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Formulating Economic Policy for 1979 and Beyond: Old Problems and New Constraints

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THE Administration recently outlined its economic strategy for 1979 and 1980, and also addressed some of the longer-term economic problems that will face the United States in the early 1980s.[1] The major problem confronting the Administration has become familiar — reducing inflation without provoking a recession. This problem has been complicated, however, by recently enacted legislation, the Full Employment and Balanced Growth Act of 1978 (Humphrey-Hawkins) and the Revenue Act of 1978.

The Humphrey-Hawkins Act includes national economic goals for 1983 among its provisions. In particular, the Act calls for

(1) reducing the rate of unemployment to not more than 3 percent for individuals aged twenty and over and 4 percent for individuals aged sixteen and over;

(2) reducing the rate of inflation to not more than 3 percent.

The Act also contains the proviso that policies and programs for reducing the rate of inflation be designed so as not to impede achievement of the goals and timetables specified for the reduction of unemployment.

The responsibility for achieving these goals belongs to the President of the United States. He must submit an economic report and a budget which outline the programs and policies deemed necessary to achieve the goals of the Act.

The Act also indicates a role for monetary policy. The Board of Governors of the Federal Reserve System is required to present to Congress the relationship between its plans and the short-term goals presented in the President's economic report. The Federal Reserve is required only to specify its plans for the coming year, and need *not* outline its actions for the longer term through 1983.

The Revenue Act of 1978 imposed an additional set of constraints on the Administration's policymaking process. This Act was designed primarily to reduce taxes to stimulate consumer and investment spending and to improve the equity of the tax system. However, the Act also contains a Congressional policy statement about the growth rate of Federal outlays and possible further tax reduction:

> . . . as a matter of national policy the rate of growth in Federal outlays, adjusted for inflation, should not exceed 1 percent per year between fiscal year 1979 and fiscal year 1983; Federal outlays as a percentage of gross national product should decline to below 21 percent in fiscal year 1980, 20.5 percent in fiscal year 1981, 20 percent in fiscal year 1982, and 19.5 percent in fiscal year 1983; and the Federal budget should be balanced in fiscal years 1982 and 1983.

The President presented the first economic program under the provisions of this new legislation to Congress and the public in January. The details of the program are outlined in the *Budget of the United States Government for Fiscal Year 1980* and the *Economic Report of the President*. The Federal Reserve submitted its report to Congress in a Letter of Transmittal dated February 20, 1979. This article summarizes and evaluates the Administration's economic plan along with the Federal Reserve's statement of intent. The focus is on whether these monetary and fiscal plans are consistent with the achievement of the goals of the Humphrey-Hawkins Act and the Revenue Act of 1978.

BACKGROUND: ECONOMIC SITUATION AND POLICY STANCE

In order to prepare a national economic program, one must consider the current economic situation and the stance of monetary and fiscal policy. In addition, it is helpful to understand how the economic situation evolved in light of past policy developments.

Current Economic Situation and How It Evolved

In April 1978, the U.S. economy entered the fourth year of expansion.[2] Strong economic growth and em-

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[1]The Administration's economic plans are contained in two basic documents, the *Budget of the United States Government for Fiscal Year 1980* and the *Economic Report of the President,* which also includes the 1979 Annual Report of the Council of Economic Advisers.

[2]Economic developments in 1978 are reviewed in the 1979 CEA Report, Chapters 1 and 2. See also Michael E. Trebing, "Economic Developments in 1978," this *Review* (February 1979), pp. 11-18.

Table I

Selected Economic Indicators: 1978

	III/77 to IV/77	IV/77 to I/78	I/78 to II/78	II/78 to III/78	III/78 to IV/78
Gross National Product					
Current Dollars (Total Spending)	8.9%	7.1%	20.6%	9.6%	15.6%
Personal Consumption Expenditures	14.1	7.0	15.3	10.7	14.6
Nonresidential Fixed Investment	14.8	11.0	31.3	14.1	18.0
Residential Investment	27.5	0.4	21.5	1.8	17.2
Government Purchases					
Federal	15.5	−1.8	−10.9	19.8	24.0
State and Local	12.6	7.7	20.1	12.3	9.0
1972 Dollars (Output)	3.2	−0.1	8.7	2.6	6.9
Prices					
GNP Deflator	5.5	7.2	11.0	6.9	8.2
Consumer Price Index[1]	5.1	8.0	9.9	8.8	9.2
Producer Price Index	5.9	9.4	11.3	6.7	10.6
Industrial Commodities	5.6	7.0	8.3	8.6	9.2
Farm Products and Processed Foods and Feeds	7.8	19.1	22.2	1.0	17.2
Labor Market					
Employment					
Total	5.1	4.6	4.4	2.7	3.8
Payroll	4.0	3.8	6.9	2.1	4.0
Labor Utilization (End of Period)					
Employment Ratio[2]	66.1	66.5	67.1	67.3	67.7
Unemployment Rate	6.6	6.2	6.0	6.0	5.8

NOTE: All figures are compounded annual rates of change except Labor Utilization Indicators.
[1]CPI for urban wage earners and clerical workers.
[2]Total employment as percent of civilian non-institutional population aged 16-64.

ployment gains were registered in 1978, but the economic record was marred by accelerating inflation.

Total spending rose 11.7 percent in 1978, up slightly from an 11.0 percent increase in 1977. In the past year, however, the distribution of the year's growth in total spending between output and prices was substantially different than in 1977. Output growth slowed to 4.0 percent after advancing 4.9 percent in 1977. Inflation accelerated to 7.4 percent in 1978 from the 5.9 percent pace in the previous year. Total employment, however, rose 4.2 percent compared to a 3.5 percent increase in 1977.

Quarter-to-quarter variation in GNP, output, and prices was substantial in 1978 (Table I). Yet, there is little question that the growth of total spending was very strong toward the end of the year. Spending increased at a 15.6 percent annual rate in the fourth quarter which was distributed as a 6.9 percent rate of advance of output and an 8.2 percent rate of inflation.

Accelerating inflation was the most disturbing economic development of 1978. The sharp rise in prices

was not accurately predicted by either the Administration (Table II) or by most private forecasters. Consequently, the Council of Economic Advisers (CEA) devoted considerable space in its 1979 Annual Report to an analysis of the 1978 inflation.[3] The Council's analysis divides the sources of inflation into two parts — that due to "special factors," and that due to a change in the underlying rate of inflation.

Special factors refer to unusual price movements in particular markets and are generally, but not always,

[3]1979 CEA Report, Chapter 2.

Table II

Administration Forecasts for 1978

	Forecast		
	January 1978	July 1978	Actual
GNP	11.0%	10.9%	11.7%
Output	4.7	4.1	4.0
Prices	6.1	6.5	7.4
Unemployment rate	6.3	6.0	6.0

NOTE: All figures are percent changes from 1977, except for the unemployment rate which is an average for 1978.

Table III

Selected Policy and Credit Market Indicators: 1978

	III/77 to IV/77	IV/77 to I/78	I/78 to II/78	II/78 to III/78	III/78 to IV/78
Fiscal Policy					
Federal Expenditures	13.0%	4.3%	−0.4%	15.3%	17.7%
Purchases	15.5	−1.8	−10.9	19.8	24.0
Transfer Payments	6.1	4.3	1.1	19.2	6.3
High-Employment Surplus/Deficit as Percent of Potential GNP (End of Period)	−2.2	−1.6	−0.9	−0.8	−1.0
Monetary Policy					
Monetary Base	9.5	10.3	8.1	9.8	9.9
M1	7.6	6.8	9.6	8.4	4.4
M2	8.1	7.1	8.7	10.3	7.9
Credit Market (End of Period)					
Federal Funds Rate	6.51	6.76	7.28	8.10	9.58
4-6 Month Commercial Paper Rate	6.59	6.80	7.20	8.08	9.90
Corporate Aaa Bond Rate	8.10	8.45	8.67	8.75	9.03

NOTE: Figures for Federal Expenditures and Monetary Policy Indicators are compounded annual rates of change.

related to unexpected shocks on the supply or production side of the economy. Some of the special factors which had an important influence on inflation in 1978 were food prices, the depreciation of the dollar, and housing costs. The CEA pointed out, though, that these special factors fall short of providing a complete explanation for the acceleration of inflation in 1978.[4]

Most of the acceleration, it contends, was caused by a substantial increase in the "underlying rate of inflation," defined as the rise in prices, *excluding food and energy*. According to the CEA, changes in the underlying rate of inflation are closely tied to movements in unit labor costs. The rise in unit labor costs in 1978 was "explained" by an acceleration of money wages and a sluggish advance in productivity. Money wages accelerated because excess demand developed in labor markets, as indicated by a rapid decline in unemployment. The demand for labor exceeded labor force growth, which reflected increases on the demand or spending side of the economy. The CEA suggested that the January 1978 increase in the minimum wage also contributed to wage acceleration.

The fundamental development underlying the accelerating inflation in 1978, according to the CEA's analysis, was the slow growth of productivity. For the private nonfarm business sector, the 0.5 percent increase in output per hour in 1978, in conjunction with a 9.3 percent increase in wages, meant that unit labor costs rose 8.7 percent, which placed pressure on

profit margins and thereby encouraged price hikes. In comparison, unit labor costs rose 6.7 percent in 1977.

The sluggish pace of productivity in 1978 led the CEA to reassess productivity trends in recent years. This resulted in a downward revision of their estimates of potential GNP from mid-1973 through 1978. According to these revised estimates, the economy has been operating much nearer its potential in recent years than previously had been thought.[5]

Policy Stance

Monetary and fiscal actions are important factors in evaluating past and prospective economic conditions. Both monetary and fiscal policy tend to affect the pace of economic activity with a lag, so their recent trends are important in formulating an economic outlook and in developing policies for the near future.

Although there are various measures of fiscal action, the growth of Federal expenditures is possibly the most meaningful measure of fiscal stimulus or restraint.[6] An examination of this growth in 1978 (Table III) indicates that fiscal policy became relatively re-

[4]For a contrasting analysis, see Albert E. Burger, "Is Inflation All Due to Money?" this *Review* (December 1978), pp. 8-12.

[5]The newly revised CEA series on potential GNP is now quite similar in magnitude to that developed by Robert H. Rasche and John A. Tatom, "Energy Resources and Potential GNP," this *Review* (June 1977), pp. 10-24.

[6]Leonall C. Andersen and Jerry L. Jordan, "Monetary and Fiscal Actions: A Test of Their Relative Importance in Economic Stabilization," this *Review* (November 1968), pp. 11-24.

strictive in the first half of the year but sharply expansionary in the second half.

Monetary policy, on the other hand, was clearly expansionary throughout most of 1978.[7] This was a continuation of the rapid monetary expansion that began in late 1976 and carried through 1977. Growth rates of M1 and M2 were well above their long-term trends until late in the year (Table III). Only then did the growth of these aggregates slow, which indicates that monetary actions were turning restrictive or, at least, less expansionary.

ECONOMIC OUTLOOK AND POLICY PLANS: 1979-80

The economic outlook for the next year or two depends primarily on one's assessment of the economy's momentum. The forecast, however, also depends on one's framework of analysis since this framework provides the link between policy actions and economic activity. Policy recommendations will vary depending on whether movements in economic activity are attributable to monetary and fiscal policy or to exogenous forces beyond the control of the policymaker.

Short-term Outlook

The CEA has forecast a growth in GNP of 9.8 percent from fourth quarter 1978 to fourth quarter 1979 (Table IV) to be distributed as a 2.2 percent advance in output and a 7.4 percent rise in prices.[8] The Council expects the unemployment rate to rise slightly to 6.2 percent by fourth quarter 1979.

GNP in 1980 is forecast to rise at the same rate as in 1979 — 9.8 percent. The distribution between output and prices is expected to be more favorable, however, with output projected to rise 3.2 percent and inflation to slow to 6.4 percent. Unemployment is predicted to remain at 6.2 percent.

