

TOWARD MORE ACCURATE MACROECONOMIC FORECASTS FROM VECTOR AUTOREGRESSIONS

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Several recent articles have used vector autoregressive (VAR) models to forecast national and regional economic variables.¹ Although the models were small and in many cases the statistical techniques were relatively simple, the forecasts produced were of comparable accuracy to predictions made by forecasting services using much larger models, more elaborate statistical techniques, and incorporating the judgment of many analysts.² This article extends the earlier work by first showing a method for improving VAR forecasts. That method is illustrated in conjunction with the VAR model introduced by Webb [1984]. Briefly, the source of improvement is to determine lag lengths in the model by a clear-cut statistical procedure, rather than by the typical practice of specifying an arbitrary length a priori. The effect is to significantly reduce the number of estimated coefficients relative to an unrestricted VAR.

The article is organized as follows. First, a rationale for using VAR models for forecasting is presented. Next is a discussion of lag length selection. Empirical results from the proposed method of lag length selection are presented in the following section. Finally, those results are compared with two other methods for improving a VAR model's predictive accuracy.

*An earlier version of this paper was presented to the Western Economic Association Conference, Anaheim, California, July 3, 1985. The author is indebted to John Connaughton, Susan Dolman, Michael Dotsey, Thomas M. Humphrey, Anatoli Kuprianov, William Lupoletti, Yash P. Mehra, and Lee Ohanian for helpful comments. Eric Hill provided valuable research assistance. The views and opinions expressed in this paper are those of the author, and should not be attributed to other individuals in the Federal Reserve System.

¹ For example, see Litterman [1984b] for national forecasts, and Kuprianov and Lupoletti [1984] for regional forecasts.

² The assertion that VAR models can be competitive with major forecasting services has been made by Litterman [1984a], based on four years of actual forecasts. That assertion has also been made by Lupoletti and Webb [1984], based on fifteen years of simulated forecasts.

Why Use VARs?

Much of the recent interest in atheoretical methods, including VAR models, reflects a growing disenchantment with conventional structural macromodels. In part, that disenchantment is based on conventional models' spurious endogeneity/exogeneity distinctions, their ad hoc treatment of expectations, a perceived lack of correspondence between model equations and the original motivating theory, and their need for continuous ad hoc adjustments in order to produce satisfactory results.³

A particularly appealing motivation for using VAR models has been presented by Hakkio and Morris [1984]. They view a VAR as a reduced form that provides a flexible approximation to the reduced form of any model included in a wide variety of structural models. As such, they present empirical evidence that a VAR model can be dramatically superior to a misspecified structural model. Therefore, critics who believe that conventional macromodels are grossly misspecified have room to believe that a simple VAR model might better approximate the reduced form that would be derived from a model that reflected the true structure of the economy.

Statistical Lag Length Selection

VAR models estimate future values of a set of variables from their own past values. For example, consider one of the equations from a VAR model:

$$X_{v,t} = \alpha + \sum_{i=1}^k \sum_{j=1}^{m_i} \beta_{i,j} X_{i,t-j} + \epsilon_{v,t} \quad (1)$$

where X is a vector of k variables, v is an integer between 1 and k , t is an integer that indexes time, α is a constant term, $\beta_{i,j}$ is a coefficient (α and the β s are estimated by ordinary least squares), m_i is the

³ Sims [1980] presents a particularly forceful and lucid critique of conventional modeling strategies.

lag length for variable i , and $\epsilon_{v,t}$ is an error term. In other words, the current value of each variable is predicted by lagged values of itself and all other variables in X . It is apparent that the value chosen for each lag length is of some importance. Too large a value means that too many coefficients are estimated, resulting in a loss of precision in the estimates. But too small a value means that important lagged terms are omitted, thereby producing biased coefficient estimates. Both imprecision and bias will increase forecast error variance.

Nevertheless, there is no generally accepted procedure for choosing a lag length. Many authors simply present a number with no explanation for how it was chosen. Others use traditional hypothesis tests, such as F-tests or likelihood ratio tests: to compare alternative specifications. Those tests, however, were designed for testing well-defined alternatives derived from a priori theory. Since the choice of lag lengths in a VAR model does not involve theory-based dichotomies, the use of classical hypothesis tests to determine the lag length is questionable.

In addition, the prevailing custom is to treat all variables identically, thereby using one common lag length for each independent variable in each equation. It is possible, however, that identical treatment could lead to the common lag length being too long in some cases while being too short in others.

Traditional methods of choosing the lag lengths in VAR models therefore seem to leave room for improvement. The strategy examined below is to consider each lag separately, and to use a statistical procedure appropriate for exploratory data analysis rather than hypothesis testing. For each equation, lag lengths are chosen to minimize the Akaike information criterion, or AIC, which was originally proposed for selecting the order of a univariate autoregression. The AIC is a function for which the value depends on the number of estimated coefficients, and can be written as

$$AIC(m_1, \dots, m_k) = (N-p) \log \sigma^2 + 2p \quad (2)$$

where k again is the number of variables in the VAR model, each m_i is the lag length for the i 'th variable in the equation, p is the number of estimated coefficients, N is the number of observations used to estimate the equation, and σ^2 is the maximum likelihood estimate of the residual variance.

The intuition behind equation (2) is straightforward, and reflects the tradeoff that exists with respect to adding a coefficient to a statistical model. To the

extent that the additional coefficient improves the in-sample fit, the residual variance declines. By itself, that would generally⁴ cause the AIC to decline by lowering the first term in equation (2). However, estimating an additional coefficient with a fixed number of observations tends to reduce the precision of all the coefficient estimates. That is reflected in the second term, which imposes a penalty for each additional coefficient that is estimated. The minimum AIC therefore reflects a balance between the two opposing factors.

Although the minimum AIC can be determined by inspection in small models, a problem arises as the size of a model increases. Consider a five variable VAR, with possible lag lengths from one to twelve for each variable. Each equation would have 12⁵, or 248,832, possible combinations of variables. Rather than attempting to examine each possibility, an alternative is to start with short lag lengths and add coefficients as long as the AIC declines. A difficulty arises, however, since with typical macroeconomic data, the AIC does not decline smoothly as the number of coefficients rises. Thus it is easy to reach one of several local minima without finding the specification that yields the global minimum AIC. This paper uses an extensive search procedure that is described in the Appendix. That procedure is somewhat different from one proposed by Fackler [1985], who addressed a related problem: using Akaike's final prediction error to determine the lag lengths in a VAR model designed for indicating causality.

In addition to its intuitive appeal, there is evidence that the AIC has been used successfully in other settings. Most notably, Meese and Geweke [1984] investigated the performance of several methods of choosing lag lengths for univariate autoregressions that were used to predict 150 macroeconomic time series. They found that the AIC produced the best forecasts more often than any other method studied.

Empirical Results

The relative forecasting performance of several models is examined by studying simulated forecasts over a fifteen-year period. The models include an unrestricted, five-variable VAR model (UVAR5), the corresponding model specified by the AIC method (AVAR5), an unrestricted six-variable VAR model (UVAR6), the corresponding model specified by the

⁴In a few cases the term $(N-p) \log \sigma^2$ can increase due to an increase in p .

BOX

AN ILLUSTRATIVE VAR MODEL

This box employs a simple two-variable VAR model to illustrate the techniques discussed in the text. The variables are the T-bill rate (RTB) and the percentage change in the monetary base (DB). With a common lag length of one, that model would consist of two equations :

$$RTB_t = \alpha_1 + \beta_{11}RTB_{t-1} + \beta_{12}DB_{t-1} \quad (B1)$$

$$DB_t = \alpha_2 + \beta_{21}RTB_{t-1} + \beta_{22}DB_{t-1} \quad (B2)$$

where the α 's and β 's are estimated coefficients. Current observations of RTB and DB can be used to forecast future values by inserting the current values into the right sides of equations B1 and B2 and then calculating a one-quarter-ahead forecast for each variable. Those values, in turn, can be inserted into the right side of each equation and a two-quarter-ahead forecast prepared for each equation. The same process can be repeated as many times as desired: in this way, a forecast can be produced for as many steps ahead as desired.

In practice, longer lag lengths are usually necessary for accurate forecasts. A generalization of the model presented above that allows for longer lags can be written

$$RTB_t = \alpha_1 + \sum_{i=1}^{m_{11}} \beta_{11i}RTB_{t-i} + \sum_{i=1}^{m_{12}} \beta_{12i}DB_{t-i} \quad (B3)$$

$$DB_t = \alpha_2 + \sum_{i=1}^{m_{21}} \beta_{21i}RTB_{t-i} + \sum_{i=1}^{m_{22}} \beta_{22i}DB_{t-i} \quad (B4)$$

where the m's represent the lag length for each variable in each equation. In order to choose specific values for each m, suppose that lag lengths between one and four are under consideration for equation B3. Since there are two variables on the right side and four possible lag lengths, there are 4² possible choices. Based on data from 1952:2 to 1969:4, the sixteen regression equations were estimated, values of the Akaike Information Criterion (AIC) were calculated, and the results are displayed below.

		Lag length for the monetary base, DB				
		1	2	3	4	
AIC VALUES	Lag length	1	-119	-118	-113	-108
	for the	2	-125	-122	-118	-113
	T-bill rate,	3	-127*	-123	-118	-113
	RTB	4	-123	-119	-114	-109

The starred value represents the minimum AIC for the lag lengths that were examined. Therefore, in equation B3, m₁₁ would equal three and m₁₂ would equal one.

Another example is the construction of a "counter" variable (C). Suppose one wished to construct a counter for the T-bill rate over a two-year period for which the values are shown below. One could first construct the "indicator" variable (I) below, which would indicate the direction of change of the T-bill rate by letting 1 represent an increase, -1 represent a decline, and 0 represent no change. The next step would be to let the counter variable in a particular quarter equal the cumulative sum of the indicator variable up to that point.

Variable	Quarter									
	0	1	2	3	4	5	6	7	8	
RTB	7	8	9	8	8	7	8	9	10	
I		1	1	-1	0	-1	1	1	1	
C		1	2	1	1	0	1	2	3	

A counter variable thus constructed could be added as an independent variable in either of the equations above.

AIC method (AVAR6) and a set of univariate autoregressive forecasts (AR).⁵

Table I contains forecast results for three key variables: the 90-day Treasury bill rate, the growth rate of real GNP, and the growth rate of the GNP implicit price deflator. Each model's coefficients were estimated using quarterly data from 1952:2 to 1969:4. Forecasts were then constructed for 1970:1 through 1971:4. Each model's coefficients were then reestimated, using data from 1952:2 to 1970:1, and forecasts were constructed from 1970:2 to 1972:1. That procedure was repeated until the model was reestimated and forecasts were prepared for every quarter through 1984:3. Thus for each model a series of out-of-sample forecasts was generated: 60 one-quarter-ahead forecasts, 59 two-quarter-ahead forecasts, and so forth, up to 53 eight-quarter-ahead forecasts. Those forecasts were then compared with actual data. The root-mean-squared-error, or

⁵The lag lengths for the univariate autoregressions were simply the own-lag lengths from the AVAR5 model.

RMSE, is given by each entry in the first three columns of Table I.

In order to more easily compare models, the final two columns of the table include (admittedly crude) summary statistics for each model's performance. The first measure is simply the sum of the RMSEs for each variable at each horizon indicated. Lower values, of course, indicate increasing accuracy. The other measure is the sum of points awarded for the relative performance of each forecast. For each variable at each horizon, three points are awarded for the most accurate forecast, two for the second best, and one for the third best. (Points are split for ties.) In this case, higher point totals represent better relative forecasts.

It is useful to initially consider the first three models listed. The summary measures indicate that the UVAR5 and AR models are rather evenly matched. Considering only those two models, it appears that the benefits from multivariate interaction in UVAR5 are almost exactly negated by the burden of estimating too many coefficients. It is

Table I
FORECAST ERRORS, 1970 TO 1984

Model	Horizon	Interest Rate	Real GNP	Implicit Deflator	Sum 1	Sum 2
UVAR5	1	1.20	4.93	2.04		
	4	2.76	2.56	1.91		
	8	4.19	2.41	2.46	24.26	6
AVAR5	1	1.20	4.61	1.89		
	4	2.47	3.01	1.96		
	8	3.57	2.25	2.29	23.25	15
AR	1	1.24	4.62	1.76		
	4	2.62	3.17	1.96		
	8	4.13	2.29	2.54	24.33	8
UVAR6	1	1.22	5.37	2.07		
	4	2.99	2.92	1.89		
	8	4.31	2.52	2.34	25.63	5.5
AVAR6	1	1.20	4.76	1.89		
	4	2.44	2.96	1.89		
	8	3.57	1.92	2.20	22.83	19.5

Note: Column 1 contains the names of the models used to generate forecasts. Column 2 is the forecast horizon—the length of the forecast, measured in quarters. Columns 3 through 5 contain the RMSE's of post-sample forecasts. The interest rate is the 90-day Treasury bill rate. Real GNP and the implicit deflator are percentage changes at annual rates. For those two variables, 4 and 8 quarter changes are the average change over the particular period. Column 6 contains a summary measure of model performance, namely the sum of the RMSE's for each variable at each horizon. Column 7 contains another summary measure, a point total that assigns three points for the most accurate forecast for each variable at each horizon, two points for the second most accurate forecast, and one point for the third most accurate forecast.

also interesting to note the AR model's best relative performance was at the one-quarter interval. That result is intuitively plausible, since one might expect the benefits of multivariate interaction to be greatest at longer intervals.⁶

Comparing the UVAR5 and AVAR5 models illustrates the improved accuracy attainable from estimating fewer coefficients. As can be seen in Table II, which contains the specification of the models, the AVAR5 model contains only 75 coefficients. In contrast, the UVAR5 model contains 155 coefficients -31 per equation. The substantial reduction in the number of coefficients suggests a possible avenue for further improvement: the smaller number of coefficients in AVAR5 might leave enough room for another variable to be included.

