Competitive Aspects of EFTS

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There seems little doubt that EFTS is a technological force that will significantly affect the financial environment of the United States in the near future. Although the range and dimension of EFTS developments are only vaguely discernible at this time, several of these developments may substantially alter the relationships between financial institutions, while others will affect the customer's need for financial services as well as his perception of present financial institutions.

It is the intent of this paper to examine the change in the competitive relationship between financial institutions which may result from certain EFTS developments.

The methodology chosen for this analysis was conditional forecasting. This technique is useful, since it allows several forecast sets to be compared on a relative basis. The forecast sets developed will be derived from several contingent environments. These contingent environments will be determined by a number of factors; the most important of which will be the policy actions of specified federal and state regulatory authorities. These factors were singled out, since it seems evident that actions by federal and state regulatory authorities will greatly affect development of EFTS. Finally, it is not the purpose of these forecasts to exactly predict a specific future environment; rather it is to provide estimates of the magnitude of impact that certain EFTS policy or legislative decisions might have on the relationship between financial institutions.

General Model

The general conditional forecasting model is described by three sets of parameters:

$$\text{Set 1} = \{L_1, L_2, L_3, L_4, \ldots, L_n\},$$

$$\text{Set 2} = \{M_1, M_2, M_3, \ldots, M_n\}, \text{ and}$$

$$\text{Set 3} = \{N_1, N_2, N_3, \ldots, N_n\}.$$

Set 1 is composed of parameters which represent such items as federal or state laws or regulatory policies which determine the available types of financial institutions and the types of behavior in which these institutions may engage within the given environment. Set 2 is composed of parameters which describe items related to the competitive relationship between financial institutions. Set 3 is composed of parameters related to various EFTS developments: the development of consumer bank communication terminals, the development of remote service units by savings and loan associations, the introduction of telephone banking, or any number of events related to the development of an electronic payments mechanism.

In the general model the parameters of Set 3 could interact with the parameters of Set 1; thus altering the financial structure of the environment. These changes may occur through any number of events: An EFTS parameter--the development of remote electronic banking facilities--could provide a mechanism through which certain financial institutions could circumvent state-established branching restriction. Or an EFTS parameter--automatic prepayment of certain bills--could provide an electronic substitute for certain financial services presently offered only by select financial institutions.

Similarly, the EFTS parameters of Set 3 could also alter the relationship between financial institutions, represented by the parameters in Set 2; for example, certain EFTS parameters may allow certain financial institutions to offer services which allow them to compete for customers previously considered within the exclusive domain of other financial institutions. EFTS parameters could also affect the variables by which the competitive relationship among financial institutions is measured. That is, they could alter the definition of banking offices to include offices where traditional financial services are offered and offices where perhaps only certain electronic financial services are offered. Or they could expand the definition of checking account balances to include traditional demand deposits plus balances in savings accounts reserved for automatic payment of selected bills.

Since the number of environmental changes which could be produced even from introduction of a small number of parameters in Set 3 is large, several simplifications had to be made. And it is on this simplified or reduced model that all subsequent conditional forecasts for Minnesota are made.

Reduced Model

The reduced model is based on several restricted parameter sets. Set 1 will include as parameters only federal and state EFTS legislation and federal and state EFTS regulatory policies. Thus, numerous items previously included in this set as parameters will now be included only as constants. These items include: state-instituted branching regulation; state wild card laws governing the behavior of state-chartered commercial banks and savings and loan associations with respect

to the behavior of the respective federally chartered financial institutions; and federal legislation regulating the financial services offered by various financial institutions. For purposes of the reduced model, these items in Set 1 will be unchanged for each forecast set. Further, the financial institutions considered in this analysis were restricted to include only three types: commercial banks, savings and loan associations, and other financial institutions. This "other" category only includes mutual savings banks and credit unions, since credit unions in Minnesota, although numerous, are not a significant factor in the financial market and Minnesota has only one mutual savings bank. Further, the model assumes that only commercial banks and savings and loan associations are to engage in any EFTS developments.

Similar simplifications were made with respect to Set 3. The number of EFTS parameters was limited to the following; the development of remote electronic banking facilities by commercial banks and savings and loan associations. As a result of this consolidation many important electronic banking services were not considered; for example, telephone banking and automatic prepayment of bills. This limitation was made because the impact of these EFTS parameters on the financial environment posed difficult measurement problems beyond the scope of this initial study.

Finally, restricting the EFTS parameters of Set 3 eliminates the possibility of altering the parameters in Set 2. Thus, the nature of the competitive relationship between financial institutions will be assumed to be unchanged irrespective of what EFTS parameters are introduced in the environment.

Within the reduced model the market share of consumer savings was chosen to measure the competitive relationship between specified financial institutions.[1/] This was the choice because the EFTS developments to be discussed will in all likelihood have their largest impact in the consumer or retail banking financial market, and because consumer savings can be used to measure that market with a significant amount of comparability between financial institutions.

Two variables were considered important in determining market share consumer of savings: the interest rate differential paid by savings and loan associations over commercial banks on consumer savings accounts (currently 25 basis points) and the convenience of location of financial institutions; that is the number of office locations. But since the interest rate differential variable was also a financial structure parameter held constant in the reduced model, it could be disregarded. So the only variable actually determining the market share of consumer savings was the number of financial institution office locations. This variable was singled out, since it is anticipated that the placement of remote electronic banking facilities could significantly alter certain financial institutions' market share of the total number of offices.

[1/] All components of the competitive relationship are defined fully in Appendix 1.

The resulting definition of the competitive relationship between financial institutions can be written as

(Equation 1)

$$MSCS = F(MSTO)$$

where MSCS = market share consumer savings,

MSTO = market share total offices, and

F = an unspecified function.

In order for this relationship to be used as a part of the reduced conditional forecasting model, a further relationship had to be developed which could transform the group of electronic banking facilities into equivalents of the traditional office facilities presently operated by Minnesota financial institutions. This relationship is given as

(Equation 2)

$$REBF = G(TOF)$$

where REBF = remote electronic banking facilities,

TOF = traditional office facilities, and

G = an unspecified function.

These two equations will form the forecasting basis for the reduced model.

With respect to Equation 1, it was assumed that a simple linear model of the form

(Equation 1a)

$$MSCS = b_0 + b_1 MSTO$$

would be sufficient for the purposes of this analysis. In order to

specify the coefficients of this equation, regression analysis was used based on two data sets. The first data set included market share consumer savings and market share total office data for savings and loan associations operating in unit banking states. The second set included the same type of data for statewide banking states. (A complete listing of all data points in each set is provided in Appendix II.) The derived coefficients from this regression analysis are given in Equations 3 and 4.[2/]

(Equation 3)

$$MSCS_s = \underset{(1.72)}{7.9\%^*} + \underset{(5.56)}{1.5MSTO}^{2/} \qquad R^2 = .66$$

(Equation 4)

$$MSCS_u = \underset{(4.77)}{22.9\%} + \underset{(3.33)}{.8MSTO} \qquad R^2 = .54$$

where MSCS = savings and loan association market share consumer savings,

MSTO = savings and loan association market share total offices,

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[2/] The value is the t-statistic shown in the parentheses beneath each coefficient in the equations. An asterisk next to a coefficient indicates that a coefficient is not significant at the 95 percent level of confidence.

u = unit banking states, and

s = statewide banking states.[3/]

These results indicate that there exists a relative advantage for savings and loan associations operating in unit banking states over savings and loan associations operating in statewide banking states. This advantage is particularly evident in the b_0 coefficient, which is approximately 15 percent higher in unit banking states than statewide

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[3/] Two questions should be raised at this point. First, is the segmentation of the data into two sets, that is, unit banking and statewide banking, artificial and are the two resulting regression models yielding more information than would a single regression model constructed from the combined data sets? Second, since the regression equations were constructed from cross-sectional data for a single time period, is there reasonable comparability between these equations based on U.S. data and Minnesota's historical experience? The last question is of particular importance since the conditional forecasts will be made for Minnesota based on this cross-sectional model.

With respect to the first question, the answer can be given quite simply. In order to determine the similarity or dissimilarity of the regression models, the residual variances of the respective regression models ($\sigma^2_{y \cdot x}$) were tested for homogeneity by means of the two-tailed F-statistic. Using this statistic it was determined that the hypothesis which assumed the residual variances were homogeneous could be rejected at the 95 percent level of confidence. Given that the residual variances of the regression models were heterogeneous, future testing of the regression models with the Chow statistic was deemed unnecessary, and it was concluded that the regression models given in Equations 3 and 4 were structurally different.

With respect to the second question, comparisons were made between the regression models based on cross-sectional data and models constructed for Minnesota from time series data. The conclusion drawn was that no significant differences between the relevant coefficients of the time series and cross-sectional regression models existed. For a fuller discussion of this question, refer to Appendix 3. Also, a final check was made to ascertain whether or not Minnesota was atypical with respect to other unit banking states in the cross-section sample. The results indicated that Minnesota was not atypical with respect to other unit banking states. For a full discussion of this test, refer to Appendix 4.

banking states. This advantage is at least partially explained by the ability of federally chartered savings and loan associations to place office locations without regard to state branch bank regulations.[4/]

Prior to determining the functional relationship which could be used to measure the equivalence of remote electronic banking facilities relative to traditional banking offices, several simplifying assumptions were made. These assumptions were required, since there is a great lack of uniformity among remote electronic banking facilities. Therefore, it was assumed first that remote electronic banking facilities placed by commercial banks were approximated by detached automated tellers and second that the remote electronic banking devices placed by savings and loan associations were approximated by the merchant-operated equipment placed by the First Federal Savings and Loan Association, Lincoln, Nebraska.

