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CONTENTS

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Problems of Interpreting Recent Monetary Developments

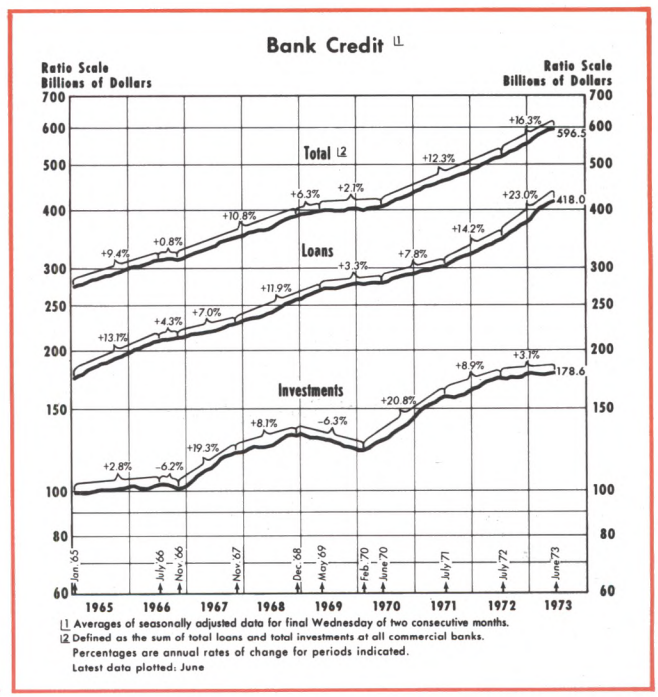
by DARRYL R. FRANCIS

IT IS GOOD to be here and to have this opportunity to discuss a topic of paramount importance to those in the business of banking as well as to the public at large.[1] Most economic analysts now believe that monetary developments have a pervasive and significant effect on all types of economic activity. For this reason, I appreciate your invitation to express my views, which I must hasten to admit are not universally held, but on which I have developed a strong feeling over several years of association with what I believe to be the highest quality of empirical research.

This is an especially interesting time to be discussing monetary developments in view of the considerable differences of opinion on how to measure and interpret the developments in the first half of 1973. Some analysts interpret recent monetary actions to have been quite expansionary, indicating an ebullient economy with an intensification of inflationary forces. On the other hand, others have indicated concern over what they deem undue monetary restraint with a likelihood of a recession late this year or early in 1974. I hope I will not add to the confusion by outlining for you my own interpretation of economic developments so far this year and what they may imply for the future. Before doing so, I think it would be useful to review some of the interpretations of recent monetary actions that have received widespread attention and the facts upon which these interpretations have been based.

Bank Credit

One prominent view of recent monetary developments has centered on the growth of commercial bank credit as the reliable leading indicator. Those analysts that focus on bank credit have been greatly concerned about the possibility of excessive expansion and a marked step-up in inflationary pressures. Since last July, commercial bank credit outstanding has risen at a rapid 16 percent annual rate. By comparison, during the period from mid-1970 to mid-1972, when aggressive actions – both fiscal and monetary – were taken to stimulate the economy which was recovering from the latest recession, bank credit rose at a 12 percent rate. The average rate of bank credit growth from 1957 to 1970 was about 7 percent.



[1] Averages of seasonally adjusted data for final Wednesday of two consecutive months.
[2] Defined as the sum of total loans and total investments at all commercial banks.
Percentages are annual rates of change for periods indicated.
Latest data plotted: June

Actually, bank loans have risen more rapidly in recent months than total bank credit. Total commercial bank loans outstanding have risen at almost a 23 percent annual rate since last July. Investment holdings of banks rose only moderately most of last fall, and

[1] This address was delivered at the Seventy-Sixth Annual Convention of the Indiana Bankers Association, French Lick, Indiana, June 13, 1973. Data that have become available since the presentation was made have been incorporated into this draft.

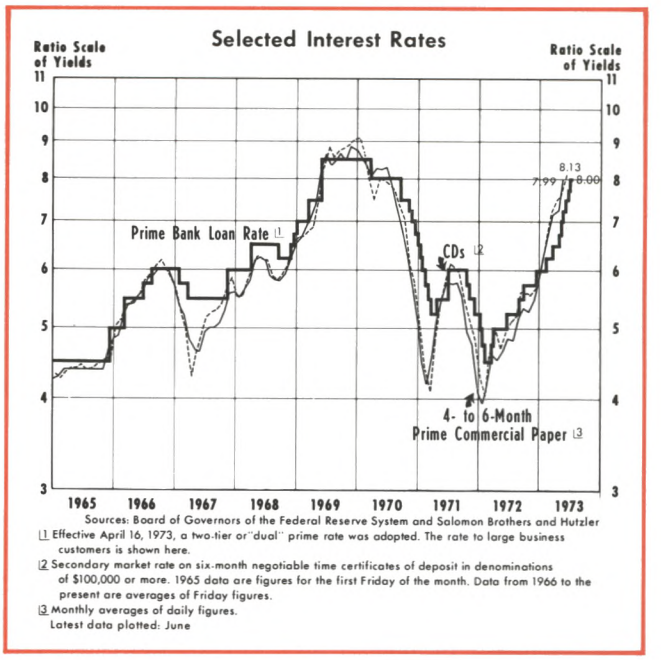
have declined since January as banks have sought funds to finance the requirements of their business and consumer customers. It has been reasoned that the accelerated expansion of total bank credit this year would supplement the funds available for spending by the public, and therefore should be interpreted as a strong inflationary force in the economy.

The head of Chase Econometric Associates, Inc., the forecasting, analysis, and consulting subsidiary of the Chase Manhattan Corporation, indicated in a newsletter that bank credit developments have been an important element in "the unprecedented increase" in spending.[2] Increases in bank credit have been much greater than in prior periods of rapid economic expansion. Although the money stock, defined to include currency in the hands of the public and private demand deposits, did slow during the first quarter of 1973, Chase Econometrics noted that banks were able to expand their credit because of an unusual buildup in Treasury deposits in commercial banks (which are not included in the definition of the money stock). Also, banks sold an increasingly larger amount of large negotiable certificates of deposit to raise funds to expand loans. Hence, the huge credit expansion was accomplished at a time of relatively slow growth of the money stock. Chase Econometrics concluded that concentrating on the narrow definition of money, while neglecting what occurred in credit markets, is an acute case of "M_1 myopia." I would agree that the tightness or ease indicated by a given growth of M_1 should not be analyzed in a vacuum, but I do not go all the way with the second part of the conclusion — namely, that the acceleration of bank credit growth indicates more stimulative monetary actions this year than last.

