cash inflows should not object to discount savings certificates and are likely to find zero-coupon savings accounts advantageous if they are offered a slightly higher return than on a savings account with comparable maturity but paying interest on a regular schedule. It must be kept in mind that IRAs and Keoghs are arrangements whereby the interest income, whether paid or accrued (but not withdrawn), is tax deferred. Hence, the owner of such an account has no tax liability during the life of the account and so requires no cash flow for meeting tax payments.

2. NEEDED TAX REFORM. Savers who are not able to defer taxes would find zero-coupon savings accounts unattractive in the absence of some additional incentives. One feature of a savings account that has added to its attractiveness is that the before-tax promised and realized returns are equal. Any disparity between the promised and realized return on savings accounts arises solely from the fact that the need to pay income tax (state and federal) on the interest prevents full reinvestment of the coupon payments. All other investment media, with the exception of zero-coupon financial claims, do not possess the feature that before-tax promised and realized returns will be equal. Savings accounts would become a more attractive investment vehicle if the spread between after-tax promised and realized returns were to be narrowed by allowing deferral of income tax until the year in which the interest is actually, rather than constructively, received by the account holder. Long-term, zero-coupon savings certificates would likely be very marketable instruments if the tax laws were amended to provide for such a tax deferment.

The short-term loss of income to the U.S. Treasury that such an amendment of the tax laws would entail requires some justification. Probably the most compelling case that can be made for allowing taxes on zero-coupon savings accounts to be deferred until maturity or withdrawal of interest is that widespread consumer acceptance of these savings accounts would help to stabilize the mortgage and housing markets. Since this happens to be a national goal or high social priority, mortgage market stabilization may be worth subsidizing and tax deferral may be warranted. Moreover, one of the larger subsidies to the housing sector is Regulation Q, which has been experiencing a slow death for several years and which will be phased out by March 1986. It could be argued that tax deferral of interest on long-term discount savings certificates should replace the subsidy that has been provided by Q-ceilings.⁹ Another reason for providing a subsidy to discount savings certificates is that, to the extent tax deferral increases the marketability of these accounts, there will be a salutary effect on the ability of S&Ls to immunize against interest rate risk. This would have the additional benefit of reducing a major financial and political constraint upon monetary policy.

The U.S. Treasury is likely to resist any attempt to allow tax deferral on long-term, zero-coupon savings accounts for two reasons: (1) loss of tax revenue, and (2) it would become more difficult for the Treasury to market its own securities to individuals because these proposed new savings accounts would in some ways be superior to securities offered by the Treasury.¹⁰ If long-term discount savings accounts had interest income that were both tax deferred and insured by an agency of the U.S. Government, they would be preferable to long-term Treasury securities which currently lack the tax deferral feature because intermediate and long-term

Treasury securities are issued at or near par value. Hence, nearly all income on Treasury securities is interest income (and is subject to tax in the year received) and virtually no income is attributable to original issue discount on which taxes can be deferred until the bond is sold or matures, whichever comes first.¹¹ Moreover, with Q-ceilings being phased out, such deposit accounts will soon be paying competitive market rates which would make them more attractive than U.S. Savings Bonds, the only instrument sold by the Treasury that might be considered similar to a long-term, zero-coupon savings account. To be strictly comparable, however, savings bonds would have to pay market rates, be made available in a wider range of maturities and in larger denominations.

3. INCREASED PRICE RISK. Because the price risk of a security is proportional to its duration, zero-coupon securities have greater price volatility than coupon securities with the same maturity. Risk averse investors may not find this built-in feature very appealing. However, this drawback applies only to negotiable securities. Most consumer-type savings accounts are nonnegotiable; hence, price volatility is not an issue. Price risk may be an important drawback in the case of negotiable capital notes and may therefore impose a serious limit on the maximum maturity of zero- (or low-) coupon capital notes that can be sold.

