

A Monetary Analysis of the Administration's Budget and Economic Projections

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THE administration's budget proposals and economic report, presented to Congress and the nation in early February, have generated considerable controversy.¹ The prospect of historically large deficits through 1987 has especially unsettled many observers. Many question the plausibility of the administration's economic forecast, which they consider too optimistic.

Economic forecasts have always been a critical part of the budget process. One can see, however, how their importance is magnified in an inflation-swollen economy. A re-estimate of GNP growth by only 1 percent, for example, results in a change of \$13 billion in federal budget receipts within two years.² In addition, federal expenditures in recent years have become more sensitive to the pace of inflation and output, as the number of inflation-indexed programs and income-security programs, which automatically change in response to economic conditions, has increased.

Aside from the budget issue, the administration's projections are of general interest because they reflect the philosophy that guides the administration's economic policies. This year's budget and economic report provide the first detailed statement of the administration's economic philosophy. One key difference from the previous administration's philosophy is in the interpretation and role of monetary actions in the determination of economic events.

This article analyzes the role of monetary actions in the current administration's economic framework. The discussion evaluates the consistency of the administration's economic projections, given the structure of the economy and past experience with lags in the effect of economic policy. The basis for this evaluation is a monetary model of the U.S. economy developed at the Federal Reserve Bank of St. Louis.³ The implications of the analysis also are applied to the federal budget outlook.

MONETARY ANALYSIS AND THE ECONOMIC REPORT

The Economic Report of the President and The Annual Report of the Council of Economic Advisers (CEA Report) together provide a concise summary of the economic philosophy behind the administration's decision-making. President Reagan's report devotes relatively little space to the subject of monetary policy, although the president states support for "... a policy of gradual and less volatile reduction in the growth of the money supply."⁴ This support contrasts with President Carter's statement a year earlier "... that public opinion not hold the Federal Reserve to such a rigid form of monetary targeting as to deprive it of the flexibility it needs to conduct a responsible monetary policy."⁵

The most explicit discussion of the role of monetary actions in the administration's economic framework is in the CEA Report. For example, in the opening chapter, which summarizes current economic conditions, the CEA singles out the varying

¹*Budget of the United States Government for Fiscal Year 1983* (hereafter referred to as *Fiscal 1983 Budget*) and the *1982 Economic Report of the President*, which also includes the 1982 Annual Report of the Council of Economic Advisers (hereafter referred to as *CEA Report*).

²See *Fiscal 1983 Budget*, p. 2:9.

³For details of this model, see the appendix.

⁴*1982 Economic Report of the President*, p. 8.

⁵*1981 Economic Report of the President*, p. 13.

and generally restrictive rate of monetary expansion as the chief culprit responsible for the economy's unsatisfactory performance in the 1979-81 period. The CEA goes on to say that "continued monetary restraint and a reduction of the within-year variability of money growth . . . are necessary both to reduce inflation and provide the basis for sustained economic growth."⁶

The CEA Report's overall theme is that the federal government's role in economic affairs should be reduced. Consistent with that theme is a program to control inflation, which, as the CEA states forcefully, is essentially a monetary phenomenon. Thus, ". . . a decrease in money growth is the necessary strategy to end inflation."⁷ In light of the important role that expectations play in the inflationary process, the CEA is very specific: "For the Federal Reserve, this means setting money growth targets consistent with a sustained decrease in the rate of inflation and then adhering to those targets."⁸

After establishing these guidelines for an anti-inflationary monetary policy, the CEA details the economic prospects for 1982, 1983 and beyond. Assumptions about money growth, however, do not play an explicit role in its economic forecasts. Instead, the CEA's forecasts follow the traditional "adding-up" approach typical of previous CEA Reports; that is, the activity of individual sectors are forecast and summed to obtain an aggregate forecast. Oddly enough, the CEA, after emphasizing the connection between money growth and nominal magnitudes like GNP and the price level, and recognizing the relationship between deviations of money growth from trend and the movements of real GNP, slights the role of money growth in their projections, particularly for 1982 and 1983.⁹

⁶1982 CEA Report, pp. 24-25.

⁷*Ibid.*, p. 55.

⁸*Ibid.*, pp. 59-60.

⁹The CEA attempts to correct for this oversight. It notes that:

Concerns have been expressed that the Federal Reserve's targets for money growth are not compatible with the vigorous upturn in economic activity envisioned late in 1982. . . We believe that such fears, while understandable on the basis of recent history and policies, are unjustified in light of current policies and the Administration's determination to carry them through. (1982 CEA Report, p. 25.)

This statement contrasts sharply with a statement found elsewhere in its report:

Indeed, changes in the trend of the growth rate of nominal GNP over the period 1960 to 1981 are almost entirely attributable to changes in the trend of the growth rate of the money stock (M1), as opposed to changes in the trend of the growth rate of velocity (Chart 3-3). (1982 CEA Report, p. 63.)

ADMINISTRATION ECONOMIC PROJECTIONS

Ever since enactment of the Congressional Budget and Impoundment Control Act of 1974 (hereafter referred to as the Control Act), the incumbent administration has been required each year to present five-year projections of the federal budget. Thus, the current budget and economic reports cover the period through 1987.