A proxy variable was also substituted as a measure of the equivalence of these devices. This proxy variable measured the relative effectiveness of these specified electronic banking facilities to attract new deposits relative to traditional office facilities. This proxy variable is given in Equation 5.

(Equation 5)

$$\frac{\text{Deposit Gain Remote Electronic Bank Facility}}{\text{Deposit Gain Traditional Banking Facility}} = \text{Equivalence Proxy}$$

Using data gathered by the First Federal Savings and Loan Association, Lincoln, Nebraska, the relative effectiveness of remote

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[4/] Federal Home Loan Bank Board statutes and regulations contain only one significant (although not inclusive) restriction to FHLBB policy regarding federal association branching. Section 556.5, subparagraph (2) of paragraph (b) specifies that branch is to be in the same state as the home office and branch is to be located within 100 miles of the association's home office.

electronic banking facilities was determined to be .45. Thus, a remote electronic banking facility is approximately one-half as effective as a traditional facility.[5/]

Similar results were obtained using data collected by the National Association of Mutual Savings Banks.[6/] From this data, remote electronic banking facilities--automated teller machines--had a relative effectiveness of .32 or were approximately one-third as effective as a traditional office facility.

Equation 2 can be rewritten as

(Equation 2a)

$$N = RE \times N'$$

where N = equivalent number of traditional office facilities,

N' = number of remote electronic banking facilities, and

RE = relative effectiveness parameter.

This range of values (from one-third to one-half) for the relative effectiveness of these electronic facilities strongly suggests

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[5/] Several problems exist when using data collected by the First Federal Savings and Loan Association. First, the time period over which the data was collected was relatively short; thus the "novelty effect" of these devices on consumer banking patterns might tend to overstate the true, or long-run, average relative effectiveness. Further, concurrent with introduction of the devices was extensive promotional and premium campaigns. These effects although they could not be isolated, may help to explain why the relative effectiveness of these remote electronic banking facilities were somewhat higher than predicted by the more general data collected by the National Association of Mutual Savings Banks.

[6/] Linda Fenner Zimmer, "Cash Dispensers and Automatic Teller," Savings Bank Journal, Vol. 56, No. 4 (June 1975).

that these banking facilities are effective substitutes for traditional facilities and are not merely replacements for tellers or other bank personnel.

Given this reduced model, three conditional forecast sets were developed. Conditional Forecast Set I examines the potential impact of the development of remote electronic banking facilities by commercial banks on the savings and loan industry. Conditional Forecast Set II examines the potential impact of the development of remote electronic banking facilities by savings and loan associations. Finally, Conditional Forecast Set III examines the combined impact of the development of these facilities by both commercial banks and savings and loan associations.

CBCT Conditional Forecast Set I

The Development of Remote Electronic Banking Facilities by Commercial Banks in Minnesota

In December 1974 the Comptroller of the Currency issued an interpretive ruling (Title 12, Chapter 1, Part 7) which allowed national banks to establish remote electronic banking facilities (Customer-Bank Communication Terminals--CBCTs). The original interpretive ruling allowed the placement of CBCTs in unlimited numbers and without geographic limitations. In May 1975 this December ruling was amended. The most important revision was that a CBCT could no longer be located more than 50 miles from the nearest office of the bank installing the facility unless the CBCT was shared with a local financial institution.

The Comptroller's ruling that CBCTs may be operated by national banks without regard to the restrictions contained in federal laws regulating branch banks, has been successfully challenged in the courts. In June 1975 a U.S. District Court in Denver, Colorado, ruled that since a CBCT accepts deposits, it violates the National Bank Act and Colorado laws which prohibit branch banking.[7/]

In Minnesota only one national bank, the Zapp National Bank, St. Cloud, has installed a CBCT. But in July 1976, the Minnesota commissioner of banks requested that the Zapp National Bank close its off-premise CBCT and at this writing, the Zapp National Bank CBCT is not operating.

7/ Other district courts have ruled in a similar manner, and CBCT development in unit banking states has ceased. In October 1976 the U.S. Supreme Court refused to hear any appeals of these lower court decisions.

For the purposes of this conditional forecasts, the following structural parameters are assumed to exist with respect to the legal aspects of CBCT development by commercial banks. First, it is assumed that the Comptroller's revised interpretative ruling of May 1975 stands as stated--without adjustments or suspensions of allowed CBCT banking activities by subsequent court rulings. The second assumption is that state-chartered banks in Minnesota, either through state enabling legislation or state bank wild card provisions in existing Minnesota legislation, may establish remote electronic banking facilities which can offer substantially the same services as CBCTs under the Comptroller's original ruling. Finally, all regulations issued by the FHLBB with respect to the development of electronic banking facilities by savings and loan associations are assumed to be inactive, and no remote electronic banking facilities are assumed to have been established by savings and loan associations.

Since no significant CBCT development is presently under way in any unit banking states and no reliable surveys of possible CBCT development are available, the following procedure was used to estimate the potential number of CBCTs which may be developed.

It has been noted previously that savings and loan associations operating in unit banking states seem to have an inherent advantage over savings and loan institutions which operate in statewide banking states. Further, this inherent advantage may be partially explained by the inability of commercial banks to branch or place offices in banking states without major locational restrictions, while savings and loan associations have only limited locational restrictions with respect to

branching. This advantage is made evident if one examines the mean market share for consumer savings and total offices for savings and loan associations operating in unit banking and for those operating in statewide branch banking states. These results are summarized in Table 1.

Table 1

SAVINGS AND LOAN ASSOCIATIONS' MEAN MARKET SHARE IN UNIT BANKING AND STATEWIDE BRANCHING STATES

	Unit Banking States	Statewide Banking States
Consumer Savings	37.1%	31.0%
Total Offices	17.0%	14.9%

This difference in mean savings and loan association market share of total offices between unit banking states and statewide branching states was used as a first approximation to the potential loss of savings and loan assocations' market share of total offices in Minnesota due to CBCT development by commercial banks in unit banking states. This relationship is summarized in Equation 6.

(Equation 6)

$$MSTO_i - MSTO_f = \mu_u - \mu_s$$

where $MSTO_i$ = Minnesota savings and loan association market share total offices prior to CBCT development,

$MSTO_f$ = Minnesota savings and loan association market share total offices subsequent to CBCT development,

μ_u = savings and loan association mean market share total offices unit banking states, and

μ_s = savings and loan association mean market share total offices statewide banking states.

Using Equation 2 and this difference in the market share of total offices and the number of offices of financial institutions in Minnesota, the potential number of CBCTs developed by Minnesota banks can be determined.[8/]

Using the previously determined average values, it was estimated that between 440 and 660 CBCTs would be operated by commercial banks in Minnesota. It should be emphasized that this estimate for CBCT development in Minnesota is only a first approximation, in that the analysis assumed all banks in Minnesota to act as independent entities. Thus, no adjustments were made for Minnesota's extensive multibank holding company structure. Further, no provision was made for the impact of sharing of CBCTs among commercial banks.

Given an estimate of potential CBCT development in Minnesota, placements of these CBCTs within the state were also projected. Estimates of potential placement were made based on two assumptions: First, commercial banks would distribute their CBCTs on the basis of where commercial banks predominate; that is, according to the distribution of commercial bank assets within the state.[9/] This type of placement pattern would be expected if commercial banks viewed other commercial banks as their primary competition for consumer savings deposits. Second, commercial banks would distribute their CBCTs on the basis of where savings and loan associations are located: that is, according to the distribution of savings and loan associations' assets within the state. This type of placement might be expected if commercial banks

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[8/] The complete estimation procedure for determining the potential number of CBCTs in Minnesota is given in Appendix 5.

[9/] All asset distributions as of December 31, 1974.

viewed the savings and loan association as their primary competitors for consumer savings deposits. These estimates of possible CBCT distributions based on the above assumptions are summarized in Table 2.

Using these estimates, two CBCT conditional forecasts were constructed. The first CBCT forecast examines the least impact that estimated CBCT development will have on the consumer savings market share of Minnesota savings and loan associations, and the second CBCT forecast examines the greatest impact such developments are likely to have.

The model structure for the least impact CBCT conditional forecast is presented in Chart 1. Within this structure it is assumed that changes in the market share of total offices caused by CBCT development are indistinguishable from changes caused by the development of traditional facilities in Minnesota. The loss of savings and loan consumer savings market share due to a loss in their total office market share is estimated from a movement down the regression line for unit banking states. This movement is summarized in Equation 7. Within this scenario set it is assumed that such CBCT developments will only affect the relationship between commercial banks and savings and loan associations. Further, state credit union and mutual savings bank market share are held constant throughout this analysis.

