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A Cross-Sectional Investigation of the Net Interest Margins of Commercial Banks

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ABSTRACT

Recent research investigating the interest rate risk exposure of commercial banks has declared banks to be well hedged, i.e. they will be little affected by changes in market rates of interest. These studies examine time series data for a sample of commercial banks and find that the measure of income or net interest income does not vary with interest rates over time. This paper examines a sample of banks cross-sectionally to investigate the range of interest rate risk exposure among banks of different sizes and in different markets. The data for 1984 and 1985 show that, on average, banks have positive gaps between rate sensitive assets and liabilities, but that a significant range of gap positions exists. Empirical results indicate that balance sheet measures such as gap are not reliable measures of interest rate risk in that they are not closely related to subsequent changes in net interest margins.

A CROSS-SECTIONAL INVESTIGATION OF THE NET INTEREST MARGINS OF COMMERCIAL BANKS

I. INTRODUCTION

The volatile economic and financial environment of the last decade has given rise to an increased awareness of and concern about the degree to which financial institutions are exposed to interest rate risk. While this concern has had its greatest focus on savings and loan associations, all financial intermediaries are potentially subject to the effects of widely varying interest rates. In this paper the interest rate risk exposure of commercial banks is investigated. Bank net interest margins (NIMs) are examined as a measure upon which the *ex post* outcomes of interest rate movements are reflected.

Banks, as financial intermediaries, issue liabilities with different characteristics than the assets they acquire. One dimension of these differences is term to maturity with the classic description being that banks borrow (issue liabilities) short and lend (acquire financial assets) long. To the extent that this characterization is true, banks therefore assume both liquidity and interest rate risk in performing this term structure intermediation. If the opposite characterization were the case (i.e., borrow long and lend short) banks would no longer be exposed to liquidity risk, but would still have interest rate risk. The increase in the use of variable rate assets (and to a much lesser extent liabilities) has no effect on liquidity risk, but alters the focus of interest rate risk exposure from term to maturity to the time that must elapse before a variable rate asset (liability) may be repriced when market rates of interest change. The recent removal of Regulation Q interest ceilings on deposit liabilities has increased banks' potential exposure to the effects of changing interest rates.

To what degree are banks exposed to interest rate risk? Regulatory efforts to avoid bank failure have been aimed primarily at asset quality and capital adequacy rather than interest rate risk exposure. However, there has been an increasing focus by managers and regulators on measuring the interest rate risk exposure of banks.[1] However, anticipating the conclusion of this paper, the device often used to measure interest rate risk, the gap between interest sensitive assets and liabilities, may be a tool with little predictive ability. If the gap measure is not closely associated with the ex post outcomes of interest rate variation, than it should not be relied upon by managers or by regulators, and a better measure needs to be developed.

In Section II measures of interest rate risk exposure are examined and NIM is decomposed into its several elements; Section III provides a description of the sample of commercial banks and the manner in which balance sheet and income statement data are used; empirical results are discussed in Section IV; and Section V contains conclusions, implications and indicates further research needed.

II. INTEREST RATE RISK EXPOSURE AND NIM

As an intermediary, a bank operates in various types of markets. In (retail) deposit markets a bank must make available deposit liabilities that satisfy the liquidity or term preferences of its customers. In loan markets borrowing customers also have specific maturity needs. The balance sheet that results from this activity is likely to leave the bank with a position that exposes it to interest rate risk. In other cash markets, such as securities and purchased funds markets, a bank has some discretion in issuing liabilities and acquiring assets with desired maturities. In order to arrive at an overall desired exposure to interest rate risk, a bank can manipulate discretionary asset and liability maturities.

However, the achievement of a desired exposure via activity in cash markets has costs. Purchasing funds at a specific maturity to meet interest rate risk exposure objectives may not minimize the cost of funds. In other words, the benefits of adjusting risk exposure to the desired position must be compared to the costs of making the adjustment. In addition, banks with established channels for purchasing funds and with borrowing customers with diverse maturity needs may be able to adjust interest rate risk exposure easier or more cheaply than banks without these conditions. Since large banks generally have more diverse asset and liability markets, these banks may be expected to adjust their exposure more quickly to desired levels. Graddy and Karna (1984) have found evidence that this is the case.

This discussion leaves open the question of what a bank's desired interest rate risk exposure is. An extensive literature has developed that applies the concept of immunization to financial institutions [Bierwag and Toevs (1982) and Kaufman (1984)]. Using information on the durations of assets and liabilities a bank can establish an immunized position that gives it zero exposure to movements in interest rates. Whether or not this is the desired exposure, it establishes a benchmark position against which departures from the immunized position can be compared [see Bierwag, Kaufman, and Toevs (1983)]. If a bank has confidence in its interest rate forecasts, nonimmunized positions would be optimal.[2]

Another issue that separates academic treatment of interest rate risk from observed practice is the choice of the variable to be immunized. For a bank that has the objective of maximizing firm value, the strategy should be to immunize the market value of the firm from changes in interest rates. Most banks seem to be concerned with the impact of interest rate risk on cash flows, such as measures of income or net interest income. Since most banks do not have market traded stock, and since most regulation is cast in terms of book value, this may be a rational approach [Santomero (1984)].