The administration also must set five-year numerical goals for several key economic indicators under the provisions of the Full Employment and Balanced Growth Act of 1978 (Humphrey-Hawkins). This act originally specified the following goals: an unemployment rate of 4 percent and a rate of increase in consumer prices of 3 percent by 1983, and an interim goal for federal outlays to equal 21 percent of GNP by 1981. However, the act allowed a change in this timetable if deemed necessary, and, in January 1980, President Carter extended the timetables for unemployment to 1985 and for inflation to 1988.

A Review of Previous Long-Term Projections

Incumbent administrations have been presenting long-term economic projections since the passage of the Control Act in 1974. Table 1 summarizes these projections.¹⁰ They represent the efforts of three different administrations: President Ford's, in 1975-77, President Carter's in 1978-81 and President Reagan's in early 1982.

The table indicates that, for each administration, the one-year forecasts have been quite accurate for all of the indicators.¹¹ In fact, the record for GNP is good as far as four years ahead. For all the other major indicators, the forecasts tend to deteriorate beyond the two-year horizon. This may reflect the practice

¹⁰The table is limited to the official reports published in January or February of each year and thereby excludes revised estimates when a new administration comes into power and those contained in the mid-session review of the budget.

¹¹The root-mean-squared errors for table 1 are as follows:

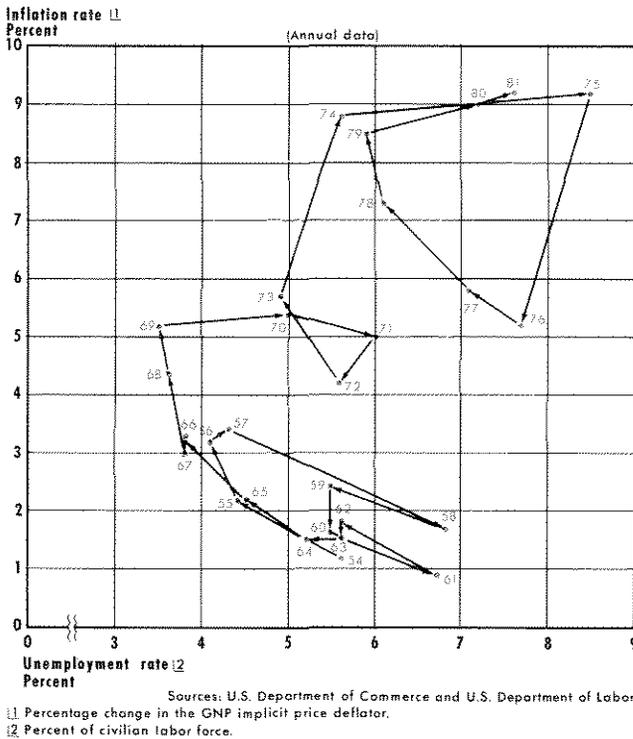
	GNP	Real GNP	GNP deflator	Unemployment rate
1 year ahead	0.92	1.00	0.97	0.22
2 years ahead	1.01	1.32	1.72	0.45
3 years ahead	1.14	2.77	2.63	1.16
4 years ahead	0.98	3.72	3.59	1.75
5 years ahead	2.46	4.45	4.88	1.97
6 years ahead	2.16	5.16	5.10	2.22

Table 1
Administration Economic Projections (percent)

Date of forecast	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987
GNP													
Early 1975	7.2	12.6	12.4	12.0	10.8	10.8							
1976		12.4	12.2	12.4	11.9	10.9	9.1						
1977			11.0	11.3	11.6	10.5	7.9	6.4					
1978				11.0	11.2	10.8	10.5	9.6	8.5				
1979					11.3	9.5	10.1	9.4	7.9	6.3			
1980						8.3	10.7	12.8	12.9	12.0	11.0		
1981							11.4	13.1	12.3	11.8	11.0	10.2	
1982								8.1	11.5	10.2	9.7	9.2	9.0
Actual ¹	8.0	10.9	11.6	12.4	12.0	8.8	11.4						
Real GNP													
Early 1975	-3.3	4.8	5.6	6.5	6.5	6.5							
1976		6.2	5.7	5.9	6.5	6.5	4.9						
1977			5.2	5.1	5.9	5.5	3.9	3.5					
1978				4.7	4.8	4.8	5.0	4.7	4.2				
1979					3.3	2.5	4.2	4.7	4.4	3.4			
1980						-0.6	1.7	4.3	5.0	4.9	4.7		
1981							0.9	3.5	3.5	3.7	3.7	3.7	
1982								0.2	5.2	5.0	4.7	4.4	4.3
Actual ¹	-1.1	5.4	5.5	4.8	3.2	-0.2	2.0						
Price deflator													
Early 1975	10.8	7.5	6.5	5.1	4.1	4.0							
1976		5.9	6.2	6.1	5.0	4.2	4.0						
1977			5.6	5.9	5.4	4.7	3.8	2.8					
1978				6.1	6.2	5.7	5.2	4.7	4.2				
1979					7.7	6.8	5.7	4.5	3.4	2.8			
1980						8.9	8.8	8.2	7.4	6.8	6.1		
1981							10.5	9.3	8.5	7.8	7.0	6.3	
1982								7.9	6.0	5.0	4.7	4.6	4.5
Actual ¹	9.3	5.2	5.8	7.3	8.5	9.0	9.2						
Unemployment rate													
Early 1975	8.1	7.9	7.5	6.9	6.2	5.5							
1976		7.7	6.9	6.4	5.8	5.2	4.9						
1977			7.3	6.6	5.7	4.9	4.8	4.7					
1978				6.3	5.9	5.4	5.0	4.5	4.1				
1979					6.0	6.2	5.7	4.9	4.2	4.0			
1980						7.0	7.4	6.8	5.9	5.1	4.3		
1981							7.8	7.5	7.1	6.7	6.3	6.0	
1982								8.9	7.9	7.1	6.4	5.8	5.3
Actual ¹	8.5	7.7	7.1	6.1	5.8	7.1	7.6						

