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A report on monetary policy and open market operations in 1980 begins on page 56.

An interim report of Treasury and Federal Reserve foreign exchange operations for the period February through April 1981 starts on page 76.

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Recent Instability in the Demand for Money

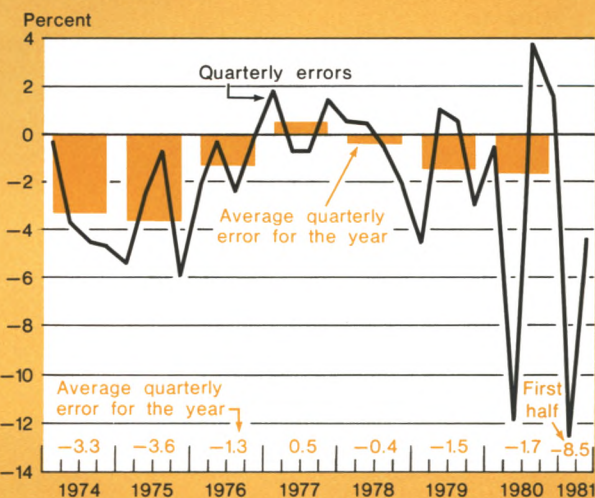
In the mid-1970s (1974 to 1976) the growth of the narrow money stock became very weak relative to what would have been expected from past relationships of money to income and interest rates. Money growth averaged about 2¾ percentage points less than expected during that period.¹ For the next two years, 1977 and 1978, the simulation from the money demand equation tracked the actual performance of the money stock very well, suggesting the return of stability in the demand for money (Chart 1). Since 1979, however, the overpredictions once again have become very large (3.0 percentage points on average). But, in contrast to the 1974-76 period, the shift since 1979 has tended to be concentrated largely in just three or four quarters rather than as a series of more moderately sized errors.

In the first quarter of 1979 and second quarter of 1980, the large negative errors in growth rate terms did not appear to mark the beginning of another protracted shift in the money demand equation. Indeed, following the large error in the second quarter of 1980, some sizable *underpredictions* of money growth occurred in the second half of the year. For the first quarter

of 1981, it is too early to know whether the large overprediction of money growth will be followed by several

Chart 1

**Errors from the Money Demand Equation--
Quarterly Growth Rates of M-1B Adjusted*
less Predicted**



*See box for definition of this series.

Source: Table 1.

¹ Extensive economic research was done on "why the money demand equation shifted" without any definitive solutions being found. A comprehensive review of this research can be found in Stephen Goldfeld, "The Case of the Missing Money", *Brookings Papers on Economic Activity* (1976:3). More than just one model of money demand exists. For the purposes of this article, the money demand equation refers to the conventional form used by Goldfeld in which real money balances are expressed as a function of a short-term market interest rate, the interest rate on savings deposits, real income, and lagged real money balances. The box contains a more detailed discussion.

Determinants of the Demand for Money

The "demand for money" in its basic form is an expression relating the public's desired holdings of money balances to a measure of the volume of transactions in the economy—usually gross national product (GNP)—and the opportunity cost (interest income foregone) of holding money balances (often measured by a short-term interest rate). An increase in the volume of transactions causes the demand for money balances to rise, while an increase in interest rates raises the cost of holding money balances, resulting in a reduction of money holdings. In this article, a commonly used specification is employed to examine the stability of the demand for money (footnote 1). The principal determinants are shown in the table below. Constant-dollar

GNP per capita is used as the measure of transactions, and the opportunity cost of holding money balances is represented by the three-month Treasury bill rate and the commercial bank passbook (savings deposit) rate. A lagged dependent variable is also incorporated because the public's adjustment of actual money balances to the desired level resulting from a change in income or interest rates occurs gradually over time, not entirely in the same quarter as the change in income or interest rates. The estimated equation is shown in the table. The period from 1959-II to 1973-IV was used because the recomputation of the aggregates on the basis of the new definitions begins in 1959 and money demand equations have been unstable in the post-1973 period.

Estimated narrow money demand equation, 1959-II to 1973-IV

In logarithmic form

Dependent variable	Independent variables									
$\frac{M}{P.N}$	=	$\frac{-0.11}{(0.4)}$	+	$\frac{0.097}{(4.0)**} \left(\frac{Y}{P.N} \right)$	-	$\frac{0.011}{(2.3)*} (RTB)$	-	$\frac{0.022}{(1.4)} (RCBP)$	+	$\frac{0.728}{(7.3)**} \left(\frac{M(-1)}{P.N} \right)$

Summary statistics: RHO = 0.52; S.E.E. = 0.0043; $\bar{R}^2 = 0.93$.

Variables:

M = M-1B less the portion of other checkable deposits estimated as coming from sources other than demand deposits, primarily savings deposits. This adjustment was made to obtain a more accurate measure of transactions balances. "M-1B adjusted" is used throughout this article.

P = GNP deflator.

N = Population.

Y = Nominal GNP.

RTB = Three-month Treasury bill rate.

RCBP = Commercial bank passbook rate.

M (—1) = M lagged one quarter.

$\frac{Y}{P.N}$ = Real per capita GNP.

$\frac{M}{P.N}$ = Real per capita money balances.

Figures in parenthesis are t-values; * indicates significance at the 95 percent confidence level, ** at the 99 percent confidence level. The equation was estimated using the Cochrane-Orcutt method.

quarters of negative errors or whether some offsets will occur later in the year as in 1980. However, based on still preliminary gross national product (GNP) data, a sizable negative error for the second quarter of 1981 also appears likely and, barring any substantial revisions to the GNP statistics, the first half of 1981 would contain the largest two-quarter overprediction of money growth in the post-1973 period, averaging about 8½ percentage points.

The question of how much the money demand equation might shift is of crucial importance for monetary policy. If a downward shift in money demand occurs, perhaps reflecting financial innovation (new means of managing cash balances that enable individuals and corporations to undertake the same level of transactions with lower money holdings), then the Federal Reserve's monetary targets would need to be lower to be consistent with the goal of moderating inflationary pressures. In the next section, the shift in the money demand equation will be examined in more detail, and in the final section some of the explanations for this shift are reviewed. The technical analysis that follows is not necessary for reading the final section. The box contains a description of the conventional money demand equation used in this article.

Econometric results

To put the overall performance of this money demand equation into perspective, quarterly dynamic simulations were run for each year from 1960 to 1980. That is, in the first quarter of each year the simulation was started by using the actual value of the lagged money stock, while the predicted values generated from the equation were used in the final three quarters. Beginning in 1975, the equation was put "back on track" each year by adjusting the constant term for the money demand shift from the previous year.² For 1981, data for only the first two quarters are available, so that the equation was simulated for just the first half of the year. Successive one-year periods were used in the simulations because of the current policy focus on one-year targets. The errors (actual less predicted values) in growth rate terms are shown in Table 1 as well as the average and root mean squared prediction errors (RMSPE) for the periods 1960 to 1973, 1974 to 1976, 1977 to 1978, and 1979 to 1981-II.

For the period from 1960 to 1973, the RMSPE was

almost 2 percentage points. Roughly speaking, this 2 percentage point error can be interpreted as indicating that 95 percent of the time the predicted values should be within + or - 4 percentage points of the actual values. In fact, only two out of the fifty-six errors (3.6 percent) were larger than + or - 4 percentage points.

While this might already seem like a fairly wide confidence band, the simulation accuracy of the equation deteriorated considerably in the 1974-76 period. During that time the money stock grew at an average rate just over 5 percent, but the simulations from the equation called for nearly 8 percent growth, for an average error (bias) of 2.7 percentage points. Furthermore, the RMSPE increased from 1.9 percent in the sample period to 3.4 percent, primarily as a result of the large bias. Once the bias in the forecasts is removed, however, the equation tracks about as well as it had within the sample period. In 1977 and 1978, on the other hand, the simulations from the equation were remarkably accurate; the prediction errors were all small, with zero average error, *i.e.*, both the actual and predicted values averaged about 7¼ percent. At that time, stability—in the sense of simulation accuracy—seemed to have been reestablished for the money demand equation.

But since 1979 the difficulties with trying to track money stock growth with a conventional money demand equation appear to have been compounded. For the period from 1979 through the second quarter of 1981 the prediction errors averaged 3 percentage points—just about as large as in the 1974-76 period. Moreover, the variance of the prediction error increased markedly. This is the result of much greater volatility in the money stock series without a corresponding increase in the variance of the predicted series. The greater variance of the prediction error, together with the reappearance of bias in the predictions, raised the RMSPE to 6 percent. Hence, not only did the money demand equation "shift again" in the 1979 to 1981-II period by an average amount of about the same size as in the 1974-76 period, but the errors became much more erratic in nature when compared with the 1974-76 period. The RMSPE over the last two and one-half years was about 75 percent larger than in the 1974-76 period (Table 1).

The reasons for the larger prediction errors in the 1979 to 1981-II period can be seen more clearly from Chart 2. The simulations relative to the actual values for each time period (1974-76 and 1979 to 1981-II) are plotted in two ways—one showing the simulation values not adjusted for bias (average error) and another showing the simulation results corrected for bias. By comparing the two series for each time period, a rough

² For a stable money demand relationship, the dynamic simulation for each one-year period would be started simply by incorporating the lagged value of the actual money stock. The demand for money, however, has not been stable in the post-1973 period. Hence, the constant term in the regression equation was lowered to correct for the previous shift in the demand for money before starting each new yearly simulation. The adjustments to the constant term are available from the authors upon request.

Table 1

Dynamic Simulation Results for Successive One-Year Periods, 1960-I to 1981-II

Actual less predicted growth rates; in percentage points

Period	M-1B adjusted*	Predicted	Error		M-1B adjusted*	Predicted	Error
1960: I	-1.4	-0.3	-1.1	1971: I	7.0	9.1	-2.1
II	-0.6	1.1	-1.7	II	9.5	8.2	1.3
III	4.0	2.3	1.7	III	6.2	6.8	-0.6
IV	0.3	2.0	-1.7	IV	3.3	7.0	-3.7
1961: I	1.4	1.7	-0.3	1972: I	8.2	9.7	-1.5
II	3.4	2.5	0.9	II	7.3	8.5	-1.2
III	2.5	2.8	-0.3	III	7.9	7.1	0.8
IV	3.6	3.0	0.6	IV	9.5	6.9	2.6
1962: I	3.0	2.2	0.8	1973: I	8.3	6.7	1.6
II	2.4	2.5	-0.1	II	4.9	6.0	-1.1
III	-0.3	2.4	-2.7	III	4.8	5.0	-0.2
IV	2.2	2.7	-0.5	IV	4.8	6.7	-1.9
1963: I	4.0	3.8	0.2	1974: I	6.7	7.0	-0.3
II	3.7	3.5	0.2	II	3.7	7.4	-3.7
III	4.2	2.9	1.3	III	3.7	8.2	-4.5
IV	3.7	3.4	0.3	IV	4.5	9.2	-4.7
1964: I	2.8	3.1	-0.3	1975: I	3.0	8.5	-5.5
II	2.8	3.3	-0.5	II	6.0	8.4	-2.4
III	6.6	3.6	3.0	III	7.5	8.2	-0.7
IV	5.0	3.0	2.0	IV	3.1	9.1	-6.0
1965: I	3.2	2.5	0.7	1976: I	5.5	7.6	-2.1
II	2.2	3.2	-1.0	II	6.5	6.8	-0.3
III	4.9	3.9	1.0	III	4.1	6.5	-2.4
IV	7.0	3.9	3.1	IV	7.3	7.5	-0.2
1966: I	6.9	3.3	3.6	1977: I	9.2	7.4	1.8
II	4.4	4.2	0.2	II	7.1	7.8	-0.7
III	-1.2	3.7	-4.9	III	6.6	7.3	-0.7
IV	0.9	4.2	-3.3	IV	8.3	6.9	1.4
1967: I	4.2	5.8	-1.6	1978: I	7.5	7.0	0.5
II	5.7	5.9	-0.2	II	9.1	8.7	0.4
III	8.8	5.4	3.4	III	7.8	8.3	-0.5
IV	6.2	5.1	1.1	IV	6.5	8.6	-2.1
1968: I	5.4	4.6	0.8	1979: I	3.9	8.4	-4.5
II	7.3	5.4	1.9	II	9.2	8.2	1.0
III	7.6	5.7	1.9	III	8.5	8.0	0.5
IV	8.3	5.4	2.9	IV	4.3	7.3	-3.0
1969: I	7.7	3.6	4.1	1980: I	6.5	7.0	-0.5
II	3.4	4.2	-0.8	II	-3.6	8.3	-11.9
III	1.6	4.6	-3.0	III	12.9	9.1	3.8
IV	2.7	4.5	-1.8	IV	10.0	8.3	1.7
1970: I	3.9	4.9	-1.0	1981: I	-1.1	11.4	-12.5
II	4.4	5.0	-0.6	II	5.2	9.6	-4.4
III	4.8	5.3	-0.5				
IV	6.4	6.0	0.4				

* See the box for definition of this series.

Table 1 (continued)

Summary statistics; in percentage points

Period	Mean (standard deviation)				Period	Mean (standard deviation)			
	Actual	Predicted	Error	RMSPE†		Actual	Predicted	Error	RMSPE†
Entire period	5.0 (2.9)	5.7 (2.4)	-0.7 (2.7)	2.9	1977 to 1978	7.8 (1.1)	7.8 (0.7)	0 (1.2)	1.2
1960 to 1973	4.5 (2.7)	4.5 (2.0)	0 (1.9)	1.9	1979 to 1981-II	5.6 (5.0)	8.6 (1.3)	-3.0 (5.1)	6.0
1974 to 1976	5.1 (1.6)	7.9 (0.9)	-2.7 (1.8)	3.4					

† Root mean squared prediction error.

Table 2

Comparison of the Sources of Prediction Errors

Period	MSPE*		Bias	Decomposition of MSPE*			
				Unequal variation		Incomplete covariation	
1974 to 1976	11.6	=	7.5 65%†	+	0.5 4%†	+	3.6 31%†
1979 to 1981-II	36.5	=	8.9 24%†	+	12.8 35%†	+	14.8 41%†
Formula	$(1/N) \sum (P_i - A_i)^2$	=	$(\bar{P} - \bar{A})^2$	+	$(s_P - s_A)^2$	+	$2(1-r) s_P s_A$

where:

P = the predicted value,

A = the actual value,

 \bar{P} = the mean of the predicted values, \bar{A} = the mean of the actual values, s_P = the standard deviation of the predicted values, s_A = the standard deviation of the actual values,

r = the correlation coefficient of the predicted and actual values,

N = the number of observations.

* Mean squared prediction error.

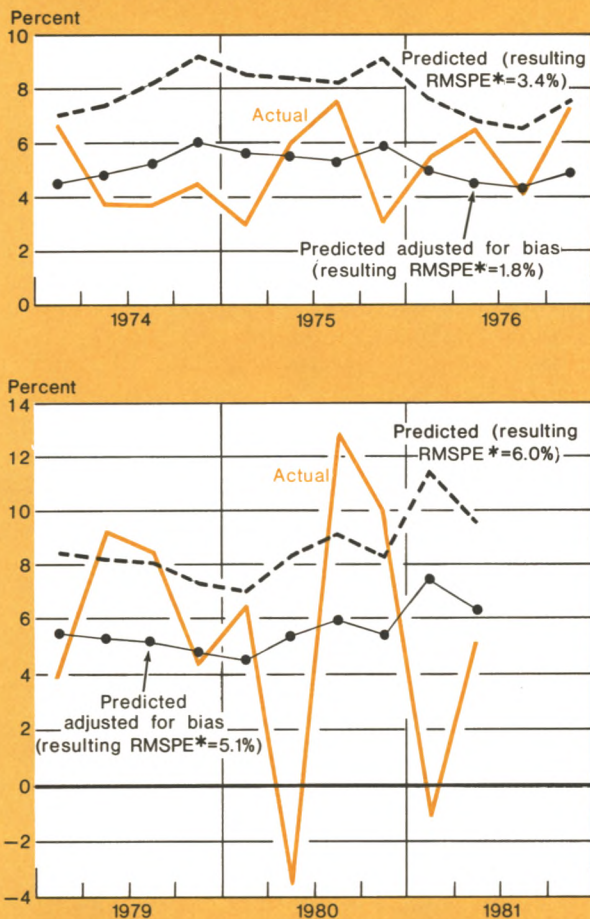
† Percentage of total.

idea can be obtained of how much of the error was due to the bias in the simulations and how much was due to other factors.

In the 1974-76 time period most of the error was due to bias, whereas in the 1979 to 1981-II period much of the error was due to the failure of the predicted series to parallel the movements in the money stock. In the 1974-76 period, adjusting the simulations for bias reduces the RMSPE by almost one half from 3.4 percentage points to 1.8 percentage points. In contrast, for the 1979 to 1981-II period, adjusting the simulations for bias reduces the RMSPE by only about 1 percentage point from 6 percent to 5.1 percent.

Chart 2

Comparison of Money Demand Errors 1974-76 and 1979 to 1981-II



*Root mean squared prediction error.

Source: Table 1.

These results can be shown more formally by using the Theil error decomposition procedure.³ The mean squared prediction error (MSPE) can be separated into three elements, each of which refers to a particular kind of prediction error.

- *Bias.* This term is zero if the average of the forecast values is equal to the average of the actual series.
- *Unequal variation.* If the standard deviations of the predicted and the actual series are the same, this term equals zero.
- *Incomplete covariation.* This term is zero only if the predicted and actual series are perfectly correlated.

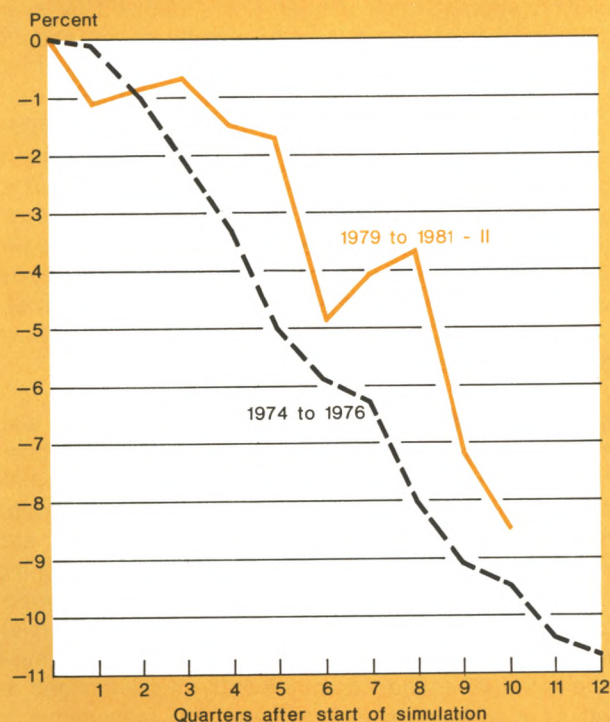
Table 2 shows the breakdown of the MSPE for the periods 1974-76 and 1979 to 1981-II. In the 1974-76 time period, 65 percent of the error was due to bias, and the percentage stemming from incomplete covariation was about 30 percent. In contrast, in the 1979 to 1981-II period the percentage of the MSPE stemming from bias (24 percent) is far less than in the 1974-76 period even though the size of the average error was about the same. Unequal variation and incomplete covariation became relatively and absolutely more important factors; this means that the predicted series in the latter time period was not only relatively less variable than—but also less well correlated with—the actual series.

In sum, two and one-half years after what appears to be “another shift” in the money demand equation, both similarities and differences have become evident when compared with the 1974-76 period. Chart 3 contains a comparison of the errors in predicting the level of the money stock as a percentage of the actual values for the two time periods. Two and one-half years into the shift periods, the errors in each case have amounted to roughly 9 percent of the actual values. But in contrast to the rather smooth shift in the 1974-76 period, the shift in this later time period has shown a great deal of volatility—complicating the interpretation of the monetary data. The significantly different features of the prediction errors in these two periods of money demand shift raise the question of whether the explanations offered for the 1974-76 shift also pertain to the 1979 to 1981-II period. In the section to follow, these explanations will be reviewed to see if they are still applicable to the 1979 to 1981-II period.

³ Henri Theil, *Applied Economic Forecasting* (Amsterdam, Holland: North Holland Publishing Co., 1966).

Chart 3

Cumulative Errors from the Money Demand Equation as a Percentage of Actual Levels*



*A dynamic simulation was performed for each time period; in the second simulation the equation was put back on track by adjusting the constant term for the 1974-76 shift.

Explanations for the shift

What causes the money demand equation to over-predict money growth for a prolonged period of time either by a relatively constant amount (1974-76) or sporadically by a large magnitude (1979 to 1981-II)? Little agreement exists in the economics profession on this question even though extensive research has been done. Some economists have attributed the post-1973 shift in the conventional equation, at least in part, to an incorrect specification of the demand for money; that is, an important factor determining the demand for money has been omitted. For example, a case has been made that long-term, as well as short-term, financial assets are substitutes for money. Hence, long-term yields—such as the twenty-year Government bond yield and/or the dividend-price ratio of common stocks—influence the public's demand for money; and

therefore these yields should be included in the demand for money equation.⁴

Others take the view that wealth should appear in the equation along with a measure of transactions for two basic reasons. First, wealth belongs in the demand for money because the public holds money balances, not only to undertake current expenditures on goods and services (for which current income serves as a proxy), but also for purely financial transactions. Second, as wealth increases, the public can better afford the conveniences resulting from holding money balances instead of a less liquid asset earning a higher rate of return. Along these same lines, some analysts argue that permanent income, a weighted average of current and past income, is a better determinant of the transactions demand for money because the public does not desire to incur the costs of adjusting money holdings for temporary movements in income.⁵ In the remainder of this article, two additional explanations often cited for the post-1973 shift will be reviewed.

Financial innovations. Some analysts have taken the view that when interest rates attain record levels, not only does the expected flow of funds from demand deposits into market instruments occur—accounted for in the money demand equation—but consumers and businesses also seek out new ways to manage money balances more efficiently. The effects of innovations are not captured in the conventional money demand equation.⁶ Moreover, since not all firms will adopt these new techniques immediately, money growth continues to appear weak for several quarters after short-term interest rates decline from record levels, making it appear that lower interest rates are not resulting in the expected pickup in money growth (Chart 4).

This line of reasoning seemed to explain the 1974-76 period rather well in that money growth remained weak relative to predictions for several quarters following the peak level of interest rates. Repurchase agreements are often pointed to as a financial instrument gaining widespread use during this time that might have contributed to the shift. Money market mutual funds were

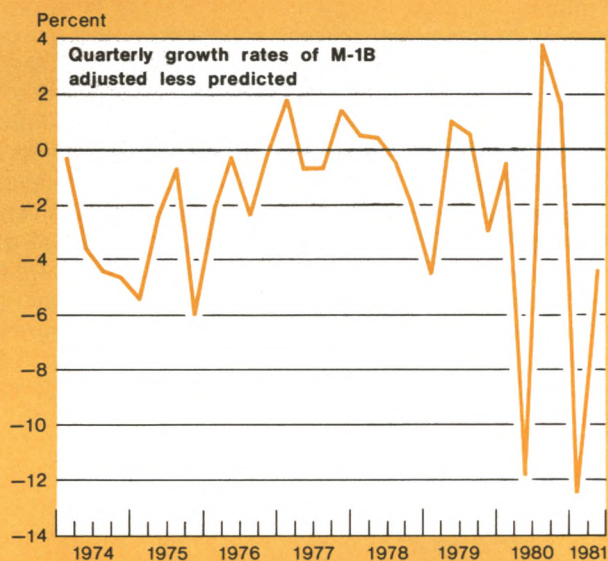
⁴ M.J. Hamburger, "Behavior of the Money Stock: Is There a Puzzle?", *Journal of Monetary Economics* (1977:3).

⁵ G.S. Laumas and D.E. Spencer, "The Stability of the Demand for Money: Evidence from the Post-1973 Period", *Review of Economics and Statistics* (1980, Vol. 62); B.M. Friedman, "Crowding Out or Crowding In? Economic Consequences of Financing Budget Deficits", *Brookings Papers on Economic Activity* (1978:3).

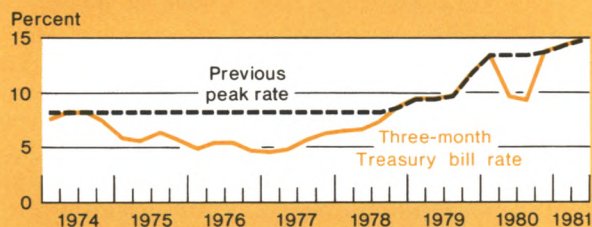
⁶ J.ENZLER, L. Johnson, and J. Paulus, "Some Problems of Money Demand", *Brookings Papers on Economic Activity* (1976:1); T. Simpson and R. Porter, "Some Issues Involving the Definition and Interpretation of the Monetary Aggregates", *Controlling the Monetary Aggregates III* (Federal Reserve Bank of Boston, Conference Series No. 23, October 1980).

Chart 4

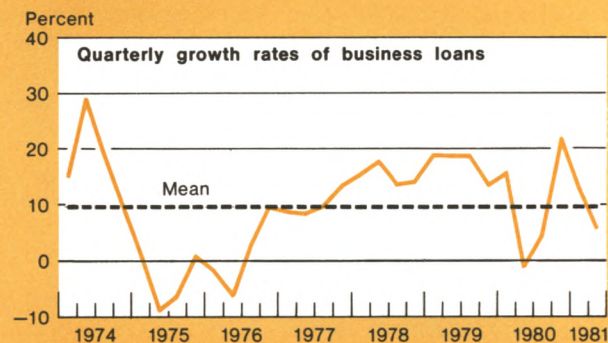
Since 1973, the money demand equation has tended to overpredict money growth . . .



. . . near peaks in short-term interest rates . . .



. . . and during periods of weakening growth of business loans.



Sources: Board of Governors of the Federal Reserve System (middle and bottom panels). Table 1 contains the data for the top panel.

also developed during this period, but their total assets were small relative to the size of the shift in the demand for money. The explanation in terms of financial innovation does not work well for 1980, however, when two quarters of unusually weak money growth at about the time interest rates peaked were followed by even stronger than expected money growth in the second half of the year. The imposition and subsequent lifting of the credit restraint program probably had important impacts on the public's demand for money during 1980, masking the possible effects of financial innovation. The large error in the first quarter of 1981 occurred about the time of yet another peak in short-term rates, but only time will tell whether this will mark the beginning of another series of consecutive overpredictions. Based on preliminary GNP data, however, another sizable overprediction of money growth appears to have occurred in the second quarter of 1981.

Business loans. Shifts in the demand for money also have tended to occur during periods of weakening business loan growth, possibly because compensating balances are declining or expanding at a slower rate.⁷ The 1974-76 period, the second quarter of 1980, and the first half of 1981 were all periods of weakening loan demand, as well as times when the money demand equation overpredicted money growth (Chart 4). Moreover, since banks often require firms to hold these balances against loan commitments or credit lines as well as against outstanding loans, the movements in compensating balances could be even more pronounced than expected just from the reduced pace of business lending. During a period of weakening loan demand, firms would not be willing to incur the expense in terms of idle balances of maintaining credit lines at levels established during a period of strong loan demand. Also, in response to weak loan demand, banks might reduce compensating balance requirements instead of or along with the rate charged on the loans.

Business loans and compensating balances are sensitive to the interest rate cycle. When rates begin to decline from cyclical peaks, corporations often restructure their debt away from short-term borrowings at banks into long-term debt issues, thereby lowering compensating balances. This makes it difficult to untangle the effects of financial innovation and business loans on money stock growth, because the effects often tend to occur at about the same time in the interest rate cycle and impact in the same direction. When the events of

⁷ Goldfeld, *loc. cit.*, reviews the empirical evidence on using business loans to explain money growth.

1980, however, are viewed in light of the volatility in business loans, some sense can be made out of the erratic growth of the money stock. In the second quarter as rates declined from record levels, corporations were able to reduce their borrowings from banks and, hence, a shift in the money demand equation occurred. In the second half of the year, as the economy became stronger than expected and inflationary expectations ratcheted upward, activity in the bond market slowed considerably and firms relied more on bank loans again, resulting in stronger money growth than would have been expected given the pace of economic activity. In contrast, in the 1974-76 period, corporations were able to restructure their debt over a period of several quarters as the economy remained weak and interest rates low. Thus, the shift in the money demand equation seemed to last for a much longer period.⁸

Finally, the shift in money demand might have occurred, at least in part, as a result of a combined

effect of financial innovation and business loans. That is, at high rates firms develop more effective cash management techniques, and they use those funds no longer kept in demand deposits to repay expensive short-term loans. Since these loans could have compensating balances against them, demand deposits are subsequently reduced beyond the initial effect of the financial innovation. This type of explanation would seem to work for the 1974-76 period but to a lesser extent for 1980.

Moreover, it appears that the impacts of business loans and/or financial innovation on the performance of the money demand equation are not limited to the post-1973 period. The simulations from the money demand equation overpredicted money growth for several quarters about the time interest rates peaked in 1966 and 1969 (Table 1). These were also periods of weakening business loan demand, again making it difficult to know whether financial innovation, compensating balances, or some combination of the two caused money growth to be overpredicted.

In sum, the extreme volatility in the errors from the money demand equation during the last two and one-half years appears to reflect some of the severe strains that the economy has gone through. While shifts in the money demand equation are easy to identify *ex post*, the underlying reasons are much more difficult to discover. Short-term interest rates have risen to record levels during this period, undoubtedly spurring at least some increased emphasis on cash management. Moreover, wide swings in short-term credit demands at commercial banks have also taken place. By and large, the sources of the recent instability in the money demand equation could well be the same ones often pointed to for the 1974-76 shift in money demand—financial innovation and compensating balances, with financial innovation probably contributing the larger part.

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⁸ If compensating balances "explain", at least in part, the shift in the money demand equation, why not incorporate them directly in the equation? Some analysts have attempted to do this by using business loans as a proxy since data on compensating balances are not collected. But business loans are not a very good proxy. Compensating balances are determined, not only by the level of business loans outstanding, but also by the percentage required which varies with credit conditions. Moreover, compensating balances are held for other reasons as well, such as to pay for loan commitments and cash management services. Also, even if business loans were a good proxy for compensating balances, demand deposits would be affected only to the extent that firms were holding more balances than needed for day-to-day transactions as a result of compensating balance requirements. The increased emphasis on cash management in recent years has lowered the desired level of demand deposits for any given level of transactions, while the increasing use of explicit fees by banks rather than compensating balances has also lowered the level of these balances for any given level of lending activity. This makes it difficult to know whether firms are holding deposits beyond what is needed for transactions purposes to a greater or less extent than in the past. Finally, business loans are highly correlated with GNP, making it difficult to get both variables "to work" in a money demand equation.

Bank Lending to Non-OPEC LDCs: Are Risks Diversifiable?

Since the 1973-74 quadrupling of oil prices, the largest United States and foreign commercial banks have substantially increased their involvement in international lending, including lending to non-OPEC less developed countries. This lending is an important link in the recycling process whereby surpluses from oil-exporting countries, in the form of deposits, are channeled to less developed countries (LDCs), in the form of loans, to finance their deficits.

The recycling process was an inevitable outgrowth of the first oil shock. A small group of oil-exporting nations—Organization of Petroleum Exporting Countries (OPEC)—accumulated a huge current account surplus in 1974-77, while both non-OPEC developing countries and industrialized countries ran a deficit in those years. Industrialized countries were able to finance their deficits in varying degrees through direct capital inflows from the OPEC countries. By contrast, the non-OPEC LDCs did not attract direct OPEC investments but, instead, sought to finance a substantial part of their deficits by borrowing funds from the international banks that were taking OPEC deposits.

As these large flows of funds occurred, many analysts began to express concern about the risks that banks face as a result of their participation in the recycling process. These concerns escalated after the second round of large oil price increases in 1979-80. During these years the average price of a barrel of oil more than doubled from \$14 to \$32.50 per barrel. The OPEC surplus, having declined from \$64 billion in 1974 to \$5 billion in 1978, swelled to \$120 billion in 1980, with nearly one half of these flows invested in commercial banks of the industrialized countries. Mean-

while, the deficits of the non-OPEC LDCs, having declined from \$38 billion in 1975 to \$21 billion in 1977, increased sharply to \$65 billion in 1980.

While there is nothing particularly new about recycling—banks have always played the role of intermediation between savers and ultimate investors—recycling does have several special characteristics. First, while governments have always deposited funds in commercial banks, the magnitude of the OPEC deposits together with the small number of countries and commercial banks involved is unique. More importantly, never prior to the 1974 oil shock had non-OPEC LDC governments used financial intermediaries for balance-of-payments financing on such a large scale. The latter aspect of recycling has exposed the largest United States and foreign commercial banks to country risk. Country risk can be thought of as the group of risks arising from the economic, political, legal, and social conditions in a foreign country that may have adverse consequences for loans extended to borrowers in that country. Thus, as discussed further in Box 1, the risks faced by financial intermediaries in the recycling process are somewhat different from those confronted in domestic and international financial intermediation.

Concern about country risk was greatly exacerbated by the financial intermediaries' increased exposure to non-OPEC LDCs in the wake of the oil price shocks. The exposure of United States banks to non-OPEC developing countries increased from \$23.8 billion at the end of 1974 to \$47.7 billion at the end of 1977. By December 1980 the figure had further swelled to more than \$73 billion. Foreign banks have increased their exposure even more rapidly, from \$20.0 billion at

year-end 1974 to \$122 billion by December 1980.

This has created the need for improved techniques for banks and their supervisors to monitor country risk. Banks have developed extensive internal procedures to evaluate country risk. The political, economic, and social conditions within each country are reviewed, generally twice each year, more often if close monitoring is necessary. Top management sets maximum exposure limits by country and by area, based on both lending opportunities and country risk considerations. Thus, bank management attempts to control risk by avoiding an excessive concentration of lending to a particular country. If a single borrower seeks a large credit, this can be accommodated via the syndication mechanism in which several banks collaborate to finance the loan.

The three Federal bank supervisory authorities—the Comptroller of the Currency, the Federal Deposit Insurance Corporation, and the Federal Reserve System—implemented a new approach to foreign lending at the end of 1978. The basis of this supervisory approach is to emphasize diversification across countries and types of borrowers to avoid excessive concentration of risk. The regulators attempt to highlight concentrations of lending that are large relative to bank capital or to country conditions for discussion with bank management. The regulators also examine the banks' procedures for monitoring and controlling country risk.¹

Both bankers and regulators emphasize that a careful evaluation of country conditions is appropriate before making a decision on a particular loan. This evaluation process allows the bank to appraise the return on the credit in relation to its risk. In addition, both bankers and regulators emphasize diversification. The logic is that, while credits to a particular country may not be paid off on schedule under all circumstances if the events triggering default differ across countries, the overall risk on the bank's loan portfolio may be very small.