Interest rate risk arises because, for a bank, as interest rates change, the rates earned on assets held in the portfolio may change at different times than rates paid on liabilities. This happens even if asset and liability rates are perfectly correlated because of the contractual characteristics of the assets and liabilities (term to maturity or repricing intervals). In terms of interest flows, interest revenues and interest expenses are not perfectly correlated, producing variability in net interest income due to changes in market rates of interest.

With a focus on net interest income (NII) many banks measure the degree of interest rate risk exposure by relating the dollar amounts of assets and liabilities whose returns or costs will change if market rates of interest change. This relationship may be the difference between these quantities, called the gap [Toevs (1983)], or the ratio of these quantities, called the gap ratio, as shown in (1) and (2):

$$\$GAP = \$RSA - \$RSL \tag{1}$$

$$GAP\ RATIO = \$RSA/\$RSL \tag{2}$$

where \$RSA and \$RSL indicate the dollar amount of rate sensitive assets and liabilities. The term "rate sensitive" must be specified and usually means the asset (liability) either matures or can be repriced within a specified time period, often one year. The interpretation given to these measures is that a \$GAP of zero (GAP RATIO of 1) indicates a hedged position, that is NII will not change as interest rates change. Any \$GAP that is nonzero (GAP RATIO not equal to 1) represents a balance sheet position that is exposed to interest rate risk, i.e., NII will vary as interest rates change.

These measures of interest rate risk exposure omit the consideration of other factors impacting on the level or variability of NII. Most bank annual reports present an <u>ex post</u> analysis of variances in NII by calculating the impact on NII of (1) changes in the volume of earning assets and interest bearing liabilities and (2) changes in the mix of earning assets and interest bearing liabilities as well as (3) changes in interest rates. Impacts of (1) and (2) on NII are not handled in the \$GAP or GAP RATIO measures.

In the cross sectional analysis below, NII will be converted to net interest margin or NIM which is NII/EA where EA is earning assets. The definition of NIM can be expanded to illustrate the influences of additional variables besides market rates of interest. The definition of NIM is:

$$NIM = \frac{NII}{EA} = \frac{\text{Int Income} - \text{Int Expense}}{EA} = \frac{rEA - iIBL}{EA} \quad (3)$$

where

r = average interest rate earned on earning assets;

i = average interest rate paid on interest bearing liabilities;

EA = average earning assets; and

IBL = average interest bearing liabilities.

Equation (3) can be rewritten as:

$$NIM = \frac{r_s EA_s - i_s IBL_s}{EA} + \frac{r_L EA_L - i_L IBL_L}{EA} \quad (4)$$

where the s subscript represents assets and liabilities that mature or are repricable in some short term period and their associated rates; the L subscript represents the remaining earning assets, interest bearing liabilities, and their associated average rates. Over some short time horizon, allowing only interest rates to change, a bank's NIM will change only due to changes in the first term of (4).

Equation (4) can be manipulated to become (5):

$$NIM = r_s[\frac{GAP_s}{EA}] + r_L[\frac{GAP_L}{EA}] + (r_s - i_s)[\frac{IBL_s}{EA}] + (r_L - i_L)[\frac{IBL_L}{EA}] \quad (5)$$

where GAP_s and GAP_L are as defined in (1) for short term and long term earning assets and interest bearing liabilities respectively. Equation (5) expresses a bank's NIM as a function of its balance sheet gaps for short term and long term assets and liabilities, each expressed as a percentage of earning assets, the extent to which its earning assets are funded by interest bearing liabilities, and the interest rates and interest rate spreads it experiences. If GAP_s is zero, NIM can still be affected by any change in the spread $(r_s - i_s)$ or by a change in the funding of earning assets by short term IBL. Flannery and James (1984a and 1984b) and Tarhan (1984) use measures similar to GAP_s/EA to proxy the rate sensitivity of a bank's balance sheet position, although each chooses a different scaling variable.

III. SAMPLE DATA AND METHODOLOGY

The data used in the empirical analysis is for a sample of banks drawn from the Call and Income Reports of all insured commercial banks. The sample consists of 404 banks drawn randomly from each of the five size groups shown below (using end of year 1984 total asset size).