¹As of February 1982

Chart 1
Inflation and Unemployment



whereby assumptions for the current and next year are called "forecasts," but beyond the next year are labeled "projections consistent with moving gradually toward relatively stable prices and maximum feasible employment." For the longer term, these projections seemingly ignore or seriously misjudge some fundamental economic constraints.

The failure of the U.S. economy to achieve relative price stability and "full employment" is obvious when one compares the projection record for these two indicators with actual performance. (For additional historical perspective, see chart 1.) Since the start of publishing long-term projections, each administration has projected a general decline of both inflation and unemployment. The actual performance of the economy, of course, has been far different. Though the rate of inflation declined from 1975 to 1976, it has accelerated on an annual average basis each year since then. The unemployment rate did fall from 1975 through 1979, but since then has risen sharply. Such persistent forecast errors are probably a reflection of the fact that each administration gives insufficient weight to the long-term effects of its

economic policies. According to the most recent CEA report, "The events of the past 15 years are a good illustration of the danger of pursuing economic policies based on short-run analysis and focused on immediate problems. Sound policy requires emphasis on a time horizon during which the sometimes lengthy, and usually unpredictable, lags in economic processes can work."¹²

Current Projections

Table 2 summarizes the Reagan administration's economic projections. The nominal GNP goal for fourth quarter 1987 is \$5,248 billion, which would mean a 9.8 percent average annual rate of increase from 1981 to 1987. This rate would be distributed as a 4.4 percent rate of expansion in real GNP and a 5.2 percent rate of increase in the GNP deflator. In 1987, according to these projections, real GNP would be growing at a 4.3 percent rate, the GNP deflator would be rising at a 4.4 percent rate and the unemployment rate would decline to 5.2 percent by the fourth quarter.

As a part of its program, the administration has proposed a budget plan aimed at a year-by-year reduction in the size of the federal deficit. Federal outlays are projected to decline to 19.7 percent of GNP in fiscal 1987 compared with an estimated 23.5 percent in fiscal 1982. More importantly, however, the administration announced its support of a monetary policy that will produce continued gradual reductions in the rate of monetary growth.

From the fourth quarter of 1979 to the fourth quarter of 1980, M1 (currency plus checkable deposits) grew at a 7.3 percent annual rate. The Administration assumes a gradual but steady reduction in the growth of money to one-half that rate by 1986.¹³

The CEA notes that inflationary expectations must adjust speedily to the anti-inflationary monetary regime in order to attain these economic goals.¹⁴

A MONETARY ANALYSIS OF ADMINISTRATION PROJECTIONS

In sharp contrast to previous administrations, the present administration has explicitly spelled out a target path for monetary growth. It is therefore of

¹²1982 CEA Report, pp. 49-50.

¹³*Ibid.*, p. 206.

¹⁴*Ibid.*, p. 26.

Table 2
**Administration's Economic Projections: 1982-87 (from
 fiscal 1983 budget)¹**

	GNP (billions of dollars)	Real GNP (billions of 1972 dollars)	Prices (1972=100)	Unemployment rate	M1 (billions of dollars)
IV/1981 Actual	\$2995 (9.7)	\$1498 (0.8)	200.0 (8.8)	8.4%	\$436.7 (5.0)
IV/1982	3307 (10.4)	1543 (3.0)	214.4 (7.2)	8.4	457.4 (4.7)
IV/1983	3671 (11.0)	1623 (5.2)	226.2 (5.5)	7.6	477.9 (4.5)
IV/1984	4038 (10.0)	1702 (4.9)	237.2 (4.9)	6.8	498.1 (4.2)
IV/1985	4417 (9.4)	1781 (4.6)	248.1 (4.6)	6.2	517.8 (4.0)
IV/1986	4819 (9.1)	1857 (4.3)	259.5 (4.6)	5.6	537.0 (3.7)
IV/1987	5248 (8.9)	1937 (4.3)	270.9 (4.4)	5.2	555.5 (3.4)
1981-87	(9.8)	(4.4)	(5.2)	6.6	(4.1)

NOTE: All GNP data adjusted to February 1982 revision of NIA accounts; M1 reflects revision of February 1982. M1 figures correspond to monetary policy assumption stated in the 1982 CEA Report.