Interest Rates

Another approach to assessing monetary developments has been to focus on the cost of credit rather than on volume. Interest rates, particularly short-term rates, have risen substantially since last fall. The rate on bank loans to prime business customers has risen from 5¼ percent last August to 8¼ percent recently. Yields on Treasury bills, commercial paper, bankers acceptances and other money market instruments have risen even more sharply.

When credit costs rise and funds become less readily available, it is reasoned that businessmen and



consumers are forced to trim their expenditures. According to this view, the exceptional rate of increase in total spending in the past few quarters would have been even greater if interest rates had not risen. More importantly, higher costs of credit affect future spending plans, and hence, some are becoming concerned that interest rate behavior, possibly even a credit crunch, could foster an economic downturn in the near future. An example of this approach was presented in a recent issue of a national news magazine, where in discussing the task of restraining inflation it was stated, "If this tight money policy is continued for long, . . . it could well lead to oppressive interest rates, a drying up of credit and a dangerous slowdown in the economy comparable to the 1970 recession."[3]

Money Stock

A third view frequently cited in the press and advisory services has been put forth by some monetarists who have been concerned that monetary actions may have become too restrictive. The money stock of the nation rose at only a 2 percent annual rate from December to March this year. By comparison, money rose at a 7 percent rate on average in the previous two years. It was argued that this sharp slowing in the growth of the narrowly defined money stock, if continued, would lead to a substantial economic slowdown. When people have less money than they

[2]See "The Macroeconomic Forecasts," of Chase Econometrics, Inc., April 25, 1973.

[3]Reprinted by permission from TIME, The Weekly Newsmagazine; Copyright Time, Inc. (May 7, 1973,) pp. 75-76.

desire to hold, given current economic conditions, they tend to reduce their rate of spending.

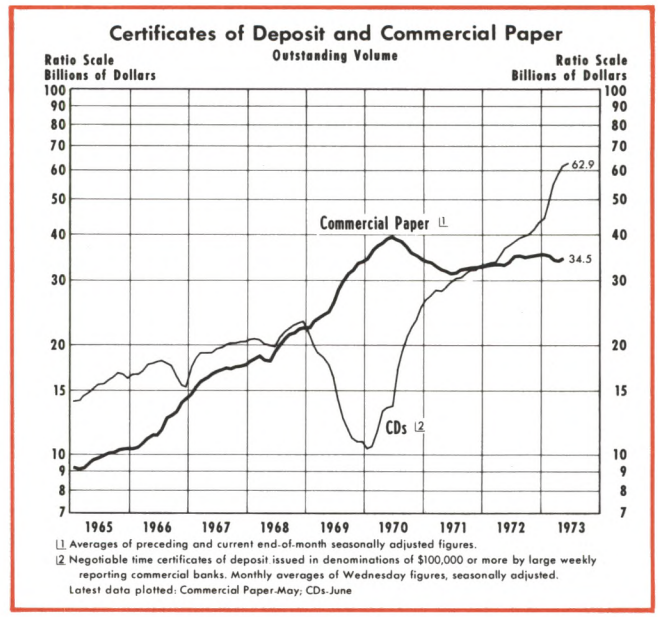
The April 1973 "Monthly Economic Letter" of the First National City Bank states, "In an atmosphere in which more and more people are asking whether credit conditions in 1973 could approach those during the 'crunch' periods of 1966 and 1969, it is increasingly evident that the commercial banking system is in the midst of a tight squeeze."[4] Loan demand has been unusually great. Yet, "since late 1972, the monetary authorities have refused to supply any more reserves to the banking system. Through December, total reserves — and consequently the money supply — continued to rise rapidly because banks sharply increased the reserves they were willing to borrow from the Fed. But since early January, banks have been so heavily in debt to the Fed that they have been unwilling to increase their borrowings much more, despite the continued climb in credit demands and in interest rates on bank loans. Consequently, . . . reserves available against private nonbank deposits, and the money supply . . . have zigzagged sideways."

According to the First National City Bank "Letter", commercial banks have increased their credit largely by aggressive bidding for CD funds, which results in more total deposits with a given amount of reserves. However, Citibank argues that "the sharp slowdown in money stock growth has led to speculation about the possibility of monetary overkill."

Our View

Turning to our interpretation at the Federal Reserve Bank of St. Louis of the developments in early 1973, I cannot agree with those who hold the view that the recent rapid growth of bank credit can be taken as an indication that monetary actions have been more stimulative this year than last. Nor can I agree with either the interest rate approach or a strict narrow money approach which argues that monetary developments so far this year have been unduly restrictive. Now, let me see if I can outline for you the problems with each of the three foregoing positions.

It is true that bank credit has been rising at a phenomenal rate in recent months. If this credit were entirely newly-created credit in the sense of being an addition to total credit, then I would be in more agreement with those who are concerned about an acceleration in the growth of bank credit. However, the facts are that a major share of this credit merely reflects a re-routing of the flow of funds from savers



to borrowers through the banking system rather than through other channels.

You may recall that earlier this year the Committee on Interest and Dividends successfully encouraged commercial banks to refrain from increasing interest rates on loans — particularly the prime rate — even though market conditions indicated that such a move was appropriate. As a result many borrowers found that rates offered by commercial banks were more attractive than rates on funds from other sources — such as commercial paper. Hence, demand for credit by businesses tended to shift toward banks. In order to meet the loan demand, banks obtained funds, that previously had flowed into commercial paper and other market instruments, by aggressively pricing their large certificates of deposit. Thus, the rapid rise in commercial bank credit was largely offset by a smaller volume of other credit. At the same time, total credit in the economy was not very much affected by the somewhat artificial and temporary upward movement in bank credit.

Fears of an economic downturn based on the recent marked rise in interest rates is similarly only a partial analysis. If the jump in interest rates were solely the result of a monetary contraction, then I would agree that a slowing or a decline in economic activity would likely result. So, let us review the facts behind the interest rate rise.