(Equation 7)

$$\Delta MSCS_1 = .8 \times \Delta MSTO$$

where $\Delta MSCS_1$ = change in savings and loan market share consumer savings least impact CBCT conditional forecast, and

$\Delta MSTO$ = change in savings and loan market share total offices due to CBCT development.

The results of this least impact CBCT conditional forecast are presented in Table 3. Forecasts are made for three geographic divisions: the state of Minnesota, the Minneapolis-St. Paul area, and the outstate region of Minnesota.[10/]

The results from the EFTS forecasts are then combined with the historical trends for the relevant variable which each of these geographic regions has experienced during the years 1970 to 1974.[11/] These results are summarized graphically in Charts 2, 3, and 4.[12/] The time periods for the forecasts were arbitrarily chosen, and the choice of this time period does not affect the magnitude of any forecasted EFTS effects in that these effects are solely determined by the model parameter values which exist as of December 31, 1974. The shaded areas of the projections in these exhibits represent reasonable estimates of the uncertainties associated with this analysis.

The greatest impact CBCT condition forecast is constructed in much the same way as was the least impact forecast. The model structure of this conditional forecast is presented in Chart 5. Within the reduced model, it is assumed that the development of CBCTs by commercial banks

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[10/] The compositions of the Minneapolis-St. Paul and of the outstate regions of Minnesota are defined in Appendix 1.

[11/] Regression equations for all historical trends are given in Appendix 6.

[12/] These graphic displays are presented for their heurestic value only. It seems unlikely that the trend lines, especially those depicting the market share of total offices, will continue independent of EFTS activity.

Table 3

HOW COMMERCIAL BANK DEVELOPMENT OF CBCTs WILL AFFECT
MINNESOTA'S CONSUMER SAVINGS MARKET

12/31/74

(Thousands of $ and % Share of Market)

DIVISION / FIN. INST. / ENVIRONMENT			MINNESOTA			MINNEAPOLIS-ST. PAUL			OUTSTATE			TOTAL		
			COMMERCIAL BANKS	SAVINGS & LOANS	OTHER	COMMERCIAL BANKS	SAVINGS & LOANS	OTHER	COMMERCIAL BANKS	SAVINGS & LOANS	OTHER	STATE	MINNEAPOLIS-ST. PAUL	OUTSTATE
INITIAL ENVIRONMENT			7,707 56.7	4,647 34.2	1,227 9.0	3,415 44.2	3,284 42.5	1,027 13.3	4,292 73.3	1,363 23.3	200 3.4	13,581 100.0	7,726 56.9	5,855 43.1
CONDITIONAL FORECAST	Assumption 1	Least Impact	7,941 58.5	4,413 32.5	1,227 9.0	3,580 46.3	3,119 40.3	1,027 13.3	4,361 74.5	1,294 22.1	200 3.4	13,581 100.0	7,726 56.9	5,855 43.1
		Greatest Impact	8,660 63.6	3,694 27.2	1,227 9.0	4,088 52.9	2,611 33.8	1,027 13.3	4,572 78.1	1,083 18.5	200 3.4	13,581 100.0	7,726 56.9	5,855 43.1
	Assumption 2	Least Impact	same as Assumption 1			3,545 45.9	3,154 40.8	1,027 13.3	4,396 75.1	1,259 21.5	200 3.4	same as Assumption 1		
		Greatest Impact				3,945 51.1	2,754 35.6	1,027 13.3	4,715 80.5	940 16.1	200 3.4			