Is this emphasis which bankers and regulators place in diversification warranted? Some analysts are concerned that the benefits to banks of loan diversification among non-OPEC LDCs may be very limited, as these countries face a more or less common set of problems. They are particularly concerned about the heavy dependence on imported oil which the non-OPEC LDCs must purchase at the world price. Others contend, however, that country specific factors are far more important. The LDCs are a heterogeneous

group of countries. Not only are they at different stages of economic development, but they have very diverse political systems, economic policies, and trade structures. Thus, there are indeed many opportunities for loan diversification.

The purpose of this article is to examine empirically the importance of the common risks in LDC loans in contrast to country specific factors. If these country factors are important relative to the common factors, there are substantial opportunities for reducing risk by diversifying lending to many different LDCs. Alternatively, if the common factors are large, compared with country specific factors, the opportunities for reducing risk by lending to many different LDCs will be limited. The intuition behind these concepts can best be explained by reference to portfolio theory.

The concept of diversifiable risk

When selecting its asset portfolio, a bank is concerned with many factors: the expected return on its loans and some estimate of the uncertainty associated with this prediction, the front-end and other fee income associated with its credits, the value of other business relationships which are generated by extending various credits, political considerations, the maturity mix of its assets *vis-à-vis* its liabilities, etc. By abstracting, however, we can consider a bank to be primarily interested in two features. The first is the expected rate of return on the portfolio. This is an average of all possible returns on the portfolio. The second feature is a measure of uncertainty which indicates the extent to which the actual return on the portfolio is likely to diverge from the expected value. The divergence of the actual return on the portfolio from its expected value is measured by the variance of the portfolio.² The bank will choose its asset portfolio in such a way as to maximize the expected rate of return for a given level or variance or to minimize variance for any given rate of return.³

² For a clear and rigorous treatment of portfolio theory, see William F. Sharpe, *Portfolio Theory and Capital Markets* (New York: McGraw Hill, 1970).

³ Describing a portfolio solely in terms of two parameters, the expected return and the variance, is technically correct only in two situations: if the rate of return on assets can be described by a particular class of distributions or if the bank has quadratic utility. The acceptable distributions are those which can be completely described in terms of the expected return and the variance which are the first two moments of the distributions. Examples of this class of distributions include the normal and lognormal distribution. In the case of quadratic utility, only the first two moments of the distribution are relevant to the bank. Since the rate of return on loans is a skewed distribution which cannot be described in terms of two parameters, as a loan will never yield more than the promised rate of return, we are implicitly assuming that banks have quadratic utility or a close approximation thereof.

¹ For a description of the supervisory approach to international lending, see the Federal Reserve Board press release issued on November 8, 1978, outlining the uniform examination procedures for evaluating and commenting on country risk factors involved in international lending by United States banks.

Box 1: Bank Risks

In the normal course of domestic and international financial intermediation, bank management must evaluate a well-known set of risks, namely, interest rate risk, credit risk, liquidity risk, foreign exchange risk, and regulatory risk. But, when banks take an active role in the recycling process, they encounter two additional risks: fund availability risk and country risk. Each of these risks will be explored in turn.*

Interest rate, credit, and liquidity risks are inherent features of financial intermediation. Banks generally hold liabilities of a shorter duration than the rollover period on their assets. Consequently, as interest rates change, banks incur *interest rate risk*. When interest rates rise, banks are forced to fund their lower yielding assets at the new higher rates, cutting into the banks' profit margins. Conversely, when interest rates fall, banks are able to fund their assets at the new lower rates, increasing their profit margin. In periods of volatile interest rates, interest rate risk can be substantial and funding decisions will have a large impact on the profitability of financial intermediaries. Banks can protect themselves against interest rate risk by attempting to match the interest rate structure of their assets and liabilities by tying the return on the former to a rate close to the market rate. Examples of this include banks' pricing their assets as a percentage over the prime lending rate or pricing as a percentage over the London interbank offer rate (LIBOR). To the extent perfect maturity matching is impossible, banks can and do hedge some of the remaining risk in the interest rate futures market.

Credit risk stems from the possibility that an entity may be unable to repay its debts. Banks attempt to minimize this risk by diversifying their loan portfolios and by syndicating a large credit to a single borrower among several banks. Syndication, which allows a group of banks to extend a large credit to a borrower at the same interest rate for the same maturity, is common in both domestic and international financial intermediation. In the former, syndications are rarely publicized, whereas in the latter they commonly are.

Liquidity risk is the risk that the bank, while still solvent, may be unable to make payments as they come due. Although some of these commitments are fixed in

advance, others may be hard to judge, such as when a corporate customer chooses to draw down a deposit or draw against a line of credit. Thus, the bank wants to position itself so that it can meet its unexpected as well as its anticipated obligations. This is achieved by holding liquid assets which can be resold easily in well-developed secondary markets. In addition, banks meet cash needs by borrowing in money markets such as Federal funds or overnight Eurodollars. Each bank must be careful to remain within what is perceived as its share of the market, since an excessive demand for funds could be interpreted as an indication of internal problems. This may cause a reluctance on the part of other banks to lend to a particular bank which, even if unwarranted, may cause a liquidity squeeze.

When a bank moves from purely domestic international financial intermediation, it encounters one additional risk, foreign exchange risk, and substantially increases its regulatory risk. *Foreign exchange risk* is the result of a bank holding a net open position in a foreign currency. This may result from either foreign exchange speculation or a currency mismatching of assets and liabilities. In both cases, as the value of the foreign currency in which the bank has a net open position fluctuates, the bank can experience foreign exchange gains and losses. Foreign exchange risk is a bigger problem for foreign banks than for United States banks, since the dollar is often the vehicle currency in international transactions. Both United States banks and foreign banks often limit their potential losses from foreign exchange risk by allowing each office to have only limited net exposure. This maximum can be set either on a currency-by-currency basis or as a limit on all foreign currencies. In addition, limits are often set on the global operations of the bank. Thus, the head office may offset what seems to be an excessive overall position (even though all branches may be within their limits) to keep its total exposure within desired limits.

Regulatory risk is the risk that reserve requirements, capital/asset ratios, special taxes, or other regulations may be imposed on banking operations in a particular location. Banks generally protect themselves against these by a clause in loan agreements which allows them to pass through the added costs that would result from the imposition of special taxes or regulations. Thus, the banks are able to preserve their profit margins to a great extent should this risk arise.

The role of commercial banks in the recycling process has posed two significant risks above and beyond those confronted in ordinary domestic and interna-

* A slightly different categorization of bank risks can be found in W.E. Moskowitz, "Global Asset and Liability Management at Commercial Banks", this *Quarterly Review* (Spring 1979), pages 42-48. That categorization focuses on the risks in domestic and international financial intermediation and does not examine the unique risks financial intermediaries face in the recycling process.

Box 1: Bank Risks (continued)

tional financial intermediation: fund availability risk and country risk. *Fund availability risk* arises because, while governments have always deposited funds in commercial banks, never has such a small group of surplus governments deposited so many funds in relatively few commercial banks over a prolonged period of time. In normal financial intermediation, if a large customer relies upon a bank for its full range of banking services and the customer withdraws all funds, the one bank can borrow more heavily. In the Euro-market, if a major depositor were to withdraw all funds, all banks could not simultaneously borrow more heavily. We would expect fund availability problems to be short run in nature as the depositor would have to move his funds to other investments. This will change relative rates of return until the market re-establishes an equilibrium situation. Banks protect themselves against fund availability risk by offering depositors who already have sizable deposits in the bank a lower return in an attempt to discourage such deposits. Banks may also protect themselves by including a fund availability clause in loan agreements, which allows a financial institution to recall a credit

should funding become impossible. But of course such a clause is only useful if the borrower can repay easily.

Country risk can be defined as the uncertainties arising from political or economic developments within a country which may influence the ability and willingness of borrowers within that country to meet their obligations. Country risk is usually broken down into two components. Sovereign risk is the possibility of political or military measures which may prevent payments of external obligations. Transfer risk relates to the inability of borrowers within a country to obtain foreign exchange in order to make payments in the currency agreed upon. Country risk occurs in international financial intermediation but is greatly aggravated by the recycling process, as never prior to the 1974 oil price increases had non-OPEC LDC governments used financial intermediaries for balance-of-payments financing on such a large scale. Banks have attempted to moderate country risk in the same manner as credit risk, by diversifying their loan portfolios and by syndicating a large credit to a single borrower among several banks. They are also paying closer scrutiny to economic and political developments abroad.

Box 2: Concepts of Expected Return and Variance

The concepts of expected return and variance can best be illustrated by reference to a simple example. Consider a one-year \$1 loan to country X priced at the London interbank offer rate (LIBOR) plus 3 percentage points. The loan has the following three payoff probabilities:

Probability	Payoff
94%	\$1 + r + 0.03, where r is the LIBOR
4%	\$1
2%	0

The highly simplified example is far more realistic than a simple paid-off-not-paid-off scenario in that it allows for a spectrum of possibilities: receiving principal plus interest, receiving only principal, and receiving nothing.

The expected return on the loan can be calculated by weighting the return on each payoff by the probability of occurrence. We take r to be 14 percent:

$$\begin{aligned}\text{Expected rate of return} &= 0.94(0.17) + 0.04(0) \\ &\quad + 0.02(-1) \\ &= 0.1598 - 0.02 = 13.98\%\end{aligned}$$

The variance is the squared deviation of each outcome from the mean, weighted by the probability of occurrence. This is computed as follows:

$$\begin{aligned}\text{Variance} &= 0.94 (0.17 - 0.1398)^2 + 0.04(0 - 0.1398)^2 \\ &\quad + 0.02 (-1 - 0.1398)^2 \\ &= 0.009 + 0.008 + 0.0260 = 0.0277 = 2.77\%\end{aligned}$$

Thus, this loan has an expected return of 13.98 percent and a variance of 2.77 percent. Changing the probabilities of the various outcomes will change both the expected rate of return and the variance.

Each asset has an expected return and variance. Box 2 illustrates how this can be calculated for a sample loan. The expected return on a portfolio is determined by the expected return of each of the underlying assets weighted by their share in the portfolio. By contrast, the variance of a portfolio depends, not only upon the variance of the individual assets, but also on the extent to which the rates of return on assets in the portfolio move together. The general proposition of portfolio theory is that, if different assets can be held in the same portfolio, the bank can achieve a lower variance for the same rate of return. This is desirable because the lower variance reduces the bank's uncertainty in its investment decisions.

The benefits from mixing assets can best be illustrated by means of a simple example. Consider two assets, each with an expected return of 15 percent and a variance of 5 percent. If a bank held a portfolio comprised solely of asset 1 or asset 2, the expected return on the portfolio would be 15 percent and the variance would be 5 percent. If the bank mixes assets, the variance of the portfolio will usually be less than 5 percent. The amount of reduction of variance depends on the extent to which the rates of return on the two assets move together. The comovements of two assets can be measured by a statistic called the correlation coefficient, a figure which is scaled to fall between 1 and -1. If one assumes the two assets have a slightly positive correlation, say, a correlation coefficient of 0.3 and the portfolio is comprised of equal amounts of assets 1 and 2, the mixed portfolio will still have the same 15 percent expected return as the underlying assets. However, the variance of the mixed portfolio now will be only 2.875 percent rather than 5 percent.⁴ If the returns on the two assets do not move together at all, that is, the correlation is equal to zero, the variance of a mixed portfolio will be 2.5 percent. If their rates of return move exactly inversely to one another, that is, the correlation between the assets is -1, a mixed portfolio comprised of equal amounts of assets

1 and 2 will have an expected return of 15 percent and zero variance. The intuition for this last result is, if asset 1 has a "good" outcome, perfect negative correlation requires this to be offset by asset 2's "bad" outcome and vice versa.

The only case in which diversification will not reduce risk at all is if the two assets move together perfectly, that is, they have a correlation of 1. This will occur if the two assets respond identically to various occurrences and, hence, become interchangeable for investment purposes. In this case, a portfolio comprised of equal amounts of assets 1 and 2 will have the same expected return and variance as each of the underlying assets: 15 percent and 5 percent, respectively.

To reiterate, a portfolio's expected return is the weighted average of the expected return on the component assets. The weights are given by the proportion of the portfolio in each asset. A portfolio's variance is dependent on the correlation between the assets as well as on the variance of each of the components.

This means that computing the variance of a portfolio with a relatively small number of assets, say 15, is tedious: it requires 120 terms—105 correlation terms and 15 variance terms. In general, computing the variance of a portfolio requires one variance for each asset and $N(N-1)/2$ correlation coefficients where N is the number of assets.

The process of computing the variance of a portfolio can be simplified by assuming that the actual rate of return on an asset may be separated into two components: one component which is asset specific and independent of all other returns (the nonsystematic portion) and another component which is common to all assets (the systematic portion).⁵ Consequently, the variance of an individual asset can be separated into its nonsystematic and systematic components.⁶ The

⁴ A portfolio's expected return and variance are given as follows:

$$E_p = \sum_i P_i E_i, \text{ where } i = 1 \dots N$$

$$\sigma_p^2 = \sum_i \sum_j P_i P_j \rho_{i,j} \sigma_i \sigma_j, \text{ where } i, j = 1 \dots N$$

and E_p = expected return on the portfolio; P_i = proportion of portfolio in asset i ; E_i = expected return on asset i ; σ_p^2 = variance of the portfolio; $\rho_{i,j}$ = correlation between assets i and j ; σ_i = standard deviation of asset i ; N = number of assets in the portfolio.

In the two-asset case, the variance can be simplified as follows:

$$\sigma_p^2 = P_1^2 \sigma_1^2 + P_2^2 \sigma_2^2 + 2 P_1 P_2 \rho_{1,2} \sigma_1 \sigma_2$$

For the portfolio discussed in the text, $P_1 = P_2 = 0.5$, $\sigma_1^2 = \sigma_2^2 = 0.05$, and $\rho_{1,2} = 0.3$. Thus, the variance of the portfolio can be easily computed.

$$\sigma_p^2 = (0.25)(0.05) + (0.25)(0.05) + (0.25)(0.3)(0.05) = 0.02875.$$

⁵ Technically, it is assumed the rate of return on an asset is linearly related to both the market rate of return and an asset specific factor. The market return will be reflected in the rate of return on an index comprised of all relevant assets. The hypothesized relationship may be written as follows:

$$R_i = a_i + b_i I + C_i$$

where R_i = actual return on asset i ;

a_i = constant; b_i = constant; I = actual return of index; and C_i = uncertain variable related to asset specific factors.

⁶ If the expected value of C_i is zero and the correlation between the index and C_i is zero, it can be shown that the variance of asset i can be decomposed into two components:

$$\sigma_i^2 = (b_i \sigma_I)^2 + \sigma_{C_i}^2$$

where σ_i^2 = variance of asset i ; σ_I^2 = variance of the index; and

$$\sigma_{C_i}^2 = \text{variance of } C_i.$$

The first term— $(b_i \sigma_I)^2$ —is the systematic variance of the asset.

The second term— $\sigma_{C_i}^2$ —is the nonsystematic variance of the asset.

systematic component consists of background factors which affect all assets. Different assets will have different absolute and relative amounts of systematic and nonsystematic variance.

The variance of a portfolio now takes on a particularly simple form: it has one systematic component and N nonsystematic components. The systematic component measures the sensitivity of the portfolio's rate of return to a factor common to some broader group of assets. This common factor is determined by forming an index comprised of all relevant assets. The nonsystematic components are the nonsystematic variance of each of the assets in the portfolio weighted by the square of their portfolio share.⁷

We can now explain why the nonsystematic variance for a portfolio can be diversified away. We have noted that the nonsystematic variance for a portfolio is given by the sum of the nonsystematic variances each weighted by the square of the share in the portfolio. Thus, if there are N assets in a portfolio and an equal proportion ($1/N$) of the total is held in each asset, nonsystematic variance is given by $1/N$ times the average value of the nonsystematic variance of the assets. Thus, if $N = 10$, the nonsystematic variance of the portfolio would be only $1/10$ of the average value of the nonsystematic variance of the component assets. Hence, by holding ten securities, 90 percent of the systematic variance has been diversified. As N gets very large, nonsystematic variance disappears entirely.

Systematic variance by definition cannot be reduced through diversification. The systematic variance of the average asset is the same as the systematic variance of a portfolio comprised of all assets. Thus, systematic variance will not be reduced regardless of the number of assets in a portfolio.

Take a bank with a portfolio of assets consisting of non-OPEC LDC loans. Each credit will be associated with a certain amount of nonsystematic or country specific variance and a certain amount of systematic variance. The relative amounts of each of these types of variation measures will differ from loan to loan. Applying portfolio theory as outlined above, if one holds a very large portfolio consisting of small holdings of each of a large number of countries, the amount of

variation in the portfolio due to country specific factors will be small. Thus, of concern to the banker is the systematic variation of the country credits.

Portfolio theory hence provides a methodology whereby rate-of-return figures can be used to measure the amount of systematic and nonsystematic risk. Unfortunately, however, meaningful rate-of-return figures on non-OPEC LDC credits are not available over a sizable period of time because large-scale medium- and long-term lending to non-OPEC LDCs is a relatively recent phenomenon. Long-term lending to non-OPEC LDCs began to grow rapidly, albeit from a small base, in the late 1960s. This growth accelerated in the 1971-73 period, as banks began aggressively to seek new lending outlets by offering narrow spreads on syndicated credits and attractive terms on other types of loans. As we have seen earlier, the volume of lending mushroomed after the quadrupling of oil prices in 1973-74.

Measures of risk

Since rate-of-return figures are not available, we cannot explicitly estimate diversifiable and nondiversifiable risks in a portfolio of LDC credits. However, if we are able to develop proxies which are related to rates of return inasmuch as they capture country risk considerations, we can implement the methodology outlined above using the proxies. A proxy is a substitute for a variable which is unobservable or unavailable. Proxies for country risk may be found in indicators of problems that may hinder a country's ability to repay its debts: balance-of-payments difficulties caused by real or monetary disturbances, liquidity difficulties, and political difficulties. Each of these difficulties could be expected in some instances to translate into a difference between the actual and promised rate of return. Each of these difficulties will be considered in turn.

Country risk analysts spend a great deal of effort assessing the factors affecting a country's balance of payments, as foreign exchange earnings and competing needs for them are extremely important in forecasting debt-servicing difficulties. First, consider the real factors affecting the balance of payments. On the import side, an important consideration is a country's ability to lower imports in times of balance-of-payments difficulties. For example, the more important such items as food and fuel are in total imports, the less scope a country has to cut back. On the export side, the growth and diversity of exports are extremely important. An economy that depends primarily on the export of one commodity such as copper, the price of which can fluctuate widely, can easily encounter difficulties. On the other hand, if the economy exports a number of different raw materials and manu-

⁷ The variance of a portfolio is given as follows:

$$\sigma_p^2 = b_p^2 \sigma_1^2 + P_1^2 \sigma_{c1}^2 + P_2^2 \sigma_{c2}^2 + \dots + P_N^2 \sigma_{cN}^2$$

where P_i = proportion of portfolio in asset i ;

σ_p^2 = variance of the portfolio; $b_p = \sum_i P_i b_i$, where $i = 1 \dots N$;

N = number of assets in the portfolio.

The first term on the right-hand side of the equation is the systematic component. The other N terms represent the nonsystematic components.

factured goods, the balance-of-payments difficulties stemming from a price change for any one commodity would be lessened. In addition to the diversity of exports, a country risk analyst must also consider a country's export markets. For example, the more widely dispersed export flows are across trading partners the less severe the effects would be if one trading partner were to suffer a recession or impose import barriers. In addition, the country's ability to develop its export markets is an indication of its economic management and hence its prospects for rapid development. Other important factors in analyzing a balance-of-payments position include the country's ability to attract foreign exchange through capital inflows, such as foreign direct or portfolio investment, as well as its ability to contain capital outflows.

Monetary disturbances can also have very adverse effects on the balance of payments of an economy. Few LDC governments permit exchange rates to float freely. Rapid money supply growth will tend to increase domestic inflationary pressures. When an overvalued exchange rate is maintained, foreign goods look relatively cheaper and imports are encouraged. This can result in large losses of foreign exchange reserves, causing a foreign exchange shortage. The maintenance of an overvalued exchange rate, even if it is not exacerbated by a rapidly growing money supply, can lead to a loss of reserves or to increased external borrowing.

A great deal of emphasis is placed on international liquidity in assessing country risk. Bankers tend to feel more comfortable with developing economies that have a relatively large international asset position. A sizable cushion of reserves allows a country to ride out transitory difficulties in the balance of payments and to adjust more smoothly to structural changes in the economy. Nonetheless, a large net asset position is not always desirable. It could be an indication that the government does not have a commitment to sustained real growth or lacks the planning and know-how to convert financial resources into expanded production.

Political risk is important for several reasons. It is closely aligned to economic prospects, as political instability may render governments unwilling or unable to pursue appropriate economic policies. Moreover, when forcible political change occurs, either internally or by invasion, the new government may again be unwilling to repay the debt-servicing costs incurred by the previous government. However, political factors are difficult to incorporate into a quantitative analysis, and thus are not considered further in this article.

Bearing in mind these major causes of debt service difficulties and data availability considerations, four

proxies were chosen for country risk:⁸

- (1) growth of exports,
- (2) growth of the money supply,
- (3) growth of international reserves,
- (4) growth of imports/reserves.

The growth-of-exports proxy measures, in a very crude sense, balance-of-payments risk due to real disturbances. The growth of the money supply serves as a proxy for balance-of-payments difficulties due to monetary risk. The final two measures serve as proxies for liquidity risk.

This choice of proxies is reinforced by recent efforts in country risk analysis that have concentrated on the development and use of discriminant analysis and logit models to determine which economic variables are the most important in terms of predicting debt rescheduling.⁹ These models have two major problems. First, they are based on relatively few past cases. Second, they use a "reschedule—did not reschedule" dichotomy whereas, in reality, there is a spectrum of possibilities for the bank, ranging from being paid off in full to receiving nothing. Not all debt reschedulings result in lower rates of return to commercial banks, as temporary problems can be overcome by allowing the country to stretch out its payments. In addition, rescheduling arrangements often involve more favorable spreads on loans from the lender's viewpoint. However, only in countries in which rescheduling or outright default occurs can the rate of return be lower than the promised rate of return. Borrowers prefer rescheduling to outright defaults as the latter will severely restrict their future access to international capital markets. Even with these problems in

⁸ These proxies were chosen solely for the purposes of the analytic study. They do not necessarily correspond to the country-risk screening indicators used by the Federal Reserve Bank of New York or the Federal Reserve System.

⁹ Discriminant analysis and logit are statistical procedures that allow a researcher to isolate ratios which best explain the binary valued dependent variables of rescheduling and nonrescheduling. Pioneers in the use of these models include: Charles R. Frank, Jr., and William R. Cline, "Measurement of Debt Servicing Capacity: An Application of Discriminant Analysis", *Journal of International Economics*, Vol. 1, No. 3 (1971), pages 327-44; G. Feder and R. Just, "A Study of Debt Servicing Capacity Applying Logit Analysis", *Journal of Development Economics*, Vol. 4, No. 1 (1977), pages 25-38; Alice L. Mayo and Anthony G. Barrett, "An Early Warning Model for Assessing Developing Country Risk", *Proceedings of a Symposium of Developing Countries' Debt*, ed. Stephen H. Goodman (Export-Import Bank of the United States, August 1977); Nicholas Sargen, "Use of Economic Indicators and Country Risk Appraisal", *Economic Review* (Federal Reserve Bank of San Francisco, Fall 1977); and Krishan Saini and Philip Bates, "Statistical Techniques for Determining Debt Servicing Capacity for Developing Countries: Analytical Review of the Literature and Further Empirical Results" (Federal Reserve Bank of New York, Research Paper No. 7818, September 1978).

the discriminant analysis and logit methodology, it is interesting to note that the proxies chosen are statistically significant in these models. This provides us with additional confidence in our choice of proxies.

Empirical results

Diversifiable and nondiversifiable risk was estimated for the major non-OPEC LDC borrowers. Each proxy was divided into its systematic and nonsystematic components using portfolio theory. The empirical methodology is described in Box 3. The empirical results for the first two proxies—growth of exports and growth of the money supply—are summarized in Table 1. The empirical results for the latter two proxies—

growth of international reserves and growth of imports divided by reserves are shown in Table 2. The results can be easily interpreted. Glancing at the growth of the money supply measure for Brazil (Table 1), one notes the standard deviation of the Brazilian money supply is 12.49 percent per quarter. The systematic standard deviation is 1.50 percent per quarter, while the nonsystematic standard deviation is 12.39 percent. The variance, which is equal to the total standard deviation squared, is 153.51 percent per quarter. The percentage of systematic variance is the systematic variance divided by the total variance. The systematic variance is 1 percent and the nonsystematic variance is 99 percent.

Box 3: Data and Methodology

This article utilizes data for non-OPEC LDC borrowers with more than \$1.6 billion in exposure to United States banks as of June 1979 to measure diversifiable and nondiversifiable risk. The exposed amount was calculated from the country lending exposure survey conducted by the three bank regulatory agencies on June 30, 1979. This survey includes both the claims and contingencies of United States banks and their overseas branches. Where the residence of the borrower differed from the residence of the guarantor, the latter was used to calculate country exposure. The sixteen countries with sufficient borrowings were Brazil, Mexico, Korea, Taiwan, the Philippines, Spain, Argentina, Hong Kong, Greece, Colombia, Chile, Yugoslavia, Ecuador, Thailand, Panama, and Peru. These largest non-OPEC LDC borrowers account for over 75 percent of total United States bank lending to non-OPEC LDCs. Unfortunately, due to data availability considerations, only twelve to fifteen of the countries could be used for most of the proxies as data on Taiwan, Hong Kong, Colombia, and Panama were sometimes unobtainable.

For each proxy, a quarterly time series of observations was compiled for each of the largest borrowers.* An index for each proxy was then constructed from the country indexes, with each country weighted by its borrowing share. A regression was then performed for each country as given by equation (1).

$$(1) X_i = a_i + b_i \bar{X} + e_i$$

where \bar{X} = index for a given country risk measure,
 X_i = country risk measure X for country i ,
 a_i and b_i are constants.

For export growth, international reserve growth, and

growth of imports/reserves, the regression was executed for the 1960-79 period. Data on money supply growth for some of the included countries were available only for the 1969-79 period. Systematic or non-diversifiable variance for country i for a given risk measure is equal to the b_i constant obtained from the regression, squared, times the variance of the index as given by equation (2).

$$(2) \text{Systematic variance} = (b_i \sigma_x)^2$$

The nonsystematic or diversifiable variance is the standard error of the regression, squared, times $(N-2)/(N)$ as given by equation (3).

$$(3) \text{Nonsystematic variance} = (\text{standard error of regression})^2 (N-2)/(N)$$

The systematic and nonsystematic standard deviation is the square root of the appropriate variance.

This approach could be flawed if the first oil shock caused structural changes which increased systematic risk. To test for the occurrence of structural shift at the end of 1973, a regression given by equation (4) was performed.

$$(4) X_i = a_i + b_i \bar{X} + g_i D + h_i D\bar{X} + e_i$$

where $D = 0$ prior to 1974-I;

$= 1$ from 1974-I to end of period; and

a_i, b_i, g_i , and h_i are constants.

The t -statistic on the h_i coefficient can be interpreted as a test for significance. It was found that the h_i coefficient was insignificant almost 80 percent of the time. In five out of twelve cases when the h_i coefficient was significant, it indicated a decrease rather than an increase in systematic risk for the later period. Thus, it appears that there was no structural shift in the proxies used in the post-1973 period.

* All data were obtained from the International Monetary Fund's *International Financial Statistics*.

Table 1

Empirical Results for Export and Money Supply Proxies*

In percent per quarter

Country†	Growth of exports, 1960-79					Growth of money supply, 1969-79				
	SSD	Non-SSD	TSD	Sys V	Non-SV	SSD	Non-SSD	TSD	Sys V	Non-SV
Brazil	10.14	16.43	19.31	28	72	1.50	12.39	12.49	1	99
Mexico	8.33	13.90	16.21	26	74	19.80	35.02	40.23	24	76
Korea	14.12	17.81	22.73	39	61	3.29	21.28	21.53	2	98
Philippines	5.24	13.56	14.54	13	87	6.27	46.71	47.13	2	98
Spain	12.68	21.47	24.93	26	74	5.65	19.03	19.85	8	92
Argentina	4.08	19.65	20.08	4	96	176.28	119.26	212.83	69	31
Hong Kong	4.72	8.92	10.09	22	78	—	—	—	—	—
Greece	34.79	45.25	57.08	37	63	3.48	24.70	24.94	2	98
Colombia	4.20	15.29	15.86	7	93	—	—	—	—	—
Chile	5.94	18.32	19.26	10	90	3.94	25.38	25.68	2	98
Yugoslavia	10.61	9.67	14.36	55	45	2.91	20.00	20.21	2	98
Ecuador	4.88	18.31	18.95	7	93	.60	36.77	36.78	0	100
Thailand	-1.69	16.42	16.50	1	99	5.69	49.18	49.50	1	99
Panama	5.04	18.60	19.27	7	93	—	—	—	—	—
Peru	5.50	16.00	16.92	11	89	-3.84	26.65	26.93	2	98

* The column headings are as follows:

SSD = Systematic standard deviation.

Non-SSD = Nonsystematic standard deviation.

TSD = Total standard deviation.

Sys V = Percentage of systematic variance.

Non-SV = Percentage of nonsystematic variance.

† Data on Taiwan not available from the International Monetary Fund, *International Financial Statistics*.

Table 2

Empirical Results for Liquidity Proxies*

In percent per quarter

Country	Growth of international reserves, 1960-79					Growth of imports/reserves, 1960-79				
	SSD	Non-SSD	TSD	Sys V	Non-SV	SSD	Non-SSD	TSD	Sys V	Non-SV
Brazil	17.86	12.42	21.76	67	33	15.53	13.29	20.44	58	42
Mexico	3.33	8.58	9.20	13	87	9.82	10.94	14.70	45	55
Korea	2.84	13.41	13.71	4	96	13.13	18.43	22.62	34	66
Philippines	2.89	14.33	14.62	4	96	4.48	13.21	13.95	10	90
Spain	3.89	13.71	14.25	7	93	4.13	16.82	17.32	6	94
Argentina	10.17	33.83	36.36	8	92	8.40	30.19	31.34	7	93
Greece	2.14	9.56	9.80	5	95	11.89	17.57	21.22	31	69
Colombia	7.85	20.14	21.62	13	87	9.71	25.46	27.25	13	87
Chile	6.54	33.84	34.46	4	96	8.94	36.70	37.78	6	94
Yugoslavia	3.29	23.28	23.51	2	98	10.58	20.13	22.74	22	88
Ecuador	8.66	16.43	18.57	22	78	8.02	21.90	23.32	12	88
Thailand	-2.24	5.11	5.12	0	100	-.66	7.43	7.46	1	99
Panama	2.79	17.30	17.52	3	97	8.12	17.75	19.52	17	83
Peru	2.59	19.41	19.58	2	98	4.34	18.72	19.22	5	95

* See Table 1 footnotes.

For most countries, the bulk of the variance is non-systematic or diversifiable as opposed to systematic, although there is always a bit of both. Systematic variance dominated only in exceptional cases where one country had extremely rapid growth of a particular proxy, and the growth was highly correlated with the index. This was the case with Argentinean money supply growth and Brazilian international reserve growth. Even so, only six countries (Brazil, Mexico, Korea, Argentina, Greece, and Yugoslavia) had more than 33 percent systematic variance on one or more of the four risk measures. Only two of the countries (Brazil and Korea) had more than 33 percent systematic variance on two or more risk measures.

The four risk proxies each attempt to capture a different aspect of the economy. As such, the independent use of the four proxies may tell different stories for some of the countries. Systematic variance for a country can be high as measured by one proxy and low as measured by another. For example, Brazil has 28 percent systematic variance as measured by export growth, 1 percent systematic variance as measured by money supply growth, 67 percent systematic variance as measured by international reserve growth, and 58 percent systematic variance as measured by imports/reserves growth.

Even so, the stories were not very different for most of the countries. Widely disparate results, where systematic variance is more than 50 percent in one proxy and less than 10 percent in another proxy for the same country, occurs in only three cases (Brazil, Argentina, and Yugoslavia). Moderately disparate results, where systematic variance for the highest proxy is between 25 and 50 percent and systematic variance for the lowest proxy is under 10 percent, occurs in four cases (Mexico, Korea, Spain, and Greece). Five of the countries had less than 15 percent systematic variance in all indexes (the Philippines, Colombia, Chile, Thailand, and Peru).

One method of estimating systematic variances for a given country when disparate results were obtained from the four proxies is to calculate a weighted average. For example, if the proxies were weighted equally, systematic variance would be 38 percent for Brazil, 22 percent for Argentina, and 20 percent for Yugoslavia. The usefulness of these results depends on either the appropriateness of the weights chosen or the sensitivity of the results to the weights.

Extensions

Two empirical extensions to the above analysis were considered. First, the sample period was split at the end of 1973 to test for a structural change in the relationship between systematic and nonsystematic risk.

If there were a dramatic increase in systematic risk as a result of the first oil shock, it would render the original empirical work based on long-term series less useful. The empirical methodology is discussed in Box 3. It was found that in nearly 80 percent of the cases there was no significant difference between systematic risk in the period prior to end-1973 and the 1974 and after period. In nearly half the cases when there was a significant difference, it represented a decrease rather than an increase in systematic risk.

The second extension was to consider the extent of diversification that could be achieved when lending is concentrated in a particular area. The results discussed thus far assume that the bank is holding a portfolio of country credits, similar to the average portfolio of country credits held by all United States banks. While the major money-center banks do hold well-balanced portfolios, many regional banks do not. They concentrate their lending to countries in a particular area (for example, Latin America) because they have other business relationships with these countries, such as financing importers who concentrate on Latin American goods. Thus, those banks may have a built-in informational advantage over their competitors in dealing with particular countries. They can exploit this by specializing their limited international lending staff in making loans to the countries in an area. Consequently, they can often arrange for a larger role in syndicated credits and hence a larger front-end fee than would be warranted by their resources. The trade-off in this type of specialization is that they hold a less geographically diversified portfolio.

How much additional risk is assumed by this specialization? Recomputing the earlier results based on a portfolio of eight Latin American borrowers (Brazil, Mexico, Argentina, Colombia, Chile, Ecuador, Panama, and Peru) indicated a slight, but not substantial, loss in diversification opportunities as a consequence of a geographical specialization. When the sample was pared further to the six South American borrowers, the conclusion remained that the loss in diversification opportunities was not substantial. Thus, very sizable gains from diversification can be achieved by holding relatively few country loans.