Size Class	Asset Size Range	Number of Sample Banks	Sample Banks as a % of All Banks in this Size Class
SIZE 1	> $1 billion	52	19%
SIZE 2	$300 mil - $1 bil	57	11
SIZE 3	$100 - $300 mil	92	6
SIZE 4	$50 - $100 mil	105	4
SIZE 5	$25 - $50 mil	98	3

The empirical work below assumes that bank managers establish a balance sheet position at the beginning of a period based on the bank's market position, forecasts of interest rate movements, and the resulting desired exposure to interest rate risk. Therefore, balance sheet variables measuring exposure to interest rate risk such as measures of gap or funding are calculated as of the beginning of the period being examined. NIM is calculated as the realized value for the period. The sample data are for four six-month periods over the two years 1984 and 1985.

The question of what specific balance sheet items are considered as "short" remains unresolved. The measures of interest rate risk exposure should be related to the specific planning horizon of the management of the bank. For example, if the planning horizon is three months, then \$RSA and \$RSL in equations (1) and (2) should be assets and liabilities which are potentially repricable within the next three months. All other balance sheet items are, by definition, long; a change in interest rates during the next three months will have no impact on the interest revenue or expense generated over the next three months by these existing "long" assets or liabilities.

If one does not know the relevant planning horizon of individual banks, one year is often assumed to be the cutoff point for defining short assets and liabilities. In earlier work this assumption was required by the availability of bank balance sheet data. Flannery and James (1984a and 1984b) and Tarhan (1984) use a one year horizon to construct their interest rate risk exposure measures. Since 1983, banks have been required to report maturity and repricing data for selected assets and liabilities on Schedule RC-J of the call report. The selected assets include almost all of a bank's earning assets. Selected liabilities reported in RC-J exclude many deposit accounts for which maturity or repricing dates are undefined or uncertain. How to account for liabilities like NOW and super NOW accounts, MMDAs, and even passbook savings accounts have provided empirical fog over the measurement of interest rate risk. Flannery and James (1984b) infer the effective maturities of demand, savings, and small time deposits by using market data on bank stock prices. Their results indicate that these items behave more like "long" liabilities in that when market interest rates change, the bank's effective cost of funds from these liabilities changes by only a small amount.

Because of the results of Flannery and James (1984b), "short" liability measures used here include only the Schedule RC-J liability items. In the empirical section some estimates are obtained using a GAP_s which includes super NOWs and MMDAs as short term interest sensitive liabilities. To anticipate the results, little explanatory power is gained by using this alternate measure of gap. A one year horizon is only a crude measure of interest rate sensitivity since it weights balance sheet items that reprice in 30 days equally with those that reprice in 350 days. With Schedule RC-J data it is possible to calculate a less crude gap measure by weighting the dollar amount of assets (liabilities) in each maturity or repricing bucket[3] by the average maturity for the bucket to obtain a weighted average gap measure. This alternate gap measure is also used in the empirical work.

This study uses six-month periods as the assumed planning horizon of sample banks. Therefore, four six-month periods are examined for the two-year period 1984-1985. During this two-year period interest rates exhibited a variety of behaviors (see Chart 1). For the first eight months of 1984 short term interest rates rose. Over the next five months, until February 1985, rates fell to levels below those in January 1984. Early 1985 saw a slight rebound in rates followed by another decline until about June 1985. The last six months of 1985 where characterized by relatively flat rates. Long term rates followed a similar but less volatile pattern. Thus this two year period allows the examination of NIMs during rising, falling, and relatively stable interest rate periods.

Ordinary least squares is used to identify cross-sectional differences in bank behavior among banks of different sizes during periods of different interest rate movements. Much of the recent literature examining bank reactions to different interest rate movements concludes that commercial banks are relatively well hedged, that is, their exposure to interest rate risk is small [Flannery (1981), Flannery and James (1984a, 1984b), Hanweck and Kilcollin (1984), Mitchell (1985)]. In this study this conclusion is tested for banks of different sizes and with different balance sheet positions. While it may be the case that the banking system is hedged in the aggregate, it remains an open question as to the range of interest rate risk exposure being assumed by individual banks.

IV. EMPIRICAL RESULTS

The average values reported in Table 1 provide a partial description of the sample of commercial banks used for the empirical work. For the four six-month periods, NIM declined until the last half of 1985. The short gap position of the banks (defined over the traditional 12 month horizon here) varied considerably over the sample period. Whether these variations are due to managerial choice or due to changes in nondiscretionary balance sheet items is not clear. On balance the sample banks have net $RSA positions, or positive gaps at the short end. The share of the sample banks with negative gaps is significant but decreasing. This is, perhaps, a reflection of an increasingly held view that interest rate declines cannot continue, and an increase in rates is near. Sample funding ratios, the percentage of earning assets funded by interest bearing liabilities, are relatively constant but decline somewhat at the end of 1985.