Chart 2

HOW COMMERCIAL BANK DEVELOPMENT OF CBCTs WILL AFFECT
MINNESOTA'S CONSUMER SAVINGS MARKET

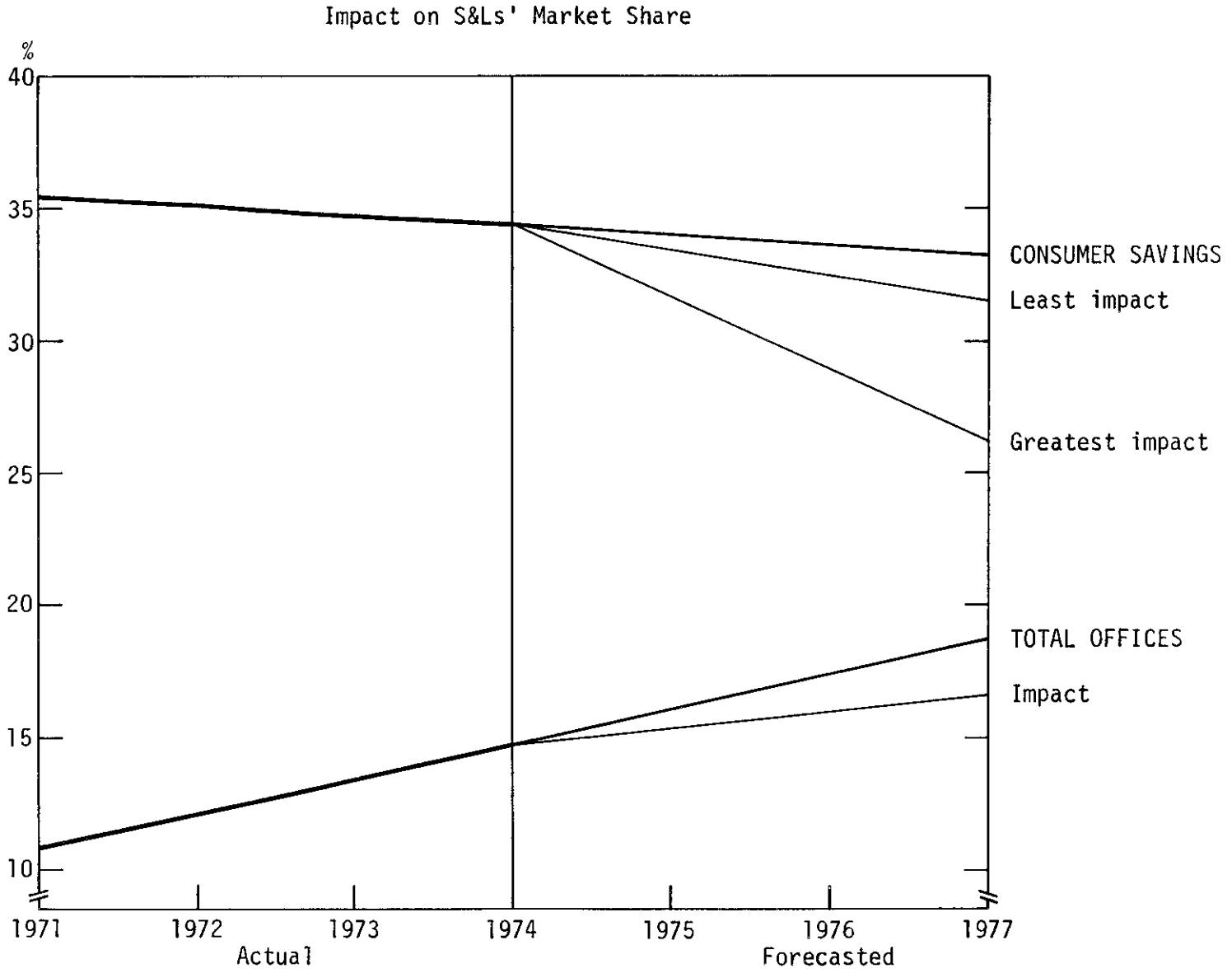


Chart 3

HOW COMMERCIAL BANK DEVELOPMENT OF CBCTs WILL AFFECT MINNEAPOLIS-ST. PAUL'S CONSUMER SAVINGS MARKET

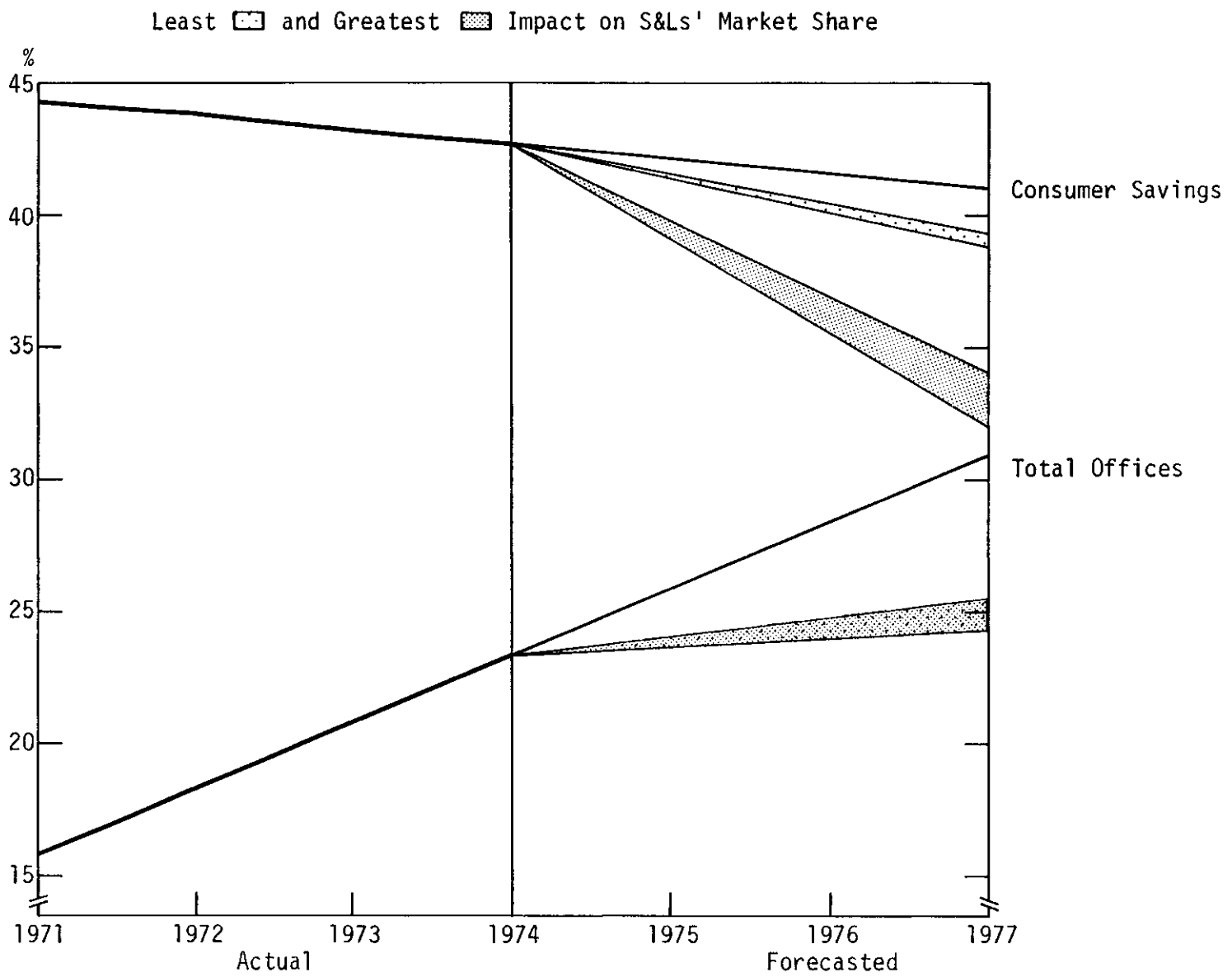


Chart 4

HOW COMMERCIAL BANK DEVELOPMENT OF CBCTs WILL AFFECT
OUTSTATE MINNESOTA'S CONSUMER SAVINGS MARKET

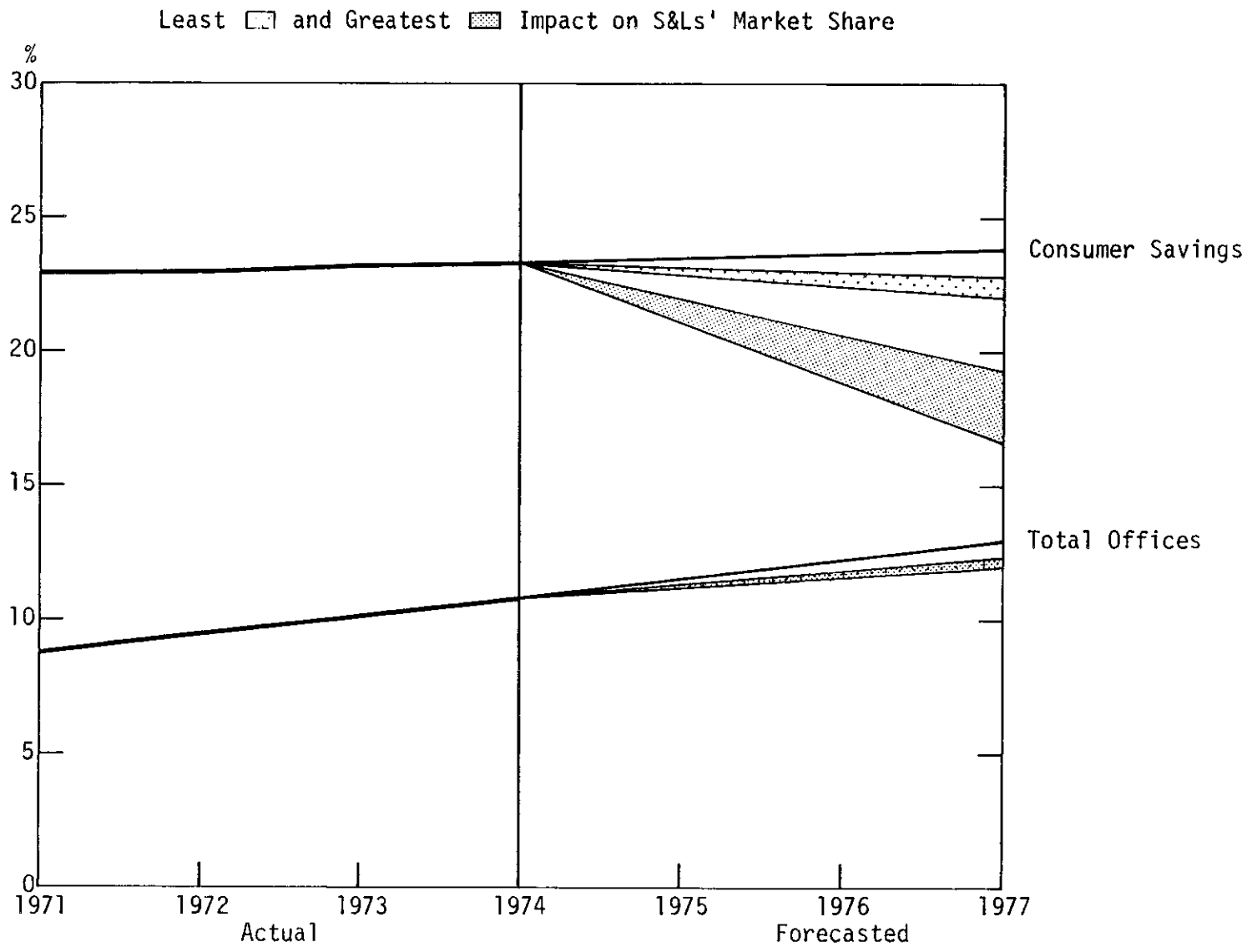
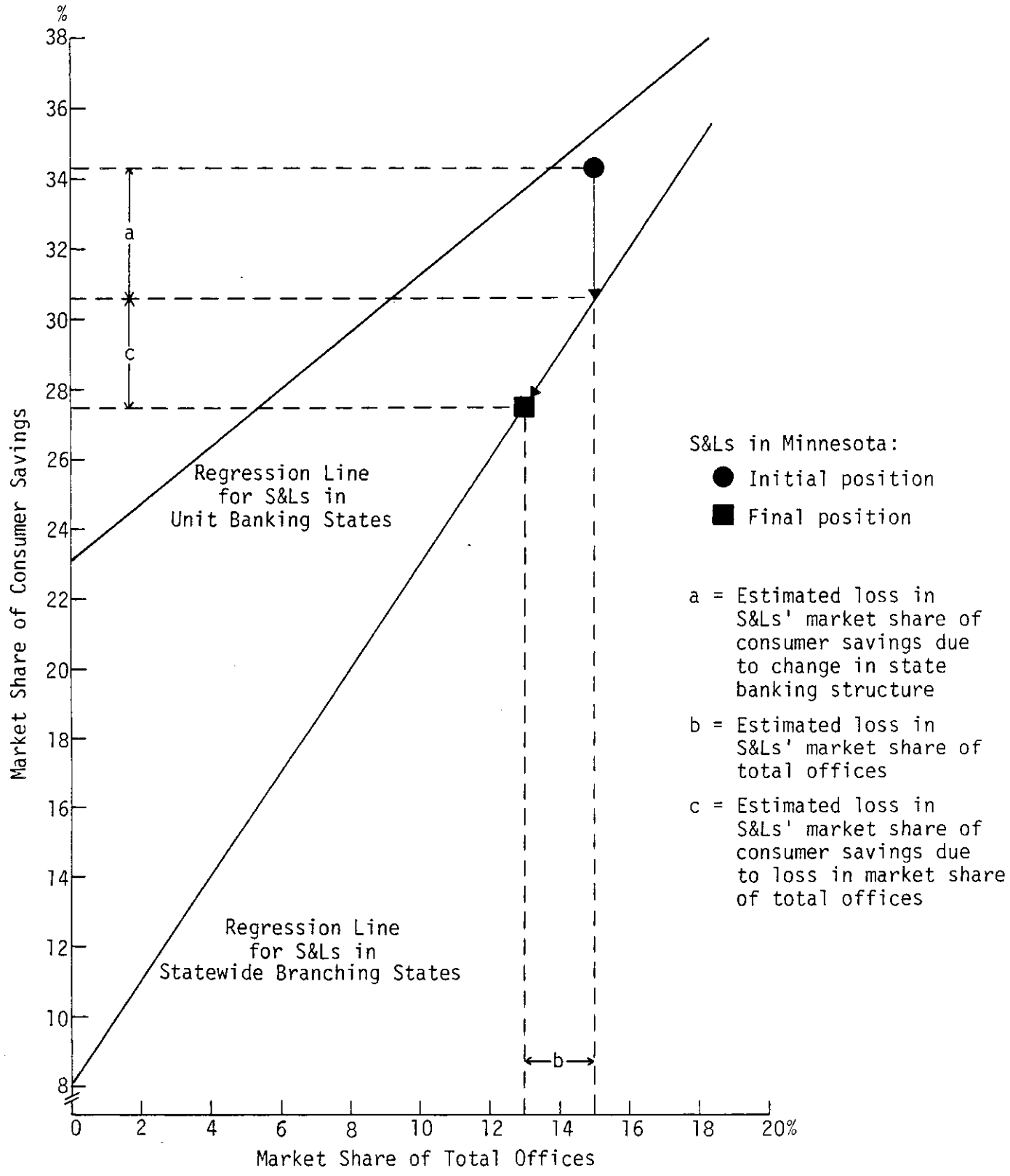


Chart 5

GREATEST IMPACT CBCT CONDITIONAL FORECAST
ON S&Ls' MARKET SHARE OF CONSUMER SAVINGS AND TOTAL OFFICES



will have two major effects. First, the competitive structure of Minnesota banking subsequent to CBCT development by commercial banks will more closely approximate the structure exhibited by statewide banking states than that exhibited by unit banking states. Second, the impact of a subsequent loss of market share of total offices due to CBCT development by commercial banks will have a relatively larger effect on the savings and loan market share of consumer savings market due to this change in banking structure. This change will be measured by movements along the regression line for statewide banking states.