Interest rates are a price for the use of borrowed funds. Rates are determined by supplies of and demands for funds — just as the prices of housing, food, or other goods are set by demand and supply. There is no factual indication that the supplies of loanable

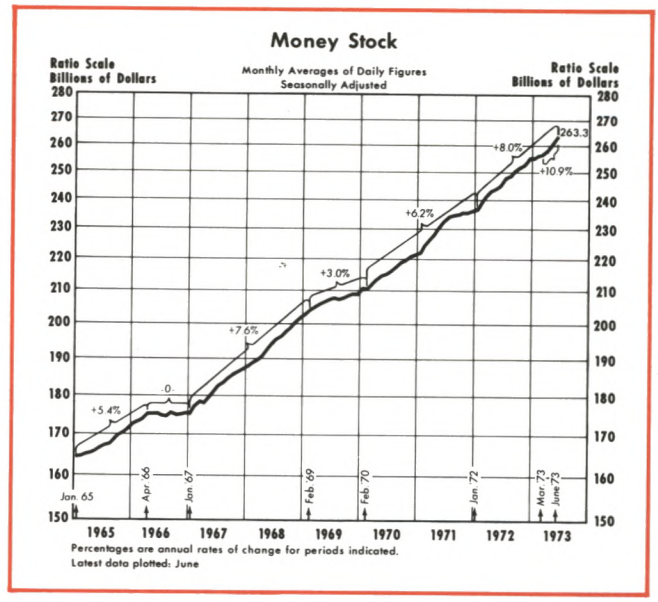
[4] pp. 3-4.

funds have been contracting this year. Personal and corporate incomes have risen at rapid rates; the provision of central bank credit, as indicated by the rapid growth of Federal Reserve credit and the monetary base, has not been cut-off; and the growth of commercial bank credit has accelerated from last year.

The strongest upward force on market interest rates late last year and in early 1973 – probably accounting for the bulk of the rise – came from the demand side. Economic activity – stimulated by the rapid monetary expansion of 1971 and 1972 – has been increasing rapidly. Accompanying the greater activity has been a strengthening in the demand for credit by businesses and consumers. Also, inflationary pressures have intensified as the economy has approached a high level of capacity utilization. In the past it has been observed that when expectations of higher inflation rise, interest rates rise even more. Lenders seek to protect the purchasing power of their funds, while borrowers accept the higher rates in anticipation of repaying in cheaper dollars.

Hence, the higher interest rates are primarily a result of the greater credit demands associated with the rapid expansion of business activity and the rising expectations about future inflation. In short, present interest rate levels are primarily the lagged result of rapid monetary expansion during 1971 and 1972. Current monetary actions have probably played only a minor role in recent interest rate developments. Hence, any overall restraining effect on the economy from the marked rise in market interest rates to date is likely to be slight. Individual borrowers, it is true, have been finding funds increasingly more difficult and more costly to obtain as the demand for credit has been rising even more rapidly than the increasing supplies. But this does not imply that aggregate economic activity is being stifled by inadequate credit.

Most of the time I find myself among those who follow closely the trends of money stock growth in analyzing the impact of monetary actions on the economy. However, I feel the conclusion that monetary actions were unduly restrictive in the first few months of this year because of the slow money growth in that period is unwarranted. For one thing, the time period was relatively brief. Our research shows that normally it takes six to nine months for a significant change in the growth of money to have a measurable impact on real economic activity, and even longer before prices are affected. More importantly, the slow growth of money in those few months was related to several unusual market developments, which were thought to be only temporary since the basic forces underlying



the trend growth of money continued to expand rapidly.

Let's look at what has happened to money growth recently. During October and November last year the growth rate of money slowed somewhat from the rates earlier in 1972, but in December money rose sharply. Then from December to March money rose at an unusually slow 2 percent pace, but since March the stock of money has gone up at an 11 percent rate. In view of the fact that money apparently affects economic activity with a distributed lag over a period of several quarters, it seems more useful to analyze money on balance over the period since sometime last year rather than focus on each of the shorter run fluctuations. As of June the level of money was up an estimated 7.4 percent from a year ago. This was approximately the same rate of increase which prevailed in both the seven-month period from last November[5] and in the period from fourth quarter 1970 to fourth quarter 1972.

Contrary to the view of some analysts that the slow growth of the narrowly defined money stock in the first quarter was monetary overkill, I have been concerned throughout much of this period that monetary expansion could continue to be excessive. I am strongly persuaded that reduction in monetary stimulus is essential to the elimination of inflationary pressures, and postponement of actions to restrain monetary growth implies that a more costly anti-inflation battle must eventually be waged.

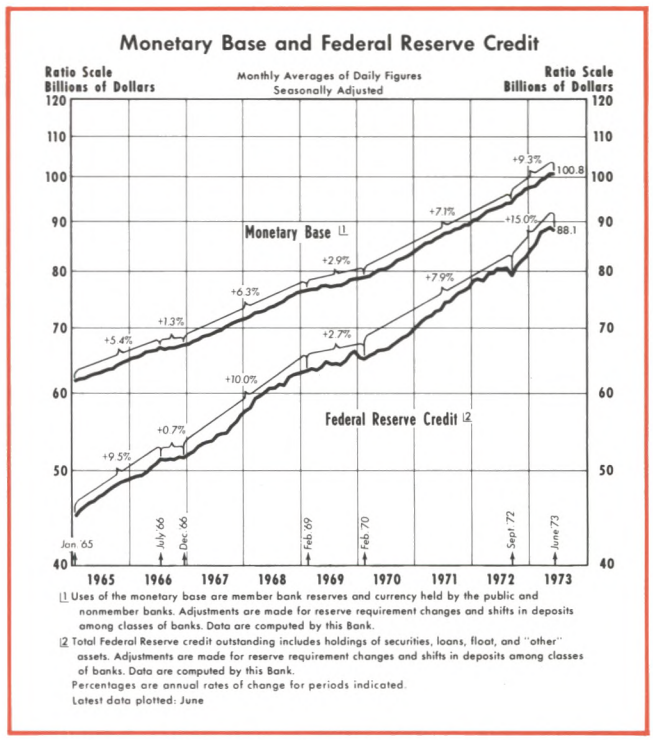
[5]The choice of November 1972 avoids the distortion introduced into rates-of-change calculations from abnormal base periods, such as December or January.