NIM performance and balance sheet positions vary considerably among the different size classes of commercial banks. Size groups 3 (assets of $100-$300 million) and 4 (assets of $10-$100 million) earned the highest NIMs in 1985 and 1984 respectively. These results are understandable by examining the relative balance sheet positions for these two size groups. Size 4 banks were positioned with larger positive gaps to benefit from the market rate rises in 1984, but these same positions caused them to be hurt (relative to size 3 banks) by the market interest rate declines in 1985.

The largest banks earn the smallest NIMs which is consistent with the view that these banks operate in larger geographic markets and deal with larger borrowing customers, all of which leads to competitive pressures that shrink spreads that can be earned. The smallest banks, about whom regulatory concern is often great, have average short gaps that seem unremarkable compared to other banks, but the standard deviations of these short gasps are 40 percent to 80 percent larger than those of Size 1 banks. The fact that the small bank sample has larger percentages of banks with negative gaps in three of the four periods further demonstrates the greater diversity of small bank balance sheet positions. Conventional wisdom assigns these small banks the greatest difficulty in altering interest rate risk exposure to desired levels by transactions in the cash markets.

A. Estimates of Earning Rates and Spreads

Following the spirit of the statistical cost accounting literature [Hester (1966) and Rose and Wolken (1986)], equation (6) is estimated for the total sample of banks and for each size group subsample.

$$NIM = a_1[\frac{GAP_S}{EA}] + a_2[\frac{GAP_L}{EA}] + a_3[\frac{IBL_S}{EA}] + a_4[\frac{IBL_L}{EA}] \quad (6)$$

In this form a_1 and a_2 are estimates of r_s and r_L respectively, and a_3 and a_4 are estimates of (r_s-i_s) and (r_L-i_L) respectively. Both the short and long term rates earned should reflect the levels and movement of market interest rates over the 1984-85 period. Since NIM is affected by changes in spreads, estimates of a_3 and a_4 will be examined to see how spreads have changed and how changing spreads will have affected bank NIMs. In estimating equation (6) average balance sheet data for each six-month period are used, and the six month planning horizon is assumed. NIM is the actual value realized for the six-month period.

Coefficient estimates for equation (6) are shown in Table 2. Estimates of a_1 and a_2 using the total sample reflect the rising rates in the first half and the first several months of the second half of 1984. A downward sloping yield curve is evident in these estimates of r_s and r_L for 1984. Most of the rates are lower in 1985 and the yield curve is upward sloping. Estimates of (r_s-i_s) are not significantly different from zero in 1984, and are barely significant in 1985. However, these estimated spreads mirror the movements of NIM, rising over the first three periods and then falling in the last half of 1985. For the total sample of banks, a larger spread was earned on the long term portion (maturity or repricing of over six months) of the balance sheet. Spreads of 350 to 400 basis points of asset returns over liability costs are estimated.

When examining the estimated coefficients for subsamples segmented by size, it is noted that small banks (SIZE 5) tended to earn higher estimated average rates on short asset than large banks and lower estimated average rates on long assets. The pattern of the estimated spread coefficients showed small banks earning significant and larger spreads on short assets, with the spread increasing as market interest rates fell in late 1984 and most of 1985. On the other hand, the largest banks earned the largest spreads on long term balance sheet positions. The implications of these estimated rates and spreads are that small banks find positive spread opportunities in both short and long balance sheet positions; large banks have smaller (and sometimes not significantly different from zero) spreads from their short balance sheet positions, but greater spreads from long term positions. These differences in short and long margins leaves large banks with smaller NIMs when compared to small banks.

B. Change in NIMs

Equation (5) indicates the ex post relationship between NIM and gap, earning rates, spreads, and funding ratios. To examine the relative importance of various balance sheet positions and their changes, equation (7) is estimated:

$$\Delta NIM = b_0 + b_1[\frac{GAP_s}{EA}] + b_2[\Delta \frac{EA}{TA}] + b_3[\Delta \frac{IBL}{EA}] \quad (7)$$

Here the focus is on the change in NIM that occurred for each six-month period and its relationship with the gap position at the beginning of the six-month period, the change in the volume of earning assets (relative to total assets), and the change in the funding ratio, both changes measured over the six months.

If the movement in NIM is dominated by movements in market interest rates, b_1, b_2 and b_3 should be small or zero, and b_0 should be positive during periods of rising rates (since the sample is net asset sensitive) and negative during periods of falling rates. If the different individual bank gap positions or changes in their earning asset and interest bearing liability mixes have significant impacts on NIM, then b_1, b_2 or b_3 will have coefficients significantly different from zero.