These assumptions are justified on the following basis: CBCTs have certain similarities to branches although their impact on a given area or organization is not as great as a traditional office. Minnesota banks also operate under the additional constraint that they cannot branch while the state's savings and loan associations may, within limits, operate branches. Thus, CBCT activity in Minnesota has a potential inherent advantage to commercial banks which may not accrue to savings and loan associations. Further, the 50-mile geographic limits imposed by the Comptroller's ruling are not a serious impediment to CBCT development given Minnesota's population distribution and the state's multibank holding company activity.

Estimated loss in savings and loan consumer savings market share, for the greatest impact conditional forecast, is expressed by

(Equation 8)

$$\Delta MSCS_2 = -[MSCS_M - MSCS_M'] + 1.5\ \Delta MSTO$$

where $\Delta MSCS_2$ = change in savings and loan market share consumer savings in the greatest impact CBCT conditional forecast,

$MSCS_M$ = present savings and loan market share consumer savings--Minnesota,

$MSCS_M'$ = estimated savings and loan market share consumer savings if Minnesota had a statewide banking structure, and

$\Delta MSTO$ = change in savings and loan market share total offices due to CBCT development.

The results of this greatest impact CBCT conditional forecast are presented in Table 3. Graphic displays of the EFTS forecasts combined with the historical trends are also presented in Charts 2, 3, and 4.

RSU Conditional Forecast Set II

The Development of Remote Electronic Banking Facilities by Savings and Loan Associations in Minnesota

The Federal Home Loan Bank Board instituted a temporary regulation in January 1974 (Title 12, Chapter V(c), Part 545) permitting federally chartered savings and loan associations to establish a system for electronic funds transfer through remote service units (RSUs).

Several important provisions of the regulation should be noted: RSUs are allowed to process deposits, withdrawals, and loan payments on established accounts. No new accounts may be opened at RSUs. Funds transfer must be effected through a card or equivalent identification device. Finally, the Federal Home Loan Bank Board may require sharing of an RSU among other institutions insured by the FSLIC subject to certain constraining provisions.

For the purpose of these conditional forecasts, the following structural parameters are assumed to exist with respect to the legal aspects of RSU development by savings and loan associations in Minnesota. The Federal Home Loan Bank Board regulation on RSU activity stands as issued. Minnesota state-chartered savings and loan associations are also allowed to establish these facilities under enabling legislation.

This set contains two conditional forecasts. These forecasts will describe the possible impact estimated RSU development could have on the savings and loan market share of the consumer saving market.

Estimated RSU developments were derived in the following manner: The typical size of associations independently developing RSUs was analyzed. It was determined that all associations which had developed

or planned to develop RSUs had assets which ranked them within the top 200 institutions in the United States. Also, associations which were developing joint RSU projects had a combined asset size which would rank these associations in the top 200 in the United States. Minnesota has five savings and loan associations ranked in the top 200 associations in the United States. Thus, five associations were chosen as a reasonable estimate of the greatest number of savings and loan associations in Minnesota likely to engage in independent RSU developments or serve as anchor savings and loan associations in the development of a shared network of remote service units.

Additional estimates were made for the likely number of RSUs developed by each of those five associations. These estimates were made from actual RSU development within the United States. From available information filed with the FHLBB, it was determined that on average each relevant savings and loan association would develop approximately 40 RSUs.

The procedure used to estimate the lowest possible number of possible RSU developments in Minnesota was to take the total of all RSUs in place and intended for development as of June 1, 1976. Minnesota has two major savings and loan associations which have developed or plan to develop approximately 100 RSUs. Table 4 summarizes these RSU developments.

Table 4

ESTIMATED RSU DEVELOPMENT IN MINNESOTA

	Number of Associations Likely to Develop RSUs	Total Number of RSUs Developed
Least Impact RSU Conditional Forecast	2	100
Greatest Impact RSU Conditional Forecast	5	200

The model structure used for these RSU conditional forecasts is similar to the structures presented in Chart 1. This model structure assumes that the development of RSUs by savings and loan associations will not have a significant effect on Minnesota's banking structure; that is, Minnesota will continue to closely resemble the structure exhibited by unit banking states. This assumption seems justified on the grounds that state and federally chartered savings and loan associations can already branch within Minnesota. Therefore, development of RSUs doesn't provide a substantial additional advantage. The impact of RSU development on Minnesota's savings and loan association market share of consumer savings can be estimated from

(Equation 9)

$$\Delta MSCS = .8\ \Delta MSTO$$

where $\Delta MSCS$ = change in savings and loan association market consumer savings, and

$\Delta MSTO$ = change in savings and loan association market share total offices due to estimated RSU development.

The results for these conditional forecasts are presented in Table 5. Graphic displays showing the combination of EFTS impact in conjunction with historical trends are given in Charts 6, 7, and 8.

Table 5

HOW S&L DEVELOPMENT OF RSUs WILL AFFECT
MINNESOTA'S CONSUMER SAVINGS AND TOTAL OFFICES MARKET

ENVIRONMENT & ESTIMATE / FIN. INST. / DIVISION / VAR.						SAVINGS & LOANS					
						MPLS.-ST. PAUL		OUTSTATE		MINNESOTA	
						Market Share of					
						OFFICES	SAVINGS	OFFICES	SAVINGS	OFFICES	SAVINGS
INITIAL ENVIRONMENT						23.9	42.5	10.9	23.3	15.0	34.2
CONDITIONAL FORECAST	LEAST IMPACT	Relative Effectiveness of RSUs	1/3	Assumption	1	28.0	44.6	11.8	24.4	17.1	36.1
					2	27.0	44.1	12.4	25.1		
			1/2		1	29.9	45.6	12.3	24.9	18.1	36.9
					2	28.6	44.9	13.0	25.9		
	GREATEST IMPACT		1/3		1	33.4	46.8	13.1	25.4	20.0	38.4
					2	31.4	45.7	14.4	26.7		
			1/2		1	37.3	48.6	14.2	26.4	22.3	40.3
					2	34.8	47.1	16.0	28.3		