Contributing to my concern is the observation that the basic forces underlying monetary growth have continued to be expansionary. Since last November, for example, Federal Reserve credit has risen at a very rapid 13 percent annual rate, after increasing just over 7 percent in the previous year. The growth of the monetary base, which underlies the growth of the money stock over a period of several months, has risen at an 8 percent annual rate since last November, the same as in the previous year.

The growth of money slowed in the first few months of this year despite the marked acceleration of Federal Reserve credit and the persistent path of the monetary base. The explanation of this paradox lies in the bunching of several market developments which prevented the rapidly rising base from supporting a proportionately larger growth of money. These market developments appear to have been temporary aberrations, for in the past two months the growth of money has accelerated sharply to a 12.5 percent rate.

An important factor absorbing the monetary base early in the year was an unusual buildup in Treasury deposits in commercial banks. These funds in Treasury accounts are not included in the money stock, but banks are required to hold reserves against these Treasury deposits the same as private deposits. During the international monetary turmoil, the Treasury received a large inflow of funds from foreign central bank purchases of Government securities, as these foreign banks sought to invest the dollars accumulated in maintaining exchange rates between their currency and the dollar. Also, early in the year Treasury receipts from personal and corporate income taxes and from agencies such as the Social Security Administration were running well ahead of payments. In late March, Treasury balances at commercial banks averaged about $11 billion, up from an average of about $7 billion in December. It is well known that the Treasury does not usually hold large idle cash balances, and as these funds are spent, the private money stock has expanded.

Other factors contributing to the slower growth of money relative to base early this year include the rapid growth of CDs and a marked increase in currency in the hands of the public. The growth of CDs at banks absorbs reserves leaving less available to support private demand deposits and other time deposits. Both of these factors are also likely to be temporary, and as they return to more normal patterns, it would be necessary to reduce the rate of



1 Uses of the monetary base are member bank reserves and currency held by the public and nonmember banks. Adjustments are made for reserve requirement changes and shifts in deposits among classes of banks. Data are computed by this Bank.

2 Total Federal Reserve credit outstanding includes holdings of securities, loans, float, and "other" assets. Adjustments are made for reserve requirement changes and shifts in deposits among classes of banks. Data are computed by this Bank.

Percentages are annual rates of change for periods indicated.

Latest data plotted: June

expansion of the monetary base in order to avoid further acceleration in the growth rate of money.

Economic Outlook

On balance through the first six months of 1973, the rate of money growth has been somewhat less than the exceptionally high rate of 1972, but this has not been true for Federal Reserve credit and the monetary base. If one can assume that the growth rate of money from this point is, on average, no more than in the past six months, some slowing in the growth of total spending on goods and services from the unusually rapid growth of the past two quarters can be expected. The rate of GNP growth will probably slow to about 8 percent by year's end, but on average for 1973 the increase should be in the range of 10 to 11 percent. Of that total, it now appears to us that about 6 percent will be in real GNP and about 5 percent in overall price increases for the year.

Moderation of spending is desirable, of course, since the economy is operating at or very near capacity and consequently inflationary pressures have been intensifying. Even so, I would hope that cutbacks in aggregate demand would be gradual; otherwise, production and employment would be seriously affected. Capacity limitations constrain production growth to about a 4 percent rate in the long run, and given our experience with prices so far this year, inflation much below a 5 percent rate on balance for the year is no

Table I

Factors Influencing the Monetary Base in the Past Seven Months[1]

Averages of Daily Figures

(Dollar Amounts in Millions)

	November 1972	June 1973	Change	Change in Source Base Attributable To:
Federal Reserve Credit				
U.S. Government Securities[2]	$71,217	$ 75,447	$+4,230	+131.1%
Loans	606	1,788	+1,182	+ 36.6
Float	2,966	2,386	— 580	— 18.0
Other Federal Reserve Assets	1,170	942	— 228	— 7.1
Total	75,959	80,562	+4,603	+142.6
Other Factors				
Gold Stock	10,410	10,410	0	0
Special Drawing Rights Certificate Acct.	400	400	0	0
Treasury Currency Outstanding	8,278	8,518	+ 240	+ 7.4
Treasury Cash Holdings[3]	375	386	— 11	— 0.3
Treasury Deposits with F.R. Banks[3]	1,321	2,407	—1,086	— 33.7
Foreign Deposits with F.R. Banks[3]	195	266	— 71	— 2.2
Other Deposits with F.R. Banks[3]	604	698	— 94	— 2.9
Other F.R. Liabilities and Capital[3]	2,378	2,732	— 354	— 11.0
Total	14,215	12,839	—1,376	— 42.6
Total Source Base	$90,174	$ 93,401	$+3,227	100 %
Reserve Adjustment[4,5]	6,221	7,072	+ 851	
Monetary Base[5]	$96,395	$100,473	$+4,078	
Monetary Base, Seasonally Adjusted[4,5]	$96,305	$100,754	$+4,449	

[1]The monetary base is defined as the net monetary liabilities of the U.S. Treasury and Federal Reserve System held by commercial banks and the nonbank public. For a brief description of each of the factors influencing the source base see *Glossary: Weekly Federal Reserve Statements*, Federal Reserve Bank of New York.

[2]Includes Federal agency obligations and bankers acceptances.

[3]These items absorb funds and therefore a reduction in them releases reserves and increases the base (sign is reversed on dollar changes and percent distribution).

[4]Adjustment for reserve requirement changes and changes in average requirements due to shifts in deposits where different reserve requirements apply.

[5]Computed by this Bank.

Totals may not add due to rounding.

longer attainable without an unusually severe reduction in production. Over time, the rate of inflation can be reduced; however, if an economic downturn is to be avoided, the transition to stable prices will be a time-consuming process. This will require both the patience and the perseverance that is inherent in the successful avoidance of the traditional massive and abrupt cutback in monetary stimulus when inflation is finally recognized as being out-of-hand. Put another way, achieving stability without suffering a recession is possible, but it will take time and highly disciplined monetary and fiscal actions to get there from here. I believe it can be accomplished, and hope those of us involved in the stabilization decision-making process have the patience, perseverance, and the wisdom to achieve this.