¹Rates of change in parentheses.

interest to see how the administration's projections compare with those derived from an explicitly monetarist model. The framework used for this comparison is a revised and updated version of the "St. Louis model."¹⁵

According to the St. Louis model, nominal GNP is determined directly by a reduced-form equation relating the percent change in GNP to current and past changes in money (M1) and high-employment federal expenditures (national income accounts basis). Estimates of this equation indicate that the growth of federal spending has little net effect on GNP over a period of a year or more.¹⁶ The primary factors affecting GNP growth are the rate of change of money and trend velocity, as embodied in the coefficients of the equation.

The change in GNP is distributed between changes in the price level and output via a price equation. The price equation specifies the percent change in the GNP deflator as a function of energy prices, demand pressure and the recent history of price change.¹⁷ Over the long run, the estimated change in the price level is dominated by the trend of money growth. Given the change in GNP and the change in the price level, the change in output is found via the GNP identity; that is, GNP equals price level times output.

The unemployment rate also is solved for as a part of the St. Louis model. Estimated changes in output along with assumptions about the growth of potential output provide the basis for calculating the unemployment rate via Okun's Law.¹⁸

¹⁵For a discussion of the original model, see Leonall C. Andersen and Keith M. Carlson, "A Monetarist Model for Economic Stabilization," this *Review* (April 1970), pp. 7-25. For a detailed summary of the model in revised and updated form, see the appendix.

¹⁶For a recent study of the impact of fiscal actions on GNP, see R. W. Hafer, "The Role of Fiscal Policy in the St. Louis Equation," this *Review* (January 1982), pp. 17-22.

¹⁷For a further discussion of the role of energy prices in the determination of the price level, see John A. Tatom, "Energy Prices and Short-Run Economic Performance," this *Review* (January 1981), pp. 3-17.

¹⁸Arthur M. Okun, "Potential GNP: Its Measurement and Significance," 1962 *Proceedings of the Business and Economic Statistics Section of the American Statistical Association*, pp. 98-104.

Table 3
St. Louis Model Projections for 1976-81: An Ex Post Comparison

Administration Projections as of Mid-1977					
	GNP	Real GNP	Prices	Unemployment rate	M1
1976 Actual	11.6%	6.0%	5.3%	7.7%	No
1977	11.3	5.1	5.9	7.0	explicit
1978	11.9	5.3	6.3	6.3	assumption
1979	11.3	5.0	6.1	5.7	
1980	10.6	5.2	5.1	5.2	
1981	9.8	4.9	4.3	4.8	
1982	8.6	4.3	4.2	4.5	
1976-81	11.0	5.1	5.5	6.1	

1977 St. Louis Model Projections with Administration GNP Path					
	GNP	Real GNP	Prices	Unemployment rate	M1
1976 Actual	11.6%	6.0%	5.3%	7.7%	5.1%
1977	11.2	5.2	5.7	7.1	6.8
1978	12.1	5.7	6.1	6.1	7.7
1979	11.1	4.5	6.5	5.7	7.8
1980	10.7	2.9	7.6	5.6	6.8
1981	9.7	0.5	9.1	6.5	6.0
1982	8.7	-0.8	9.5	8.2	5.1
1976-81	11.0	3.8	7.0	6.5	7.0

Actual Performance Using Data as of February 1982					
	GNP	Real GNP	Prices	Unemployment rate	M1
1976 Actual	10.9%	5.4%	5.2%	7.7%	5.7%
1977	11.6	5.5	5.8	7.1	7.7
1978	12.4	4.8	7.3	6.1	8.2
1979	12.0	3.2	8.5	5.8	7.8
1980	8.8	-0.2	9.0	7.1	6.3
1981	11.4	2.0	9.2	7.6	6.9
1976-81	11.2	3.0	7.9	6.9	7.4

NOTE: Administration and St. Louis Model projections taken from November 1977 Review.

To illustrate the projection performance of the St. Louis model, table 3 presents an *ex post* summary of projections made in this Review in the fall of 1977.¹⁹ The relevant projection period at that time was 1977-81. The administration's GNP projections at that time implied a path of declining growth in money, a

path that was used in simulating the St. Louis model. Since the actual path of monetary expansion was similar to that assumed in simulating the model and that implicit in the administration's projections, the growth of GNP was forecast with considerable accuracy by both the administration and the model. There were differences, however, between the administration's and the St. Louis model's forecasts for real GNP, the price level and the unemployment rate, particularly after 1978. In contrast to the administration's forecast, the model projected a slow-

¹⁹Keith M. Carlson, "Economic Goals for 1981: A Monetary Analysis," this Review (November 1977), pp. 2-7. The major differences in the model used at that time and the version described in the appendix are in the treatment of energy prices and the adjustment for serial correlation.