As Table I indicates, forecasting accuracy at various horizons for the three variables of interest was improved by adding a sixth variable. Finding that sixth variable required a fair amount of search, however.⁸ It quickly became evident that an additional variable would fail to improve the accuracy of forecasts if any one of three conditions held: (1) the additional variable did not appreciably augment the explanatory power of in-sample regressions for which the dependent variable was one of the three key variables; (2) when the additional variable was the dependent variable, the in-sample fit of its regression equation was poor; or (3) the additional variable itself could not be predicted accurately in post-sample forecasts.

The third condition is worth emphasizing, since it may not be obvious to the casual user of VAR forecasts. For example, in searching for a sixth variable for AVAR6, preliminary regressions (with GNP, the deflator, or the interest rate as the dependent

⁶In Lupoletti and Webb, a similar comparison between Charles Nelson's actual ARIMA forecasts and the UVAR5 simulated forecasts found the ARIMA forecasts uniformly superior at a one-quarter horizon, the VAR forecasts uniformly superior at a four-quarter horizon, and mixed results at a two-quarter horizon.

⁷The lag lengths in both the AVAR5 and AVAR6 models were chosen by using data from 1952:2 to 1969:4. The post-sample forecasts that were prepared over a fifteen-year interval were all derived from that single setting of lag lengths for each model. It appears likely that periodic respecification of the models would have yielded more accurate forecasts.

⁸Variables examined included the foreign exchange value of the dollar, the NYSE composite price index deflated by the PCE deflator, manufacturers' unfilled orders deflated by the producer price index, business fixed investment and personal savings (both expressed as a percentage of GNP), and growth rates of employment and federal debt.

Table II
LAG LENGTHS FOR EACH EQUATION
IN EACH MODEL

Model	Dependent Variable	Explanatory Variables					
		RTB	DX	DP	CU	DB	GX
UVAR5	RTB	6	6	6	6	6	
	DX	6	6	6	6	6	
	DP	6	6	6	6	6	
	CU	6	6	6	6	6	
	DB	6	6	6	6	6	
AVAR5	RTB	4	0	4	0	1	
	DX	1	15	0	7	4	
	DP	0	1	4	5	2	
	CU	2	0	0	5	1	
	DB	3	4	3	0	4	
AR	RTB	4	0	0			
	DX	0	15	0			
	DP	0	0	4			
UVAR6	RTB	6	6	6	6	6	6
	DX	6	6	6	6	6	6
	DP	6	6	6	6	6	6
	CU	6	6	6	6	6	6
	DB	6	6	6	6	6	6
	GX	6	6	6	6	6	6
AVAR6	RTB	4	0	4	0	1	0
	DX	1	9	0	1	4	7
	DP	0	1	4	5	2	0
	CU	2	0	0	5	4	5
	DB	2	1	1	0	4	5
	GX	2	0	0	0	0	4

Note: The entries in this table represent the lag lengths for each variable in each equation in each model. An entry of zero indicates that the variable is excluded from that equation. A positive number indicates the number of lags that were included, beginning with the first lagged value. A constant term was also included in each equation. The variables are as follows: RTB, 90-day Treasury bill rate; DX, real GNP, first difference in logs times 400; DP, GNP implicit price deflator, first difference in logs times 400; CU, capacity utilization rate, manufacturing; DB, monetary base, St. Louis version, first difference in logs times 400; and GX, federal government expenditure as a percentage of GNP.

variable) fit better within the sample period when either a stock price index or the foreign exchange value of the dollar was included as an explanatory variable. Attempts to predict those two variables were unsuccessful, however, with forecasts at all horizons having a Theil U-statistic substantially greater than one. (That statistic indicates that simply using the last observation of the stock index or exchange rate as the forecast would have been more accurate than the model's prediction.) Not sur-

prisingly, a model containing such a poorly predicted variable produced less accurate forecasts of the other variables at four- and eight-quarter horizons, since the poor forecasts of one variable added noise to other forecasts.⁹

In brief, evidence presented in this section suggests that specifying the lag lengths in VAR models by using the AIC can improve the accuracy of forecasts. The benefits are twofold. First, there is a substantial reduction in the number of estimated coefficients. That reduction allows the remaining coefficients to be estimated more accurately. At the same time, the coefficients extracting the least information from the data are the ones removed. The second benefit is that additional variables can be added once the profligate parameterization of an unrestricted VAR model is reduced. These additional variables may contain information that is not contained in the original data.

Other Techniques

The most widely used method for reducing the parameterization of VAR models was proposed by

⁹ Of course, movements of a price determined in a competitive financial market should not be able to be predicted with such publicly available information as lagged variables. If so, that would indicate the persistence of unexploited profit opportunities.

Litterman.¹⁰ In essence, his method involves imposing prior beliefs concerning some statistical properties of the data. Those beliefs, often referred to as Bayesian priors, include such ideas as (1) macroeconomic data can be accurately described as random walks around a trend, and (2) a variable's own lags are better predictors of that variable's future values than are lags of other variables.

One example of Bayesian restrictions was imposed on UVAR6, with the results given in Table III under the heading BVAR6.¹¹ The comparison between AVAR6 and BVAR6 is of particular interest, since each model takes a different approach toward effectively restricting the parameterization of a VAR

¹⁰ For example, see Litterman [1979] and Doan, Litterman, and Sims [1983].

¹¹ The exact setting is given by the RATS statement

SPECIFY (TIGHT=.1, DECAY=.9).5

which imposes a particular pattern on the lags in the model, a particular relationship between own lags and lags of other variables, and the standard deviation of the prior. No experimentation was conducted to find the setting that worked best within the sample period—it is hoped that the results are indicative of the benefits of using priors for real-time forecasting. See Doan and Litterman [1984] for more discussion of the exact meaning of the restrictions that were imposed.

In addition, it should be noted that Litterman's priors are most often used for variables expressed in levels, whereas three variables in UVAR6 are expressed as percentage changes. No experimentation was conducted to determine if the form of the priors should be changed in such a case.

Table III
FORECAST ERRORS, 1970 TO 1984

Model	Horizon	Interest Rate	Real GNP	Implicit Deflator	Sum 1	Sum 2
AVAR6	1	1.20	4.76	1.89		
	4	2.44	2.96	1.89		
	8	3.57	1.92	2.20	22.83	8.5
BVAR6	1	1.20	4.44	1.75		
	4	2.48	2.45	1.94		
	8	3.74	1.60	2.61	22.21	8.5
CVAR6	1	1.19	4.71	1.91		
	4	2.26	1.96	3.09		
	8	2.92	2.20	2.56	22.80	10

Note: Column 1 contains the names of the models used to generate forecasts. Column 2 is the forecast horizon—the length of the forecast, measured in quarters. Columns 3 through 5 contain the RMSE's of post-sample forecasts. The interest rate is the 90-day Treasury bill rate. Real GNP and the implicit deflator are percentage changes at annual rates. For those two variables, 4 and 8 quarter changes are the average change over the particular period. Column 6 contains a summary measure of model performance, namely the sum of the RMSE's for each variable at each horizon. Column 7 contains another summary measure, a point total that assigns the most accurate forecast for each variable at each horizon two points, and the second most accurate forecast one point.

model. Both methods are atheoretical from an economic point of view. The Bayesian method, however, relies on a priori statistical restrictions, whereas the method used to construct AVAR6 lets the data determine the form of the model.

A different approach to improving forecast accuracy was given by Neftci, who proposed a method for incorporating the stage of the business cycle into VAR models. He first constructed an “indicator” variable I for the unemployment rate U by letting I_t equal one if the unemployment rate in quarter t is higher than in the previous quarter, letting I_t equal minus one if the unemployment rate declined in quarter t , and letting I_t equal zero if the unemployment rate was unchanged. He then constructed a “counter” variable C by setting

$$C_t = \sum_{j=1}^t I_j \quad (3)$$

The counter variable (lagged one quarter in order to avoid adding contemporaneous information) can then be added to the equations of a VAR model. Neftci found that the counter significantly improved the explanatory power of the equation explaining the unemployment rate.

Table III shows what happens when one employs Neftci’s method to construct a counter variable for the capacity utilization rate and then adds that variable to equations in AVAR6. The resulting model is labeled CVAR6. Since the counter is a nonlinear transformation of the capacity utilization rate, it can add information that would not be picked up by OLS regressions containing the capacity utilization vari-

able. It is possible that the additional information helps to incorporate the stage of the business cycle.

As Table III indicates, there are mixed results in comparing AVAR6 and the two alternatives. The two summary measures give different orderings of the three models. Looking at individual variables, AVAR6 was most accurate for predicting the implicit deflator, BVAR6 was most accurate for predicting real GNP, and CVAR6 was most accurate for predicting the T-bill rate. Without additional information it is difficult to assert with any confidence that one model is likely to outperform the others in the near future.

Conclusion

The results in this article document the improved forecast accuracy that can be obtained by restricting the parameterization of a VAR model. Although the gains are consistent, they are not dramatically large. Initial experiments with other techniques of improving forecast accuracy did not yield consistently large additional improvements.

Researchers interested in improving atheoretical forecasts may continue to investigate methods of restricting the parameterization of VARs. Further work may also examine the benefits of combining forecasts. For example, Lupoletti and Webb have documented small but consistent improvements in accuracy from combining dissimilar forecasts. At some point, however, it will be appropriate to ask if we are near the boundary of forecast accuracy, given the limited information in historic macroeconomic time series.

APPENDIX

SETTING LAG LENGTHS IN VECTOR AUTOREGRESSIONS

Consider the following equation from a vector autoregression

$$X_{v,t} = \alpha + \sum_{i=1}^k \sum_{j=1}^{m_i} \beta_{i,j} X_{i,t-j} + \epsilon_{v,t} \quad (1)$$

where X is a vector of k variables, v is an integer between 1 and k , t indexes time, α is a constant term, $\beta_{i,j}$ is a coefficient, m_i is the lag length for variable i , and $\epsilon_{v,t}$ is an error term. The problem addressed in this Appendix is choosing values for the m_i 's. The choice can be made by attempting to minimize the Akaike Information Criterion (AIC)

$$AIC(m_1, \dots, m_k) = (n-p) \log \sigma^2 + 2p \quad (2)$$

where n is the number of observations, σ^2 is the maximum likelihood estimate of the residual variance, and p is the number of estimated coefficients— α and the $\beta_{i,j}$'s.

THE PROBLEM

The AIC has been primarily used by other authors to determine the lag length in univariate autoregressions. For that task it is easy to find the minimum AIC by inspection of a small number of alternatives. For the multivariate case, finding the minimum can be more difficult. For k variables and a maximum lag of L periods, there are Lk possibilities. It can quickly become infeasible to compute the AIC for all potential alternatives.

Accordingly, some strategy for examining a subset of alternatives is necessary. Designing such a strategy is complicated by two characteristics that were observed with macroeconomic data. First, the AIC often has many local minima. Therefore, from an arbitrary starting point it is likely that a sequence of lag-length selections will fail to converge to the set of choices that yields the global minimum of the AIC. Second, the partial derivative of the AIC with respect to a particular lag length depends on the other lag lengths. Therefore it is possible that lengthening a particular lag will lower the AIC even though a shorter lag length belongs to the set that minimizes the AIC.

The strategy for selecting lag lengths in this paper has five elements: (1) Choose a starting specification. A specification is defined as a particular value (possibly zero) for the lag length of each variable that might enter the equation. (2) Lengthen the lag for each variable by one period. Consider adding a term (that is, lengthening the lag length for one variable by one period) if it lowers the AIC more than any other term examined. (3) Look several steps ahead, in order to avoid converging to a local minimum. (4) When steps (2) and (3) fail to find a lower AIC after several attempts, stop adding terms. (5) Examine the final values in each lag, to see if removing a term lowers the AIC. Each element of the strategy is discussed below. An objective of the strategy is to minimize the role of judgment in finding a specification, in addition to finding a specification that is likely to have an AIC in a reasonably small neighborhood of the global minimum.

1. Starting Specification Experimentation revealed that the choice of the starting specification would often affect the final specification. Since univariate autoregressions with a lag length of four often forecast macroeconomic data fairly well, all specification searches began with an own lag of four, a constant, and no other variables.

2. Adding Terms Alternatives to the starting specification included adding one period to the own lag, or adding one period for an additional variable. The process of lengthening each lag in turn by one period, while holding other lags constant, is the first step of the adding procedure. After looking at the effects of lengthening each lag, the term that lowered the AIC by the largest amount was added to the equation, unless it led to a cul-de-sac (as described in the next paragraph).

3. Look Ahead It was observed in some cases that, although adding one term did not lower the AIC, adding more than one did. Therefore a three-step look-ahead procedure was built into the search. That is, even if adding one term failed to lower the AIC, two additional

attempts were made at lengthening that lag. Even with the three-step look-ahead, however, it was still possible to take the wrong path and reach a cul-de-sac. Therefore, when the AIC failed to decline, six more attempts were made to add terms. In each attempt one term was added, even if the AIC rose. In many cases the additional search would successfully bypass a local minimum and find an even lower value for the AIC.

4. Stop Adding When the AIC failed to decline after six rounds, no further attempts were made to add more terms. In most equations that endpoint represented a seemingly reasonable specification. For real GNP, however, the process added many variables while only reducing the AIC by a small amount. The result was an equation that appeared overparameterized. Therefore, a limit of thirty-one coefficients (the number of coefficients in each equation of the unrestricted five-variable VAR) was imposed on the GNP equation.

5. Subtracting Variables The four preceding steps produced specifications that would occasionally include values at the end of lags with suspiciously low t-statistics in regression equations. Therefore attempts were made to remove those particular terms and to recalculate the AIC. This step resulted in a lower AIC in a few cases. To mechanize the procedure, the final lagged value for each variable was removed and the AIC recalculated. If the AIC declined, the term that lowered the AIC by the greatest amount was removed and the procedure repeated. This procedure is necessary since the adding process could include a term that would make redundant a term added earlier.

CONCLUSION

The efficacy of this strategy in approaching the global minimum of the AIC is unknown. Further investigation may employ Monte Carlo studies in order to compare this strategy with other approaches to selecting lag lengths. Intuitively, this strategy has the appeal of avoiding certain pitfalls by including techniques for bypassing local minima and removing redundant variables.

The other objective, minimizing the role of judgment in specifying equations, can be more readily assessed. Judgment is used in setting the following values: the initial specification, the number of look-ahead steps, the number of repetitions of the adding procedure attempted before stopping, and the maximum number of estimated coefficients per equation. Compared to other methods of specifying equations, however, that is a small amount of judgment. The procedure is therefore compatible with the atheoretical spirit that has motivated many authors to use VAR models.

