

ON RECOGNIZING INFLATION

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Introduction

Inflation is defined as a sustained increase in the general price level over time. It generally rises insidiously, building up momentum over a period of time. One economist has observed, "Inflation is like a slow curve ball; why is it so deceptive?" As this article will show, in the past even the best of forecasters were often unable to foresee an upswing in the inflation rate.

This article examines the quality of inflation forecasts in the 1972-82 period, which contained two episodes of especially virulent inflation. Special attention is given to the periodic forecasts of two prominent forecasting services, the consensus of quarterly forecasts published annually by this Bank¹ during the seventies, and the *Greenbook*² forecasts made by the staff of the Board of Governors of the Federal Reserve System. The *Greenbook* forecasts provide a particularly good vehicle for the study as they were: 1) as good or better than other forecasts, 2) consistent, 3) published regularly and often, and 4) generated primarily for policy briefings, which meant that one of their major interests was the outlook for inflation. The analysis will show that all of the forecasters had difficulty in predicting rising inflation.

An examination of the successes and failures of inflation forecasting in the seventies is especially relevant now, for there has been considerable concern recently that inflationary pressures are mounting again. Those who argue that inflation is heating up point to the more rapid increases in commodity

prices and consumer prices as well as to the rising rates of utilization of capital and labor thus far in 1988.

Information of the kind presented here should be useful in reminding the reader of the serious inflation problem the nation faced on two occasions in the seventies. The annual rate of increase of the implicit deflator for GNP during 1972-74 rose from an average of 3.6 percent in the first half of 1972 to 14.3 percent in the third quarter of 1974, and the annual rate of increase of the deflator in the 1976-80 period rose from an average of 5.0 percent in the first half of 1976 to 12.1 percent in the fourth quarter of 1980. Yet, consistent with inflation's insidious nature, the severity of the underlying inflation risk was not fully recognized in the early stages of either of these episodes.

This article is not able to specify the exact sources of error in recognizing and forecasting the inflation of the seventies, but it does suggest some possibilities. These include: 1) the inability to foresee supply shocks (particularly oil shocks), 2) the difficulty of modeling the inflationary process, and 3) the tendency for actual money growth to exceed its target range in the seventies.

Theories of Inflation

As a preliminary, it may be useful to review briefly the theories of inflation prevalent during the period (1972-82) covered by this article. One of the most popular intermediate macroeconomic theory texts of the 1960s, Gardner Ackley's *Macroeconomic Theory*, defined inflation in approximately the way that it is defined now, namely, a "... persistent and appreciable rise in the general level or average of prices" [1, p. 421]. Ackley divided inflation into three basic types, demand inflation, cost inflation, and some combination of the two. Demand inflation denoted the classical type of inflationary process in which price increases came in response to excess aggregate demand.³ Cost inflation came about as a result of the power of various groups, e.g., labor unions, large firms, trade associations, etc., to raise wages and prices even in the absence of excess demand for their goods or services.

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¹ The Federal Reserve Bank of Richmond published summaries of major economic forecasts at the beginning of each year over the 1953-86 time period. The Bank began to publish details of major quarter-by-quarter forecasts in the 1972 *Business Forecasts* booklet. The table showing the consensus (median) forecast was first published in the 1973 *Business Forecasts* booklet.

² The *Greenbooks* are briefing documents prepared by the staff of the Board of Governors of the Federal Reserve System prior to each meeting of the FOMC. They are distributed to the Presidents of the regional Banks as well as to the Governors and senior staff of the Board. The *Greenbooks* are highly confidential at the time of their release, and are available to the public (excepting some sensitive international material) after a five-year lag.

³ Aggregate demand is composed of the demand for the economy's output of goods and services by consumers, investors, government, and foreigners.

During the seventies, cost inflation theories were folded into a more general supply shock theory of inflation. According to this theory, some event or another, such as a union-induced wage increase, a crop failure, a fuel shortage, etc., would restrict aggregate supply and, by causing a shortage, lead to an increase in prices.

Supply shock theories can explain a change in relative prices or a one-time rise in the price level, but they fall short as explanations of inflation (defined, remember, as a series of *continuing* rises in the general price level). There is an inherent inconsistency in a theory that explains a continuing rise in prices by a series of apparently unrelated random events, and this inconsistency has led to a decline in the use of supply shocks as explanations of inflation. The failure of anti-cost-push policies such as wage and price controls and wage/price guidelines to stop the inflation of the seventies also contributed to the decline in the usage of supply shock theories of inflation.

Supply shock explanations of inflation, however, were utilized heavily in the seventies and early eighties. The typical inflation forecast frequently enumerated a variety of supply factors⁴ that would be likely to affect inflation in the near-term future. Such forecasts implied that inflation would subside naturally once the effects of the special factors had worked themselves out. If, however, the economy was actually plagued by a general inflation, each "special factor" would be succeeded by another, and the longer-term inflationary process would be seen as a succession of special situations.

Milton Friedman observed that "Inflation is, always and everywhere, a monetary phenomenon, produced in the first instance by an unduly rapid growth in the quantity of money" [4, p. 39]. His now-famous statement has been generally accepted by the economics profession. This conception of inflation implies that excess money growth is the source of excess aggregate demand, and it implicitly denies the relevance of supply shocks as sources of inflation (defined again as a *continuing* increase in the price level).

Inflation Forecasts

This section presents the forecasts for prices published in the *Greenbooks* prepared by the staff of the Board of Governors prior to each FOMC meeting

⁴ These factors included such items as employment costs, energy prices, food prices, price controls and decontrols, car prices, steel prices, strikes, industry desires to improve or protect profit margins and worker desires to restore real incomes, etc.

over the 1972-82 time period. Over the 1972-82 time period, 118 separate forecasts for the price level and general business conditions were made, an average of almost 11 forecasts per year. The forecasts for the implicit deflator for GNP will be analyzed below. The analysis is primarily concerned with the accuracy with which the forecasts predicted the direction of inflation: that is, whether it would rise or fall. The reason for this primary concern relates to the nature of policymaking. Since policymakers are naturally sensitive to the potential short-run costs of efforts to restrain inflation, there is a risk that they may opt for too lenient (restrictive) policies if the inflation is incorrectly expected to subside (increase) on its own.

Each *Greenbook* forecast included estimates for the prior quarter, the current quarter, and projections for a varying number of quarters into the future. The lengths of the forecasts varied from zero (two forecasts, dropped from the analysis) to eight (one forecast) quarters into the future. Most of the forecasts had an horizon of four to six quarters. These forecasts are depicted in Charts 1 to 3.

Charts 1-3 For expositional clarity the plots of the forecasts are distributed among three charts. The charts are indexed along two dimensions. First, the charts are indexed by the month of the quarter in which the forecast was made. Chart 1, for example, shows forecasts made in the first month of the quarter, Chart 2 includes forecasts made in the second month of the quarter, and Chart 3 shows forecasts made in the third month of the quarter. Second, the charts are indexed by time period. Section (a) of the charts shows forecasts made during the period from the first quarter of 1972 (1972:1) to the first quarter of 1976 (1976:1), the (b) sections show forecasts made during 1976:1 to 1980:1, and the (c) sections show forecasts made in 1980:1-1982:4.

The white line on each chart shows the annualized quarterly rate of change of the implicit deflator for GNP as estimated two quarters after the date shown.⁵ The thin black lines show the *Greenbook* forecasts. Every forecast began with an estimate of

⁵ For example, the rate shown for the first quarter of 1973 is the rate estimated for that quarter as of the third quarter of 1973. The data for the GNP and related accounts are revised several times, often substantially, after their original release. In order to provide a consistent series, and to be fair to the forecasters who were basing their forecasts on what they thought was historical data, the "actual" implicit deflator series used in this article ignores revisions made after two quarters. There are substantial differences, therefore, between the "actual" rates of increase in the implicit deflator in 1972-82 in the charts and the final official estimates.