The CEA expects inflation to slow in 1979 for reasons of demand-pull, that is, easing of pressure from the spending side of the economy. Output growth is projected to drop below its long-term trend. This forecast differs markedly from the CEA forecast

Table IV

Forecasts for 1979 and 1980
(Fourth Quarter to Fourth Quarter)

	Administration		Private Forecasters	
	1979	1980	1979	1980
GNP	9.8%	9.8%	7.5%	10.0%
Output	2.2	3.2	0.2	3.7
Prices	7.4	6.4	7.3	6.6
Unemployment (End of Period)	6.2	6.2	6.9	6.9

NOTE: Figures shown for private forecasts are averages for the Conference Board, Chase Econometrics, Data Resources Institute, and the Wharton Econometric Forecasting Unit. Source: Conference Board *Statistical Bulletin* (February 1979).

for 1978. Potential GNP is now seen as a constraint on the growth of output, and the projected slowing of this growth is viewed as desirable in order to reduce inflation. In early 1978, potential GNP was estimated to be high enough, relative to the projection of output, for the CEA to consider demand pressures a minor threat to reducing inflation.

Budget Plans for 1979-80

The CEA has indicated that inflation is the No. 1 problem facing the nation's policymakers. Despite the limited role assigned to monetary and fiscal actions in explaining the acceleration of inflation in 1978, the CEA recommends a policy of "measured" monetary and fiscal restraint.[9] The Administration's budget plan is labeled "austere."[10] The basis for this label is that the proposed growth of Federal outlays for fiscal years 1979 through 1982 is less than the projected rate of increase of GNP.

The Administration's proposed budget plans on a quarter-by-quarter basis are shown in Table V.[11] According to these figures, fiscal restraint, as measured by the growth of expenditures relative to receipts, will not become effective until calendar 1980. Continued stimulus is projected through 1979.

Implications for Monetary Policy

The CEA's discussion of monetary policy in 1979 and 1980 is sketchy. It stresses the importance of monetary restraint, but does not recommend a pre-

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[7]The CEA interpreted monetary actions as restrictive throughout most of the year. See 1979 CEA Report, pp. 28, 47-53.

[8]Discussion of the outlook is found in the 1979 CEA Report, Chapter 3. A comparison of the CEA's forecast with a consensus of private forecasters shows that they are not far apart. The CEA tends to be a bit more optimistic than the consensus, but the differences are not large.

[9]Ibid., pp. 79-80, 93-97.

[10]See *The Budget of the United States Government for Fiscal Year 1980,* p. 12.

[11]For a detailed discussion of the Administration's budget plan, see Charles A. Waite and Joseph C. Wakefield, "Federal Fiscal Programs," *Survey of Current Business* (February 1979), pp. 21-33.

Table V

Administration Budget Plan: 1979 and 1980
(Billions of Dollars)

		NATIONAL INCOME ACCOUNTS BUDGET			HIGH-EMPLOYMENT BUDGET			
		Receipts	Expenditures	Surplus/ Deficit	Receipts	Expenditures	Surplus/ Deficit	Surplus/ Deficit as % of GNP
1978:	I	$396.2	$448.8	$−52.6	$413.9	$446.9	$−33.0	−1.6%
	II	424.7	448.3	−23.6	428.5	447.0	−18.5	−0.9
	III Actual	441.7	464.5	−22.8	446.7	463.2	−16.5	−0.8
	IV	463.2	483.8	−20.6	459.5	482.8	−23.3	−1.0
1979:	I	460.0	490.3	−30.3	465.3	489.3	−24.0	−1.0
	II	469.6	497.4	−27.8	476.3	496.3	−20.0	−0.8
	III	478.0	514.8	−36.8	487.1	513.7	−26.6	−1.1
	IV Estimated	488.0	526.8	−38.8	499.2	525.6	−26.4	−1.1
1980:	I	508.2	536.9	−28.7	523.6	535.7	−12.1	−0.5
	II	520.5	542.5	−22.0	536.1	541.1	− 5.0	−0.2
	III	532.9	549.8	−16.9	547.3	548.4	− 1.1	−0.0

NOTE: Estimates for high-employment budget prepared by Federal Reserve Bank of St. Louis. GNP here is expressed as potential GNP in nominal terms.

ferred growth rate for the major monetary aggregates. Given past behavior patterns for M1 velocity, however, the 9.8 percent projected growth for GNP suggests a growth in M1 of between 6 and 7 percent. Considering the effects of automatic transfers, one could interpret the Administration's strategy as a call for about a 3 to 4 percent growth in measured M1.[12] The 1980 forecast of GNP indicates a continuation of this growth rate.

Under the provisions of the Humphrey-Hawkins Act, the Federal Reserve must outline its strategy in light of the Administration's plan. The Federal Reserve presented its strategy to Congress on February 20.[13] In its report, the targets of 1½ to 4½ percent for M1 growth for the year ending fourth quarter 1979 were deemed consistent with the Administration's short-term goals. This range includes the 3 to 4 percent M1 growth implied by the CEA's GNP forecast, that is, when account is taken of velocity growth and the effects of automatic transfers. The movements of the aggregates since late 1978, however, indicate that this M1 range has not been met thus far in 1979. Preliminary estimates indicate that M1 declined at a 2.3 percent rate in the first quarter. To achieve the Federal Reserve's target range, M1 growth would have to accelerate to a 2.8 to 6.9 percent rate for the rest of the year.

PLANNING FOR THE LONG TERM: 1981-83

Since 1974, the Administration has presented long-term projections for the economy and the budget along with its short-term forecasts.[14] These long-term projections were introduced into the economic planning process by the Budget Control Act of 1974. Effective in 1979, however, the nature of these projections was changed by the enactment of the Humphrey-Hawkins Act. Previous Administrations were simply required to present these projections. Under the Humphrey-Hawkins Act, these projections must now be consistent with the Act's long-term goals for unemployment and inflation.

A further constraint on long-term budget planning was introduced in the Revenue Act of 1978. That Act specified targets for the growth of Federal outlays and their size relative to GNP, and presented a timetable for achieving a balanced Federal budget. These targets, however, are conditional and must be met only if further tax reductions are to be enacted.

Aiming for Economic Goals in 1983

The Humphrey-Hawkins Act of 1978 specifies targets for economic policy in 1983. These targets consist of reducing unemployment to 4 percent of the labor force and lowering the inflation rate (as measured by

[12]John A. Tatom and Richard W. Lang, "Automatic Transfers and the Money Supply Process," this *Review* (February 1979), pp. 2-10.

[13]"Monetary Policy Report to Congress," Federal Reserve *Bulletin* (March 1979), pp. 185-200.

[14]For a summary of the long-term projections made in past years, see Keith M. Carlson, "Economic Goals for 1981: A Monetary Analysis," this *Review* (November 1977), p. 3.

Table VI

Long-Range Economic Projections

	Actual	Forecast		Assumptions			
	1978	1979	1980	1981	1982	1983	1984
GNP	11.6%	11.3%	9.5%	10.1%	9.4%	7.9%	6.3%
Output	3.9	3.3	2.5	4.2	4.7	4.4	3.4
Prices	7.4	7.7	6.8	5.7	4.5	3.4	2.8
Unemployment rate	6.0	6.0	6.2	5.7	4.9	4.2	4.0

SOURCE: *The Budget of the United States Government for Fiscal Year 1980.*

the consumer price index) to 3 percent per annum. The Act does not specify how to achieve these goals, but it does suggest that monetary and fiscal policies be supplemented with manpower policies and wage-price guidelines.

The Budget document details the economic projections through calendar 1984 (Table VI), and presents budget estimates through fiscal 1984. The economic projections for 1981 through 1984 are *not* presented as forecasts of probable economic conditions. They are, rather, projections that *assume* progress toward the goals of the Humphrey-Hawkins Act.[15] Only the budget estimates through 1982 are intended to be budget plans. Projections for 1983 and 1984 are simple extrapolations beyond the planning base.[16] The Administration does *not* offer a budget plan designed explicitly to achieve the long-run economic goals.

The CEA's 1979 Annual Report discusses long-term goals and some of the factors that will have a bearing on their achievement.[17] The discussion is general, with no specific recommendations for monetary and fiscal policy for achieving the goals. The CEA focuses its discussion of the Humphrey-Hawkins Act on the feasibility of achieving the inflation and unemployment goals simultaneously. In previous sections of its report, the CEA suggests that a 6 percent unemployment rate indicates a tightness in labor markets which causes wages to accelerate. Consequently, the CEA concedes that the unemployment target cannot be reached by means of monetary and fiscal policies alone, and argues that structural initiatives to improve the functioning of the labor market will also be needed.

The simultaneous achievement of the inflation goal, on the other hand, is discussed within the context of

striving to reduce inflation with the help of wage-price guidelines. The CEA does recognize the importance of changing tax policy to encourage investment and thereby step up the growth of potential GNP. Emphasis also is given to the improvement of the social and economic regulatory process so that incentives to produce and invest will not be dampened further. The direct role of monetary expansion in achieving the long-run inflation goals is *not* mentioned by the CEA.

The Balanced Budget Goal

The other major constraint imposed on the Administration is specified in the Revenue Act of 1978. This constraint is spelled out in terms of a timetable for slowing Federal spending as well as balancing the budget by fiscal 1983. Since budget estimates beyond 1982 are only extrapolations, these projections are suggestive at best.

Table VII indicates that long-term budget projections do not fulfill the requirement of the Act. The requirement of a balanced budget by fiscal 1982 is met, but outlays as a percent of GNP are too large in each of the years. The rate of growth of outlays exceeds the rate of inflation by more than 1 percent in every year but 1980.

EVALUATION OF ADMINISTRATION'S PLAN: A MONETARY VIEW

The Administration's economic plan does not consider the implications of alternative growth paths for the monetary aggregates. This is true for both the short-term and the long-term projections. For purposes of comparison, the Administration's plan is analyzed within the context of the St. Louis model.[18]

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[15]See the discussion in *The Budget*, p. 37.

[16]*Ibid.*, pp. 40-41.

[17]1979 CEA Report, pp. 106-134.

[18]The model used here is a slightly modified version of that described in Leonall C. Andersen and Keith M. Carlson, "A Monetarist Model for Economic Stabilization," this *Review* (April 1970), pp. 7-25.

Table VII

Long-Range Budget Projections: Unified Budget
(Billions of Dollars)

	Actual	Estimates				Projections	
	1978	1979	1980	1981	1982	1983	1984
Receipts							
Current services	$402.0	$456.0	$504.5	$571.3	$646.6	$715.3	$777.8
Proposed changes			−1.9	4.5	6.0	3.0	2.4
Budget receipts	402.0	456.0	502.6	576.8	652.6	718.3	780.2
Outlays							
Current services	450.8	491.3	536.1	577.8	610.6	640.2	667.1
Proposed changes		2.1	−4.5	0.2	4.3	5.4	6.6
Budget outlays	450.8	493.4	531.6	578.0	614.9	645.6	673.7
Surplus/Deficit							
Current services	−48.8	−35.4	−31.6	−6.5	36.0	75.1	110.7
Proposed changes		−2.0	2.6	5.3	1.8	−2.4	−4.2
Budget surplus/deficit	−48.8	−37.4	−29.0	−1.2	37.8	72.7	106.5
Outlays as % of GNP	22.1%	21.6%	21.2%	21.0%	20.3%	19.7%	19.3%
% change in outlays	11.9	9.4	7.7	8.7	6.4	5.0	4.4
% change in GNP deflator	6.8	7.9	7.0	5.9	4.8	3.6	2.9
Difference	5.1	1.5	0.7	2.8	1.6	1.4	1.5

NOTE: Figures are for fiscal years.
SOURCE: *The Budget of the United States Government for Fiscal Year 1980.*

The model is used to project the course of inflation and unemployment using the path for nominal GNP contained in the Administration's economic plan. For purposes of the simulation, no impact was factored in for either the wage-price guidelines or for structurally-oriented programs to improve the functioning of the labor market. Table VIII summarizes the results.

The St. Louis model indicates that, since inflation was so rapid in 1978, its momentum will carry through into the early 1980s, especially if monetary and fiscal policies are stimulative enough to generate GNP advances in the range of 9.5 to 10 percent. Even with sluggish growth in output into 1981, the momentum of inflation is strong enough to more than offset the downward pressures on prices associated with that slow growth.