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A REVIEW OF BANK PERFORMANCE IN THE FIFTH DISTRICT, 1984

David L. Mengle and John R. Walter

Fifth District banks generated strong profits during 1984. Though return on assets (ROA) and return on equity (ROE) were somewhat lower than in 1983, they were well above the average for the previous five years.

The rise of market interest rates in the first half of 1984 and their fall in the second half led to a net interest margin performance different in the Fifth District from that reported for all banks in the United States. For example, Fifth District banks were more successful than banks in the rest of the nation at controlling interest expense as a percentage of assets. At the same time, although District banks posted gains in interest income, banks reported even stronger results nationwide. The result in the Fifth District was a net interest margin lower than any reported in the last six years. In comparison, all U. S. banks reported a slight increase in net margin. Still, Fifth District margins remained well above those in the rest of the nation.

One of the most important factors affecting bank profitability in 1984 was the increase in provisions for loan losses, both in the Fifth District and for the whole United States. In addition, noninterest revenue and expense continued to play significant roles in offsetting changes in net interest margins. Although Fifth District banks could not match the performance of banks nationwide in increasing noninterest income, they have continued to be successful at reducing noninterest expense, a goal that has so far eluded banks at the national level.

Because of Fifth District banks' higher net interest margin, lower provision for loan losses, and declining noninterest expense, they were able to continue to outperform banks nationwide in both return on assets and return on equity. In an era of steadily declining profitability on the national level, banks in the Fifth District have been able to maintain high returns.

Interest Revenue

Gross interest ratio, defined as gross interest revenue divided by average assets, rose by 44 basis points during 1984 to 10.02 for banks in the Fifth Federal Reserve District (see Table I). This increase, in contrast with the decreases of the two previous years, reflects the generally higher market rates experienced over much of 1984 shown in Chart 1. With average market rates 1% to 1.5% above 1983 rates, 97% of Fifth District banks expanded their level of interest income compared with 1983 and 70% increased gross interest income as a percent of average assets. At the national level, the increase in the gross interest ratio was even greater (see Appendix).

This increase in gross interest revenue obscures some differences between the performance of various size categories of banks, as shown in Chart 2. For example, medium-sized banks, that is, those with total assets between \$100 million and \$750 million,

Chart 1

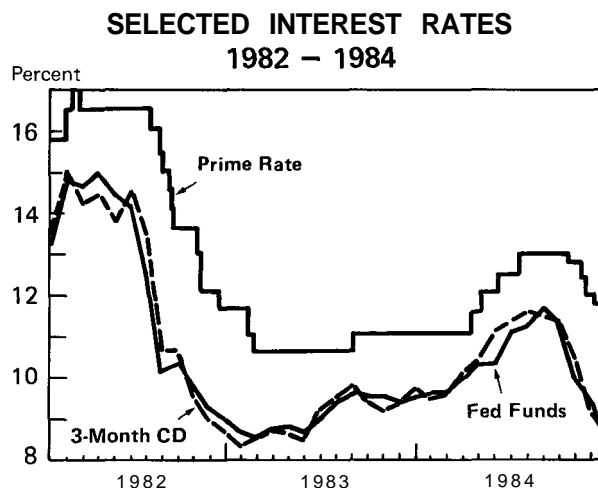


Table I

**INCOME AND EXPENSE AS A PERCENT OF AVERAGE ASSETS
FIFTH DISTRICT COMMERCIAL BANKS, 1979-1984**

Item	1979	1980	1981	1982	1983	1984
Gross interest revenue	8.49	9.46	11.15	10.86	9.58	10.02
Gross interest expense	4.53	5.60	7.29	6.93	5.82	6.33
Net interest margin	3.96	3.86	3.86	3.93	3.76	3.69
Noninterest income	0.80	0.90	1.01	1.03	1.16	1.15
Loan loss provision	0.26	0.26	0.25	0.28	0.25	0.33
Securities gains or losses ²						- 0.02
Noninterest expense	3.24	3.37	3.48	3.53	3.45	3.37
Income before tax	1.26	1.13	1.14	1.15	1.22	1.12
Taxes	0.28	0.20	0.19	0.18	0.22	0.19
Other ³	- 0.04	- 0.04	- 0.09	- 0.10	- 0.02	0.00
ROA ⁴	0.94	0.89	0.86	0.87	0.98	0.93
Cash dividends declared	0.30	0.32	0.33	0.37	0.34	0.31
Net retained earnings	0.64	0.57	0.53	0.50	0.64	0.62
ROE ⁵	13.51	12.79	12.56	13.12	15.21	14.62
Average assets (\$ millions)	80,671	88,280	97,217	108,439	121,173	137,131

(Discrepancies due to rounding errors)

Source: Consolidated Reports of Condition and Income as submitted by insured banks to their primary regulators.

¹ Average assets are based on fully consolidated volumes outstanding at the beginning and at the end of the year.

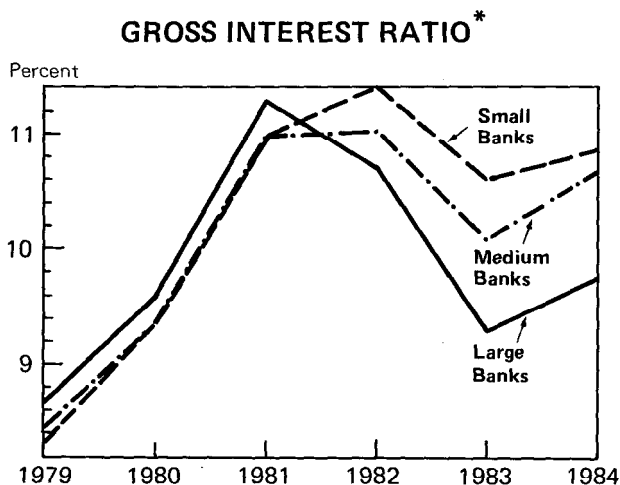
² Banks were required to report securities gains or losses above the tax line, on their income statements, for the first time in 1984.

³ Includes securities and extraordinary gains or losses after taxes, for 1979-1983 data, and extraordinary items and other adjustments after taxes for 1984 data.

⁴ ROA is net income divided by average assets.

⁵ ROE is net income divided by average equity. Average equity is based on fully consolidated volumes outstanding at the beginning and at the end of the year.

Chart 2



*Interest revenue divided by average assets.

had a gross interest ratio increase of 59 basis points over 1983, while large banks (assets over \$750 million) saw an increase of 46 basis points. In contrast, the smallest Fifth District banks (less than \$100 million) experienced only a 26 basis point increase in gross interest revenue. As in previous years, this reflects the lower variability of the yields on loans in smaller banks' portfolios.

Table II shows that return on total loans for all Fifth District banks rose by 21 basis points. The insensitivity of small banks' loan portfolios to interest rate changes led to considerably slower growth in loan income than that achieved by the larger banks. Specifically, 31% of small Fifth District banks' loan portfolios consists of mortgage loans, which typically have fixed rates and long terms and are therefore comparatively insensitive to fluctuations

Table II
AVERAGE RATES OF RETURN ON SELECTED INTEREST-EARNING ASSETS
FIFTH DISTRICT COMMERCIAL BANKS, 1979-1984

item	1979	1980	1981	1982	1983	1984*
Total loans	11.25	12.50	14.48	14.14	12.38	12.59
Net loans	11.37	12.63	14.64	14.30	12.53	12.74
Total securities	6.43	7.15	8.57	9.27	9.20	9.68
U. S. Government	8.14	9.16	11.22	11.79	11.17	
State and local	5.17	5.56	6.11	6.68	6.74	
Other	2.88	3.25	4.20	5.82	5.96	
Total interest-earning assets	10.09	11.28	13.18	12.68	11.11	11.77

* Total and net loans here include leases while in other columns they do not.

in market rates. In comparison, mortgages averaged 21% of medium banks' and 13% of large banks' loan portfolios. At the same time, large banks held 30% of their gross loan portfolios in commercial and industrial (C&I) loans, while medium banks held 26% and small banks held 20%. C&I loans tend to be interest-sensitive because they often have short terms or carry variable interest rates.

It is important to look closely at loan growth patterns since, as is made clear by Table III, the prom-

inence of loans relative to other assets in District banks' portfolios increased during 1984. Total loan growth (Table IV) picked up during the last quarter of 1984, and was spread evenly among most categories of loans. An exception to the pattern was agricultural loans, which grew as a percent of total loans during the first half of the year but declined in the second half. The result was that, as total loans grew by slightly more than 20% between the end of 1983 and the end of 1984, farm loans fell from

Table III
ASSET CATEGORIES AS A PERCENT OF TOTAL ASSETS
FIFTH DISTRICT COMMERCIAL BANKS, 1982-1984

Asset Category	1982	1983	1984
Securities	23.43	25.86	24.45
Loans and leases - Total	50.10	51.07	54.41
Home mortgages	10.22	9.55	9.56
Commercial real estate and development loans	6.78	7.20	8.49
Commercial and industrial loans	15.03	15.50	16.54
Consumer loans	14.34	14.60	15.88
Other loans	3.94	4.10	3.61
Leases	0.58	0.58	0.74
Agricultural loans	0.89	0.93	0.81
Less: Unearned income on loans	- 1.68	- 1.38	- 1.22
Less: Allowance for loan loss	- 0.59	- 0.61	- 0.71
Cash and due from balances	14.80	13.79	11.92
Fed funds	6.21	4.05	4.40
Other assets	6.04	5.84	5.52
Total	100.00	100.00	100.00

(Discrepancies due to rounding errors)

Table IV

**QUARTERLY GROWTH RATES IN SELECTED LOAN CATEGORIES
FIFTH DISTRICT COMMERCIAL BANKS, 1984**

Loan Category	Q 1	Q 2	Q 3	Q 4
Home mortgages	1.99	3.64	3.60	3.78
Commercial real estate and development loans	7.63	7.40	5.96	9.43
Commercial and industrial loans	6.94	5.09	1.64	6.06
Consumer loans	2.62	6.65	5.36	7.15
Other loans	- 11.22	1.36	4.34	6.62
Leases	3.94	5.24	8.51	22.01
Agricultural loans	8.56	8.46	- 7.79	- 8.42
Total loans	3.51	5.41	3.72	6.44

1.84% to 1.49% of this total. Within the agricultural loan category, loans secured by farmland, which had remained fairly steady as a percent of total loans during 1983, fell throughout 1984. Other agricultural loans, which rose during the first half of 1984 and fell during the second half, were lower in each quarter than in the corresponding period in 1983.

Table II shows that gross returns on securities, the ratio of securities income to average securities outstanding, increased from 9.20% in 1983 to 9.68% in 1984. This increase, however, was due almost entirely to large banks' strong performance, since banks with less than \$750 million in total assets showed little or no improvement in return on their securities.

Interest Expense

Just as the higher market rates prevalent during 1984 pushed up interest revenue, so did they push up interest expense. As a percent of average assets, interest expense in Fifth District banks increased 51 basis points from 5.82% in 1983 to 6.33% in 1984 (Table I).

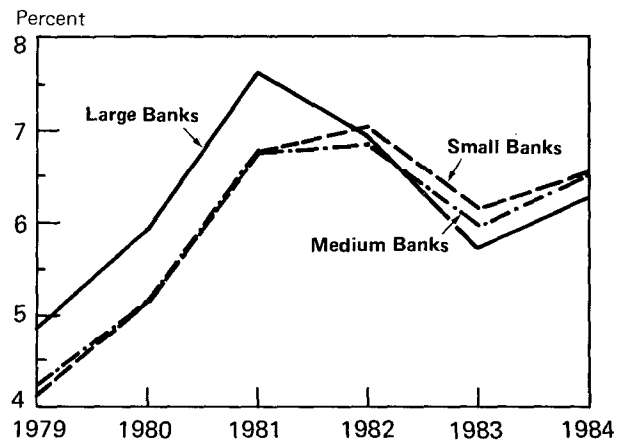
Chart 3 reveals that the effect of higher market rates on interest expense varied with bank size. Fifth District banks with more than \$100 million in assets had an average increase of 54 basis points in their interest expense ratio. For smaller banks, however, the increase was a more modest 37 basis points.

The average cost of interest-bearing liabilities in Fifth District banks rose 60 basis points during 1984, as reported in Table V. Contributions to this increase varied among the different categories of liabilities. The average cost of such liabilities as large time deposits, deposits in foreign offices, and Fed

funds grew much more rapidly than this average figure. At the end of 1984, these relatively interest-sensitive liabilities accounted for 24% of total liabilities. Such liabilities as small time deposits (those in denominations less than \$100,000), passbook savings accounts, individual retirement accounts, Super NOW accounts, NOW accounts, and money market deposit accounts (MMDA), all of which are included in the Other Deposits category in Table V, produced a much smaller increase in interest expenses because of the relatively less interest-sensitive nature of these accounts. Because the deposits included in the Other Deposits category together make up about 52% of all liabilities in Fifth District banks, they helped to offset the higher funds costs arising from the more interest-sensitive liabilities.

Chart 3

INTEREST EXPENSE RATIO*



*Interest expense divided by average assets.

Table V

**AVERAGE COST OF FUNDS FOR SELECTED LIABILITIES
FIFTH DISTRICT COMMERCIAL BANKS, 1979-1984**

Item	1979	1980	1981	1982	1983	1984
Interest bearing deposit accounts	7.15	8.68	10.63	9.91	8.19	8.72
Large time deposits	9.96	11.33	14.35	12.05	7.62	9.47
Deposits in foreign offices	10.28	13.17	15.18	12.79	7.73	9.19
Other deposits	6.16	7.54	9.23	9.12	8.34	8.55
Subordinated notes and debentures	8.19	8.20	8.11	8.34	8.32	8.03
Fed funds	11.94	13.34	15.54	11.21	8.52	9.58
Other	6.98	8.65	13.49	11.29	8.75	9.18
Total	7.60	9.13	11.23	10.10	8.24	8.84

Fifth District institutions were considerably less reliant on funds with volatile yields than were banks nationwide. The relatively interest-sensitive categories of deposits provided 32% of total liabilities for all U.S. banks, while the Other Deposits category amounted to 41%. This helps explain the greater increase in interest expense for U.S. banks during 1984 compared with banks in the Fifth District.