Qualifications

The major strength of the approach used in this article is that it quantifies diversifiable and nondiversifiable risk in the absence of reliable rate-of-return measures. There are, however, four major qualifications to this approach. First, this methodology assumes that there is no measurement error in the proxies that will bias the results. If such error exists and is random, the measures used will overstate diversifiable risk and

Second, even if these ratios capture in some crude sense economic ability to pay, they will not capture political ability or willingness to pay. If political risks are highly correlated across countries, the results presented in this article may overestimate diversifiable risk. To a limited extent, however, political risk may be captured in the economic variables. For example, political inability to pay may be captured in extremely sluggish export growth. Moreover, there is little evidence so far that political events that have interfered with debt service have been correlated across countries.

Finally, it should be noted that this study estimates only diversifiable risk within a select group of non-OPEC countries. Bank management, however, is concerned with the total risk and the total rate of return on the bank's portfolio. Loans to non-OPEC LDCs comprise approximately 10 percent of the assets of the nine largest banks. To the extent that the bank's rate of return on LDC loans is not highly correlated with the rate of return on other assets in the bank's portfolio, opportunities for diversification are larger than those indicated. Thus, estimates of diversifiable risk presented in this article should be regarded as a lower bound. There is some evidence to suggest that the rates of return on the loans to non-OPEC LDCs are

Conclusions

- First, it appears that the efforts of the Federal regulatory authorities to emphasize loan diversification are well placed. Since banks can significantly diversify risks even by holding credits to relatively few countries, the regulators' emphasis should indeed be placed on encouraging diversification and attempting to identify concentrations of lending that are large relative to bank capital.
- Second, it appears that the nightmares of bankers, regulators, and journalists of massive LDC defaults paralyzing the United States banking system are not warranted on economic grounds. Non-OPEC LDCs are not a homogeneous group, as this study has demonstrated. Country specific risks, which are relatively independent across borrowers are far more important to the economic health of the countries than common factors. Indeed, it is misleading to speak of the aggregate exposure of the banking system to non-OPEC LDCs as it implies a much greater uniformity across countries than appears to be the case.

Laurie S. Goodman

The National Defense Budget and Its Economic Effects

National defense is the only category of Federal spending in which the Administration has budgeted major increases. The expanded budget reflects the Administration's commitment to greater defense capability. Naturally, the prospect of sizable increases in defense budgets has substantial economic implications, and the purpose of this article is to analyze those economic implications. One important issue is how much defense is likely to cost over the next five years. Related to that is whether the increase in the March 10 budget proposal will be sufficient to satisfy the requirements of alternative defense strategies. Another important question is what the potential effects on the economy will be of a medium-term defense buildup that is as large as (or conceivably larger than) the one proposed by the Administration.

Before moving into that economic analysis, the article provides some background on the context—in terms of defense planning—in which defense budgets are inevitably made. This section draws heavily on the published research of leading defense scholars. It focuses on two dimensions of defense planning that have a significant impact on the size and composition of the defense budget: the choice of conventional war strategy and decisions about major weapon systems and personnel compensation.

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Because of the complexity of the issues involved, from the technical standpoints of both defense planning and economics, there are no definitive answers to many of the questions that have been raised. Nevertheless, an analysis of the defense outlook supports these preliminary conclusions:

- The Reagan administration's defense budget proposal for fiscal year 1982 represents an across-the-board funding increase to the Carter defense program and not a basic strategy change. In fact, there has been no publicly announced change in basic defense strategy for conventional forces since the start of the Nixon administration.
- Any reassessment of conventional war strategy may require major changes in budgets for fiscal year 1983 and beyond.
- Even without such a reassessment the Administration still has major multibillion dollar issues to resolve, primarily on strategic nuclear weapons and personnel costs. Until these decisions are made, it will be difficult to place a firm estimate on how much defense is likely to cost over the next five years.
- Regardless of the outcome of those decisions, however, it appears likely that there will be pressures for defense expenditures significantly in excess of what is contained in the

Table 1

Defense Budget Authority Estimates and Projections

By fiscal year, in billions of dollars

Defense budgets	1981	1982	1983	1984	1985	1986
Pre-January 1981 policy	173.7	198.1	219.0	238.0	252.0	256.6
Carter proposal*	173.7	200.3	225.0	250.5	277.5	306.5
Reagan proposal	180.7	226.3	259.6	294.9	333.0	374.3
Reagan vs. pre-January policy	+7.0	+28.2	+40.6	+56.9	+81.0	+117.7
Reagan vs. Carter	+7.0	+26.0	+34.6	+44.4	+55.5	+ 67.8

*Carter numbers have been adjusted to reflect economic assumptions in the Reagan proposal.

Administration's multiyear projections. For one thing, the costs of the force levels that would satisfy the major competing strategies appear to exceed the funding levels for 1982-86 contained in the March 10 budget revisions. In addition, higher than anticipated defense inflation rates and the persistence of cost growth (overruns) of major defense acquisitions could erode the purchasing power of the Administration's projected budget levels.

- Budget increases for national defense could create inflationary pressures, although that outcome is not inevitable. It depends on a number of conditioning factors, including the size, composition, and speed of the buildup, capacity utilization in industry, and the course of monetary policy. In procurement, the projected increase (measured in constant dollars) is larger, more rapid, and of longer duration than the Vietnam war buildup. An analysis of that period suggests that a policy of not monetizing defense-induced increases in the Federal deficit would not have been sufficient to ensure against a rise in the inflation rate lasting for some time. But, in contrast to that earlier period, inflationary pressures from the defense increase may be mitigated in 1982 by the existence of underutilized industrial capacity. Also relevant is that, in most instances, the Administration budget does not increase quantities of goods to be bought in 1981 and 1982 above plans that were publicly announced in 1980 or, in many cases, above levels that were actually purchased in 1980. Rather, the proposal by and large funds growth (since the

start of 1980) of the estimated unit costs of weapon systems. For 1983 to 1986, the inflationary consequences are more uncertain for three reasons: because defense procurement may be increased more than currently projected; because of uncertainty about whether nondefense investment resulting from business tax cuts and prospective economic growth will place excessive demands on a few sectors of the economy that also supply goods to defense; and because it is impossible to accurately predict the response of the public and of inflationary expectations to an extended period of monetary restraint.

In all likelihood, the high cost to the budget and the economy of expanding defense may lead to demands by some for more nondefense budget cuts or smaller tax cuts, while others may call for scaling back or delaying plans for new defense purchases. Such a debate would highlight one danger that has been stressed by several defense scholars: that is, if a new defense strategy is formulated in isolation from domestic policy options, the ultimate outcome may be undesirable, in that the country may not be willing or able to purchase the forces required by that strategy. Consequently, they argue that it is very important to formulate and to choose an affordable defense strategy through a process that explicitly weighs the costs and risks of different strategies against the benefits of tax relief and alternative nondefense budgets. In recognition of this interdependence, many experts see a need for a comprehensive review of major policy alternatives by the Administration, similar to an interdepartmental analysis coordinated by the National Security Council staff in the early 1970s.

Defense strategy

The March 10 budget submission increased former President Carter's proposal for defense budget authority by \$7.0 billion in 1981 and \$26 billion in 1982. For fiscal years 1983-86, the Reagan administration has projected budget authority that on a cumulative basis exceeds the Carter projection by over \$200 billion, starting with a \$35 billion increase for 1983 and culminating in a \$68 billion increase for 1986 (Table 1). It is not generally realized that the Carter proposal was itself an increase in dollar terms above a projection of policies in effect prior to January 1981. For fiscal year 1986, the Reagan administration budget authority exceeds that baseline by almost \$120 billion. The pattern of the outlay increases in the March 10 budget revisions is similar, but the size of the changes is slightly smaller since outlays generally lag behind budget authority.

In contrast to the proposed tax cuts (with their supply-side rationale) and the nondefense outlay cuts (with their detailed justifications such as increasing state flexibility and privatization of government activities), the defense spending increases are not the outgrowth of a new strategic plan. Statements by the Administration suggest a belief that the Carter defense budget was simply not large enough. The size and not necessarily the direction of the defense budget was the immediate problem. Consequently, the Administration's proposal for 1981 and 1982 contains relatively few new initiatives but, instead, contains increases across the board. The lack of any new plan may also be a result of the short amount of time the new Administration had to review the Carter five-year defense program prior to submitting budget revisions on March 10.

The last major change in defense conventional force strategy occurred at the start of the Nixon administration. As a result of National Strategic Study Memorandum 3 (NSSM-3), a crosscutting analysis of alternative foreign and domestic policy options, defense planning has taken place under a requirement of simultaneously satisfying one major war and one minor war or contingency—for example, a Warsaw pact attack on central Europe and a North Korean attack on South Korea. This so-called "one and one-half war" strategy was adopted after it became clear that the two and one-half war strategy used since the early 1960s was not affordable and possibly unnecessary.¹ (For strategic nuclear forces, United States policy has for some time espoused mutual deterrence through the maintenance of a triad of submarine-based missiles, land-based missiles, and nuclear weapons de-

livered by fixed-wing aircraft. Targeting assumptions were altered somewhat by the Carter administration, but basic elements of strategic nuclear policy remain unchanged.)

Recently, certain questions have been raised about defense conventional force planning. The first question concerns whether the United States has been purchasing the kinds of forces that provide the capability to satisfy the one and one-half war strategy. A fundamental assumption underlying the one and one-half war strategy is that United States forces are fungible and can be moved from bases in the United States to wherever crises might occur. In the past several years, defense conventional force programs have been geared to fighting a major war in Europe and the assumption has been that the types of forces that would meet this requirement would also satisfy a minor contingency. However, defense analysts have maintained that it is not clear whether the armored divisions or heavy fighter aircraft required for a major war in Europe would be appropriate for a minor contingency, such as intervention in the Caribbean or southern Africa, where speed and maneuverability may be more important than sophisticated firepower.² Also, investments have not been made recently in the airlift and sealift necessary for a one and one-half war strategy.

A second and more fundamental question is whether the one and one-half war strategy is still appropriate in the current international environment. For example, various Persian Gulf scenarios are, in theory, supposed to be satisfied by force planning for a minor contingency. However, the kinds of forces required for these situations may be very different from those required either for a European war, a defense of South Korea, or intervention in the Caribbean.³

The questions that have been raised about force planning imply alternative approaches to the formulation of the defense program for fiscal year 1983 and beyond. As the Administration prepares the 1983-87 five-year defense program, it may consider the following options that have been put forward by various defense planners:

- The Administration could validate its earlier decision to increase the Carter program across the board. This would mean stating that the

² Stansfield Turner, "Toward a New Defense Strategy", *New York Times Magazine* (May 10, 1981), pages 14-17, 50, 55.

³ Dov Zackheim suggests that, for Persian Gulf contingencies, the Marines may need equipment to permit them to operate beyond the beach and not merely near the coast. See *The Marine Corps in the 1980s* (Congressional Budget Office, May 1980).

¹ Henry Kissinger, *White House Years* (1980), pages 220-22.

March 10 proposals were made because of a firm belief that the size rather than the direction of the pre-Reagan defense program was the problem and not because of insufficient time to formulate a new defense strategy.

- The NSSM-3 strategy could be retained, as in the first option, but with less emphasis placed on the purchase of equipment for a war in Europe and more placed on the demands of minor contingencies. Forces could be reconfigured so that they are in fact fungible. In particular, this would mean more light divisions, more numerous but lighter and less capable ships and aircraft, more vertical takeoff and landing aircraft, and a major increase in airlift and sealift.
- The more demanding minor contingencies in the Persian Gulf and Korea could be raised to permanent scenarios. This new strategy—a “one plus two one-half wars” strategy—would require prepositioning more men and equipment in the Persian Gulf, a greater capability for the Marines to operate beyond the beach, and improved sealift and possible better airlift. It is not clear how the less demanding minor contingencies fit into this option. One possibility would be to assume that forces designated for Korea or the Persian Gulf could be moved and applied, if needed, to intervention in other areas.
- Defense planning could be geared toward a capability to respond simultaneously to one major war plus multiple minor contingencies. The strategy would be the most expensive option because it would include purchasing forces to fight (at the same time) a European war, Persian Gulf and Korean wars, and a certain number of small third world skirmishes.

Published reports of the recently approved defense policy guidance for the preparation of the 1983-87 five-year defense plan cite a planning strategy of preparation for what is termed worldwide war. Without specifics about assumptions concerning simultaneity of operations and the number of regions, it is extremely difficult to ascertain whether this guidance represents a strategy change. It could mean planning for more than one major conflict and multiple minor contingencies or it could be a new way of presenting and implementing the NSSM-3 strategy. Although the Administration supplied budget projections for 1983-86 with

the March 10 revisions to the 1982 budget, it will be difficult to assess how much defense actually will cost over the next five years until basic defense strategy is clarified.

Major policy decisions

A second factor that makes an assessment of the likely five-year defense budget totals difficult is the fact that the Administration has yet to make some major policy decisions, many of which are not related to conventional war strategy. Although the alternatives are not necessarily to invest billions or to spend nothing on the major programs involved in these decisions, even small alterations in the programs can have large dollar effects and may affect the funding levels for other programs, both large and small, over the next five years.

- *MX basing.* The question is whether to proceed with the proposal for thousands of miles of roads for the mobile missile (MX) or to deploy the missile in existing Minuteman silos. If the latter option is adopted, deployment would probably be accompanied by an antiballistic missile (ABM) system. Deployment of an ABM system would probably mean either disregarding the treaty or modifying it at the scheduled review by the United States and the Soviet Union in 1982. This is a \$30-40 billion decision (in 1982 dollars).
- *Manned bombers.* The Administration budget contains research and development funds for a new manned bomber, similar to the B-1. The decision that must be made is whether to move forward with further development and procurement or to make changes to B-52s and FB-111s until the Stealth bomber is ready. At a minimum, this is a \$20-30 billion decision (in 1982 dollars).
- *Air defense.* The Air Force would like to replace its F-106 aircraft used for strategic defense of the United States with F-15s. This is about a \$5 billion decision (in 1982 dollars).
- *Theater nuclear forces.* The issue is whether or not to proceed with placing more ground-launched cruise missiles and Pershing missiles in Europe. NATO (North Atlantic Treaty Organization) allies would like them there, but individual countries prefer not having the missiles located on their soil. This is a \$5 billion decision (in 1982 dollars).

- **Shipbuilding.** It is not clear that the United States shipbuilding industry currently has sufficient capacity to increase production rates for nuclear warships as rapidly as implied by the recently announced Navy shipbuilding program. Options include reopening one or more Government shipyards to new construction or building more conventionally powered ships.

- **Manpower.** Recent pay raises have helped improve retention in the military. However, current plans call for as much as a 200,000 increase in active duty man-years. Even without a force buildup, the services will probably face recruiting shortfalls, given the quality and composition constraints imposed by the Congress. The current approach of using across-the-board pay raises as an incentive is expensive (a 10 percent pay raise costs over \$3 billion per year). But shifting to an elaborate system of targeted incentives could distort the pay system. A recently formed high-level task force on military manpower will apparently consider numerous options including reinstituting the draft. That would dramatically lower the optimal capital-labor trade-off in defense and would imply a much smaller increase in defense procurement.⁴

- **Mobility forces.** Flexible forces need to be movable. Current capabilities are thought to be inadequate. The Administration has to decide on the mix of airlift and sealift and the levels of procurement for additional aircraft and/or ships. This is a \$15-25 billion decision (in 1982 dollars). The decision is somewhat dependent on basic decisions about conventional war strategy.

⁴ The manpower problem is very complex. For example, since the start of the all-volunteer force, military unit labor costs have fallen in real terms. In an unconstrained situation, the services could raise salaries and bonuses to attract more recruits up to a point where the estimated marginal product of an extra dollar spent on labor equals the marginal product of an additional dollar spent on procurement. However, the resource-allocation decision is constrained in various ways. Pay levels are restricted by comparisons between civilian and military Government employees (it is difficult to convince of Congressmen approving base pay levels for colonels that exceed their own salaries) and comparisons within the military (it would be difficult to have a pay system where the salary and initial bonus for an unskilled recruit exceeds the pay of a three-year veteran). As a result of such constraints, the military does not appear to have had the option to become more labor intensive despite the real decline in unit labor costs.

The cost of defense

Although decisions about overall strategy and about specific weapon systems and policies make it impossible to fix firmly the cost of defense over the next five years, it is likely that there will be pressures for more funds than included in the March 10 budget proposal and projection.

The first reason for this is that the force levels and investments needed to satisfy the major alternative strategies may cost more than was allotted in the March 10 budget revisions. (Recall that the budget projections for 1983-86 did not represent a commitment to a new strategy.) Although one analyst concludes that an alternative that resembles a one plus two one-half wars strategy would cost the same or less than the funding levels contained in the Administration's budget projection, that estimate appears to be understated. For example, the ten-year costs for modernizing and fully equipping three reserve divisions are given as \$3 billion (\$100 million per year, per division).⁵ A more realistic estimate, using recent Army data, is two or three times that amount. Also, the cost estimate assumes the upgrading of reserve and national guard divisions and air wings, an assumption that holds down total costs but is probably unrealistic. In particular, most analysts believe reserve divisions probably could not be expected to operate as front line divisions if they were comprised entirely of reserves. Rather, reserve companies or battalions would have to be combined with a cadre of active duty forces. This would require a major change in the organization of the national guard and to a lesser extent of the reserves. Such changes have been resisted by the reserves and by the services. Another practical problem has been recruiting and retention in the reserves. Summing up, if the reserve ground forces in the one plus two one-half wars strategy are replaced with active duty forces, the five-year costs exceed the Administration projection by 5 to 10 percent or \$50-100 billion (1982 dollars). A strategy of preparing to fight a worldwide war (interpreted here to mean one major contingency and multiple minor contingencies) would require capabilities that exceed a one plus two one-half wars strategy and consequently would cost more. (This assumes, of course, the Defense Department does not proclaim the strategy and then fails to provide the funds to purchase the required capabilities—as was the case with the two and one-half war strategy of the sixties.)

A second reason why additional pressures might

⁵ William W. Kaufmann, *Setting National Priorities* (Brookings Institution, May 1981).

emerge for defense increases is cost growth (overruns) of major weapon system procurements. In January 1980 and January 1981 the Carter administration submitted budget requests that documented substantial increases in the unit prices of major weapon systems over the previous year's estimates. For example, in January 1981 the unit price for the SSN 688 attack submarine exceeded the January 1980 estimate by 20 percent. The cost increases over the same period for the XM-1 tank was 76 percent. In January 1980 the unit price of the F-18 fighter aircraft was estimated to be 25 percent higher than in January 1979. (In all three cases, there was no change in the quantities purchased.) The 1979-80 cost growth of the F-18 was followed by a 40 percent increase in the unit price between 1980 and 1981. In this case, the quantity to be purchased was cut.

Cost growth of weapon systems can be attributed to changes in requirements or technical specifications, poor estimates of inflation, and changes in quantities purchased. There is no precise way to predict changes in requirements and specifications. However, an unsettled conventional war strategy would

make such changes more likely. Changes in quantities purchased are generally an outgrowth of other problems. When requirements and inflation push costs up, budget constraints often dictate a reduction of or a slowdown in purchases. Usually, these reductions force manufacturers to produce in uneconomical quantities.

One factor that is clearly a potential source of pressure for increased defense funds is inflation. For the purposes of budget preparation, the Department of Defense has traditionally priced their proposed purchases with Administration projections of the gross national product (GNP) deflator. However, since 1975 the deflator for defense durables has consistently grown at a faster rate than the GNP deflator. In 1980, the difference was about 1 percent (Table 2). In addition, there is some disagreement about the likelihood of the Administration's March 10 GNP deflator forecast. The forecast had inflation declining rapidly over the next few years. In July the Administration lowered its forecast for inflation even further. A less optimistic path for defense inflation, such as one projected this spring by the Congressional Budget

Table 2

Inflation for Defense Durable Goods

By calendar year; fourth quarter to fourth quarter rates of growth; in percent

Deflators	1975	1976	1977	1978	1979	1980
Defense durable goods	10.2	7.0	12.0	8.6	8.1	10.8
Gross national product deflator	7.6	4.7	6.1	8.4	8.1	9.9
Difference	+ 2.6	+2.3	+ 5.9	+0.2	—	+ 0.9

Table 3

Effect of Higher Inflation for Purchases on Defense Cost

By fiscal years

Category	1982	1983	1984	1985	1986
Budget authority difference* (in billions of dollars)	+ 6.7	+13.9	+22.7	+34.1	+48.7
Outlay difference (in billions of dollars)	+ 3.6	+ 8.9	+15.5	+24.3	+35.8
Administration defense inflation (in percent)	8.7	7.3	6.2	5.5	5.0
Congressional Budget Office (CBO) defense inflation (in percent)	11.4	10.0	9.0	8.8	8.5

* Difference is the result of using higher CBO defense inflation rates.

Office (CBO), and the use of specialized deflators for defense purchases would imply a much larger increase in defense costs. By fiscal year 1986, defense procurement costs would exceed the projection in the March 10 budget revisions by almost \$50 billion (Table 3). This should not be taken to mean that the CBO forecast is more likely to be right. Rather it is meant to show how sensitive the defense budget (and its purchasing power) is to the course of inflation. Even relatively moderate differences in inflation projections can be associated with big differences in projections of defense budget authority and outlays.

The economic effects of the defense buildup

Having reviewed the defense budget outlook, it appears safe to conclude that, although total costs cannot be projected precisely, pressure will be considerable for funding that is at least as great as projected in the March 10 budget revisions. Using these figures as a starting point, the next question is what are the potential economic effects of the buildup. The economic consequences can be roughly divided into effects on the aggregate economy stemming from excess demand caused by the increase in defense-related Government purchases and effects on certain sectors of the economy caused by the supply or capacity limitations of defense industries. These latter effects, depending on their size, may result in changes or distortions that spread to the economy as a whole.

Aggregate demand and inflation

Some economists believe that the defense buildup will exacerbate our inflation problems. Lester Thurow compares the projected increase to the Vietnam buildup, pointing out that the constant dollar rise in outlays between 1965 and 1970 was only \$24.2 billion in 1972 prices, compared with the \$41 billion increase between 1981 and 1986 projected by the Reagan administration.⁶ Thurow argues that the defense increase and the tax cut combined will overstimulate aggregate demand and lead to a new round of inflation. His concern is similar to that expressed by Wassily Leontief in various interviews. Leontief believes that: "If handled improperly, these huge jumps in military spending will mean higher inflation, a worsening balance of payments gap, a drain on productive investment, soaring interest rates, increasing taxes, a debased currency and, in the longer term, more unemployment."

⁶ Lester Thurow, "How to Wreck the Economy", *New York Review of Books* (April 6, 1981). His figures are slightly high for the 1965-70 increase which was \$21 billion, but he also does not point out that the spending peak was in 1968. The constant-dollar growth between 1965 and 1968 was \$32 billion. See *Federal Government Finances* (Office of Management and Budget, March 1981).

Other economists dispute the contention that the defense increase will be inflationary.⁷ They contend that the defense spending increase in the Vietnam era was inflationary primarily because the Federal Reserve monetized the deficit increases produced by the defense buildup and allowed the money supply to grow too rapidly. According to this school of thought, Administration goals for cutting the rate of growth of money and credit in half by 1986 (compared with 1980 rates of growth) are consistent with the view that the Federal Reserve will not monetize near-term deficits that result from the defense increase and the tax cut. Thus, even though the defense increase is large, Federal Reserve money stock targets will effectively put a lid on nominal GNP and inflation. This hypothesis about the effects of monetizing the deficit is an extremely important one.⁸ Unfortunately, it is not possible to turn back the clock in order to validate or refute arguments about the effects of fiscal or monetary policy in the sixties. To evaluate the effects of a defense buildup, for any specified growth path of the money stock all that can be used is economic logic and historical statistical relationships. In simplified terms, the analysis goes something like this.

Initially, an increase in Government purchases for defense would result in more real aggregate demand, compared with a path for the budget and the economy that does not include a defense buildup. This could be expected to result in more inflation unless the economy were operating well below capacity. (In 1965, the economy was operating near full capacity.) The higher nominal GNP, resulting from more real aggregate demand and possibly more inflation, leads to an increase in desired money holdings. However, since the growth path for the money stock is fixed, interest rates are higher. Eventually, higher rates choke off the additional GNP growth and inflation slows. At some point, GNP and interest rates might even converge back to the levels that would have been reached in the absence of the defense stimulus.

The description of the dynamics of a surge in defense spending, combined with an unchanged path for money growth, leaves a number of questions unanswered. In particular, how long would it have taken for higher interest rates to slow real growth and inflation

⁷ Herbert Stein, "The Economics of American Defense, Q & A.", *Wall Street Journal* (July 7, 1981).

⁸ Variants of the same arguments have been used both for the defense increase and for the tax cut proposal. See "The Reagan Program for Economic Recovery and the Kennedy Tax Cuts", a staff study prepared for the Joint Economic Committee, April 1981. According to this study, an additional feature of the tax program is that the real portion of nominal GNP will increase while the inflation component will decrease because of supply-side incentive effects.

and, before that occurred, how much inflationary momentum would develop? The length of lags and the relative magnitudes of various economic effects are primarily empirical rather than theoretical questions. To analyze them, two experiments were performed on an empirical model designed to capture the historical behavior of the United States economy, the Federal Reserve-MIT-Penn (FMP) econometric model. In the first experiment, we compared estimates of the path the economy followed in 1966 through 1969, assuming

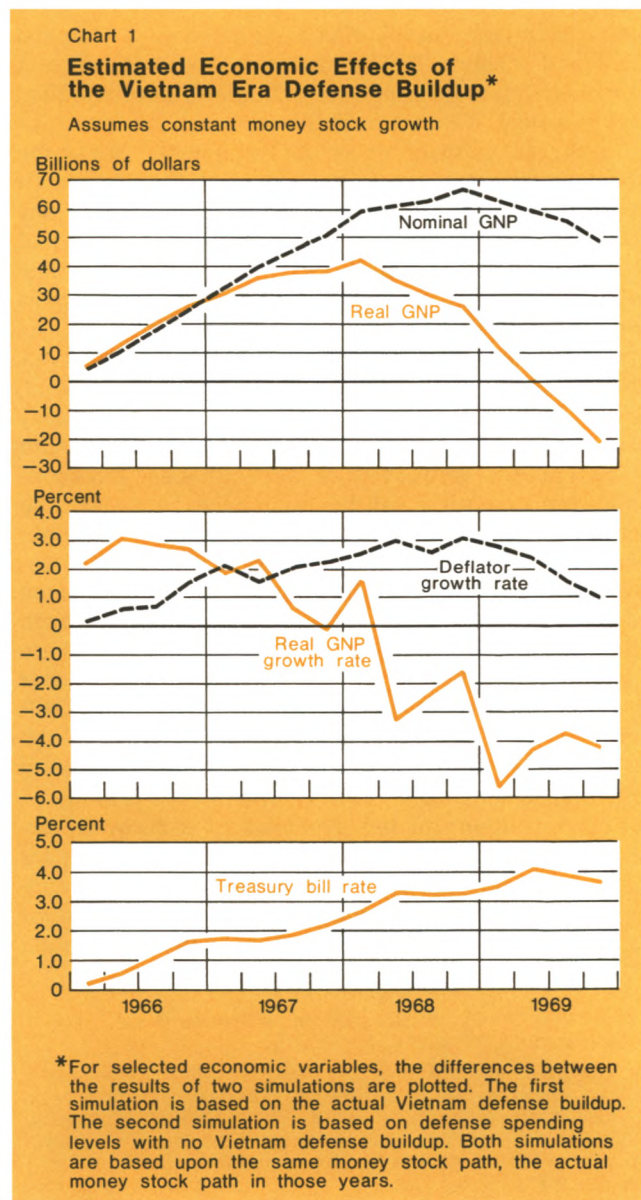
the historical defense buildup, with estimates of the path of the economy without that defense buildup—taking the actual historical pattern of monetary expansion for both cases. In the second experiment, we compared the path the economy might have taken with the Vietnam defense buildup, but under a more restrictive monetary policy, with the path the economy might have taken without a defense buildup but with the historical growth of money.

The results of the first experiment, reported in Chart 1, are that twelve quarters after the start of the buildup in 1966 the inflation rate with the defense buildup exceeds the rate under the no-buildup assumption by 3 percentage points. The estimated differences narrow after that because of the lower real growth resulting from higher interest rates. The results of the second experiment show an inflation rate after eight quarters approximately 1 percentage point higher than for a simulation of the economy without a defense buildup but with the historical pattern of monetary growth. All econometric estimates are subject to a considerable margin of error, and the results of experiments like these should be assessed with caution. Nevertheless, the empirical relationships do tend to refute the hypothesis that the defense buildup in and of itself had no inflationary consequences.

The hard question is whether economic conditions today are enough like those that existed in the mid-1960s to justify similar conclusions about the inflationary effects of a medium-term defense buildup. Clearly, there are more differences than similarities. The economy is operating further below its potential than it was in the earlier period, and unemployment is higher. Also, the defense increase is proportionally smaller; using the Administration's economic assumptions and defense estimates, defense outlays as a percentage of GNP would increase by 1.8 percentage points between 1980 and 1985, compared with 2.1 percentage points between 1965 and 1968. But the inflation rate is initially far higher, and the public's inflationary expectations are more unstable. Under these circumstances, what seems to be a fair conclusion is that, while the increase in the defense budget may not cause the inflation rate to go up, it could tend to retard progress toward reducing inflation under maintenance of a policy of monetary restraint.

Cost push and bottlenecks

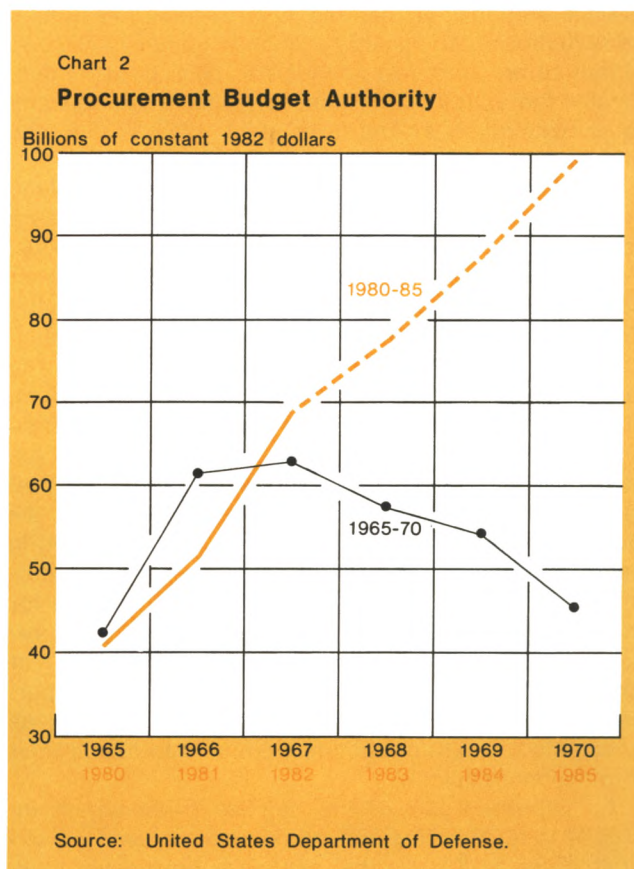
In addition to these macroeconomic considerations, there is a risk of inflationary effects if the defense buildup confronted supply or capacity limitations in the industries that support defense procurement. The defense increase proposed by the Administra-



tion is heavily concentrated in procurement. As shown in Chart 2, the growth of procurement budget authority between 1980 and 1982 in constant dollars exceeds the growth of 1965 through 1967, *i.e.*, 70 percent vs. 49 percent. The magnitude of the planned procurement spending suggests that, to the extent to which the demand for defense goods in the near term is price inelastic (or insensitive to price increases) and United States industrial capacity is limited, the procurement buildup could have effects similar to the 1979 oil price shock where supply limits confronted a temporarily inelastic demand. Also, the Administration plans sustained real growth of procurement, compared with the Vietnam era when real budget authority for procurement fell in each year from 1968 through 1970. These further increases in defense spending will be occurring at the same time that the effects of the business tax cut will be building rapidly. (For example, the estimated Federal Government revenue loss from the business tax cuts will grow by \$22 billion between 1985 and 1986, compared with only \$7 billion between 1981 and 1982. There is some concern expressed by private-sector economists that the demand for defense goods will crowd out spending on business investment goods.⁹ For example, based on the 1972 input-output tables, it appears that increased capital spending resulting from the business tax cuts would place demands on several of the same industries that directly or indirectly supply the defense sector. These include aircraft and parts, ordnance and accessories, communications equipment, shipbuilding, and electronics.

The capacity problems faced by the defense sector as a result of the defense buildup are unclear at present. This is partially because the items that will be purchased in 1983 through 1986 have not yet been identified. However, even the current situation is ambiguous. Most analysts agree that, at the prime contractor level, there does not appear to be a problem. For example, a number of aircraft assembly plants are producing at less than full capacity. One of the reasons for this is that the Reagan budget did not represent an increase in planned aircraft purchases. Although both the Carter and Reagan budgets represent increases in dollar terms to the funding levels resulting from Congressional action through the end of the 96th Congress, increases in estimates of unit costs meant that the actual number of aircraft to be purchased under both budgets was actually lower than had been anticipated only several months earlier.

⁹ Gary M. Wenglowksi and Rosanne Cahn, "Impact of Defense Buildup Underestimated", *Economic Research* (Goldman Sachs Economics, June/July 1981).



The F-18 aircraft is a case in point. In the January 1980 budget and throughout the rest of the calendar year, the Carter administration publicly stated its intention to purchase 96 F-18 aircraft per year, starting in fiscal year 1982. The manufacturer made plans for producing the aircraft. In January 1981, the Carter administration cut the 1982 purchase to 58 aircraft because of budget problems. The Reagan administration in March increased the 1982 quantity to 63 aircraft—33 short of the amount planned several months earlier. For the F-16 aircraft, 175 planes were purchased in 1980 and 180 have been bought in fiscal year 1981. Although the original plan was to buy 180 aircraft in fiscal year 1982, cost and budget problems caused the Carter administration to reduce its request to 96. The March 10 budget revisions increased the 1982 request to 120 aircraft, 60 less than purchased in 1981. This same phenomenon is repeated throughout the defense program for aircraft and missile purchases. Another reason for the extra capacity at aircraft assembly plants is the slowdown or postponement of commercial purchases. In shipbuilding, decreasing Federal support for com-

mercial shipbuilding has led to delays in commercial construction and resulting excess capacity among prime contractors for nonnuclear ship construction. Finally, the auto industry appears to have the capacity to accommodate an increase in purchases of trucks and tracked combat vehicles for defense.