The inflation projection, along with the GNP path assumed by the Administration, leaves little room for real growth. As a result, unemployment rises steadily. Then, in 1983 and 1984, if GNP growth is reduced before the inflation rate has been lowered to any great extent, output growth will be slowed further. Consequently, unemployment jumps sharply in 1983 and 1984.

The purpose of presenting these simulations is to show that, in the St. Louis model, the Administration's GNP projections are not consistent with a path of steadily declining inflation. Given that this inflation path is unlikely, the paths of output growth and unemployment are also brought into question.

Table VIII presents some alternatives to the GNP path outlined by the Administration. The 4, 6, and 8 percent paths for M1 correspond to the M1 measure before the introduction of automatic transfers. Each of these paths was generated from first quarter 1979 as a starting point for M1. According to these alternative simulations of steady money growth, the spirit of the Humphrey-Hawkins Act is most closely met if money growth is kept moderate. Each of the alternatives indicates the difference between short-run and long-run costs and benefits. Policymakers are confronted with the difficult task of choosing between short-term benefits and long-term costs.

SUMMARY

The Administration has developed a multi-faceted economic plan for the nation. The problem confronting the Administration in the short run is quite familiar — how to reduce inflation and unemployment

Table VIII

Alternative Economic Projections: 1979-1985

	1979	1980	1981	1982	1983	1984	1985
Administration							
GNP	11.3%	9.5%	10.1%	9.4%	7.9%	6.3%	—
Output	3.3	2.5	4.2	4.7	4.4	3.4	—
Prices	7.7	6.8	5.7	4.5	3.4	2.8	—
Unemployment rate	6.0	6.2	5.7	4.9	4.2	4.0	—
St. Louis Model (Approximate Administration GNP Path)							
GNP	11.5	9.8	9.9	9.3	8.0	6.4	5.8%
Output	3.8	2.2	1.8	1.3	0.9	0.7	1.8
Prices	7.4	7.5	8.0	7.9	7.0	5.6	3.9
Unemployment rate	6.1	6.3	6.8	7.4	8.2	9.1	9.7
St. Louis Model (4 percent M1 growth from 1/79)							
GNP	10.0	6.9	7.0	7.2	7.2	7.2	7.2
Output	2.6	0.3	1.2	2.5	3.9	4.8	5.3
Prices	7.3	6.6	5.9	4.6	3.2	2.3	1.9
Unemployment rate	6.4	7.5	8.3	8.6	8.4	7.8	6.9
St. Louis Model (6 percent M1 growth from 1/79)							
GNP	10.5	9.0	9.3	9.5	9.5	9.5	9.5
Output	3.0	1.9	2.1	2.6	3.2	3.6	3.8
Prices	7.3	7.0	7.1	6.8	6.1	5.7	5.5
Unemployment rate	6.3	6.8	7.1	7.4	7.4	7.2	6.9
St. Louis Model (8 percent M1 growth from 1/79)							
GNP	11.1	11.1	11.6	11.7	11.7	11.7	11.7
Output	3.5	3.5	2.9	2.3	1.8	1.6	1.8
Prices	7.3	7.4	8.5	9.3	9.7	10.0	9.8
Unemployment rate	6.2	6.1	6.0	6.3	6.7	7.2	7.2

simultaneously. The Administration's economic plan focuses on the Federal budget and the wage-price guidelines. Monetary policy is discussed only generally. The potential impact of alternative courses of monetary expansion is not assessed.

The Administration presents projections for the long term, but does not develop a way to achieve the 1983 goals of the Humphrey-Hawkins Act. Its budget plan, however, when analyzed within the context of the Revenue Act of 1978, indicates that the goal of a balanced budget appears to be easily met. There is some question, however, whether the growth of Federal spending is being reduced as rapidly as suggested in the Congressional policy statement.

The St. Louis model was used to simulate the Administration's plan. Using the GNP growth path projected by the Administration, achievement of the Humphrey-Hawkins inflation and unemployment targets does not appear feasible in the absence of new structurally-oriented programs. Furthermore, alternative courses of monetary expansion indicate that the goals of Humphrey-Hawkins will be difficult to achieve by 1983. The spirit of the Act would appear to be best met by aiming toward a moderate growth in the money stock.

Do Floating Ceilings Solve the Usury Rate Problem?

JEAN M. LOVATI and R. ALTON GILBERT

MOST states set maximum limits on interest rates which lenders may charge on residential mortgage loans. These usury laws are intended to protect borrowers from "exorbitant" interest rates which lenders might charge in the absence of such legal controls. Advocates of usury ceilings often express concern for borrowers who have little knowledge of prevailing interest rates or few alternative sources of credit.[1]

In most states, usury ceilings on conventional residential mortgage loans are set at *fixed* levels by state laws. When market interest rates rise above the usury ceilings, many individuals cannot find lenders who will finance their home purchases. Also, during such periods residential construction declines relative to that in states not subject to such restrictive usury ceilings.

In recent years several states have raised their usury ceilings, eliminated usury ceilings entirely, or adopted floating ceilings which change periodically as other interest rates change. Floating usury ceilings are intended to protect individual borrowers from unusually high interest rates, while avoiding disruptions in the credit flow to home buyers and reductions in residential construction which can result when market interest rates approach or exceed usury ceilings. This paper evaluates whether floating usury rate formulas recently adopted by various states will avoid impeding the flow of credit to home buyers.

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[1]For a discussion of arguments in favor of usury ceilings, see Norman N. Bowsher, "Usury Laws: Harmful When Effective," this *Review* (August 1974), pp. 16-23, and Harold C. Nathan, "Economic Analysis of Usury Laws: A Survey," Working Paper 78-7, Federal Deposit Insurance Corporation.

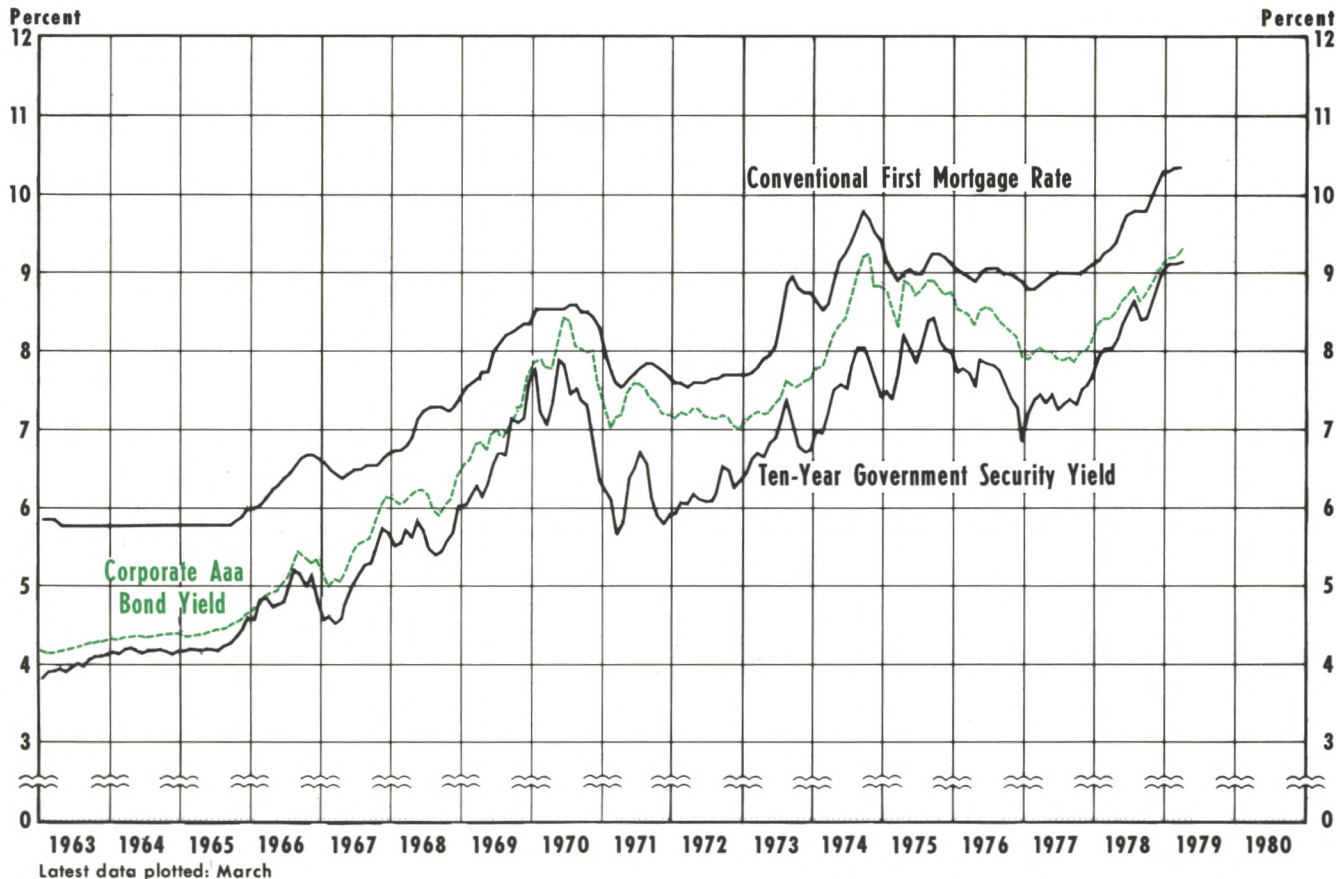## EFFECTS OF USURY CEILINGS: THEORY AND EVIDENCE

The Residential Mortgage Market: The Theory

Lenders typically make investments which, they hope, will maximize their profits. Consequently, they shift their assets among various investments in response to changes in relative rates of return. For instance, if yields on long-term U.S. Treasury bonds rise relative to yields on residential mortgages, lenders will reduce their mortgage investments and increase their holdings of government bonds. In so doing, they bring relative rates of return back in line.

In addition, lenders can choose to invest in residential mortgages on properties in different parts of the country. In the absence of usury ceilings, mortgage interest rates in any section of the country cannot deviate too much from the national average rate for long. Lenders will make more credit available in areas with relatively high interest rates.

Lenders usually are willing to make more risky mortgage loans if borrowers adequately compensate them for those risks by paying higher interest rates. This trade-off between risk and interest rates can be illustrated for the ratio of mortgage loan to house price, one aspect of risk. Since lenders assume ownership of mortgaged property if borrowers default on mortgage payments, the ratio of the loan to the market value of the house is an important consideration in evaluating risk. Lenders will make loans which are larger relative to the prices of homes being purchased if borrowers will pay sufficiently higher

Chart I
Long-Term Interest Rates

Percent

Conventional First Mortgage Rate

Ten-Year Government Security Yield

Corporate Aaa
Bond Yield

1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980
Latest data plotted: March

interest rates to compensate for the greater risks. Thus, lenders do not treat mortgage loans as a homogeneous type of asset; they attach various degrees of risk to individual loans, depending upon borrowers' personal circumstances, credit histories, and preference for loan terms. The nature of the properties to be mortgaged also affects risk, differing with the prospects for depreciation in market value.

These mortgage market characteristics indicate that in the absence of government-imposed interest rate ceilings:

(1) The average level of interest rates on new residential mortgages will fluctuate with changes in other long-term interest rates,

(2) Interest rates on new residential mortgages will tend to be similar in different parts of the country, when adjusted for differences in the riskiness of loans, and

(3) Interest rates on new residential mortgages will vary in a given area, depending upon risk characteristics.

The Residential Mortgage Market: Some Evidence

As Chart I indicates, yields on conventional residential mortgages *do* change over time as changes in other long-term interest rates occur. The somewhat fixed differentials between these interest rates reflect the investors' perceptions of differential risks and transactions costs on these types of investments.[2]

A recent study reports that the range of mortgage interest rates among metropolitan areas averages about 75 basis points. However, the study also re-

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[2]For evidence that lenders shift assets between residential mortgage loans and other long-term investments when relative interest rates change, see William L. Silber, *Portfolio Behavior of Financial Institutions* (New York: Holt, Rinehart and Winston, Inc., 1970, pp. 18-56). Silber found evidence of such behavior for mutual savings banks, pension plans, life insurance companies, and property and casualty insurance companies. He did not find evidence of such substitution among assets by commercial banks and savings and loan associations.

ports that about half of the variation in mortgage interest rates can be explained by loan terms and usury ceilings. After adjusting for these factors, the range of unexplained variation in interest rates is only about 25 basis points.[3] Chart II indicates that average mortgage interest rates in individual metropolitan areas remain close to national average interest rates over time, when interest rates in those areas are not constrained by usury ceilings.