Looking into next year, a growth rate of money in the range of 4 to 6 percent would likely be accompanied by a growth of nominal GNP in the range of 7 to 8 percent, and at this point our best judgment is that about half, and more likely less, would be in real output, and the remainder in prices. As you can see, I am not convinced of the necessity for a recession, nor am I assuming in this analysis any stronger use of economic controls by the Administration or Congress to deal with inflation.[6] I do not believe that price-wage controls in and of themselves should be viewed as a basic cure for inflation. Since I hold the view that in the longer run a high level of employment is consistent with relatively stable prices, I continue to advocate achieving a stable rate of monetary growth consistent with that objective. Therefore, assessment of the economic outlook does not assume that controls are either necessary or desirable in order to restrain the rise in prices. A return to more strict controls is again rumored, and they may come. If so, they may affect expectations and market interest rates for a while, and they will certainly affect statistical indicators of economic activity. Under-the-table transactions, black market activity, and product mix changes do not show up in the published price indexes. However, controls can have the appearance of working only if rational fiscal and monetary actions are taken. Otherwise the conflict between real economic forces and the administered economic programs will create a situation which is acceptable to no one.

[6]This presentation was given prior to the June 13, 1973 announcement of a second price freeze followed by Phase IV.

Formulating a Model of the Mexican Economy

by GILBERTO ESCOBEDO

In this article Mr. Escobedo presents two alternative approaches to the development of an econometric model of the Mexican economy. One model is based on a neo-Keynesian framework of analysis; the other model incorporates the theoretical positions of monetarists. Before summarizing the structure of the two models, Mr. Escobedo expresses his views of the debate between monetarists and neo-Keynesians.

For some background information into the complexities of the Mexican economy, the reader may wish to refer to an article by Mr. Escobedo in the June issue of this REVIEW.

ONE OF THE interesting peculiarities of the evolution of economic theory is that it closely follows the economic performance of the leading industrial countries of the Western World. In the present century we can trace this trend very clearly. When the world fell into the "great economic depression" in 1933, the prevailing theory assumed the problem away and therefore could not provide a solution for bringing the economy out of the difficulty. The Keynesian approach emerged at that time as the "great savior" of the economic discipline. Monetary variables were considered irrelevant and fiscal policy came to be regarded as the "solution" in a "new era" of Government intervention in the economy.

In the post-war period, as economies became more sophisticated and some neo-Keynesian solutions to economic policy were not proven to be as efficient as previously thought, monetary theory regained importance.[1] Much discussion has occurred in the last 5 or 6 years regarding the relative importance of fiscal versus monetary policy. The question has not been settled definitely, although a consensus of opinion seems to be emerging.[2] The present state of the discussion seems to lie at least in part in what can be considered the main exogenous policy variable – Government expenditures for Keynesian theory or money stock for the monetary theory – since each approach assigns an important role to the effectiveness of those variables in the system.

Furthermore, the discussion has been extended to the question of how much benefit or loss is added to the economic system when the policymakers use the instruments they have available to obtain a desired goal. Given that the results of these actions are subject to a high degree of uncertainty, the question raised is whether it is better for policymakers to use the imperfect instruments available or whether policy interference should be kept at a minimum with the system left to "self correct" as Milton Friedman suggests.

The criticism of the "activist" position rests on the premise that serious limitations exist in the ability to predict both the behavior of the system in the absence of action and the effect of action. There is also a time consuming process involved in correcting the lags between the recognition of the problem, the formulation of appropriate action, the implementation of action, and the results of such action. Actions taken without knowledge of the adjustment process during these lags would tend to destabilize an inherently stable economy.

The main criticism of the "self-correcting" position is focused on the assumptions that the economy "tends" toward stability and that the use of an activist policy is only "disruptive." This assumption cannot be proven for no test could completely isolate the system from Government actions which are not aimed at stabilization. Neo-Keynesians therefore conclude that "... the evidence of both Keynesian and monetarist models of economic activity suggests that we

[1] Milton Friedman, "The Role of Monetary Policy," *American Economic Review* (March 1968).

[2] Good examples of these discussions are Frank DeLeeuw and John Kalchbrenner, "Monetary and Fiscal Actions: A Test of Their Relative Importance in Economic Stabilization – Comment," this *Review* (April 1969), pp. 6-11, and Leonall C. Andersen and Jerry L. Jordan, "Monetary and Fiscal Actions: A Test of Their Relative Importance in Economic Stabilization – Reply," this *Review* (April 1969), pp. 12-16.

live in an economy of persistence rather than self-correction" because the economy is permanently subject to multiplier effects and therefore intervention in the economy is called for as a corrective device.[3]

Whatever the outcome of this controversy might be, it is clear that there is a recognized influence on the economy from changes in both monetary and fiscal variables. The policymaker thus needs to follow an analytical framework in predicting the behavior of the economic system, so that the level of uncertainty of his actions can be minimized. We will disregard in this paper a discussion of self-correcting mechanisms which, even if relevant in countries like the United States, would not necessarily be applicable in more Government-oriented economies like Mexico.

ECONOMIC POLICY IN DEVELOPED ECONOMIES

The Keynesian Approach

The original version of the Keynesian theory emphasized the role of fiscal variables, such as Government expenditures and taxes, as the most important policy instruments for influencing economic activity. The effect of a fiscal action on spending is viewed as a multiple of the original magnitude of such fiscal action. Government spending, for example, is transformed into a direct demand for goods and services, which generates additional income, which in turn is spent. This process continues until the leakages (savings and taxes) bring it to an end – the final result being a multiple of the original Government expenditure. Taxes affect disposable income (a major determinant of consumer spending) and profits of businesses (a major determinant of investment spending). Therefore, according to Keynesians, budget surpluses or deficits are good measures of the influence of Government spending or taxing on economic activity.

More advanced neo-Keynesian interpretations recognize monetary actions as an indirect influence on economic activity through the effect of changes in market interest rates. But even in this case the way in which a budget deficit is to be financed has not always received adequate consideration.

With the help of the Hicksian IS-LM framework, the effects on the economy of fiscal actions, such as an increase in Government spending, can be traced. This increase induces a change in both consumption and saving, which in turn increases investment (an upward movement along the IS schedule as well as a shift due to an accelerator type effect) and therefore income in the next period. But this shift of the IS curve will have an effect on the demand for money and, depending on what happens to its supply, market interest rates may or may not move up. If there is no displacement to the right of the LM curve, the final effect of increased Government expenditures will be a higher level of income, but also higher interest rates prevailing in the market.