Table 4
St. Louis Model Simulations: 1982-87 (assuming
administration's GNP path)¹

	GNP (billions of dollars)	Real GNP (billions of 1972 dollars)	Prices (1972=100)	Unemployment rate	M1 (billions of dollars)
IV/1981 Actual	\$2995 (9.7)	\$1498 (0.8)	200.0 (8.8)	8.4%	\$436.7 (5.0)
IV/1982	3306 (10.4)	1538 (2.7)	215.1 (7.5)	8.8	471.2 (7.9)
IV/1983	3670 (11.0)	1603 (4.3)	229.1 (6.5)	8.1	507.0 (7.6)
IV/1984	4037 (10.0)	1662 (3.7)	243.2 (6.2)	7.7	540.0 (6.5)
IV/1985	4416 (9.4)	1720 (3.5)	257.1 (5.7)	7.5	572.9 (6.1)
IV/1986	4819 (9.1)	1787 (3.9)	270.2 (5.1)	7.2	606.7 (5.9)
IV/1987	5249 (8.9)	1861 (4.1)	282.8 (4.6)	6.8	641.3 (5.7)
1981-87	(9.8)	(3.7)	(5.9)	7.7	(6.6)

¹Rates of change in parentheses.

ing in output and an acceleration of the price level in the latter part of the period, both of which occurred.

Simulation Using Administration GNP Growth Path

The first issue addressed here is the feasibility of the output and inflation scenarios. The analysis does not, at this point, examine the question whether GNP can be attained with the administration monetary assumptions; it focuses exclusively on its projections of inflation and output growth, given its path for the growth of GNP. The assumptions used for the other exogenous variables in the St. Louis model are as follows: potential GNP is assumed to grow 3.3 percent per year from late 1981; growth in high-employment federal expenditures is projected at 6.3 percent per year; and the change in the relative price of energy is assumed to be zero.²⁰

The results of this simulation, shown in table 4, should be compared with those in table 2. It should be noted first that the path of money growth required to attain the administration's projected GNP path is substantially higher than what they explicitly state as desired. Assuming that this GNP path is attained, however, the St. Louis model indicates that the administration's projections are indeed optimistic. The model indicates an unemployment rate of 6.8 percent in late 1987 in contrast to the administration's projected 5.2 percent rate, with annual real growth averaging 0.7 percent lower for the model simulation. The model is also more pessimistic on inflation, indicating an annual average inflation rate of 5.9 percent instead of the administration's estimated 5.2 percent.

Alternative Simulations

Since the administration explicitly supports a monetary policy of gradual reduction in the rate of monetary growth, the results of this scenario, in which M1 growth is reduced gradually and steadily to a 3.7 percent rate in 1986, are summarized in table 5. All other assumptions are the same as in the previous simulation.

²⁰These assumptions are designed to be consistent with the administration's, even though they do not provide specific estimates of these variables in either the CEA Report or the Fiscal 1982 Budget. For a discussion of prospects for real GNP growth, see 1982 CEA Report, pp. 115-17.

As might be expected, the model shows a growth rate of nominal GNP much less than the administration has projected (compare with table 2). The CEA is aware of this discrepancy, but does not explain why the assumed growth of velocity should far exceed its historical rates of growth (see chart 2).²¹ For this scenario of a gradual reduction of money growth, the model indicates that the administration's inflation goal is easily achieved; in fact, the simulated inflation rate falls well below the administration's projected rate after 1983.²² The simulated path for real GNP, however, is considerably different than the administration has projected. In the early years, 1982-84, the model simulates much slower output growth, followed by faster growth in the later years. As a result, the simulated unemployment rate is still at a high 6.9 percent in late 1987 compared with an administration estimate of 5.2 percent.

Finally, a third simulation was run, based on a constant 5 percent annual growth in money through 1987. The results are shown in table 6. This steady money growth path comes closer to attaining both of the administration's inflation and unemployment goals than either of the simulations summarized in tables 4 and 5. With steady 5 percent money growth, inflation averages 3.9 percent per year for the projection period, and the unemployment rate is brought to near 6 percent by late 1987.

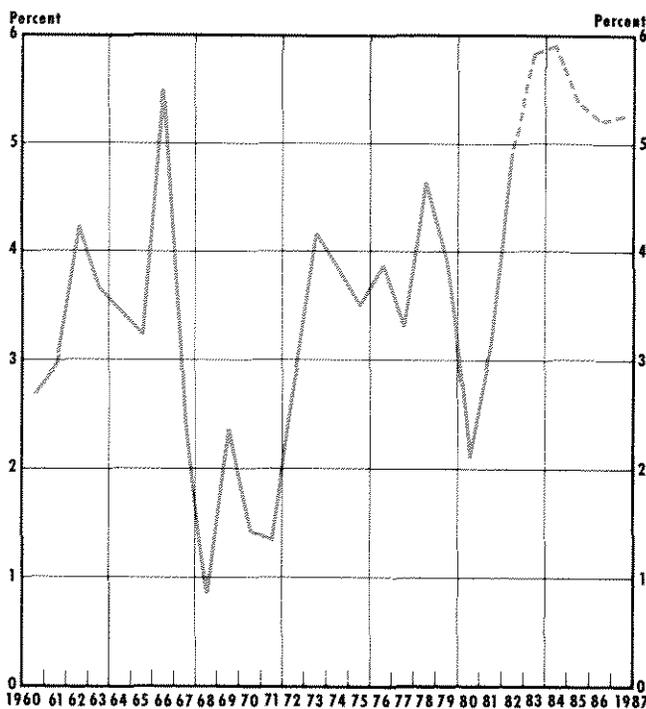
Money Growth and the Administration's Projections: The Basic Conflict

The administration has emphasized that it is important to establish credibility in economic policy in order to "break the back" of inflation expectations. Behind this strategy is the presumption that, if inflation can be reduced more rapidly than past relationships would indicate (e.g., faster than is embodied in the estimates from St. Louis model), greater output growth would result. This prospect would produce a brighter outlook for the interim years than shown in the simulations employing gradual money reduction (table 5). There is little likelihood, however, that the unemployment rate would be reduced to as low as the administration's estimate of 5 percent.