4. CRISIS AT MATURITY. Because the issuer of a long-term, zero-coupon security would be able to go a long number of years without proving its creditworthiness by making interest payments in full and on time to the holder of the security, it is possible that doubts may arise concerning the ability of the issuer to redeem the debt and accrued interest. A zero-coupon security having a promised yield of 10 percent and a maturity of eight years would have a final value composed of 46.7 percent

principal and 53.3 percent interest. If the final value were less than the maximum federal insurance on deposits (currently \$100,000), there would be no crisis at maturity. For deposits whose final value exceeds the federal insurance maximum then in force, a definite concern about the issuer's ability to repay could very well surface; it is likely that increased disclosure requirements will have to be placed upon institutions issuing long-term discount certificates. Again, the nonnegotiability of savings accounts renders academic the issue of increasing default risk premiums as the deposit approaches its maturity date.¹² For negotiable subordinated capital notes, however, the crisis-at-maturity question may be important. The capital notes of most small financial institutions do not enjoy a good secondary market; consequently, most purchasers of these capital notes plan to hold the notes to maturity, and the crisis at maturity dilemma does not apply. Larger financial institutions whose capital notes trade in an active secondary market may be faced with the issue of crisis at maturity with zero-coupon capital notes. Given the possible spillover effects of such a (real or perceived) crisis atmosphere, larger financial institutions may choose to avoid issuing long-term discount capital notes.

5. COMPLEXITY OF THE INSTRUMENT. As mentioned previously, zero-coupon financial claims are not new; Treasury bills comprise about 35 percent of the marketable government debt, and savings bonds have been well accepted when they paid competitive rates. In and of themselves, fixed rate, zero-coupon securities are probably less complex than comparable coupon securities. If zero-coupon securities were issued by private firms such as S&Ls that previously issued only coupon securities, these savings accounts may come to be viewed as being more complex than they really are.

In a volatile interest rate environment that reflected divergent expectations about future inflation rates, it is possible that fixed rate, zero-coupon securities would not find much of a market. In these circumstances, a variable rate discount certificate could be offered. The interest return for any given period would be paid at maturity but would be tied to a short-term market interest rate or to some index of market rates. As is discussed in the next section, this may be a convenient way of getting around the Treasury Department's regulations regarding the payment of taxes on each year's accrual of the original issue discount.

The complexity of a variable rate, zero-coupon savings account could very well limit market acceptance for several reasons. First, the final value of the account would be unknown. Second, the promised return is an unknown parameter. Third, the exposure of the issuing financial institution to future payouts, while not unlimited, can still be several-fold greater than with fixed rate liabilities and would dissuade the institution from offering these instruments without call provisions in the indenture. The callability feature would add to the instrument's complexity. Fourth, the uncertainty of future rates would make suppliers of funds desire a reverse call (or put) feature, adding further to the instrument's complexity. Such put and call features are beyond the understanding of many potential providers of funds to financial institutions and would seriously limit the market for these complex instruments. This has been the case with floating rate notes issued by bank holding companies in 1974-75 (and more recently by Citicorp in 1980). And last, a variable rate discount security has a duration that is equal to the period over which the coupon is fixed. For example, if the rate were changed every six months in accordance with some index of money market

rates, the duration of the security would be six months. But the original reason for suggesting a zero-coupon savings account was to permit an S&L to apply immunization principles by issuing long duration deposits.

Consequently the original impetus for zero-coupon savings accounts would be vitiated if it were necessary to offer variable rate, long-term savings accounts.

6. REDUCED PROFITABILITY. By reducing one major component of risk--the systematic risk associated with interest rate movements--immunization should lower the overall riskiness of many individual S&Ls and the S&L industry as a whole, unless S&Ls choose to maintain the same overall risk exposure by bearing increased risk in other areas. Since lower risk is generally associated with lower profitability (but not necessarily in proportion), the risk-return characteristics of the industry would change as additional S&Ls attempted to immunize. In the short run the return on capital will be reduced. The reduced profitability will place additional limits on the rate at which capital is expanded and will consequently reduce an institution's ability to withstand shocks due to causes other than interest rate movements.