Several studies find that, during a given period of time, the interest rates charged by mortgage lenders depend upon the risks and costs associated with individual loans. In general, mortgage interest rates tend to be higher on loans which are a larger percentage of the purchase price of the house, and lower on loans with longer maturities and for homes of higher dollar value.[4] One study also found that characteristics of the property influenced the mortgage interest rate, with a higher interest rate for a property in poorer physical condition or in a neighborhood with greater risk of depreciation in value.[5]

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[3]Mark Meador, "Interregional Mortgage Rate Differentials," *Federal Home Loan Bank Board Journal* (September 1978), pp. 2-6.

[4]In one study, a researcher applied for mortgage loans at a sample of savings and loan associations (S&Ls) and commercial banks in the Chicago area, providing each lender with the same personal information and description of the house to be purchased. The study was conducted in 1960 and repeated in 1965. In both years he found variation in interest rates among lenders when proposing the same down payment. He also found that individual lenders offered to lend at lower interest rates if he wished to make a larger down payment. See Allen F. Jung, "Terms on Conventional Mortgage Loans — 1965 vs. 1960," *National Banking Review* (March 1966), pp. 379-84. Another study was based on a survey of individual mortgage loans made by a sample of S&Ls and commercial banks in the Chicago area from April 1960 through July 1963. Mortgage interest rates were found to be higher on loans with higher ratios of loan to purchase price, lower on loans with longer maturities, and lower on loans for homes of higher dollar value. Mortgage interest rates also were found to be lower at lenders with greater total assets, and varied systematically by location of lenders within the Chicago area. See Alfred N. Page, "The Variation of Mortgage Interest Rates," *Journal of Business* (July 1964), pp. 286-94. For additional evidence on interest rate differentials on residential mortgages, see Jack M. Guttentag, "Changes in the Structure of the Residential Mortgage Market: Analysis and Proposals," Appendix A, in Irwin Friend, ed., *Study of the Savings and Loan Industry*, Vol. IV (Federal Home Loan Bank Board, July 1969), pp. 1545-56. Loan commitment data reported by the Federal Home Loan Bank Board show that interest rates on mortgage loans with loan-to-price ratios of 95 percent are 40 to 50 basis points above rates on loans with loan-to-price ratios of 75 percent. See Stephen T. Zabrenski, "New Measures of Mortgage Rates and Lending Policies," *Federal Home Loan Bank Board Journal* (June 1978), pp. 14-19.

[5]This study used data on about 550 residential mortgage loans made by one large S&L in California from 1967 through 1971. The interest rate on each mortgage was measured as the difference between the effective interest rate on the loan and the average interest rate that the S&L was charging at the time the loan was made. That measure of the interest rate was used

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Studies of delinquencies and defaults on residential mortgages indicate that lenders have a sound statistical basis for assigning different risks to mortgage loans, based upon characteristics of borrowers and loan terms. One study found the following factors positively related to incidence of delinquency (loans 90 days or more in arrears) in mortgage payments:

(1) Ratio of the loan to the purchase price of the house

(2) Occupation of borrower, with delinquency lower for professionals, executives, and managers, and higher for salespersons

(3) Number of dependents.[6]

Another study on defaults on FHA-insured home mortgages finds that the incidence of default is positively related to both maturity of loans and loan-to-value ratios, and negatively related to borrowers' income.[7]

A recent study by the U.S. League of Savings Associations indicates that the relatively young with moderate to low incomes are primarily the borrowers who buy their first homes with low percentage down payment loans (see Table I). As indicated in the studies cited above, these are the borrowers most likely to become delinquent or default on their mortgage loans, and, consequently, they are charged higher mortgage interest rates.

Effects of Usury Ceilings on the Market for Residential Mortgages

As mortgage interest rates in a state rise closer to a fixed usury ceiling, two general effects occur.

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as the dependent variable in regression analysis. The authors found that mortgage interest rates were positively related to the ratio of the amount of the loan to the appraisal value of the home to be purchased, and negatively related to maturity and dollar amount of the loan. The authors also found that characteristics of the property to be mortgaged influence the mortgage interest rate. Dummy variables for properties in neighborhoods with poorer prospects for appreciation in value and for properties in poorer physical condition had positive regression coefficients which were statistically significant. See Richard L. Sander and Howard E. Sosin, "The Determinants of Mortgage Risk Premiums: A Case Study of the Portfolio of a Savings and Loan Association," *Journal of Business* (January 1975), pp. 27-38.

[6]John P. Herzog and James P. Earley, *Home Mortgage Delinquency and Foreclose* (New York: National Bureau of Economic Research, 1970).

[7]George M. Von Furstenberg, "Default Risk on FHA-Insured Home Mortgages as a Function of the Terms of Financing: A Quantitative Analysis," *Journal of Finance* (June 1969), pp. 459-77, and "Risk Structure and the Distribution of Benefits Within the FHA Home Mortgage Insurance Program," *Journal of Money, Credit and Banking* (August 1970), pp. 303-22.

Table I

Distribution of First-Time Home Buyers by Age, Income, and Percentage Down Payment on Mortgage Loans[1]

| Age of first-time home buyers | Down payment as a percentage of home purchase price | | | | |
	5.0%	5.1% to 10.0%	10.1% to 19.9%	Total less than 20%	Percentage of first-time home buyers in age group
18 to 29	5.5%	26.2%	20.0%	51.7%	62.9%
30 to 39	5.9	19.6	17.0	42.5	26.2
40 to 49	4.3	16.8	13.0	34.1	7.0
50 and over	0.8	11.0	10.2	22.0	3.9

| Annual income of first-time home buyers | Down payment as a percentage of home purchase price | | | | |
	5.0%	5.1% to 10.0%	10.1% to 19.9%	Total less than 20%	Percentage of first-time home buyers in income group
Less than $15,000	5.6%	23.2%	15.9%	44.7%	22.0%
$15,000-$24,999	6.4	27.4	20.7	54.1	49.3
$25,000-$34,999	4.6	18.8	54.1	40.7	18.3
$35,000 or more	2.9	11.6	49.3	29.3	10.4

[1]Based upon a national survey of 8,500 purchasers of single-family homes who obtained conventional mortgages at savings and loan associations during 1977.

SOURCE: *Homeownership: Affording the Single-Family Home*, U.S. League of Savings Associations, Economics Department.

First, some borrowers are rationed out of the market because lenders are not permitted to charge above-average interest rates to compensate themselves for additional risk. Only lower-risk borrowers, such as those who have accumulated sufficient savings to make higher percentage down payments, or those buying houses in neighborhoods with less risk of depreciation in market value, receive credit.

Second, as interest rates on alternative long-term investments rise relative to the state's usury ceiling (and as average mortgage interest rates in other states rise above the local ceiling rate), residential mortgage lending will decline relative to that in states not subject to such restrictive limits on interest rates. Since mortgage financing is essential for most home buyers, home building activity in states subject to relatively low usury ceilings will decline relative to that in other states.

One recent study confirms the first effect of usury ceilings on loan terms.[8] When market interest rates rise above usury ceilings, lenders in states with re-

strictive usury ceilings indirectly charge higher effective interest rates through higher closing costs. This indicates that lenders circumvent usury ceilings to some extent by charging higher loan fees when contract interest rates are restricted by usury ceilings. However, other results of this study indicate that lenders do not fully circumvent usury ceilings by charging higher fees, since usury ceilings influence other loan terms. In particular, lenders require larger percentage down payments when market interest rates rise near or above usury ceilings. Borrowers unable to meet the higher percentage down payments are rationed out of the market.[9]

The second predicted effect of usury ceilings — a decline in mortgage lending in a state with a relatively low usury ceiling when market interest rates in other states rise above the usury ceiling — is substantiated by studies of mortgage lending in Georgia, New York, and Pennsylvania.[10] Other studies report that usury ceilings affect residential c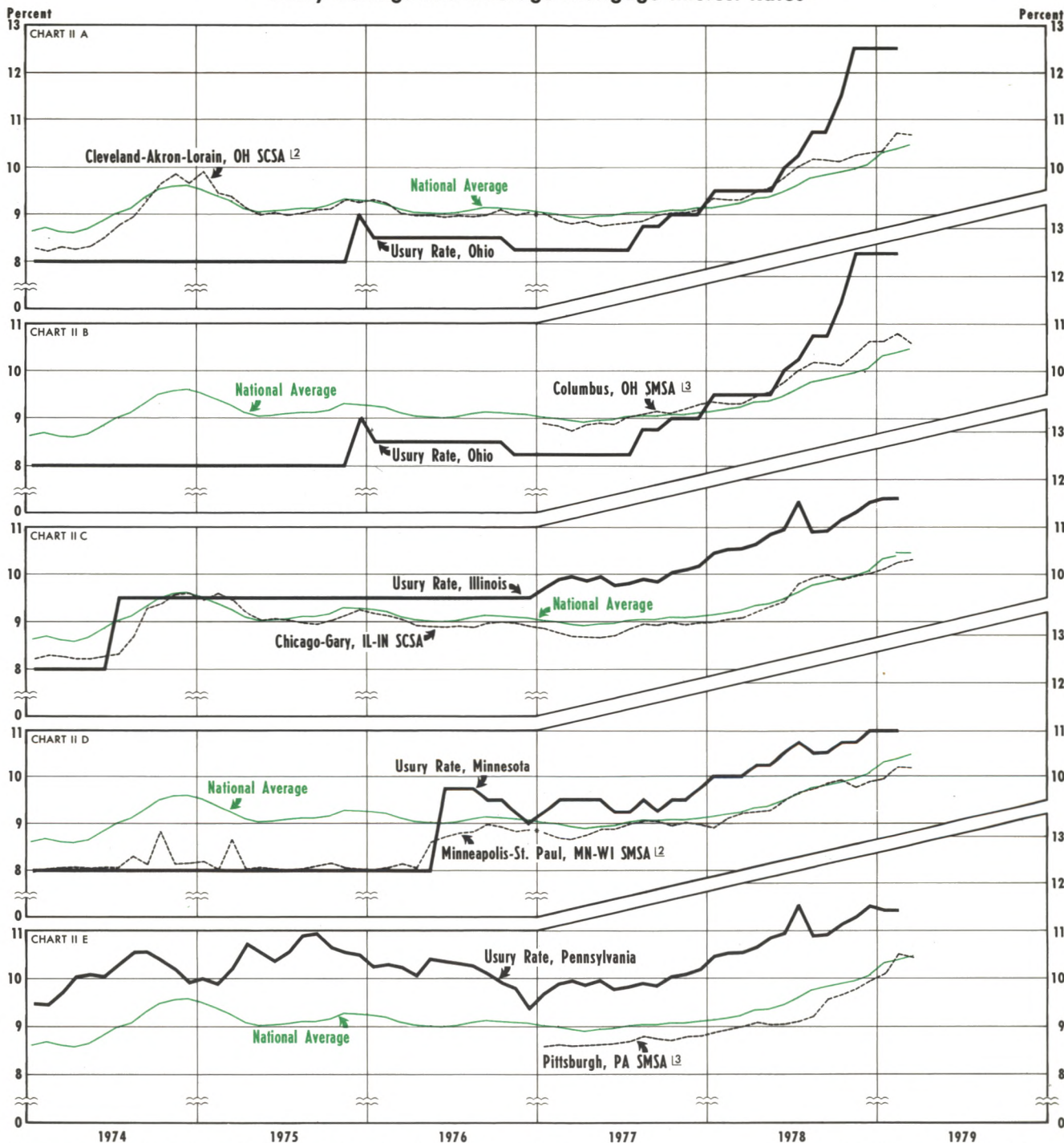onstruction activity. Housing starts or permits in states with relatively low usury rates decline between 11 and 20 percent for each 100 basis point rise in market interest rates relative to usury ceilings.[11]

[8]James R. Ostas, "Effects of Usury Ceilings in the Mortgage Market," *Journal of Finance* (June 1976), pp. 821-34.