At the subcontractor level, there may be a problem. The war production base at this level has shrunk as a result of the defense reductions in the early 1970s. For example, between 1968 and 1975 the number of aircraft subcontractors declined by 35 percent.¹⁰ Forgings and pressed steel for airframes and landing gears are produced at only a few plants. Three of the most important materials for these forgings—titanium, chromium, and cobalt—are imported from South Africa and Zaire and are subject to supply interruptions. Assembly plants cannot put together aircraft if the prefabricated materials are not available. However, the Defense Department, in general, and the Air Force, in particular, report a drop in production lead times during the past several months. One of the reasons for this appears to be that prime contractors have reserved future positions in the production lines for forgings in anticipation of accelerated defense purchases. When the acceleration was not so great as anticipated, other contractors were able to obtain their forgings more quickly.

An important part of the defense procurement increase is for missiles and other systems used by aircraft, ships, and tanks that contain sophisticated electronics and guidance mechanisms. The electronics industry is currently operating below capacity. However, defense may face problems in this area since the electronics chips needed for missile and guidance systems are more sophisticated and much fewer in number than those needed for electronics games and toys. Manufacturers are apparently not particularly anxious to produce fifty to one hundred complex chips for defense rather than a million for civilian applications unless the profit per item is large.

Some economists such as Thurow are concerned that attempts to increase defense production will draw top analysts and engineers away from high technology nondefense industries at the same time that our major competitors, such as Japan, are proceeding forward, unhindered by a similar defense buildup. It is extremely difficult, if not impossible, to evaluate this argument. However, it is clear the procurement budget will contain large funding increases for high technology items like missiles and electronics equipment,

and some shortages of engineers have begun to appear on the West Coast.¹¹

In summary, the budget increase in defense procurement is very large and will apparently far exceed the Vietnam procurement increase. Such a large increase could pose problems for the economy as a whole by driving up prices in certain sectors or crowding out investment. However, upon careful examination, it appears that the near-term increase in the quantity or number of items purchased is smaller than had been anticipated by prime contractors; consequently, there appears to be sufficient capacity at the prime contractor level, and possibly even at the subcontractor level, to accommodate the increases proposed for 1982. The longer range outlook depends on the size and composition of the proposals that will be made in connection with the 1983 budget, after decisions are made about defense conventional war strategy and major issues like basing for the MX missile.

Conclusion—a new NSSM-3?

This article has argued that there is a likelihood of pressures for greater increases in defense spending than embodied in the Administration's five-year plans and that there is a risk but not the certainty that those increases could prove to be inflationary. Several responses by the Administration and the Congress are possible to lessen those pressures and reduce the danger of inflationary consequences. They include identifying further cuts in nondefense spending, foregoing approved tax cuts, or rejecting the arguments in favor of more defense spending and imposing an arbitrary ceiling on defense budget increases.

That these would be difficult choices underscores the importance of not formulating a conventional war strategy, or planning defense forces, in isolation from their economic implications. Alternative strategies entail different risks, and for any given strategy alternative force levels mean different risks.¹² The military risks and costs attached to each strategy need to be stacked up against the benefits of domestic spending and tax relief. Otherwise, the following illustrative scenario might occur: The Defense Department could adopt a planning strategy geared to fighting simultaneously one major war plus multiple minor wars or contingencies and commence purchases of the appropriate types of equipment—for example, F-18 fighters

¹¹ Fralick, *loc. cit.*

¹² This latter point is exemplified by the analysis of defense forces by Phillip Morrison and Paul Walker. They argue that the advent of new technology makes it possible to scale back defense spending dramatically at an acceptable risk of being unable to meet requirements. See "A New Strategy for Military Spending", *Scientific American* (October 1978), pages 48-61.

¹⁰ James Fralick, "The Coming Squeeze on Defense Industries", *Morgan Guaranty Survey* (May 22, 1981).

and AV-8B vertical takeoff and landing aircraft. However, cost growth, inflation, and other budget and economic problems could mean that the quantities purchased would have to be scaled back so that it would become likely that neither the major war nor the minor contingencies could be fought successfully. In this case, it would have been preferable to evaluate alternative decision packages prior to choosing a defense strategy. One package could, hypothetically, contain the benefits of funding adequately the requirement of the major war plus multiple minor wars or contingencies and the costs—in foregone consumption, investment, and productivity—of smaller tax cuts. An-

other package might contain the economic benefits of tax relief and the costs or risks of funding adequately only the capability of fighting simultaneously one major war and one minor skirmish and not attempting to purchase the capability to satisfy the requirements of demanding Persian Gulf scenarios. In fact, five decision packages along these lines were assembled and evaluated in the early 1970s, prior to adoption of the then new one and one-half war strategy. Similar crosscutting alternatives may be needed for the 1980s prior to the adoption of a new defense strategy to ensure that the broad economic implications are fully and explicitly considered.

James R. Capra

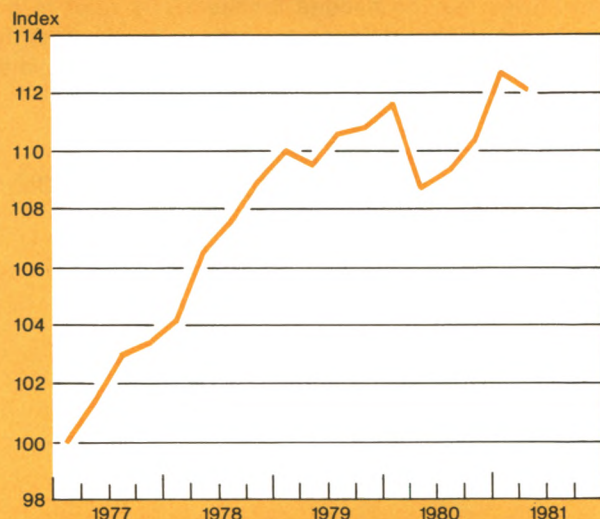
The business situation

Current developments

Chart 1

Real Gross National Product

1977-1=100; seasonally adjusted annual rate



Source: United States Department of Commerce.

Following the surge in economic activity at the beginning of the year, real gross national product declined somewhat in the second quarter (Chart 1). Industrial production has increased only modestly since January, and housing starts have tumbled. Real consumer outlays have fallen below their January level, reflecting weakness not only in auto sales but in other consumer durables purchases as well. Employment growth also appears to have leveled off in recent months, and on balance the unemployment rate held steady at about 7.3 percent during the first half of the year.

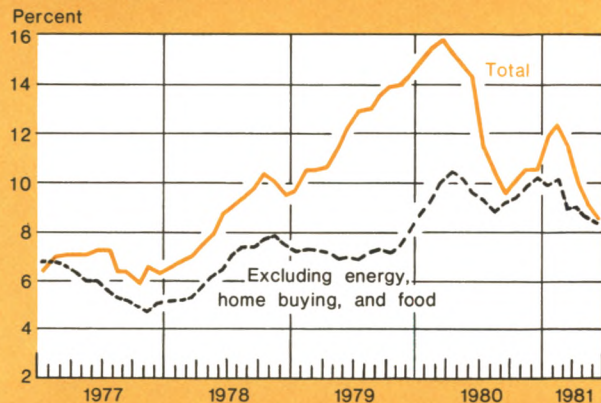
The first half of 1981 witnessed a welcome slowdown in inflation, particularly in the consumer price index (Chart 2). Retail food prices, which had risen at over a 15 percent annual rate in the second half of 1980, were virtually unchanged during the first six months of 1981. The decline in home prices late in 1980 showed up in the consumer price index at the start of 1981. Although mortgage interest rates continued to post hefty increases, they have been rising less rapidly than at the end of last year. This moderation in food and home-buying costs allowed the index to decelerate despite the sharp jump in oil prices at the start of the year. The subsequent fall in petroleum prices has allowed the slower rate of increase in the index to continue despite a recent acceleration in home prices.

Last year's jump in retail food prices and this year's subsequent moderation reflected wide swings in prices of raw agricultural commodities (Chart 3). Hog and steer prices rose rapidly in the early summer of 1980 before starting to decline in August. Wheat and corn prices peaked later in the year. Volatility in food prices is nothing new. For example, farm prices fell throughout 1976, resulting in stable retail food prices that year.

Chart 2

Consumer Price Index

Change from six months earlier;
seasonally adjusted annual rate

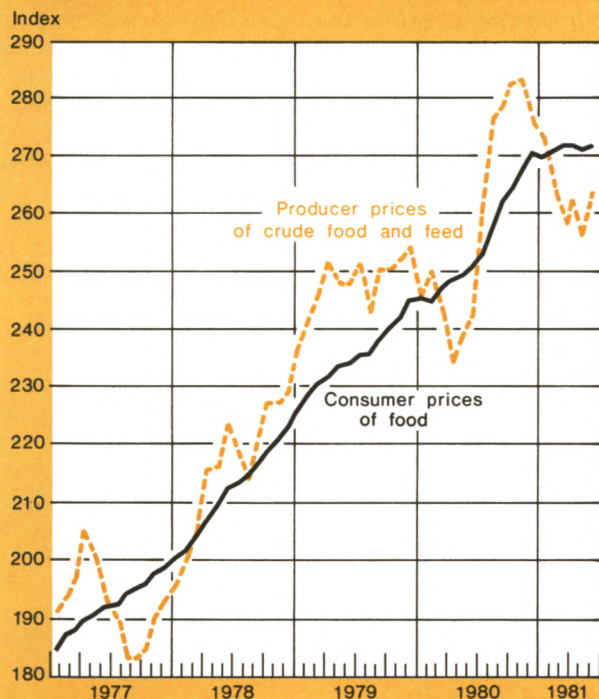


Source: United States Bureau of Labor Statistics.

Chart 3

Food Prices

1967=100; seasonally adjusted



Source: United States Bureau of Labor Statistics.

By 1978 and 1979, however, rapid increases at the farm level showed up as double-digit inflation in food prices paid by consumers.

Another factor contributing to the recent slowdown in food prices was the omission of the April 1, 1981 adjustment to dairy price supports. In recent years support prices have been adjusted semiannually in response to movements in the parity price of milk.* Large surplus stocks of dairy products have accumulated as supply has constantly exceeded demand. The new farm bills before the Congress propose reductions in the support levels from 80 percent of parity to 75 or 70 percent. The likely effect of these proposals would be the elimination or reduction of the scheduled October 1, 1981 dairy support price increase and, possibly, some reduction of the 1982 increase. The elimination of the April 1, 1981 increase helped reduce dairy

price growth between February and May to 3.4 percent at an annual rate from the 12.3 percent rate of the previous three months, shaving 1.2 percentage points off the growth rate of the food-at-home component.

The fall in meat prices is partly a result of the poor outlook faced by cattle farmers in the second half of 1980 and early this year. Confronted with high feed prices, a reduction of pasturage because of drought, and high carrying costs of cattle, farmers in the second half of 1980 decided to reduce the size of their herds, temporarily increasing meat supplies. An indication of both the unavailability of forage and the unprofitability of intensive feeding is that a relatively high proportion of the cattle slaughter came from "non-fed" cattle, cattle which had not been fattened on feedlots prior to slaughter. The relatively mild winter further increased meat supplies by reducing losses and permitting rapid weight gains by cattle. All these factors contributed to a beef and veal supply in the first five months of the year which was 4 percent above that of the same period in 1980. This held down prices not only for beef but, indirectly, for pork as well. As of this June, however, hog herds were significantly smaller than they had been a year ago, and pork farmers surveyed by the United States Department of Agriculture indicated intentions of producing substantially smaller pig crops in coming months.

The outlook for meat prices hinges on some very unpredictable factors. If good weather makes corn prices fall, the meat supply could decline in the near term, as farmers place more of their cattle in feedlots for fattening rather than have them slaughtered. Conversely, with low corn supplies and poor pasturage, the slaughter of nonfed cattle could approach last year's high rates. This would produce a temporary glut on the market but, over the longer term, would result in a smaller livestock herd and thus smaller meat supplies. Another important source of uncertainty is interest rates, which help determine the cost of withholding cattle from the market.

Farm prices now account for only 30-35 percent of the retail food dollar; the remaining 65-70 percent covers processing and distribution costs. These costs increased markedly at the beginning of 1981, as accelerated oil price decontrol, the January increase in social security taxes, and the minimum wage increase provided upward pressure. The Department of Agriculture's food marketing cost index rose at a 16.4 percent annual rate in the first quarter of 1981, the largest increase in over a year.

The effects of these upward cost pressures were particularly evident in the prices of foods for which processing and distribution account for especially large shares of total costs. For example, in contrast

* The parity price of milk is the price which would give dairy farmers the same purchasing power for their milk as they enjoyed during the 1910-14 period.

to the overall stability of food prices so far this year, prices for bakery products, fats and oils, and other prepared foods have been increasing at double-digit rates. The only category of highly processed food which showed price moderation was nonalcoholic beverages, and this reflected steep declines in coffee and sugar prices.

All in all, however, food prices at the retail level have moderated. Together with fuel price declines, they have helped reduce the rate of inflation as measured by the consumer price index. These favorable

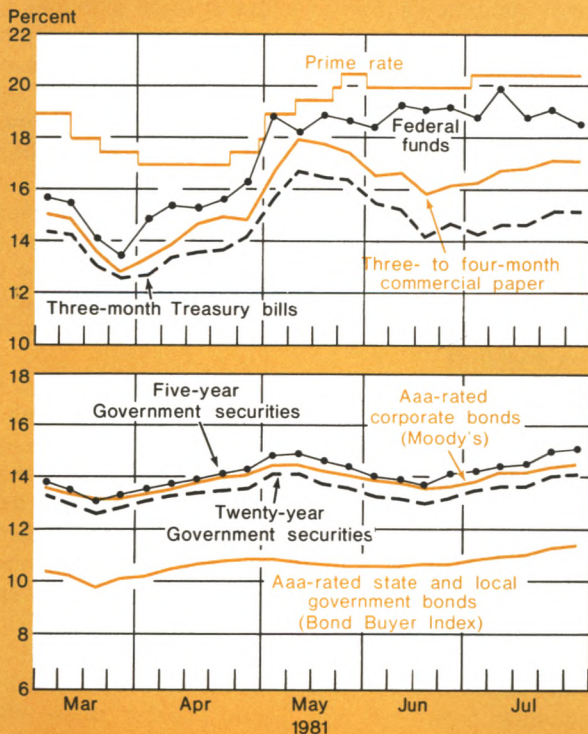
factors reflect for the most part temporary expansions of supplies of certain commodities relative to the demand for them. Food and fuel prices, therefore, cannot necessarily be counted on to continue having such a big slowing effect on the index. More heartening for the longer term is the fact that the Index excluding food, energy, and home buying has decelerated this year, albeit to a lesser degree than the overall index. Since these other prices are generally less subject to wide, transitory swings, their slowdown may represent a more sustainable reduction of inflation.

The financial markets

Current developments

Chart 1

In recent months, interest rates have remained at or near record levels.



Sources: Federal Reserve Bank of New York, Board of Governors of the Federal Reserve System, and Moody's Investors Service, Inc.

Interest rates rose at the beginning of the second quarter and remained at or near record levels into July. At the short end of the term structure, rates were sustained by both strong demands for bank credit and restraint in the provision of bank reserves to contain the growth of the monetary aggregates, which was rapid in March and April. Longer term rates were kept high by concerns in financial markets about the implications for the economy of proposed tax cuts and continued sizable Federal budget deficits, especially in view of Federal Reserve determination to hold the growth of the monetary aggregates within target ranges.

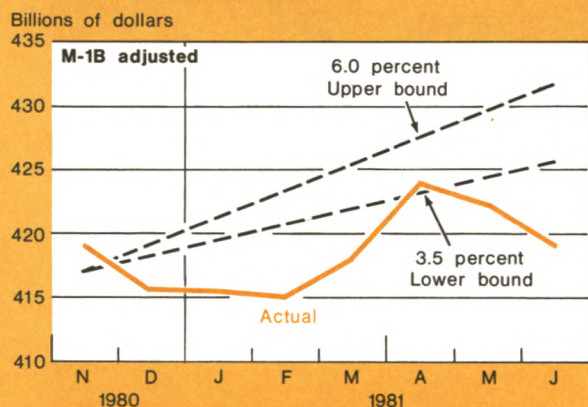
In light of the levels of short-term market interest rates and consistent with the need for restraint over bank reserves, the Federal Reserve System raised the discount rate 1 percentage point to 14 percent, effective on May 5. At the same time, it raised the surcharge imposed on large banks that borrow frequently at the discount window from 3 percent to 4 percent.

By the end of the first half of the year, the paths of the monetary aggregates showed divergent trends. M-1B, adjusted for shifts in 1981 to newly authorized negotiable order of withdrawal (NOW) accounts, fell in May and June to below the lower bound of its target range. M-2 was at the upper edge of its range at mid-year, while M-3 was above its upper bound.

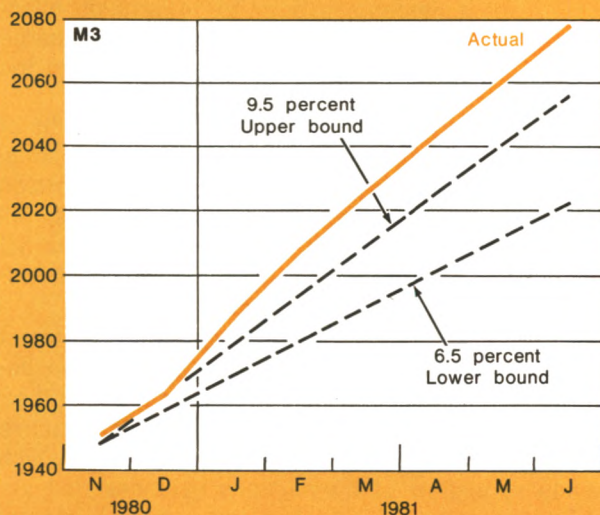
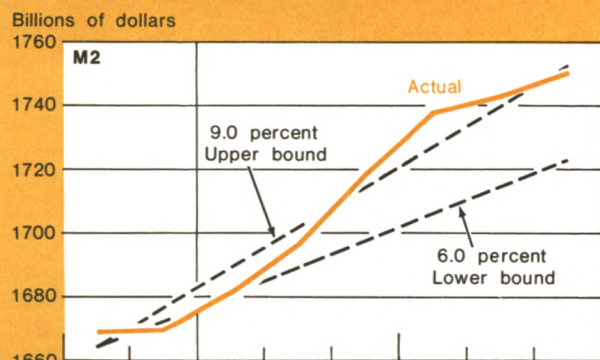
The public apparently has adapted to high interest rates by managing their zero- or low-interest transactions balances very carefully and placing more of their funds in high-yielding liquid alternatives. This response accounts for the large divergence between M-1B (which is made up mainly of transactions balances and exclusively of balances paying a zero- or low-interest rate) and the broader aggregates, M-2 and M-3 (which add a range of assets yielding market interest rates to M-1B). Noting this divergence, Federal Reserve Board

Chart 2

Although M-1B is below the lower bound of its target range . . .



. . . the broader aggregates are at or above their upper bounds.



Source: Board of Governors of the Federal Reserve System.

Chairman Paul Volcker announced that the Federal Open Market Committee (FOMC) considered growth of M-1B near the lower end of its target range for 1981 as a whole to be acceptable and desirable, while it continued to view growth of the broader aggregates near the tops of their ranges as acceptable. Given the public's closer control over transactions balances, lower growth of M-1B is consistent with an unchanged degree of anti-inflationary restraint.

Money market mutual funds

Money market mutual fund shares, which are included in M-2 and M-3, have been prominent in the public's shift into high-yielding liquid assets. Although the first money funds appeared in 1972, they have only recently become an important segment of the financial markets, growing from \$10 billion in 1978 to more than \$130 billion now. The expansion of money funds accounted for two thirds of the difference between the growth of M-2 and the growth of M-1B over the first half of 1981.

The appeal of money funds

Money market mutual funds have become popular with individuals, many corporations, and small- to medium-size bank trust departments. For all, they offer a diversified vehicle that is more liquid than most other money market instruments. For investors of small amounts, an important additional advantage is the small (generally \$2,000 to \$5,000) required initial investment, and even smaller minimum for subsequent purchases and redemptions. By contrast, the direct purchase of money market instruments generally requires an expenditure of at least \$10,000, and many instruments are available only in units of \$100,000. Through their investment activities, money funds effectively transform large-denomination open market claims—like certificates of deposit, bankers' acceptances, and commercial paper—into fund shares, which can be bought or redeemed in smaller units.

Economies of scale in money management appear to be important for corporations and bank trust department customers of money funds. They can achieve greater net returns by investing in money funds than they could by establishing and operating their own facilities for short-term investments. They and some wealthier individual holders also respond to changes in relative yields by shifting back and forth between money funds and money market instruments. Such behavior helps explain both the strong growth of money funds over most of the first half of 1981, and their slow growth in May, when interest rates were widely thought to be reaching a peak and three- to six-month investments were available with yields exceeding those posted by money funds.

Banks and thrift institutions respond to the competitive challenge of the money funds

The Federal Reserve's Regulation Q and parallel regulations of other Federal regulators limit the interest rates that banks and thrift institutions can pay in the retail market—that is, on deposits of less than \$100,000. These regulations are a fundamental reason why money funds have developed—to pool small amounts of funds and obtain the higher yields available in the unregulated wholesale market. Banks and thrift institutions have sought ways to continue to attract funds in the retail market that would not be subject to Regulation Q.

Since 1978, these institutions have been authorized to offer six-month money market certificates in minimum units of \$10,000 with an interest rate tied to the United States Treasury bill rate. Many institutions offer these certificates together with credit lines that serve to reduce the minimum amount needed to acquire the certificates and to enhance their liquidity.

In recent months, many banks and thrift institutions have begun to accept funds through "retail repurchase

agreements". In these transactions, the consumer purchases a participation in the depository institutions' holdings of United States Government or agency securities. The institution agrees to buy back the participation at a specific time or on notice. Such transactions are not subject to Regulation Q, but neither are they covered by deposit insurance.

In another effort to compete with money market funds, three large bank holding companies and one major industrial firm each recently announced plans to issue \$100 million in seven-year money market notes to be sold in \$1,000 denominations. To approximate the yield and the stable principal value of money funds, the interest rates on these notes were to be reset each week in line with the thirty-day commercial paper rate. The underwriting firm was to establish a secondary market in the notes to enhance their liquidity. This innovation was not an immediate success. In the midst of misunderstandings concerning the distribution network and turbulence in the money market, the three bank holding companies postponed their issues. The industrial company dropped its plans.

Still another effort to compete with money funds was launched by a California bank in May. The bank began to offer Eurodollar deposits at its foreign branch to small investors. The Federal Reserve Board responded to this initiative by amending Regulations Q and D to subject small Eurodollar deposits to interest rate ceilings and reserve requirements.

Issues raised by money funds

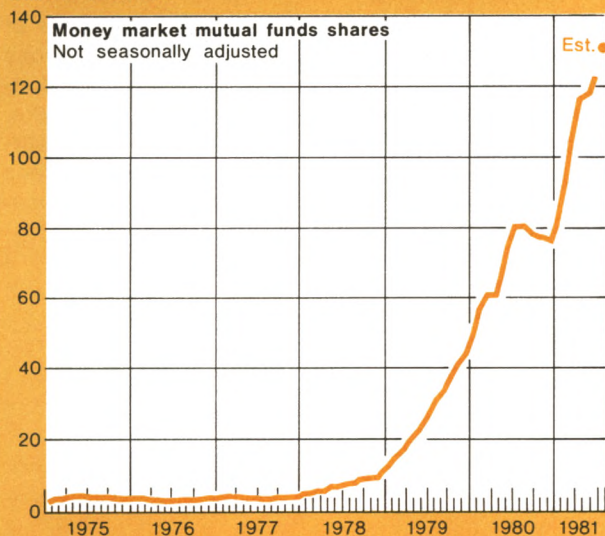
The rapid growth of money funds has raised a number of issues. One is whether banks and thrift institutions should be given additional latitude within Regulation Q to offer deposits that are competitive with money funds. The Depository Institutions Deregulation Act of 1980 mandated the phasing-out of Regulation Q ceilings on time and savings deposits. The Depository Institutions Deregulation Committee established by the act has set a schedule for phasing out these restrictions between now and 1985, beginning with the longer maturities. Since short-dated deposits are the closest substitutes for money funds, the opportunities for banks and thrift institutions to offer deposits competing with money funds will continue to be limited by Regulation Q for some time. Nevertheless, these institutions can be expected to look for ways of enhancing the liquidity of the deregulated deposits and to experiment further with nondeposit instruments to compete with money funds.

A second issue arises from the arrangements for the use of share drafts to make third-party payments from money fund balances. (Many funds provide their investors with these check-like instruments which can be used, for example, to pay household bills.) These

Chart 3

The continuing popularity of money market funds explains most of the difference in the recent growth of the narrow and broad aggregates.

Billions of dollars



Shares in July 1981 estimated from incomplete weekly data.

Sources: Board of Governors of the Federal Reserve System and Investment Company Institute.

arrangements create a potential for money funds to substitute for demand deposits and NOW accounts, although share drafts are normally restricted to a minimum size of \$500. To date, few money fund accounts are used routinely for making third-party payments. Nevertheless, the transactions capability of money funds has reinforced concerns over competitive equity and has raised monetary control questions.

In addition to the freedom from interest rate restrictions, money funds enjoy an advantage over demand deposits and NOW accounts in being free from reserve requirements. Proposals have been made to subject money funds to reserve requirements, including a proposal by Chairman Volcker that those accounts carrying a third-party payment privilege be subjected to the reserve requirement on transactions deposits. Such a reserve requirement would reduce, but not eliminate, the interest rate advantage of money funds over demand deposits and NOW accounts. At current interest rates, yields on money funds would be reduced by about 200 basis points.

A reserve requirement on those money fund accounts that allow third-party payments could improve the regulatory structure for monetary control somewhat. To use their money fund balances for transactions purposes, shareholders would have to accept somewhat lower returns. Those willing to hold fund shares without a third-party-payment arrangement would earn higher returns. The segregation of money fund balances in this way would facilitate monetary analysis. With this regulatory distinction, it might then be logical to include money fund transactions balances in M-1B. More importantly, Federal Reserve control over total reserves would then directly influence the aggregate supply of transactions balances in depository institutions and money funds. However, a large volume of transactions balances in money funds with variable, market-oriented interest rates could mean that the demand for transactions balances would be less stable in the

short run and less responsive to interest rate movements. As a result, attempts to control these balances over short intervals could entail even greater interest rate variability. At the same time, the issue of competitive equity between money market funds and deposits at banks and thrift institutions would remain unresolved.

A third issue is the effect of the growth of money funds on the allocation of credit in the economy. Money fund managers have concentrated their investments in the liabilities of major money-center banks and in commercial paper issued by large prime-rated firms. Because of these investment practices, some observers have questioned whether credit is being channeled increasingly to large banks and corporations. Recently, however, brokers have begun to package certificates of deposit issued by thrift institutions and small banks for sale to money funds. This development suggests that market forces are at work to sustain the flow of funds to smaller institutions and their customers.

The broad appeal of money funds is indicated by their rapid growth, which resumed again in June, and by public support for them whenever states have considered restrictions on them. As long as interest rates on money market instruments remain higher than the deposit rate ceilings on retail deposits, households and other investors of moderate sums will have strong incentives to hold money fund shares. Even without binding rate ceilings, the liquidity and diversification of these investments would be attractive features.

Market forces already have begun to ease some of the dislocations caused by the success of the money fund industry. However, the issues of monetary control are likely to become more acute in the future. Therefore, it is important to consider ways for ensuring that the treatment of money funds' transactions balances is part of a consistent framework for monetary control.

Bankers' Acceptances

Over the last decade, the dollar volume of bankers' acceptances has increased some tenfold, reflecting in large part the growth of dollar-denominated international trade flows during that period. The expansion has brought in its wake major changes in the practices of the accepting banks, the organization and functioning of the secondary market, and the Federal Reserve's participation in that market.

The acceptance market has evolved despite the constraints of highly complex and, in some cases, anachronistic regulations. Because banking practices and monetary policy implementation have changed dramatically since the regulations governing acceptances were established, proposals to change the regulations are under discussion. Legislation currently before the Congress would raise the legal limits on the amount of certain types of acceptances a bank could create and, if enacted, might have a major impact on the acceptance market.

Notwithstanding the market's prominence, acceptances continue to be the least understood of the actively traded money market instruments. Before the impact of prospective changes in the acceptance market can be assessed, it is necessary to understand procedures for creating acceptances and the current regulations which influence them.

The authors would like to acknowledge the helpful comments of Arthur Bardenhagen, L. Thomas Block, Peter J. Bourke, Joseph A. Collieran, H.J. Escobar, Peter Gall, Kenneth D. Garbade, Robert Giordano, Ralph T. Helfrich, Susan Merriman, Iwao Miyamoto, Virginia Molinelli, Joseph Oricoli, Edward J. Ozog, Gordon M. Schmidt, and Walker F. Todd. The views expressed do not necessarily reflect those of the Federal Reserve Bank of New York.

Creating acceptances

Creating an acceptance involves nothing more or less than substituting a bank's creditworthiness for that of a borrower. The instrument itself is but one species of a bill of exchange—*i.e.*, a draft or order to pay a certain amount of money at a specified time. It differs from other bills in that it bears the unconditional promise of a bank to pay the draft at maturity.

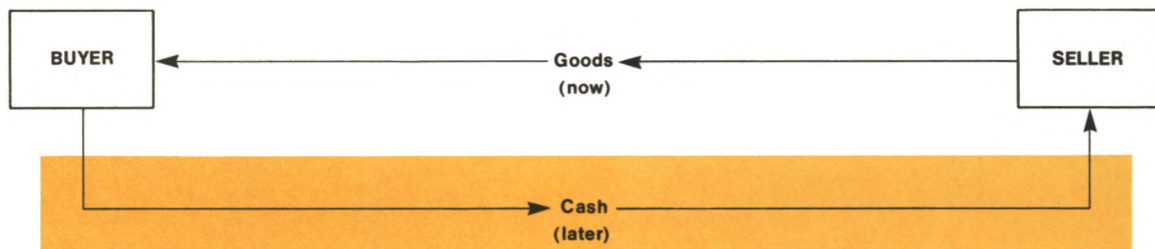
Typically, a buyer does not pay cash for a shipment of goods but requires credit until the goods are sold. This may present a problem for a seller who is poorly equipped to evaluate the creditworthiness of the buyer. Also, the seller may need immediate payment. As illustrated in Chart 1, a bank familiar with the buyer's business can act as an intermediary between the two trading partners by assuming the responsibility of making the payment for the goods on the buyer's behalf. Because of its superior ability to evaluate the buyer's creditworthiness, the bank may be more willing than other parties to assume the risk that the buyer may not be able to reimburse it.

In a typical acceptance transaction, the bank guarantees payment by "accepting" a time draft drawn on it by the seller.¹ The illustration shows a time draft ordering a bank to pay \$100,000 to an export firm ninety days from presentation of the draft at the bank. By accepting such a time draft, the bank assumes an unconditional liability to pay the seller (or the ultimate

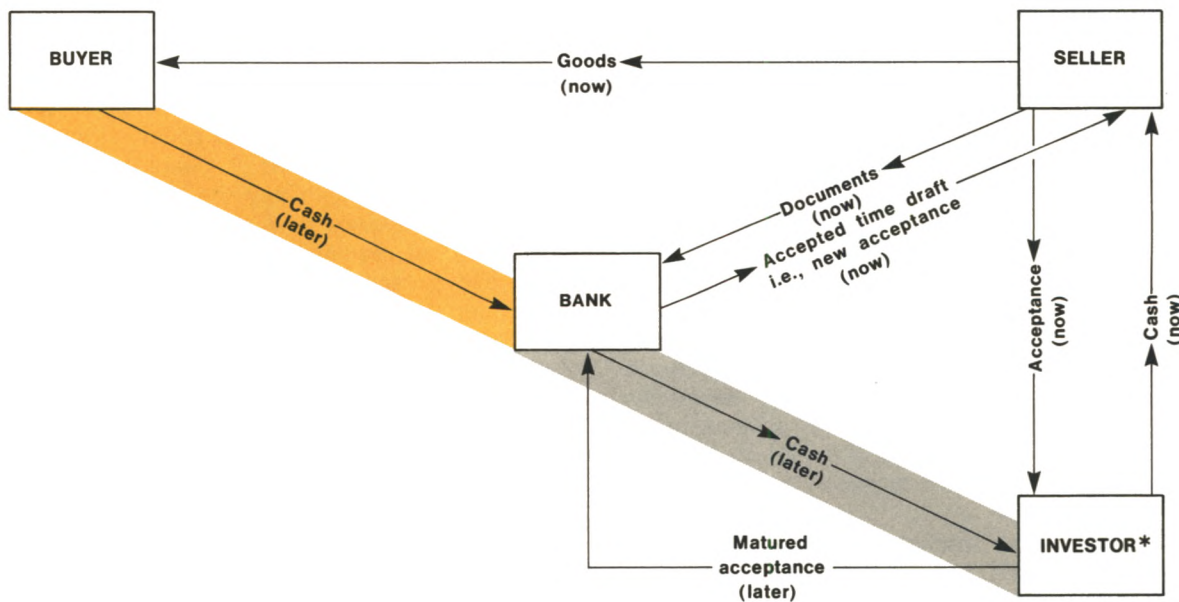
¹ Another alternative would be for the seller to draw a sight draft (an order to pay immediately upon presentation) which would be paid with the proceeds of a time draft drawn by the buyer, accepted by the bank, and sold to an investor. In this case, the seller does not assume ownership of the acceptance at any point.

Chart 1

If a buyer and a seller arrange a delayed-payment transaction, the seller must assume the risk that the buyer may be unable to pay . . .



. . . but, if the same basic transaction is arranged with a bank guaranteeing payment, the risk is transferred from the seller to the bank.



SHADED AREAS DENOTE: credit risk; = substantial credit risk, = minor credit risk.

*Typically an acceptance is purchased (discounted) first by the accepting bank and then resold (rediscounted) to another investor.