Chart 6

HOW S&L DEVELOPMENT OF RSUs WILL AFFECT
MINNESOTA'S CONSUMER SAVINGS MARKET

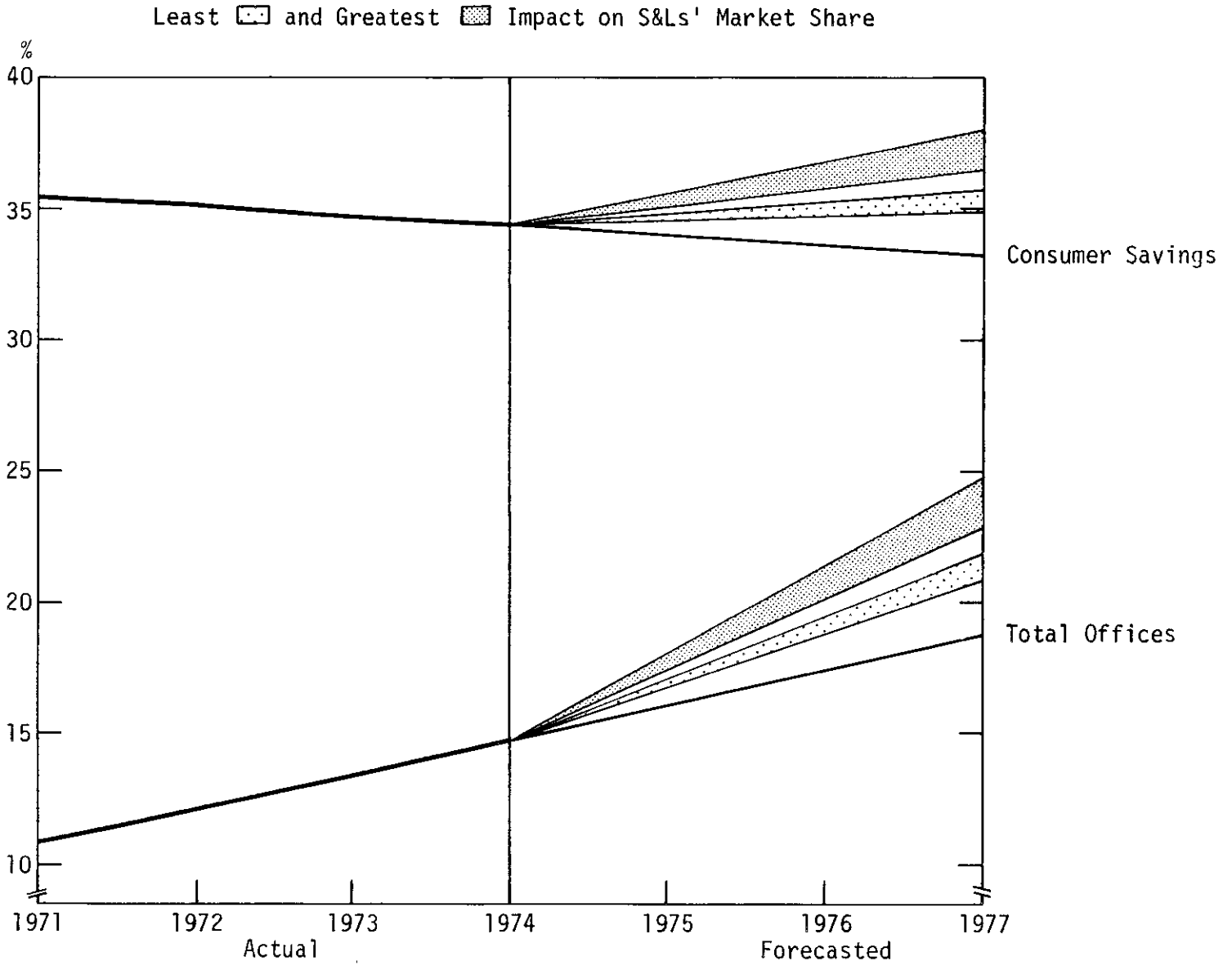


Chart 7

HOW S&L DEVELOPMENT OF RSUs WILL AFFECT
MINNEAPOLIS-ST. PAUL'S CONSUMER SAVINGS MARKET

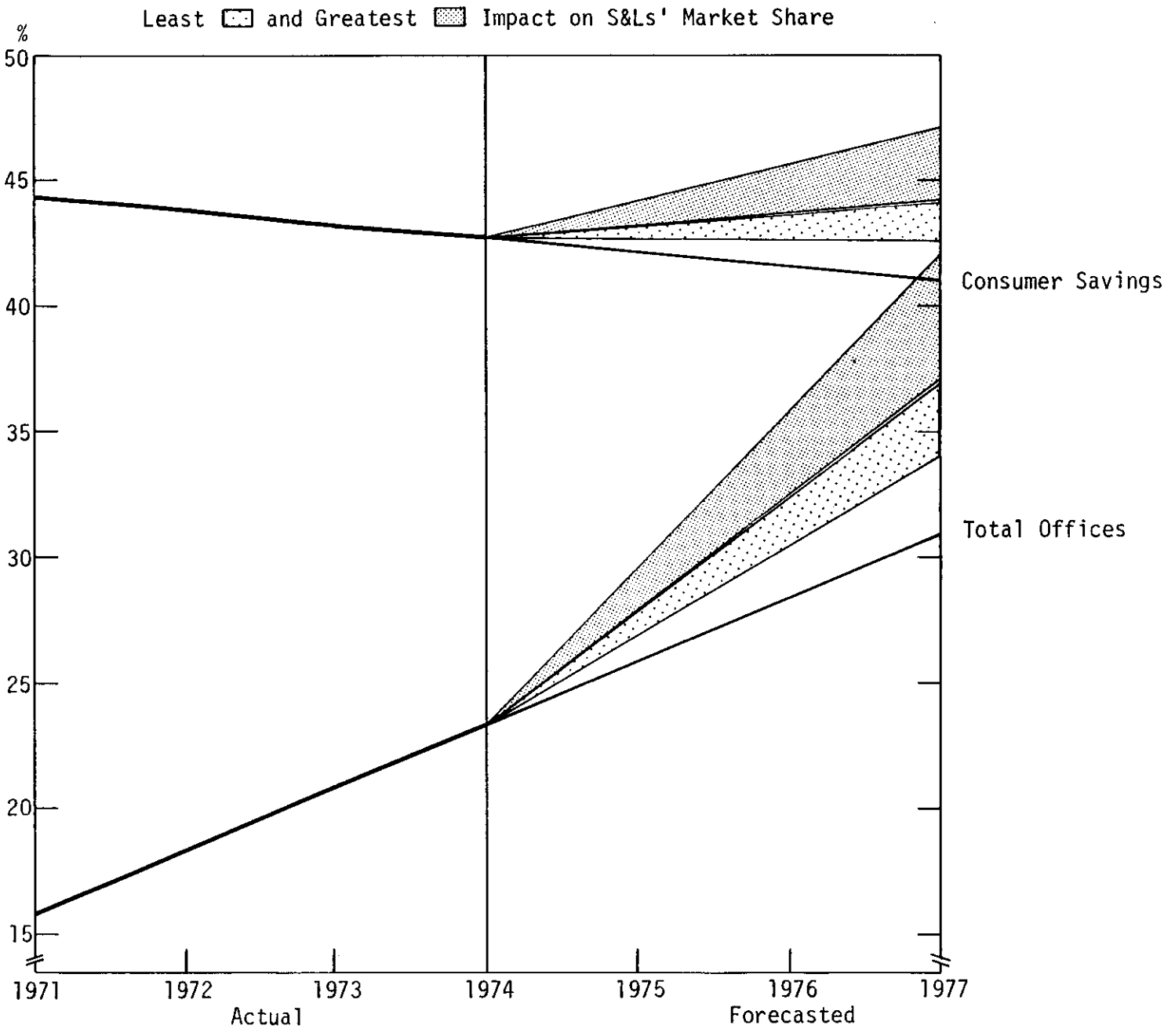
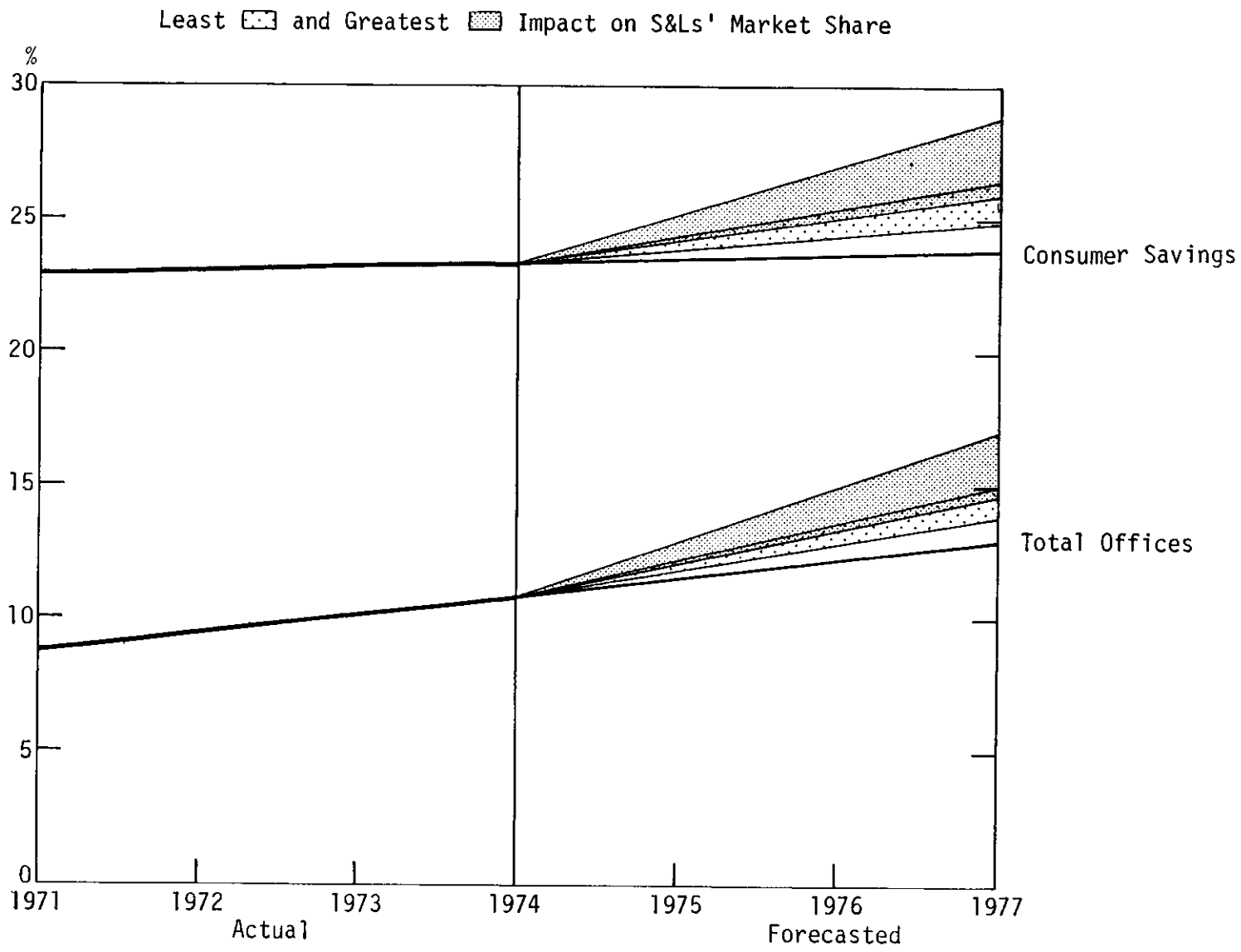