[9]Such rationing occurred in Canada during 1963-67, when maximum rates on government-insured mortgages were set administratively, generally below interest rates on conventional mortgages. During this period, only about 13 percent of mortgages insured by the Canadian government were made to individuals in the bottom third of the income distribution, compared to 30 percent during 1971-75 when the ceiling was removed entirely. Lawrence B. Smith, "An Analysis of the Effects of the Removal of the Yield Ceiling on Federally Insured Mortgages in Canada," *Journal of Finance* (March 1977), pp. 195-201.

[10]Charles L. France, "Pennsylvania's Floating Usury Ceiling: An Economic Evaluation," Working Paper #1, Federal Home Loan Bank of Pittsburgh, August 1975; Ernest Kohn, Carmen J. Carlo, and Bernard Kaye, "The Impact of New York's Usury Ceiling on Local Mortgage Lending Activity," New York State Banking Department, January 1976, and James E. McNulty, "A Reexamination of the Problem of State Usury Ceilings: The Impact in the Mortgage Market," Working Paper #21, Federal Home Loan Bank Board, March 1979.

[11]Ostas, "Effects of Usury Ceilings"; Philip K. Robins, "The Effects of State Usury Ceilings on Single Family Homebuilding," *Journal of Finance* (March 1974), pp. 227-35; and Kenneth Rosen, "The Impact of State Usury Laws on the Housing Finance System and on New Residential Construction," Princeton University, 1978.

Usury Ceilings and Average Mortgage Interest Rates [1]

CHART II A

Cleveland-Akron-Lorain, OH SCSA [2]

National Average

Usury Rate, Ohio

CHART II B

National Average

Columbus, OH SMSA [3]

Usury Rate, Ohio

CHART II C

Usury Rate, Illinois

National Average

Chicago-Gary, IL-IN SCSA

CHART II D

National Average

Usury Rate, Minnesota

Minneapolis-St. Paul, MN-WI SMSA [2]

CHART II E

Usury Rate, Pennsylvania

National Average

Pittsburgh, PA SMSA [3]

1974   1975   1976   1977   1978   1979

[1] Average mortgage interest rates are effective rates for the purchase of previously-occupied homes.
[2] Effective January 1977, data are based on expanded geographic areas.
[3] Data not available prior to 1977.
    Latest data plotted: Usury Rate-February; Others-March preliminary

Source: Federal Home Loan Bank Board News

FLOATING USURY RATES: A NEW TYPE OF CEILING

In recent years several states have established usury ceilings which are automatically adjusted at frequent intervals to changes in other interest rates (see Table II). Floating ceilings are intended to avoid the harmful effects of fixed ceilings on home financing and residential construction, while still protecting borrowers from possible "exorbitant" interest rates. These floating usury ceilings are tied to various interest rates, the most common being yields on long-term U.S. Government bonds and the Federal Reserve discount rate.

Do Lenders Always Charge the Floating Usury Rate?

One issue that concerns advocates of usury ceilings is whether lenders would always charge the maximum interest rate permissible on residential mortgages. Finance companies which make small loans to individuals often charge the maximum interest rates allowed by states and raise their loan rates whenever the usury limits are raised. Do lenders in the residential mortgage market respond similarly when floating usury ceilings rise?

Chart II provides evidence on this issue. Usury ceilings and average mortgage interest rates are plotted for five metropolitan areas in states which have had floating usury ceilings for several years.[12]

The chart for the Cleveland, Ohio, area requires special explanation, since average mortgage interest rates were above the usury ceiling during 1974-77. Savings and loan associations are exempt from the Ohio usury law, and, therefore, can make mortgage loans at interest rates above the usury ceiling. The same explanation applies to mortgage interest rates for Columbus, Ohio, in 1977, when the survey of mortgage interest rates began for that area. Since the second half of 1977, the usury ceiling has been above average mortgage interest rates, which indicates that the rates lenders charge are not determined by the

floating usury ceiling. Average mortgage interest rates in Cleveland and in Columbus were approximately the same as the national average, both when mortgage rates in those two cities were above the usury ceiling and when they were below.

In the Chicago area, mortgage interest rates apparently were constrained lower than national average mortgage rates in the first half of 1974 by the 8 percent usury ceiling. Contract interest rates were equal to or below the usury ceiling, but effective interest rates were slightly higher due to initial fees. Since early 1975, average mortgage interest rates in the Chicago area have been below the state usury ceiling, following closely the national average mortgage interest rate.

Mortgage rates in Minneapolis were substantially below national average interest rates until early 1976, when the state usury rate was allowed to float at 2 percentage points above the yield on ten-year U.S. Treasury bills.[13] Since then, average mortgage interest rates in the Minneapolis area have been below the usury ceiling and have followed the national average mortgage interest rate. The same pattern holds for Pittsburgh, with average mortgage interest rates in that area remaining substantially below the floating usury ceiling for Pennsylvania since 1977.

Are the Floating Usury Rates Set High Enough?

Use of a *floating* usury ceiling will avoid problems in mortgage financing which occasionally result with *fixed* ceilings only if the floating rate remains above the mortgage interest rates that would prevail in the absence of usury ceilings. Relationships among interest rates vary over time, and, therefore, a floating usury rate which is currently above mortgage interest rates may be below in the future. Also, a floating ceiling which remains above national *average* mortgage rates may not be high enough to enable relatively high-risk borrowers to obtain funds.

The prospects for the various floating usury ceilings to remain above mortgage interest rates in the future can be assessed by examining past relationships between interest rates on conventional residential mort-

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[12]The mortgage interest rates are those on existing homes, which tend to be higher than mortgage rates on newly-built homes. Using the higher of these average interest rates is appropriate in determining whether lenders always charge interest rates equal to the legal maximums, because it intentionally biases the observations in the direction of finding such a pattern. Average mortgage interest rates for the Philadelphia area are based upon a high percentage of mortgage loans made by lenders outside of Pennsylvania. Therefore, observations are not presented for the Philadelphia area.

[13]For a few months in 1974 and 1975, average contract interest rates on conventional residential mortgages on existing homes in the Minneapolis-St. Paul area were above 8 percent. This is probably due to an exemption from the usury laws for loans of $100,000 or more, and loans by some national banks at 1 percentage point above the Federal Reserve discount rate, a permissible interest rate for national banks. The discount rate was above 7 percent during that period.

Table II

Floating State Usury Ceilings

State	Usury Ceiling on Residential Mortgages	Exemptions	Effective Date	Prior Ceiling	Number of months since January 1963 when the implied usury ceilings were equal to or below:[1]		
					National average interest rate on conventional residential mortgages for newly-built homes	National average mortgage interest rate plus 25 basis points	National average mortgage interest rate plus 50 basis points
Alaska	5 percentage points above discount rate of 12th Federal Reserve District	loans over $100,000	June 1976	4 percentage points above discount rate of 12th Federal Reserve District	0	0	0
Delaware	4 percentage points above Federal Reserve discount rate	FHA, VA, and loans over $100,000	August 1974	9%	0	4	17
Georgia	2½ percentage points above monthly index of long-term U.S. Government bond yields, rounded to the nearest 25 basis points	FHA, VA, and loans over $100,000	March 1979	9%	0	0	8
Illinois	2½ percentage points above monthly index of long-term U.S. Government bond yields	FHA and VA loans	January 1977	9½%	0	0	1
Iowa	2 percentage points above index of 10-year constant maturity U.S. Government notes and bonds, with ceiling changed quarterly	FHA and VA loans	July 1978	9%	6	41	113
Minnesota	2 percentage points above monthly index of long-term U.S. Government bond yields, rounded to the nearest 25 basis points	FHA, VA, and loans over $100,000	May 1976	8%	6	49	125
Montana	greater of 10% or 4 percentage points above discount rate of 9th Federal Reserve District on conventional mortgage and VA loans up to $150,000

greater of 10% or 5 percentage points above discount rate of 9th Federal Reserve District on conventional mortgage and VA loans between $150,000 and $300,000 | FHA loans; conventional and VA loans over $300,000 | April 1975 | 10% | 0 | 0 | 0 |

Nevada	12% or 3 ½ percentage points above the lowest daily prime rate at the 3 largest U.S. banks, if this rate is 9% or more	FHA and VA loans	June 1975	12%	0	0	0
New York	2 percentage points above index of 10-year constant maturity notes and bonds, with ceiling set quarterly and increased by no more than 25 basis points from one quarter to the next[2]	FHA, VA, and loans over $250,000 except those secured by 1- to 2-family residential property	May 1979	9 ½ %	19	70	152
North Dakota	greater of 7% or 3 percentage points above the rate on 30-month certificates of deposit[3]	FHA and VA loans	March 1969	7%	31	40	48
Ohio	3 percentage points above discount rate of 4th Federal Reserve District	FHA, VA loans, loans over $100,000, and loans by savings and loan associations	November 1975	8%	50	69	89
Pennsylvania	2 ½ percentage points above the monthly index of long-term U.S. Government bond yields	FHA and VA loans; conventional mortgage loans over $50,000; loans secured by real estate, 3 or more units	January 1974	8%	0	0	1
Vermont	1 ¼ percentage points above the average of the yield of 3- to 5-year U.S. Government securities and the yield on seasoned corporate bonds[4]	FHA and VA loans	March 1979	Same as current ceiling, but subject to maximum rate of 9 ¾ %	112	160	179
West Virginia	1 ½ percentage points above monthly index of long-term U.S. Government bond yields	FHA and VA loans	June 1978	8%	193	193	193

NOTE: Effective May 1, 1979, Tennessee adopted a floating ceiling on residential mortgages set monthly at 2 percentage points above the Federal National Mortgage Association (FNMA) auction rate on conventional mortgages. The implied floating ceiling for Tennessee is above the conventional mortgage rate plus 50 basis points since 1972, when the FNMA series began.

[1]The floating usury ceilings in each month for Alaska, Delaware, Montana, Nevada, and Ohio are based upon the Federal Reserve discount rate or prime rates of large commercial banks for the same month. The floating usury rates in each month for Georgia, Illinois, Minnesota, Pennsylvania, Vermont, and West Virginia are based on specified interest rates in effect two months earlier. The floating rate for Iowa is set quarterly. For each month in a calendar quarter, Iowa's floating rate is based on the specified interest rate in effect two months prior to the beginning month of the quarter. The rate for New York is calculated similarly, except that increases are limited to a maximum of 25 basis points, and that the first quarter of each year begins in February to correspond to the timing of the New York floating rate law.

[2]The usury ceiling on residential mortgages in New York state was increased in January 1979 from 8½% to 9½%, with the floating usury rate taking effect in the quarter beginning May 1979.

[3]Applies to institutions other than savings and loan associations (S&Ls). Conventional mortgage loans made by S&Ls are subject to a ceiling of 12%.

[4]Applies to mortgage loans on 1- to 2-family residential property.

gages and interest rates to which the floating rates are tied. Most floating ceilings have been adopted only since 1974. Suppose, however, they had been in effect since 1963. Would the implied usury ceilings calculated from the floating rate formulas have been higher than the average interest rates on conventional residential mortgages since 1963?[14]

Results of comparisons of implied usury ceilings to mortgage interest rates are presented in the last three columns of Table II. The first of these columns gives the number of months since January 1963 when the implied floating usury ceilings are equal to or *below* the national average interest rate on conventional mortgages for newly-built homes. This table indicates that some states have set their floating usury ceilings too low to avoid disruptions in the flow of credit to home buyers. These observations are especially pertinent for Vermont and West Virginia, which have set their floating rate formulas so low that the implied usury ceilings are below the national average interest rates on conventional mortgages for most months since 1963.[15]

Restrictions on the speed with which floating usury rates are allowed to adjust to changes in market interest rates also create potential problems in home financing. Iowa restricts the speed of adjustment in its floating rate by setting its usury ceiling quarterly, at 2 percentage points above the yield on ten-year U.S. Treasury bonds. The implied usury rates calculated for Iowa are below the conventional mortgage interest rate for six months since 1963. If the floating ceiling rate for Iowa were set monthly instead of quarterly, the implied usury rate would have been below the national average mortgage rate for only one month since January 1963.