Table 3 presents average values for the change in NIM and the independent variables of equation (7). The change in NIM column is the average change from the previous period's NIM. GAP_s/EA is measured as of the beginning of each six-month period using a 12-month horizon;[4] the other change variables are the change from the beginning to the end of each six-month period. From the last half of 1983 to the first half of 1984 the average NIM of these banks rose. It then fell in each of the next two six-month periods, and finally rose slightly in the last half of 1985. The short term gap position of the banks was positive throughout this period, but shifts in the short gap are evident. The reduction in the average short gap by the beginning of the second half of 1984 suggests a belief that interest rates would fall, which did happen. An increase in the short gap by the beginning of the next two six-month periods suggests a forecast of rising interest rates, which did not occur.

The change in the EA/TA ratio captures the effect of mix changes on NIM. If this ratio increases, the asset portfolio consists of relatively more earning assets which should have a positive impact on NIM. For the total bank sample, the average value of this measure was negative in two of the four periods, causing a drag on NIM. The change in IBL/EA captures changes in the way that the earning assets are funded. If this ratio falls in value, a relatively larger share of earning assets is being funded by liabilities on which no interest is paid. A decline in this ratio would have a positive impact on NIM. For the total bank sample this ratio showed decreases in three out of four periods, providing a boost to NIM.

Table 3 also shows average values for banks with negative GAP_s separately from those with positive GAP_s. The number of banks with $GAP_s < 0$ declined considerably in 1985 from 1984. The negative gap banks had a poorer change in NIM performance in 1984 and a superior change in NIM performance in 1985 when compared to banks with positive gaps. Holding other things constant, a bank NIM would perform better if its gap is positive during rising rate periods and negative during falling rate periods. The results here do not fit this expected pattern, implying that other things were not constant. It is clear from the average values in Table 3 that negative gap banks had significantly different changes in the EA/TA and IBL/EA ratios than did positive gap banks.

Table 4 presents estimated coefficients for equation (7) separately for the total sample, for negative gap banks, and positive gap banks. The estimated constant terms for the total sample have the hypothesized signs, positive when rates are rising and negative when rates are falling, but are statistically significant in only two of the four periods. Only one-third of the estimated coefficients other than the constant term are significant, indicating little ability for this set of independent variables to explain changes in NIM.

For the total sample the coefficients of the gap measures, GAP_s/EA, are positive for both 1984 periods and negative for both 1985 periods. However, the 1984-2 period coefficient is not significantly different from zero. Since the total sample is characterized by a positive gap position, this is the expected result with the gap associated with NIM increases when rates rose in 1984-1 and with NIM decreases when rates fell in 1984-2 and 1985-1. The 1985-2 gap coefficient indicates that the positive gap was associated with NIM declines during this relatively flat rate period.

During the first three six-month periods the coefficients on $\Delta(EA/TA)$ are negative but not significant. Perhaps the positive influence on NIM from a higher proportion of total assets as earning assets is buffered during a period of falling rates by the lower earning rates on the added earning assets. This buffering could cause this volume effect to be reduced in magnitude.

For the total sample the coefficient on $\Delta(IBL/EA)$ is significant only in the 1985-2 period. The interpretation of the negative coefficient in 1985-2 is of a declining NIM in the case of an increase in the proportion of earning assets funded by interest bearing liabilities, even though liability rates are falling.

When the total sample is divided into negative gap and positive gap subgroups, the number of significant coefficients remains unimpressive. For the banks with positive gaps, the gap coefficients have the expected signs but only two of the four coefficients are significantly different from zero. For the negative gap banks, the gap coefficient is significant only in the 1985-2 period. Few of the remaining coefficients for the Δ(EA/TA) and the Δ(IBL/EA) variables are significant, especially for the negative gap subgroup.

In an attempt to increase the explanatory power of the gap measure, GAP_s was defined in two alternate ways: (1) the IBL_s component of GAP_s was defined to include super NOW and MMDA liabilities, and (2) weighted average gap measures were used. Neither of these alternative specifications of GAP_s improved the explanatory power of equation (7).

V. IMPLICATIONS AND CONCLUSIONS

The research reported in this paper has attempted to measure the interest rate risk exposure of commercial banks in recent years. An emerging view that banks are well hedged and thus immune to changes in interest rates is tested. The emerging view is generated by a time series examination of the response of bank revenues, expenses and profits to changes in interest rates. An alternative approach, used here, is to examine a cross-section of banks for periods of time with both interest rate increases and interest rate declines.

Average sample data indicate that many individual banks are not well-hedged, and a variety of balance sheet positions exists among different banks. However, empirical results indicate that differing gap positions do not have a clear-cut and dominant impact on the changes in net interest margins experienced by individual commercial banks. Other facts, such as changes in balance sheet mix and changes in the way earning assets are funded, do have some influence on bank net interest margins, but the explanatory power of this set of variables is low. A gap measure by itself appears to be unable to provide much information about a change in a bank's NIM in the next period.