For Keynesians the money stock in equilibrium is given exogenously, as is the price level. Adjustments from a low to a higher equilibrium position through developments in the monetary sector occur as a result of an outward shift in the LM curve. This shift, induced by a change in the money stock, reduces the rate of interest which, in turn, promotes investment and higher levels of income, consumption, and savings. The process continues until new equilibrium levels of income and interest rates are achieved.

This static framework has been developed into a dynamic system allowing prices and credit rationing effects to affect the slopes and positions of the pairs of IS-LM curves determined in each income period.[4] Presently the Keynesian framework allows for changes in monetary and fiscal actions to take place at the same time, and considerations about the financing of Government expenditures can be introduced. Financing with monetary expansion will result in the full Keynesian multiplier effect while financing by either taxes or borrowing from the public has a smaller multiplier effect on spending.[5]

Neo-Keynesians also recognize that exogenous Government expenditures (whether directed towards the achievement of allocation, distribution or stabilization objectives) have to be integrated in such a way that an expenditure intended to achieve stabilization objectives does not hamper the desired distribution or allocation of resources.[6] This is a difficult distinction to document empirically, especially in economies near full employment in which the trade-off between the goals of economic policy may be sharper. It is also difficult to classify the amounts and types of debt the

[3]See Arthur M. Okun, "Fiscal-Monetary Activism: Some Analytical Issues," *Brookings Papers on Economic Activity* (No. 1, 1972), p. 147.

[4]J. R. Moroney and J. M. Mason, "The Dynamic Impacts of Autonomous Expenditures and the Monetary Base on Aggregate Income," *Journal of Money, Credit and Banking* (November 1971), pp. 793-814.

[5]James Tobin, "An Essay on the Principles of Debt Management" in *Essays in Economics* (Chicago: Markham Publishing Company, 1971).

[6]Richard Musgrave, *The Theory of Public Finance* (New York: McGraw-Hill, 1959).

Government uses to finance each type of expenditure. Consequently, the portfolio approach, as developed by James Tobin, attributes both a direct and an indirect effect on the economy to fiscal actions, depending on the relative amounts and terms of the debt. This development gives greater detail to the final impact of Government expenditures and brings the fiscal and monetary approaches closer together.

The Monetarist Approach

Outside the context of the Keynesian framework of IS-LM analysis, a group of economists in the United States have developed a theoretical approach that stresses the influence of monetary and financial variables on economic activity. This approach is a reformulation of the quantity theory which emphasizes the role of money as an asset. In this framework, the demand for money is treated as a part of capital or wealth theory, and the concern is with the composition of asset portfolios which provide utility or satisfaction to holders.[7]

Two well-defined markets are set forth. Economic entities make choices in the market for goods and services and in the market for financial assets, so a Walrasian framework of supply and demand is necessary for each financial asset. Market interest rates (prices of financial assets) and changes in the outstanding stocks of most financial assets are determined by the market process, along with prices and quantities of goods and services.[8]

The modern quantity theorists assume that the *real* money stock and the level of *real* income are determined by this supply and demand mechanism, which eventually will come to a high-employment equilibrium, since it is assumed that the economy has an "inherent force" towards stability. Therefore, changes in the nominal stock of money will not affect "real" variables in the long run, but will influence only nominal interest rates, prices, and spending on goods and services.[9]

This theory also incorporates the view that the influence of fiscal actions depends mainly on the method of financing Government spending. Financing by either taxing or borrowing from the public involves a transfer of command over resources from the public to the Government, giving way to the "crowding out" effect on private expenditures. That is, the Government will use funds otherwise available to the private sector, therefore affecting the rate of interest and eventually total spending on goods and services.

Summing up, we could say that the modern quantity theory stresses the influence of money on the pace of economic activity. Such a relation has been empirically tested only in an aggregated level where the results are satisfactory, but the monetarists have made little effort to test the responses to financial variables in a disaggregated structural-type model.[10]

ECONOMIC POLICY IN DEVELOPING ECONOMIES

The popular Keynesian theory developed in the industrialized countries during the 1940s and the 1950s was not directly applicable to the underdeveloped economies. Special adjustments had to be made to consider problems such as industrialization, income distribution, and growth. There were the so called "developing theories" advanced by nationals of these countries like Raul Prebisch of Argentina, Juan Noyola of Mexico, Celso Furtado of Brazil, and Anibal Pinto of Chile, as well as by foreigners such as Nicholas Kaldor, Ragnor Nurske, Harry G. Johnson, and Walt Rostow. These "developing theories" followed two main courses.

The Structuralist Position

This approach, which was promoted primarily by the United Nations, stresses that inflation is not a monetary phenomenon, but the result of disequilibria of a very real nature that are expressed in the form of the general level of prices. Inflation can be attributed to structural factors (population and productivity), dynamic factors (different rates of sectoral growth), and institutional factors (behavior of public and private sectors).[11]

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[7]Milton Friedman, "Money: Quantity Theory," *International Encyclopedia of the Social Sciences* (vol. X, 1968), pp. 432-47.

[8]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.

[9]Milton Friedman uses this argument in "The Role of Monetary Policy" to show how badly monetary policy has been conducted in the United States.

[10]Leonall C. Andersen and Keith M. Carlson, "A Monetarist Model for Economic Stabilization," this *Review* (April 1970), pp. 7-25. See also Gene Fisher and David Sheppard, "Effects of Monetary Policy on the United States Economy," Organisation for Economic Cooperation and Development, *Occasional Studies* (December 1972).

[11]Juan Noyola, "El Desarrollo Economico y la Inflacion en Mexico y otros Paises Latinoamericanos," *Investigation Economica* (1956). Also see United Nations Economic Commission for Latin America, *Development Problems in Latin America* (Austin: University of Texas Press, 1971), pp. 161-211.

Once inflation starts, there is an inherent "propagation" in the economic system due to the state of income distribution and to the behavior of the private and public sectors. The conclusion of this group is that if a choice had to be made between inflation and economic stagnation or unemployment, inflation is preferable.