The floating usury rate formula recently adopted by New York state restricts the speed of adjustment

to other interest rates even more than that of Iowa.[16] Under the New York law, the usury rate will be set quarterly at 2 percentage points above the yield on ten-year U.S. Treasury bonds, but increases in the usury rate from one quarter to the next may be no greater than 25 basis points. The implied usury rates based upon the New York specification are equal to or less than mortgage interest rates for nineteen months over the period since 1963, more than three times as often as for Iowa which does not limit the quarterly changes in its usury rate.

Minnesota has another type of restriction on the speed of adjustment of its usury ceiling. The floating ceiling is adjusted *monthly* to a level 2 percentage points above the yield on ten-year U.S. Treasury bonds, but rounded to the nearest 25 basis points. If, for instance, the yield on ten-year U.S. Treasury bonds is 8.12 percent, the usury ceiling in Minnesota is 10 percent; with a ten-year bond yield of 8.13 percent, the usury ceiling is 10.25 percent. Rounding to the nearest 25 basis points tends to delay the rise in the usury ceiling when long-term interest rates are rising, and to delay the decline in the usury ceiling when long-term rates are declining. Since January 1963, the implied usury ceiling for Minnesota is less than the national average mortgage interest rate for six months, whereas it would have been below for only one month without rounding to the nearest 25 basis points.

To some extent these restrictions on the speed of adjustment defeat the purpose for having a floating usury rate. The restrictions occasionally cause the implied floating usury rates for Iowa, Minnesota, and New York to be below mortgage interest rates when long-term interest rates are rising rapidly.

The relatively low usury ceiling in Ohio during 1976-77 illustrates the problem with tying a usury ceiling to the Federal Reserve discount rate. When Ohio initially adopted the floating usury ceiling in November 1975, the usury rate was increased 100 basis points to only 25 basis points below the national average mortgage interest rate. However, the gap between the usury rate and the national average mortgage rate began to widen almost immediately, as the Federal Reserve twice lowered the discount rate during 1976. Two major problems with tying usury ceilings on residential mortgage interest rates to the discount rate are these: 1) the Federal Reserve generally adjusts the discount rate to changes in *short-term* market interest rates, whereas mortgages are

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[14]These comparisons may understate the effects of usury ceilings on the flow of credit to home buyers, since some of the mortgage interest rates incorporated in the national average rate were at times constrained by usury ceilings. One study reports that when interest rates are relatively low, the average mortgage interest rates in areas with relatively high usury ceilings are approximately equal to the national average rate, but when interest rates are high, increases in the national average rate lag behind the increases in areas with relatively high usury ceilings. See McNulty, "A Reexamination of the Problem of State Usury Ceilings," pp. 5-9.

[15]Two other states with implied floating usury ceilings which were below mortgage interest rates for a substantial number of months are North Dakota and Ohio. However, those states make exceptions for S&Ls. In North Dakota, S&Ls are subject to a 12 percent usury ceiling, and in Ohio, S&Ls are exempt from the usury ceiling. Therefore, the major effect of usury ceilings on residential mortgages in these states is to determine which financial institutions make mortgage loans during certain periods.

[16]The New York usury ceiling on residential mortgages was recently raised to 9.50 percent, and beginning May 1, 1979, will be set quarterly according to a floating rate formula.

long-term investments, and there often are large gaps between short-term and long-term interest rates, and 2) at times, the discount rate, being set by administrative action and not by market forces, is allowed to remain out of line with other interest rates.

The potential for the floating usury rates to create mortgage financing problems for relatively high-risk borrowers can be assessed by adding 25 to 50 basis points to the average conventional mortgage rate on newly-built homes, and comparing that interest rate to the implied floating ceilings for each month since 1963. Two recent studies indicate that a state's usury ceiling must be at least 50 basis points above the national average mortgage interest rate in order to avoid impeding the flow of credit to relatively high-risk borrowers.[17]

For several states, the floating usury rates are almost always above the average mortgage rate, but are *below* the average mortgage rate plus 25 basis points for a substantial number of months. Of course, the differences are even greater with 50 basis points added. The frequency with which implied usury ceilings are below the average mortgage interest rate plus 50 basis points is especially great for states with restrictions on the speed of adjustment of their floating rates. For instance, the average mortgage interest rate plus 50 basis points is above the implied usury rate for New York about 80 percent of the time since 1963, and above the implied usury ceiling in Minnesota about 65 percent of the time. Thus, floating usury ceilings in several states are likely to ration relatively high-risk borrowers out of the mortgage market much of the time. This is substantiated by a study of Minnesota's floating usury ceiling which reports that conventional mortgage loans in that state continue to have relatively high percentage down payments since the floating ceiling was adopted.[18]

In contrast, states with usury ceilings 2.50 percentage points above yields on long-term U.S. Government bonds, or 5 percentage points above the Federal Reserve discount rate, and no restrictions on the speed of response of usury ceilings to changes in

the interest rates to which they are tied, are almost always above the national average mortgage interest rate. This result holds even with additional basis points added to the average mortgage rate to allow for a risk premium for loans with higher-risk characteristics.[19] These appear to be the minimum differentials above the yields on ten-year U.S. Treasury bonds and the Federal Reserve discount rate which are necessary to avoid impeding the flow of credit to home buyers.

CONCLUSIONS

Since fixed usury ceilings on residential mortgage interest rates, at times, have had adverse effects on home financing and residential construction, several states recently have adopted floating usury rates in an attempt to avoid these adverse effects when mortgage interest rates rise. These floating usury rates are increased or decreased in specified relationships to various other interest rates, the most common being yields on ten-year U.S. Treasury bonds and the Federal Reserve discount rate.

Two issues are raised concerning the effects of the floating usury rates. The first is whether mortgage interest rates equal the floating usury ceilings. In general, average mortgage interest rates charged by lenders in areas subject to floating usury ceilings remain approximately equal to *national* average mortgage interest rates, not the floating usury ceilings.

The other issue is whether the floating usury rates adopted by various states have been set high enough to remain above national average interest rates on residential mortgages over time. Based upon past relationships between mortgage interest rates and the other interest rates to which the floating usury ceilings are tied, floating usury rates for a few states were below national average mortgage interest rates for substantial periods of time. Floating usury ceilings in several additional states are set so close to average mortgage interest rates that relatively high-risk borrowers will frequently be rationed out of the market for conventional residential mortgages. In contrast, states with usury rates set 2.50 percentage points above yields on ten-year U.S. Treasury bonds or 5 percentage points above the Federal Reserve discount rate appear to have set their usury ceilings high enough to avoid impeding the flow of credit to home buyers.

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[17]One study finds that Georgia's usury ceiling begins to affect mortgage loan originations by savings and loan associations in Georgia when the market interest rate on mortgages rises to within 50 basis points of the usury ceiling. McNulty, "A Reexamination of the Problem of State Usury Ceilings." A survey of interest rates on loan commitments finds that interest rates on loans with loan-to-price ratios of 95 percent are 40 to 50 basis points above those on loans with loan-to-price ratios of 75 percent. Zabrenski, "New Measures of Mortgage Rates and Lending Policies."

[18]David S. Dahl, Stanley L. Graham, and Arthur J. Rolnick, "Minnesota's Usury Law: A Reevaluation," *Ninth District Quarterly*, Federal Reserve Bank of Minneapolis (Spring 1977), pp. 1-6.

[19]The result also holds for Tennessee's recently adopted floating ceiling (effective May 1, 1979) set at 2 percentage points above the Federal National Mortgage Association (FNMA) auction rate on conventional mortgages. The implied floating ceiling for Tennessee is above the conventional mortgage rate plus 50 basis points since 1972, when the FNMA series began.

Did Discount Rate Changes Affect the Foreign Exchange Value of the Dollar During 1978?

DOUGLAS R. MUDD

U.S. monetary policy in 1978 showed an increased sensitivity to international considerations, as indicated by statements accompanying last year's discount rate changes (see Exhibit I). Conditions in foreign exchange markets were cited among the reasons for five of the seven discount rate increases in 1978. In contrast, international considerations were not mentioned among the reasons for any of the four discount rate changes in the previous two years.[1]

Some economists believe that discount rate increases affect financial asset markets through "announcement effects" which, by causing market participants to expect future interest rates to be higher than previously anticipated, exert immediate downward pressure on financial asset prices.[2] Several studies have found support for the existence of such announcement effects on the U.S. and Canadian economies, while another has discovered no evidence of a significant relationship between discount rate changes and fluctuations in financial asset prices in the United States over the recent past.[3]

This article examines, in a relatively non-technical fashion, the announcement effect of discount rate changes on the foreign exchange value of the dollar in 1978. Despite the reported purposes of these discount rate increases, there does not appear to have been a general, significant announcement effect of discount rate changes on foreign exchange markets.

WHY SHOULD DISCOUNT RATE CHANGES HAVE ANNOUNCEMENT EFFECTS?

The discount rate is the interest rate charged by the Federal Reserve on short-term loans to member banks. Under present operating procedures, the effectiveness of discount rate changes per se in achieving the general objectives of monetary policy, particularly the control of bank reserve or money stock growth, is questionable. Increases in reserve requirements and Federal Reserve sales of U.S. Government securities reduce the amount of member bank reserves available to expand loans and deposits. Discount rate increases, however, do not necessarily produce the same effect. Although increases in the discount rate raise the cost of borrowing reserves, borrowings from the Federal Reserve comprise a minor proportion of total reserves.[4] Raising the discount rate to reduce member bank borrowing is neither a powerful nor a widely-used monetary policy tool at the present time.

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[1]"Announcements," Federal Reserve Bulletin (January 1976), p. 65; (December 1976), p. 1061; (September 1977), p. 867; (November 1977), p. 1031.

[2]For an extensive discussion of the announcement effect see Warren L. Smith, "The Instruments of General Monetary Control," National Banking Review (September 1963), pp. 47-76.

[3]Evidence of announcement effects on common stock prices in the United States was presented by Roger N. Waud, "Public Interpretation of Federal Reserve Discount Rate Changes: Evidence on the 'Announcement Effect,'" Econometrica (March 1970), pp. 231-50. Evidence of announcement effects on the Canadian economy was presented by M. L. Kliman, "The Administered Bank Rate and Its Announcement Effect," Canadian Journal of Economics (November 1974), pp. 625-41. For evidence against the existence of any sort of meaningful announcement effects in the United States after 1967 see Raymond E. Lombra and Raymond G. Torto, "Discount Rate Changes and Announcement Effects," Quarterly Journal of Economics (February 1977), pp. 172-76.

[4]See R. Alton Gilbert, "Benefits of Borrowing from the Federal Reserve when the Discount Rate is Below Market Interest Rates," this Review (March 1979), pp. 25-32 and Elijah Brewer, "Some Insights on Member Bank Borrowing," Federal Reserve Bank of Chicago Economic Perspectives (November/December 1978), pp. 16-21.

Exhibit I

Discount Rate Increases During 1978

Date of Announce- ment	Effective Date of Change	Previous Discount Rate	New Discount Rate	Reason for Increase[1]
January 6	January 9	6 %	6½ %	The recent disorder in foreign exchange markets constitutes a threat to orderly expansion of the domestic and international economy. In view of this, the Board of Governors of the Federal Reserve System today approved an increase in the discount rate. . . .
May 11	May 11	6½	7	Action was taken in recognition of increases that have already occurred in other short-term interest rates and will bring the discount rate into closer alignment with short-term rates generally.
June 30	July 3	7	7¼	Action was taken in recognition of increases that have occurred recently in other short-term interest rates and to bring the discount rate into closer alignment with short-term rates generally.
August 18	August 21	7¼	7¾	Action was taken in view of recent disorderly conditions in foreign exchange markets as well as the continuing serious domestic inflationary problems.
September 22	September 22	7¾	8	Action was taken in recognition of recent increases in other short-term interest rates, to bring the discount rate into closer alignment with short-term rates generally, and as a further step to strengthen the dollar.
October 13	October 16	8	8½	The action was taken to bring the discount rate into closer alignment with increased short-term market interest rates, and in recognition of continued high inflation, the recent rapid rate of monetary expansion and current international financial conditions.
November 1	November 1	8½	9½	The Treasury Department and the Federal Reserve today announced measures to strengthen the dollar and thereby counter continuing domestic inflationary pressures. The Federal Reserve Board announced the following specific actions: — approval of a one percentage point increase in the discount rate at the Federal Reserve Bank of New York. . . .