Demand deposits continued to decline as a percentage of total deposits in Fifth District banks. In 1983, these non-interest-bearing checking accounts represented 25.5% of total domestic deposits. By the end of 1984 this ratio had fallen to 24.8%, although it should be noted that this decline was smaller than that which had taken place from 1982 to 1983. As the significance of demand deposits in the liability structures of banks declines, interest expense as a percent of liabilities or assets increases due to the rise in the importance of interest-paying liabilities. Because holders of demand deposits are compensated implicitly through services provided by their banks, increases in interest expense should be offset somewhat by diminutions in noninterest expense. Since the reduction of the importance of demand deposits in the Fifth District was small relative to total liabilities, it is unlikely that much of this shift from noninterest expense to interest expense took place during 1984.

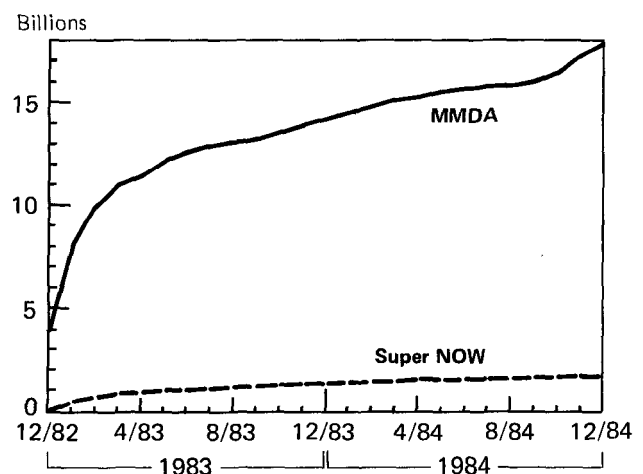
In 1984, Fifth District banks did not experience the same rapid growth in MMDAs and Super NOW accounts that occurred in 1983.¹ As seen in Chart 4, MMDA growth was steady throughout the year, expanding by \$3.7 billion during the year, from an initial figure of \$14.1 billion to an end-of-year \$17.8

billion. During this same period, Super NOWs grew by about \$400 million. By the end of 1984, MMDAs and Super NOWs together made up 14.5% of total liabilities, while at the end of 1983 they accounted for 13%. On the one hand, if consumers replaced maturing certificates of deposit with MMDAs or Super NOWs, this liability structure shift may have lowered Fifth District banks' total interest cost. On the other hand, if depositors simply replaced regular demand deposits and savings deposits with Super NOWs and MMDAs, banks may have experienced interest expense increases as the latter accounts grew in importance.²

²Michael C. Keeley and Gary C. Zimmerman (1985) provide evidence regarding sources of funds for MMDAs.

Chart 4

MMDA AND SUPER NOW GROWTH



¹See F. Ward McCarthy, Jr. (1984), pp. 24-S.

Net Interest Margin

Since interest expense in the Fifth District rose more quickly relative to average assets than did interest income in 1984, net interest margin declined from 3.76% to 3.69%. This seven basis point decline contrasts with the one basis point increase enjoyed by banks on the national level, and is also difficult to explain given that the spread between the prime rate and the 90-day certificate of deposit rate increased through most of the second half of 1984. However, the negative net interest margin growth in the Fifth District conceals the differences between banks in the three size categories (see Chart 5). Although net margin decreased eleven basis points for small banks and eight for large banks, it actually increased by six basis points for medium-sized banks.

Table VI breaks down various aspects of net interest margin performance for all Fifth District banks and for the three size classes. Looking at per-

Chart 5

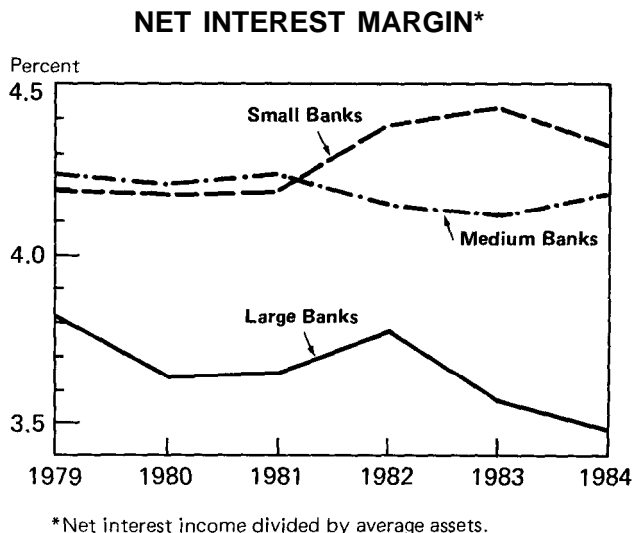


Table VI

**CHANGES IN NET INTEREST MARGINS IN RELATION TO INTEREST INCOME AND
INTEREST EXPENSE GROWTH RATES AND BALANCE SHEET COMPOSITION
FIFTH DISTRICT COMMERCIAL BANKS, 1984**

Total Assets (\$ millions)	Number of Banks	A	B	C	D	E
		Interest Income Growth	Interest Expense Growth	Percent of Rate-Sensitive Liabilities ¹	Percent of Rate-Sensitive Assets ²	Percent Change in Net Margin
Less than 100						
Increased margin	155	17.07	15.80	54.29	41.55	7.97
Others	307	14.12	20.98	54.90	41.95	-7.55
Total	462	15.03	19.27	54.71	41.82	-3.20
100 to 750						
Increased margin	37	21.65	20.36	58.17	50.71	10.96
Others	63	17.36	24.14	54.58	44.19	-6.13
Total	100	19.11	22.50	56.07	46.88	0.25
750 and over						
Increased margin	15	23.65	23.47	57.32	54.36	9.51
Others	18	14.52	21.98	57.21	51.95	-8.92
Total	33	18.71	22.70	57.26	53.09	-1.29
All banks						
Increased margin	207	22.72	22.33	57.17	52.79	9.48
Others	388	14.89	22.13	56.47	49.26	-8.21
Total	595	18.26	22.22	56.79	50.83	-1.35

¹Rate-sensitive liabilities include Super NOW accounts, and money market deposit accounts. In addition, the following are included provided they have immediately adjustable interest rates or maturities of one year or less: time deposits, deposits in foreign offices, and nondeposit interest-bearing liabilities.

²Rate-sensitive assets include those loans and leases, debt securities, and other interest bearing assets with immediately adjustable interest rates or with maturities of one year or less.

formance for the aggregate of all banks, it appears that the major differentiating factor between banks experiencing higher and those experiencing lower net margins is ability to generate higher interest income growth. In 1983, the situation was just the opposite, there being little difference between interest income performance while ability to reduce interest expense was crucial to higher margins. Further, in 1983 this was true for all three size classes.³ A closer look at the 1984 numbers shows, however, that there are more differences between banks than is apparent from the aggregate figures for all banks. Among small and medium banks, for example, interest income and interest expense growth were of roughly equal significance in determining changes in net margins. For large banks, however, interest income growth was a far more important determinant of margins than was interest expense growth.

It is more difficult to draw any strong conclusions from differences between banks with regard to the sensitivity of banks' assets and liabilities to changes in interest rates. During a period of rising market rates, holding relatively interest-sensitive assets and interest-insensitive liabilities should cause margins to rise. Alternatively stated, if the duration of assets is less than that of liabilities, assets will be repriced (at higher rates) more frequently than liabilities.⁴ Looking at the aggregate of banks, it appears that interest-sensitive assets could have been helpful to those banks having higher net margins. Once the figures are broken into size classes, however, relative sensitivities become less informative. More definite statements could be made on this subject if durations of bank balance sheets were computed, but that is beyond the scope of this paper.

As noted above, Fifth District banks with between \$100 million and \$750 million in total assets at the end of 1984 produced a six basis point rise in their net interest margin overall. However, only 37% of these banks had an increased net margin ratio, the others experiencing a decline. Medium-sized banks with improved net margins were, in fact, larger in terms of total assets than the average for their cate-

³ McCarthy (1984), pp. 26-7.

⁴ Duration may be defined as the weighted average life of a security or as the sensitivity of the value of a security to interest rate changes. See George G. Kaufman (1984).

gory. As a group, small banks experienced the largest decline in net margins. Only 33% of these banks were able to improve their net margins compared to last year.

Noninterest Revenue and Expense

Noninterest income in Fifth District banks was 12% higher during 1984 than in 1983. Asset growth exceeded noninterest income growth, however, so noninterest income relative to assets fell by one basis point (Table I). Service charge income, which made up about 34% of noninterest income, increased relative to average assets over 1983, as did leasing income (Table VII). These increases were offset by declines in Other Noninterest Income, which includes such items as income from fiduciary activities, credit card fees, and safe deposit box rentals. In contrast, noninterest income at the national level rose significantly in 1984, the major contributing factor being an increase in Other Noninterest Income.

Fifth District banks' flat noninterest income performance was more than offset by an eight basis point decrease in noninterest expense as a percent of assets, compared to a ten basis point increase at the national level. Decreases in both salaries expense and bank premises costs contributed to this fall. The decline in the Fifth District was largely the result

Table VII
NONINTEREST INCOME AS A PERCENT
OF AVERAGE ASSETS
FIFTH DISTRICT COMMERCIAL BANKS
1983 AND 1984

Item	1983	1984
Total noninterest income	1.16	1.15
Service charge income	0.37	0.39
Leasing income	0.07	0.08
Other noninterest income	0.72	0.69
Total noninterest expense	3.45	3.37
Salaries	1.78	1.74
Bank premises	0.60	0.56
Other	1.07	1.07
Noninterest margin	- 2.29	- 2.22

(Discrepancies due to rounding errors)

of a twelve basis point average decline at large banks, medium banks experiencing only a three basis point decline and small banks a two point rise. At the national level, noninterest expense was pushed up by both salaries and Other Noninterest Expense, which includes such costs as legal fees, federal agency assessments, travel expenses, and telephone bills.

Loan loss provisions in Fifth District banks grew more in 1984 than in any of the past four years. In fact, relative to average assets, this expense item was approximately one-third greater in 1984 than in the previous year. Although this is a significant increase by Fifth District standards, some perspective may be gained by comparing the Fifth District results in Table 1 with the national loan loss provisions shown in the Appendix. Through 1981, loan loss provisions for the Fifth District banks were similar to those for all U. S. banks. In 1952, however, loan loss provisions relative to assets grew 50% over the previous year for all U.S. banks, while they went up by only 12% in the Fifth District. Similarly, 1983 national loan loss provisions grew by over 20%, while in the Fifth District they actually declined. Thus, although the 32% Fifth District increase in 1984 loan loss provisions represents a greater change than does the national change of 17%, it should be borne in mind that Fifth District loan loss provisions as a percentage of assets remain significantly lower than those for the aggregate of all banks in the nation.

Within the Fifth District, most of the increase in provision for loan loss took place during the fourth quarter. Banks with more than \$750 million in assets were principally responsible for the larger than normal increase, since these banks as a group increased provisions by ten basis points relative to assets. This increase was to a great extent made necessary by rapid loan growth. At the same time, small and medium-sized banks increased their provisions an average of only two basis points.

Loan and lease chargeoffs net of recoveries were .29% of total loans and leases in Fifth District banks in 1984, essentially unchanged from the previous year. In comparison, the 1984 figure for all U.S. banks was .71%. Past due, nonaccrual, and renegotiated loans and leases amounted to 3.32% of total loans in Fifth District banks in 1984, while they averaged 5.07% for all U.S. banks. The most significant illustration of Fifth District banks' continu-

ing pattern of conservative writeclown policies may be seen in the ratio of current year recoveries to previous year chargeoffs, which gives an indication of how aggressively loans are being charged off. This ratio was 30.5% for Fifth District banks in 1984, while the same ratio for all U.S. banks was 20.3%.⁵ Since this ratio generally increases as banks both enforce vigorous collection procedures and take less time to write off doubtful loans, there is no evidence that Fifth District banks have abandoned their tradition of conservative chargeoff policies.

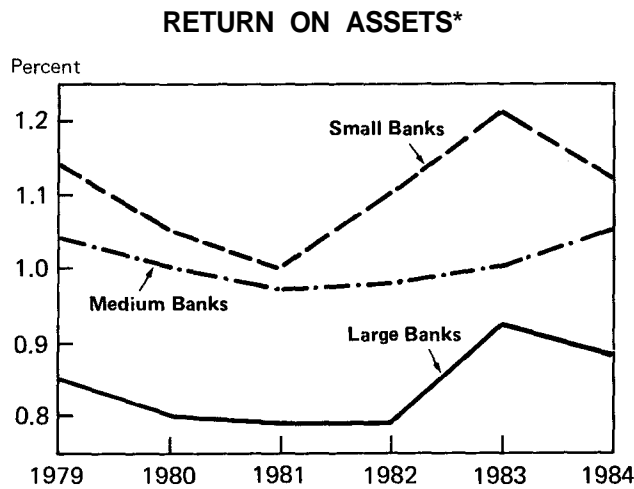
Profits and Dividends

Profits before taxes relative to average assets fell by ten basis points from 1983 levels at banks in the Fifth District. Small and large banks had fifteen and eleven basis point declines, respectively, while medium-sized banks realized a nine basis point increase. Had Fifth District banks not increased provisions for loan losses, income before taxes relative to average assets would have been only two basis points below its 1983 level. Taxes as a percent of average assets fell by five basis points at both large and small banks but increased by four basis points at medium-sized banks.

Return on assets (ROA), defined as net income divided by average assets, declined for the aggregate of Fifth District banks from .98% in 1983 to .93% in 1984. As Chart 6 shows, however, these figures mask interesting variations among banks of different sizes. For example, large banks produced an average decline in ROA of four basis points to .88%. Although these institutions experienced declining net margins and noninterest income along with a significant increase in provisions for loan losses, they enjoyed lower noninterest expenses, losses on securities, and taxes. Medium-sized banks, where the 1.05% ROA represented a rise of five basis points over 1983, had higher net interest margin, greater noninterest income, and lower noninterest expense than in 1983. However, some of these gains were offset by a slight increase in provision for loan losses, an increase in securities losses, and higher taxes. Small banks' ROA fell on average by nine basis points to 1.12%. This decline was the result of a

⁵ For a more detailed breakdown of this ratio on the national level, see Federal Deposit Insurance Corporation (1985), p. 13.