Several possible reasons for the lack of close association between gap measures and NIMs are possible. As certain off-balance sheet items increase in amount, the interest rate sensitivity of the bank is less accurately characterized by a balance sheet-based measure. Interest rate swaps, for example, alter the interest rate sensitivity of a bank's cash flows, but this influence is not captured in a gap measure. However, this error in measurement should apply only to the (usually larger) institutions engaging in these swaps and probably has little impact on the usefulness of gap measures for smaller banks.

The more likely reason for the lack of a strong, measurable relationship between a bank's gap and its change in NIM is the inaccuracy of the gap measures in proxying the desired degree of exposure. In addition, a particular gap measure value is valid only at the point in time at which the balance sheet is constructed. Balance sheet values can change daily, destroying the predictive ability of a gap value that is several weeks or several months old. It is difficult to capture the effects of a dynamic process with static measure.

In attempting to measure the interest rate risk in the banking system by looking at balance sheet measures or gaps, an accurate picture of exposure to risk would not be obtained. Whether for examination purposes or for determining appropriate variable insurance premiums, current gap measures are inappropriate indicators of risk without taking other factors into account.

ENDNOTES

[1]The Federal Savings and Loan Insurance Corporation has proposed variable insurance premiums based on a measure of interest rate risk exposure for insured savings and loan associations.

[2]A bank would choose the position that would benefit it from the expected interest rate movement, rather than an immunized position that would snelter it from the effects of interest rate movements.

[3]The "buckets" or maturity ranges in Schedule RC-J of the call report are (1) immediately adjustable, (2) two days to three months, (3) over three months to six months, (4) over six months to one year, (5) over one year to five years, and (6) over five years. The first four buckets are used to calculate the weighted average gap measures.

[4]Equation (7) was estimated using a short gap position defined for a six month horizon. The results of using GAP_S defined in this way differed little from those reported in Table 4.