Chart 1

IMPLICIT DEFLATOR FOR GNP: Forecasts Made in 1st Month of Quarter

Annualized Percent Change

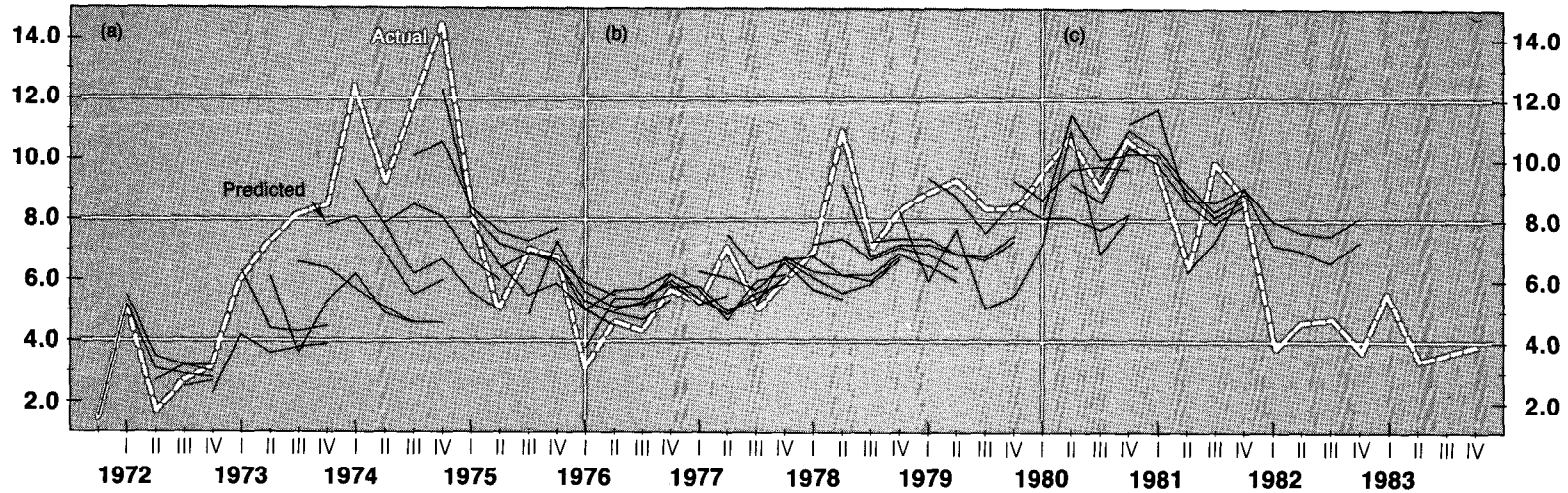


Chart 2

IMPLICIT DEFLATOR FOR GNP: Forecasts Made in 2nd Month of Quarter

Annualized Percent Change

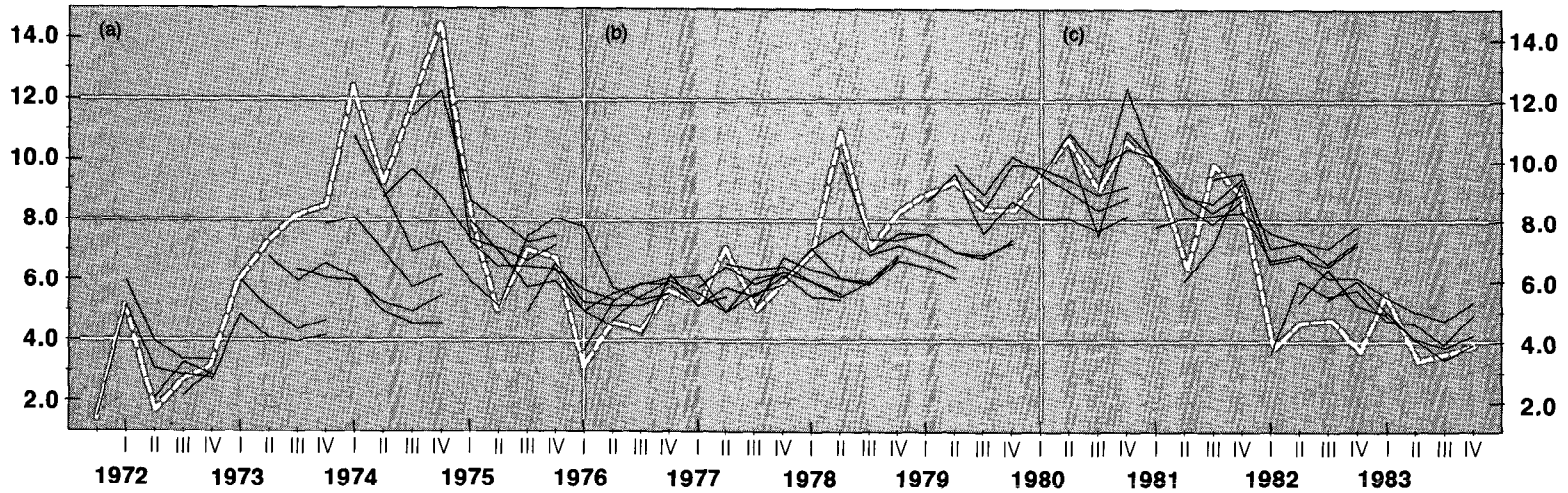
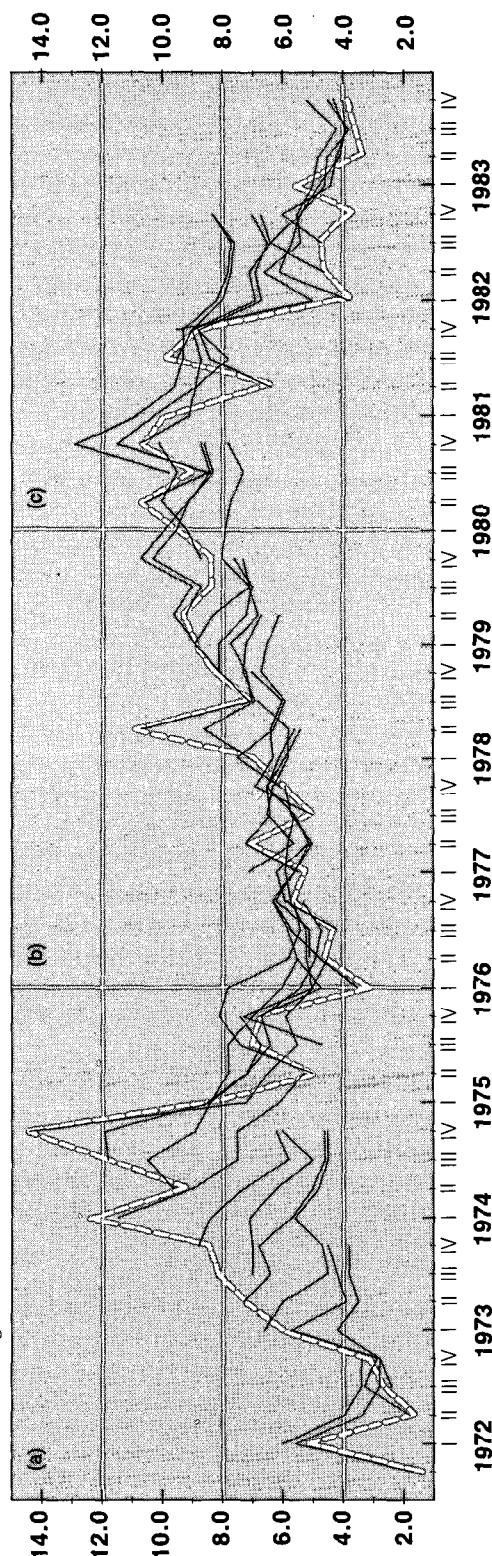


Chart 3

**IMPLICIT DEFLATOR FOR GNP:
Forecasts Made in 3rd Month of Quarter**

Annualized Percent Change



the increase in the deflator in the quarter prior to that in which the forecast was made, so the line depicting a forecast made in any one quarter always begins in the previous quarter.

The forecast made in January 1974, for example, contained the following projections for the annualized quarter-by-quarter rate of increase in the implicit deflator in the 1973:4 to 1974:4 time period: 7.8%, 8.1%, 6.9%, 5.5%, and 6.0%. The numbers representing this forecast are plotted as the thin black line, denoted by an arrow, in the middle of Chart 1.

The projections for the prior quarter tended, because of better availability of data, to be closer to the actual the later in the quarter they were made. Since the *Greenbooks* were usually prepared early in the month, the first-month-of-quarter forecasts were usually prepared before the U.S. Department of Commerce released the preliminary estimates for GNP and related accounts in the prior quarter.

The second-month-of-quarter *Greenbook* forecasts, however, could incorporate the Commerce Department's preliminary estimates for the prior quarter, and the third-month-of-quarter forecasts could utilize the first revision of the statistics.

As the charts clearly show, the forecasts generally tended to predict subsiding inflation, whether or not inflation actually subsided. The charts show that the tendency to underpredict rising inflation was especially apparent in the 1972:1 to 1975:1 period, and that the tendency continued, albeit to a more modest extent, in the 1976:1-1980:1 period. In contrast, the forecasts tended to overestimate the strength of inflation in 1980:2-1983:2.⁶

The charts also show clearly that the inflation forecasts in the 1976:1-1980:1 and 1980:2-1983:4 periods were considerably closer to the mark than the forecasts for inflation in the 1972:1-1974:3 period. The apparent improvement in forecasting ability after 1974:3 may indicate that the forecasters were able to model inflation better after having been able to evaluate the effects of oil and food shocks on the economy in 1972:1-1974:3. It may, however, merely indicate that economic conditions and inflation were particularly difficult to evaluate in the earlier period.

⁶ It should be noted that underpredicting inflation when its permanent component is rising, and overpredicting it when its permanent component is falling, need not reflect poor forecasting procedures. John Muth [7] showed that for a series generated by unobservable permanent and transitory components, the optimal forecasting technique would tend to systematically underpredict any rise or fall in the permanent component, approaching the correct forecast asymptotically.

Two summary statistics: F-slope and A-slope This article is not particularly concerned with examining how well the actual rate of inflation was predicted in any one quarter. Its concern, rather, is how well the forecasts capture the outlook for increasing (decreasing) inflation over the forecast horizon. In seeking to answer this question, the first step was to determine the slopes of the forecast lines using a regression technique. These estimated slopes are, essentially, the slope of whatever straight line would best represent each thin line depicted on the charts. For example, the forecast for January 1974 has a slope of -0.62 , indicating that the annualized rate of rise in the deflator was expected to decline by 0.62 percentage points per quarter on average over the forecast horizon of 1973:4-1974:4.

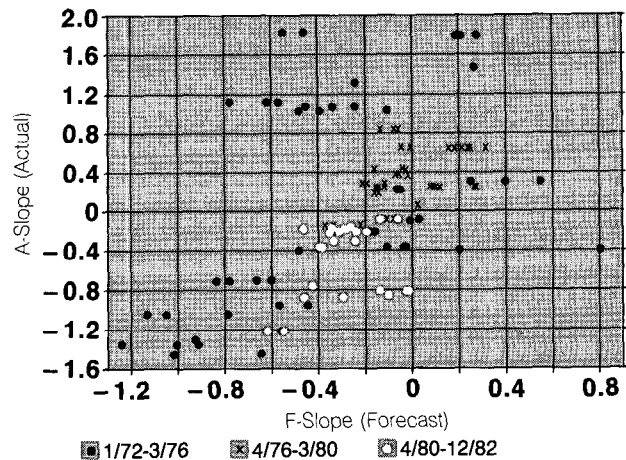
The slope values for the forecasts, described above, will be termed "F-slope" values (where F denotes forecast) for future reference. Corresponding "A-slopes" were calculated for the actual changes in the deflator. For example, the A-slope value calculated from actual changes in the deflator over the 1973:4 to 1974:4 time period was 1.07, which indicates that the actual annualized rate of increase in the deflator was 1.07 percentage points per quarter, on average.

Over the 1972-82 period, the *Greenbook* predicted decreasing inflation (negative F-slope values) in 94 out of 118 forecasts. Inflation actually decreased in only 59 (exactly one-half) of the 118 forecast horizons. The forecasts correctly anticipated increasing inflation in 20 out of its 59 occurrences and incorrectly anticipated it (i.e., predicted rising inflation when inflation actually declined) four times. In contrast, the decreasing inflation was predicted correctly in 55 of 59 occurrences.

Chart 4 shows the scatter diagram of the 118 F-slopes and A-slopes. The F-slopes are plotted from the horizontal axis and the A-slopes are plotted from the vertical axis. Thus, if the sign of the A-slope was predicted correctly in a particular forecast, the point representing that forecast would be in the first (+, +) or third (-, -) quadrant of the graph. If the rising inflation were incorrectly expected to subside, the point would be plotted in the second (-, +) quadrant, while if subsiding inflation were incorrectly expected to rise, that point would be plotted in the fourth (+, -) quadrant. Different symbols are used in the scatter diagram to show whether a forecast was made in 1972-76, 1976-80, or 1980-82.

The scatter diagram clearly confirms the previous assertions about Charts 1-3, namely, that the inflation forecasts were least accurate in the 1972-76 period. The black dots, which are used to depict the earlier forecasts, are the outliers in the second and fourth quadrants of the diagram.

Chart 4
F-SLOPES VS. A-SLOPES
Jan. '72-Dec. '82



Forecast Errors

Table I presents a statistical analysis of the *Greenbook* forecasts and compares them to forecasts made by two major private econometric forecasting firms.⁷ The table uses standard measures of forecast accuracy, root mean squared errors and mean absolute errors,⁸ to evaluate the relative accuracy of the *Greenbook* F-slope values in periods of rising and subsiding inflation, respectively. It then compares the *Greenbook's* performance to the performance of the two private firms and the Richmond quarterly consensus to determine whether there was anything markedly unusual about the *Greenbook* performance in relation to other forecasters.

The first two rows of the table compare F-slope values to A-slope when the data were separated into periods of rising inflation (positive A-slopes) and periods of subsiding inflation (negative A-slopes). The root mean squared and mean absolute errors are shown to be roughly two and one-half times as large when inflation is actually rising as when it is subsiding. The last column of Table I shows the number of times that the sign of the A-slope was predicted

⁷ Stephen McNees kindly provided the historical series on the forecasts made by the private forecasting firms.

⁸ The root mean squared error is calculated by finding the difference between the F-slope and A-slope values for each forecast, squaring the differences, averaging the squared differences, and finding the square root of the average squared difference. The mean absolute error is calculated by giving each difference a positive sign and then averaging those differences. A set of perfect forecasts would have a root mean squared error and a mean absolute error of zero.

Table I

**COMPARISON OF BOARD STAFF (GREENBOOK) FORECASTS OF THE OUTLOOK
FOR INCREASING OR DECREASING INFLATION* TO THOSE OF TWO PRIVATE
ECONOMETRIC FORECASTING FIRMS AND THE CONSENSUS FORECAST
PUBLISHED IN THE BUSINESS FORECASTS BOOKLET**

(Includes Forecasts Made Between January 1972 and December 1982)

Comparison	Root Mean Squared Error	Mean Absolute Error	Number of Observations	Number of Times Sign of A-Slope Was Predicted Correctly
Greenbook to Actual				
When inflation accelerates	0.93	0.71	59	20
When inflation decelerates	0.38	0.26	59	55
Greenbook to first econometric firm (EF1)				
When inflation accelerates				
Actual versus EF1	0.99	0.75	38	13
Actual versus GB match	0.95	0.71	38	13
When inflation decelerates				
Actual versus EF1	0.58	0.45	39	24
Actual versus GB match	0.41	0.29	39	35
Greenbook to second econometric firm (EF2)				
When inflation accelerates				
Actual versus EF2	0.99	0.75	39	13
Actual versus GB match	0.94	0.72	39	14
When inflation decelerates				
Actual versus EF2	0.55	0.42	37	20
Actual versus GB match	0.38	0.29	37	35
Greenbook to consensus				
Actual versus consensus	0.73	0.56	11	7
Actual versus GB match	0.64	0.48	11	8

* The price index forecasted is the Implicit Price Deflator for GNP. The forecasters estimated the annual percentage rate of increase in the deflator for the quarters in the forecast horizon. These forecasts were regressed on a quarterly time trend, and the statistical analyses shown above were applied to the slopes of the regression lines.

correctly. The sign was predicted correctly much more often when inflation was actually subsiding.

The information in the remaining rows of Table I provides a comparison of *Greenbook* forecasts to those made by two private forecasting services and to the consensus of quarter-by-quarter forecasts published annually in the Federal Reserve Bank of Richmond's *Business Forecasts* booklets during the 1972-82 time period. The private services did not forecast on a month-by-month basis, nor did the monthly publication dates of their forecasts correspond, so it was necessary to devise a *Greenbook* match for each service that would correspond to the forecasts made by the service. A different *Greenbook* match was also necessary for the consensus forecast, as it was published only once per year.