Chart 6



*Net income divided by average assets.

substantial decrease in net interest margin with other factors cancelling one another. In comparison, for all U.S. banks, the average ROA fell from .67% in 1983 to .64% in 1984.

Return on average equity (ROE) decreased by 59 basis points to 14.62% for all Fifth District banks. Despite this decline, ROE in 1984 was still high compared with the preceding five years. As shown in Table VIII, aggregate leverage (average assets divided by average equity) increased thirteen basis points over last year, but this was not sufficient to counteract the effect of lower return on assets. Again, the aggregate numbers conceal some variation, since medium-sized banks' ROE increased by

Table VIII

RATES OF RETURN AND LEVERAGE FOR FIFTH DISTRICT COMMERCIAL BANKS

Year	Return on Assets		Assets/Equity	=	Return on Equity
1979	0.94	X	14.37	=	13.51
1980	0.89	X	14.35	=	12.79
1981	0.86	X	14.56	=	12.56
1982	0.87	X	15.06	=	13.12
1983	0.98	X	15.53	=	15.21
1984	0.93	X	15.66	=	14.62

(Discrepancies in calculations are due to rounding errors.)

74 basis points (see Chart 7). For all U.S. banks, the average ROE fell from 11.24% in 1983 to 10.63% in 1984.

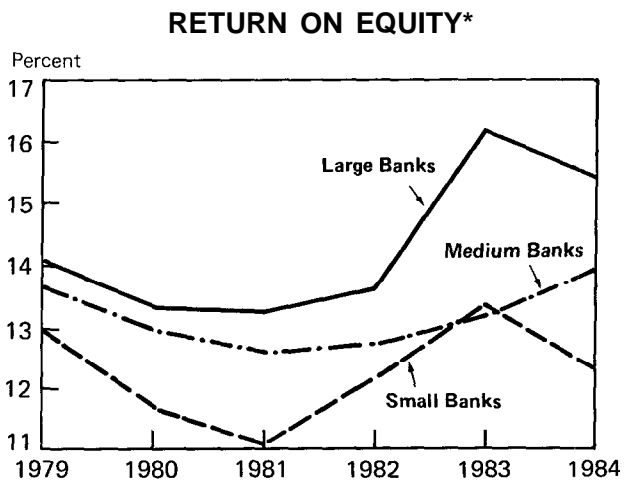
Dividends paid out by Fifth District banks to stockholders declined from .34 cents per dollar of average assets in 1983 to .31 cents in 1984. Small banks paid out 31% of net income as dividends, which was the lowest payout for the three size categories. Medium banks distributed 39% as dividends, while large banks paid out 33%. The average dividend to net income ratio for all banks in the United States was 49% in 1984, compared to only 34% for Fifth District banks.

Capital Adequacy

Capital⁶ was augmented at Fifth District banks in 1984. According to the data in Table IX, banks in the Fifth District increased primary capital from 7.24% of adjusted assets in 1983 to 7.28% in 1984,

⁶The measure of capital used here is not precisely the same as that used by any of the regulatory agencies. In this article, primary capital includes common stock, perpetual preferred stock, surplus, undivided profits, capital reserves, mandatory convertible instruments up to a certain percentage of primary capital, reserves for loan and lease losses, and minority interest in consolidated subsidiaries. Secondary capital (total capital less primary capital) includes limited life preferred stock, subordinated notes and debentures, and those mandatory convertible instruments not eligible for primary capital. In addition, the measure used here subtracts intangible assets from average assets plus loan loss reserves (to yield adjusted assets), and from capital. For a detailed explanation of capital adequacy standards, see R. Alton Gilbert et al. (1985).

Chart 7



*Net income divided by average equity.

Table IX

CAPITAL ADEQUACY
FIFTH DISTRICT AND ALL U. S. COMMERCIAL BANKS

1983				
	Small Banks	Medium Banks	Large Banks	Total
Fifth District				
Primary ratio	11.65	8.00	6.35	7.24
Total ratio	11.70	8.15	6.61	7.46
All U. S. banks				
Primary ratio	9.48	7.80	5.69	6.73
Total ratio	9.78	8.10	6.04	7.02
1984				
Fifth District				
Primary ratio	9.60	8.35	6.64	7.28
Total ratio	9.63	8.41	6.92	7.49
All U. S. banks				
Primary ratio	9.24	7.94	6.35	7.11
Total ratio	9.31	8.15	6.66	7.36

and total capital from 7.46% to 7.49%. Primary and total capital ratios were higher for Fifth District banks than for all U.S. banks both in 1983 and 1984, although the capitalization ratios increased by a somewhat greater percentage nationally than was the case in the Fifth District.

The only size category of banks that experienced declining ratios was that of small banks, and this was true nationally as well as for the District. This should not be a cause for concern, however, since capitalization of small banks as a group was well above the threshold of regulatory concern⁷ in both years. Large Fifth District banks increased their primary ratio by 29 basis points while the average for all large banks in the country grew by 66 points. Even with the greater increase at all large U. S. banks, however, large Fifth District commercial banks remained, on average, more extensively capitalized at the end of 1984 than did their peers throughout the country. Finally, medium-sized banks in the Fifth District increased their capital ratios at about the same rate as did large District banks, while

⁷The FDIC and Comptroller have established 6 percent as the minimum total capital ratio, while the Fed generally considers under 6 percent to be undercapitalized, 6 percent to 7 percent acceptably capitalized, and over 7 percent to be adequately capitalized. For a description of the Federal Reserve standards, see 50 Fed. Reg. 16057.

all U. S. banks in the middle category reported minor increases. The inference to be drawn from all this is that Fifth District banks are as a group well capitalized by national standards, although it should be borne in mind that such averages as are presented here conceal a great deal of variation among individual banks, especially in the smallest size category.

It is of interest to examine more closely how growth in capitalization was brought about. Increasing equity capital is one means of augmenting capital ratios, and in 1984 Fifth District banks increased equity capital by 13.4%. Retained earnings, the difference between net income and cash dividends, provided 77% of this increase. Table VIII shows, however, that leverage increased in the Fifth District in 1984, which in turn implies that asset growth continued to outpace equity growth. Thus, higher capital to assets ratios were not attributable to increases in equity capital. Rather, higher allowance for loan losses was apparently the most significant factor contributing to the rise for District banks. For all U. S. banks, the most important factors were increases in subordinated notes and mandatory convertible debt.

Concluding Comments

Fifth District banks' 1984 performance, relative to the average for all U. S. banks, was outstanding. Fifth District banks had a much higher ROA and ROE than the national average. Their loan charge-offs and nonperforming loans relative to total loans were a fraction of the national average. Finally, Fifth District banks had capital ratios which demonstrated stronger capital positions than their peers nationwide. These strong capital ratios not only show the results of the District's traditionally conservative approach to banking, but also place District banks in a good position for continued growth in 1985.

Still, District banks should note that their higher performance levels conceal some significant differences between them and other banks in the nation. First, interest revenue in the Fifth District was below the national level. Second, noninterest income performance was far better at the national level than in the District. Finally, although net interest margins in the Fifth District remained higher than those for the nation, they have been declining steadily in the District while staying fairly steady nationwide. In the coming years, it will be important for banks in the Fifth District to pay attention to these areas, while continuing to make the **most** of their considerable strengths.

APPENDIX

INCOME AND EXPENSE AS A PERCENT OF AVERAGE ASSETS¹ ALL U. S. COMMERCIAL BANKS, 1979-1984

Item	1979	1980	1981	1982	1983	1984
Gross interest revenue	8.62	9.87	11.81	11.19	9.50	10.11
Gross interest expense	5.50	6.78	8.75	8.02	6.36	6.95
Net interest margin	3.12	3.09	3.07	3.17	3.15	3.16
Noninterest income	0.78	0.89	0.99	1.05	1.12	1.27
Loan loss provision	0.24	0.25	0.26	0.39	0.47	0.55
Securities gains or losses ²						- 0.01
Noninterest expense	2.54	2.63	2.76	2.91	2.95	3.05
Income before tax	1.12	1.10	1.04	0.91	0.84	0.82
Taxes	0.28	0.28	0.24	0.17	0.18	0.19
Other ³	- 0.04	- 0.03	- 0.04	- 0.03	0.00	0.01
ROA ⁴	0.80	0.79	0.76	0.71	0.67	0.64
Cash dividends declared	0.28	0.29	0.30	0.31	0.33	0.31
Net retained earnings	0.52	0.50	0.46	0.40	0.34	0.33
ROE ⁵	13.90	13.70	13.20	12.20	11.24	10.63
Average assets (\$ billions)	1,593	1,768	1,940	2,100	2,253	2,398

(Discrepancies due to rounding errors)

Source: Federal Reserve Bulletin, 1981, 1984 (1979-83 data), Consolidated Reports of Condition and Income as submitted by insured banks to their primary regulators (1984 data).

¹ See Table I, footnote 1.

² See Table I, footnote 2.

³ See Table I, footnote 3.

⁴ See Table I, footnote 4.

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THE MONETARY CONTROL ACT AND THE ROLE OF THE FEDERAL RESERVE IN THE INTERBANK CLEARING MARKET

Anatoli Kuprianov

I. INTRODUCTION

The Monetary Control Act of 1980 changed the terms of Federal Reserve participation in the interbank clearing market. It required services which had previously been made available free of charge to Federal Reserve member banks, to be priced competitively and made available to all depository institutions on equal terms. This article explains why Congress legislated this change. To do this, the article investigates the origins of the debate over the Federal Reserve's role in the payments system that arose in the decade preceding the enactment of this legislation.

Two principal issues surfaced as part of this larger debate; namely, Federal Reserve access and pricing policies. The first dealt with the terms of access to Federal Reserve payments services. Debate over this issue arose as a result of thrift industry deregulation. To make use of new transaction account powers, thrifts requested access to the Federal Reserve's clearing network. The industry was granted indirect access to some Federal Reserve services, but not always on the same terms as those enjoyed by commercial banks. Subsequent thrift industry demands for a nondiscriminatory access policy were supported by the Justice Department's Antitrust Division, and finally resulted in congressional action to institute such a policy.

Pricing policy dealt with the pricing of Federal Reserve services. Debate over this issue arose for three reasons. First, since the Federal Reserve did not price its services explicitly, an expansion of its service offerings in the 1970s raised concerns among market participants that private sector competition in these new areas could be preempted. Second, mea-

sures then under consideration by Congress to end the Federal Reserve's increasingly serious membership problem were expected to result in a considerable loss of revenue to the U.S. Treasury. Pricing was adopted to mitigate this revenue loss. Third, a nondiscriminatory pricing policy was essential to the resolution of the access policy issue. The pricing provisions of the Monetary Control Act effectively resolved all of these issues.

This article is organized as follows. Section II discusses the origins of the debate over granting nonmember institutions direct access to Federal Reserve services. In this discussion, attention is focused on thrift industry deregulation as a driving force behind the debate over access policy. Section III reviews the debate over issues related to Federal Reserve pricing. Section IV presents a summary of the article and some concluding comments.

II. ACCESS TO FEDERAL RESERVE SERVICES

Before the Monetary Control Act was passed, member banks obtained most payments services from the Federal Reserve. As a result of the Federal Reserve's expansion of its Regional Check Processing Centers (RCPCs) in the early 1970s, many privately-operated clearinghouses closed.¹ Nonmember banks therefore tended to rely on correspondents,

¹ Many of the regional clearinghouses that closed when the Federal Reserve expanded its RCPC system have reopened since Federal Reserve pricing was initiated in 1981. In addition, there has been new entry into this market as a result of pricing. See Joanna H. Frodin, "Fed Pricing and the Check Collection Business: Private Sector Response," *Federal Reserve Bank of Philadelphia, Business Review* (January/February 1984), pp. 13-21.

most of which were members of the Federal Reserve, to clear checks and for other payments services. These correspondents were permitted to "pass through" their respondents' checks to the Fed and also to resell other services such as the wire transfer of funds over Fedwire, the Federal Reserve's electronic funds transfer network. In this way, non-member banks were able to gain indirect access to Federal Reserve services.

When thrift institutions first began to offer limited third-party payments services, they needed access to a clearing network. A newly organized automated clearinghouse (ACH) system, designed to handle the electronic transfer of recurring payments from transactions deposits held with banks, appeared to be ideally suited to the limited powers initially granted to thrifts. Access to this system was controlled by the commercial banking industry, however, and bankers demanded regulatory reform that would eliminate much of the special treatment enjoyed by thrifts as the price of direct access. Thus, the question of access was linked to the broader issues dealing with the regulatory reform of the financial services industry. To complicate matters further, the Federal Reserve had assumed a major role in the operation of the ACH network. This operational role subsequently involved it in the ensuing debate over access policy.

Thrift industry deregulation and regulatory reform of the financial services industry constituted key issues in the debate over ACH access policy. Their importance necessitates a brief review of these issues. This is followed by a detailed review of the debate over thrift industry access to the ACH network. The response of the commercial banking industry and the Federal Reserve to these events is examined. Finally, the role of the Justice Department in resolving the debate over access policy is explained.

Deregulation and the Entry of Thrift Institutions into the Payments System

The U. S. financial regulatory structure that emerged from the Great Depression was designed to prevent a recurrence of the financial chaos experienced in that episode. The prevailing view then was that excessive competition among financial institutions contributed to instability in financial markets.

Accordingly, the resulting laws and regulations were intentionally designed to limit competition. Restrictions on interest rates paid to depositors acted to limit competition among all financial institutions, while other rules limited the range of activities permitted for financial institutions. These rules placed each institution into a distinct category (for example, thrift institutions or commercial banks), and then restricted the activities permitted for firms in each category.

Within this scheme, making commercial loans and accepting demand deposits were activities relegated to commercial banks and prohibited to federally insured thrifts. The latter were to specialize in gathering consumer time deposits and extending mortgage loans. To help them attract such deposits, Regulation Q gave thrifts a slight competitive advantage in the form of somewhat higher interest rate ceilings than those imposed on commercial banks.