²¹See footnote 9.

²²Over the long run in the St. Louis model, the inflation rate approximates the rate of monetary growth. Prior to the achievement of this equilibrium, however, the St. Louis model oscillates.

Chart 2
Rate of Change of M1 Velocity¹



¹Data are two-year rates of change, using fourth quarter data. Dashed line is implicit in administration projections. Velocity is GNP divided by M1.

The more fundamental question yet to be answered is how the administration expects GNP to grow rapidly if money growth gradually declines. With the administration making explicit statements about interest rates falling in future years, apparently the result of declining inflation, velocity growth might be expected to slow rather than accelerate. Furthermore, velocity growth historically has been remarkably stable over time, an observation that the CEA itself has emphasized.²³ Thus, while the output-inflation breakdown of GNP in the St. Louis model may be open to question, there seems to be little reason to question its GNP projections.

THE FEDERAL BUDGET OUTLOOK AND ECONOMIC PROJECTIONS

The administration's economic projections are of interest because they indicate how the nation's economic welfare can be expected to change in coming years. They are also of interest because of their impact on estimates of the budget deficit. The

²³See footnote 9.

Table 5

St. Louis Model Simulations: 1982-87 (assuming declining growth rate of money from 5.0 percent rate in 1981-82)¹

	GNP (billions of dollars)	Real GNP (billions of 1972 dollars)	Prices (1972=100)	Unemployment rate	M1 (billions of dollars)
IV/1981 Actual	\$2995 (9.7)	\$1498 (0.8)	200.0 (8.8)	8.4%	\$436.7 (5.0)
IV/1982	3227 (7.7)	1501 (0.2)	215.0 (7.5)	9.7	457.4 (4.7)
IV/1983	3472 (7.6)	1528 (1.8)	227.3 (5.7)	9.9	477.9 (4.5)
IV/1984	3727 (7.3)	1581 (3.5)	235.8 (3.7)	9.7	498.1 (4.2)
IV/1985	3989 (7.0)	1659 (4.9)	240.7 (2.1)	9.0	517.8 (4.0)
IV/1986	4259 (6.8)	1754 (5.8)	242.9 (0.9)	8.0	537.0 (3.7)
IV/1987	4534 (6.5)	1860 (6.0)	244.0 (0.4)	6.9	555.4 (3.4)
1981-87	(7.2)	(3.7)	(3.4)	8.9	(4.1)

¹Rates of change in parentheses.

Table 6

St. Louis Model Simulations: 1982-87 (assuming steady growth rate of money of 5.0 percent)¹

	GNP (billions of dollars)	Real GNP (billions of 1972 dollars)	Prices (1972=100)	Unemployment rate	M1 (billions of dollars)
IV/1981 Actual	\$2995 (9.7)	\$1498 (0.8)	200.0 (8.8)	8.4%	\$436.7 (5.0)
IV/1982	3233 (8.0)	1504 (0.4)	215.0 (7.5)	9.6	458.6 (5.0)
IV/1983	3495 (8.1)	1537 (2.2)	227.5 (5.8)	9.7	481.5 (5.0)
IV/1984	3779 (8.1)	1580 (4.0)	236.6 (4.0)	9.3	505.6 (5.0)
IV/1985	4085 (8.1)	1683 (5.3)	243.0 (2.7)	8.4	530.8 (5.0)
IV/1986	4416 (8.1)	1784 (6.0)	247.7 (2.0)	7.3	557.4 (5.0)
IV/1987	4774 (8.1)	1895 (6.2)	252.3 (1.8)	6.1	585.3 (5.0)
1981-87	(8.1)	(4.0)	(3.9)	8.4	(5.0)

¹Rates of change in parentheses.

Table 7
Alternative Budget Estimates: Fiscal 1987 (billions of dollars)

	Receipts	Outlays	Surplus/Deficit
Administration estimates from fiscal 1983 budget	\$926	\$979	\$-53
St. Louis model simulation using administration's GNP path	926	1028	-102
St. Louis model simulation assuming declining growth rate of money	781	925	-144
St. Louis model simulation assuming steady 5 percent growth of money	829	940	-111

size of prospective deficits has become an issue among economic analysts, presumably because they consider it an indicator of the government's impact on credit markets and, thus, on long-term economic growth.²⁴ However, as is shown below, the process of estimating the deficit is an imprecise exercise.

Economic Activity and the Budget

Although the effect of the budget on economic growth is still an open issue, there is no question that the budget is sensitive to the pace of economic activity. This relationship received added emphasis in this year's budget document as budget figures appear to have become more and more sensitive to economic conditions.