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CHART 1

INTEREST RATES: 1984 and 1985

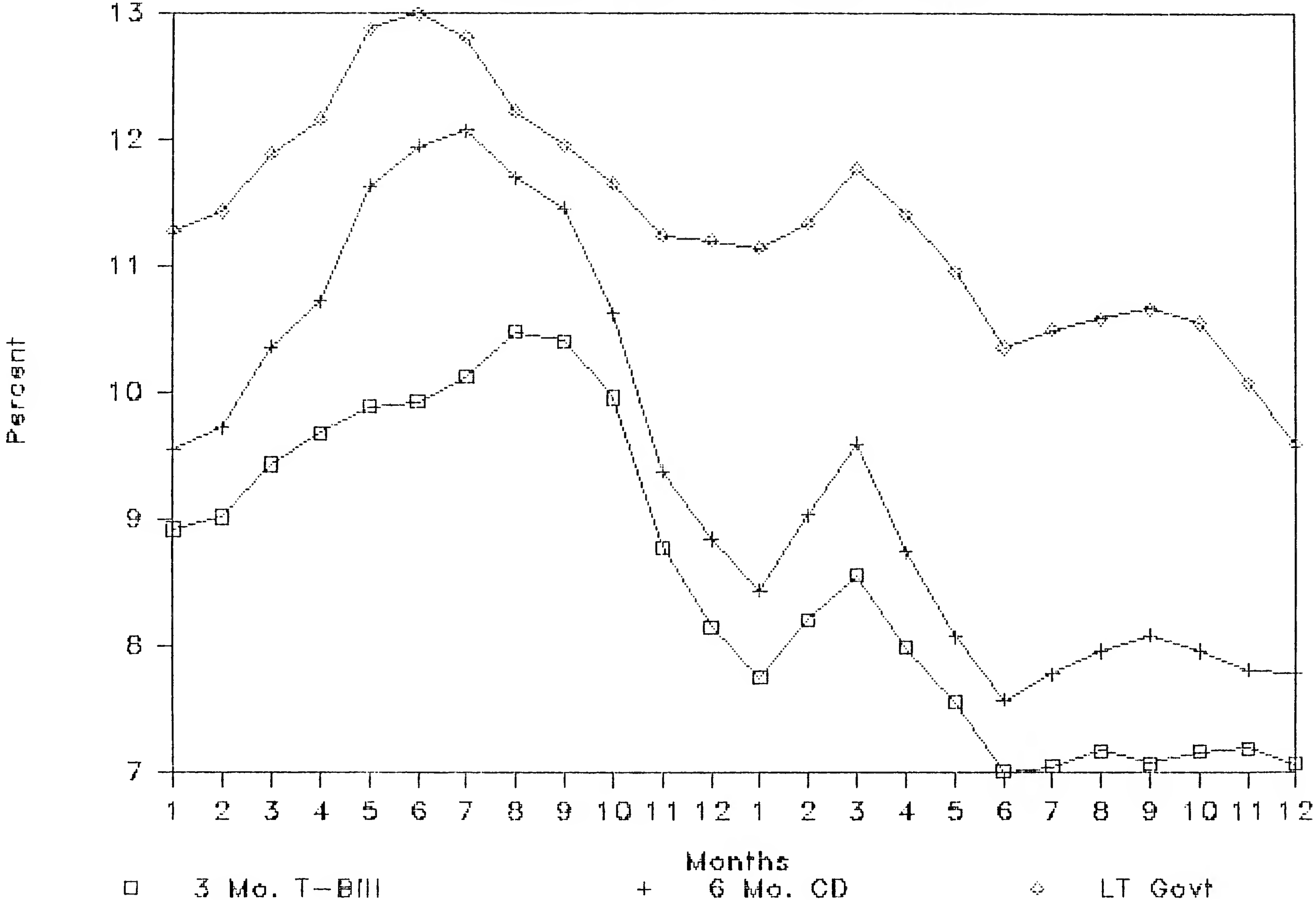

TABLE 1

SELECTED VARIABLE MEANS

Time period:		1984-1	1984-2	1985-1	1985-2
TOTAL	NIM	4.745%	4.697%	4.531%	4.573%
(404)[1]	GAP_s/EA[2]	0.1438	0.1225	0.1447	0.1651
	IBL_s/EA	0.4359	0.4493	0.4464	0.4263
	% $GAP_s<0$	17.08%	17.82%	11.88%	9.41%
SIZE 1	NIM	4.192%	4.315%	4.297%	4.280%
(52)	GAP_s/EA	0.1312	0.1281	0.1485	0.1661
	IBL_s/EA	0.5085	0.5196	0.5077	0.4894
	% $GAP_s<0$	7.69%	5.77%	5.77%	5.77%
SIZE 2	NIM	4.554%	4.606%	4.546%	4.455%
(57)	GAP_s/EA	0.1238	0.1204	0.1462	0.1731
	IBL_s/EA	0.4402	0.4644	0.4557	0.4349
	% $GAP_s<0$	15.79%	12.28%	5.26%	5.26%
SIZE 3	NIM	4.744%	4.675%	4.736%	4.775%
(92)	GAP_s/EA	0.1298	0.1148	0.1486	0.1833
	IBL_s/EA	0.4471	0.4437	0.4346	0.4077
	% $GAP_s<0$	18.48%	17.39%	8.70%	6.52%
SIZE 4	NIM	4.978%	4.894%	4.506%	4.677%
(105)	GAP_s/EA	0.1553	0.1226	0.1463	0.1539
	IBL_s/EA	0.4044	0.4226	0.4242	0.4066
	% $GAP_s<0$	15.24%	19.05%	12.38%	13.33%
SIZE 5	NIM	4.902%	4.766%	4.483%	4.499%
(98)	GAP_s/EA	0.1628	0.1271	0.1356	0.1540
	IBL_s/EA	0.4181	0.4366	0.4427	0.4257
	% $GAP_s<0$	23.47%	26.53%	21.43%	12.24%

[1] Sample sizes.

[2] GAP_s and IBL_s are beginning of period positions and are defined over a 12 month horizon.

TABLE 2

ESTIMATED COEFFICIENTS FOR EQUATION (6)

$$NIM = a_1[GAP_s/EA] + a_2[GAP_L/EA] + a_3[IBL_s/EA] + a_4[IBL_L/EA]$$

		a_1	a_2	a_3	a_4	$\bar{R}^2$
1984-1	TOTAL	0.11551 (0.0060)	0.10117 (0.0059)	-0.00087 (0.0040)	0.03955 (0.0019)	0.34392
	SIZE 1	0.10843 (0.0157)	0.13266 (0.0160)	-0.00138 (0.0065)	0.04742 (0.0065)	0.56203
	SIZE 5	0.10807 (0.0106)	0.08939 (0.0108)	0.00759 (0.0078)	0.04032 (0.0030)	0.36771
1984-2	TOTAL	0.13086 (0.0064)	0.12505 (0.0069)	0.00387 (0.0040)	0.03448 (0.0019)	0.35077
	SIZE 1	0.09921 (0.0180)	0.13778 (0.0189)	0.01323 (0.0068)	0.05403 (0.0074)	0.43630
	SIZE 5	0.12200 (0.0130)	0.10816 (0.0139)	0.02121 (0.0081)	0.03237 (0.0035)	0.27702
1985-1	TOTAL	0.11090 (0.0057)	0.11358 (0.0061)	0.00759 (0.0038)	0.03933 (0.0017)	0.31213
	SIZE 1	0.09902 (0.0137)	0.15504 (0.0152)	0.00891 (0.0056)	0.05711 (0.0057)	0.62515
	SIZE 5	0.09610 (0.0127)	0.08801 (0.0129)	0.02567 (0.0084)	0.03643 (0.0034)	0.12440
1985-2	TOTAL	0.10832 (0.0063)	0.11210 (0.0065)	0.00717 (0.0042)	0.04055 (0.0019)	0.26967
	SIZE 1	0.08715 (0.0152)	0.14417 (0.0180)	0.01546 (0.0068)	0.05863 (0.0064)	0.48540
	SIZE 5	0.10600 (0.0133)	0.10460 (0.0133)	0.02874 (0.0095)	0.03486 (0.0035)	0.14799