Until the late 1960s, this regulatory structure appeared to work more or less as its architects had intended. Most thrifts were able to operate profitably by borrowing money at relatively low, short-term interest rates while acquiring mortgage loans which paid higher, long-term rates. Because of interest rate regulation, the increased fluctuations in interest rates that began in the late 1960s resulted in severe disintermediation in the thrift industry. This disintermediation created funding problems for the industry as a whole. As a result, many thrifts became interested in diversifying their operations into new areas with the hope of restoring profitability.

Congress did not begin to deal with these issues comprehensively until the passage of the Depository Institutions Deregulation and Monetary Control Act of 1980 (DIDMCA) and the Garn-St.Germain Act of 1982. However, the events of the decade preceding the enactment of these measures conspired to bring about a process of piecemeal deregulation driven by underlying market forces.² To help its members attract deposits and thereby mitigate the

²Detailed accounts of the events of this period and the debate that accompanied the financial industry deregulation are available in Thomas F. Huertas, "The Regulation of Financial Institutions: A Historical Perspective on Current Issues," in George J. Benston, ed., **Financial Services: The Changing Institutions and Government Policy** (Prentice-Hall, 1983), chap. 1, and also in Almarin Phillips and Donald P. Jacobs, "Reflections on the Hunt Commission," *ibid.*, chap. 9.

effects of disintermediation, the Federal Home Loan Bank Board (FHLBB) authorized federally-chartered savings and loans to permit preauthorized, nonnegotiable third-party transfers from consumers' savings accounts for household-related expenses in 1970. These rules were further liberalized in 1975 to permit such transfers for any purpose.

The New England states acted more aggressively to help their state-chartered thrifts attract deposits. In 1972, state-chartered mutual savings banks in Massachusetts and New Hampshire were permitted to begin offering NOW accounts. These deposits were, for all practical purposes, interest-bearing checking accounts. In response, Congress granted all depository institutions in these two states similar authority in 1974. This authority was later extended to depository institutions in all the New England states in 1976.³ Thrifts and other financial institutions nationwide were not permitted to offer interest-bearing checkable deposits until 1980, when the DIDMCA was passed.

To make use of these new powers, thrifts needed increased access to the nation's payments system. In New England, the Federal Reserve agreed to process and clear NOW account drafts for thrifts on terms similar to those extended to nonmember commercial banks. On a national level, the thrift industry became interested in acquiring access to the newly developing system of automated clearinghouses. The eventual resolution of this issue provides an interesting case study in antitrust law. Understanding the issues that were debated, however, requires some knowledge of the unique aspects of the automated clearinghouse system's organizational structure.

The Organization of Automated Clearinghouses

An automated clearinghouse, or ACH, is a computerized facility that performs basically the same functions as an ordinary clearinghouse. Rather than processing and sorting paper checks, however, an automated clearinghouse processes payments information stored on magnetic tapes and transmitted over a telecommunications network.

³ Alfred Broaddus, "Automatic Transfers from Savings to Checking: Perspective and Prospects." Federal Reserve Bank of Richmond, **Economic Review** 64 (November/December 1978) : 3-13, contains a detailed chronology of innovations in third-party payment services during this period.

Automated clearinghouses in the United States were developed through the cooperative efforts of commercial banks and the Federal Reserve System. These efforts began in 1968, when the Special Committee on Paperless Entries (SCOPE) was created by a group of California banks to study alternative means of reducing the volume of paper checks processed by banks. That same year the American Bankers Association (ABA) created the Monetary and Payments System (MAPS) Planning Committee, which subsequently recommended the formation of a national system of automated clearinghouses.

With some assistance from the Federal Reserve, SCOPE completed the development of a computer software package and a set of operating rules in 1972. The California Automated Clearinghouse Association (CACHA) was formed that same year and was the first automated clearinghouse in the United States. In response to a formal request from CACHA, the Federal Reserve Bank of San Francisco agreed to provide the necessary clearing and settlement facilities and assumed responsibility for operating the automated clearinghouse. These services were made available at no explicit charge to all banks that were members of CACHA.

Over the next several years, the number of regional ACHs grew rapidly. In virtually every case, Federal Reserve Banks assumed responsibility for operating these facilities. The first privately operated ACH was not formed until December 1975, when the New York ACH (NYACH) began operation. Today there are over 30 separate ACH associations in operation in the United States; most continue to be operated by the Federal Reserve.⁴ The regional automated clearinghouses are linked together by a nationwide telecommunications network, also operated by the Federal Reserve.⁵

⁴ Norman Penny and Donald I. Baker, **The Law of Electronic Funds Transfer**, (Boston: Warren, Gorham, and Lamont, Inc., 1980). Chapter 3 contains a history of the development of automated clearinghouses in the United States.

⁵ This nationwide ACH network was completed in 1978. As with the regional automated clearinghouses, the nationwide network was organized through the joint efforts of the banking industry and the Federal Reserve. Further details may be found in Board of Governors of the Federal Reserve System, "Nationwide EFT Network," **Federal Reserve Bulletin** 64 (October 1978): 823-24.

Although Federal Reserve Banks assumed responsibility for managing the routine operations of most of the newly organized automated clearinghouses, the ACH associations themselves were governed by rules adopted by their member institutions. Association rules not only governed routine operations, but also dealt with the more fundamental questions concerning organizational structure such as the terms of membership and conditions imposed on access to services. These rules permitted all commercial banks (including banks that were not members of the Federal Reserve System) access on equal terms. Banks that were not members of the Federal Reserve System were required to maintain accounts with member banks for purposes of settlement, however, since nonmember institutions did not keep reserves with Reserve Banks.

When the development of an electronic alternative to the existing system of clearing paper checks was initiated in 1968, the question of whether thrifts should participate in such a system was not an issue since most thrifts could not then offer deposits with third-party payment powers. This had changed by the time CACHA began to operate in 1972, however, because of the FHLBB's 1970 rule and the advent of NOW accounts in New England.

The California Savings and Loan League approached CACHA in the summer of 1972 to inquire about the possibility of participation in the newly formed ACH. Subsequently, several savings and loan associations applied for membership in CACHA. At first, thrifts expressed an interest only in receiving ACH credits (such as automatic payroll deposits) and debits originated by others. After some negotiation, CACHA offered to permit thrifts to establish "pass-through" accounts with banks that were members of the ACH. Membership in the ACH on the same terms as commercial banks, however, was denied. This meant that thrifts wishing to originate ACH transactions were required to deal with a correspondent bank, which would initiate transactions on their behalf. This proposal was consistent with the ABA's recommended access policy.

Banking Industry Policy on ACH Access

The ABA's proposed policy on ACH access for thrifts was similar to the "pass-through" policy adopted by the Federal Reserve in response to earlier

requests for access to its check-clearing system by New England thrifts. In the latter case, thrifts were permitted to establish pass-through clearing accounts (amounting to three percent of their NOW account deposits) with a Federal Reserve member bank, which would then clear checks and NOW account drafts through the Federal Reserve Bank of Boston on their behalf. This policy gave New England thrifts access to check-clearing services on the same terms as those extended to nonmember banks.⁶

In contrast, the ABA's policy treated all commercial banks alike, while imposing different conditions on thrifts. In retrospect, this difference in the two policies was a crucial one. Apparently thrifts were willing to accept a pass-through access policy when that same policy was uniformly imposed on nonmember banks. In the case of automated clearinghouses, thrifts claimed that the banking industry's discriminatory access policy put them at a competitive disadvantage.

To the banking industry the issue of ACH access was intimately tied to the broader issues of thrift industry deregulation and, more generally, to regulatory reform of the financial services industry. The rationale for the existing regulatory structure, which treated thrifts more leniently in several important respects, was based on the premise that thrift institutions were not permitted to compete in certain traditional banking markets. Bankers viewed the thrift industry's attempts to gain direct access to ACH services as an attempt to circumvent the legal restrictions that prohibited thrifts from offering demand deposits. In addition, they argued that their industry had borne the cost of developing the ACH system, and that the thrift industry was attempting to gain a "free ride" as a result of these efforts.⁷

The ABA did not completely rule out equal access to the ACH system. However, it demanded equal regulatory treatment of thrifts, including the imposition of more stringent reserve requirements (such as those imposed on banks) and the abolition of the more favorable interest rate ceilings enjoyed by thrifts under Regulation Q, as the price of such access. Direct access to ACH facilities for thrifts

⁶ See Penny and Baker, **The Law of Electronic Funds Transfer** at 19-7.

⁷ Penny and Baker at 19-26.

(or any clearing facilities for that matter) was opposed “. . . unless authorized through legislative restructuring of the nation’s financial system and equalization of regulatory and reserve obligations have been achieved.”⁸

Federal Reserve Policy on ACH Access

The Federal Reserve became involved in the debate over ACH access because of the major role it had assumed in the operation of that system. Thrifts, unable to secure access on the terms they desired from the ACH associations, appealed to both the Federal Reserve and Congress to grant them direct access to these systems. Initially the Federal Reserve supported the banking industry’s proposed access policy, citing essentially the same concerns as those expressed by the bankers. Congress took no formal action during the early stages of the debate, but appeared to agree with the Federal Reserve’s position.

Like the banking industry, the Federal Reserve viewed ACH transactions as a substitute for paper checks. By law, banks were prohibited from paying explicit interest on demand deposits. The Board expressed concern that permitting thrifts direct access to the ACH system, including the authority to directly originate ACH transactions, could undermine legal restrictions prohibiting the payment of interest on demand deposits. It therefore argued that only those institutions explicitly authorized by Congress to offer demand deposits should be permitted direct access to the ACH system. Representative Ferdinand St. Germain of the House Banking Committee appears to have shared this view.⁹

In 1973, commercial banks had not yet received authority to originate preauthorized, third-party payments from customers’ savings accounts such as that granted earlier to federally-chartered savings and loans. This meant that customers of commercial

banks were required to originate ACH payments from non-interest-bearing checking accounts. A customer of a federally-chartered thrift, however, could originate such payments directly from a savings account. The ban on direct access did not prohibit thrifts from offering this service to their customers, but the banking industry apparently felt that permitting thrifts direct access under existing regulations would give them a greater competitive advantage in this area. The Federal Reserve Board, facing an acute membership problem and therefore aware of member banks’ perceptions of unequal and unfair regulation, viewed thrifts’ newly acquired third-party payments powers as a breach in existing regulations, and did not wish to ratify the existence of this “loop-hole” by helping the thrift industry gain direct access to ACH services. In the end, however, competitive pressures led to the extension of similar authority to commercial banks, while thrifts gained even greater powers.¹⁰

As a long-run solution to the problem of thrift access, the Federal Reserve proposed reforms that would place thrifts on a more equal competitive footing with commercial banks. As part of these reforms, legislation that would permit thrifts to join the Federal Reserve System was proposed. Under this plan, thrifts that joined the Federal Reserve would be granted direct access to all the System’s payments services. Thrifts that became members would also be required to bear all the costs of membership, however, such as meeting the same reserve requirements imposed on member banks. Until such legislation was enacted, the access policy proposed by the banking industry was viewed as an adequate short-term solution. The following statement by Governor George M. Mitchell of the Federal Reserve Board summarizes the Board’s policy:

If Congress said, we want all the institutions to be part of the money system, then there wouldn’t be any question about it. You know what the arguments are for making them more like banks, giving them the same reserve requirements and giving them the same interest rate ceiling arrangements—that is essentially what we are talking about.¹¹

⁸ “Fed Urged to Move Cautiously on EFTS; Many See Dangers to Private Competition,” **American Banker**, April 9, 1974. This article also summarizes the comments of a great many other interested parties, including thrift industry groups, on the issues of pricing and access to the automated clearinghouse network. The views expressed by CACHA on this issue mirrored those of the ABA.

⁹ See comments of Rep. Ferdinand St. Germain, in **Electronic Funds Transfer System (EFTS)/Failure of the U. S. National Bank of San Diego**, Hearings before the Subcommittee on Bank Supervision and Insurance of the House Committee on Banking and Currency, 93 Cong. 1 Sess. (GPO, 1974), p. 26.

¹⁰ Commercial banks were first permitted to make preauthorized, nonnegotiable third-party transfers from customers’ savings accounts in September of 1975, five months after the FHLBB further liberalized similar third-party transfer powers for federally-chartered savings and loans. Once again, see Broaddus, “Automated Transfers from Savings to Checking.”

¹¹ **Electronic Funds Transfer System**, Hearings, p. 30.

The Federal Reserve's expanded membership proposals were also intended to provide a means of recovering the added costs of servicing thrifts under a policy of direct access. Giving thrifts access on the same terms as banks would require the Federal Reserve to bear the cost of servicing additional end points on its ACH system. Setting explicit fees for ACH services offered a means of recovering the added cost of servicing thrifts directly, but the thrift industry argued that any fees should be imposed uniformly on all institutions receiving ACH services. The increasing seriousness of the Federal Reserve's membership problem made the Board reluctant to charge its member banks for payments services.