7. REDUCED COMPETITION BETWEEN BANKS AND S&Ls. If both banks and S&Ls make a sincere effort to immunize, it is likely that the differences between the two types of institutions will become more pronounced rather than blurred. Given the short-term nature of their assets compared to S&Ls, banks are likely to heavily promote MMCs or some other savings account closely related to it. S&Ls, on the other hand, should promote long-term, zero-coupon savings accounts to match their long duration assets. Where the two institutions in the past have competed vigorously and directly--namely, for retail savings accounts--they will, in the

future, compete to a lesser extent. Banks wishing to immunize will likely reduce their mortgage lending. S&Ls wishing to immunize will also want to reduce their mortgage lending, substituting short-term consumer loans. Thus, there may be less competition in the origination of conventional, one-to-four family mortgages as a result of industry-wide attempts by banks and S&Ls to immunize. Some of the forementioned reduction in competition in the deposit-taking and mortgage lending areas is likely to be offset somewhat by increased competition in consumer lending.

MARKETING ZERO-COUPON DEPOSITS

An S&L that attempts to market zero-coupon deposits by referring to them by such an esoteric title will find few, if any, customers. However, with only modest creativity in disguising the name of the new account by using euphemistic terminology, zero-coupon accounts have the potential to gain a respectable share of the deposit market. This can be seen by evaluating the relative advantages and disadvantages of these accounts discussed in the previous section.

Zero-coupon deposits--or perhaps they should be referred to as deposits having interest paid at maturity--have few serious disadvantages, most of which can be easily overcome, and they have many advantageous characteristics as well. The primary disadvantage is the lack of cash flow to the owner. But the new, deregulated IRA/Keogh account approved by the DIDC effective December 1, 1981 is an account that does not require a cash flow. The absence of a regular cash flow has never been a serious drawback to sales of Series E or EE savings bonds; further, S&Ls and banks sold a large volume of 4-year and 6-year certificates of deposit in the mid-1970s, most of which allowed the interest to compound and be paid out at maturity

or the date of early withdrawal (at a penalty). Short maturity and regular cash flow are important to some but not all depositors.

The absence of cash flow could present a problem for long-term deposits that do not offer the tax-deferral feature of IRA/Keogh accounts. But the need for explicit tax-deferral is somewhat unclear. As discussed in footnote 11, each year's amortization of a corporate security's original issue discount is subject to federal income tax. The registration statements provided by issuers of deep discount and zero-coupon corporate bonds typically have a section containing standard verbiage describing the applicable tax codes. Whether these tax codes really apply to an S&L deposit paying all interest at maturity is unclear.

The lack of clarity on this point leaves S&Ls with three options. First, zero-coupon deposits can be sold to depositors who are clearly tax exempt. IRA/Keogh accounts are ideal in this regard. Pension funds are also tax exempt; and further, they enjoy the privilege of being able to aggregate the FSLIC insurance protection across their membership beneficiaries so that they are not limited by the \$100,000 insurance maximum of an individual.¹³ Several S&Ls have begun to offer three-year and longer zero-coupon accounts to pension funds at rates slightly above market for a federally insured investment.

A second but risky way to issue long-term, zero-coupon accounts is to tie the rate paid to a short-term index over which the S&L has no control. Thus the depositor would only know, for the sake of example, that the rate paid is the six-month Treasury bill rate plus 150 basis points; the rate would change every six months; and that all interest would be paid at maturity in four years or longer. Because future reinvestment rates are not known and final maturity date has not been established, the original

issue discount cannot be determined for tax purposes. Even if the Internal Revenue Service (IRS) were to go along with such an interpretation of the tax codes, it seems clear that such deposits could only be marketed to a sophisticated class of investors who understand the put and call options and the implications of variable rates. Further, these investors need to have control over the timing of their other tax liabilities; otherwise the final receipt of interest at maturity could have very adverse tax consequences. Clearly this is a limited market and one that the IRS could eliminate with a single, concise ruling on the tax status of zero-coupon deposits.

A third option that should be explored is to lobby the Congress to change legislation to permit some tax deferral on long-term savings. Such lobbying efforts have been going on for many years and will likely continue. Primary emphasis has been given to tax deferral of interest income for specially earmarked savings to fund high social priority investments such as the purchase of a first home or the financing of a child's college education. Up to this point in time, the Congress has resisted most of these lobbying efforts based largely on the fact that both housing and education were already the recipient of numerous subsidies.¹⁴ Since the economic logic behind tax incentives to boost savings is not overly compelling, any decision to legislate such subsidies must be based partially on political grounds.¹⁵ The fundamental decision that must be addressed is whether it is less expensive to the U.S. Treasury to utilize a shotgun approach by providing tax incentives to saving that benefit individual taxpayers and some classes of financial institutions not in need of a subsidy as opposed to using selective direct outlays for bailouts or

subsidies of a few individuals or financial institutions that have the greatest need for subsidization.