Illustration of a Bankers' Acceptance

<p>THE TRANSACTION WHICH GIVES RISE TO THIS INSTRUMENT IS THE IMPORT OF STAPLES FROM OVERSEAS TO NEW YORK</p>	JAN. 1, 1981		NEW YORK		\$ 100,000.00
	Date		City		
	AT 90 DAYS AFTER SIGHT OF THIS DRAFT				
	Tenor				
	EXPORT FIRM				
PAY TO THE ORDER OF		EXPORT FIRM			
PAYABLE AT		ONE HUNDRED THOUSAND AND NO/100 DOLLARS			
X Y Z BANK		DOLLARS			
NEW YORK, N.Y.		EXPORT FIRM			
AUTHORIZED SIGNATURE		EXPORT FIRM			

holder of the draft) regardless of whether the buyer reimburses the bank or not. The bank indicates its willingness to do so by stamping the draft "accepted" and affixing the signature of an officer empowered to sign for the bank.

If the bank is willing to provide its guarantee, it notifies the seller (most likely through the medium of the seller's bank) that a letter of credit has been issued on behalf of the buyer authorizing the seller to draw a draft on the bank for an indicated dollar amount. The letter of credit also indicates the terms that must be met by the seller before the bank will accept the draft. The letter of credit is a legally binding commitment by the bank to accept the draft if the specified terms are met. Letters of credit are usually irrevocable, subject to cancellation only with the consent of all parties to the agreement. The terms specified in the letter may include presentation of documentary proof from which the bank can ascertain that the goods in question actually have been shipped and that the underlying transaction conforms to Federal Reserve regulations (Appendix). Once the goods are shipped, the related documents are forwarded by the seller (or his bank) to the buyer's bank along with

the time draft drawn on the buyer's bank. When these are received, the buyer's bank verifies that the specified terms have been met and accepts the time draft.

At this point, the acceptance is the property of the seller. Frequently, however, the seller prefers to obtain cash immediately so that the accepting bank generally offers to discount (purchase) the acceptance for its own account.² The bank, in turn, may rediscount (sell) the acceptance in the secondary market. Upon maturity, the ultimate investor will present the acceptance through his bank to the accepting bank for payment. The bank, of course, collects the funds owed it by the buyer.

The key element of an acceptance is obviously the bank's unconditional guarantee of payment on the draft, an obligation fully on par with the bank's obligation to redeem its uninsured deposits at maturity. While this feature is common to all acceptances, there are, of course, many possible variations on the simple sequence of events outlined above. For example, the

² Since acceptances carry no explicit interest payment, they trade at a discount from the face value similarly to most other money market instruments.

bank's customer may be a seller financing a series of shipments to a known buyer over a period of time at his own risk. This might make sense, for example, if the buyer is a subsidiary of the seller and the parent firm can obtain better financing terms than the subsidiary. Or a buyer might be planning to finance a number of purchases. In both of these cases, an acceptance facility permitting a series of drafts to be drawn might be used.³

Moreover, it is not necessary that the buyer's bank be the accepting bank as in the example above; the draft could be drawn on and accepted by the seller's bank or some other bank, provided it was willing to assume the risk. In addition, a bank may endorse an acceptance of some other bank. In this way, a less well-known bank may be able to lower the financing cost for its borrowing customers by arranging for a well-known bank to add its name to the acceptance and assume an obligation to pay at maturity if the accepting bank cannot do so. The acceptance is then made more marketable.⁴

Some acceptances are not trade related. For example, finance bills raise working capital for the firm drawing the draft. Such acceptances are close substitutes for commercial paper but differ from commercial paper backed by a bank credit line principally in that the bank's obligation to pay the acceptance is unconditional.⁵

Finally, an acceptance may or may not involve the actual extension of funds by the accepting bank. If the bank accepts the draft but does not discount it, then the bank has simply provided its guarantee to facilitate the raising of funds by the borrower from some other source. However, for reasons discussed in more detail below, the bank typically buys and then sells its acceptance, and the acceptance serves as a medium for the bank both to advance credit as well as to fund itself.

In contrast to the many possible procedures for creating acceptances, the instrument itself is fairly standardized. As the Appendix explains, the nature of the underlying transaction is important in determining a bank's maximum allowable exposure to any single

customer, as is the original term to maturity (or tenor) of the acceptance. Moreover, both of these factors are important in determining whether funds raised by a bank through the sale of an acceptance are subject to reserve requirements and whether the acceptance is eligible as collateral for repurchase agreements (RPs) executed by the Federal Reserve.

Growth trends

Trade-related acceptances fall into three main categories depending on the nature of the underlying transaction. The first group—import and export acceptances—are used to finance United States imports and exports, respectively. Prior to the 1960s, these acceptances were by far the predominant form of acceptance financing.

Starting in the early 1960s, however, third-country acceptances—which finance trade between countries other than the United States—increased rapidly and on the whole have been the major source of expansion of total acceptances outstanding. Most third-country acceptances are created by the largest United States banks for foreign borrowers and foreign banks, mostly in Japan and to a less degree Korea and Latin America. These acceptances generally originate with drafts drawn on a foreign bank or its United States branch or agency. To obtain the requisite dollars to pay the draft, the foreign bank may draw a so-called “refinance bill” to be accepted and discounted by a United States bank. Since 1974, third-country acceptances have accounted for about half of total acceptances outstanding, with import and export acceptances each providing between 20 and 28 percent of the total.

Domestic acceptances—which finance the shipment and storage of goods within the United States—are the least utilized type of trade-related acceptance, representing only about 3 to 6 percent of total outstandings. The additional documentation burden required for the funds raised from the sale of domestic shipment acceptances to be exempt from reserve requirements, as well as the more popular use of open account financing for domestic United States trade, has inhibited their use (Appendix, Table 2).

Numerous interrelated factors have influenced the utilization of trade-related acceptances. These include the monetary and regulatory policies of different countries, the prevailing and expected future dollar exchange rates, and changes in the value and volume of trade. For example, the sudden price shocks to the agricultural and petroleum markets during the 1970s greatly affected the nominal value of acceptances used to finance the trade of these commodities. During 1974 alone, in the wake of sharply increased oil prices, total acceptances outstanding more than doubled. Rapid in-

³ Recently, Petroleos Mexicanos (Pemex), the Mexican state petroleum producing and refining firm, arranged a \$4 billion acceptance facility with a consortium of eighty-two banks, the largest such facility ever.

⁴ Acceptances accepted by only one bank are referred to as “two-name paper”, since they are the obligation of the drawer as well as the accepting bank. Paper accepted by one bank and endorsed by another is “three-name paper”, and so forth.

⁵ However, commercial paper is sometimes backed by a bank's “standby” letter of credit, in which case the bank's obligation to pay an investor is more binding than a credit line and only slightly more conditional than under an acceptance.

creases also occurred in 1979 and 1980, and by May of this year the total was \$60.6 billion, more than double the level just three years ago (Chart 2).

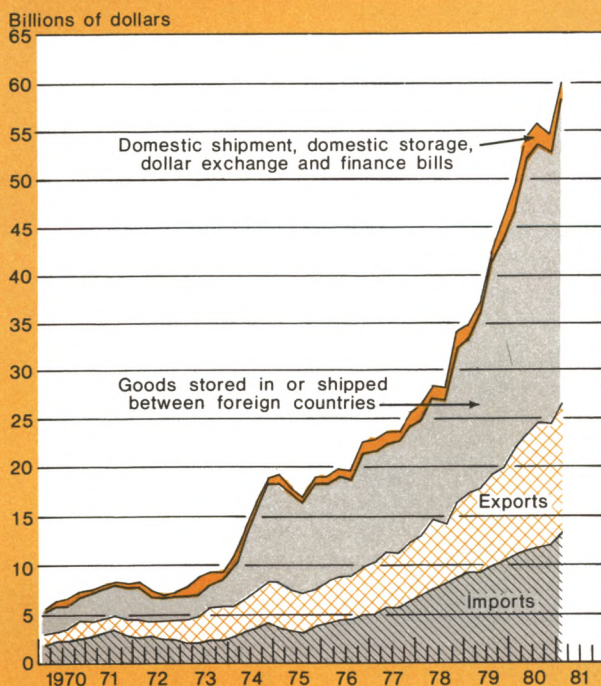
Currently, acceptances which are not specifically trade related constitute only a small portion of the market, though they have been important at various times in the past. For example, so-called dollar exchange bills may be accepted for agriculturally dependent countries, mostly in Latin America, to alleviate seasonal shortages of dollars. In recent years, however, these countries have stabilized their foreign trade earnings through crop diversification and industrial development. Accordingly, their need for this form of financing has become negligible.

In addition, finance bills were once a significant factor in the acceptance market. As discussed in detail below, the volume of these acceptances has declined in recent years to negligible levels, but conceivably banks may again use them to meet customers' credit demands.

Chart 2

Types of United States Bankers' Acceptances Outstanding, 1970-81

End of quarter



Source: Federal Reserve Bulletin.

Advantages to banks

As mentioned above, a bank has several options in an acceptance transaction. First, the bank may opt to complete only the first stage of the transaction—i.e., to accept the draft. In this case the bank itself advances no funds; it merely guarantees payment on the acceptance at maturity in return for a commission. Moreover, this guarantee is not a reservable liability. The owner of the draft can obtain funds before maturity by selling it to an investor who is willing to buy this unconditional obligation of the bank. Should a non-bank dealer firm discount the acceptance and place it with an investor, the dealer would be performing a function similar to that of dealers underwriting commercial paper issues.

Alternatively, the bank may discount the acceptance and then hold it in portfolio as an investment. In this case it is making a loan which must be funded like any other loan. Holding acceptances may be attractive if the bank has reached its limit on sales of certain types of acceptances.⁶

Finally, a bank may accept, discount, and subsequently rediscount the acceptance. The funds raised through rediscounting an acceptance are exempt from reserve requirements, providing the acceptance is of the type described in Section 13(7) of the Federal Reserve Act and the applicable aggregate limits are not violated (Appendix). The principal difference between this option and the first above is that, in addition to the acceptance commission, the bank would hope to earn the spread between the bid and asking rates on acceptances in the secondary market. For example, if the acceptance commission were 0.50 percentage point and the bid-ask spread 0.10 percentage point, then the bank would increase its profit by one fifth, provided that the market rate did not change during the interval of time between discounting and rediscounting the acceptance.

From the accepting bank's perspective, creating, buying, and selling an acceptance perform a function equivalent to issuing a negotiable certificate of deposit (CD) to fund a loan to a customer. However, because the funds raised from the sale of an acceptance which meets specific regulatory standards are exempt from reserve requirements, they will be less costly to a bank than those raised through issuing CDs.

In addition, a rediscounted acceptance may have significantly less interest rate risk than a fixed-rate loan funded with a fixed-rate CD. Should interest rates

⁶ As discussed further in the Appendix, acceptances held in portfolio are not included in the amount subject to a member bank's aggregate limit. Therefore, to avoid violating regulations, a member bank at its aggregate limit may hold acceptances temporarily until other outstanding acceptances mature.

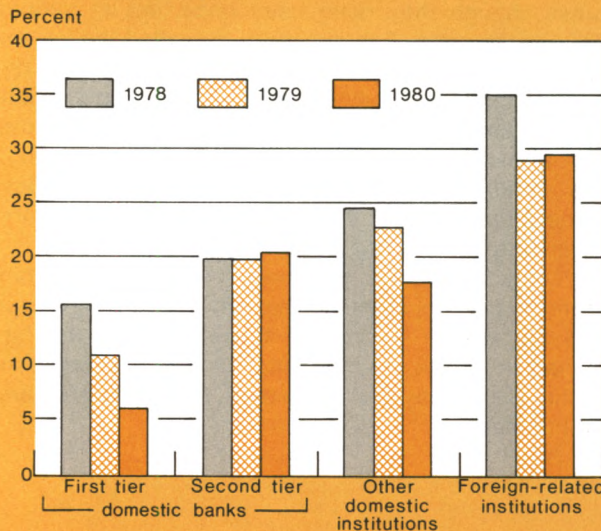
decline sharply, the bank loan would probably be prepaid while the bank would be unable to prepay its CD. In contrast, the commission fee for an acceptance is paid in advance and is in principle nonrefundable, so that prepayment can increase the borrower's effective financing cost substantially. Moreover, in the relatively infrequent cases when prepayment does occur, a penalty is generally added to the current acceptance discount rate, raising the effective cost still further. Finally, an acceptance, particularly if it is secured, may well pose less default risk than an unsecured loan, since the accepting bank may have recourse to the goods of the underlying transaction if the borrower defaults.⁷

At times, banks have had especially strong inducements to attempt to raise reserve-free funds through the sale of acceptances. For example, in 1969-70, when below-market Regulation Q ceilings capped interest rates payable on CDs, massive amounts of CDs matured without being renewed.⁸ In response, large banks turned to acceptances—among other things—as one way to accommodate their borrowers' financing needs. By creating, buying, and then selling acceptances, banks could meet their customers' loan demands and avoid the constraints of Regulation Q as well as the costs imposed by reserve requirements.⁹

In early 1980, record-high interest rates and an increase in the marginal reserve requirement on "managed liabilities", imposed under the credit restraint program in March 1980, combined to increase the effective cost of funds raised through issuing CDs. Consequently, banks sold acceptances and held a

Chart 3

Own Acceptances Held in Portfolio as a Percentage of Total Outstanding of Each Group *



* As measured by total acceptances outstanding in December 1980, the first tier of domestic banks is the top ten United States accepting banks. The second tier is the next twenty largest United States accepting banks. Other domestic institutions are the approximately 250 remaining domestic accepting institutions. Foreign-related institutions include about 70 foreign-owned banks and agencies and branches of foreign banks in the Second, Seventh, and Twelfth Federal Reserve Districts.

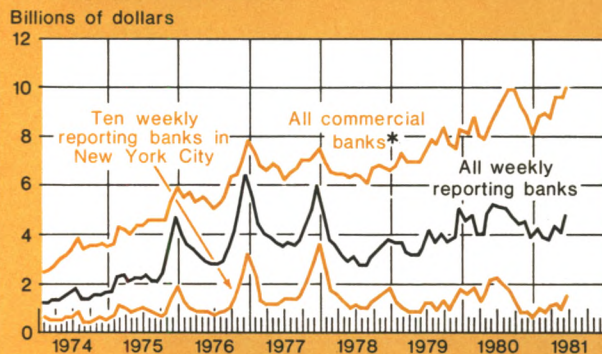
⁷ Most acceptances are unsecured, though import bills typically provide for the accepting bank to hold title documents. Nevertheless, the value of the collateral in such a case can be exaggerated. The story is told of a major New York City bank which financed the import of an elephant for a circus via an acceptance. Unfortunately, by the time the elephant arrived in this country, the circus had gone bankrupt. The bank thus owned the elephant, and a bank representative took possession of the animal and found it a place to stay in a warehouse while a purchaser was being sought. The elephant was provided with water, food, etc., and was chained securely to an I-beam in the warehouse wall. As fate would have it, the elephant panicked during the night, pulled the I-beam out of the wall, destroyed the warehouse and with it, alas, the collateral for the acceptance.

⁸ For a description of the CD market during this period, see William C. Melton, "The Market for Large Negotiable CDs", this *Quarterly Review* (Winter 1977-78), pages 22-34.

⁹ In addition, in 1969 some innovative banks also began creating and selling working capital acceptances (finance bills) since the funds received from the sale of these bills were not reservable at the time. The volume of such bills increased rapidly, from average levels of \$300-400 million in the early 1970s to almost \$1.5 billion in June 1973, equal at that point to about one fifth of all other acceptances. In mid-1973, however, reserve requirements were imposed on funds raised through the sale of finance bills, and only negligible amounts have been created since then.

Chart 4

Acceptances Held by Commercial Banks Average of weekly figures



* Includes domestic banks, United States branches and agencies of foreign banks, New York investment company subsidiaries, and Edge Act corporations.

Source: Federal Reserve Bulletin.

historically low 16.2 percent of outstandings in 1980.¹⁰ In general, the largest accepting banks were more aggressive in this regard than other institutions (Chart 3).

Tax considerations and so-called "window dressing" made acceptance holdings at the year-end attractive to a few large money-center banks during the latter part of the 1970s. A bank's allocation to its loan loss reserve of up to a specified percentage of total loans outstanding at the end of the year was deductible for Federal and some state income tax purposes.¹¹ Since acceptances held in portfolio are classified as loans, purchases of acceptances expand the dollar volume of tax-deductible loan-loss allocations. Therefore, in an environment in which loan losses were rising and loan demand was weak, some large banks increased their holdings of acceptances at the year-end and let them decline again shortly afterward. In addition, this maneuver reduced the ratio of loan write-offs to loans outstanding, a measure used by some bank stock analysts in evaluating bank management. Such window dressing had tapered off by 1978 as loan volume rose and alternative means to reduce taxes developed (Chart 4).

Advantages to borrowers

Compared with the costs of other borrowing alternatives, acceptances can be an attractive means of financing. In addition, an individual customer may be able to borrow more from a single bank by using acceptances to supplement other types of financing.¹²

The total interest costs of some other financing alternatives in June of this year are illustrated in Table 1. Generally, a bank will quote a potential acceptance customer an "all-in" rate, which includes several charges in addition to the acceptance discount rate in the secondary market. The commission charge listed in the table can vary depending on the availability of bank funds and the quality of the borrower's credit. In addition, the borrower may incur costs to secure required documentation. For example,

if the acceptance is financing a domestic storage or shipment transaction, Federal Reserve regulations require a title document to certify that the collateral is under the control of an acceptable third party.

Clearly, in June 1981, acceptance financing potentially was less costly than conventional prime-based or LIBOR (London interbank offering rate)-based borrowing. The acceptance cost was comparable to that of prime commercial paper. But, for small- and intermediate-sized firms, the total costs of acceptance financing may well have been competitive with issuing commercial paper, if these firms have access to the commercial paper market at all. Investors will demand higher rates on the commercial paper of these firms than on an acceptance of a well-known bank.¹³

To reap the full cost advantage of acceptance financing, however, a borrower needs to be able to specify fairly precisely the duration of his financing need and thus the tenor of the acceptance. As noted earlier, prepayment of the acceptance—which generally would be required if the goods underlying the transaction were sold before the tenor date—may raise the borrower's effective financing cost substantially. Moreover, a bank cannot give a prior unconditional assurance of being able to accept a renewal draft, so that, if funds were not available by the tenor date, the borrower might have to arrange other means of finance. Hence, the relative inflexibility of its maturity somewhat limits the usefulness of the instrument.

Investors

An impressive record of safety and liquidity makes acceptances attractive short-term investments. Yields on ninety-day acceptances are closely in line with rates on ninety-day CDs. Since late 1977, the yields on both acceptances and CDs have averaged almost 100 basis points above Treasury bills of comparable maturity (Chart 5).

Acceptance investors include state and local governments, governmental agencies, savings institutions, foreigners, foreign central banks, industrial corporations, insurance companies, investment funds, accepting banks, and individuals. Data on dealer sales to these groups suggests that most investors have main-

¹⁰ Under the program, banks were asked to limit the growth of their credit extensions. To offset the growth of other forms of credit, banks reduced their holdings of their own acceptances as well as those of other institutions.

¹¹ This percentage is being phased down in accordance with the Tax Reform Act of 1969. Between 1969 and 1975, it was 1.8 percent, while currently it is 1.2 percent and scheduled to be 0.6 percent in 1982.

¹² A bank's credit extension to a borrower via an acceptance eligible for discount is subject to a separate and distinct limit from the general lending limit of 10 percent of a national bank's paid-in and unimpaired capital stock and surplus—Sec. 5200 of the revised Statutes (12 U.S.C. 84). This provides the borrower with an avenue for additional borrowing capacity. Since acceptances made for a borrower are subject to a separate "10 percent limit", the effective per customer lending limit is 20 percent. Similar provisions generally apply to state-chartered banks.

¹³ Of course, if borrowing under an acceptance, these firms would pay higher commission fees. However, in contrast to acceptances, the backing which a bank gives a commercial paper offering by extending a line of credit to the issuer is generally revocable and thus does not remove all the credit risk to the investor. Accordingly, firms perceived to be riskier must pay higher rates on their paper. As noted earlier, commercial paper can also be backed by an irrevocable letter of credit, in which case the bank's commitment to advance funds is more binding and the risk to the investor correspondingly reduced. However, the fee for such a service would be greater than for a revocable credit line.

Table 1

Comparison of Acceptance and Alternate Financing in June 1981

In percent

Method of borrowing	Charges
Bankers' acceptance:	
Ninety-day discount rate*	16.42
Prime acceptance commission†	0.50
"All-in" rate	16.92
Adjustment to convert discount basis to simple interest basis	0.75
Total interest charge	17.67
Bank loan:	
Bank prime rate‡	20.03
Total interest charge	20.03
LIBOR:	
Ninety-day London interbank offer rate	18.00
Spread over LIBOR§	0.25
Total interest charge	18.25
Commercial paper:	
Ninety-day prime paper rate	16.32
Dealer placement fee	0.125
Adjustment to convert discount basis to simple interest basis	0.71
Commitment fee for bank backup lines	0.50
Total interest charge	17.66

All interest rates are monthly averages.

* The discount rate used in the example is for acceptances of the type described in Section 13(7); if the underlying transaction were not of this type, funds raised through its sale would be subject to reserve requirements, and the discount rate would have been about 70 basis points higher.

† Plus spread over prime acceptance commission, if any.

‡ Plus spread over prime and interest equivalent of compensating balances, if any.

§ Plus interest equivalent of compensating balances, if any.

tained their relative market share over the years.¹⁴ However, as mentioned previously, accepting banks have decreased their acceptance holdings, and the investment portfolios of foreign central banks maintained by the New York Federal Reserve Bank contain fewer acceptances (Box 1). In contrast, money market mutual funds have greatly expanded their market share in the past few years, increasing their holdings in just four years from less than 0.5 percent to 15.4 percent of total acceptances outstanding in 1980. The growth

¹⁴ During 1980, dealers reporting to the Federal Reserve Bank of New York made about 19.8 percent of their sales (exclusive of those to other dealers and through brokers) to commercial banks, 18.5 percent to Federal, state, and local government agencies, 18.5 percent to industrial corporations, and 8.7 percent to foreigners, including the foreign central banks for whom the Federal Reserve Bank of New York acts as agent.

might have been even greater, but funds registered in New York limited their holdings in order to minimize their state and city tax liabilities.¹⁵ A fund can do so by restricting acceptance holdings to less than 15 percent of its total investment and business capital.¹⁶ While amendments to the New York State tax laws for regulated investment companies recently eliminated this constraint, growth of acceptance holdings is still inhibited by the New York City tax structure.¹⁷

Secondary market

The ability to trade acceptances efficiently depends on the existence of a relatively standardized instrument. One dimension of standardization is the dollar amount of the bill. The typical trading size in the secondary acceptance market has changed over the years because of the development of "round lot" trading. Currently, a round lot consists of one or more acceptances of similar maturities issued by banks in the same credit class totaling \$5 million. For example, a round lot might comprise five \$1 million acceptances or ten \$500,000 acceptances. Banks can create acceptances of relatively uniform size which can conveniently be aggregated with other acceptances into a round lot by instructing customers to draw one draft to finance several smaller underlying transactions. Alternatively, a very large transaction might be handled by instructing the customer to draw several drafts of conveniently aggregatable sizes which together can finance the underlying transaction. Acceptances of smaller or uneven dollar denominations are considered "odd lots". Dealers generally are reluctant to bid for odd lots and do so only at a below-market price. As a result, banks generally hold these acceptances in their own portfolios or sell them directly to individuals.

Another dimension of standardization is the uniformity of credit quality of acceptances. By trading the acceptances of certain banks "on the run"—i.e., as readily substitutable for the acceptances of other banks in their credit class—dealers and other market participants avoid the need for extensive individual negotiation and appraisal. Nevertheless, investors do perceive gradations in the creditworthiness of different

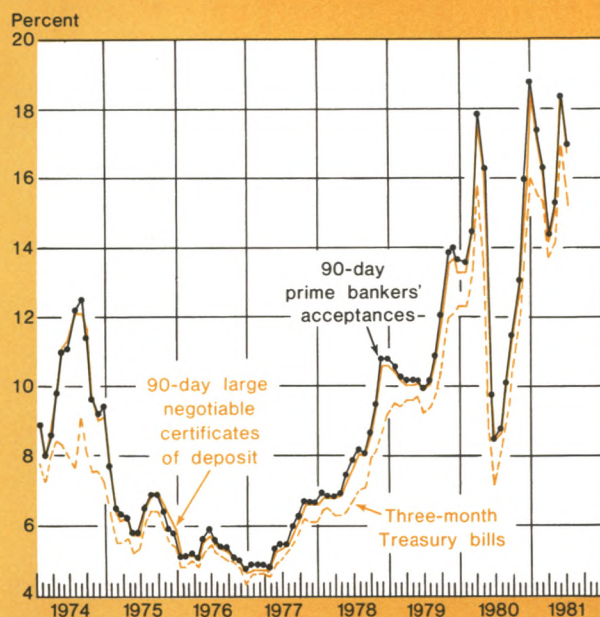
¹⁵ About seventy-five money market mutual funds are registered in New York State, representing approximately 73 percent of the assets of all money market funds, and are subject to the state's tax laws.

¹⁶ Unlike CDs, which are classified as investment capital under the New York State and City General Corporation Franchise Tax Laws, holdings of bankers' acceptances are classified as business capital. Because of the tax implications of this distinction, funds limit their acceptance holdings.

¹⁷ Effective January 1, 1980, New York State adopted the Federal Government's tax scheme for a regulated investment company, with some modifications.

Chart 5
Money Market Rates

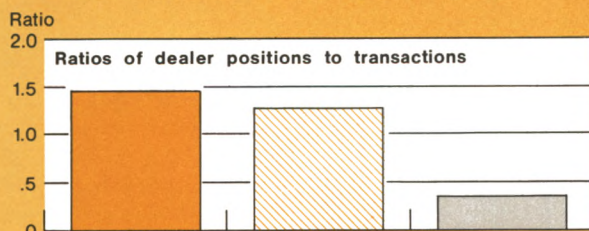
Bond equivalent yield basis



Source: Federal Reserve Bulletin.

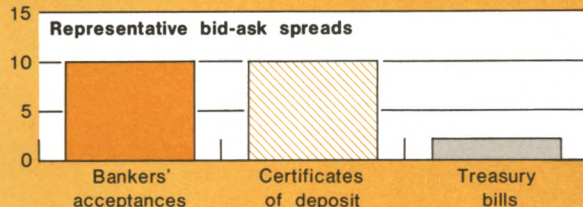
Chart 6

Since acceptances and certificates of deposit require more inventory per transaction than Treasury bills . . .



. . . dealers compensate by maintaining higher spreads between their bid price and asking price.

Basis points



bank names, and their preferences influence dealers' holdings of acceptances as well as the rates at which different acceptances trade (Box 2).

The heterogeneity introduced by the perceived differences in credit risk makes the secondary market for acceptances similar to that for CDs. In both markets, investor preferences dictate that dealers maintain a reasonable selection of names and maturities; dealers' interest in minimizing their own risk exposure also encourages this practice.¹⁸ Moreover, an acceptance or CD of a specific bank and maturity date may be unique, so that it is practically impossible for dealers to establish short positions.¹⁹ For these reasons, the amount of acceptances and CDs held in inventory by dealers relative to their purchases and sales is larger than for homogeneous securities such as Treasury bills. This, in turn, means that dealers incur greater inventory financing costs per dollar of transactions than for Treasury bills.²⁰ Dealers try to recoup these costs by maintaining a spread between their bid price and asking price which is larger than for bills. Then each "round trip"—i.e., a matching purchase and sale—nets the dealer a commensurately greater return (Chart 6).

Dealers' acceptance positions, which generally average \$1-2 billion, are also influenced by expectations of the near-term course of interest rates as well as the cost of financing inventories. For example, during mid-1980, when interest rates recently had declined substantially and expectations were widespread that further declines would occur, dealers' positions soared to \$2-3 billion. For the most part, acceptance dealers finance their positions by using them as collateral for RPs with corporations, state and local governments, or money funds.²¹ Rates charged for such RPs generally are about 20-30 basis points higher than RPs with Treasury or United States agency collateral.

¹⁸ In some instances, dealers limit their total holding of an individual bank's CDs and acceptances. The logic to this arrangement is that both CDs and acceptances are principally obligations of the bank, though an acceptance is also the contingent liability of the drawer.

¹⁹ A short position is created when a dealer sells a security which he does not own. The dealer borrows the security and delivers it to the buyer. Later, the security is bought by the dealer and returned to the lender. The dealer will profit if the security's price has declined between the time the short sale was made and the time it was covered.

²⁰ Moreover, as explained below, the financing cost per dollar of acceptances or CDs is generally higher than for Treasury or agency securities.

²¹ The major exception to this generalization is bank dealers, who must maintain reserves against RPs with acceptance collateral if done with nonbank customers. To avoid the reserve requirement burden, bank dealers generally finance their acceptance positions either through RPs done with banks or through Federal funds purchases. In each case, the financing cost is generally higher than that which would be incurred by a nonbank dealer financing through RPs.

Box 1: Federal Reserve Participation in the Acceptance Market during the 1970s

During the 1970s, the Federal Reserve greatly altered the rules governing its participation in the market, in part because of recurring problems related to the perceived heterogeneity of acceptances.

The market's ever-changing perception of the credit quality of different banks necessitated periodic revisions in the Domestic Open Market Desk's eligibility list.¹ For instance, in 1970, the Bank of Japan removed its limitation on Japanese agencies' issuance of their own acceptances. Since the consequent increase in Japanese agency acceptances led to an oversupply of these acceptances in the market, they were temporarily dropped from the Desk's eligibility list. Later, these acceptances were restored to the list when agencies displayed restraint in selling their acceptances and their market standing improved.

A more serious and less tractable problem resulted when the market began differentiating between the relative standing of different banks on the Desk's eligibility list. Since the Desk executed all acceptance purchases at the same rate, dealers had an incentive to sell acceptances to the Federal Reserve which traded at a rate somewhat higher than the average for those on the eligibility list. As a result, the System portfolio tended to accumulate relatively low-grade paper. The Desk responded to this problem in 1971 by establishing internal guidelines on the volume of individual bank names which it would purchase for the System account.² While this procedure limited such purchases, it did not wholly eliminate the problem.

Since the Federal Open Market Committee (FOMC) decided to discontinue outright transactions in acceptances effective March 15, 1977, these percentage allocations for purchases of each bank name are now irrelevant. In announcing its decision, the FOMC noted

that the market for bankers' acceptances had become mature and efficient, and thus no longer needed support through Federal Reserve outright purchases. In addition, it was noted that outright purchases and sales of acceptances had not been of sufficient size to contribute materially to the needed volume of System open market operations. Currently, repurchase agreements (RPs) are the only channel through which the System buys and sells acceptances for its own account. Approximately 250 bank names are eligible to serve as collateral for such RPs.³

During the 1970s the portion of RPs arranged by the System with acceptances as collateral increased considerably relative to total RPs. In part, this reflected the massive expansion of the amount of acceptances outstanding. However, another factor was the Desk's practice of applying the same minimum cutoff rate to all the competitive bids received, irrespective of whether the collateral was acceptances or Treasury and agency securities. Since market practice was to set a somewhat higher rate for RPs with acceptance collateral, the Desk's procedure often contributed to the attractiveness of System RPs for dealers needing to finance their acceptance inventory. In these circumstances, it was not surprising that the portion of RPs executed with acceptance collateral should have shown such growth. In fact, in 1974, dealer proposals for RPs with acceptance collateral occasionally taxed the ability of the Acceptance Division of the Federal Reserve Bank of New York to process them promptly. Accordingly, on some days the volume of such RPs was limited by setting the lowest rate accepted on them above the lowest rate accepted on RPs against Treasury and agency securities. In that year, RPs executed by the Desk with acceptance collateral exceeded 14 percent of all RPs, quite a jump from the 6.5 percent share during the previous year. More recently, such RPs constituted 11 percent of the total in 1977, rose to 15 percent in 1978 and 28 percent in 1979. Last year, to be more in line with market practices, the Desk began to set the minimum rate on RPs arranged with acceptance collateral somewhat above the minimum rate on those arranged with Treasury and agency collateral.⁴ During 1980, the share of RPs executed with acceptance collateral dropped sharply to 17 percent.

¹ To qualify its paper as eligible for purchase by the Federal Reserve, an accepting institution must meet requirements (1), (2), and (5), as described in Ralph T. Helfrich, "Trading in Bankers' Acceptances: A View from the Acceptance Desk of the Federal Reserve Bank of New York", *Monthly Review* (Federal Reserve Bank of New York, February 1976), pages 51-57.

² Holdings of a particular bank's acceptances were limited to not more than 30 percent of the bank's total acceptances in existence as indicated by monthly survey reports to the Federal Reserve. The only exception was that holdings of Japanese agency acceptances were limited to 5 percent of each agency bank's outstandings in the market rather than the total amount in existence. Since large amounts of acceptances were normally held by the Japanese agency banks in their own portfolios, it was felt that a limitation defined in terms of their outstandings in the market would relate the Federal Reserve's participation more directly to the willingness of other investors to acquire the agencies' bills. The limit on holdings of a domestic bank's acceptances was increased to 50 percent of that bank's total outstanding in 1974, while the limit for a foreign agency bank was increased to 15 percent of its outstandings in the market.

³ However, in December 1979, the Federal Reserve announced it would no longer purchase under RPs or accept as collateral for advances acceptances that indicate that the Iranian Government or any of its controlled entities is a party to the documents or to the underlying transactions.

⁴ Although some market participants do RPs collateralized by less prime acceptances at a higher rate than those collateralized by prime acceptances, the Federal Reserve makes no such distinction.

Box 1: Federal Reserve Participation in the Acceptance Market during the 1970s (continued)

Finally, during 1974, two other important changes were made in the System's acceptance operations to make them conform more closely to market practices. In July, the requirement of dealer endorsement of acceptances sold to the System and customer accounts was terminated. In earlier years such endorsement had been a common practice, but by the 1970s the System was the only market participant requiring it.

The second change, effective in November 1974, was the termination of the Federal Reserve guarantee provided for acceptances purchased by the Desk on behalf of the accounts of foreign central banks. This procedure had probably performed a useful role in promoting the development of the acceptance market in earlier years, but by the 1970s it was creating difficulties. In April and May 1974, acceptance rates rose rapidly relative to rates on Treasury bills. During the May-September period, the gross spread exceeded 200 basis points and peaked at over 400 basis points in July, compared with a more normal spread of less than

100 basis points.⁵ In these circumstances, foreign central banks regarded investments in Federal Reserve-guaranteed acceptances as especially attractive. As a result, acceptances held in foreign accounts mushroomed from \$581 million at the beginning of the year to over \$2 billion (11.8 percent of total acceptances outstanding) shortly before the termination of the guarantee in November. In the view of the Board of Governors, the guarantee of a particular money market instrument for the benefit of a particular group of investors was unwarranted. Following its termination, the number of active foreign accounts declined from twenty-five to six, and the dollar amount held in these accounts fell to \$293 million by the end of 1975.