Table I shows that the *Greenbook* forecasts have lower root mean squared and mean absolute errors than the forecasts made by the services, regardless of whether inflation is rising or subsiding. The table also shows that while the *Greenbook* forecasts have only slightly lower error statistics than the services when inflation is rising, they have substantially lower error statistics when inflation is subsiding.

The table also shows that the Board staff forecasts had lower error statistics than the *Business Forecasts* consensus. Since there were only 11 of the consensus forecasts, they were not split into periods of increasing and decreasing inflation.

The analysis shown in Table I thus shows clearly that the *Greenbook* forecasts were no worse than those made by the forecasting services in predicting worsening inflation and clearly better than the services in predicting decreases in inflation. It also shows that all the forecasters studied were relatively less accurate in predicting rising inflation.⁹

As noted earlier, a visual comparison of the charts indicated that the *Greenbook* forecasts seemed to be further from the mark in the 1972-76 period than in the 1976-80 period. Table II shows the results of an analysis of the differences in the forecasts during the rising inflation portion of the two time periods. The table confirms the conclusion of the visual inspection. The root mean squared and mean absolute errors from July 1972 to March 1974

(the period of increasing inflation in 1972-76) are over three and a third times higher than they are in the February 1976 to November 1979 period. Table II also shows, however, that the *Greenbook* forecasts were modestly more accurate than the two competing forecasts in each time period.

The *Greenbook* forecasts actually predicted rising inflation accurately only slightly less frequently in the July 1972 to March 1974 period (7 of 21 episodes, 33 percent of the time), than in the February 1976 to November 1979 period (16 of 43 episodes, 37 percent of the time). The lower root mean squared errors for the later period, therefore, stem more from smaller misses in predicting the magnitude of the rise than from relatively fewer accurate predictions of the direction of inflation.

⁹ The mean error statistics from this Bank's quarterly consensus series and from other analyses show that forecasters in general tended to underestimate inflation in the seventies (see reference to McNees [8] and Zarnowitz [11] in Karamouzis and Lombra's interesting study of Federal Reserve policymaking and forecasting [6, p. 12]. See also McNees [9, p. 18]).

Table II

EVALUATION OF BOARD STAFF (GREENBOOK) FORECASTS OF THE OUTLOOK FOR INFLATION* IN DIFFERENT TIME PERIODS AND A COMPARISON OF STAFF FORECASTS TO THOSE OF TWO PRIVATE ECONOMETRIC FORECASTING SERVICES

Comparison	Root Mean Squared Error	Mean Absolute Error	Number of Observations	Number of Times Sign of A-Slope Was Predicted Correctly
Greenbook to actual				
July 1972 to March 1974	1.47	1.33	21	7
February 1976 to November 1979	0.44	0.39	43	16
January 1980 to December 1982	0.38	0.26	26	26
Greenbook to first econometric firm (EF1)				
July 1972 to March 1974				
Actual versus EF1	1.55	1.39	14	5
Actual versus GB Match	1.48	1.32	14	4
February 1976 to November 1979				
Actual versus EF1	0.51	0.43	28	10
Actual versus GB Match	0.43	0.37	28	12
Greenbook to second econometric firm (EF2)				
July 1972 to March 1974				
Actual versus EF2	1.57	1.45	14	3
Actual versus GB Match	1.49	1.37	14	5
February 1976 to November 1979				
Actual versus EF2	0.45	0.38	28	12
Actual versus GB Match	0.43	0.37	28	11

* The price index forecasted is the Implicit Price Deflator for GNP. The forecasters estimated the annual percentage rate of increase in the deflator for the quarters in the forecast horizon. These forecasts were regressed on a quarterly time trend, and the statistical analyses shown above were applied to the slopes of the regression lines.

Possible Reasons for Mispredicting Rising Inflation

The discussion in this section attempts to evaluate three competing hypotheses that, taken individually or taken together, could explain the apparent difficulty that forecasters experienced in predicting rising inflation.

Proposed Hypotheses

1. *Unpredictable supply shocks* The inflation prediction errors resulted from unforeseen shocks to aggregate supply such as the OPEC oil embargo, crop failures, etc.

2. *Tendency to underutilize the economic theory of the inflationary process* The overall inflationary process was perceived as a series of supply shocks, so money growth was given insufficient attention.

3. *Money growth in excess of that targeted* The *Greenbook* and perhaps other forecasts assumed that the money supply would grow at the longer-run target rates previously set by the Federal Open Market Committee (FOMC), so the inaccuracy of the projections stemmed from actual money growth exceeding its target range over several sustained periods in the seventies.

Evaluation of the Proposed Hypotheses

1. *Unpredictable supply shocks* This hypothesis undoubtedly explains some of the forecasting errors. As noted in footnote six, John Muth [7] showed that, as a statistical matter, if the movement in a series over time was composed of transitory and permanent components that were not separable *ex ante*, the optimal forecasting technique would underpredict the series when the permanent component was rising and overpredict it when the permanent component was falling. As the charts showed, that pattern of forecast error describes the staff forecasts during the 1972-82 period, as inflation was underpredicted in 1972-74 and 1976-80 and overpredicted in 1980-82.

A brief review of supply shocks and their effects on staff forecasts in the two periods of sharply rising inflation, 1972-74 and 1976-80, follows.

1972-74 The inflation of 1972-74 was well under way before the imposition of the OPEC oil embargo in October 1973. The Nixon administration had imposed a wage/price freeze in August 1971 followed by a more flexible wage and price control program lasting from November 1971 to January 1973, when it was replaced by an even more flexible program that ran through June 1973. This last program was particularly ineffective, as the wholesale price index increased at a 24 percent annual rate during the five months of the program, and by the end of the program (June), the Consumer Price Index was rising at about a 10 percent annual rate.

The rate of money growth, however, had slowed in the first half of 1973 from the extraordinarily rapid rates of growth registered in 1972 (the slowing in money growth rates continued through the first quarter of 1975). There was thus a general belief during the second and third quarters of 1973 that the economy was cooling and inflation was beginning to subside. Thus, it was understandable, for example, when in April 1973 the *Greenbook* began to predict decreasing inflation on the grounds that price pressures would subside once the changes in the price control program had worked through the economy.

In theory, the imposition of the oil embargo in October 1973 and the consequent oil shortage should

have produced merely a one-time increase in prices combined with a reduction in output. Such probably would have been the case had the economy not previously been in a period of general inflation. Because it *was* in such a situation, however, inflationary expectations rose, and even though the rate of money growth was slowing, it was apparently sufficient to fuel continued increases in inflation until the third quarter of 1974.

1976-80 The inflation of 1976-80 was less influenced by unforeseen oil shocks, although undoubtedly the January 1979 Iranian revolution (and probably the shortages resulting from the Department of Energy's fuel allocation program) affected the price level in the first half of 1979. In any event, it is difficult to determine whether the major impetus for the rising inflation in 1979 stemmed from the oil shortages or from prior excess money growth and already rising inflationary expectations.¹⁰

Evaluation As was shown in Table II, the inflation forecasts for the 1976-80 period were closer to the mark than the forecasts made in 1972-74. Thus, although it is difficult to confirm, the oil shocks probably did affect the accuracy of the forecasts to a large extent in the 1972-74 period. This does not mean, however, that the unforeseen oil shock wholly explains the tendency to mispredict rising inflation, for that tendency was apparent both before and after the announcement of the 1973 oil embargo, and it was apparent in the 1976-80 period both before and after the Iranian revolution oil shock.

2. *Underutilizing the economic theory of inflation as a monetary phenomenon* Nearly all forecasters in the seventies routinely cited nonmonetary factors (supply shocks, etc.) in rationalizing their respective inflation forecasts. For example, the *Greenbook* cited such developments as expected changes in the minimum wage, unusual weather, and various fuel price increases¹¹ in explaining its forecasts. Among other

¹⁰ Stephen Axilrod observed that "Growth of M1 failed to slow over the first three quarters of 1979. At the same time, prices were placed under additional upward pressure by the second oil shock in the early part of the year. Overall price increases moved into the double digit area. That had also occurred in 1974, but in the earlier period there had been less of a buildup in inflationary expectations and less of an erosion in the credibility of the Federal Reserve's will and capacity to control the situation" [2, p. 16].

¹¹ A complete list of relevant staff commentary on inflation from *Greenbooks* published between April 1972 and December 1982 and the numerical staff forecasts for the rate of increase in the implicit deflator for GNP made between January 1972 and December 1982 are available from the author upon request. The commentary demonstrates that nonmonetary factors were frequently used to explain the inflation forecasts.

forecasters, Walter Heller and George Perry referred to a "... chronic cost-push rate of about 6 percent per year" [5, p.1], and Albert Sommers stated as the consensus of the Conference Board's 1978 Economic Forum, "We are experiencing structural inflation, not cyclical inflation" [10, p. 7].

The emphasis given to these nonmonetary explanations of inflation may have diverted attention away from the effects of past growth in the money supply on observed inflation rates in both the 1972-74 and 1976-80 periods, and hence may have contributed to the forecast errors in the two periods. The relevant issue here is whether the permanent component of inflation in the seventies was predictable *ex ante* (see the discussion of Muth [7] above). From the viewpoint of the theory that inflation is a monetary phenomenon, the permanent component of the rate of growth of the price level should be explained by past rates of growth of money. Excessive reliance on nonmonetary factors to explain inflation thus may have contributed to the errors in inflation predictions by diverting attention from prior movements in money growth.

3. *Money growth in excess of that targeted* A third hypothesis is that the forecast errors resulted, at least in part, from actual money growth exceeding the Federal Reserve's monetary targets during periods of mounting inflationary pressure (especially in the late seventies). As Stephen Axilrod, former Staff Director for Monetary and Financial Policy at the Federal Reserve, observed:

In 1977 and 1978, M1 had accelerated to a pace of slightly more than 8 percent per year, after growing by an average of 5½ percent per year over the previous two years. Not only did this acceleration itself appear to signal that policy was becoming more expansionary, but also the credibility of policy was being eroded by the consistency with which actual M1 growth came in above adopted target ranges in a strong economy. This psychological effect was made even worse in the circumstances of the time by the fact that new one-year target ranges were adopted quarterly, with the most recent quarter serving as a base . . . and with no apparent effort to make up for the preceding over shoots. This became known as "base drift." The erosion of credibility because the targets were missed and because the process of target setting also led to a perception that the targets were perhaps not serious constraints fueled inflationary expectations [2, p. 15].

The 1977-80 time period coincides with the second period of rising inflation depicted in section (b) of Charts 1 to 3. During that period the average year-by-year money growth was 7.2 percent, while the average announced target range was 4.25 percent to 6.75 percent (derived from Broadus and Goodfriend [3, p.7]). Monetarists would argue that

the coincidence of this episode of above-target money growth and the period of inflationary buildup was not due to chance, since excess money growth fuels inflation.

As the *Greenbook* forecasts routinely assumed future money growth at the midpoint of the System's stated target range, it can be argued that the monetary overshoots were partially responsible for the *Greenbook* forecast errors. Still, the *Greenbook* forecasts were no worse than the private forecasts, which were not constrained to accept announced monetary targets. Of course, the extent to which the private forecasts were influenced by the Federal Reserve's announced monetary targets is not known, but it seems likely that the targets had some influence. Thus, although the missed money growth target hypothesis cannot be confirmed as a source of forecast error, neither can it be dismissed.

Conclusions

This study demonstrated that rising inflation was difficult to forecast in the seventies. The analysis indicated that both the forecasts contained in the Federal Reserve's *Greenbook* and those prepared by other prominent forecasters tended to mispredict rising inflation during the two episodes of sharply rising inflation in the decade, although the forecasting performances did improve somewhat in the second episode, between 1976 and 1980. The article also noted that forecasters tended to overpredict inflation somewhat in the early eighties when it began to diminish.

The article discussed three possible explanations for the forecast errors: 1) unpredictable supply shocks, 2) excessive attention to nonmonetary developments affecting the price level and insufficient attention to past money growth, and 3) actual money growth coming in above target in the seventies. The discussion concluded that none of the explanations could be ruled out.

The lesson to be drawn from the inflation forecasting experience of the seventies is that rising inflation is insidious and difficult to recognize. The past, however, is not necessarily prologue to the

future. Forecasters, like everyone else, learn from their experiences. Virtually all forecasters—those at the Federal Reserve and elsewhere—are making strong efforts to improve on the inflation forecasting performance of the seventies and early eighties. It is hoped that this paper, by reviewing the earlier experience in some detail, will contribute to this effort.