In prior years, analyses of the connection between the budget and the economy focused on government revenues. Given our tax laws, different revenue estimates depend on the assumptions made about GNP and such related indicators as wages and salaries, and corporate profits. The relationship still holds, of course, but the size of today's economy is so large that a given growth rate of GNP translates into a much different dollar amount of federal revenues than it did just a few years ago. This relationship between GNP and government revenues is important because public attention seems to focus on the dollar size of the federal deficit.

²⁴Such an effect is not in the St. Louis model; incorporation of this presumed relationship between the size of the deficit and the rate of economic growth would require specifying potential output as a function of either the size of the deficit or the size of government. The only role for federal deficits in the St. Louis model is their possible relationship to the rate of money growth.

At the same time, federal outlays have become increasingly sensitive to variations in economic activity. The usual effect via unemployment insurance continues to operate, but, like the revenue side, a given unemployment rate now involves a greater amount of dollar expenditures than before. In addition, automatic changes in outlays for a number of welfare programs occur when the economy slows down or speeds up. In fact, approximately 30 percent of federal outlays now are indexed to inflation. Finally, interest payments on the national debt, an important endogenous component of the budget, reflect both the size of the deficit and the level of interest rates.

Budget Implications of Alternative Simulations

To examine the sensitivity of budget estimates to alternative economic assumptions, budget equations were added to the St. Louis model. The growth of receipts was specified as a function of the growth of nominal GNP, using the elasticity implied in the administration's budget document.²⁵ The growth of outlays was expressed as a function of the growth of output and the rise in prices, again using the relevant elasticities from the budget document.

Table 7 summarizes the budget results for fiscal 1987 for all three simulations. Only results for fiscal

²⁵Fiscal 1983 Budget, pp. 2:6-13. The implied elasticities are found by comparing the budget effects of three economic scenarios. These scenarios are higher inflation/same growth, higher growth/lower inflation, and lower growth/higher inflation, with all alternatives defined with reference to the administration's basic economic projections (summarized in table 2).

1987 are given to ease the comparison of alternative policy scenarios. Moreover, focusing on 1987 illustrates the imprecision that encompasses any budget estimates, because a small change in growth rates can translate into a difference of many billions of dollars. All simulations assume that the basic proposals contained in the fiscal 1983 budget are enacted.²⁶ The differences in results reflect only the impact of differing economic assumptions.

The first simulation, using the administration's GNP path as shown in table 4, yields a deficit of \$102 billion; the administration estimates \$53 billion. The estimate for receipts is the same as the administration's because the growth of nominal GNP is the same. Outlays are higher for this simulation because of higher inflation estimates, which push up outlays for indexed programs, and lower real growth estimates, which boost outlays for unemployment compensation and other unemployment-related welfare programs.

The second simulation, based on a gradual reduction of money growth (see table 5), yields a much larger deficit in 1987 than the administration projects. Outlays are less than projected by the administration because inflation is slower, but receipts fall

even more sharply because the growth of nominal GNP is much less rapid. As a result, the deficit is estimated at \$144 billion for 1987 — despite the incorporation of the administration's proposals to reduce government programs in the 1983 budget.

The third simulation, based on steady 5 percent money growth (see table 6), yields a slightly larger deficit than the simulation using the administration's GNP path. However, both outlays and receipts are lower than in that case.

SUMMARY AND CONCLUSIONS

The administration has presented a controversial set of economic assumptions and budget projections for the years through 1987. Some simulations of a monetarist model, however, demonstrate that the administration's projections contain fundamental inconsistencies. Based on U.S. economic experience since 1960,

- (1) the administration's estimates for GNP growth are inconsistent with its stated monetary targets; and
- (2) given its GNP growth path, its estimates of real growth, unemployment and, to a lesser extent, inflation appear too optimistic.

These conclusions also indicate that the administration's estimates of the size of the federal deficit are imprecise. Given the administration's budget plan, the pattern of declining growth in money that it supports will result in a deficit of about \$144 billion in 1987, \$93 billion more than is projected in the fiscal 1983 budget.

²⁶This also assumes the Economic Recovery Tax Act of 1981 is left intact. The basic proposals themselves have been revised since February, but details await the outcome of negotiations between Congress and the administration. The purpose of the estimates presented here is to illustrate the budget impact of alternative economic assumptions without actually attempting to forecast the size of the deficit.

Appendix

Revised Form of St. Louis Model¹

The version of the St. Louis model used for the simulations in this article is summarized in table 1, with the coefficients given in table 2. Equations 1, 2 and 4 are estimated with Almon constraints on the coefficients. Equation 1 is estimated with ordinary least squares. Three characteristics differentiate this model from the original version published in 1970: (1) most variables are entered in rate-of-change form rather than first-difference form; (2) the demand

slack variable is entered in real rather than nominal terms; and (3) where relevant, the model's equations have been corrected for serial correlation problems.

¹For further discussion, see Keith M. Carlson and Scott E. Hein, "An Analysis of a Modified St. Louis Model," a paper prepared for the Spring Conference on Comparing the Predictive Performance of Macroeconomic Models at Washington University in St. Louis (April 20, 1982).