⁵ The net spread was slightly less, since the Federal Reserve charged 1/8 percentage point for its guarantee and passed on a 1/16 percentage point charge for the dealer endorsement. However, with the termination of dealer endorsements in July, this latter charge was removed.

Box 2: Structure of Acceptance Rates

During the 1970s, the trend toward negotiated dealer rates and the emergence of a tiered rate structure greatly affected the workings of the secondary market. The more refined rate tiers reflected greater discrimination among different bank names by investors.¹

Prior to 1969, acceptance dealers posted the rates at which they would sell prime acceptances. Rates on acceptances perceived as more risky were scaled off these posted rates. In late 1969, two firms announced that they would no longer follow this practice but would negotiate rates on a case-by-case basis. Their motive was to increase their share of the market. Although negotiation away from posted rates had occurred from time to time prior to 1969—largely as a *sub rosa* practice—negotiated rates were the exception rather than the rule. Other acceptance dealers continued to post rates after 1969 but reserved the right to negotiate. At the same time, though, these dealers began to display greater flexibility in changing their posted rates.

In 1974, following the emergence of problems at Franklin National Bank, prime acceptances were no longer considered to be a homogeneous group, and

thus posted rates became less meaningful. Most dealers opted instead to quote a range of rates within which they expected to trade prime acceptances. This reflected a greater tiering of acceptance rates, similar to the tiering which developed simultaneously in the CD market.² The final abandonment of posted rates occurred in August 1974. Accordingly, the Federal Reserve then began collecting data on the range of rates quoted by dealers on prime acceptances.

Practices affecting secondary market acceptance rates have not changed materially since 1974. Dealer firms continue to quote ranges of rates (about 10 to 15 basis points) within which they expect to trade prime acceptances. The rates tend to be inversely related to the size of the accepting bank. As a rule, acceptances from the top ten or so money-center banks trade at rates at the lower end of the dealers' quoted ranges, and acceptances of well-known regional banks and United States agencies and branches of foreign banks trade at rates near the top of the ranges. Acceptances created by smaller and less well-known banks trade at considerably higher rates.

¹ Although an acceptance is also the contingent liability of the drawer of the draft, the market has long since come to rely on the credit quality of the accepting bank as the primary criterion of the credit quality of the acceptance.

² The emergence of rate tiers in the CD market is analyzed in Dwight B. Crane, "Lessons from the 1974 CD Market", *Harvard Business Review* (November-December 1975), pages 73-79.

Organizationally, the secondary market is, like the market for most money market instruments, an over-the-counter market.²² It is comprised of about thirty dealers and a handful of brokers, principally located in New York City and linked by telephone lines. Of these dealers, about two thirds (including some bank dealers) have a direct relationship with the Federal Reserve Bank of New York, making them so-called "reporting dealers". (Some dealer firms are reporting dealers in acceptances but not in Treasury and agency securities, and vice versa.) Some of these dealers obtain direct access to purchase orders from the foreign customers for which the Federal Reserve Bank of New York acts as an agent. Other market participants can sell to customer accounts at the Federal Reserve through one of these dealers. In addition, when the Federal Reserve is arranging RPs as part of its open market operations, these dealers may be able to finance their acceptance inventory at competitive rates by using it as collateral for the RPs (Box 1).²³

Traditionally, a key function performed by dealers has been to distribute acceptances for accepting banks. During the 1960s, about three fifths of reporting dealer sales were to commercial banks, reflecting the key role of dealers in the production of "three-name paper" desired by some foreign investors. An accepting bank would sell its own acceptances to a dealer in exchange (generally with a spread of $\frac{1}{8}$ percent) for acceptances of other banks. The banks would then endorse the other banks' acceptances and sell them to foreign investors. Over the years, as foreign investors ceased to demand three-name paper, dealer sales to commercial banks declined to well under one fifth of total sales.

A large portion of reporting dealer sales are now to institutional investors. Lately, however, a number of money-center banks have stepped up their efforts to reach these investors directly instead of through dealers. The economic incentive is clear: a bank that sells its paper directly to investors can save the cost of the dealer's bid-ask spread. This strategy is more feasible now than in the past primarily because of the emergence of money market mutual funds as major acceptance investors, many of which have significant

amounts to invest. As yet, these activities do not appear to have altered the share of dealers in the distribution of acceptances, since banks continue to sell a bit more than one half of their acceptances to dealers, with the rest going to institutional investors.

Brokers in the acceptance market, like brokers generally, provide a central source of information concerning the bid and offering rates of the many market participants. In addition, they preserve anonymity for dealers and thus allow trades to take place without an individual dealer having to make known the extent of his buying or selling interest.²⁴ For example, if it were widely known in the dealer community that a particular dealer was trying to liquidate a large position, the other dealers would have the opportunity—and the incentive—to bid at lower prices for the acceptances being offered. While the recent development of acceptance brokers has thus somewhat reduced this risk, daily trading volume in the broker market is modest, averaging a bit more than \$100 million per day compared with average daily reporting dealer transactions of well over \$1 billion. The reason for the small share of the brokers is that dealers naturally prefer to save the 1 basis point broker commission whenever possible by arranging trades directly with other dealers or investors.

Outlook

Future growth of the bankers' acceptance market will be influenced by the outcome of discussions on proposed regulatory changes. In the last several years, as Chart 7 shows, the market share of the largest accepting banks has dropped, while that of other accepting banks has either held stable or increased. Some major accepting banks, which are members of the Federal Reserve System, have reached the aggregate limitation on the amount of certain types of acceptances they can create and subsequently sell to raise reserve-free funds (Appendix). Regional member banks, while generally below their limits at present, may soon become constrained by this limitation as well. However, nonmember banks—including virtually all the United States agencies and branches of foreign banks—are exempt. Because of these competitive inequities, the Board of Governors of the Federal Reserve System recently indicated its support for legislation which would increase the aggregate limitation

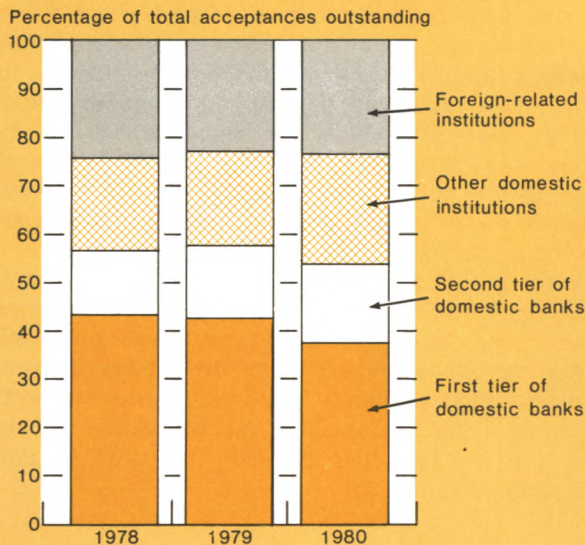
²² For descriptions of the secondary market for Treasury securities, see Christopher J. McCurdy, "The Dealer Market for United States Government Securities", this *Quarterly Review* (Winter 1977-78), pages 35-47, and Kenneth D. Garbade, "Electronic Quotation Systems and the Market for Government Securities", this *Quarterly Review* (Summer 1978), pages 13-20.

²³ However, when RPs are arranged for the accounts of customers of the Federal Reserve, only Treasury and agency securities may be used as collateral.

²⁴ Because the two largest brokers clear their own transactions, they do not give up the names of parties to an acceptance trade. A broker without such a capability must do so.

Chart 7

The market share of the largest domestic accepting banks has declined while that of other institutions has increased or remained steady. *



* As measured by total acceptances outstanding in December 1980, the first tier of domestic banks is the top ten United States accepting banks. The second tier is the next twenty largest United States accepting banks. Other domestic institutions are the approximately 250 remaining domestic accepting institutions. Foreign-related institutions include about 70 foreign-owned banks and agencies and branches of foreign banks in the Second, Seventh, and Twelfth Federal Reserve Districts.

and provide for a more uniform limitation for all accepting institutions.²⁵

Increasing the aggregate limitation would permit banks to structure more loans as acceptances, since the proceeds from the sale of certain types of acceptances are not reservable. To the extent that banks did increase such acceptance sales and reduced issues of CDs, growth of the M-3 monetary aggregate, which includes CDs but not acceptances, would be depressed. However, the magnitude of such an effect

²⁵ Specifically, the Board recommended legislation to raise the aggregate limitation on the creation of Section 13(7)-type acceptances immediately to 150 percent of unimpaired capital and surplus, with a further increase to 200 percent allowed to institutions receiving prior approval from the Federal Reserve. The power of withholding approval would enable the Federal Reserve to prescribe certain standards, including minimum capital requirements, general condition, and level of risk exposure that an institution would be required to meet before assuming the greater exposure.

would be very small, and the narrower aggregates M-1B and M-2 would be unaffected.

Another consideration is the Treasury's prospective loss of revenue. If, for example, sales of reserve-free acceptances were to increase 50 percent, replacing about 18 percent of outstanding large CDs, this would produce a revenue loss to the Treasury from reduced reserve holdings of about \$135 million per year.²⁶

Irrespective of the ultimate outcome of proposed changes in the limitation on reserve-free funds raised through acceptance sales, a number of technical changes could be made to the regulations to simplify the creation process and thus to reduce considerably the legal and clerical costs to market participants. As discussed in the Appendix, overlapping sets of standards must be met for an acceptance to be eligible for discount, eligible for purchase, or exempt from reserve requirements. Currently, the only practical application of the rules for discount eligibility is in defining customer limits, *i.e.*, in limiting the volume of acceptance lending by a bank to an individual customer. A similar constraint could be placed on a bank's acceptance credit extension to one customer by replacing discount eligibility standards with those for purchase eligibility. Then legislative reference to discount eligibility could be eliminated without any undesirable consequences. Of course, since the rules for discount eligibility and purchase eligibility are not perfectly overlapping, some minor adjustments would be required.²⁷ While standards for purchase eligibility are currently important, they could also be eliminated if the Federal Open Market Committee (FOMC) permitted all types of acceptances to serve as collateral for System RPs. However, even if the FOMC preferred to maintain this distinction, substantial simplification could still be achieved. Consolidation of the standards for purchase eligibility with those necessary for a reserve requirement exemption if the acceptance is sold would mean that only two broad categories of acceptances would exist: those both eligible for purchase *and* exempt from reserve requirements and those which are not.

As noted earlier, to be exempt from reserve requirements if sold, domestic shipment acceptances must be accompanied by documentation considerably more

²⁶ In 1980, large time deposits at member banks averaged \$170.3 billion. Using 18 percent of this average, the revenue loss was calculated assuming about a 4 percent reserve requirement and a 1980 average three-month Treasury bill interest rate of about 11 percent.

²⁷ In some cases, an acceptance is eligible for discount but not for purchase. For example, while foreign storage and dollar exchange acceptances with tenors of six months or less are eligible for discount, they are not eligible for purchase.

complex and expensive than that required for acceptances related to international transactions. Removal of this extra documentation requirement would make procedures for creating domestic acceptances uniform with those for international transactions. The insertion of this requirement in the original Federal Reserve Act apparently was related to the "real bills doctrine" prevalent at the time and reflected a view that special precautions were necessary to ensure that acceptances financing domestic transactions actually would be self-liquidating and trade related. The Board has been disposed to retain it in order to focus the benefits of the reserve requirement exemption on trade.

Finally, the regulations provide that the tenor of an acceptance—rather than its remaining maturity—must be less than six months in order that funds raised through its sale be exempt from reserve requirements. Hence, a bank cannot create an acceptance with a longer tenor, hold it in portfolio until six months before maturity, and then sell it. The regulation would be more precisely focused on the use of acceptance sales by banks as a funding device if the requirement

referred to the remaining rather than the original maturity of the acceptance.

Whatever the outcome of proposed modifications in the acceptance regulations, major changes in the acceptance market may be in the offing. The role of dealers as distributors of acceptances seems likely to erode somewhat in the next several years. Banks are stepping up efforts to distribute their acceptances directly to investors, primarily money funds, and eventually this may reduce the portion of paper placed through dealers. Though the rapid growth of the money funds is likely to subside once banks are allowed to pay market interest rates on consumer-type deposits, the enlarged bank distribution networks are likely to be permanent.

In short, the acceptance market, having risen in a few years from relative obscurity to one of the most active money markets, should be transformed still further as banks and nonbank institutions innovate to meet credit demands more efficiently. However, the precise characteristics of this innovation will depend critically on action taken in regard to pending regulatory amendments.

William C. Melton and Jean M. Mahr

Appendix: Regulations Governing Bankers' Acceptances

Regulations concerning bankers' acceptances currently affect accepting banks in essentially three ways: (1) by defining the types of acceptances which are eligible for purchase by the Federal Reserve under repurchase agreements (RPs) and those which are eligible to secure Federal Reserve advances, (2) by setting conditions under which the funds obtained from the sale of an acceptance are reservable, and (3) for certain types of acceptances, by limiting the exposure which a bank can assume per individual customer and in aggregate (Table 2).

The conditions governing discount eligibility—contained in Section 13(6) of the Federal Reserve Act—were important in the early years of the Federal Reserve System. However, since then, Federal Reserve practice has been not to discount acceptances but rather to make advances to member banks secured by collateral which is eligible either for discount or for purchase.¹ As illustrated in Chart 8, the purchase eligi-

bility standards are broader and encompass—except in two minor cases—those for discount eligibility. Hence, standards for eligibility for purchase rather than those for discount are relevant for the practical operation of the discount window.

The reserve treatment of a member bank's acceptance liability, however, is determined by a different set of regulations. The sole determinants of reservability are that the acceptance has been sold by the bank *and* does *not* conform to the type described in Section 13(7). Thus, reservability is logically distinct from discount eligibility.² The reserve requirement is

¹ This practice is explicitly sanctioned in Section 13(8) of the Federal Reserve Act.

² Until very recently, discount eligibility was important for determination of the required reserves of banks. Section 204.2(a)1(vii) (E) of Federal Reserve Regulation D, as revised effective November 13, 1980, specifically exempts from reservable deposits funds obtained through "the creation, discount, and subsequent sale by a depository institution of its bankers' acceptance of the type described in paragraph 7 of Section 13 of the Federal Reserve Act". The corresponding part of the earlier regulation required *in addition* that such acceptances be eligible for discount.

Appendix: Regulations Governing Bankers' Acceptances (continued)

Table 2

Bankers' Acceptances: Eligibility and Reservability

Type of bankers' acceptance	Eligible for purchase*	Eligible for discount†	Exempt from reserve requirements if sold‡
Export-import, including shipments between foreign countries:			
Tenor—6 months or less	Yes	Yes§	Yes
6 months to 9 months	Yes	No	No
Domestic shipment, with documents conveying title attached at the time of acceptance:			
Tenor—6 months or less	Yes	Yes§	Yes
6 months to 9 months	Yes	No	No
Domestic shipment, without documents conveying title:			
Tenor—6 months or less	Yes	No	No
6 months to 9 months	Yes	No	No
Shipment within foreign countries:			
Tenor—any maturity	No	No	No
Foreign storage, readily marketable staples secured by warehouse receipt:			
Tenor—6 months or less	No	Yes§	Yes
6 months to 9 months	No	No	No
Domestic storage, readily marketable staples secured by warehouse receipt:			
Tenor—6 months or less	Yes	Yes§	Yes
6 months to 9 months	Yes	No	No
Domestic storage, any goods in the United States under contract of sale or going into channels of trade and secured throughout its life by warehouse receipt:			
Tenor—6 months or less	Yes	No	No
6 months to 9 months	Yes	No	No
Dollar exchange, required by usages of trade, only in approved countries:			
Tenor—3 months or less	No	Yes	No
3 months to 9 months	No	No	No
Finance or working capital, not related to any specific transaction:			
Tenor—any maturity	No	No	No

Tenor refers to the full length of time of the acceptance from date of inception to maturity. To be eligible for discount, a bankers' acceptance must be endorsed by at least one member bank, as provided in Section 13(6) of the Federal Reserve Act.

* Authorizations announced by the Federal Open Market Committee on April 1, 1974.

† In accordance with Regulation A of the Federal Reserve Act.

‡ In accordance with Regulation D of the Federal Reserve Act.

§ Providing that the maturity of nonagricultural bills at the time of discount is not more than ninety days.

|| According to revised Regulation D, these acceptances are reservable, but the Federal Reserve Board's legal staff has expressed an opinion that the exemption from reserve requirements is also applicable to dollar exchange acceptances.

Source: Adapted from an unpublished paper by Arthur Bardenhagen, Vice President, Irving Trust Company, New York.

Appendix: Regulations Governing Bankers' Acceptances (continued)

calculated by treating the acceptance liability as a deposit with maturity equal to the acceptance tenor.³

The funds obtained from the sale of an acceptance which does conform to the standards of Section 13(7) are exempt from reserve requirements, providing such acceptances outstanding are not greater than 50 percent of a member bank's paid-up and unimpaired capital stock and surplus. With the prior approval of the Board of Governors, this limit can be increased to 100 percent.⁴ Since this so-called "100 percent rule" is defined exclusively in terms of the standards in Section 13(7), it has no relation to discount eligibility.

The reserve treatment of acceptances created by nonmember banks is similar in principle to that for member banks, with two important differences. First, the aggregate limitations on acceptances applying to nonmembers are generally substantially more liberal than member banks' 100 percent rule and provide a larger base of reserve-free-type acceptances (Table 3). Second, since the Monetary Control Act of 1980 provided that comparable reserve requirements for nonmember banks be phased in over time, the reserve requirement applying to the nonmember banks will be lower for several years before eventually becoming equal to that of members. Thus, the lower reserve requirement of nonmembers—and most foreign bank branches and agencies in particular—provides them a temporary advantage.

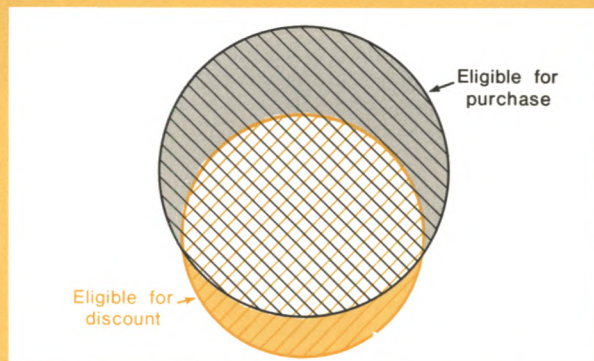
Customer limits are generally 10 percent of the member bank's unimpaired capital and surplus for acceptances eligible for discount unless the excess is secured. However, states may apply more liberal limits to institutions under their jurisdiction. Edge Act corporations are exempt from the 10 percent limit for

³ Thus, a bank cannot make an acceptance with a seven-month tenor exempt from the reserve requirement by simply holding it for a month and then selling it when it has six months remaining to maturity. For this reason, domestic accepting banks almost always hold such acceptances.

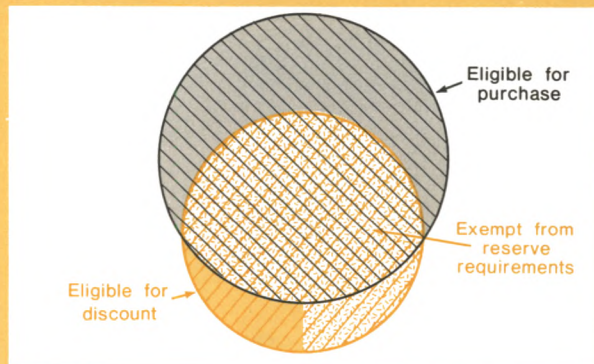
⁴ According to Section 13(7) of the Federal Reserve Act, a member bank cannot create acceptances in an amount greater than 100 percent of its capital. In practice, however, this limitation actually restricts the amount of acceptances which can be sold to raise reserve-free funds. According to the Published Interpretations of the Board of Governors (paragraph 1700), when a member bank purchases its own acceptances of the type described in Section 13(7), these acceptances are not included in the aggregate amount since the bank no longer has an outstanding obligation. Only if the acceptance is sold, thus renewing the obligation to pay at maturity, is it included in the aggregate amount. Therefore, a bank must limit the amount of Section 13(7)-type acceptances sold to 100 percent of capital and hold in portfolio any acceptances created beyond the aggregate amount allowed, or maintain reserves against the excess amount sold.

Chart 8

Standards for eligibility for discount and purchase overlap except in some minor cases.



However, not all these acceptances are the type which are exempt from reserve requirements if sold.*



*Table 2 explains, in detail, the standards which must be met for an acceptance to be eligible for discount and/or eligible for purchase and/or exempt from reserve requirements if sold.

eligible acceptances resulting from the international shipment of goods if the corporation's exposure is covered by guarantees of reimbursement by other banks. In addition, Edge Act corporations are allowed to reduce their aggregate exposure to one customer by entering into participation agreements with other banks, while member banks are not allowed to do so. Customer limits on acceptances ineligible for discount are generally identical to those applying to loans.

Appendix: Regulations Governing Bankers' Acceptances (*continued*)

Table 3

Synopsis of Major Rules and Regulations Governing Bankers' Acceptances

Category	Member banks	Nonmember banks	Edge Act corporations	State-chartered foreign branches and agencies
Customer limitations:				
Bankers' acceptances eligible for discount	10% of capital unless secured	Governed by state loan limitations*	10% of capital unless secured†	Governed by state loan limitations*
Bankers' acceptances ineligible for discount	For national banks, 10% of capital; state members governed by state loan limitations*	Governed by state loan limitations*	10% of capital	Governed by state loan limitations*
Reservability of bankers' acceptances sold into the market:				
Bankers' acceptances described in Section 13(7) of the Federal Reserve Act‡	Not reservable; the total outstanding must not exceed 50% of capital (100% with prior approval of the Board of Governors)§	Not reservable; aggregate limits set by state laws	Not reservable; but bankers' acceptances in excess of 200% of capital must be secured	Not reservable; aggregate limits set by state laws
Other bankers' acceptances	Reservable; no aggregate limit#	Reservable; aggregate limits set by state laws	Reservable; no aggregate limit	Reservable; aggregate limits set by state laws
Acceptability of bank name for purchase by Federal Reserve and as collateral for advances				
	Acceptable in principle**	Acceptable in principle**	Acceptable in principle**	Acceptable in principle**

* The customer limit on the sum of eligible and ineligible acceptances for New York State-chartered banks and branches and agencies of foreign banks is apparently 10 percent of the bank's overall capital. Those chartered in Illinois are subject to 15 percent of capital for ineligible acceptances (except dollar exchange) unless secured, in which case the limit is 50 percent. In California, eligible acceptances (except dollar exchange) are limited to 10 percent of shareholders equity and capital notes unless secured, in which case the limit is 50 percent. The total of secured and unsecured ineligible acceptances is limited to 20 percent of shareholders' equity and capital notes.

† Unless (i) the excess represents the international shipment of goods and the Edge corporation is fully covered by primary obligations to reimburse it for that portion which is guaranteed by banks or bankers, or (ii) the Edge corporation is covered by participating agreements from other banks.

‡ The revised Regulation D effective November 13, 1980 slightly expanded the category of acceptances which were exempt from reserve requirements (provided the aggregate limit was satisfied); previously, acceptances described in Section 13(7) and eligible for discount were exempt.

§ In addition, domestic acceptances are limited to 50 percent of such capital. According to the Published Interpretations of the Board of Governors (paragraph 1700), when a member bank purchases its own acceptance, the acceptance is not included in the aggregate limit. However, when the acceptance is sold, it is included in the limit.

|| New York State- and Illinois State-chartered banks and United States branches and agencies of foreign banks have no aggregate acceptance limit. In California, eligible acceptances are subject to 50 percent of shareholders' equity, capital, and notes and with permission of the Superintendent of Banking to 100 percent. Ineligible acceptances have no aggregate limit.

One exception is that dollar exchange acceptances are limited to a separate and distinct 50 percent of capital and are not included in the limits imposed by Section 13(7) of the Federal Reserve Act.

** Individual banks must satisfy requirements set by the Federal Open Market Committee.

Monetary Policy and Open Market Operations in 1980

The Federal Reserve faced a turbulent year in the economy and in financial markets in 1980 as it sought to dampen inflationary pressures by restraining money and credit growth. The economy was buffeted by a number of shocks, including sharp hikes in energy prices, heightened tensions in the Middle East, and rapidly shifting inflationary expectations. The special credit restraint program announced on March 14—and its subsequent removal—had a larger than expected impact and combined with other developments to produce dramatic changes in economic activity, interest rates, and financial flows. The economy plunged into a steep recession in the second quarter and then, much to the surprise of almost all analysts, recovered over the balance of the year—making the recession one of the shortest on record. Interest rates soared to unprecedented levels early in the year, dropped dramatically in the spring, only to rise sharply again, in some cases to new highs, by late autumn. The recession and the Reserve System's firm policy stance helped

dampen inflationary expectations temporarily, but the quick turnaround in the economy and concern over the prospects for the Federal deficit renewed public anxiety over the price outlook. By the year-end, inflationary psychology still seemed firmly embedded in the economy, although the speculative fever evident earlier in the year in the commodities markets and the sense of rapidly accelerating inflation had not returned.

The wide swings in economic activity in 1980, in turn, led to marked changes in the public's needs for cash balances, testing the System's new reserve-oriented strategy for monetary control adopted in October 1979. That strategy—which involves placing more emphasis on managing the supply of reserves, while allowing much greater scope for movements in the Federal funds rate—provided an automatic market adjustment of short-term rates when monetary shortfalls and overruns occurred. When growth of the monetary aggregates, and hence the demand for reserves, fell below the objectives of the Federal Open Market Committee (FOMC) in the spring as the economy weakened, the Domestic Open Market Desk's provision of nonborrowed reserves in line with those objectives led to sharp declines in short-term rates as banks cut back their borrowing from the discount window. By late summer, and more intensively through the autumn, with money growth strengthening along with the economy, short-term rates began to climb as the Desk's restraint on the supply of nonborrowed

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Chart 1

Targeted and Actual Growth of M-1A

Billions of dollars

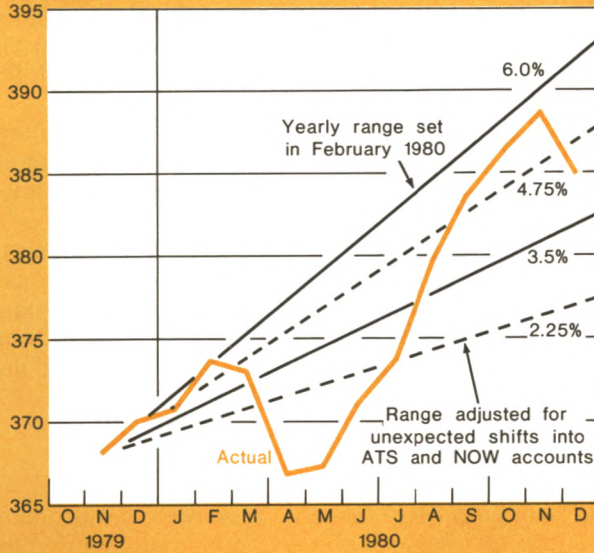


Chart 2

Targeted and Actual Growth of M-1B

Billions of dollars

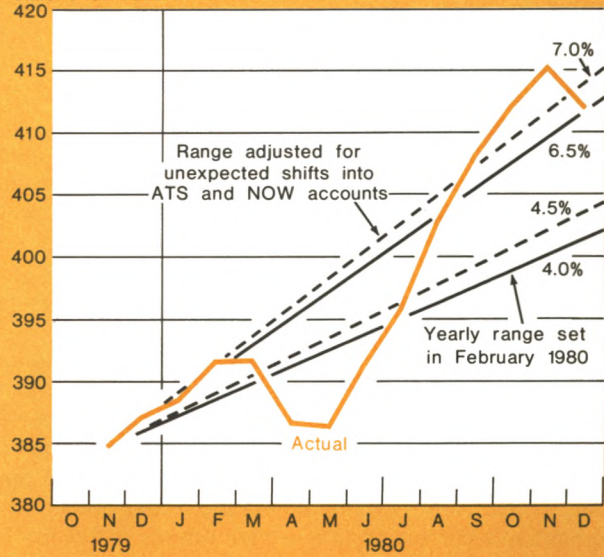


Chart 3

Targeted and Actual Growth of M-2

Billions of dollars

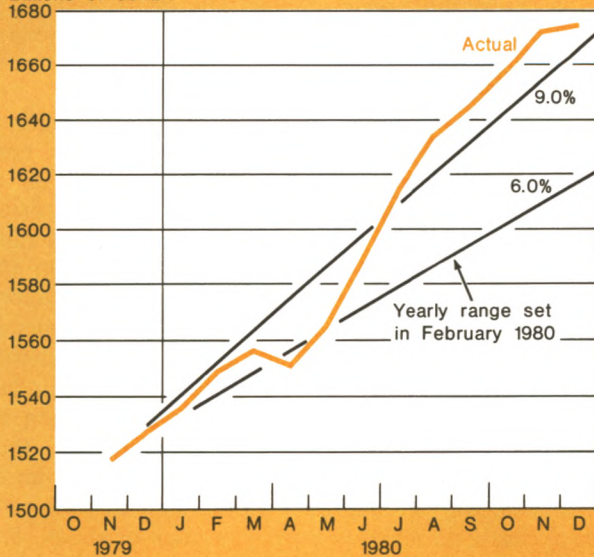
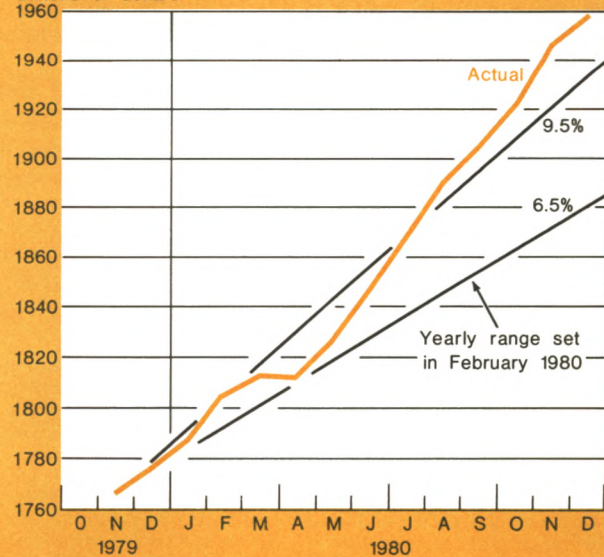


Chart 4

Targeted and Actual Growth of M-3

Billions of dollars



reserves relative to reserve demands forced banks to borrow heavily from the window to meet their reserve requirements. On several occasions, the nonborrowed reserve path was modified to speed up the adjustment process. The path was raised to reduce the need for borrowing when the aggregates were growing substantially below the Committee's objectives, and lowered to force even higher borrowing when the aggregates were growing substantially above the objectives. Increases in the discount rate and the imposition of the discount rate surcharge on frequent borrowing by large banks were even more important at times in speeding the response to monetary overshoots. In this way, the new strategy worked to encourage banks and the public to make portfolio changes that in time helped bring money growth back in line with the Committee's objectives.

For the year as a whole, growth of the monetary aggregates was near the upper ends of the Committee's targeted ranges. Measured from the fourth-quarter average of 1979 to the fourth-quarter average of 1980, M-1A and M-1B rose by 5.0 percent and 7.3 percent, respectively,¹ slightly above the upper ends of the Committee's corresponding growth ranges of 2¼ to 4¾ percent and 4½ to 7 percent after appropriate adjustment.² Both aggregates weakened substantially toward the year-end, and by December their growth was within the Committee's (adjusted) path ranges (Charts 1 and 2). Growth of the broader aggregates, on a quarterly average basis, also exceeded somewhat the Committee's expectations. M-2 rose over the four quarters of 1980 by 9.8 percent, compared with its 6 to 9 percent range, while M-3 increased by 9.9 percent as against its range of 6½ to 9½ percent (Charts 3 and 4). The expansion of the broader aggregates was spurred on, in part, by the rapid advance of money market mutual fund shares which, not only drew funds from other components of M-2, but also diverted flows that otherwise would have gone directly

into money market instruments not contained in the aggregate measures, such as Treasury bills and commercial paper. The volume of money market mutual fund shares outstanding nearly doubled over the first eight months to about \$80 billion before edging downward over the balance of the year. Bank credit grew 7.9 percent over the four quarters of 1980, within the 6 to 9 percent range that had been associated with the Committee's aggregate ranges.

The remainder of this report focuses special attention on the System's experience with the reserve strategy for monetary control in 1980 from the vantage point of the Desk. After highlighting economic and financial developments over the year and discussing the FOMC's choices of yearly monetary ranges and short-term objectives, it describes how the Desk worked to achieve intermeeting reserve paths corresponding to these objectives through day-to-day open market operations.

The Economy and Financial Markets

After more than four years of expansion, the economy experienced a short but dramatic recession during the first half of 1980. The contraction was followed by moderate growth in the second half of the year that did not quite recover the earlier decline. The unemployment rate jumped up by more than 1½ percentage points in the spring and, after falling slightly in subsequent months, leveled off at 7½ percent. Inflation, as measured by the gross national product (GNP) price deflator, increased to nearly 10 percent over the four quarters ended in the final quarter of 1980 from about 8 percent in the previous year. The sharp swings in economic activity and consequent shifts in inflationary expectations and credit demand over the year led to unprecedented movements in interest rates.

As the year began, there were few, if any, signs of the long-expected recession. Increases in the consumer price index accelerated to an annual rate of over 18 percent, reflecting in part sharp hikes in oil prices and mortgage interest rates. The Carter administration's new budget was generally viewed in the markets as overly expansive, while expectations mounted that the Russian involvement in Afghanistan would lead to stepped-up United States defense spending. Renewed speculation in precious metals underscored doubts about the prospects for dampening inflationary pressures. Inflationary expectations thus worsened, precipitating rapid increases in interest rates including an unprecedented jump in long-term rates. The bond markets were in a state of shock, and bond prices plummeted as investors sought refuge in short-term assets.

¹ Figures in the body of the report reflect data available as of March 6, 1981. The chronological sections make use of data published at the time, since Federal Reserve decisions were based on them.

² These reflect adjustments to the original ranges of 3½ to 6 percent and 4 to 6½ percent for the impact of actual shifts of funds into automatic transfer service (ATS) accounts and negotiable order of withdrawal (NOW) accounts during the year. The Committee's 1980 growth ranges for M-1A and M-1B, first set in February and then reaffirmed in July, allowed for a ½ percentage point difference between the two, but the difference turned out to be about 2¼ percentage points. The Board of Governors staff estimates that about two thirds of the increase in ATS and NOW accounts reflected shifts of funds from demand deposits, with the rest coming out of savings accounts and other components of M-2. On this basis, the M-1A range was revised downward and the M-1B range revised upward.