According to this approach, developing economies should direct their efforts towards the stimulation of growth by means of industrialization. This would be achieved by promoting import substitution so that, at the same time the terms of trade are improved, an increased capacity to import would make it possible to sustain the large capital needs of development. Therefore, Government expenditures should be heavily directed toward promoting the industrial infrastructure of the country. This process would allow productivity to increase and ameliorate the problem of income distribution.

An additional effort would have to be made by the Government in order to guarantee the productivity of private investment which sometimes is "poorly oriented, directed to superfluous goods or to foreign markets."[12] However, at the beginning of the 1960s, when some of these countries were finishing their import substitution process, and the pace of industrialization was slowing, a new ingredient was incorporated into the problem of development. The patterns of commercial policy of the advanced countries had to be changed, so as to make it possible for those countries in the process of development to export non-traditional products which, under prevailing conditions, could not be placed competitively in the international markets.

The "Orthodox" Position

This approach was promoted mainly by the International Monetary Fund and other international agencies. It also has a heavy Keynesian influence, but gives more consideration to the financial sector and especially to the rate of exchange. The increase in prices is viewed as originating with the expansion of additional income, from the inherent process of development, from the expansion of bank and extra-bank credit, and from increasing costs due to "commercial practices."

Furthermore, this approach holds that external factors are basic in explaining monetary disequilibria. The reasoning is that Government spending, or a surplus in the current account of the balance of payments, produces an increase in aggregate demand, which induces increases in investment. In turn, increased growth of income is promoted and, consequently, imports grow at a higher rate than income.[13] Since the growth of exports is slower, a deficit in the current account occurs. A change in relative prices – domestic and foreign – or a monetary policy oriented toward sustaining output growth at high rates, accentuates the balance-of-payments deficit and it becomes necessary to devalue in order to restore external equilibrium.[14] Later developments of this approach rejected devaluation as a necessary means for restoring equilibrium, turning more to domestic and foreign savings for that purpose and, therefore, making development with price stability the goal of economic policy.

In general, one can conclude that the "developing theories" have relied very heavily on Keynesian theory. Even the most recent approaches to economic policy, with a heavy content of social considerations, are still based on a Keynesian-type mechanism. This is only natural if one considers that capital markets and financial institutions have been almost nonexistent in developing countries and that Government plays a central role in the economic mechanism.

To a great degree Mexico has been an exception to the usual experience of developing economies. In Mexico a wide and competing banking system has been developed which has attracted not only domestic but also considerable amounts of foreign savings. Nevertheless, economic policy is still conducted mainly in the Keynesian tradition, giving relatively little attention to the role of financial variables in the economic system. Therefore, the exploration of new approaches to economic policy seems appropriate.

Such is the purpose of this study, empirical results of which are summarized in the remainder of this paper. The analysis has been directed only to short-term economic policy, but it seems necessary that similar considerations be given to long-term policy consistent with the goals of employment and more equitable income distribution.

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[12]For a more recent interpretation of the structuralist position, see David Ibarra, "Mercado, Desarrollo y Politica Economica," *El Perfil de Mexico en 1980,* ed. Siglo XXI, 1970, and Luis DiMarco, ed., *International Economics and Development,* Essays in Honor of Raul Prebisch (New York: Academic Press, 1972), p. 11.

[13]The income elasticity of imports is normally assumed to be greater than one.

[14]For a more detailed view of these approaches, see Leopoldo Solis, "Mexican Economic Policy in the Post-War Period: The Views of Mexican Economists," Supplement to *American Economic Review* (June 1971).

DEVELOPMENT OF THE MODELS

The institutional characteristics and the historical background of Mexico, which were presented in the June 1973 issue of this *Review*, provide a foundation for the two econometric exercises presented below. From these two exercises we will try to determine if the recent theoretical and empirical developments in industrialized countries can be used in developing economies which are concerned more with growth and income distribution than with stabilization and full employment. In so doing, the traditional, but still popular, approaches given by the "developing theories" will be disregarded.

The construction of the models could have been approached from two extremes. The models could have incorporated "a prioristic policies" based on theories rather than empirical research, or they could have been constructed around "empirical policies" based on experience with little theoretical background.[15] Since neither of these extremes is desirable, two models have been developed of an intermediate type based on knowledge of past economic behavior. These models are appropriate for testing the relative importance of fiscal and monetary policies in income-expenditure determination. By statistical simulation we can determine which of the two approaches fits best.

The models only consider quantitative policy – that is, moderate changes in quantitative instruments such as Government expenditures and money supply. The short-run structure of the economic environment is assumed to remain unchanged. No consideration is given to policies of increasing complexity, such as changes in the monetary or fiscal structure, the pattern of income distribution, or the state of property arrangements.

It is hoped that the results of these efforts will be helpful for a number of purposes. First, they should provide a framework for evaluating the attainability and desirability of alternative policy objectives, given the maintenance of present relationships. In addition, the results should indicate whether a change in these relationships is necessary, and if so, how the alteration could be accomplished.

A word of caution should be advanced regarding availability of data. Mexico, as is the case with most developing countries, suffers from a considerable lack of statistical data, and this situation has been deteriorating rather than improving in recent years. The national accounts are only available from 1950 to 1968, the last input-output table is for 1960, and no flow-of-funds tables have yet been produced. Therefore, the construction of reliable statistical series for our purposes was a difficult task which excluded those variables undocumented. Nevertheless, awareness of the difficulty in gathering consistent and reliable information is one of the "side-benefits" of model building and should serve as a feed-back to those institutions involved in statistical development.

[15]Jan Tinbergen, *On the Theory of Economic Policy* (Amsterdam: North Holland Publishing Company, 1955).

A Summary of the Fiscal Model Structure

Consistent with the Keynesian approach, the main economic policy variable of this model is Government expenditures which are considered exogenous to the system.[16] The other instrumental variable is the rate of interest, which the central bank regards as "controllable." The rate of interest acts as the credit rationing variable.[17]

The purpose of the model is to estimate the financing requirements of a given level of Government expenditures while trying to meet the goals of a high growth rate of gross domestic product, a stable rate of exchange, and a "minimum" of inflation.