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A REVIEW OF BANK PERFORMANCE IN THE FIFTH DISTRICT, 1987

John R. Walter and David L. Mengle

Bank profitability as measured by return on assets and return on equity declined in the Fifth Federal Reserve District¹ in 1987 due largely to increased loan and lease loss provisions. Nationwide the profitability decline was considerably larger because the average loss provision greatly exceeded that in the Fifth District. These results should come as no surprise because of the well-publicized additions to reserves against Third World debt made by large banks both within and outside the District.

For Fifth District banks, a decline in net interest margin and securities gains was offset by lower noninterest expense. For the average of all U.S. banks, securities gains were down and noninterest expense was up, but higher noninterest income offset them completely.

Profits

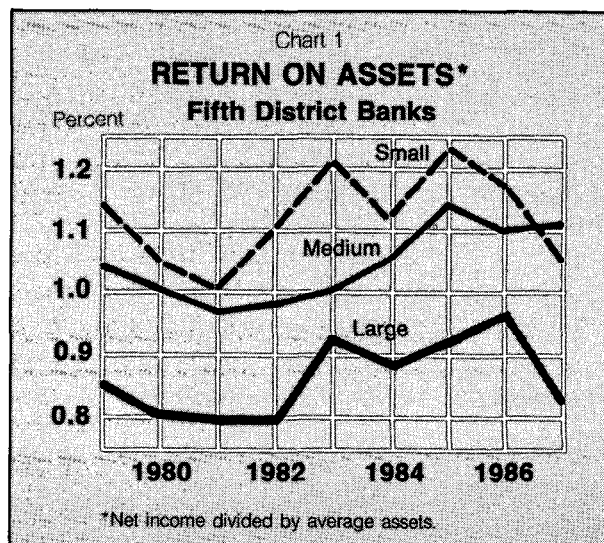
Return on Assets Table I shows that return on assets (ROA) for Fifth District banks declined from 1.00 percent in 1986 to .88 percent in 1987. The drop was more dramatic at the national level, where return on assets fell from .63 percent in 1986 to .11 in 1987 (Table II). Net income in the Fifth District fell for the first time in the past thirteen years, dropping 2.1 percent. For the sum of all U.S. banks, net income fell 80.6 percent. Slightly less than 10 percent of Fifth District banks and 18 percent of all banks in the country suffered losses during the year. While Fifth District banks' average return on assets and return on equity (ROE) were below their average for the last ten years, the national average for the ratios was the lowest in post-World War II history.²

Much of the decline in the average ROAs for banks in the Fifth District (and banks throughout the United

States) reflected ROA declines at large banks. Chart 1 shows that large Fifth District banks' (more than \$750 million in 1987 total assets) average ROA fell from .97 percent in 1986 to .82 percent in 1987. Medium-sized Fifth District banks (1987 total assets between \$100 million and \$750 million) experienced a slight increase in ROA from 1.10 percent in 1986 to 1.11 percent in 1987 while the ROA for small District banks (less than \$100 million in total assets) fell from 1.17 percent in 1986 to 1.05 percent in 1987.

The decline in average ROE reflected declines in both ROA and the ratio of book value of assets to book value of owner's equity. Chart 2 shows that while large banks suffered the greatest decline in ROE, medium and small banks also had diminished ROEs compared with their 1986 levels. Large banks' ROE fell to 14.32 percent in 1987 while medium and small banks' ROEs fell to 13.82 and 11.19 percent, respectively. Average ROE for all U.S. banks fell from 10.22 percent in 1986 to 1.88 percent in 1987 (see Table II).

The lower profits for 1987 reflected the higher loan and lease loss provisions against Third World debt made by large banks. Because loss reserves are



Valuable research assistance was provided by Richard Ko.

¹ Maryland, Virginia, North Carolina, South Carolina, the District of Columbia, and most of West Virginia. A table summarizing performance by state is in the Appendix.

² Office of Research and Strategic Planning, Federal Deposit Insurance Corporation, "Commercial Banking Performance—Fourth Quarter, 1987," *Quarterly Banking Profile*, Fourth Quarter 1987, Chart A, p. 1.

Table I
INCOME AND EXPENSE AS A PERCENT OF AVERAGE ASSETS¹
FIFTH DISTRICT COMMERCIAL BANKS, 1979-87

Item	1979	1980	1981	1982	1983	1984	1985	1986	1987
Gross interest revenue	8.49	9.46	11.15	10.86	9.58	10.02	9.48	8.51	8.09
Gross interest expense	4.53	5.60	7.29	6.93	5.82	6.33	5.70	4.97	4.59
Net interest margin	3.96	3.86	3.86	3.93	3.76	3.69	3.78	3.54	3.50
Noninterest income	0.80	0.90	1.01	1.03	1.16	1.15	1.22	1.22	1.22
Loan and lease loss provision	0.26	0.26	0.25	0.28	0.25	0.33	0.46	0.40	0.50
Securities gains ²						-0.02	0.06	0.15	0.07
Noninterest expense	3.24	3.37	3.48	3.53	3.45	3.37	3.40	3.29	3.17
Income before tax	1.26	1.13	1.14	1.15	1.22	1.12	1.20	1.23	1.12
Taxes	0.28	0.20	0.19	0.18	0.22	0.19	0.22	0.23	0.25
Other ³	-0.04	-0.04	-0.09	-0.10	-0.02	0.00	0.00	0.00	0.00
Return on assets ⁴	0.94	0.89	0.86	0.87	0.98	0.93	0.98	1.00	0.88
Cash dividends declared	0.30	0.32	0.33	0.37	0.34	0.31	0.31	0.34	0.47
Net retained earnings	0.64	0.57	0.53	0.50	0.64	0.62	0.67	0.66	0.41
Return on equity ⁵	13.51	12.79	12.56	13.12	15.21	14.62	15.41	15.87	13.83
Average assets (\$ millions)	80,671	88,280	97,217	108,439	121,173	137,131	156,574	181,133	203,376

Note: Discrepancies due to rounding error.

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 1979-83 data, and extraordinary items and other adjustments after taxes for 1984-87 data.

⁴ Return on assets is net income divided by average assets.

⁵ Return on equity 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.

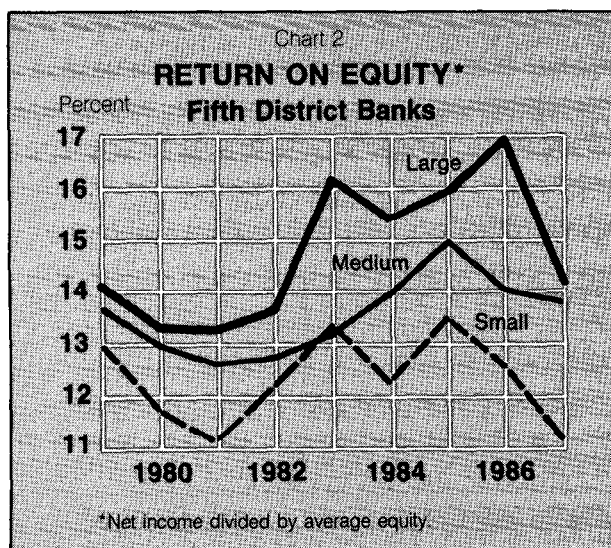
Source: Consolidated Reports of Condition and Income.

Table II
INCOME AND EXPENSE AS A PERCENT OF AVERAGE ASSETS¹
ALL U.S. COMMERCIAL BANKS, 1979-87

Item	1979	1980	1981	1982	1983	1984	1985	1986	1987
Gross interest revenue	8.62	9.87	11.81	11.19	9.50	10.11	9.23	8.15	7.99
Gross interest expense	5.50	6.78	8.75	8.02	6.36	6.95	5.98	5.02	4.87
Net interest margin	3.12	3.09	3.07	3.17	3.15	3.16	3.25	3.13	3.12
Noninterest income	0.78	0.89	0.99	1.05	1.12	1.27	1.39	1.46	1.63
Loan and lease loss provision	0.24	0.25	0.26	0.39	0.47	0.55	0.66	0.76	1.24
Securities gains ²						-0.01	0.06	0.13	0.05
Noninterest expense	2.54	2.63	2.76	2.91	2.95	3.05	3.15	3.17	3.26
Income before tax	1.12	1.10	1.04	0.91	0.84	0.82	0.89	0.81	0.29
Taxes	0.28	0.28	0.24	0.17	0.18	0.19	0.21	0.19	0.18
Other ³	-0.04	-0.03	-0.04	-0.03	0.00	0.01	0.01	0.01	0.01
Return on assets ⁴	0.80	0.79	0.76	0.71	0.67	0.64	0.70	0.63	0.11
Cash dividends declared	0.28	0.29	0.30	0.31	0.33	0.31	0.33	0.33	0.36
Net retained earnings	0.52	0.50	0.46	0.40	0.34	0.33	0.37	0.31	-0.24
Return on equity ⁵	13.90	13.70	13.20	12.20	11.24	10.63	11.33	10.22	1.88
Average assets (\$ billions)	1,593	1,768	1,940	2,100	2,253	2,398	2,604	2,799	2,926

Notes: Discrepancies due to rounding error.
For footnotes see Table I.

Sources: *Federal Reserve Bulletin*, 1981, 1984 (1979-83 data); Consolidated Reports of Condition and Income (1984-87 data).

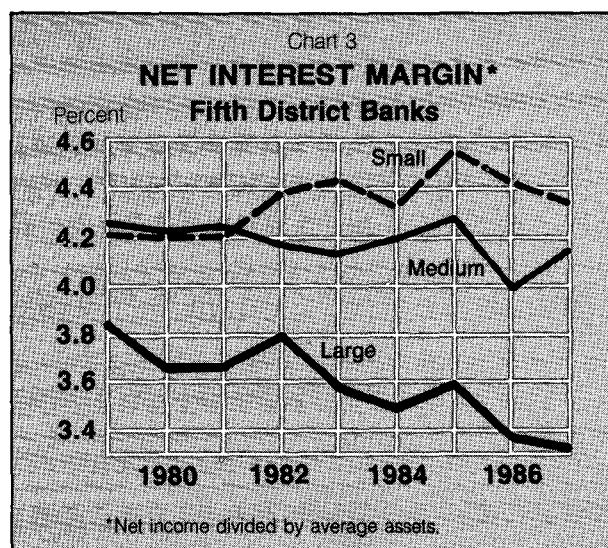


deducted from total assets when calculating ROA, the income stream from the asset portfolio should yield a higher return in succeeding years. Because the increased provisions move bank assets closer to their true market values, one might expect, other things remaining the same, higher returns in 1988.

Interest Margin

Net interest margin fell to its lowest level in the years covered by Table I. Market interest rates rose throughout 1987, yet rates were on average below their levels during 1986 in many of the markets where commercial banks operate. Interest income declined by more than interest expense for District banks as a group. Some banks fared better, however. For example, while net margin fell for both small and large Fifth District banks, medium Fifth District banks increased their average net margin by 17 basis points (Chart 3). At the national level, the average net interest margin fell by only one basis point.

Fifth District banks continued to earn a much higher interest margin than their counterparts nationwide. Interest income relative to assets was higher at Fifth District banks than for all U.S. banks because earning assets constituted a higher percentage of District banks' assets. Interest expense was lower at Fifth District banks because those institutions paid lower rates on average for comparable liabilities. Further, lower cost liabilities made up a larger percentage of their total funding. That is, District banks derived a higher percentage of their liability base from relatively low-cost consumer deposits and a much lower percentage from higher-cost foreign office deposits. Tables III and IV show that both the rates



earned and the rates paid by Fifth District banks declined in 1987 as compared with 1986.

Noninterest Revenue and Expense

Fifth District noninterest income, including service charges on deposit accounts, leasing income, trust activities income, credit card fees, mortgage servicing fees, and safe deposit box rentals, was unchanged from 1986 to 1987 (Table I). Noninterest expense, however, fell from 3.29 percent of average assets to 3.17 percent.

The decline in noninterest expense stemmed largely from falling salaries expense relative to average assets indicating that employee productivity in generating assets more than offset rising salaries per employee. Actually, large Fifth District banks accounted for virtually all the improvement in the noninterest expense figure since small and medium banks experienced little change. While the average number of employees at large Fifth District banks declined by less than 1 percent, the number of employees per million dollars of assets at these banks fell by 12 percent. Similarly salaries per employee rose by 7 percent at large banks.