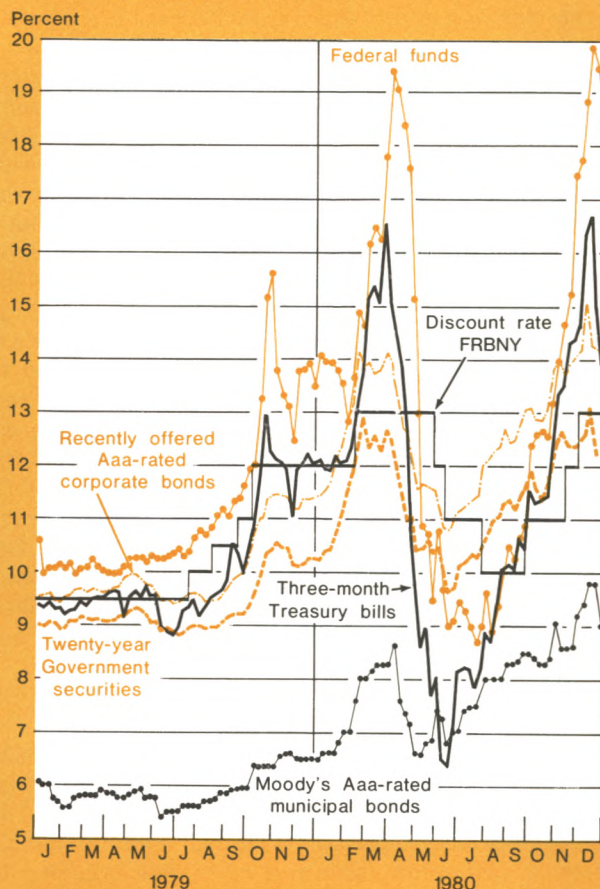
In this atmosphere, President Carter announced in mid-March a broad program intended to stem inflationary forces. As part of this effort, the Federal Reserve undertook a set of measures aimed at restraining the growth of credit. These included (1) a voluntary program to restrain the growth of domestic lending by leading financial institutions, (2) a special 15 percent deposit requirement on increases in unsecured consumer credit and assets of money market mutual funds, (3) an increase in the marginal reserve requirement on banks' managed liabilities, and (4) the imposition of a 3 percentage point surcharge on discount window borrowing by frequent large bank borrowers.

During late March and early April, evidence began to mount that the economic expansion had come to an end. Consumer spending, which had been important in sustaining the expansion, began to fall late in the first quarter and then dropped sharply in the second quarter as the March 14 credit control program took hold. The personal savings rate, at a relatively low level of 4.9 percent in the first quarter, increased to 6.2 percent in the second quarter. Mortgage rates, freed from state usury ceilings, reached levels at which housing demand, and thus new construction, declined dramatically. The auto industry, which had curtailed its production in the last months of 1979, cut back still further in the spring of 1980 as consumer demand slackened. In all, real GNP (after adjusting for the effects of inflation) grew at a modest rate in the first quarter and then declined at a record annual rate of nearly 10 percent in the second quarter.

Interest rates continued to climb for a brief period after the economic downturn began. By early April, yields on virtually all fixed-rate financial assets attained record levels, though some of these records were eclipsed later in the year. The average effective Federal funds rate reached a high of 19.39 percent for the week of April 2 (Chart 5), and at the same time the prime rate charged by commercial banks hit 20 percent. Three-month Treasury bill rates in regular weekly auctions registered a high of 16.53 percent in March, while long-term Treasury bonds yielded 12.85 percent at their peak in February. Then, as the sharp downturn in the economy led to a substantial drop in the demand for credit and a moderation of inflationary expectations, interest rates declined precipitously. In early May, the Federal Reserve began to phase out its credit restraint measures by eliminating the surcharge on discount window borrowing. Later in the month, the special deposit requirements and marginal reserve requirements were cut in half. On July 3, with the economy looking quite weak and growth of the various monetary aggregates well within or below their individual target ranges, the Federal Reserve announced

Chart 5

Selected Interest Rates



that the remaining provisions of the program would be phased out by the end of the month. The weekly average effective Federal funds rate fell to as low as 8.68 percent near the end of July, while the prime rate at most major banks stood at 11 percent. Three-month Treasury bill rates reached a low of 6.37 percent, and long-term Treasury bond yields fell to 9.49 percent in mid-June.

Notwithstanding the consensus forecast of further economic contraction in the third quarter, the economy then began to show signs of renewed strength. As the economy turned the corner, growth of the monetary aggregates accelerated sharply and the demand for credit rebounded from its depressed second-quarter rate. Though demand from the private sector was still

somewhat below normal levels, government financing needs increased to a historically high level. As the third quarter unfolded, interest rates turned up. Inflationary expectations worsened, as the strength of the economy became apparent in data released late in the quarter.

The momentum of the economic rebound continued into the final quarter of the year as did the heavy Treasury financing needs. Increases in consumer prices, which were relatively moderate during the summer months, began to accelerate. The Federal Reserve's restrictive approach to the supply of reserves in the face of continued strong money growth was associated with strong upward pressure on short-term market interest rates. On November 17, the Federal Reserve raised the basic discount rate 1 percentage point to 12 percent and established a 2 percentage point surcharge on frequent borrowing by large banks. On December 5, the basic rate was raised again to 13 percent and the surcharge was boosted to 3 percent. Yields on all fixed-rate assets increased sharply over the last few months of the year, surpassing the previous record highs set in early spring for many maturity areas and types of issues. The weekly average effective Federal funds rate hit 19.83 percent in December, at the same time that the prime rate reached 21½ percent. Three-month Treasury bill rates peaked at 16.67 percent and long-term Treasury bonds yielded 13.17 percent in December.

Patterns of finance

The patterns of government and private finance were influenced in varying degrees by the dramatic oscillations in the economy and interest rates in 1980. The recession added substantially to the Federal deficit, which in turn contributed to a more than doubling of net Treasury borrowing from the public. The net rise in marketable Treasury debt held outside Federal Reserve and Government accounts was \$90 billion in 1980, compared with \$37 billion in 1979. As the growth of income tax receipts dropped off and income maintenance expenditures expanded, Treasury borrowing surged. In each of the last two quarters of 1980, the Treasury raised about \$28 billion in new cash and thus added to the upward pressure on interest rates during the period. For the year as a whole, outstanding publicly held coupon issues increased by \$45.3 billion, including \$1.2 billion equivalent of German mark-denominated notes sold to German residents in January. Treasury bills held by the public increased by \$44.8 billion.

Federally sponsored agencies and corporations raised \$26.7 billion in net funds from the public over the year, up from \$25.6 billion in 1979. The three major borrowers were the Farm Credit Administration, the

Federal Home Loan Banks, and the Federal National Mortgage Association.

State and local governments issued a gross volume of \$46.3 billion of long-term bonds in 1980, compared with \$42.3 billion in 1979. Tax-exempt borrowers subject to legal rate ceilings were effectively excluded from the bond market during the periods of high interest rates. New issue activity in the tax-exempt bond market thus fell off during the first few months of 1980 and then rebounded during the spring and summer months. Toward the year-end, some issuers again were priced out of the market. At the same time, however, other state and local borrowers accelerated their schedules for issuing housing revenue bonds in anticipation of Federal legislation (signed into law December 5) that would soon limit the volume of tax-exempt mortgage bond financings. Consequently, the volume of new issues did not drop as much in the last quarter as it had in the first quarter of the year.

In the private sector, the demand for credit fluctuated in response to changes in the level of economic activity. Early in the year, nonfinancial corporations faced a large financing gap. With long-term interest rates high and rising, however, many corporations postponed planned bond offerings and increased their reliance on short-term borrowing (largely bank loans and commercial paper). Growth of short-term business credit was further bolstered by corporations who borrowed in anticipation of a possible move to credit controls by the Federal Reserve. Proceeds from such borrowing were not needed immediately but boosted corporate holdings of liquid assets. Consumer credit and mortgage debt continued to expand, albeit at a reduced pace, in the first quarter of the year.

After the implementation of credit controls in mid-March, bank loans to businesses and consumers dropped off sharply. While market interest rates fell rapidly in the spring, banks were slow in reducing their prime rates, thus increasing the spread between prime and commercial paper rates and diverting some corporate borrowers to the commercial paper market. In addition, many corporations met their financial needs in the second quarter by drawing down their liquid asset holdings and marketing the backlog of new bond issues delayed from earlier in the year. Consumer debt fell sharply in the spring and summer, reflecting both the decline in consumer spending and the impact of the credit control program. Banks increased the fees and the minimum monthly payments on instalment debt, making this sort of borrowing less attractive to the consumer, while many consumers apparently decided on their own to use credit cards and charge accounts more sparingly. Growth of mortgage debt was sharply curtailed in the second quarter.

Private-sector demand for credit rebounded somewhat in the second half of the year, as the economy resumed its expansionary course. As interest rates began to increase, the spread between prime and commercial paper rates declined to more normal levels. In addition, many banks moved to price short-term business loans more competitively. Consequently, bank loans rebounded while outstanding commercial paper contracted—but by less than the rise in bank credit. Corporate borrowing in the bond market continued at a healthy pace through most of the second and third quarters but then declined again as long-term interest rates approached, and then surpassed, the record levels achieved earlier in the year. Growth of mortgage debt increased in the third quarter but remained below normal levels for the remainder of the year. Consumer credit demand picked up late in the third quarter and continued to expand over the remainder of the year.

Over the year as a whole, new issues in the corporate bond market amounted to \$52.8 billion, up from \$40.1 billion in 1979. Commercial and industrial loans at commercial banks increased by about 11 percent to a level of \$325.1 billion at the year-end. Outstanding nonfinancial commercial paper grew by \$6.8 billion to \$37.1 billion. Total consumer instalment credit remained virtually unchanged at \$313.4 billion, while mortgage debt grew more slowly than in previous years.

Financial futures markets

During 1980, transactions in Treasury bill and bond futures contracts came to play an even more important role in the trading strategies of dealer firms and some other financial institutions. Activity in interest rate futures markets grew rapidly, not only in relation to previous experience, but also in comparison with trading in the underlying cash markets. Daily volume in three-month Treasury bill futures contracts on the International Monetary Market (IMM), by far the most active bill futures market, averaged slightly more than 13,000 contracts (\$13 billion), an increase of nearly 75 percent over 1979. Trading in Treasury bond futures contracts more than tripled to nearly 26,000 contracts (\$2.6 billion) per day on average. The increasing volume of arbitrage between the cash and futures markets continued to prompt concern among regulators that difficulties in the futures markets could spill over into the cash markets. Widespread pressure on the commodities futures markets in the spring (from the silver market) and in December (from the grain markets) exerted pressure on the financial futures markets and, in turn, on the cash markets. In addition, deliveries against futures contracts were heavy at times, reaching record high levels in bills and bonds in December.

Monetary Policy and Its Implementation

Long-term targets

In planning policy for 1980, the FOMC reaffirmed its goal of gradually lowering money and credit growth over a period of years to dampen inflationary expectations and to reduce inflation. The Committee's longer run objectives for money and credit growth continued to be formulated within the framework of the Full Employment and Balanced Growth ("Humphrey-Hawkins") Act of 1978. In accordance with the act, the Board of Governors reported to the Congress in February on the System's goals for money and credit expansion for the year ended in the fourth quarter of 1980 and related these goals to the objectives for the economy contained in the President's January Economic Report. Then, in July, the Board reported on the System's reassessment of the 1980 targets and its preliminary plans for 1981, relating these to the Administration's forecasts contained in its midyear budget review. The Committee's targets were set using new definitions of the money stock which take into account recent innovations and regulatory developments in the financial system, while arranging monetary assets according to their functional characteristics rather than the particular issuing institution.³

The Committee faced a number of uncertainties when it met in February to consider its objectives for money and credit expansion in 1980. Apart from uncertainties about the economy and the international situation (heightened by new tensions in the Middle East and Afghanistan), there were particular questions about likely monetary developments relevant to the target-setting procedures. The shift of funds into ATS accounts and NOW accounts in New York State that was evident in the previous year was expected to subside. However, legislation to extend NOW accounts nationwide was pending in the Congress. Passage of such legislation would be expected to depress M-1A growth as the public shifted funds into NOW accounts from demand deposits, while boosting M-1B growth as such shifts occurred from savings deposits and other assets. But the timing and extent of the shifts were in doubt.

³ Two narrow transactions measures, M-1A and M-1B, replaced the old M-1 measure (currency plus demand deposits adjusted). M-1A is basically the same as M-1, except that it excludes demand deposits held by foreign commercial banks and official institutions. M-1B adds to M-1A three other checkable instruments at all depository institutions, namely, NOW accounts, ATS accounts, and credit union share draft balances. Among the broad money stock measures, the new M-2 adds to M-1B savings and small time deposits at all depository institutions, money market mutual fund shares, overnight repurchase agreements (RPs) issued by commercial banks, and certain overnight Eurodollars held by United States nonbank residents. M-3 includes also large time deposits at all depository institutions and term RPs issued by commercial banks and savings and loan associations.

While growth of the broader aggregates was not expected to be significantly affected by the introduction of nationwide NOW accounts, there were questions on the prospects for growth of some of the newer elements contained in these measures—particularly money market mutual fund shares.

Against this background, the Committee continued to formulate its yearly objectives for money and credit expansion in terms of ranges that were 2½ to 3 percentage points wide. In line with its general policy of seeking a gradual reduction of money and credit expansion over a period of years, the midpoints of the growth ranges for 1980 were moderately below actual money and credit growth in 1979, continuing the general trend toward lower money growth from the levels recorded in 1978 (Table 1).

By the time the Committee met in July to reconsider the 1980 ranges and to formulate tentative plans for 1981, the economy and the monetary aggregates had weakened considerably. The particularly marked weakness in the narrow aggregates suggested that the demand for money might have shifted downward, either because the rapid rise in interest rates in the winter encouraged the public to economize on its cash balances to an unusual extent or because the credit restraint program had led the public to pay down debt, in part, by drawing down money balances. Growth among the aggregates also varied from earlier expectations. Legislation authorizing continuation of ATS accounts and allowing NOW accounts nationwide effective December 31, 1980 was signed into law at the end of March. Commercial banks which already had the authority to issue ATS accounts began to promote them aggressively in anticipation of other institutions being able to offer NOW accounts shortly. As a result, while the Commit-

tee's yearly ranges had allowed for a ½ percentage point difference between the growth rates of M-1A and M-1B, the actual difference in the second quarter was on the order of 2 percentage points. In addition, growth of the broader monetary aggregates was being supported by the rapid advance of money market mutual fund shares. Hence, by June, although growth rates of the narrow monetary measures from the fourth quarter of 1979 were below the Committee's yearly ranges, growth rates of the broader measures were within their respective ranges.

Despite the shifting relationships among the aggregates, the Committee elected to retain its targets for the year. It noted, however, that growth of the narrow monetary aggregates might end the year toward the lower bounds of their respective ranges, while growth of the broader aggregates might be above their midpoints and, in the case of M-2, even toward the top end of its range.

Short-term objectives

At each meeting, as part of the new reserve approach, the Committee specified short-term objectives for growth of M-1A, M-1B, and M-2. These objectives, along with the Committee's initial assumption for borrowing at the discount window, were used by the staff to construct the reserve paths which, in turn, guided open market operations over intermeeting periods.

At the outset of the year, the Committee chose short-term objectives for the narrow aggregates that were a bit below the midpoints of their respective yearly ranges. Thus, at the February meeting, when the FOMC first began to use the new definitions of the money stock, its short-term objectives for the December-March period were annual growth rates of 4½ percent for

Table 1

Growth of Monetary and Credit Aggregates Relative to Targets of the Federal Open Market Committee

From fourth quarter of previous year to fourth quarter of year indicated; in percent

Aggregate	1978 actual	1979 actual	1980 original range	1980 adjusted range*	1980 actual
M-1A	7.4	5.0	3½ to 6	2¼ to 4¾	5.0
M-1B	8.2	7.7	4 to 6½	4½ to 7	7.3
M-2	8.4	9.0	6 to 9		9.8
M-3	11.3	9.8	6½ to 9½		9.9
Bank credit	13.5	12.3	6 to 9		7.9

* Reflects adjustments to original ranges for estimated impact of actual shifts of funds into ATS accounts and NOW accounts (see footnote 2 of text).

M-1A and 5 percent for M-1B. Consistent with this approach, M-2 was expected to grow at an annual rate of 6½ percent.

As the year unfolded and the aggregates strayed from path rates consistent with their yearly ranges, the Committee's general approach in setting its short-term monetary targets was to provide for returning money growth to path over a period of several months. Hence, when the aggregates were running below path rates consistent with their yearly ranges, the Committee tended to set relatively high short-term growth objectives—but not so high as to attempt to close the gap in a period as short as, say, one month. Similarly, when the aggregates were above path rates consistent with the yearly ranges, the Committee chose short-term objectives that were on the low side, again pointing the way back to path over several months. At the same time, the Committee tended to be relatively tolerant of overshoots in the short-term objectives when growth was low relative to the longer term goals, and tolerant of undershoots in the short-term objectives when growth was running high relative to the longer term goals. In taking this approach, the Committee was mindful of the volatile short-run behavior of the aggregates and, therefore, the difficulty of controlling or even interpreting movements over short periods. Moreover, it tried to take into account lags in the effects of changes in financial market conditions on money growth. A more aggressive approach to setting short-term monetary targets—say, one that attempted close month-to-month control—risked the possibility of whipping the markets and ultimately destabilizing money growth and interest rates over a longer period.

The Federal funds rate range

In addition to setting short-term objectives for the monetary aggregates at each meeting, the Committee also specified broad ranges for the Federal funds rate. The Committee's formal instructions to the Manager with respect to these ranges changed somewhat beginning with the directive issued at the December 1980 meeting. Earlier directives had called for the Desk to aim for reserve paths consistent with the Committee's aggregate objectives, provided that in the period before the next meeting the weekly average Federal funds rate remained within the specified range. If it appeared that the constraint on the Federal funds rate was inconsistent with the reserve objectives, the Manager was promptly to notify the Chairman who would then decide whether the situation called for supplementary instructions from the Committee. The December directive retained the notification requirement if it appeared that developments in the funds market, taken over a period of time, were inconsistent with the specified range. In

the meantime, however, the Desk was to continue aiming for reserve objectives without the funds rate acting as a constraint in the absence of any further Committee instruction.

Even before this change, the Federal funds rate ranges, in fact, played only a temporary and rather modest role in guiding open market operations over the year. In the first place, over most of the year the ranges—which varied from 4 to 8½ percentage points in width—were sufficiently wide as to pose no constraint on the Desk's efforts to achieve the reserve paths. Second, when there was a potential conflict between the funds rate range and the reserve paths, the Committee was fairly quick to adjust the funds ranges to remove the conflict. Over the year, the Committee adjusted the formal ranges during intermeeting periods downward on one occasion and upward on three occasions, including once in early December when it temporarily suspended the upper bound of the range as aggregate growth continued to exceed its objectives. On one occasion, at the May 20 meeting, the Committee instructed the Manager to seek further consultation before letting the Federal funds rate fall significantly within the formal range of 8½ to 14 percent. Subsequently, in early June, the Committee allowed the Desk to use the full scope of the range.

Reserve paths and the adjustment process

Subsequent to each meeting, the staff constructed paths for total reserves and nonborrowed reserves consistent with the Committee's short-term aggregate objectives, following the procedures developed in October 1979. To arrive at a total reserve path, it first estimated the required reserves needed to support the deposits contained in the Committee's targets, taking into account the likely growth of currency, the composition of these deposits by type and maturity, and their distribution among banks by size and membership status. To this the staff added estimates of excess reserves and required reserves needed to support the growth expected in reservable liabilities not contained in the short-term aggregate targets, such as net interbank deposits and large time deposits. The nonborrowed reserve path was then derived by subtracting from the total reserve path the initial borrowing level agreed to by the Committee.

Each week (generally on Fridays), as new information on deposits and reserves became available, senior Board staff and the Account Manager reviewed the paths for their consistency with the Committee's monetary aggregate objectives. These reviews resulted in frequent adjustments to the paths for technical changes in the money-reserves relationship and, on a few occasions, for perceived changes in banks' de-

mand for borrowed reserves. At the same time, consideration was also given to adjusting the nonborrowed reserve path relative to the total reserve path to speed up the response to overshoots or undershoots in money growth (discussed below).

Operations over intermeeting periods focused primarily on hitting the path for nonborrowed reserves, the measure subject to reasonably close short-run control. The Desk aimed to achieve the average nonborrowed reserve path for blocks of several weeks, either encompassing the full intermeeting period or two separate subperiods when the meetings were more than five weeks apart. Each week the Desk had a nonborrowed reserve objective, which was derived in the following way. First, the estimated and projected average demand for total reserves over the intermeeting period (or subperiod) was compared with the average nonborrowed reserve path to provide an estimate of average borrowing needed over the period as a whole if the average nonborrowed reserve path were to be achieved. Then, the average borrowing needed over the remaining weeks of the period was calculated, taking into account the actual borrowing in previous weeks. Finally, this level of borrowing was subtracted from weekly projections of total reserves over the remaining weeks to give a series of weekly nonborrowed reserve objectives.

As the Desk worked to achieve the average nonborrowed reserve path, borrowing at the discount window and money market rates tended to adjust whenever money growth deviated from the Committee's short-term aggregate objectives. When money growth was above these objectives, for example, as in the autumn of 1980, banks' demand for total reserves exceeded the nonborrowed reserve path by more than the initial borrowing assumption. Hence, with the Desk supplying nonborrowed reserves in line with the path, interest rates tended to move higher as banks were forced to seek greater access to the discount window to meet their reserve requirements. Similarly, when money growth was below the Committee's objectives, the demand for total reserves exceeded the nonborrowed reserve path by less than the initial borrowing assumption. In this case, the Desk's provision of nonborrowed reserves in line with the path meant that banks had less need to borrow from the discount window and rates tended to move lower. These resulting changes in money market rates under the reserve approach, in turn, worked to encourage banks and the public to make the portfolio changes needed to return money growth in time back in line with the Committee's objectives.

On occasion, as seemed appropriate, the nonborrowed reserve path was modified relative to the total

reserve path in order to accelerate the adjustment process. These changes were intended to encourage an even sharper response in borrowing, and hence in reserve availability and interest rates, to monetary deviations so that the pressures for restoring money growth in line with the Committee's objectives were intensified. The nonborrowed reserve path was lowered in five of the thirteen reserve periods over the year by a total of about \$750 million. Downward adjustments were concentrated near the start of the year and again in the autumn when the aggregates persisted in overshooting the Committee's objectives. Upward adjustments to the path occurred in only one reserve period, for a total of \$100 million, in the spring when the aggregates fell well below Committee objectives.

A more important source, at times, of accelerating the adjustment of reserve availability and interest rates to monetary overshoots was the effect of increases in the discount rate and the imposition of a discount rate surcharge on frequent borrowing by large banks. When the discount rate was raised, banks tended to bid up the Federal funds rate to maintain the previously prevailing spread. Similarly, banks seemed reluctant to borrow at the surcharge rate, and thus the imposition of the surcharge appeared to boost the funds rate by nearly the same amount within a few weeks. In combination, these factors appeared to account for about half of the 10½ percentage point increase in the funds rate over the August-December period. The remaining increase reflected the automatic response of rates to monetary overshoots under the reserve approach and the downward adjustments made to the nonborrowed reserve path. Reductions of the discount rate and the lowering, and then subsequent removal, of the surcharge in the summer were made when funds were trading at levels below the discount rate and, hence, seemed to have had little impact on rates.

Day-to-day operations

Each day the Desk had before it projections, prepared independently by the Board and New York staffs, of the supply of nonborrowed reserves for several weeks, assuming that the Desk initiated no further action. These projections reflected the influence on reserves of market factors, such as float, Treasury balances, and currency in circulation. A comparison of these forecasts with the weekly average nonborrowed reserve objectives served as the principal guide to open market operations. Temporary needs to add or take out reserves to achieve the nonborrowed reserve objectives were met mainly through repurchase agreements (RPs) and matched sale-purchase transactions in the market. (On occasion, the Desk also provided reserves by passing through to the market a portion of the foreign tem-

porary investment orders, although these were usually arranged internally with the System Account.) When the projected need to add reserves extended for several weeks, the Desk at times purchased securities on an outright basis in the market or from foreign accounts. Extended needs to take out reserves were met in part through sales in the market or to foreign accounts or by letting a portion of the System's holdings mature without replacement.

While comparisons of the projected supply of nonborrowed reserves with the objectives for nonborrowed reserves were the major influence on operations over the year, the Desk had to take into account other factors as well. For one thing, borrowing from the discount window early in a statement week sometimes ran significantly above or below the level assumed in constructing the nonborrowed reserve objective. When borrowing ran far enough above the assumed level early in the week, for example, mathematically there might have been no way to achieve the average level of borrowing anticipated at the start of the week. This presented the Desk with a dilemma. If the nonborrowed reserve objective were met in full, this would produce huge excess reserves and probably a sharp easing in the money market at the end of the week. Alternatively, if the Desk absorbed the excess arising from the higher borrowing, this would mean coming out below its nonborrowed reserve objective for the week. On the opposite side, when borrowing early in the week ran significantly below the level sought for the week, the Desk could either provide nonborrowed reserves according to the objective, causing a sharp jump in borrowing and the funds rate at the end of the week, or else provide reserves more abundantly and overshoot the nonborrowed reserve objective. Either a sharp tightening or easing of money market conditions at the end of a week risks generating bank responses predicated on a continuation of those tighter or easier conditions. Such occurrences can confuse the market about the System's basic policy stance and, thereby, undermine bank and public portfolio adjustments consistent with achieving the System's money growth objectives over a longer time span.

Another complicating factor for open market operations was that projections of reserve supplies continued to be subject to a wide margin of error. Over 1980, the average absolute forecast error of weekly average nonborrowed reserves from projections made at the beginning of statement weeks amounted to \$750 million. (This was actually somewhat less than in the previous year, mainly reflecting a decline in the variability of float, the chief source of error.) The accuracy of projections improves during the week, as data become available each day on actual reserves of the previous

day. Still, even on the last day of the statement week, the average absolute projection error of weekly average reserves was \$163 million, and sometimes it was much larger.

Reserve projection errors were not a major source of deviation from the System's average nonborrowed reserve path for multiweek reserve periods as a whole, but they frequently led to sizable misses from the weekly nonborrowed reserve objective. Large projection errors, like overborrowing or underborrowing, may result in sharp changes in interest rates, which confuse the market on the System's policy intentions and thus impede monetary control.

Because the projections are subject to a large degree of error, the Desk also looked at other indicators of reserve supplies, such as the behavior of the Federal funds rate and the volume of dealer offerings at various rates when the Desk solicited propositions for RPs and matched sale-purchase transactions. Each week, the Desk had some rough idea of where funds might be expected to trade consistent with the mix of borrowed and nonborrowed reserves that it was seeking. If the funds rate moved significantly above or below this level, it suggested there might be an error in the projections. The Desk was aware that other factors could also influence funds rate behavior and, hence, it was cautious about using the funds rate as a guide to operations. Of the relatively few times that the behavior of the funds rate relative to expectations actually influenced operations since the October 6 program, the Desk found it a somewhat useful, although not wholly reliable, guide to reserve supplies.⁴

With the Desk aiming to achieve reserve objectives rather than a Federal funds rate target, both the timing and frequency of Desk operations have changed markedly under the new reserve approach. The most notable change has been in the timing within the day of Desk entries in the market to arrange RPs and matched sale-purchase transactions. Such actions are now largely initiated within the period from 11:30 a.m. to 12:15 p.m., following the regular morning conference call which reviews reserve projections and market developments. By operating chiefly within this period, the Desk has tended to reduce the significance that the market attaches to the Federal funds rate prevailing at the time of market entry. By comparison, under the Federal funds rate strategy, the Desk was prepared

⁴ See "Implementing the New Operating Procedures: The View from the Trading Desk", part of the Federal Reserve Staff Review of Monetary Control Procedures (January 1981), pages 15-16. This study found that the Federal funds rate provided reasonably good guidance when reserve projections were well off the mark but was less reliable when there were small misses.

Table 2

Comparison of Actual Reserves to Path: Summary

Four weeks ended February 6, 1980 to four weeks ended January 14, 1981

	Average deviation per reserve period (millions of dollars)	Average absolute deviation per reserve period (millions of dollars)	Average absolute deviation as percentage of reserve measure (percent)
Deviations from paths			
Nonborrowed reserves:*			
Total	-144.3	170.9	0.41†
Accepted or intentional:			
Transition between reserve periods	- 55.5	55.5	0.13
Weekly deviation of borrowing	- 45.0	45.0	0.11
Special borrowing	- 3.8	3.8	—
Monetary aggregate growth	- 13.4	13.4	0.03
Federal funds rate constraint	- 1.4	1.4	—
Unintentional:			
Dealer propositions	+ 10.9	12.9	0.03
Projection errors‡	- 36.2	49.7	0.12
Total reserves:*			
Total	+ 68.7	326.1†	0.77†
Required	+108.7	338.4	0.79
Excess	- 40.0	72.6	0.17
Nonborrowed	-144.3	170.9	0.40
Borrowed	+212.9	382.2	0.90

* Computed from adjusted paths.

† Individual components do not sum to total because of interaction of components.

‡ Calculated as residual.

to intervene in the market well before 11:00 a.m. and after 1:00 p.m. if the funds rate deviated in either direction by $\frac{1}{8}$ to $\frac{1}{4}$ percentage point or so from the System's objectives.

The frequency of Desk operations in the market also seems to have changed significantly under the new operating procedures. Over the first year under the reserve approach, for example, the number of Desk market entries to arrange RPs and matched sale-purchase transactions dropped by about one third from the level of the previous year. The largest percentage decline appeared to be in the number of entries to arrange a relatively small volume of transactions (less than \$1 billion). Under the Federal funds rate strategy, such transactions were often used to signal the System's policy intentions, even when reserve projections suggested no need for action.⁵

Experience in hitting reserve paths

Table 2 summarizes the System's record in achieving its path objectives for nonborrowed and total reserves in 1980. Specifically, the table shows average deviations from path, and the source of these deviations, for the thirteen reserve periods running from the four weeks ended February 6, 1980 to the four weeks ended January 14, 1981. Deviations are measured from adjusted (rather than original) path levels, since these were the objectives that the System sought to hit.

For nonborrowed reserves, deviations (ignoring sign) averaged about \$170 million per reserve period, or 0.4 percent of the average level of nonborrowed reserves. Deviations were much larger for total reserves. They averaged about \$325 million (again ignoring sign) or nearly 0.8 percent of total reserves. As explained below, there was a tendency for nonborrowed reserves to come in below path; over the year as a whole, nonborrowed reserves ran about \$145 million on average below path values for the thirteen reserve periods. In contrast, total reserves were about \$69 million above

⁵ For a further discussion of the impact of the new procedures on the frequency and timing of Desk actions, *ibid.*, pages 17-19.

path, on average, reflecting the overshoot in required reserves associated with somewhat higher than targeted monetary aggregate growth over the year, offset in part by a shortfall in excess reserves.

Of the absolute deviations in nonborrowed reserves from path, about two thirds represented decisions to tolerate or even to aim for reserve supplies either above or below average path values. They arose from a variety of considerations but mainly reflected a desire to maintain continuity in the degree of adjustment pressure on the banks in the transition from one reserve period to the next around the time of the FOMC meetings and deviations from expectations for borrowing in the final week of a reserve period. Unintentional deviations resulted primarily from reserve projection errors and, to a lesser extent, from the inability of the Desk to arrange the volume of open market operations planned because of insufficient dealer propositions.

The tendency for nonborrowed reserves to come out below path largely reflected the behavior of borrowing over the year which more often ran above rather than below expectations, especially during periods of rising interest rates. Instead of allowing a huge excess at the end of statement weeks, the Desk at times deliberately chose to undershoot its weekly nonborrowed reserve objective. When this occurred in the final week of a reserve period, it meant that nonborrowed reserves would come out below the average path value for the period as a whole. Moreover, even if it occurred earlier in the period, it meant that there might be a large gap in nonborrowed reserves to fill in the final week, with the implication of a large drop in borrowing in that week, even when the FOMC's new instructions might involve a rise in the subsequent week. At such times, the Desk chose to avoid large changes in adjustment pressure in the final week, and thus would allow or even encourage nonborrowed reserves to come out below the path value.

Conducting Open Market Operations

January to April

Money growth in the aftermath of the October 6, 1979 policy changes was close to, or somewhat below, the Committee's objectives in late 1979 and in early 1980, but growth began to pick up and exceed the Committee's objectives as the first quarter unfolded. The System's new operating procedures automatically imposed resistance to the overrun; reductions of the nonborrowed reserve path and an increase in the discount rate reinforced the drag on money growth.

Very early in the year, however, the aggregates tended to fall short of the objectives set at the Com-

mittee's January meeting. These objectives specified growth over the December-to-March period at annual rates of 4 to 5 percent for M-1 and 7 percent for M-2, in each case using the definitions as they existed before the redefinition in February 1980 (Table 3). In consequence, total reserves fell below their path level in the interval following the January meeting, the four weeks ended February 6. The initial borrowing assumption used in constructing a path for nonborrowed reserves was \$1.0 billion, down from \$1.5 billion on average in December. However, over the first three weeks, borrowing consistently ran high, especially over the weekends. By the final week, because of the resultant overruns in borrowed reserves, the Desk confronted a situation in which achievement of the nonborrowed reserve path on average for the period implied that excess reserves would have to be quite high, even if borrowing fell to zero. Such a drastic easing in reserve availability seemed inappropriate and would have been highly confusing to the financial markets. The interim nonborrowed reserve objective for the final week was adjusted to imply a modest amount of borrowing for the week, but average borrowing of about \$1.25 billion for the entire four-week period. Nonborrowed reserves came out slightly above the intended level for the week, but averaged \$380 million below path for the period, and total reserves were \$125 million below path. Federal funds generally traded in the area of 13 to 14 percent over the period.