Standard errors in parentheses. $\bar{R}^2$ is adjusted R-squared.
GAP_S, IBL_S, and EA are average values for each six month period.

TABLE 3

SELECTED VARIABLE MEANS

		NUMBER OF BANKS	CHANGE IN NIM (basis pts)	GAP_s/EA	$\Delta(EA/TA)$	$\Delta(IBL/EA)$
1984-1	TOTAL	404	13.15	0.14376	0.01749	-0.00999
	$GAP_s<0$	69	11.21	-0.07228	0.01697	-0.00445
	$GAP_s>0$	335	13.55	0.18826	-0.01760	-0.01113
1984-2	TOTAL	404	-10.64	0.12251	-0.00275	-0.00212
	$GAP_s<0$	72	-25.53	-0.08776	-0.00189	-0.00619
	$GAP_s>0$	332	-7.40	0.16811	-0.00294	-0.00124
1985-1	TOTAL	404	-15.98	0.14472	0.00468	0.00763
	$GAP_s<0$	48	1.54	-0.08246	0.00508	-0.00179
	$GAP_s>0$	356	-18.34	0.17535	0.00462	0.00890
1985-2	TOTAL	404	2.38	0.16489	-0.00100	-0.00007
	$GAP_s<0$	38	33.26	-0.08894	-0.00046	0.00431
	$GAP_s>0$	366	-0.83	0.19117	-0.00106	-0.00052

GAP_s is defined over a 12 month horizon.

All changes are from the beginning to the end of the indicated six month period.

TABLE 4

ESTIMATED COEFFICIENTS FOR EQUATION (7)

$$\Delta NIM = b_0 + b_1[GAP_s/EA] + b_2[\Delta(EA/TA)] + b_3[\Delta(IBL/EA)]$$

		b_0	b_1	b_2	b_3	$\bar{R}^2$
1984-1	TOTAL	0.00045 (0.00058)	0.00856 (0.06269)*	-0.01375 (0.01434)	0.01259 (0.00769)	0.07074
	GAP_s<0	0.00183 (0.00130)	0.01003 (0.01405)	0.00755 (0.02862)	0.02577 (0.02366)	-0.01281
	GAP_s>0	-0.00076 (0.00082)	0.01406 (0.00368)*	-0.02503 (0.01697)	0.00846 (0.00865)	0.09017
1984-2	TOTAL	-0.00158 (0.00044)*	0.00357 (0.00229)	-0.01517 (0.01638)	-0.01820 (0.01134	0.00467
	GAP_s<0	-0.00165 (0.00143)	0.01497 (0.01313)	-0.03188 (0.05028)	-0.05704 (0.03084)*	0.01935
	GAP_s>0	-0.00068 (0.00063)	-0.00063 (0.00313)	-0.00960 (0.01739)	-0.01044 (0.01228)	-0.00664
1985-1	TOTAL	-0.00013 (0.00047)	-0.01015 (0.00236)*	-0.01462 (0.01458)	0.00915 (0.01011)	0.04260
	GAP_s<0	-0.00069 (0.00147)	-0.00369 (0.01314)	-0.04400 (0.05700)	0.00515 (0.02903)	-0.04612
	GAP_s>0	0.00029 (0.00063)	-0.01234 (0.00303)*	-0.01106 (0.01509)	-0.00983 (0.01083)	0.04186
1985-2	TOTAL	0.00083 (0.00042)*	-0.00349 (0.00194)*	0.02175 (0.01330)	-0.01943 (0.00867)*	0.03545
	GAP_s<0	0.00553 (0.00161)*	0.02554 (0.01409)*	-0.12737 (0.05296)*	0.00177 (0.02928)	0.13047
	GAP_s>0	-0.00021 (0.00052)	0.00077 (0.00233)	0.03052 (0.01329)*	-0.02478 (0.00879)*	0.05631

Standard errors in parentheses. * indicates coefficient is significant at the 5 percent level. $\bar{R}^2$ is adjusted R-squared. GAP_s is defined over a 12 month horizon.