Nationwide the rise in noninterest income was partially offset by increased noninterest expense. Here is a continuing difference between Fifth District banks and their peers at the national level. A comparison of Tables I and II shows that noninterest income has remained flat in the Fifth District while continuing to increase nationwide over the last several years. By contrast, noninterest expense has risen persistently for all U.S. banks while the trend has been downward in the Fifth District. Last year (1987) was

Table III

**AVERAGE RATES OF RETURN ON SELECTED INTEREST-EARNING ASSETS
FIFTH DISTRICT COMMERCIAL BANKS, 1979-87**

Item	1979	1980	1981	1982	1983	1984 ²	1985 ²	1986 ²	1987 ²
Total interest-earning assets	10.09	11.28	13.18	12.68	11.11	11.77	11.06	9.78	9.25
Total loans and leases	11.25	12.50	14.48	14.14	12.38	12.59	11.92	10.63	10.05
Net loans and leases ¹	11.37	12.63	14.64	14.30	12.53	12.74	12.08	10.77	10.19
Total securities	6.43	7.15	8.57	9.27	9.20	9.68	9.01	8.30	7.61

¹ Net loans are: total loans net of allowance for loan losses for 1979-83; total loans and leases net of the sum of allowance for loan and lease losses and allocated transfer risk reserve for 1984-87.

² Total and net loans and leases here include leases while in other columns they do not.

Table IV

**AVERAGE COST OF FUNDS FOR SELECTED LIABILITIES
FIFTH DISTRICT COMMERCIAL BANKS, 1979-87**

Item	1979	1980	1981	1982	1983	1984	1985	1986	1987
Interest-bearing deposit accounts	7.15	8.68	10.63	9.91	8.19	8.72	7.89	6.77	6.12
Large certificates of deposit	9.96	11.33	14.35	12.05	7.62	9.47	7.91	7.07	6.65
Deposits in foreign offices	10.28	13.17	15.18	12.79	7.73	9.19	7.92	6.40	6.69
Other deposits	6.16	7.54	9.23	9.12	8.34	8.55	7.97	6.74	5.97
Subordinated notes and debentures	8.19	8.20	8.11	8.34	8.32	8.03	9.64	8.48	9.21
Fed funds	11.94	13.34	15.54	11.21	8.52	9.58	7.67	6.92	5.87
Other	6.98	8.65	13.49	11.29	8.75	9.18	6.73	5.19	7.34
Total	7.60	9.13	11.23	10.10	8.24	8.84	7.90	6.76	6.13

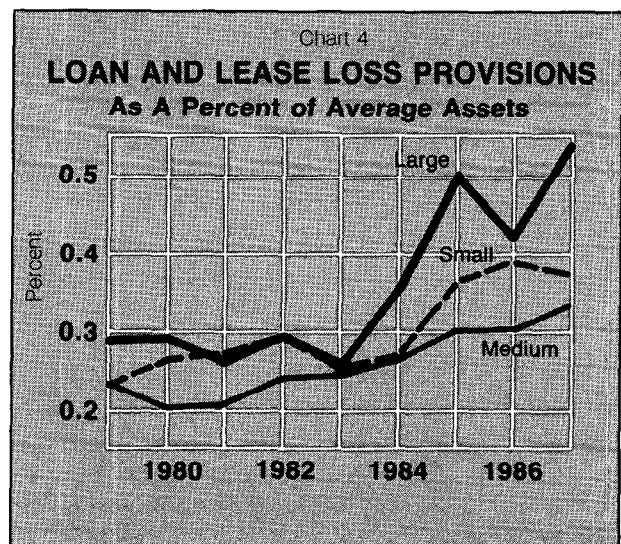
the first in which Fifth District noninterest expense dropped below the national average as a percent of assets.

Loss Reserves

Fifth District banks on average increased provision for loan and lease losses³ to .50 percent of average assets, the highest provision in the years covered by Table I. The 10 basis point increase during 1987 occurred mainly at large banks, while at small and medium-sized banks loan and lease loss provision relative to assets changed little compared with 1986 (see Chart 4). Increases occurred during the second and fourth quarters of 1987 and were greatest at banks with significant foreign loan exposures. The large increase in provision for loan and lease losses raised the allowance for loan and lease losses relative to total loans from 1.35 percent in 1986 to 1.41 percent in 1987 for all Fifth District banks on average. For large Fifth District banks the ratio grew from 1.40 percent in 1986 to 1.48 per-

cent in 1987. Allowance declined at medium-sized banks from 1.2 percent to 1.15 percent, and rose slightly at small banks from 1.13 percent to 1.15 percent.

Net charge-offs relative to total loans at medium and large banks rose to .38 percent and .59 percent,



³ Provision for loan and lease losses is the income statement flow magnitude that adds to the balance sheet stock item known as allowance for loan and lease losses.

respectively, while small banks' charge-offs declined to .42 percent. Charge-offs for the average of all Fifth District banks increased from .47 percent in 1986 to .55 percent in 1987. Loans classified as past due 90 days or more and those not accruing interest fell as a percent of total loans from 1.12 in 1986 to 1.11 in 1987.

At the national level, loan and lease loss provision relative to average assets increased by 48 basis points. Large banks were responsible for the increase. Allowance for loan and lease losses relative to total loans grew significantly from 1.64 percent in 1986 to 2.70 percent in 1987. Charge-offs relative to total loans declined for all U.S. banks, from .94 percent to .89 percent on average. Relative to total loans, loans past due 90 or more days or not accruing interest increased for U.S. banks from 2.77 percent to 3.49 percent, more than three times the average for the Fifth District.

Capital

Fifth District banks increased average regulatory capital ratios during 1987 (Table V). Both primary and total capital ratios grew for all three size groups. Increases at small District banks occurred in spite of a large decline in undivided profits, and were the result of additions to common stock, surplus,⁴ and allowance for loan and lease losses. Medium District banks increased capital ratios with additions to common stock and undivided profits. Large Fifth District banks' capital ratios increased because of minor changes in several of the items counted as regulatory capital. In fact, without a six basis point increase in allowance for loan and lease losses, the average total capital ratio of large District banks would have actually declined by three basis points. The effect of loss reserves on regulatory capital ratios is especially significant since their inclusion as capital has been questioned by many observers.⁵

At the national level the regulatory capital ratios grew much more quickly than for the Fifth District and were higher on average than those for Fifth District banks. Growth occurred in all size groupings in both primary and total capital. Far more than in the Fifth District, the nationwide increase in large banks' primary and total capital ratios was the result of higher allowance for loan and lease losses. Without the increase, the total capital ratio for large U.S. banks would have declined by 63 basis points. For

⁴ Surplus is the amount received from the sale of common or preferred stock in excess of par or stated value.

⁵ See for example David C. Cates, "Self-Review Is Answer to Unrealistic Capital Policy," *American Banker*, April 16, 1987.

Table V
CAPITAL RATIOS
FIFTH DISTRICT AND ALL U.S. COMMERCIAL BANKS

	1987			
	Small	Medium	Large	Total
Fifth District				
Primary ratio	10.39	8.83	6.98	7.53
Total ratio	10.43	8.85	7.27	7.76
Equity ratio	9.65	8.17	5.76	6.41
All U.S. Banks				
Primary ratio	9.46	8.19	7.33	7.75
Total ratio	9.50	8.36	7.74	8.07
Equity ratio	8.57	7.27	5.24	6.02
1986				
	Small	Medium	Large	Total
Fifth District				
Primary ratio	10.23	8.75	6.91	7.49
Total ratio	10.27	8.77	7.24	7.75
Equity ratio	9.40	7.93	5.63	6.31
All U.S. Banks				
Primary ratio	9.26	8.01	7.03	7.52
Total ratio	9.30	8.15	7.51	7.88
Equity ratio	8.32	7.00	5.53	6.17

Note: Primary capital here is common stock, perpetual preferred stock, surplus, undivided profits, capital reserves, mandatory convertible instruments, allowance for loan and lease losses, and minority interest in consolidated subsidiaries, less intangible assets. Total capital includes primary capital plus limited life preferred stock and those subordinated notes and debentures not eligible for primary capital. Equity capital is common stock, perpetual preferred stock, surplus, undivided profits, and capital reserves. Primary capital and total capital are divided by quarterly average assets plus allowance for loan and lease losses less intangible assets to produce primary ratio and total ratio. Equity capital ratio is equity capital divided by total assets. The primary capital and total capital ratios used here correspond closely but not exactly to the different measures used by the federal bank regulatory agencies.

small U.S. banks the majority of the increase came from increased allowance for loan and lease losses and surplus. For the average of all medium banks in the nation the increase in regulatory capital came from growth in common stock, surplus, allowance for loan and lease losses, and subordinated notes.

As an alternative to either primary or total capital, equity capital may be preferred as a capital measure because it does not include loss reserves. Rather, it consists only of common stock, surplus, undivided profits, capital reserves, and perpetual preferred stock. Using ratios of equity capital to total assets shows a different picture of how Fifth District banks performed relative to all banks. Specifically, Fifth District banks raised equity capital ratios from 6.31 percent in 1986 to 6.41 in 1987. As shown in

Table V, all three size classes increased equity capital. In contrast, for the average of all U.S. banks equity capital decreased, although the overall decrease conceals increases for both small- and medium-sized banks. Further, equity capital ratios for all three size classes remained higher in the Fifth District than at the national level. Thus, once loss allowance is removed from the capital measure the performance of Fifth District banks relative to their peers nationwide appears more favorable.

Change in retained earnings may have influenced capital levels through its effect on undivided profits. Specifically, retained earnings fell relative to average assets at Fifth District banks because of increased dividends and lower ROA. For example, large Fifth District banks increased dividends relative to assets from .33 to .48 percent. As a result, large banks' average retained earnings declined relative to assets by 29 basis points to reach a level of .35. Medium-sized Fifth District banks increased dividends relative to assets from .40 to .45 percent but only lowered

retained earnings by 4 basis points. Small banks increased dividends relative to assets from .39 to .44 percent but had a 17 basis point decline in retained earnings. At the national level banks raised dividends relative to assets from .33 to .36 percent. Since income relative to assets was only .11 percent, banks nationwide paid out more in dividends than they earned. Consequently, retained earnings on average were negative.

The behavior of retained earnings in 1987 exemplifies a dilemma facing bankers seeking to build up capital. On the one hand, increases in retained earnings add to equity. On the other hand, higher payouts may seem necessary to attract new equity investment. But current payouts are not investors' only consideration; also relevant are a bank's future prospects. Since retained earnings can be used to purchase income producing assets which augment the value of the bank, it is not clear that investors will invariably insist on receiving their income as current dividends rather than as capital gains or enhanced payouts in the future.

APPENDIX

BANK PERFORMANCE MEASURES BY FIFTH DISTRICT STATE—1987

(Percent)

	DC	MD	NC	SC	VA	WV
	SMALL BANKS					
ROA	0.09	1.12	0.66	1.02	1.21	1.03
ROE	0.89	12.47	6.43	9.41	13.35	11.36
Nonperforming loans & leases	1.17	0.78	1.02	1.28	1.01	2.00
Net charge-offs	0.82	0.22	0.30	0.41	0.43	0.53
Number of banks	8	47	34	54	122	145
	MEDIUM BANKS					
ROA	0.75	1.12	1.14	0.99	1.24	1.07
ROE	12.12	14.03	12.40	13.12	16.68	12.22
Nonperforming loans & leases	0.56	0.50	1.01	1.15	0.73	2.12
Net charge-offs	0.37	0.12	0.59	0.33	0.42	0.52
Number of banks	7	31	17	9	36	34
	LARGE BANKS					
ROA	0.23	0.73	0.96	0.91	0.88	1.12
ROE	4.70	11.76	16.99	14.66	15.98	16.18
Nonperforming loans & leases	1.70	1.22	1.00	1.44	0.87	1.02
Net charge-offs	0.50	0.64	0.53	0.59	0.66	0.38
Number of banks	5	11	10	5	9	1
	TOTAL					
ROA	0.28	0.80	0.96	0.93	0.97	1.06
ROE	5.43	12.21	16.24	13.48	15.71	12.00
Nonperforming loans & leases	1.54	1.09	1.00	1.39	0.86	2.00
Net charge-offs	0.49	0.55	0.53	0.54	0.60	0.51
Number of banks	20	89	61	68	167	180

Notes: Banks not operating at the beginning of 1987 are excluded from these totals. Nonperforming loans & leases are loans and leases past due 90 days or more and those not accruing interest, as a percent of total loans. Net charge-offs are loan and lease charge-offs, net of recoveries, as a percent of total loans.