At the February meeting, the Committee indicated an initial borrowing level of \$1.25 billion for drawing the path, which was close to the actual level in the previous intermeeting period. It was anticipated that this would be associated with Federal funds trading in about the same range as in January. During February, projections of the aggregates soon pointed to greater than desired strength in M-1A, M-1B, and M-2, compared with the Committee's growth objectives. As projected demand for total reserves moved well above its path, a number of steps were taken. In mid-February the nonborrowed reserve path was lowered to promote a more rapid return of aggregate growth to desired levels; the reduction affected both subperiods in the interval following the February meeting, the three weeks ended February 27 and the three weeks ended March 19. The Federal Reserve Board also approved an increase in the discount rate of 1 percentage point to 13 percent to exert pressure in the same direction. The average Federal funds rate moved up by a bit more than 1 percentage point to about 14.90 percent for the week ended February 20. The Committee raised the top of the funds rate range from 15½ percent to 16½ percent late in the first subperiod, when it ap-

Table 3

Specifications from Directives of the Federal Open Market Committee

Date of meeting	Specified short-term annualized rates of growth for period mentioned (percent)			Range for Federal funds rate (percent)	Initial assumption for borrowed reserves (millions of dollars)	Discount rate on day of meeting and subsequent changes (percent)	Notes
	M-1A	M-1B	M-2				
1/9/80.....	December to March 4-5* 7*			11½-15½	1,000	12	The Committee's objectives were set in terms of M-1 and the old definitions of M-2 and M-3. In July 1979, the Committee had set growth of objectives for M-1, M-2, and M-3 from the fourth quarter of 1978 to the fourth quarter of 1979 of 3 to 6, 5 to 8, and 6 to 9 percent, respectively. (The M-1 objective incorporated later revisions in assumptions about the growth of NOW and ATS accounts.) The Committee anticipated growth in 1980 within those ranges.
2/5/80.....	December to March 4½ 5 6½			11½-15½	1,250	12 13 on 2/15 +3 percent sur- charge on 3/17	FOMC indicated its objectives would be furthered by growth of M-1A, M-1B, M-2, and M-3 from the fourth quarter of 1979 to the fourth quarter of 1980 within ranges of 3½ to 6, 4 to 6½, 6 to 9, and 6½ to 9½ percent, respectively. The associated range for bank credit was 6 to 9 percent. On February 22, the upper limit of the range for Federal funds rate was raised to 16½ percent. On March 6, 1980 the upper limit of the range for Federal funds was raised to 17½ percent. The next day the Committee further modified the domestic policy directive to raise the upper limit of the range for Federal funds to 18 percent.
3/18/80.....	December to June 4½ 5 7¾ (or somewhat slower)			13-20	2,750	13 + 3	
4/22/80.....	December to June 4½ 5 6¾ (or somewhat slower)			13-19	1,375	13 + 3	On May 6 the lower limit of the range for Federal funds rate was reduced to 10½ percent. The 3 percent surcharge was removed effective May 7.

* Rates for M-1 and old definition for M-2.

Table 3 (continued)

Specifications from Directives of the Federal Open Market Committee

Date of meeting	Specified short-term annualized rates of growth for period mentioned (percent)			Range for Federal funds rate (percent)	Initial assumption for borrowed reserves (millions of dollars)	Discount rate on day of meeting and subsequent changes (percent)	Notes
	M-1A	M-1B	M-2				
5/20/80.....	April to June 7-7½ 7½-8 8 (or moderately faster)			8½-14	100	13 12 on 5/30 11 on 6/13	
7/9/80.....	June to September 7 8 8			8½-14	75	11 10 on 7/28	Objectives for 1980 remained the same. In addition, on July 29 the Committee agreed that, for the period from the fourth quarter of 1980 to the fourth quarter of 1981, it looked for a reduction of the ranges for growth of ½ percentage point from the ranges adopted for 1980, abstracting from institutional influences affecting the behavior of the aggregates.
8/12/80.....	June to September 6½ 9 12			8-14	75	10	
9/16/80.....	August to December 4 6½ 8½			8-14	750	10 11 on 9/26	
10/21/80.....	September to December 2½ 5 7¼			9-15	1,300	11 12 + 2 on 11/17	
11/18/80.....	September to December 2½ 5 7¼ (or somewhat less)			13-17	1,500	12 + 2 13 + 3 on 12/5	On November 26 the Committee raised the upper limit of the range for the Federal funds rate to 18 percent. On December 5 the Committee modified the directive by providing leeway for pursuit of the Committee's short-run objectives for the behavior of reserve aggregates without operations being precisely constrained by the intermeeting range for the Federal funds rate for one week, and then extended it to the meeting on December 18-19, 1981.
12/19/80.....	December to March 4¼ 4¾ 7 (or somewhat less)			15-20	1,500	13 + 3	The objectives abstracted from the effects of deposit shifts connected with the introduction of NOW accounts on a nationwide basis. It was recognized that the introduction of NOW accounts nationwide at the beginning of 1981 could widen the discrepancy between growth of M-1A and M-1B.

peared that achievement of the reserve objective would produce a firmer money market.

The level of borrowing implied by the nonborrowed reserve path rose to \$2.1 billion during the week of February 27, the final week of the subperiod, as the demand for total reserves built up. In that week, the Desk was willing to accept some shortfall of nonborrowed reserves from the objective when data on the aggregates indicated additional strength. On average, total reserves were about \$265 million above path for the first subperiod while nonborrowed reserves were about \$250 million below path.

In the second subperiod, the nonborrowed reserve path was lowered again to slow the growth of reserves and the implied level of borrowing rose to about \$2.25 billion. In this period, banks borrowed heavily early in the week as they began to anticipate another increase in the discount rate. At the same time the money market firmed substantially, with funds often trading above 16½ percent. The Committee again raised the top of its Federal funds rate range, boosting it first to 17½ percent and then to 18 percent. In the final week of the interval, a 3 percentage point surcharge above the discount rate was imposed on frequent borrowing by large banks as part of the credit restraint program inaugurated on March 14.

With borrowing running high early each week, the Desk risked overshooting on total reserves and providing substantially more excess reserves than the level incorporated in the path if it sought to meet the nonborrowed objective. Alternatively, it could come close to total reserves by allowing nonborrowed reserves to fall short of the weekly interim objective. The Desk chose the first alternative late in the first week, when it appeared that the demand for excess reserves would be high, compared with the level contained in the path, as banks moved to offset a deficit in the previous week. It chose the second alternative for the second week, when it appeared that total reserves would move even further above path, threatening massive and unwanted excesses. Borrowing thus rose to \$2.5 billion and then to \$3.4 billion, well above the levels implied by the path.

As a result of the high borrowing, in the last week borrowing consistent with hitting the nonborrowed reserve path was fairly low—about \$1.2 billion. However, adding nonborrowed reserves to the degree consistent with such a decline in borrowing hardly seemed in keeping with the thrust of policy just emerging as part of the March 14 credit restraint program. Therefore, the nonborrowed reserve interim objective for the week kept the implied level of borrowing equal to the objective of the previous week, about \$2.2 billion. As it turned out, borrowing again was very heavy

over the weekend and, rather than press redundant reserves on the banking system, the Desk allowed nonborrowed reserves to fall below the objective while borrowing averaged about \$3.0 billion. Consequently, the three-week average of nonborrowed reserves turned out \$670 million below path, while total reserves were about \$660 million above path.

The March Committee meeting followed by four days the announcement of the Carter administration's program of fiscal and monetary restraint. At that meeting, the FOMC placed the Federal funds range at 13 to 20 percent. The Committee agreed to an initial borrowing level of \$2.75 billion for establishing the nonborrowed reserve path, while recognizing that the imposition of the 3 percentage point surcharge on frequent borrowing by large banks as part of the credit restraint program was introducing additional uncertainty about borrowing demands. On the one hand, it was felt that large banks might curtail their use of the window to avoid the surcharge and any stigma it might confer. On the other hand, some banks might misconstrue the new policy as allowing unfettered access if banks were willing to pay the surcharge. In the first two weeks of the interval, which covered the five weeks ended April 23, nonemergency borrowing⁶ dropped back from the levels seen at the end of the previous interval. This occurred even as the Federal funds rate rose to the range of 18 to 20 percent, from the 16 to 16½ percent area prevailing in mid-March (Chart 6). In response to the apparent downward shift in borrowing, the nonborrowed reserve path was raised by \$150 million in the second week.

By early April it was apparent that the aggregates were weakening. Automatically the level of borrowed reserves began to fall as the demand for total reserves decreased in relation to the path established for nonborrowed reserves. Operations maintained nonborrowed reserves close to, or slightly above, their path levels throughout most of the interval, while actual borrowing declined from the area of \$2.7 billion in the first week to about \$2.25 billion or a bit higher over the middle three weeks. In the last week, a large downward revision in the projected demand for total reserves indicated that borrowing would be likely to drop sharply if the nonborrowed reserve path were met. In view of the imminence of the Committee meeting, it was decided that the week's objective should not fully allow for such an abrupt shift in borrowing. However, during

⁶ Borrowing by one particular large regional bank, which was not strictly in the nature of short-term adjustment borrowing, was included in the borrowing data for the period. In subsequent periods, when that bank's borrowing became relatively high and was considered emergency borrowing, that borrowing was treated as nonborrowed reserves in calculating the paths.

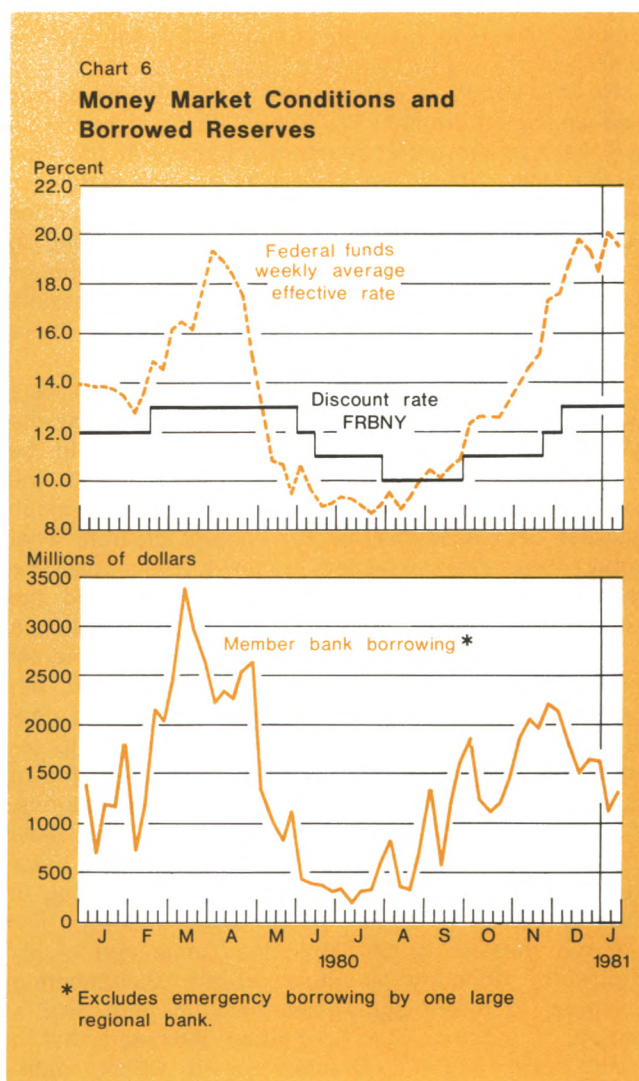
that week borrowing swung back up, and by the week's end it appeared that borrowing would run well above the desired level. In these circumstances, the Desk allowed nonborrowed reserves to fall short of the interim objective. For the period, total reserves averaged about \$485 million below path and nonborrowed reserves were about \$310 million below path.

The money and bond markets reacted sharply to the System's moves in late winter. The spread between the Federal funds rate and the basic discount rate widened substantially in response to the rise in discount window borrowing and to the introduction of a surcharge on borrowing by large banks. While the credit restraint program led initially to higher prices on debt securities, the steep rise in the Federal funds rate was soon accompanied by pressures in the securities markets as well. Interest rates on many issues rose to record highs in late March.

April to August

The steep decline in economic activity during the spring was accompanied by considerable weakness in the aggregates. The weakness was especially pronounced in April; M-1A contracted at a record annual rate of nearly 20 percent. The aggregates then stabilized in May and rebounded in June and July, but the narrow aggregates still remained low as compared with the FOMC's longer run objectives. The System's procedures acted to keep nonborrowed reserves expanding so that banks repaid their discount window borrowing in April and May as the demand for total reserves fell. The Federal funds rate and other market rates dropped sharply, along with the weakening economy. Reserves then generally grew at a rate deemed consistent with the Committee's short-run goals through early summer.

At the April 22 meeting the Committee's initial borrowing assumption averaged about \$1.4 billion,⁷ down from \$2.75 billion at the previous meeting. In the following four weeks the demand for total reserves fell considerably below path. In view of this shortfall, the nonborrowed reserve path was raised by \$100 million relative to the total reserve path. As the period progressed, the level of borrowing implied by the paths fell to about \$200 million in the second week of May. In the money market the funds rate fell from about 17½ percent during the week of the meeting to an average of about 13 percent in early May. On May 6, the Committee voted to lower the bottom end of its Federal funds range from 13 percent to 10½ percent



given the low levels of borrowing expected. (Also on that day the Board eliminated the 3 percentage point surcharge.) By the last week of the period, the week ended May 21, the implied level of borrowed reserves was zero. On the last day of the week—the day after the May Committee meeting—the money market eased considerably in the morning, and sizable amounts of funds traded at 9¼ percent. At that meeting, the Committee had indicated that the Desk should not allow the funds rate to decline significantly within its new range of 8½ to 14 percent without being consulted. In these circumstances, the Desk drained a small amount of reserves even though projections indicated that nonborrowed reserves were close to the level desired. Despite this, nonborrowed reserves were only

⁷ The paths actually incorporated assumed borrowing levels of \$1.5 billion in the first two weeks followed by \$1.25 billion in the last two weeks of the period.

\$58 million below path for the four-week period, although total reserves were about \$890 million below path.

By mid-spring it was evident that the aggregates had weakened dramatically along with the economy in the wake of the credit restraint program. At the time of the May meeting the narrow aggregates were well below the lower bound of their annual path rates (Charts 1 and 2). The steepness of the decline in economic activity argued for a rapid return in money growth back to path in order to cushion the recession. However, other considerations suggested a more gradual approach.

For one thing, the broad monetary aggregates were not nearly so weak as the narrow aggregates. By the May meeting, both M-2 and M-3 appeared to be slightly above or close to levels consistent with the lower bounds of their ranges. For another, the much sharper decline in the narrow aggregates from what would have been expected on the basis of past relationships between money, interest rates, and the economy raised the possibility of a downward shift in the demand for money.⁸ Finally, short-term interest rates had already moved sharply lower, in part, because the new reserve approach provided for a generous supply of nonborrowed reserves relative to reserve demands as money weakened. A further drop in rates would risk exacerbating inflationary expectations, threatening the value of the dollar in exchange markets and ultimately requiring a sharp rise in rates later in the year as money growth responded with a lag to the low rates.

Given these considerations, the Committee chose short-term monetary objectives at the May meeting designed to return aggregates back to path over a period of months. The Committee indicated that it would accept moderately faster growth without automatically putting upward pressure on rates. Therefore, in the period between the May and July meetings, the reserve paths were adjusted flexibly so that faster growth of the aggregates would not result in increased borrowing. In effect, a minimum path was established based upon the Committee's acceptable growth rates over May and June: 7 to 7½ percent for M-1A, 7½ to 8 percent for M-1B, and 8 percent for M-2. When the

projected demand for reserves exceeded the minimum total reserve path, the total reserve path for operational purposes was increased to make it equal to the projected demand. (Otherwise, an increase in the demand would have called for an increase in borrowing.) In all but one week of the May-June interval, the projected demand for total reserves did exceed its minimum path, and the average level of borrowing implied by the paths for the period as a whole remained generally at the frictional level of \$100 million approved initially by the Committee.

Under this procedure, there was some uncertainty as to where Federal funds would trade given the frictional levels of borrowing implied by the paths. Federal funds were not expected to trade much above the discount rate, which was 13 percent at the beginning of the interval and was lowered in two steps to 11 percent by mid-June. On the other hand, the Committee had established a Federal funds range of 8½ to 14 percent. As implied borrowing moved down to frictional levels, the Desk began to encounter operational difficulties that recurred from time to time through July. If additional reserves were made available beyond those needed to meet requirements, they inevitably would push up excess reserves in the week. As banks attempted to get rid of the excesses, they would put downward pressure on the Federal funds rate. This process was limited in practice by Desk action to minimize substantial funds rate trading below the lower bound. Even in the face of this difficulty, nonborrowed reserves came out only \$95 million below the upward revised path in the subperiod ended June 18 while total reserves were \$65 million below their path level.

In the remaining three weeks of the intermeeting period, borrowing tended to average even less than the \$100 million level incorporated in the paths for the second subperiod. It was decided to tolerate the lower borrowing because pushing it up to offset shortfalls did not seem in keeping with the spirit of previous Committee decisions. Nonborrowed reserves averaged about \$100 million above path for the three-week interval, reflecting also a large excess which proved difficult to dislodge late in the last week. Total reserves were \$80 million above path on average, again reflecting the high excesses.

In the period between the July and August meetings, the path-setting procedures were designed to resist weakening in the aggregates as in the previous period and to accommodate modest strengthening. Early in the period this accommodation was made. In addition, the Federal Reserve Board approved a decrease in the discount rate to 10 percent on July 28. However, later in the interval, growth of the aggregates proved faster than the Committee desired, and the Desk began to

⁸ If such a shift had been permanent, resulting from the impact of record high interest rates in the winter, it would have implied that less money might be needed to support a given level of economic activity, suggesting that the appropriate policy might be to aim for growth of the narrow aggregates toward the lower bounds of their yearly ranges. Alternatively, if it had reflected the special impact of the credit restraint program, then money growth would be expected to rebound on its own, either as the effects of the program dissipated or as the program was lifted.

resist by holding back on the provision of nonborrowed reserves and inducing an increase in borrowing.

About the time that implied levels of borrowing began to rise (to about \$235 million on average for the period), banks appeared to boost their demand for excess reserves temporarily, which meant that borrowing rose faster than intended. (Later it turned out that underestimation of required reserves after the termination of marginal reserve requirements meant that reserves were scarcer relative to demands than had been realized.) Nonborrowed reserves were virtually equal to the path for the period, while total reserves were \$150 million above path (after revision for the impact of the marginal reserve requirement calculation).

Most interest rates bottomed out in June. Heavy issuance of long-term debt in the late spring, as corporations took advantage of the improved market climate, stemmed the decline in long-term rates. Projections of higher recession-induced Government deficits and the possibility of a tax cut also weighed on the markets, and rates inched upward in the early summer.

August to the year-end

The growth of the aggregates proved to be strong over the summer and through the autumn. Initially, growth of the narrow aggregates served to move these measures back into the Committee's preferred annual ranges. It was not until mid-autumn that their fast growth appeared sustained enough to raise fears of overshooting. Nevertheless, the reserve-targeting procedures automatically began to exert pressure on reserve growth by forcing banks into greater use of the discount window. Again this response was reinforced when large gaps developed between the demand for total reserves and the path levels consistent with the Committee's desired growth of the aggregates. The nonborrowed reserve paths were lowered relative to the total reserve paths, the discount rate was raised, and a surcharge was reimposed on frequent borrowing by large banks. Throughout much of the period, though, it proved difficult to gauge the relationship between borrowing and money market conditions.

These pressures produced a sharp rise in interest rates over the latter part of the year. The bounce back in money growth engendered concern about inflationary pressures. Rates increased as many businesses and consumers stepped up their demands on the credit markets when the economy rebounded after the steep drop in the second quarter. The end of the credit restraint program in the summer possibly contributed to the pickup in borrowing in the household sector. Long-term rates reached new record highs in early December and then backed off a bit. Short-term rates

also moved up sharply and, in some cases, exceeded the records set in the spring.

Shortly after the August Committee meeting, the aggregates showed unexpected strength as only a part of the \$10 billion bulge in the narrow aggregates for the week of August 6 washed out, and even that was soon regained. The aggregates generally continued to strengthen over the intermeeting period. As the demand for total reserves increased relative to the nonborrowed reserve path, implied borrowing rose to the area of \$400-500 million and then to about \$750 million in the week of the September meeting. (An initial borrowing level of \$75 million was used in constructing the paths for the five weeks ended September 17.) The Desk's strategy over the interval was to encourage the firmer money market conditions that would be associated with the higher borrowing levels while seeking to avoid actions that might affect the markets too abruptly. The Desk took note of comments made during a telephone conference of the Committee on August 22, to the effect that care should be taken to avoid a market overreaction even at the risk of some possible delay in meeting reserve objectives.

Early in the interval the Desk grudgingly supplied reserves to fill projected needs, but the Federal funds rate generally remained below the 10 percent discount rate even though it might have been expected that the funds rate would be in the area of 10 percent or somewhat above. After a shortfall in borrowing from the expected level in the first week, the Desk was able to achieve average borrowing near its intended level in the second week only by allowing tight money market conditions to develop, resulting in heavy borrowing on the last day. This heavy borrowing then extended into the week that included the Labor Day holiday even though the Desk filled a projected reserve need early on. Even so, Federal funds generally traded at rates below those that normally would have been associated with the actual level of adjustment borrowing, about \$1.2 billion. Federal funds averaged 10.47 percent for the week. By the last week of the interval, the expected level of borrowing was \$750 million after allowing for a \$150 million downward revision to the nonborrowed reserve path, but borrowing was much higher than that over the weekend. Rather than aim for the nonborrowed reserve objective and produce an overabundance of total reserves and easier money market conditions, the Account Management tolerated a shortfall in nonborrowed reserves for the week and also a \$110 million shortfall for the intermeeting interval. Meanwhile, total reserves were \$360 million above path on average, reflecting the rapid growth of the aggregates.

In the period following the September meeting, the

strengthening in the demand for total reserves relative to the nonborrowed reserve path implied amounts of borrowing above the \$750 million level approved by the Committee. As early as the second week it also seemed appropriate to consider lowering the nonborrowed reserve path. However, to assess the demand for reserves and borrowing in the wake of the discount rate increase to 11 percent announced early in the second week, a reduction of the nonborrowed reserve path was delayed until the third week, when it was lowered by \$200 million.

The tendency of borrowing to run higher than expected early in the week persisted into the first few weeks of the interval following the September meeting. Again the Desk faced the dilemma of hitting the weekly nonborrowed reserve objective and producing a total reserve surfeit at the week's end or of tolerating a shortfall from the objective. The Account Management chose the latter alternative in the first two weeks as borrowing was in the area of \$1.6 billion to \$1.9 billion, well above the levels of \$1.1 billion to \$1.2 billion implied by the paths. Later in the period the Desk at times provided large amounts of reserves early in the week to forestall heavy borrowing over the weekend and to permit nonborrowed reserves to turn out closer to the weekly objectives. Nonborrowed reserves turned out \$80 million below path on average for the period as a whole, and total reserves were \$380 million above path.

During the intermeeting interval there was strong demand for reserves, reflecting the strong growth of the aggregates. The feeling developed that the building pressure might continue, and banks moved to a more cautious stance toward borrowing. This contrasted with the perceptions in September when banks had been willing to borrow at the discount window rather than bid up the funds rate because of their clear borrowing records over the summer. However, once borrowing levels mounted and the discount rate was raised, banks seemed less complacent about their potential future recourse to the window and more willing to pay higher rates in the money market to obtain funds. The cumulative evidence of rapid growth of the aggregates and a rebound in the economy probably played a role, too.

While the resurgence of money growth in the summer had not been a major cause of concern, because it had moved the aggregates back in line with the Committee's yearly ranges, concern mounted as the growth remained strong. By the October meeting, M-1A growth from the fourth quarter of 1979 was just about at the midpoint of its yearly range, while M-1B and M-2 were somewhat above the upper limits of their respective ranges. It was recognized at this meeting that ATS and NOW accounts were rising more rapidly than had been expected when the yearly ranges were

set in February, depressing M-1A and boosting M-1B. After adjustment for this factor, both measures were near the upper ends of the Committee's ranges.

Against this background, the Committee favored a marked slowdown in money growth from the very rapid pace in August and September. However, there was concern that a harsh program of attempting to bring the aggregates back toward the midpoints of their ranges by the year-end would, given the lag in the impact from market conditions to money behavior, run the risk of engineering an undershoot in money growth going into 1981. Thus, the Committee chose short-run objectives for the September-December period that were more consistent with the upper ends of their yearly ranges but were designed to produce an appropriate policy over a longer period.

In the four-week period following the October meeting, the demand for total reserves exceeded the nonborrowed reserve path by a generally widening margin due to the rapid growth of the aggregates. Reflecting this and a downward adjustment of \$150 million in the nonborrowed path, the implied level of borrowing over the interval rose to \$1.5-1.6 billion, compared with the initial level of \$1.3 billion incorporated in the paths. In practice, borrowing generally exceeded the implied levels, in part because the demand for excess reserves rose, especially after the initial phasing-in of the Monetary Control Act (MCA) starting in mid-November. Nonborrowed reserves were \$40 million below the average path level for the period, largely as a result of a shortfall in market factors on the last day. Total reserves, on the other hand, were \$350 million above path, reflecting the strength in the aggregates.

In this environment, the Federal funds rate moved up from about 13¼ percent in the first week to an average of around 15¼ percent in the last week. Higher borrowing levels were partly responsible, but perhaps even more important were the increase in the discount rate to 12 percent and the imposition of a 2 percentage point surcharge late in the interval.

The last week in the period was the first week that reserves were held under the provisions of the MCA. The implementation of the MCA resulted in a large decline in reserve requirements (about \$2.9 billion net) at the same time that many financial institutions were required to hold reserves at Federal Reserve Banks for the first time. Excess reserves⁹ turned out to be very high in that first week. In subsequent weeks

⁹ Total reserves were defined as reserve balances with Federal Reserve Banks plus vault cash at institutions with required reserve balances plus vault cash equal to required reserves at other institutions. The effect was to remove from the definition of excess reserves the surplus vault cash at those institutions where vault cash exceeded their reserve requirements.

(through early 1981), excess reserves remained high by historical standards, a development that proved to be puzzling. They averaged about \$580 million through mid-January, compared with about \$360 million in the similar period a year earlier.

Following the November meeting, the estimated demand for total reserves over the five weeks ended December 24 was initially fairly strong, compared with the total reserve path. In view of this strength the nonborrowed reserve path was lowered by \$170 million relative to the total reserve path. In addition, effective December 5, the basic discount rate was boosted by 1 percentage point to 13 percent and the surcharge was raised to 3 percentage points. The implied levels of borrowing for the early weeks of the period were about \$1.8-2.0 billion, compared with the level of \$1.5 billion initially specified.

The money market tightened considerably over the early part of the interval. Funds began trading above the upper end of the Committee's 13 to 17 percent range and, at the end of the first week, the FOMC raised the upper end of the range to 18 percent. Following the increase in the discount rate in early December and further firming in the funds rate above 18 percent, the FOMC voted to allow the Desk temporary leeway to exceed the 18 percent upper funds rate limit. In the following week, this authority was extended until the December meeting.

By mid-December the implied borrowing levels dropped a bit because borrowing in earlier weeks had run above the expected levels and because the gap between the demand for reserves and the path narrowed. The funds rate fell back slightly in the last week of the interval, the week ended December 24,¹⁰ as the Desk

was aiming at a level of nonborrowed reserves consistent with \$1.5 billion of borrowing. As it turned out, reserves were much more plentiful than expected on the last day; nonborrowed reserves averaged \$65 million above path as excess reserves amounted to about \$800 million for the week. Total reserves were \$320 million above path over the intermeeting interval.

The aggregates started to weaken early in December, with the narrow aggregates actually falling for the first time since the spring. The weakness was quickly reflected in borrowing levels as the projected demand for reserves fell in relation to the nonborrowed reserve path. By the final week of the four-week subperiod following the December meeting, the week ended January 14, the implied weekly borrowing had fallen to about \$925 million, although this partly reflected the need to compensate for the higher borrowing early in the period. However, the Desk held back on reserve provision late in the last week, when reserves appeared to be more plentiful than they actually turned out to be. For the period as a whole, nonborrowed reserves averaged \$40 million less than path, and total reserves were \$110 million below path. Despite the reduction of pressures on reserve positions, the money market remained unusually firm. In part, this reflected the typical year-end pressures in the money markets, as many firms dressed up their balance sheets for statement-publishing-date purposes. While the average funds rate dipped at the year-end, it rose to a record high level of slightly over 20 percent during the first week in January, even though discount window borrowing was only about \$1.1 billion that week.

The securities markets took encouragement from the weakness in the aggregates and rallied in the latter part of December. Many participants felt that the System might relax its policy stance and that the high interest rates which developed would probably restrain the economy in the coming year. The rally lost some of its steam in January 1981 when the economy continued to show underlying strength.

¹⁰ For path-setting purposes, the December 24 week was also included in the first four-week subperiod following the December meeting. Since the paths implied a borrowing level of \$1.5 billion for that interval, the nonborrowed reserve path for the five-week interval ended December 24 was altered to allow for borrowing at that level.

Treasury and Federal Reserve Foreign Exchange Operations

Coming into the three-month period under review, the United States dollar was in strong demand against most major currencies. The dollar was bolstered by the relatively favorable United States current account position, which has remained in surplus in contrast to the deficits of many other industrial countries, and by the wide interest differentials in favor of dollar placements. The bidding for dollars also reflected bullish sentiment on the part of market participants who responded positively to the determination shown by the Reagan administration to deal with inflation and to revitalize the United States economy. At the same time, as traders focused on political and economic problems facing Western European countries, sentiment toward other currencies became increasingly bearish. The German mark was under particularly heavy selling pressures both against the dollar and against the other European currencies linked formally or informally to the mark. By early February, the markets for dollars had become increasingly one way, with the dollar rising virtually every day. Through mid-February, the dollar advanced by a further 4 percent against the German mark and the other continental European currencies, for a total rise on the order of 20 percent since the previous September. In addition, the dollar rose 3 percent against sterling, ½ percent against the Japanese yen,

and ¾ percent against the Canadian dollar over the first half of February.

The United States authorities continued to intervene in the exchange markets, buying foreign currencies on days in which the dollar was rising sharply and, on occasion, placing simultaneous bids and offers to settle a volatile market. In all, the Trading Desk operated in the market on nine of the fourteen trading days between February 2 and 23, as a net buyer of marks on each occasion. The total marks thus acquired amounted to \$610.0 million equivalent, which was split evenly between the Federal Reserve and the Treasury. An additional \$168.4 million equivalent of marks was bought from correspondents. The proceeds of these market and correspondent purchases were added to System and Treasury balances.

After mid-February, the demand for dollars lost steam. By that time, interest rates in the United States were easing somewhat, as the growth rates for the narrow monetary aggregates were coming in below the Federal Reserve's target range. Moreover, the authorities of other countries were acting to raise interest rates or to tighten liquidity conditions in their markets. In particular, on February 19, the Bundesbank took action to defend the mark, suspending the usual Lombard facility to commercial banks and announcing that Lombard credits would be made available at its discretion and at rates that could vary on a day-to-day basis. Interest rates in Germany immediately shot up. As traders scrambled to cover short positions, the mark rebounded against the dollar and rose from the

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Table 1

**Drawings and Repayments by
Foreign Central Banks and the Bank for
International Settlements under
Reciprocal Currency Arrangements**

In millions of dollars; drawings (+) or repayments (—)

Bank drawing on	Outstanding January 31, 1981	February 1, through April 30, 1981	Outstanding April 30, 1981
Federal Reserve System			
Bank of Sweden	200.0	—200.0	-0-

Data are on a value-date basis.

Table 2

**Net Profits (+) and Losses (—) on
United States Treasury and Federal Reserve
Current Foreign Exchange Operations**

In millions of dollars

Period	Federal Reserve	United States Treasury Exchange Stabilization Fund	General account
February 1 through April 30, 1981	— 1.4	— 3.8	-0-
Valuation profits and losses on outstanding assets and liabilities as of April 30, 1981	—271.1	—1,106.9	+958.5

Data are on a value-date basis.

bottom to the top of the European Monetary System (EMS) band. Over late February and early March, dollar rates fell back with wide day-to-day movements. On balance, from late February through mid-March, the dollar dropped off some 8 percent against the German mark and other EMS currencies, while holding fairly steady against the pound sterling and the Japanese yen and declining less than 2 percent against the Canadian dollar.

From late February to late March, the United States authorities did not intervene in the exchange market. On March 30, when the dollar fell sharply following the assassination attempt on President Reagan, the Desk stepped in to settle the market, selling \$74.4 million equivalent of marks out of balances, split evenly between the Federal Reserve and the Treasury. Dollar rates quickly rebounded the following day.

In April, the dollar again came into heavy demand.

Favorable sentiment toward the Reagan administration remained a generally positive psychological factor. Market participants expressed some concern that the Administration's tax cut proposals might swell rather than reduce the budget deficit, but this concern reinforced expectations that United States interest rates would remain high and that the dollar would stay strong. By early April, indicators were showing that the United States economy was stronger than expected. The expansion in the underlying economy also began to show through more clearly in the demand for money and credit, and even the narrow measures of the monetary aggregates began to grow rapidly. With the Federal Reserve restraining the growth of reserves, the strong demand for money prompted a renewed rise in United States interest rates. Although some central banks abroad continued to raise their own interest rates, or to take other measures to keep a tight rein on liquidity, foreign interest rates did not rise as sharply as rates in the United States so that large interest differentials in favor of dollar placements widened.

In mid-April the Treasury announced that, after study and consultation with officials of the Federal Reserve, the United States authorities had adopted a minimal intervention approach and would now intervene only when necessary to counter conditions of disorder in the exchange market. In the prevailing market atmosphere, many participants interpreted this change in approach as removing a constraint on the dollar's rise. On May 4, in testimony before the Joint Economic Committee of the Congress, Treasury Under Secretary Sprinkel set forth the rationale for this more limited intervention approach.

With the dollar again in demand, dollar rates were bid up sharply, frequently in one-way markets, through the end of April. From the mid-March lows, the dollar rose by a net 8-9 percent against the German mark and other currencies linked directly or indirectly to the mark, 7 percent against the pound sterling, 5 percent against the Japanese yen, and 1½ percent against the Canadian dollar.

The United States authorities did not intervene in the markets in April, although the Desk continued to operate in the market as agent for other central banks. By the month end, several foreign central banks were intervening fairly heavily in support of their currencies either against the dollar or, within the EMS, against the German mark which remained firm among European currencies.

In April, following a heavy reflux of funds into the Swedish krona, the Sveriges Riksbank repaid, prior to maturity, the \$200 million drawn in January under the swap arrangement with the Federal Reserve.

In operations during the three-month period, the

Federal Reserve had losses of \$1.4 million on its exchange market operations, while the Exchange Stabilization Fund (ESF) lost \$3.8 million. As of April 30, valuation losses on outstanding balances were \$271.1

million for the System and \$1,106.9 million for the ESF. The Treasury's general account had valuation gains of \$958.5 million, reflecting its foreign currency borrowings.

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