Considerable marketing effort will be necessary to convince the public to purchase long-term savings accounts and other investments that do not pay any interest for several years. However, some segments of the public desire accounts with these features and they have been ill-served by Regulation Q restrictions of recent years that made these deposits unpalatable. Further, S&Ls have a strong incentive and need to issue these deposits to lessen the impact of interest rate volatility. All that is necessary is for the suppliers and demanders of funds with this commonality of interests to get together on terms. The success of long-term, zero-coupon deposits will then be an empirical matter.

CONCLUSIONS

In conclusion, the marketing of long-term, zero-coupon deposits will allow S&Ls to increase the extent to which they may immunize themselves against changes in interest rates and will postpone the cash flow crisis now facing the S&L industry. Further, if the Treasury can be convinced to allow tax deferral of interest income on long-term, zero-coupon deposits issued by S&Ls, then a more permanent and superior solution to the current earnings and solvency problems of the industry can be found. All Savers Certificates, capital injections by the FSLIC, and other government subsidies which do little to encourage long-term thrift or to solve the interest rate risk dilemma faced by the S&L industry provide no long-term relief and questionable short-term benefits to the industry or society.

In the more volatile interest rate environment that has existed since the Federal Reserve changed its operating procedures for monetary policy on October 6, 1979, the desire and need on the part of S&Ls and other

financial institutions to partially or fully immunize has undoubtedly increased. Another benefit derived from protection against interest rate changes is the renewed ability of an S&L to choose to remain a specialist in home mortgage financing.

Footnotes

¹If the overall structure of interest rates does not fall considerably below the rates generally prevailing in 1981, however, the deferral of cash outflows will not improve an S&L's survival probability.

²Gerald O. Bierwag, George G. Kaufman, and Alden L. Toevs, "Management Strategies for Savings and Loan Associations to Reduce Interest Rate Risk," in New Sources of Capital for the Savings and Loan Industry, Proceedings of the Fifth Annual Conference, Federal Home Loan Bank of San Francisco, December 1979.

³Michael H. Hopewell and George G. Kaufman, "Bond Price Volatility and Term of Maturity: A Generalized Respecification," American Economic Review, September 1973.

⁴Lawrence Fisher and Roman L. Weil, "Coping with the Risk of Interest Rate Fluctuations: Returns to Bondholders from Naive and Optimal Strategies," Journal of Business, October 1971.

⁵Other conditions must be satisfied for either complete or partial immunization to be obtained. The planning period must be known with certainty and both assets and liabilities must be marked to market. See Bierwag, Kaufman, and Toevs, "Management Strategies..."

⁶Bierwag, Kaufman, and Toevs, "Management Strategies...", Table 2, p. 186.

⁷Insurance companies may offer single-payment annuities that have many of the characteristics of zero-coupon bonds. One noticeable difference is that insurance companies generally charge a front-end load as well as an annual administrative fee.

Beginning in March 1981, financial and nonfinancial firms began offering deep-discount and zero-coupon bonds. Through November 24, 1981 the 36 issues that entered the market had a face value of \$8.5 billion and netted \$3.5 billion to the issuing corporations. Eleven of these 36 issues were zero-coupon bonds. Among the issuers were J. C. Penney, G. M. Acceptance Corp., IBM Credit Corp, CIT Financial Corporation, and Security Pacific Corporation. See Moody's Bond Survey, November 30, 1981, p. 884-885.

Footnotes (cont'd)

⁸ Even if small savers find difficulty comprehending discount savings certificates, trust departments may find them to be a useful investment vehicle, particularly for small trust accounts where transactions and search costs need to be minimized. S&Ls may find the trust account powers granted them by DIDMCA to be a useful adjunct in marketing discount certificates.