THE FEDERAL RESERVE ACT OF 1913 IN THE STREAM OF U.S. MONETARY HISTORY

James Parthemos*

Cursory histories of United States money and banking usually link the origins of the Federal Reserve System to the panic of 1907, to the Aldrich-Vreeland Act of 1908, and to the monumental work of the National Monetary Commission established by that act. It is probably more revealing to interpret the original Federal Reserve System as a key stage in a process of monetary and banking experimentation that dates back to the beginnings of the nation.¹

The first 125 years of the nation's history were marked by sharp and often bitterly divisive controversies over money and banking arrangements. Much of the history of the period can be written around the divisions over the First and Second Banks of the United States, the free banking movement of the middle nineteenth century, the national banking system, the greenback and free silver movements in the post-Civil War period, the move toward an unambiguous gold standard in the 1890s, and the groundswell of reform sentiment at the turn of the century that culminated in the Federal Reserve Act. All these developments might properly be viewed as a fledgling nation's experimental efforts to establish a set of money and banking arrangements congenial to its unique circumstances and political values.

For better or worse, Americans of the nineteenth century showed little disposition to look to Western Europe for monetary precedents. While recognizing and reflecting the cultural legacy of Western Europe, American society had developed early in its history a strong sense of its many differences with the na-

tions of Europe. It harbored a general awareness of sharp differences in historical experience, in political and social values, in geography, and in economic potential. Given such differences, Europe was not to be emulated. Rather there seemed to be general agreement that the country had to work out its own solutions, consistent with its own political and social values and with the need to subdue a vast continental expanse of great potential. The legacy of the frontier did much to shape these social and political values. That same legacy placed a premium on individual initiative and fostered a pragmatic approach to public problems that contrasted with the rigid and often doctrinaire traditionalism that characterized much of Europe.

I. Political and Geographic Influences on U.S. Monetary Evolution

The principal factors affecting money and banking evolution in the nineteenth century were the nation's unique political values and its vast, untamed geographic expanse.

More than any other contemporaneous society, the United States of that period valued individual freedom and abhorred concentrations of power, private or governmental. These characteristics comprised an important element shaping the country's monetary experience. The political structure of the nation, a federation of quasi-sovereign states, reflected these values. Tension between the federal government and individual states figured importantly in the country's early efforts to establish a satisfactory payments system. For the first forty years of the new nation's existence the federal government, following Alexander Hamilton's carefully drawn blueprint, provided monetary and banking leadership. Crucial to this leadership, which ran from 1791 to 1833, with a five-year hiatus, 1811-16, were the First and Second Banks of the United States. These were quasi-governmental institutions, chartered by the federal government, with the issue privilege and empowered to act as fiscal agent for the United States

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¹ Monetary experimentation typified the colonial period as well, as the colonies sought to establish an adequate payments system. Banking and paper money schemes were important issues exacerbating relations with the mother country. See Horace White, *Money and Banking, Illustrated by American History* (Boston, U.S.A. and London: Ginn & Co., 1896), pp. 4-22, 248-58; A. Barton Hepburn, *A History of Currency in the United States with a Brief Description of the Currency Systems of All Commercial Nations* (New York: Macmillan Co., 1915), pp. 1-12; Leslie V. Brock, *The Currency of the American Colonies, 1700-1764* (New York: Arno Press, 1975), *passim*.

Treasury. Through branches located in the more settled centers of the country they operated nationwide. They were in position to monitor the note-issues of state-chartered banks and to enforce specie redemption of these notes.

These institutions fell afoul of strong states' rights sentiments and of the Jefferson-Jackson party's equally strong aversion to concentrations of power. The removal of the government's deposits from the Second Bank in 1833 and the negation of the Bank's fiscal agency powers mark a temporary end of federal government domination of banking arrangements. From 1833 to the Civil War period the individual state governments directed their own banking evolution, with no interference from the federal government. The federal government again assumed a dominant role in the Civil War period and in the decades that followed, asserting the right to charter so-called national banks and to use the taxation power to deny the note-issue privilege to nonnational institutions. Nevertheless state governments, through their undiminished authority to charter banks, were still exercising an important role in the country's monetary affairs on the eve of the establishment of the Federal Reserve System.

The country's vast geographic expanse, stretching by mid-century from ocean to ocean, was a second factor in its monetary evolution. Until late in the nineteenth century much of the country was sparsely settled. Especially in the period before the Civil War transportation and communication facilities were primitive and high-cost over large areas of the country. For such a broad, undeveloped area a payments system based on banks and bank liabilities was a practical necessity. For local payments bank notes, especially those of state-chartered banks, were the standard medium. In parts of the country, notably in New England, bank notes were used for intercity payments as well, owing largely to the so-called Suffolk System through which the notes of most New England banks were redeemed at par in Boston. Other states, notably New York, South Carolina, Louisiana, and later Indiana, had state-chartered or state-owned banks whose notes circulated widely at par. But in much of the country, especially in the newer states of the South and the West, efforts to establish a trouble-free bank note circulation encountered problems many of which were attributable to the sparseness of settlement, to high costs of transportation and communication, and to ineffectual bank supervision. Notes circulating at a distance from the issuing bank in many cases could be presented for redemption only at considerable cost

and therefore tended to go to a discount.² Some unscrupulous bankers deliberately located their offices with a view to maximizing the cost of presentments. The notes of these so-called "wildcat banks" invariably went to substantial discount. In any case, for much of the period between 1833 and 1860, and in much of the West and the South, lax bank supervision coupled with high transportation and communication costs produced a note circulation that was a confused hodgepodge of obligations of a large number of small banks, many of doubtful viability, circulating at various rates of discount.³

Neither bank notes nor specie were efficient means of mediating interregional trade, which became increasingly important as the frontier was pushed westward. In the pre-Civil War period interregional—and, in much of the South and West, intercommunity—payments involved the use of trade acceptances and bank drafts drawn on regional centers and were much like international payments. The business journals of the day regularly carried exchange quotations on New York, Chicago, New Orleans and other regional centers. In the West, in particular, private banks joined state-chartered banks in providing facilities for interregional payments.

For most of the country banking markets in that period were highly local and, except in New England, banking systems were confined within state boundaries. The climate of strong states' rights sentiments and popular suspicions of concentrations of power militated against nationwide, or even any significant

² Unless, of course, the point of issue enjoyed a favorable payments balance with the point at which the note was circulating. In that case a note circulating at a distance from the issuer could actually go to a premium. There are numerous instances in pre-Civil War America of notes of respected banks in the East circulating in distant parts at a premium.

³ The function of monitoring the note issues of state banks and enforcing convertibility was served in the earlier period by the First and Second Banks of the United States. In the absence of these institutions "note brokerage" emerged as a profitable private activity. Note brokers bought up notes at a discount and undertook the task of presenting them for redemption. Interestingly, note brokers were not a popular group in the business community and were often referred to pejoratively as "note shavers." For an account of this activity in the 1833-60 period see Davis R. Dewey, *State Banking Before the Civil War*, National Monetary Commission, Senate Document No. 581, 61st Congress, 2nd Session (Washington, D.C.: Government Printing Office), pp. 74, 107-12.

At that time periodicals called bank note reporters were indispensable equipment for businessmen. Such periodicals carried listings of current bank notes with their respective rates of discount or premia.

degree of interstate, branching.⁴ Given the predominantly local nature of banking markets, some degree of cooperation between banks in different regions of the country was necessary to effective payments arrangements. Out of this necessity grew a system of correspondent banking unique to this country.

The Civil War and the resulting constitutional changes radically altered the relationship of the federal government to the states and established the former's primacy in shaping the monetary order. Nevertheless state governments, through their authority to charter banks and to regulate state-chartered institutions, continued to exercise an important role in the country's monetary affairs. They played a leading role in setting branching restrictions and in developing arrangements for protecting depositors against bank failures.⁵ But control over the nation's monetary base passed definitively to the federal government after 1863. The so-called "dual banking system" that emerged after the war continued, however, to involve important tensions between the federal government and the states.

The vast expanse of the country continued to affect its monetary evolution even after the development of state-of-the-art transport and communications in the latter half of the nineteenth century. In that period of rapid economic growth, the number of banks multiplied quickly. Deposit banking grew apace and the use of the check in intercommunity and interregional payments became commonplace. The banking system was confronted with the problem of collecting an increasingly large number of checks drawn on an increasingly large number of out-of-town points, with many checks having to travel large distances. Long delays and high costs involved in collecting out-of-town checks, with the resulting magnified check float, represented an important deficiency in the payments system and in arrangements for the management of bank re-

serves in the period before the Federal Reserve was established.⁶

Finally, the continental expanse of the country embraced a diversity of resource patterns. As the frontier was pushed steadily westward, a corresponding diversity of regional interests emerged. Economic sectionalism, always a major factor in United States political history, figured importantly in the nation's money and banking history as well. Credit requirements of the several distinct regions were popularly viewed as being in conflict. Moreover, in the newer capital-short states of the South and the West, the natural tendency of the settled and more highly developed centers of the Northeast to provide financial leadership was viewed with suspicion. The "money monopoly" of the East, real or fancied, was often the focal center of political dialogue. It played a major role in the undoing of the First and Second Banks of the United States, in the free banking movement at mid-century and, in the post-Civil War period, in the greenback and free silver movements. It was a major factor in the dialogue leading to the passage of the Federal Reserve Act.

II.

Halting Movement Toward a National System

The pre-Civil War period of state domination of banking presents a variety of experiments in banking arrangements. All states at one time or another tried special charter banking. Some states experimented with outright state ownership and operation of state institutions. A few states for a time even outlawed banking. The Suffolk System in New England and the Safety Fund System in New York were successful experiments in note-issue banking. In the 1850s virtually all states adopted free banking, involving general laws of incorporation under which entry into banking was open to any who met specified conditions. These included a requirement that all notes issued be secured fully by state bonds or other specified assets. This free banking principle was later incorporated into the National Banking Act of 1863.

The essential point here is that this was a period of experimentation, with experiments in individual states often having more destabilizing than stabilizing effects. Nor did the experimentation end following the Civil War reforms. Rather the focus of it, like the authority over money and banking matters, shifted towards the federal government. For the

⁴ There were, however, some cases of multistate banking. The most notable case is that of the Wisconsin Marine and Fire Insurance Company, which was a bank in everything but name. Its notes, which came to be called "George Smith's money" (after the company's founder), circulated over much of the present-day Midwest in the 1840s and 1850s. Smith maintained offices in Milwaukee, Chicago, Detroit, St. Louis, Buffalo, and Galena for purposes of redeeming these notes either in specie or New York exchange. His company was chartered first in Wisconsin. When that charter expired Smith, after some difficulty with the Wisconsin legislature, operated under a charter issued by the Georgia legislature. See Horace White, *op. cit.*, pp. 387-94.

Banking was prohibited in some states and in these states notes of out-of-state banks were frequently introduced through agents.

⁵ See Eugene Nelson White, "State-Sponsored Insurance of Bank Deposits in the United States, 1907-1929," *Journal of Economic History* 41 (September 1981): 537-57.

⁶ See *infra*, p. 23.

fifty years following passage of the National Banking Act, periodic banking crisis tended to call forth adjustments in banking and currency laws that were more in the nature of patchwork than reform. In the case of both the state and the federal governments, the nature of the experimentation was often dictated more by political pressures than reasoned economic analysis. As one observer, writing in the middle 1890s, noted:

It is safe to say that at some time in the history of this country nearly every theory evolved in connection with the business of banking has been tried and its development attempted. It is equally true that at all times in the country's history, in all sections of it, and among all classes false principles of monetary science and bad practices in finance have without exception resulted disastrously to all concerned.⁷

For the entire century, trial and error, as it were, were the order of the day, leading frequently to serious, though usually short-lived, monetary disturbances.

Experimentation was directed, for the most part, toward establishing a banking and currency system free of the tendency to periodic crises. But there were also problems with the monetary standard and the coinage system that remained unsolved for a century after the adoption of the Constitution. The first Congress adopted a bimetallic standard, passed a coinage act, and provided for the establishment of the United States Mint. Yet until the middle of the nineteenth century, coins of foreign mintage constituted a large fraction of the country's metallic money. A truly national gold coinage system was established by the middle 1850s, following the large influx of gold from California mines.⁸ But the larger gold supplies made

problems for the bimetallic standard. The silver coinage was reduced to subsidiary status in 1853 but became the focus of new sectional controversy following large new silver discoveries in the years following the Civil War. Large new gold discoveries in the 1890s put an end to the agitation over silver and finally led to the formal adoption of the gold standard in 1900. The coinage system, including the fractional denominations that are familiar today, was not firmly established until nearly a century after passage of the first coinage act.