It was widely acknowledged that the Federal Reserve's membership problem was due to the cost of the non-interest-bearing reserves member banks were required to hold. In contrast, nonmember banks and thrifts faced less stringent reserve requirements which could often be satisfied by holding certain interest-bearing bonds (most commonly, state or federal government bonds). Since the Federal Reserve was effectively prohibited from paying explicit interest on reserves, it offered payments services to its members at no explicit charge as a means of paying implicit interest. As inflation and interest rates rose throughout this period, however, the cost to banks of maintaining required reserves rose and banks began to withdraw from the System at an increasing rate.¹²

From the Federal Reserve's perspective, imposing explicit fees for payments services would amount to double-charging its members for services already paid for by holding required reserves. In addition to

¹² During this period, the Federal Reserve repeatedly expressed concerns that the continuing withdrawal of its members would make it more difficult to conduct monetary policy. One notable concern in this respect was that diminished access to the Federal Reserve's discount window (which was then largely limited to member banks) might hamper the Fed's ability to deal effectively with a financial crisis. See, for example, "Statement by William E. Miller, Chairman, Board of Governors of the Federal Reserve System, before the Committee on Banking, Finance and Urban Affairs, House of Representatives, July 27, 1978." **Federal Reserve Bulletin** 64 (August 1978): 636-42. Other writers have stressed the potential loss of revenues earned from the non-interest-bearing reserves member banks were required to hold as the primary reason for concern over the membership problem. This latter view is adopted by Marvin Goodfriend and Monica Hargraves, "A Historical Assessment of the Rationales and Functions of Reserve Requirements," Federal Reserve Bank of Richmond, **Economic Review** 69 (March/April 1983): 3-21.

being viewed as being unfair, it was feared that the adoption of such a pricing policy would further exacerbate the System's membership problem.¹³

Thrift industry groups, on the other hand, opposed the Federal Reserve's proposals for regulatory reform and expanded membership. Instead, these groups put forward proposals to impose equal access charges on both thrifts and commercial banks while opposing any reforms that would extend the same regulatory treatment faced by commercial banks to their own industry.¹⁴

To summarize, then, the Federal Reserve Board supported the banking industry's pass-through access proposals for thrifts until such time as those institutions received explicit authority from Congress to offer transactions accounts to the public. Any explicit extension of such authority to thrifts was expected to be accompanied by other regulatory reforms that would place thrifts and commercial banks on a more equal competitive footing. Additionally, the Federal Reserve proposed that thrifts be permitted to obtain membership in the System as a means of gaining direct access to its clearing network. The thrift industry, however, was more interested in gaining direct access to the ACH system than in regulatory reform, and vigorously opposed these proposals. Instead, industry representatives argued that thrifts should be granted immediate access on the same terms as commercial banks without regard to the resolution of the regulatory issues that concerned both the banking industry and the Federal Reserve. The thrift industry subsequently received aid from the Antitrust Division of the U.S. Justice Department in arguing its case.

Access Policy and Antitrust Law

The Justice Department's Antitrust Division sided with the thrift industry in the debate over the issues of access and pricing, arguing that any access policy that treated thrifts differently from banks violated existing antitrust laws. This argument was based on an established Access Principle, which the Justice Department explained as follows :

¹³ See Statement of George W. Mitchell, Member of the Board of Governors of the Federal Reserve System, **Electronic Funds Transfer System**. Hearings, pp. 1-11.

¹⁴ For a summary of the thrift industry's comments on the Federal Reserve Board's proposals see "Fed Urged to Move Cautiously on EFTS . . ."

Antitrust law requires that those who control an essential facility must grant access to it on reasonable and non-discriminatory terms to all competitors.¹⁵

In the context of antitrust law, an "essential" facility is one that provides a significant competitive advantage to any market participants that have direct access to that facility. No alternatives to the Federal Reserve's ACH system existed at that time. Moreover, it was argued that because the Federal Reserve did not charge explicit fees for these services, no competing private sector alternative was likely to develop.¹⁶ The Justice Department's view, therefore, was that the ACH system operated by the Federal Reserve was essential for purposes of antitrust law. On these grounds, it was argued that thrift institutions should be permitted direct access to ACH services on equal terms with commercial banks. Like thrift industry groups, the Justice Department favored the adoption of a system of nondiscriminatory fees for these services.

The Justice Department's position was apparently based on the premise that thrifts should be permitted to compete directly with commercial banks on equal terms. As has already been noted, however, the regulatory structure existing at that time intentionally discriminated between different types of financial institutions expressly to inhibit such competition. The Justice Department was aware of the fact that thrifts might enjoy certain competitive advantages as a result of these regulations, but argued that the existence of such advantages did not constitute sufficient grounds under antitrust law to deny thrifts direct access to an essential facility:

On the other hand, the fact that thrift institutions may enjoy other regulatory or legal advantages

¹⁵ Comments of the United States Department of Justice: Proposed Amendment of Regulation J and Related Issues (May 14, 1974).

¹⁶ Earlier, the Federal Home Loan Bank of San Francisco had proposed to establish a separate ACH system for savings and loans. Both the Federal Reserve and the Justice Department objected to this proposal. The Federal Reserve's opposition stemmed from its view that there should be a single nationwide EFT network, operated by the Federal Reserve. See "Mitchell Would Bar S&L Access to EFTS, Except Through Commercial Banks," *American Banker*, November 27, 1973. The Justice Department favored leaving the market for EFTS services to private sector competitors and so opposed any entry from government agencies. A letter from Thomas E. Kauper, Assistant Attorney General, Antitrust Division, to Garth Marston, Acting Chairman, Federal Home Loan Bank Board, 1975 explained the Justice Department's opposition to the proposed FHLB System.

does not justify a denial of equal access to an automated clearing facility; thus, in a recent antitrust case, the courts applied the bottleneck principle to the transmission system of an investor-owned electric company, despite the fact that the "competitors" gaining access were municipally owned electric systems who enjoyed various tax and other advantages. This decision was affirmed by the Supreme Court in February 1973.¹⁷

The Resolution of the Access Policy Issue

The controversy over ACH access policy was finally resolved by a pair of antitrust suits brought against the California and Rocky Mountain ACHs by the Justice Department in 1977. A more liberal access policy was instituted before then, however. The Federal Reserve had adopted a policy that encouraged the admission of thrifts into the ACH associations it serviced a year earlier (although none of these associations had adopted such a policy), and had also instituted the direct delivery of ACH items to thrifts.¹⁸ In a related development, NYACH permitted full membership and access for thrifts from the time it was first organized in 1975.

In January of 1976, the Federal Reserve Board modified its access guidelines to accommodate thrifts that might become members of ACH associations that it serviced. The new guidelines stated that ACH deposits delivered to the Federal Reserve could "... originate from any account having third-party payment powers, e.g., savings, NOW, share draft accounts."¹⁹ In contrast, earlier access guidelines had restricted authority to directly originate

¹⁷ Donald I. Baker, "Antitrust and Automated Banking," *The Banking Law Journal* 90 (September 1973): 703-18. Mr. Baker was Deputy Assistant Attorney General and Director of Policy Planning for the Antitrust Division when this article was prepared. He also participated in preparation of the Justice Department's comments to the Federal Reserve on the issue of access policy.

¹⁸ The direct delivery of ACH items to thrifts was instituted in 1975 as part of the Federal Reserve's "interim access guidelines." Under these guidelines, thrifts that received a sufficient number of ACH items and that were located along existing check courier routes could receive ACH items directly from the Federal Reserve. In addition, thrifts were given permission to pick up items directly from local Federal Reserve processing centers. See Board of Governors of the Federal Reserve System, "Access to Federal Reserve Clearing and Settlement Facilities: Proposed Policy," *Federal Register* 40 (June 17, 1975): 25,641, and also Board of Governors of the Federal Reserve System, "Interim Guidelines for Direct Deposit of Federal Payments," *Federal Reserve Bulletin* 62 (January 1976): 66-67.

¹⁹ See Board of Governors of the Federal Reserve System, "Collection of Checks and Other Items by Federal Reserve Banks," *Federal Register* 41 (January 21, 1976): 3,097-105.

ACH transactions to banks and other institutions “. . . legislatively authorized to maintain demand deposit accounts.”²⁰ In addition, language included in the later guidelines appeared to encourage ACH associations to adopt more liberal membership policies.²¹

The ABA resisted attempts to liberalize ACH access policy, arguing, as before, that ACH associations should be permitted to determine access policy for themselves and that only institutions legally authorized to offer demand deposits should be permitted to originate ACH transactions.²² The right of access for thrift institutions was finally established through two antitrust suits filed by the Justice Department in 1977. The first of these suits was brought against the Rocky Mountain ACH. The second was against the California ACH. Both of these organizations obtained their services from the Federal Reserve. In both cases the Justice Department argued that heavy Federal Reserve subsidies of ACH services and the resulting absence of explicit prices for these services effectively created local monopolies in this area. These subsidies, it was argued, discouraged the emergence of a private sector competitor and so turned these ACHs into essential facilities. Therefore, the denial of direct access to thrifts placed those institutions at a competitive disadvantage with respect to commercial banks in violation of established antitrust laws. The Justice Department won both suits, and soon thereafter all ACH associations began to admit thrifts to membership.²³ These suits had no substantial effect on Federal Reserve policies, however, since the access

guidelines adopted the year before had made explicit arrangements for eventual thrift membership in ACH associations.

As a result of these suits, the Justice Department's position on the issues of pricing and access greatly influenced the provisions dealing with those issues finally included in the Monetary Control Act. As with many of the issues involving deregulation, the enactment of legislation dealing with such issues only served to ratify earlier developments in the marketplace.

III. ISSUES RELATED TO FEDERAL RESERVE PRICING POLICY

Debate over Federal Reserve pricing policy first surfaced in the early 1970s as a result of two related sets of issues. The first concerned the competitive and antitrust implications of Federal Reserve pricing policy. The second set of issues arose as a result of the growing Federal Reserve membership problem and congressional concern over the expected cost of legislative proposals put forward to solve this problem.

Concern over the effects of Federal Reserve pricing policy on market competition arose as a result of its announcement of plans to develop and operate a comprehensive nationwide electronic funds transfer (EFT) network. Although Federal Reserve involvement in the development and operation of the ACH system was actively encouraged by a large segment of the banking industry, it also resulted in debate over the appropriate role of the Federal Reserve in the nation's payments system. The development of this new network was viewed by some as an entry into new markets by the Federal Reserve. Some bankers expressed concern that, unless the Federal Reserve began to price its services explicitly, private sector entry into these new markets would be preempted. Separately, thrift industry complaints regarding ACH access policy led to calls for the adoption of a nondiscriminatory pricing system.

The membership problem experienced by the Federal Reserve during this period made the Board of Governors hesitant to adopt such a policy, however. In the end, Congress combined pricing policy reform together with other measures designed to solve the Federal Reserve's membership problem in the final version of the Monetary Control Act.

²⁰ Board of Governors of the Federal Reserve System, "Access to the Federal Reserve Clearing and Settlement Facilities."

²¹ This is reflected in the following passage: "In providing clearing and settlement service for ACH associations, the Board anticipates that these services will be made reasonably available on a comparable basis to depository institutions having need for such services." Board of Governors of the Federal Reserve System, "Collection of Checks and Other Items by Federal Reserve Banks."

²² Letter, Willis W. Alexander, Executive Vice President, American Bankers Association to Theodore E. Allison, Secretary of the Board of Governors of the Federal Reserve System, March 19, 1976. This letter was published in **Federal Reserve Services**, Hearings before the Senate Committee on Banking, Housing, and Urban Affairs, 95 Cong. 1 Sess. (GPO, 1977), pp. 178-96.

²³ A more detailed account of these suits is contained in Penny and Baker, **The Law of Electronic Fund Transfer Systems** at 19-25.

Pricing and Competition

Soon after the Federal Reserve System was established, Reserve Banks made facilities available for the transfer of funds between member bank reserve accounts. Such transactions typically involved relatively large amounts and, like direct transactions between private correspondent banks, initially utilized either Western Union or Postal Telegraph facilities. In 1918, the Federal Reserve established its own Morse code system to provide for a more rapid and secure transfer of funds between banks. Since then, the system has been gradually updated. Fedwire, as it came to be called, became the primary facility for the transfer of funds in the federal funds market. In addition, commercial banks developed a number of private funds transfer networks that offered similar services.²⁴

The Federal Reserve Act had authorized the Board to regulate transfers of funds among Reserve banks and to receive deposits from member banks. The Board interpreted this authority as providing the statutory basis for the operation of its own wire funds transfer network.²⁵ In 1972, soon after MAPS committee recommended the formation of a nationwide ACH network, the Federal Reserve announced its own plans to develop and operate an integrated nationwide EFT network.²⁶ The scope of this planned network was broader than that of the network then operated by the Federal Reserve in that it would provide facilities to process and transfer recurring ACH-type transactions in addition to the large-dollar types of transfers the Fed had offered throughout its history. There was also some discussion of using the Federal Reserve network for supporting a retail nationwide point-of-sale (POS) network.

There was a good deal of disagreement within the banking industry on the need for the Federal Reserve to expand its operations in the area of electronic payments systems. Many of the larger money center

²⁴ A description of Fedwire and other privately operated funds transfer networks is presented in David Mengle, "Daylight Overdrafts and Payments System Risks," Federal Reserve Bank of Richmond, *Economic Review* 71 (May/June 1985): 14-27.

²⁵ See "Federal Reserve Operations in Payment Mechanisms: A Summary," *Federal Reserve Bulletin* 62 (June 1976) : 481-89.

²⁶ "Evolution of the Payments Mechanism," *Federal Reserve Bulletin* 58 (December 1972) : 1009-12.

banks, which were also major correspondent banks, voiced concerns that the Federal Reserve's development of a nationwide EFT network could preempt all such private sector initiatives. The position finally adopted by the ABA appears to have been designed as a compromise between those bankers who favored the planned expansion of the Federal Reserve's EFT network and others interested in expanding their own profit-making operations. That compromise endorsed the Fed's involvement in the ACH system, but also advocated the adoption of ". . . a pricing system on a basis fully reflecting the costs which would be incurred by a private sector effort . . ." for any new services it offered. This proposal was intended to protect private-sector incentives to offer competing services.

In addition to industry groups, the Justice Department also favored the adoption of a system of competitively-set prices for EFT services offered by the Fed. The Antitrust Division's comments to the Federal Reserve cited two principal reasons favoring the adoption of such a pricing system. The first of these reasons was connected with the issue of access policy. Here, it was noted that antitrust law required the adoption of a nondiscriminatory pricing system for essential services provided to competing firms on the grounds that: "A discriminatory pricing system can be as substantial a bar to competition as exclusionary rules."²⁸ Additionally, the Justice Department also expressed many of the same competitive concerns voiced by financial industry groups; that is, that private sector development of such systems might be discouraged if the Federal Reserve continued to offer these services at no explicit charge. To ensure against such an outcome, the Federal Reserve was urged to price its EFT services on the basis of fully allocated costs and ". . . including an appropriate allowance for capital costs."²⁹ It was argued further that such pricing concerns were tied to the issue of access because the presence of competing suppliers would lessen the likelihood that any one such supplier's services could become "essential."

²⁷ See "Fed Urged to Move Cautiously on EFTS . . ."