[1]Excerpts from Federal Reserve press releases.

Nevertheless, announcements of discount rate changes may affect economic activity if they seem to signal unanticipated changes in future monetary policy, since such changes in expectations generally are presumed to influence trading in equity and financial asset markets, such as the markets for bonds, common stocks, and foreign currencies. For example, stock prices might fall subsequent to an announcement of a discount rate increase if it seemed to signal an unanticipated change in policy toward monetary restraint. Expected future sales and, hence, profits of firms would fall as expected future growth in aggregate demand is revised downward, resulting in a current drop in equity prices.

Similarly, foreign exchange market participants could also interpret a discount rate increase as an indication of unanticipated future U.S. monetary restraint. If expectations about U.S. money stock growth were fundamentally related to the foreign exchange value of the dollar, changing expectations of future money growth would have an immediate impact on the relative prices of currencies on the foreign exchange market. Announcements of unanticipated changes in U.S. monetary policy thus would result in immediate changes in the foreign exchange value of the dollar. For example, if U.S. money stock growth were previously expected to remain high but now is expected to decline significantly, an upward adjustment in the foreign exchange value of the dollar should result.

EXCHANGE RATE MOVEMENTS: A MONETARY INTERPRETATION

The effects of changes in expectations of future monetary actions on the foreign exchange value of the dollar should be analyzed within a monetary framework in which exchange rates are identified as the relative prices of national moneys.[5] The "price" of a national money is measured by the amount of goods, services, and financial assets which can be purchased for a unit of that money. If the outstanding stock of money is larger than the amount people desire to hold (given current levels of real income, interest rates, and prices), the attempt to reduce

[5]See Michael Mussa, "The Exchange Rate, the Balance of Payments and Monetary and Fiscal Policy Under a Regime of Controlled Floating," *Scandinavian Journal of Economics*, No. 2 (1976), pp. 229-48, especially pp. 230-36.

money holdings by increasing purchases of goods, services, and financial assets will result in a general increase in their prices. Consequently, the amount of goods and services (including financial assets) which can be purchased for a unit of money declines; the price of money falls.

Similarly, the exchange value of one currency in terms of another will fall if the price of one currency in terms of goods and services falls relative to the price of the other currency. Consider the following hypothetical example: Suppose that, at current general price levels in both Germany and the United States, the dollar/mark exchange rate is one to one, and that the amount of goods and services which can be purchased in the United States for one dollar equals the amount which can be purchased in Germany for one mark. Now, let U.S. prices unexpectedly rise by, say 10 percent, while German prices remain constant. The amount of goods and services which one dollar can purchase in the United States is now 10 percent lower than the amount which can be purchased for one mark in Germany. At the existing exchange rate, people will now prefer to convert dollars to marks and purchase the relatively cheaper German goods and services. Subsequent purchases of marks with dollars will result in a 10 percent rise in the price of the mark in terms of dollars — or conversely, a 10 percent fall in the price of the dollar in terms of marks — provided that no attempt is made to "peg" the exchange rate.[6]

It should be clear that the dollar/mark exchange rate represents the U.S. dollar price of one German mark. At any point in time, this price will be determined by the relative amounts of U.S. and German moneys in existence and the relative amounts of each currency which people are willing to hold. A simplified algebraic representation of the exchange rate determination is:

$$e = \left(\frac{M_{us}}{M_f}\right)\left(\frac{L_f}{L_{us}}\right)$$

or, in terms of growth rates:

$$\dot{e} = (\dot{M}_{us} - \dot{L}_{us}) - (\dot{M}_f - \dot{L}_f)$$

where e is the price of a unit of foreign currency in terms of the U.S. dollar, M_{us} is the U.S. money stock, M_f is the foreign money stock, L_{us} is the amount of real U.S. money balances people are willing to hold (the demand for real U.S. money balances), L_f is the amount of real foreign money balances people are willing to hold (the demand for real foreign money balances), and "•" is the percentage change.[7]

From the above equations, it is clear that the price of a foreign currency in terms of the U.S. dollar will rise (that is, the dollar will depreciate) if the difference between changes in the U.S. money stock and the demand for U.S. real money balances is greater than the difference between changes in the foreign money stock and the demand for foreign real money balances. It is also clear that relative changes in money stocks alone will determine exchange rate movements *only* if changes in the quantities of U.S. and foreign moneys demanded are identical ($\dot{L}_{us} = \dot{L}_f$). There is no reason, however, to expect changes in the quantities of real money balances demanded to be equal across all countries. Thus, relative changes in the amount of moneys demanded are as important as relative changes in money stocks in determining exchange rate movements.

Among the determinants of the demand for real money balances is the expected rate of inflation. An increase in the expected rate of inflation will reduce the quantity of real money balances demanded. Thus, changes in expected rates of inflation among various countries will affect exchange rates through their impact on the amount of national real money balances demanded. A rise in the expected rate of U.S. inflation, all other things remaining constant, will result in a depreciation of the dollar (e rises) by reducing the amount of U.S. real money balances demanded relative to the amount of foreign real money balances demanded (L_{us} declines relative to L_f). The impact on the foreign exchange value of the dollar is reinforced if the change in inflationary expectations results from a rapid increase in the U.S. money stock (in this case, M_{us} would rise relative to M_f, and L_{us} would fall relative to L_f).

Relative amounts of real money balances demanded also can be significantly affected by expectations of future exchange rate movements between two national currencies, another determinant of the demand for real money balances.[8] That is, all other things being equal, if the expected future foreign exchange

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[6]This example implicitly assumes that output does not increase proportionally with money stock increases. Further, transportation and other transactions costs are ignored.

[7]A formal derivation and discussion of a extended version of this equation can be found in Rudiger Dornbusch, "The Theory of Flexible Exchange Rate Regimes and Macroeconomic Policy," *Scandinavian Journal of Economics*, No. 2 (1976), pp. 255-75.

[8]See Mussa, "The Exchange Rate," pp. 236-37. Since the expected return on holdings of foreign rather than domestic currency depends on the expected future exchange rate, factors influencing expectations of future exchange rates will affect the relative amounts of national moneys demanded.

Chart I
Weighted Average Foreign
Currency Price of U.S. Dollar
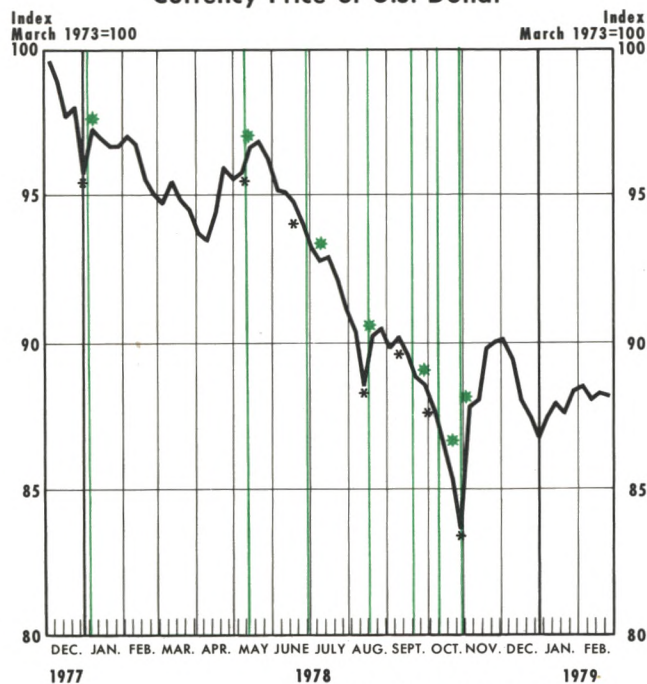
Source: Federal Reserve Statistical Release H.13

Note: The exchange rate data are weekly averages ending Wednesday Discount rate changes are shown as vertical lines on the effective dates of the changes.
* Exchange rate in the week prior to each discount rate change.
* Exchange rate in the week following each discount rate change.

value of the dollar suddenly is revised downward, the quantity of U.S. real money balances demanded could decrease sufficiently relative to the quantity of foreign real money balances demanded to produce an immediate depreciation of the dollar. It is assumed that expectations of future exchange rates are formed primarily on the basis of expectations about the future value of variables which determine the amounts of national moneys demanded and supplied. Thus, changing expectations of future relative money stock growth rates (and, hence, relative levels of various future national money stocks) will produce fluctuations in current exchange rates.

If discount rate increases are interpreted as indications of unanticipated future U.S. monetary restraint, expectations of future U.S. money stock growth (and, hence, future U.S. inflation rates) would be lowered, resulting in a rise in the expected future foreign exchange value of the dollar. The quantity of dollars currently demanded would then rise relative to the quantities of other currencies demanded, perhaps sufficiently enough to result in a rise in the current foreign exchange value of the dollar, even if U.S. money stock growth does not immediately decelerate.

However, if no indication of actual monetary restraint subsequently appears, the rise in the value of the dollar would be reversed.

MOVEMENTS IN THE VALUE OF THE DOLLAR FOLLOWING ANNOUNCEMENTS OF DISCOUNT RATE CHANGES IN 1978

To what extent did last year's discount rate increases affect the foreign exchange value of the dollar? Of the seven announcements accompanying the discount rate increases in 1978, only those of May 11 and June 30 did not mention foreign exchange market conditions. The other five listed "disorderly" foreign exchange market conditions among the reasons for the discount rate change. The data presented in Chart I provide little indication that the stated purposes for raising the discount rate had a subsequent influence on the behavior of the dollar on foreign exchange markets.

The May 11 discount rate increase was preceded by several weeks of generally stable dollar exchange rates, and was followed by two weeks of only a slight increase in the foreign exchange value of the dollar. In contrast, the July 3 change in the discount rate was preceded by a period of generally declining dollar exchange rates, which continued until mid-August. Thus, there appears to be no obvious change in the direction of exchange rate movements following those announcements which ignored foreign exchange market conditions.

There also was little change in the generally declining pattern of the weekly-average foreign exchange value of the dollar following the September 22 and October 16 discount rate increases, although international financial conditions were listed among several reasons for these increases. The value of the dollar on foreign exchange markets did rise following the discount rate increases of January 9, August 21, and November 1. The announcements of these changes dealt almost exclusively with foreign exchange market conditions.

An examination of the weekly percentage changes in the average foreign exchange value of the dollar for the weeks surrounding each discount rate increase in 1978, shown in Table I, apparently denies the existence of a general announcement effect. First, three of the seven D_1 differences in one-week changes are inconsistent with the announcement effect hypoth-

esis. The value of the dollar actually fell more during the week of the discount rate increases of July 3, September 22, and October 16, than it had in the week preceding each of these changes. Further, considering all seven cases together, one cannot reject the hypothesis that the percentage change in the foreign exchange value of the dollar in the week of each discount rate increase did not differ significantly from the change in the prior week.[9]

Similarly, one cannot reject the hypothesis that the percentage change in the foreign exchange value of the dollar in the week following each discount rate change did not differ significantly from the change in the week before each rate increase.[10] In other words, a simple statistical test on the differences in Table I indicates that, in general, there was no major impact on the foreign exchange value of the dollar consequent to the discount rate increases in 1978.

Table I

Changes in Weighted Average Foreign Exchange Value of the U.S. Dollar Surrounding Discount Rate Changes in 1978

| Week of Discount Rate Change[1] | Percent Change Over the Week | | | Differences | |
	Prior to Discount Rate Change	Of the Discount Rate Change	Following the Discount Rate Change	D_1[2]	D_2[3]
January 11	– 2.3%	1.5%	– 0.2%	3.8	2.1
May 17	0.2	0.9	0.2	0.7	0.0
July 5	– 0.7	– .09	– 0.5	– 0.2	0.2
August 23	– 2.1	1.9	0.3	4.0	2.4
September 27	– 0.6	– 0.8	– 0.4	– 0.2	0.2
October 18	– 0.9	– 1.3	– 1.4	– 0.4	– 0.5
November 8	– 1.9	4.8	0.3	6.7	2.2

[1]Week ending the Wednesday following the day a discount rate change became effective.

[2]Change over the week during which a discount rate change occurred minus the change over the week preceding the discount rate change.