A uniform bank note circulation current in all parts of the country was not achieved until passage of the National Banking Act in 1863. This act established the office of the Comptroller of the Currency to issue bank charters under specified conditions and to supervise the institutions so chartered. These national banks, so called, were authorized to issue circulating notes against collateral of government securities.⁹ The levy in 1866 of a 10 percent tax on the notes of state-chartered institutions effectively gave national banks a monopoly of the circulating privilege. From that year until the establishment of the Federal Reserve System national bank notes comprised a key component of the nation's chief currency.

These notes, gold certificates, and the greenbacks issued in the Civil War period constituted the currency of the immediate post-Civil War years. But the slow growth in the money stock in the 1870s, coupled with rapid economic growth, led to a secular deflation that soon produced strong popular movements for monetary expansion, the greenback and free silver movements of the 1870-95 period. The first of these movements succeeded in ending the progressive redemption of the Civil War greenbacks, leaving \$347 million of these as a permanent part of the circulation. The second led to passage of two silver purchase acts and the issue of some \$500 million of silver dollars and silver-backed U.S. Treasury notes.

At the turn of the century, the nation's currency comprised national bank notes supplemented by fixed quantities of United States notes and Treasury notes of 1890. A gold redemption fund was held by the Treasury against the U.S. notes. The Treasury notes of 1890 were backed dollar for dollar by silver and were, in effect, silver certificates. Gold certificates, backed dollar for dollar by gold coin, also circulated. A uniform circulation was at last in place, with all

⁷ U.S. Treasury, *Annual Report of the Comptroller of the Currency*, 1896, vol. 1, (Washington: Government Printing Office, 1896), p. 36. For a discussion of the "unscientific" nature of the efforts at monetary and banking reform before 1908 see Henry Parker Willis, *The Federal Reserve System: Legislation, Organization and Operation* (New York: Ronald Press, 1923), pp. 4-21. For continued experimentation by state governments see Eugene Nelson White, "State-Sponsored Insurance of Bank Deposits in the United States, 1907-1929," loc. cit., pp. 537-43.

⁸ *Reports of the Secretary of the Treasury of the United States*, 1845 (Washington, D.C.: Printed by John C. Rives, 1851), vol. 5, pp. 18-20. Hereinafter cited *Reports of the Secretary of the Treasury* with appropriate year. See also vol. 6, pp. 9-10.

It should be noted that in the 1840s gold and silver coins moved freely in foreign trade. There was always a good probability that gold coin arriving in this country would be shipped out again before long. Hence there was an understandable reluctance to recoining foreign coins. Secretaries of the Treasury in the 1840s and 1850s urged recoinage and sought establishment of a mint at New York City, where most foreign coin arrived, to facilitate "Americanization" of the gold coinage. See *Reports of the Secretary of the Treasury* for the years 1845-55.

For a contemporary's description of the coinage circulating in the western states before the California gold discoveries see Hugh McCulloch, *Men and Measures of Half a Century* (New York: Charles Scribner's Sons, 1900), p. 119.

⁹ Initially, the collateral requirement called for \$100 of securities backing \$90 of notes. This was later reduced to a dollar-for-dollar backing. See A. Barton Hepburn, *A History of Currency in the United States* (New York: Macmillan Co., 1915), pp. 308-9.

**National and State Banks and Deposits,
1870-1910**

	National Banks		Nonnational Banks	
	Number	Deposits (mil. dol.)	Number	Deposits (mil. dol.)
1870	1,612	1,566	325	215
1880	2,076	2,036	1,279	1,364
1890	3,484	3,062	4,717	3,296
1900	3,731	4,944	9,322	6,444
1910	7,138	9,892	18,013	13,030

Source: *Historical Statistics of the United States*, 1975, pp. 1025-27, 1028-30.

forms of money required by law to circulate at parity with gold.

The banking industry changed drastically in the decades following the Civil War. The number of banks multiplied rapidly to keep pace with accelerating economic and population growth as the frontier was pushed steadily westward. Banks chartered under the National Banking Act accounted for most of the banking expansion in the early postwar years, largely because of their legislated monopoly on note issue. But state banks adapted by emphasizing deposit banking, which soon submerged note-issue banking in importance. While the numbers and total deposits of both national and nonnational banks increased sharply between 1880 and 1910, the latter group grew more rapidly by a considerable margin and by 1910 accounted for more than 50 percent of total deposits.

Banks in both groups were required to hold minimum legal reserves. For nonnational banks, the legal requirements were governed by state laws and varied from state to state. The National Banking Act established a system of reserve requirements for national banks, which for reserve purposes were classified as country, reserve city, and central reserve city banks. Country banks were allowed to hold up to 60 percent of the required reserve on deposit with reserve city or central reserve city banks. Similarly reserve city banks were allowed to hold half of the required reserve with central reserve city banks. New York, Chicago, and later St. Louis, were designated as central reserve city banks. The number of reserve cities increased from 13 in 1880 to 28 in 1900 and 46 in 1910, reflecting the rapid growth of the country and of the number of banking institutions. Some

part of the reserves of nonnational banks were also held as deposits with reserve city and central reserve city banks.¹⁰

On the eve of the establishment of the Federal Reserve System the nation was served by more than 25,000 banking institutions. Included in this number were commercial banks, both state and national, mutual savings banks, trust companies, and private banks. For most of these institutions markets were primarily local, although correspondent connections provided limited entry to other markets. Banks in the reserve cities and central reserve cities operated clearinghouses, some of which were in position to render limited central bank services to banks over a limited market area. Supervision of this large multitude of institutions, at the federal as well as the state level, was of questionable effectiveness.¹¹

The U.S. Treasury, through its Independent Sub-Treasury System, could influence banking and credit markets and often performed important central banking functions. It systematically moved funds between the subtreasuries and the banking system to affect credit conditions and especially to meet seasonal credit demands in agricultural areas. It sometimes made advance payments of interest and principal on outstanding government bonds by way of relieving pressures on money market banks. It handled the issue and redemption of U.S. notes and Treasury notes of 1890 and supervised the issue and redemption of national bank notes. It was custodian and manager of the nation's gold reserve and was empowered to buy and sell government securities incident to the maintenance of this reserve within legally specified limits.¹²

¹⁰ See *Annual Reports of the Comptroller of the Currency*, 1880, p. CXVI; 1900, p. 356; 1910, p. 250 and footnote.

¹¹ The Comptroller of the Currency had broad authority over national banks and required regular reports of them. Neither he nor the Secretary of the Treasury were in position to monitor effectively the reserve base of the banking system. Comments of bankers operating under national charters before 1914 suggest that the Comptroller and the Secretary were the functionaries who really controlled national bank activities and that they could at times be heavy handed. But bankers always had the option of shifting to state charters and this option no doubt had a moderating effect on the federal regulators. Comment at the time of the establishment of the Federal Reserve often implied that bankers preferred regulation by the seven-man Federal Reserve Board to the two-man arrangement existing before 1914.

¹² Esther R. Taus, *Central Banking Functions of the United States Treasury, 1789-1941* (New York: Columbia University Press, 1943). Taus writes: "... [The U.S. Treasury's] powers frightened cautious businessmen and contributed to the establishment in 1913 of an organization which was intended to handle exclusively the central banking functions previously assumed by the Treasury," p. 98. See also Milton Friedman and Anna J. Schwartz, *A Monetary History of the United States, 1867-1960* (Princeton, N.J.: Princeton University Press, 1963), pp. 149-52.

III. Perceived Deficiencies in the Pre-Federal Reserve Arrangements

Contemporary critics found serious deficiencies in both the currency and the banking arrangements that existed at the turn of the century. The currency was deemed to be "inelastic," that is incapable of variation as required to meet the changing needs of trade. The banking system was considered to be inadequately supervised and to suffer from seriously defective reserve arrangements. Arrangements for clearing and collecting interbank claims were widely viewed as impeding the development of an efficient payments system and promoting abuses in bank practices.

Of the principal currency types, the quantity of U.S. notes was fixed. The silver component could be increased only by act of Congress. The gold component was at the mercy of the balance of payments. Increases in the national bank note circulation were limited, though loosely, by the outstanding volume of appropriate government securities. These were the characteristics that gave rise to the criticism that the currency was incapable of variation to meet the needs of trade.¹³ This criticism was not always separable from that focusing on the vulnerability of the banking system to recurring panics. To some observers "inelasticity" consisted in the system's inability to accommodate a significantly heightened demand for currency without producing monetary contraction and serious problems for many banks.

Contemporaneous criticism of the system of reserves was not always consistent. Some critics complained of the scattering of reserves over numerous reserve cities, while others complained of the concentration of reserves in New York.

Much discussion centered around the so-called "pyramiding" of reserves and certain abusive practices resulting from city bank competition for correspondent balances. Critics noted that a country bank's reserve balance at a reserve city bank, when redeposited by the latter at a central reserve city, actually served as a legal reserve for both the country and the reserve city bank. In that fashion reserves were "pyramided" and the banking system's lawful money¹⁴ reserves were less than the reserves shown on the books of banks. The alleged overconcen-

tration of reserves in New York was widely viewed as a source of volatility in money markets, especially precarious when large interregional transfers of funds within the banking system had to be made.¹⁵

Considered equally serious was the effect on reserves of banking practices that developed in connection with the handling of out-of-town checks through city correspondents. By the turn of the century, competition among city correspondents for the accounts of country banks led many of the former to offer collection services for respondents. Among the inducements offered was immediate credit for items sent for collection. In the absence of effective reserve monitoring, country banks often counted as reserves checks en route by mail to a reserve city correspondent serving as its reserve agent. In like fashion, the reserve city bank would send some of the same checks to its central reserve city, counting them as reserves as soon as they were in the mail. Thus the same check in transit often served to meet the reserve requirements of both the country and the city bank and stated reserves appear to have included large amounts of uncollected funds.

Other questionable banking practices characterized the system for collecting out-of-town checks. Collection entailed costs and to cover these, banks sometimes levied direct collection charges. Many smaller ones levied exchange or remittance charges through remitting less than the face value of presented checks. In the context of the time out-of-pocket costs could frequently be reduced—though real costs increased—through a variety of interbank arrangements that had the effect of delaying presentation, often through highly circuitous and uneconomic routing.¹⁶ As a result, the outstanding check float at any given time was far greater than it needed to be.

IV. Structuring the Remedies

Among serious students of monetary affairs sentiment for basic reform in the currency and the banking system was strong even before the panic of 1907.

¹⁵ See *Annual Report of the Comptroller of the Currency*, 1914, vol. 1, pp. 8-10.

¹⁶ For a discussion of check collection practices and problems in the pre-Federal Reserve period see Walter E. Spahr, *The Clearing and Collection of Checks* (New York: Bankers Publishing Company, 1926), pp. 96-130. See also Pierre Jay, "The Country Banker and the Federal Reserve System," a speech at a banquet given by the Jefferson County National Bank, Watertown, N.Y., April 17, 1916. In Federal Reserve Bank of Richmond Archives. Jay was the first chairman of the board of directors of the Federal Reserve Bank of New York.

¹³ For a discussion of two interpretations of the term "inelasticity" as applied to the currency of the time see Friedman and Schwartz, *op. cit.*, pp. 168-69.

¹⁴ Lawful money was defined to include gold and silver coin, greenbacks, silver certificates, gold certificates, and Treasury notes of 1890.

The twenty years preceding that episode had produced a rich ferment of ideas for reform.¹⁷ The panic of 1907 crystallized reform sentiment and gave it a strong popular base, making a basic overhaul of currency and banking arrangements virtually inevitable. The issue moved quickly into the political arena, there to be shaped into a reform package designed to meet political as well as economic tests. The National Monetary Commission, established by the Aldrich-Vreeland Act, produced a massive 23-volume study of banking, both here and in advanced foreign countries, which provided the economic input deemed necessary for rational reform.

From the political standpoint, the widespread suspicion of the existence of a sinister "money trust" had to be mollified, but without sacrificing the support and the skills of professionals in the financial community. Shifting of power in the banking system from large banks and clearinghouse associations to the federal government, while desirable, had to be limited and engineered with caution. The role of state governments had to be respected. Strong sectional feelings regarding real or fancied regional credit needs of a unique and often conflicting nature had to be satisfied. Popular antipathies to Europe's monolithic style of central banks had to be accommodated. In brief, peculiarly American political and cultural values placed restrictions on reform that sometimes took precedence over state-of-the-art economic logic.