²⁸ Comments of the United States Department of Justice, Proposed Amendment of Regulation J and Related Issues, p. 27.

²⁹ *Ibid.*, p. 28.

Pricing Policy and the Membership Problem

In response to these events the Federal Reserve Board announced its intent to establish a price schedule for its check-clearing and ACH services in January 1976, together with its liberalized access proposals. However, the Board continued to be concerned about the impact the adoption of such a pricing system might have on its worsening membership problem and so was careful to explain that: "In developing the pricing schedule, consideration would be given to the burden of required reserves maintained by member banks."³⁰ No timetable for the implementation of this pricing system was given, and in the end such a pricing system was adopted only after passage of the Monetary Control Act and the resolution of the membership problem.

Serious consideration of the pricing issue emerged in Congress in 1977 as part of the debate over legislation intended to alleviate the Federal Reserve's membership problem. Congressional attention initially centered on the costs of providing these services and the resulting loss of revenue to the Treasury, however, rather than the competitive and anti-trust problems that concerned industry groups.

Legislation on Pricing

The Federal Reserve had long proposed the institution of universal reserve requirements as a means of solving its membership problem. However, such measures proved to be very unpopular among nonmember institutions who lobbied vigorously against them. As a result, legislation granting the Federal Reserve the authority to pay explicit interest on member bank reserves came under consideration. Provisions extending such authority were included in Senate bill S.1664, which was submitted by the Carter administration in the spring of 1977. It contained two main provisions. First, it permitted all depository institutions nationwide to offer NOW accounts to consumers and imposed uniform reserve requirements on those accounts. Second, the bill granted the Federal Reserve permission to begin paying interest on reserves. The bill also contained language explicitly authorizing the Federal Reserve to provide payments services to all depository institutions that offered NOW accounts.

Senate bill S.1664 was never enacted, largely because of the anticipated cost of the interest payments it would have permitted. These concerns were noted

³⁰ Board of Governors, "Collection of Checks and Other Items by Federal Reserve Banks," p. 3,098.

by Senator Proxmire in the course of the hearings held to consider the bill:

Frankly, I am troubled about the proposal to permit the Federal Reserve to pay up to \$600 million a year to the Nation's larger banks in the form of interest on reserve balances Moreover, the legislation fails to direct the Fed to begin charging for the services currently valued at \$300 million, which it provides free of charge to member banks.³¹

It was widely understood that the services the Federal Reserve supplied to its member banks served as a means of paying implicit interest on required reserves. Both the Treasury and Congress therefore appeared to expect that the extension of this authority would be accompanied by the institution of a pricing system by the Federal Reserve.³² However, the Board was hesitant to commit itself to an exact date for the release of a proposed fee schedule or to set a specific timetable for the enactment of a general pricing policy before final action was taken to resolve the membership problem.³³

In addition to dealing with the Federal Reserve's membership problem, the Justice Department's anti-trust suits, which were successfully concluded at about the same time, put pressure on Congress to act on the problem of access policy. Members of Congress were very aware that over half the Federal Reserve's operating budget was devoted to the provision of payments services, and the prospect of further requests for these services by nonmember institutions promised to place further demands on that budget. Soon after the hearings on S.1664 were held, Senator Proxmire organized a separate set of oversight hearings to review the role of the Federal Reserve in the payments system and the issue of pricing those services.³⁴

In the course of these hearings, many representatives of the banking industry were asked for their views on pricing and the appropriate role of the

³¹ Opening Statement of Senator Proxmire, in **NOW Accounts, Federal Reserve Membership and Related Issues**, Hearings before the Subcommittee on Financial Institutions of the Senate Committee on Banking, Housing, and Urban Affairs, 95 Cong., 1 Sess. (GPO, 1977), p. 3.

³² See, for example, Statement of W. Michael Blumenthal, Secretary of the Treasury, in **NOW Accounts, Federal Reserve Membership and Related Issues**, pp.

³³ See, for example, Statement of Arthur F. Burns, Chairman of the Board of Governors of the Federal Reserve System, in **NOW Accounts, Federal Reserve Membership and Related Issues**, pp. 26-59, especially p. 58.

³⁴ **Federal Reserve Services**, Hearings Before the Senate Committee on Banking, Housing, and Urban Affairs.

Federal Reserve in the payments system. Representatives of major correspondent banks and other potential competitors favored a greatly reduced operational presence for the Federal Reserve. Others who testified, however, including representatives from a number of smaller banks as well as thrift industry and credit union groups, supported the maintenance of the Federal Reserve's broad operational role in the payments system. While there appeared to be no consensus on the exact services the Federal Reserve should be permitted to offer, there was universal agreement among market participants on the subject of pricing. It was widely acknowledged that private sector incentives to offer competing services should be protected and that this was best done by having the Federal Reserve adopt a pricing policy that would foster such competition.

Pricing was also favored as a means of promoting economic efficiency in the provision of payments services. In the absence of pricing, financial institutions that received Federal Reserve services had little incentive to conserve their use of such services or to encourage the use of the potentially more efficient emerging EFT services as a substitute for paper checks. However, while these latter economic arguments were recognized and discussed briefly during the oversight hearings, it was clear that the other related issues, those concerning the ultimate cost to the Treasury of the Fed's payments operations and the problem of fostering private-sector competition, dominated congressional attention. All future legislative proposals dealing with the Federal Reserve's membership problem would also address the issues of pricing and competition.

A year later, in May of 1978, Representative Stanton of Ohio introduced another bill, H.R. 12706, to permit the Federal Reserve to pay interest on reserves. The Stanton bill differed from earlier legislative proposals in that it also contained language explicitly requiring the Federal Reserve to set prices for all its payments services:

... established on the basis of all direct and indirect costs actually incurred in providing the services priced, including overhead, and an allocation of imputed costs that take into account the taxes that would have been paid and the return on capital that would have been provided had the payment services been furnished by a private business firm.³⁵

³⁵ Federal Reserve Membership Act of 1978, H.R.12706, in **Monetary Control and the Membership Problem**, Hearings before the House Committee on Banking, Finance and Urban Affairs, 95 Cong. 2 Sess. (GPO, 1978), pp. 13-17.

The bill explicitly authorized the Federal Reserve to continue offering its existing line of payments services and also permitted it to offer new payments services, "... including but not limited to payment services that effectuate the wire transfer of funds."³⁶ Any new services offered by the Federal Reserve were also required to be explicitly priced according to the requirements set forth in the act. The bill also addressed the access policy issue. Provisions contained in that legislative proposal required the Federal Reserve to make its payments services available to all depository institutions on the same terms.³⁷ Separately, an amendment proposed by Representative Reuss (then Chairman of the House Banking Committee) would have limited the gross amount of interest the Federal Reserve would be permitted to pay out to the total of the profits it earned from its payments services plus any profits earned on loans made through the discount window.³⁸ H.R. 12706 was not passed.

In the end, the House Banking Committee reported out a new bill, H.R. 14072, that dropped provisions authorizing the payment of interest on reserves and instead imposed universal reserve requirements on all commercial banks. The pricing provisions of the Stanton bill were carried over substantially intact, but included a number of new provisions giving the Federal Reserve somewhat more flexibility in setting its prices. As before, the Federal Reserve would be required to set its prices sufficient to recover all its costs, including an allowance for costs that would be incurred by a private sector competitor, but new language permitted these costs to be recovered "over the long run."³⁹ Additional changes permitted the Federal Reserve to depart from these strict cost

³⁶ Ibid.

³⁷ Of course, legal provisions such as this one, which require the adoption of nondiscriminatory access and pricing policies, do not necessarily require that all purchasers be charged the same price under all conditions. Price discrimination arises when price differentials charged to different purchasers are unrelated to underlying differences in the cost of supply. Thus, the Federal Reserve can charge institutions that are more costly to service (because they are remotely situated, for example) a higher price than it charges other institutions without violating the requirements of the Monetary Control Act. For a more detailed discussion of price discrimination, see F. M. Scherer, **Industrial Market Structure and Economic Performance** 2nd ed. (Houghton Mifflin Company, 1980), chap. 21.

³⁸ See Opening Statement of Chairman Henry S. Reuss, House Committee on Banking, Finance and Urban Affairs, **Monetary Control and the Membership Problem**, Hearings, pp. 34-53.

³⁹ Federal Reserve Act Amendments of 1978, H.R. 14072, *ibid.*, pp. 509-22.

recovery requirements when it was deemed to be in the public interest to do so.

This same language was later included in H.R. 7, The Monetary Control Act of 1979, which passed in the House of Representatives the following year. After a joint committee meeting, this bill was combined with a bill passed in the Senate to form the Depository Institutions Deregulation and Monetary Control Act of 1980. The final version of the bill contained only minor changes in the language dealing with the pricing of Federal Reserve services.⁴⁰

IV. SUMMARY AND CONCLUSIONS

The Monetary Control Act radically changed the terms governing the Federal Reserve's participation in the operation of the nation's payment system. This change was brought about because of a number of related developments arising in the decade before the act was passed that caused Congress to reevaluate the Federal Reserve's role in the payments system.

First, the Federal Reserve's involvement in the development and operation of automated clearinghouses, while encouraged by a large segment of the banking industry, also raised questions concerning which services the Fed should provide for the banking industry. A number of market participants, notably the larger money center banks and private clearinghouses, viewed this action as an expansion by the Federal Reserve into new markets. These latter groups voiced concerns that a large-scale expansion of Federal Reserve service offerings could preempt private sector initiatives, and lobbied to have the Fed's activities in this area limited.

Separately, the deregulation of the thrift industry that began in 1970 resulted in the request for direct access to ACH services. Since ACH technology was new, no real alternatives to the ACH network operated by the Federal Reserve were available. The banking industry determined the conditions of access to this network, however, and this group set the enactment of legislation that would eliminate many of the regulatory advantages then enjoyed by the thrift industry as a condition of direct access. Since the Federal Reserve had a major role in operating this system, ACH access became tied to the broader issue of Federal Reserve access policy.

The Justice Department supported the thrift industry's request for direct access, arguing that anti-trust law required equal access be granted to all competitors. In 1977, the Justice Department secured access for thrifts by successfully arguing that direct access to ACH services was "essential" for purposes of antitrust law.

These developments posed problems that were not anticipated when the Federal Reserve Act was originally enacted. Before thrifts began to offer third-party payments services commercial banks were the only institutions requiring access to clearing facilities such as those operated by the Federal Reserve, and any bank desiring direct access to the Federal Reserve's services always had the option of becoming a member of the System. Membership in the Federal Reserve, however, meant bearing the costs associated with the System's reserve requirements. The thrift industry therefore opposed access conditioned on some form of Federal Reserve membership. The ruling subsequently obtained by the Justice Department granted thrifts access to ACH services without imposing the costs of membership.

At this time the Federal Reserve was already experiencing an acute membership problem because of the relatively stringent reserve requirements imposed on its member banks. Since the Fed was effectively prohibited from paying explicit interest on these reserves, its payments services served as a means of paying implicit interest. Therefore, the adoption of a nondiscriminatory price schedule, as the Justice Department argued was necessary under antitrust law, threatened to further exacerbate the Federal Reserve's membership problem.

With these problems in mind, it is easy to understand why legislative provisions addressing the issues of access and pricing were included as part of a larger package of reforms intended to alleviate the Federal Reserve's membership problem. The Monetary Control Act lowered reserve requirements for member banks and extended these same reserve requirements to all depository institutions offering transactions accounts, thus eliminating the previous discriminatory treatment of member banks. By itself, lowering average reserve requirements for member banks could be expected to result in a reduction of the revenues the Federal Reserve earned on these non-interest-bearing reserves and subsequently paid to the Treasury. Extending these new reserve requirements to nonmember depository institutions, however, mitigated this revenue loss. Nevertheless, on net, the lower average reserve requirements autho-

⁴⁰ See Raymond Natter, "Legislative Intent Regarding Pricing of Services by the Federal Reserve Board," in **Federal Reserve Competition with the Private Sector in Check Clearing and Other Services**, H.R. Rept. No. 98-676, 98 Cong. 2 Sess. (GPO, 1984), pp. 81-91.

rized by the act were expected to result in a net revenue loss to the Treasury.⁴¹ Revenues earned by the Federal Reserve from the sale of its services were expected to offset a portion of these other lost revenues. Moreover, the adoption of a nondiscriminatory fee schedule permitted equal access to be granted to all depository institutions interested in receiving Federal Reserve services. (The act also granted access to the Federal Reserve's discount window to all institutions maintaining transactions accounts.) Finally, since this last provision would put the Federal Reserve in more direct competition with private correspondent banks, it was required to set its prices based on all direct and indirect costs, including an allowance for a return to capital that a private sector competitor would have earned in supplying such services.

Federal Reserve pricing has stimulated the growth of private clearinghouses as well as giving correspondent banks a greater incentive to process more of their own payments transactions. At the same time, nonmember depository institutions gained direct access to the Federal Reserve's clearing network. On

⁴¹ On the basis of bank deposits reported for the month of December 1977, this net revenue loss was estimated at \$155.6 million per year. See **Monetary Control Act of 1979**, H.R. Rept. 830, 96 Cong. 1 Sess. (GPO, 1979), pp. 5-6.

net, the increase in private sector competition has resulted in the Federal Reserve losing some of its market share in the area of check-clearing services, although not in all other service lines.⁴² In this sense, the Monetary Control Act has limited the Federal Reserve's role in the payments system.

In other ways, though, the act authorized an expansion of the Federal Reserve's role. Although the Fed must now compete more directly with private sector suppliers, it is no longer limited in offering its services to member banks. In addition, the Federal Reserve is now authorized to offer any new payments services, provided that the fees charged for such services are sufficient to cover all costs, including imputed private sector costs. The original Federal Reserve Act was written long before the most recent wave of technological innovation in the telecommunications industry. Those provisions authorized the Federal Reserve to clear checks and to otherwise effect the transfer of funds for member banks, but the extent to which the Fed was authorized to offer new services based on new technologies was unclear. This issue was resolved by the Monetary Control Act.

⁴² See David B. Humphrey, "Resource Use in Federal Reserve Check and ACH Operations After Pricing," **Journal of Bank Research** 16 (Spring 1985): 45-53.