Chart 8

HOW S&L DEVELOPMENT OF RSUs WILL AFFECT
OUTSTATE MINNESOTA'S CONSUMER SAVINGS MARKET



Combined Conditional Forecasts Set III

The Combined Development of Remote Electronic Banking Facilities by Commercial Banks And Savings and Loan Associations in Minnesota

These conditional forecasts will attempt to analyze the potential impact that the combined development of remote electronic banking facilities will have on the competitive structure in Minnesota. For the purpose of these conditional forecasts, the following structural parameters have been assumed with respect to the legal aspects of EFTS developments. The Federal Home Loan Bank Board's regulation on RSU development stands as issued. Comptroller's revised interpretative ruling of May 1975 stands as stated--without adjustments or suspensions of allowed CBCT banking activities by subsequent court rulings. The second assumption is that state-chartered banks in Minnesota, either through state enabling legislation or state bank wild card provisions in existing Minnesota legislation, may establish remote electronic banking facilities which can offer substantially the same services as CBCTs under the Comptroller's original ruling.

The model structure for the least and greatest combined conditional forecasts in this set is basically similar to the structure presented in the CBCT and RSU conditional forecast sets.

The first of two combined forecasts in Set III will examine the least impact the combined development of remote electronic banking facilties will have in Minnesota. This structure is presented in Chart 9. The impact of these combined developments on the savings

and loan association market share of consumer savings is given in

(Equation 10)

$$\Delta MSCS_1 = .82\ \Delta MSTO_1 + 1.5\ \Delta MSTO_2$$

where $\Delta MSTO_1$ = change in savings and loan market share total offices due to RSU development,

$\Delta MSTO_2$ = change in savings and loan market share total offices due to commercial bank CBCT development, and

$\Delta MSCS_1$ = change in the savings and loan market share savings least impact combined conditional forecast.

This structure assumes that CBCT development by commercial banks has a slight competitive advantage over RSU development by savings and loan associations. This reflects commercial banking's present limitations with regard to branching, which are not presently experienced by Minnesota savings and loan associations. (Although, the impact of such devices is not so great as to alter Minnesota's banking structure.)

The second combined conditional forecast will examine what may be the greatest impact that the combined development of remote electronic banking facilities will have in Minnesota. The model structure for this conditional forecast is also presented in Chart 9. The impact of these combined developments on Minnesota's savings and loan market shares is given in

(Equation 11)

$$\Delta MSCS_2 = .82\ \Delta MSTO_1 + 1.5\ \Delta MSTO_2 - [MSCS_M - MSCS_M']$$

where $\Delta MSTO_1$ = change in savings and loan market share total offices due to RSU development,

$\Delta MSTO_2$ = change in savings and loan market share total offices due to CBCT development,

$MSCS_M$ = present savings and loan market share consumer savings in Minnesota,

$MSCS_M'$ = estimated savings and loan market share consumer savings, assuming Minnesota had a statewide banking structure, and

$\Delta MCSC_2$ = change in savings and loan association market share consumer savings greatest impact combined conditional forecast.

Under this model, commercial banks benefit from CBCT development in two ways: First, CBCT development causes an initial loss in the market share of savings and loan associations such that the competitive relationship between financial institutions in Minnesota more closely approximates the relationship found in statewide banking states. Second, the marginal impact that these devices have on the market place will be greater--at least initially--for commercial banks than for savings and loan associations.

The combination of these EFTS impacts and the historical trend in Minnesota is illustrated in Chart 10.

Conclusions

The results for all the sets of conditional forecasts are summarized in Chart 11. Several conclusions can be drawn from these results.

First, substantial competitive benefits should accrue to those classes of financial institutions which can develop remote electronic banking facilities on an exclusive basis. And the gains in market share of consumer savings by these financial institutions as a result of this exclusive development will be substantial; especially compared to the historical trends held by these institutions.

Further, in an environment in which both commercial banks and savings and loan associations may develop remote electronic banking facilities, the forecasts strongly suggest that at best the outcome from the point of view of savings and loan associations will be a competitive draw. At worst, substantial erosion in the savings and loan association market share of consumer saving could result. The potential risk to savings and loan associations is particularly clear in the Minneapolis-St. Paul area, where the trend toward erosion of their market share consumer savings is evident and where commercial banks may gain a significant competitive advantage from the development of remote electronic banking devices.

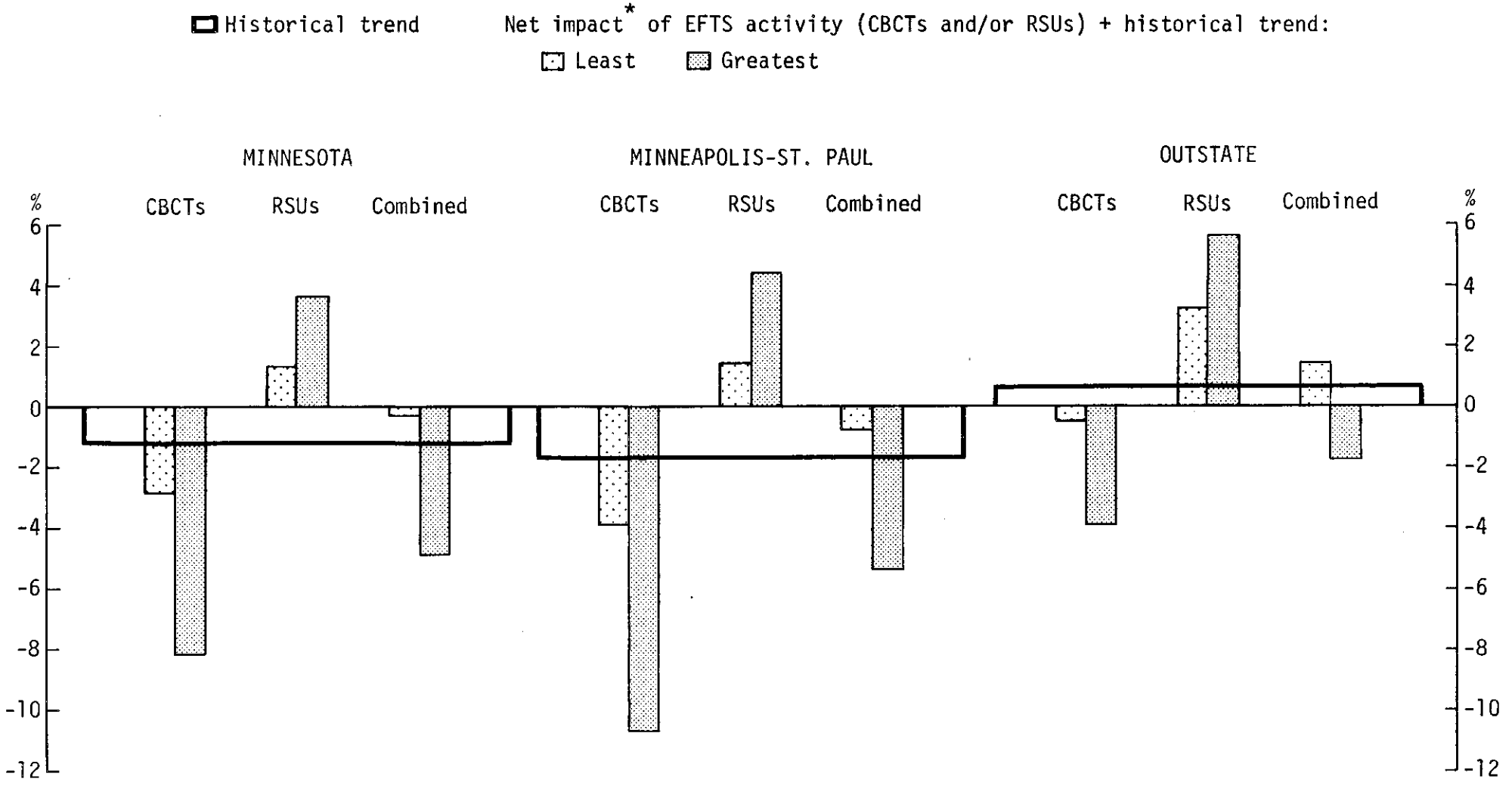
Only in the outstate area of Minnesota, where they have increased market share of consumer savings on a historical basis, does the possibility exist that savings and loan associations could benefit substantially from these EFTS developments. However, even this potential advantage is at risk in that other forecast assumptions imply a substantially reduced market share of consumer savings for savings and loan

associations. In general, savings and loan associations will have a greater risk in terms of the diminution of their competitive position than will commercial banks in this environment.