⁹ Regulation Q is often thought of as a subsidy to the housing industry but this need not always be the case. For example, when Q-ceilings are binding and widespread disintermediation takes place, Regulation Q should be regarded as a tax that reallocates expenditure away from housing to other sectors of the economy. Even when Q-ceilings are not binding, the existence of Q may reduce the flow of funds to all financial institutions that are subject to Q, thereby decreasing the overall supply of funds available to make mortgages. The important point is that Congress perceives Q-ceilings as a subsidy to housing and would likely be amenable to replacing one perceived subsidy with another. The proposal espoused in this paper--namely allowing deferment of taxes on long-term, zero-coupon savings accounts--would merely make explicit a congressionally intended subsidy to the housing sector and replace the Regulation Q subsidy, which has worked either poorly or perversely, with a subsidy that is more likely to have the intended effect.

¹⁰ If the Treasury desired to reduce the number of small tenders or tenders from noninstitutional customers at its auctions, it might welcome long-term, zero-coupon savings accounts as a politically convenient way out. In this event, the Treasury might not object to the introduction of tax deferred, zero-coupon savings accounts provided the interest rate were tied to and were held below an index of comparable maturity Treasury securities.

¹¹ According to Internal Revenue Service regulations, the original issue discount on debt of the U.S. Treasury is subject to income tax as ordinary income, but payment of the tax may be deferred until the sale or maturity of the bond, whichever comes first. On corporate debt issued after May 27, 1969, the ratable portion of the original issue discount cannot be deferred and must be included in gross income each year. Under existing tax law, the U.S. Treasury has a definite advantage in the ability to sell discount bonds owing to the tax-deferral advantage.

¹² For a discussion of default risk premiums as a debt instrument approaches maturity, see James C. Van Horne, Financial Market Rates and Flows, Prentice Hall, 1978, p. 164-172.

¹³ See United States League Federal Guide, Section L9-80.3 - Section L9-80.5, United States League of Savings Associations, 1981. Plain language examples of the underlying regulations and interpretations are provided in Letter S#172, "Special Management Bulletin Re: Insurance of Accounts Coverage of Pension and Other Trusteed Employee Benefit Plans," United States League of Savings Associations, March 17, 1978.

¹⁴It has been estimated that housing will receive tax subsidies of more than \$39 billion in fiscal 1982, over two-thirds of which was accounted for by the deductibility of home mortgage interest payments. U.S. Congressional Budget Office, The Tax Treatment of Homeownership: Issues and Options, September 1981.

¹⁵The economics of tax incentives for saving and deferral of tax on savings account earnings is explored in U.S. Senate, Committee on Banking, Housing, and Urban Affairs, The Report of the Interagency Task Force on Thrift Institutions, July 1980, pp. 124-138.

POSTSCRIPT

Beginning in March 1982 several nonS&L competitors began to offer retail, long-term, zero-coupon instruments designed specifically for IRA/Keogh plans. The first of these plans was sponsored by Paine, Webber, Jackson and Curtis Incorporated as a unit investment trust that allowed individuals to participate in a portfolio of corporate debt securities originally issued at a discount, substantially all of which were zero-coupon bonds. Approximately one week later in a full page advertisement in the March 15, 1982 Wall Street Journal, BankAmerica Corporation, the holding company for the largest U.S. bank announced a \$500 million issue of retail zero-coupon notes having three maturities: one that would double one's investment in approximately 5 years and 8 months, one that would triple one's original investment in approximately 8 years and 8 months, and one that would quadruple the original investment in 10 years and 10 months. These "Money Multiplier Notes" would sell initially for \$500, \$333.33 and \$250 respectively and would all have a maturity value of \$1,000.

Also in mid-March 1982, Merrill Lynch & Co. began to market to their IRA/Keogh customers zero-coupon CDs issued by Crocker National Bank. These certificates of deposit had maturities of five, eight, or ten years and

were marketed nationwide through Merrill Lynch's national distribution network of approximately 440 sales offices. The feature that distinguishes the Merrill Lynch/Crocker zero-coupon instruments from those offered by Paine Webber and BankAmerica Corporation is that Merrill Lynch is marketing an investment instrument with up to \$100,000 of federal deposit insurance. As quoted in the March 22, 1982 American Banker, Merrill Lynch would be happy to act as a broker for similar zero-coupon deposits issued by other banks or S&Ls. It seems readily apparent that the time for zero-coupon deposits has come; S&Ls need only follow the marketing strategies of their banking and investment company competitors.