[3]Change over the week following a discount rate change minus the change over the week prior to the change.

SOURCE: Federal Reserve Statistical Release H.13.

This conclusion can be tested more rigorously, using a simple statistical model of the weekly percentage changes in the foreign exchange value of the dollar. The model is autoregressive. This means that, in the absence of discount rate changes, the weekly percentage change in the foreign exchange value of the dollar depends upon a constant (called "drift") and the change over the prior week. This model allows past information on exchange rate movements to affect the current week's change.[11]

Announcement effects can be tested by examining the impact of discount rate changes on changes in the foreign exchange value of the dollar over several weeks following each discount rate change. To examine this impact, weekly percentage changes in the weighted average foreign exchange value of the dollar were regressed against a constant, the percentage change in the foreign exchange value of the dollar in the previous week, and dummy variables designed to represent the one-, two-, and three-week announcement effects following the discount rate changes. The results appear in Table II.

If the coefficient on the previous week's percentage change in the exchange rate ($\Delta \ln X_{t-1}$) is not significantly different from zero (which is the case in both equations), then changes in the foreign exchange value of the dollar are a function of the constant, the announcement effect of discount rate changes (represented by the dummy variables), and a random error term. The constant is significantly negative in both equations, indicating downward "drift" in the exchange rate of about .3 percent per week during the sample period.

Equation 1 in Table II indicates that the discount rate changes in the period, September 14, 1977 – February 14, 1979, did have a significant one-week impact on the value of the dollar on foreign exchange markets. However, this result can be further analyzed in light of the importance of *unanticipated* discount rate changes in the formulation of the announcement effect hypothesis.

[9]Testing the significance of the difference between the sample mean of D_1 from a hypothetical value of zero yields a t-statistic of 0.72.

[10]Testing the significance of the difference between the sample mean of D_2 from a hypothetical value of zero yields a t-statistic of 1.74.

[11]In an efficient market, knowledge of the past change in the exchange rate should provide no useful information about the change in the exchange rate in the current week. Under this hypothesis, weekly percentage changes in the exchange rate are referred to as a "random walk" (with or without "drift," depending upon the significance of the constant).

Table II

Estimation of Announcement Effects
September 14, 1977 — February 14, 1979

Equation 1:

$$\Delta \ln X_t = a_0 + a_1 \Delta \ln X_{t-1} + a_2 D_1 + a_3 D_2 + a_4 D_3$$

$a_0 = -0.0037^*$	$a_2 = 0.0151^*$	$\overline{R}^2 = .0855$
$a_1 = 0.1203$	$a_3 = -0.0050$	$DW = 2.0464$
	$a_4 = 0.0052$	$SE = .0096$

Equation 2:

$$\Delta \ln X_t = b_0 + b_1 \Delta \ln X_{t-1} + b_2 DO_1 + b_3 DO_2 + b_4 DO_3$$
$$+ b_5 DN_1 + b_6 DN_2 + b_7 DN_3$$

$b_0 = -0.0030^*$	$b_2 = 0.0050$	$b_5 = 0.0538^*$	$\overline{R}^2 = .3812$
$b_1 = 0.1079$	$b_3 = -0.0012$	$b_6 = 0.0008$	$DW = 2.0800$
	$b_4 = -0.0043$	$b_7 = 0.0225^*$	$SE = .0079$

$\Delta \ln X$ = first difference in logarithms of weighted-average foreign currency price of U.S. dollar.

D_1, D_2, D_3 = dummy variables representing the first, second, and third week announcement effects subsequent to discount rate changes.

DO_1, DO_2, DO_3 = dummy variables representing the first, second, and third week announcement effects subsequent to all discount rate changes except the November 1, 1978 change.

DN_1, DN_2, DN_3 = dummy variables representing the first, second, and third week announcement effects subsequent to the November 1, 1978 discount rate change.

*Significantly different from zero at the 95 percent level.

WERE THE 1978 DISCOUNT RATE CHANGES ANTICIPATED?

If an announcement of a discount rate change represents "new" information, a change in the behavior of the dollar on foreign exchange markets could result as expectations are revised. If the discount rate change had been previously anticipated, however, it would not alter expectations, and, hence, would have no impact on the foreign exchange value of the dollar. For example, following the discount rate change on August 21, it was reported that ". . . the Federal Reserve's move to raise the discount rate by half a percent . . . was so predictable as to be almost insignificant in the view of most traders."[12]

Anticipation of discount rate changes during 1978 could have resulted from a recognition that they generally follow a wide spread between the discount rate and short-term market interest rates. The spread between the Federal funds rate (the interest rate paid by commercial banks on reserves borrowed from other commercial banks) and the discount rate over the past fifteen months is depicted in Chart II. As shown in the chart, each discount rate change in 1978 was preceded by at least one week during which the spread between the funds rate and the discount rate was 60 or more basis points.

The November 1 discount rate increase, however, differed in several respects from the other six changes. First, it followed the previous change by only fifteen days. The average length of time between the five discount rate changes between May and October was thirty-nine days. Second, its one percentage point increase in the discount rate was the largest increase since March 1933. Third, it accompanied statements about the U.S. Treasury and Federal Reserve System's intentions of intervening in foreign exchange markets to support the dollar.[13] Consequently, the November 1 announcement could have had a larger impact on expectations of future U.S. policy actions affecting the foreign exchange value of the dollar than the previous six announcements in 1978.
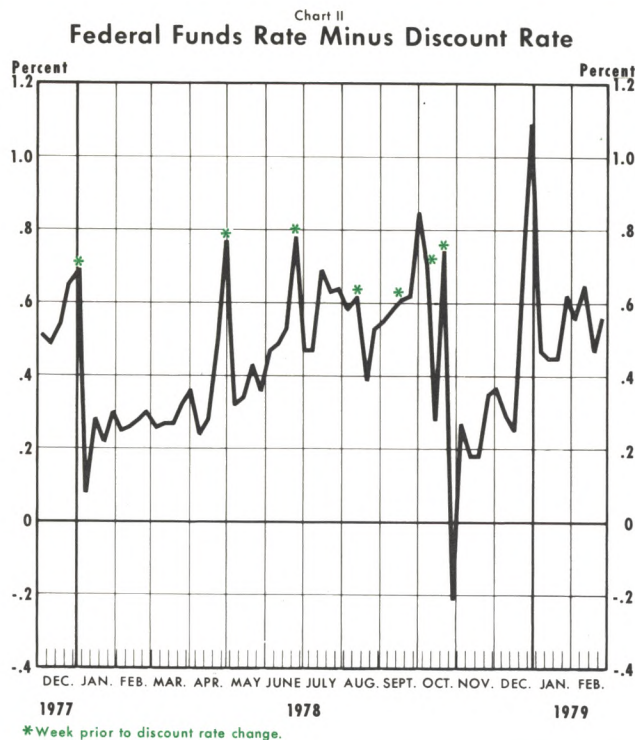
Whether the November 1 announcement produced a significantly greater impact on foreign exchange market participants' expectations than the previous discount rate changes can be determined by comparing the estimation results of equations 1 and 2 in Table II. Changes in the foreign exchange value of the dollar following the November 1 announcement were accounted for by a separate set of dummy vari-

[12]Wendy Cooper, "Currency Traders Expect New Moves," *New York Journal of Commerce*, August 21, 1978.

[13]The November 1 announcement included the following measures intended to strengthen the dollar: (1) a one percentage point increase in the discount rate; (2) a supplementary reserve requirement equal to 2 percent of time deposits in denominations of $100,000 or more; (3) the arrangement of various facilities through which the United States could obtain up to $30 billion in foreign currencies to be used in foreign exchange market intervention to support the dollar and (4) a quadrupling of previously announced U.S. Treasury gold sales (to 1.5 billion ounces per month).

Chart II
Federal Funds Rate Minus Discount Rate

*Week prior to discount rate change.

followed (by only two trading days) the announcement that the U.S. Treasury and Federal Reserve would actively use the "swap" network to " . . . re-establish order in the foreign exchange market."[15] Again, this announcement could have had a larger impact on foreign exchange markets than the subsequent increase in the discount rate.[16] However, when viewed more generally (as in Table II, equation 2), any announcement effect which might be attributed to the January 9 discount rate increase does not alter the conclusion that the foreign exchange value of the dollar was, in general, unaffected by the six discount rate increases between January and October 1978.

SUMMARY

According to a monetary interpretation, relative changes in the differences between the amounts of money supplied and demanded across countries are the primary determinants of exchange rate movements. If changes in expectations cause exchange rate fluctuations, then variations in expected future money stock growth rates could produce such fluctuations. For example, if the growth of the U.S. money stock suddenly is expected to decline, a short-term appreciation of the dollar could result as the amount of U.S. money demanded rises relative to the amount of foreign money demanded (assuming nothing else changes at the same time).

The seven announcements of U.S. discount rate increases during 1978 could have been interpreted as signals of forthcoming monetary restraint. A temporary reversal in the declining pattern of the foreign exchange value of the dollar followed the three announcements which focused primarily on strengthening the dollar as a reason for increasing the discount rate. However, there is evidence that, except for the November 1 change, the foreign exchange value of the dollar was not generally influenced by the discount rate increases announced last year.

ables in equation 2. The results indicate that percentage changes in the foreign exchange value of the dollar for three weeks following the November 1 discount rate change increased significantly. However, on average, the discount rate changes prior to November 1 had no significant effect on changes in the foreign exchange value of the dollar (none of the individual coefficients on the dummy variables, nor their sum, is significantly different from zero at the 95 percent level). Furthermore, since the November 1 announcement contained information other than a discount rate increase which could have affected expectations about U.S. policy actions, evidence for a November 1 announcement effect could be overstated by equation 2.

There are indications that the January 9 discount rate increase also significantly affected the value of the dollar on foreign exchange markets. For example, despite the 69 basis point spread between the Federal funds rate and the discount rate in the week before the change, several sources described the January 9 discount rate increase as unanticipated.[14] More importantly, however, the discount rate increase

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[14]See, for example, J. Henry Schroder Bank & Trust Company, "The Schroder Report", January 16, 1978, p. 1 and Aubrey G. Lanston & Co. Inc., January 16, 1978, p. 1.

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[15]Federal Reserve, press release, January 4, 1978. A "swap" arrangement is a renewable short-term facility under which a central bank agrees to exchange a specified amount of its own currency for the currencies of other central banks.

[16]The results of estimating an equation similar to equation 2 in Table II with separate dummy variables for the January discount rate increase indicate a significant coefficient on the dummy variable representing the announcement effect in the week following the discount rate change. However, in both the November and January cases it is not possible from these results to separate any announcement effects of the discount rate changes from any effects associated with statements about the United States' intentions to support the value of the dollar through foreign exchange market intervention.

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Marion
Fort Leonard Wood
Carbondale
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Paducah
Poplar Bluff
Mayfield
Murray
Union City
FAYETTEVILLE-SPRINGDALE
Paragould
Dyersburg
Humboldt
FORT SMITH
Russellville
Jonesboro
Blytheville
Jackson
Conway
Forrest City
MEMPHIS
LITTLE ROCK
West Helena
Corinth
Stuttgart
Hot Springs
Helena
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PINE BLUFF
Clarksdale
Cleveland
TEXARKANA
Camden
Greenwood
Columbus
Greenville
Starkville
Magnolia
El Dorado

Bedford
Seymour
Vincennes
Madison
Washington
EVANSVILLE
Frankfort
LOUISVILLE
OWENSBORO
Fort Knox
Danville
Elizabethtown
Madisonville
Bowling Green
Glasgow
CLARKSVILLE-HOPKINSVILLE

Legend

⊛ Head Office of the FRB, St. Louis
✪ Branch Offices of the FRB, St. Louis
◼ Standard Metropolitan Statistical Areas

▣ Places over 50,000
◼ Places of 40-50,000
◉ Places of 30-40,000
● Places of 10-20,000
○ Places of 20-30,000

Population is based on the 1970 census.

District States

Ill. Ind.
Mo. Ky.
Ark. Tenn.
Miss.

— State Boundaries
— District Boundary

Scale in Miles   0   32   64   96

Federal Reserve Bank of St. Louis   DECEMBER 1975