Finally, given the conclusion that these devices are effective substitutes for traditional banking facilities, there exists a strong possibility that the development of these remote electronic devices could substantially alter the competitive structure in Minnesota such that it more closely resembled the structure exhibited by statewide banking states rather than unit banking states.

Chart 11

1974-77 CHANGES IN S&Ls' SHARE OF MINNESOTA'S CONSUMER SAVINGS MARKET



*Percentage changes for largest possible effects

Appendix 1

DEFINITION OF VARIABLES

CONSUMER SAVINGS

Commercial Banks--Savings deposits and other time deposits, including individual, partnership, and corporation (IPC) deposits for insured institutions.

Savings & Loan Associations--Savings capital for insured and noninsured institutions.

Credit Unions--Savings deposits and savings shares.

Mutual Savings Bank--Savings and time deposits.

TOTAL OFFICES

Includes home offices, branches, and facilities.

Branch--Any branch bank, branch office, branch agency, additional offices, or any branch place of business at which deposits are received, checks paid, or money lent.

Facility--Any office maintained by a bank acting as a depository and financial agent of the federal government at military bases or other government institutions for the purpose of providing paying and receiving facilities for the personnel thereof.

STATE DIVISIONS

Minneapolis-St. Paul--Includes Anoka, Dakota, Hennepin, Ramsey, and Washington counties.

Outstate Minnesota--Includes all counties in Minnesota not included in the Minneapolis-St. Paul definition.

Appendix 2
Part 1

MARKET SHARE RELATIONSHIP
UNIT BANKING STATES

State	Market Share	
	Total Offices (Percent)	Total Consumer Saving (Percent)
Arkansas*	7.2	36.2
Colorado	32.9	48.0
Florida	36.2	60.4
Illinois	18.2	36.3
Iowa*	11.0	32.3
Kansas	7.1	43.3
Minnesota	15.0	34.1
Missouri	21.6	45.8
Montana	7.6	21.2
Nebraska	15.4	40.0
North Dakota	9.9	39.0
Oklahoma	14.3	33.4
Texas	30.0	37.8
West Virginia	8.9	13.0
Wyoming	3.9	27.8
AVERAGE	17.0	37.1

*Excluded from analysis

Source: Credit Union National Association, Inc., Federal Home Loan Bank Board, United States League of Savings Institutions, Federal Deposit Insurance Corporation, and National Association of Mutual Savings Banks.

Appendix 2
Part 2

MARKET SHARE RELATIONSHIPS
STATEWIDE BRANCHING STATES

State	Market Share	
	Total Offices (Percent)	Total Consumer Savings (Percent)
Alaska	10.1	20.7
Arizona	26.5	40.1
California	30.8	53.1
Connecticut	8.0	15.8
Delaware	7.9	7.5
Hawaii	26.2	39.0
Idaho	11.1	24.2
Maine	6.1	11.0
Maryland	26.0	40.7
Nevada	17.6	43.8
North Carolina	18.1	41.3
Oregon	20.0	44.2
Rhode Island	6.9	11.6
South Carolina	19.5	61.6
South Dakota	4.5	20.6
Utah	9.9	40.7
Vermont	3.4	8.7
Virginia	14.4	30.0
Washington	16.4	34.0
AVERAGE	14.9	31.0

Source: Credit Union National Association, Inc., Federal Home Loan Bank Board, United States League of Savings Institutions, Federal Deposit Insurance Corporations, and National Associations of Mutual Savings Banks.

Appendix 3

The following regression model was developed to explain historical trends for the savings and loan association market share of consumer savings and to be used for comparison purposes with the cross-sectional model.

(Equation 12)

$$MSCS_M = b_0 + b_1 MSTO + b_2 T + b_3 [I_s^{S\&L} - I_s^{Com'l\ Banks}] + b_4 [I_t^{S\&L} - I_t^{Com'l\ Banks}]$$

where MSCS = savings and loan association market share of consumer savings,

MSTO = savings and loan association market share of total offices,

T = time period,

I_s = interest rate paid on savings deposits,

I_t = interest rate paid on time deposits, and

M = Minnesota.

A correlation analysis was made on the variables in order to eliminate any multicollinearity between model variables. From the correlation analysis it was determined that the time and market share total offices variables were highly correlated as well as the variables representing interest rate differentials of time and savings deposits. As a result, one variable from each of the above sets was eliminated: the time variable and the interest differential of time deposits variables. Consequently, Equation 13 can be rewritten as

(Equation 13)

$$MSCS_M = b_0^1 + b_1^1 MSTO + b_2^1 [I_s^{S\&L} - I_s^{Com'l\ Banks}].$$

The coefficients for this model were then derived by regression analysis from Minnesota data for the period 1967 to 1974. The results from this analysis are

(Equation 14)

$$MSCS_M = \underset{(6.11)}{26.9\%} + \underset{(1.67)}{0.4MSTO^*} + \underset{(1.72)}{6.87^*[I_s^{S\&L} - I_s^{Com'l\ Banks}]} \quad R^2 = .52.$$

This regression model was then compared to the cross-section regression model for all unit banking states to determine if any significant differences existed for the two models for the relevant coefficients: b_0 and b_1. It was determined through use of the t-statistic that neither the constant coefficients 'b_0' or the coefficients of the market share total offices variable 'b_1' were significantly different between regression models at the 95 percent level of confidence.[13/]

13/ $t\left(\frac{b_0 - b_0^1}{s(b_0 - b_0^1)}\right) = .85$, where t(critical) = 2.1

and $t\left(\frac{b_1 - b_1^1}{s(b_1 - b_1^1)}\right) = 1.66$, where t(critical) = 2.1

Appendix 4

The deviance test was used to determine whether or not Minnesota should be considered atypical with respect to other unit banking states.

Two regression models are required for this test. The first model is the model derived from the full data set containing all unit banking states:

$$MSCS_u = \underset{(4.7)}{22.9} + \underset{(3.3)}{0.8}MSTO \qquad R^2 = .54.$$

The second regression model is the model derived from the data set of unit banking states which excludes Minnesota:

$$MSCS_u' = \underset{(4.50)}{23.1} + \underset{(3.21)}{0.8}MSTO \qquad R^2 = .51.$$

The following hypothesis is then tested:

$$H_o: \quad \hat{MSCS}_u'(MN) - MSCS(MN) = 0$$

where $\hat{MSCS}_u'(MN)$ = the predicted value of the savings and loan association market share of consumer savings based on the second regression model, and

$MSCS(MN)$ = the actual value of the savings and loan association market share of consumer savings.

Using the t-statistic, H_o cannot be rejected.[14/]

Thus, assuming Minnesota was drawn randomly from the sample (that is, the basis of choice was not Minnesota's deviance from the regression line), it can be concluded that the state is not atypical with respect to all other unit banking states.

14/ $t\left(\frac{\hat{MSCS}_u'(MN)-MSCS(MN)}{S[\hat{MSCS}_u'(MN)-MCSC(MN)]}\right) = .1$, where t(critical) = 2.1.

Appendix 5

ESTIMATION OF THE NUMBER OF POTENTIAL CBCTS IN MINNESOTA

N' = Estimated number of CBCTs developed in Minnesota.

N = The increase in equivalent traditional offices in Minnesota caused by the development of CBCTs by commercial banks.

RE = Relative effectiveness of remote electronic banking facilities with respect to traditional banking offices.

TO_i^A = Total traditional offices for all Minnesota financial institutions prior to CBCT development.

$TO_i^{S\&L}$ = Total traditional offices for Minnesota savings and loan associations prior to CBCT development.

$MSTO_i$ = Minnesota savings and loan association market share total offices prior to CBCT development.

μ_s = Savings and loan association mean market share total offices statewide banking states.

μ_u = Savings and loan association mean market share total offices unit bank states.

Then
$$\frac{TO_i^{S\&L}}{TO_i^A+N} = MSTO_i - (\mu_s-\mu_u)$$

or
$$N' = \left[\frac{TO_i^{S\&L}}{MSTO_i-(\mu_s-\mu_u)} - TO_i^A\right] \times RE.$$

Appendix 6

SAVINGS AND LOAN ASSOCIATIONS
MINNESOTA
1971-1974

State of Minnesota

$$MSTO = 9.50\% + 1.31T \qquad R^2 = .97$$
$$(19.79) \quad (7.41)$$

$$MSCS = 35.7\% - .32T^* \qquad R^2 = .62$$
$$(45.77) \quad (1.1)$$

Minneapolis-St. Paul

$$MSTO = 13.25\% + 2.52T \qquad R^2 = .96$$
$$(13.90) \quad (7.2)$$

$$MSCS = 44.9\% - .56T^* \qquad R^2 = .99$$
$$(47.20) \quad (1.6)$$

Outstate Minnesota

$$MSTO = 7.95 + .71T \qquad R^2 = .56$$
$$(36.14) \quad (8.88)$$

$$MSCS = 22.75 + .14T \qquad R^2 = .70$$
$$(.18) \quad (.06)$$
$$12.6 \quad 2.33$$

MSTO = Minnesota savings and loan association market share of total offices.

MSCS = Minnesota savings and loan association market share of consumer savings.

T = Time variable; T=1, 1971; T=2, 1972; T=3, 1973; T=4, 1974.