The intensified reform dialogue after 1907 produced finally, and after several iterations, the Federal Reserve Act, passed in December 1913. The title of the act emphasizes the economic problems confronted: An act to provide for the establishment of Federal Reserve Banks, to furnish an elastic currency, to afford means of rediscounting commercial paper, to establish a more effective supervision of banking, and for other purposes. The "other purposes" were concerned with improving the payments system through more efficient collection and clearing of checks and with the provision of fiscal services to the U.S. Treasury. The detail of the act, however, clearly reflects the framers' deferences to prevailing political values.

The act provides for the division of the country into no more than twelve and no fewer than eight Federal Reserve Districts, with a Reserve Bank located in each. Division of the country into districts recognized the existence of differing regional interests. It also represented an attempt to effect a regional as opposed to a centralized deployment of

the banking system's reserves and to set up machinery for efficient clearing and collection of interbank claims. Avoidance of a monolithic central bank in the style of European countries was also a consideration.

The Reserve Banks were incorporated under charters issued by the Comptroller of the Currency. The act prescribed a minimum capital of \$4 million, to be subscribed by member commercial banks. National banks were required to become members of the new reserve system and to purchase stock of the Reserve Banks of their respective districts.¹⁸ Membership for state banks was made optional, reflecting the framers' respect for state governmental authority. As the System took form, member banks emerged as the sole owners of the stock of the Reserve Banks,¹⁹ but their ownership and management rights were closely circumscribed. Their right to share in Reserve Banks' earnings was limited to a cumulative dividend of up to six percent on their holdings of Reserve Bank stock.

Arrangements for managing the individual Reserve Banks were specified in detail in the act and reflect further limitations on ownership rights. Management was put in the hands of a board of directors of nine persons, grouped in three separate classes of three persons each: Class A to represent the stock-holding member banks of the district; Class B to represent the commercial, agricultural, and industrial interest of the district; Class C to represent the broad public interest. The act provided for election of Class A and Class B directors by the member banks, which themselves were divided into three size classes, large, middle size, and small,²⁰ with each size class electing one class A and one class B director.

The power to appoint the Class C directors was vested in the Federal Reserve System's chief coordinating body, the Federal Reserve Board. One Class C director was designated chairman of the board and Federal Reserve Agent. A second was designated deputy chairman and deputy Federal

¹⁷ For an account of the dialogue and proposals in that period see Willis, *op. cit.*, pp. 3-23.

¹⁸ A member bank was required to subscribe to the capital stock of its Reserve Bank in an amount equal to 6 percent of its paid-up capital and surplus. Initially only half of this was paid in, with the other half remaining on call. The act also provided for adjustment of the capital stock subscription as the members' capital and surplus grew. See Willis, *op. cit.*, pp. 1674-75.

¹⁹ The act provided for sale of Federal Reserve Bank stock to the public and to the U.S. government in case the minimum \$4 million capital could not be raised through member bank subscriptions. Such sales never became necessary. *Ibid.*, p. 1669.

²⁰ The act provided for division of the member banks into three groups "of similar capitalization," that is on the basis of capital and surplus, with approximately equal numbers in each group. *Ibid.*, pp. 1672-73.

Reserve Agent. The Class C directors were thus the direct representatives of the Federal Reserve Board in the management of the individual banks. The act provided that no officer, director, employee, or stockholder of a commercial bank could serve as a Class C director and no officer, director, or employee of a commercial bank could serve as a Class B director. The term of office for directors was made three years.²¹ Such detailed specification of the composition of the boards of directors reflects efforts of the framers of the act to ensure against domination by any interest group and especially by large banks.

To supervise and coordinate the activities of the Reserve Banks, the act established the Federal Reserve Board, consisting of the Secretary of the Treasury and the Comptroller of the Currency serving *ex officio* and five members appointed by the President with the approval of the Senate. No more than one of these five members could be selected from any one Federal Reserve District and the President was further required to choose them with "due regard to a fair representation of the different commercial, industrial and geographical divisions of the country." This seven-man body, to be chaired by the Secretary of the Treasury, provided a degree of centralization under federal authority, although it was envisaged that the Reserve Banks would act with a high degree of autonomy in meeting regional credit and currency requirements.²²

While the framers of the act were careful to guard against banker domination, they were equally careful to encourage constructive participation in the new arrangement by the big city bankers. The latter group was amply represented in the give-and-take that shaped the specific provisions of the act. Yet many—perhaps most—remained especially skeptical of the significant shift of authority over banking to the federal government.²³ As a concession to this group, the act established the Federal Advisory Council

consisting of prominent bankers, chosen one to a Reserve District by the Reserve Bank directors. Envisaged for this council was a purely advisory role.

The framers of the act were confident that the new system would eliminate definitively the basic defects in the old arrangements. A new national currency, Federal Reserve notes issued by the Reserve Banks, would supplant the "inelastic" national bank notes and provide the necessary variability to meet the changing needs of trade. These notes were made obligations of the federal government as well as the issuing Reserve Bank. They were to be issued against a 40 percent gold reserve and a 100 percent collateral of specified types of commercial paper that were eligible for rediscount at the Federal Reserve Banks. The theory here was that linking the Federal Reserve note issue to eligible commercial paper, which presumably reflected the variations in trade volume, would ensure that the note issue would vary with the "needs of trade."²⁴ Hence the problem of the "inelastic" currency would be solved.

Similarly the redeployment of the banking system's reserves in a few regional centers, along with other changes in reserve arrangements, was viewed as at once eliminating the problem of "pyramided reserves," allowing close monitoring of the quality of reserves, and putting the Reserve Banks in position to serve regional credit and currency requirements. The act reduced reserve requirements for all classes of member banks but provided that, after a transition period, reserves were to be held as cash in vault or deposits in the district Federal Reserve Bank, divided equally between these two.²⁵ Such a deployment of reserves, coupled with the Reserve Banks' authority to rediscount each others' paper, was thought to ensure that the banking system's reserve base could quickly be mobilized to meet extraordinary banking pressures in particular geographical regions. Moreover such a deployment of reserves was designed in part to place the Reserve Banks in position to be efficient collectors of interbank claims and, ideally, to serve as an effective clearinghouse for the entire banking system. Hence a solution was provided for the multiplicity of problems arising from the old system of clearing and collecting out-of-town checks.

²¹ In keeping with the principle of regionalism, directors were required to meet requirements of residency in their respective districts. *Ibid.*

²² The virtual autonomy of the boards of directors of the regional banks in managing the discount function under broad guidelines issued by the Federal Reserve Board was repeatedly emphasized. See, for example, "Truth About the Federal Reserve System," Speech of Hon. Carter Glass of Virginia in the Senate of the United States, January 16 and 17, 1922 (Washington 1922), pp. 8-9. In Federal Reserve Bank of Richmond Historical Collection RG 1:2, Box No. 3.

²³ Willis, *op. cit.*, pp. 385ff. See also *The Intimate Papers of Colonel House, Arranged as a Narrative by Charles Seymour* (Boston and New York: Houghton Mifflin Company, 1926), pp. 160-66. See also "Truth About the Federal Reserve System," Speech by Glass, *loc. cit.*

²⁴ This so-called commercial loan theory or real bills doctrine was a basic principle underlying the money functions of the new system. The essential fallacy in the doctrine was that note issue would also vary with the price level as well as the real volume of trade. Thus its operation would be inherently inflationary or deflationary. See Friedman and Schwartz, *op. cit.*, pp. 191-92.

²⁵ Later amendments to the act provided for holding of all legal reserves with the Federal Reserve Banks.

Since reserve arrangements and the "inelastic" currency were widely viewed as the causes of recurring banking panics, the currency and reserve reforms were deemed to provide insurance against such panics. Working toward the same end was the provision of the act strengthening bank examination practices and procedures. The benign coordination of the Reserve Banks' operations by the Federal Reserve Board was expected to provide added insurance.²⁶

V.

Central Bank or Central Banking System?

The original Federal Reserve System was the product of a uniquely American political process confronting a pressing need to remove systemic defects from the nation's money, banking, and payments arrangements. It was forged as a politically feasible solution to the interrelated problems of an unsatisfactory currency, deficiencies in the payments and banking systems, and recurring financial panics.

As in most political settlements, the chief feature of the act passed in December 1913 was compromise. To an important extent both regionalism and centralization were accommodated. The act incorporated a clear intent to serve regional interests but in the context of a greater degree of centralized coordination than had existed before. Provision for management of the Reserve Banks reflects an effort to harmonize borrower and lender interests while recognizing a higher public interest that was a proper concern of government. The authority of the federal government over the banking industry was enhanced but in a manner that avoided confrontation with state governments. While the shift of power away from the large money center banks encountered strong resistance, a compromise satisfactory to the private banking sector was worked out. The highly structured system it envisaged left room for a limited private sector participation in the discharge of a key public function. It came to be referred to as a quasi-private, quasi-public system although it is clear that the public feature predominated.

It is an interesting fact that the framers of the original system studiously eschewed the term "central bank," presumably for fear that the term may play on popular suspicions of centralized control over the

nation's money and credit.²⁷ For the most part their commentaries on the System emphasized its primarily regional nature and limited Federal Reserve Board control over the rediscounting and currency issuing operations of the regional Banks. Much was also made of the provisions of the act that required that Reserve Bank directors, even those appointed by the Federal Reserve Board, be residents of their respective Federal Reserve Districts and therefore sensitive to peculiar regional needs.

Yet the act clearly envisaged a significant enhancement of centralized authority over the nation's money, banking, and payments systems. It gave the Reserve Banks a monopoly of the issue privilege and made the U.S. government a guarantor of the banks' notes. It made the Federal Reserve System the custodian of the banking system's reserves with authority to monitor the reserves of individual member banks. It vested in the System the power to set the terms on which rediscounting would be available to member banks. The Reserve Banks were given the authority to engage in open market operations in gold and in a variety of domestic credit instruments and foreign exchange. The act clearly envisaged a more effective system of federal bank examinations than had existed heretofore, with the System sharing that function with the Comptroller of the Currency. Finally, it was clearly envisaged that the Federal Reserve Board would become a major participant in the custodianship and management of the nation's gold reserve. In view of such a concentration of functions and powers in the new system, the denials of some of its chief architects that it was a central bank must be interpreted as emphasizing the diffusion of these powers over the System's thirteen units and the fact that the System was uniquely different from its foreign counterparts.

The system that was put in place in 1914 was not, and was not intended to be, a finished product. While confident that the deficiencies in the old system had been eliminated, the founders recognized that the dynamic of the U.S. economy would in time require adjustments. Indeed many minor amendments in the enabling legislation were made in the first few years of the System's life. The trials the System confronted in the 1929-33 period dispelled the founders' optimism that sharp financial disturbances were things

²⁶ Glass, Harding, and Williams frequently stated publicly that the new system virtually guaranteed that there would be no more panics. See, for example, Richmond, Va. *News Leader*, May 14, 1914, p. 1. See also "Truth About the Federal Reserve System," Speech by Glass, loc. cit.

²⁷ See, for example, "Truth About the Federal Reserve System," Speech by Glass, loc. cit. See also "The Federal Reserve System, What it is and What it is Not," Address by W.P.G. Harding, Governor, Federal Reserve Board, at the 'Made-in-Carolinas' Exposition at Charlotte, N.C., September 22, 1921. Published by the Federal Reserve Bank of Richmond, September 1921, p. 4. Federal Reserve Bank of Richmond, Historical Collection, RG 1:2, Box No. 3.

of the past. These led to a major overhaul of the System in the mid-1930s. The major reforms of that period, along with further important amendments since that time, have produced a system fundamentally different, both in structure and in approaches to money and credit control, from the original. Since the reforms of the 1930s, in particular, the System has become undeniably a central bank or, more precisely, a central banking system.

The System today retains, however, sufficient vestiges of its pristine form to continue to be described as unique among the world's central banks. In particular, in the face of increased centralization of power in the System since the 1930s, the regional Reserve Banks continue to play an important role. Their operations are crucial to the maintenance of an efficient payments system for the country. Their

information services constitute useful inputs into decisions of businesses large and small and by governments. Their role in monetary policymaking today differs considerably from what was envisaged in the original act but is no less significant. Rather it has been restructured to bring it into closer conformity with radically revised views regarding techniques of monetary and credit control. The directorates of the Reserve Banks continue to take the initiative in setting the discount rate. More important, the executive heads of the Reserve Banks, now styled presidents instead of governors,²⁸ serve actively on the Federal Open Market Committee, the System's chief policymaking body.

²⁸ Since 1936 the Federal Reserve Board has been named the Board of Governors of the Federal Reserve System and its members are now called "governors."