Table 1
The Model

$$(1) \dot{Y}_t = C1 + \sum_{i=0}^4 CM_i(\dot{M}_{t-i}) + \sum_{i=0}^4 CE_i(\dot{E}_{t-i}) + \epsilon_{1t}$$

$$(2) \dot{P}_t = C2 + \sum_{i=1}^4 CPE_i(\dot{PE}_{t-i}) + \sum_{i=0}^5 CD_i(\dot{X}_{t-i} - \dot{XF}_{t-i}^*) + CPA(\dot{P}_t) + CDUM1(DUM1) + CDUM2(DUM2) + \epsilon_{2t}$$

$$(3) \dot{P}_t = \sum_{i=1}^{21} CPRL_i(\dot{P}_{t-i})$$

$$(4) RL_t = C3 + \sum_{i=0}^{20} CPRL_i(\dot{P}_{t-i}) + \epsilon_{3t}$$

$$(5) U_t - UF_t = CG(GAP_t) + CG1(GAP_{t-1}) + \epsilon_{4t}$$

$$(6) Y_t = (P_t/100)(X_t)$$

$$(7) \dot{Y}_t = ((Y_t/Y_{t-1})^4 - 1) 100$$

$$(8) \dot{X}_t = ((X_t/X_{t-1})^4 - 1) 100$$

$$(9) \dot{P}_t = ((P_t/P_{t-1})^4 - 1) 100$$

$$(10) GAP_t = ((XF_t - X_t)/XF_t) 100$$

$$(11) \dot{XF}_t^* = ((XF_t/X_{t-1})^4 - 1) 100$$

- Y = nominal GNP
- M = money stock (M1)
- E = high employment expenditures
- P = GNP deflator (1972 = 100)
- PE = relative price of energy
- X = output in 1972 dollars
- XF = potential output (Rasche/Tatom)
- RL = corporate bond rate
- U = unemployment rate
- UF = unemployment rate at full employment
- DUM1 = control dummy (III/1971-I/1973 = 1; 0 elsewhere)
- DUM2 = post control dummy (I/1973-I/1975 = 1; 0 elsewhere)

Table 2
In-Sample Estimation: I/1960-IV/1980
(absolute value of t-statistic in parentheses)

$$(1) \dot{Y}_t = 2.44 + 0.40 \dot{M}_t + 0.39 \dot{M}_{t-1} + 0.22 \dot{M}_{t-2} + 0.06 \dot{M}_{t-3} - 0.01 \dot{M}_{t-4} + 0.06 \dot{E}_t + 0.02 \dot{E}_{t-1} - 0.02 \dot{E}_{t-2} - 0.02 \dot{E}_{t-3} + 0.01 \dot{E}_{t-4} - 0.02 \dot{X}_{t-2} - \dot{XF}_{t-2}^* + 0.02 (\dot{X}_{t-3} - \dot{XF}_{t-3}^*) + 0.02 (\dot{X}_{t-4} - \dot{XF}_{t-4}^*) + 0.01 (\dot{X}_{t-5} - \dot{XF}_{t-5}^*) + 1.03 (\dot{P}_t) - 0.61 (DUM1_t) + 1.65 (DUM2_t)$$

(2.15) (3.38) (5.06) (2.18) (0.82) (0.11) (1.46) (0.63) (0.57) (0.52) (0.34)

R² = 0.39 SE = 3.50 DW = 2.02

$$(2) \dot{P}_t = 0.96 + 0.01 \dot{PE}_{t-1} + 0.04 \dot{PE}_{t-2} - 0.01 \dot{PE}_{t-3} + 0.02 \dot{PE}_{t-4} - 0.00 (\dot{X}_t - \dot{XF}_t^*) + 0.01 (\dot{X}_{t-1} - \dot{XF}_{t-1}^*) + 0.02 (\dot{X}_{t-2} - \dot{XF}_{t-2}^*) + 0.02 (\dot{X}_{t-3} - \dot{XF}_{t-3}^*) + 0.02 (\dot{X}_{t-4} - \dot{XF}_{t-4}^*) + 0.01 (\dot{X}_{t-5} - \dot{XF}_{t-5}^*) + 1.03 (\dot{P}_t) - 0.61 (DUM1_t) + 1.65 (DUM2_t)$$

(2.53) (0.75) (1.96) (0.73) (1.38) (0.18) (1.43) (4.63) (3.00) (2.42) (2.16) (10.49) (1.02) (2.71)

R² = 0.80 SE = 1.28 DW = 1.97 $\hat{\rho} = 0.12$

$$(4) RL_t = 2.97 + 0.96 \sum_{i=0}^{20} \dot{P}_{t-i}$$

(3.12) (5.22)

R² = 0.32 SE = 0.33 DW = 1.76 $\hat{\rho} = 0.94$

$$(6) U_t - UF_t = 0.28 (GAP_t) + 0.14 (GAP_{t-1})$$

(11.89) (6.31)

R² = 0.63 SE = 0.17 DW = 1.95 $\hat{\rho}_1 = 1.43$ $\hat{\rho}_2 = 0.52$