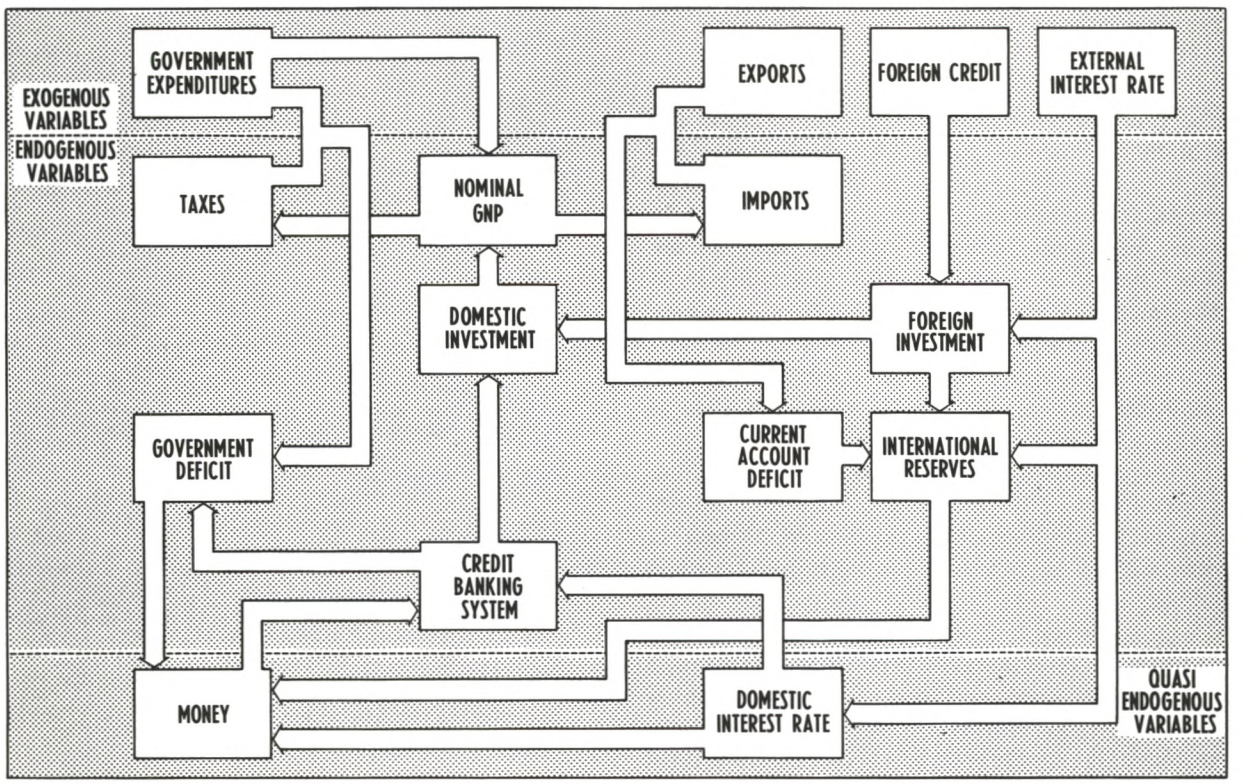
The restrictions imposed on the model are the budget and balance-of-payments deficits. That is, if the growth of GDP is to be promoted with a "minimum" of price and exchange rate instability, Government expenditures will have to follow a "moderate" rate of growth. Failure to do this will necessarily affect both Government and balance-of-payments deficits, and domestic and foreign stability will not be possible. Therefore, the relevant endogenous variables responding to different policy shocks are in the following sequence: GDP, taxes, imports, international assets, domestic credit, and the money supply (see Exhibit I).

[16]In other words, in this first model we will test the hypothesis that Government expenditures are an independent variable which will have broad and rapid effects on economic activity.

[17]This necessarily implies the existence of excess demand for funds at the "official" rates. The assumption of excess demand for funds implies that since the interest rate is fixed at an "official ceiling" there will be times when there are actually two interest rates: the official and the market rate. The latter one cannot be measured systematically and, therefore, the interest rates are not introduced in the credit equations. Official interest rates enter only in the bank's liabilities equations as a variable helping to explain the total amount of funds received by the banking system in a given period.

Exhibit I

Mexican Fiscal Policy Model



There is a basic channel which, by way of a multiplier, transforms private and public investment into expenditures on goods and services. Government investment is determined exogenously and private investment depends on the remaining funds available in the banking system after Government expenditures are financed.[18] The total amount of credit available depends on the level of domestic saving and on the interest rates prevailing in domestic and foreign markets.

Government expenditures will be financed in the first instance by revenue coming mainly from income and indirect taxes, which are endogenous to the system and a function of income and GDP. Four additional sources are considered for financing these expenditures: a) credit from the private banking system, b) credit from the central bank, which will be reflected in an increase of the money supply or in a reduction in the amount of credit discounted, c) foreign credit, and d) credit from the non-banking sector.

Private bank credit to the Government (including that of investment banks) depends on the legal reserve requirements which by law are kept in some form of Government debt instrument instead of deposits bearing no interest. This way of allocating public debt permits the central bank to rely less on an expansion in the stock of money and, therefore, helps avoid heavy pressures on inflation. Financing with new money was typical during the inflationary periods in Mexico.

Legal reserve requirements are a fixed proportion of demand deposits, time deposits, "bonos financieros" (a demand deposit bearing interest) and "hipotecarios,"[19] which in turn depend on GDP and the differential between domestic and international interest rates.

The amount of credit that the central bank grants to the Government (the level of Treasury bills purchased), in addition to that coming from domestic and

[18] See Richard A. Musgrave, *Theory of Public Finance*, Chapter 25, and Roger W. Spencer and William P. Yohe, "The 'Crowding Out' of Private Expenditures by Fiscal Policy Actions," this *Review* (October 1970), pp. 12-24.

[19] A discussion of these terms is provided in the screened section of "The Response of the Mexican Economy to Policy Actions," this *Review* (June 1973), p. 21.

international sources, is also endogenously determined. In order to extend this credit, the central bank has to lower its discount rate to private banks, reduce its holdings of international assets, or in turn increase the money supply.

Changes in international reserves depend upon the results of the balance of payments, which is the difference between exogenously fixed exports minus endogenously determined imports of consumer goods, equipment, raw materials, and services. Imports are mainly a function of current and lagged real output and investment. If changes in international reserves are endogenous, part of the monetary base also becomes endogenous, and the central bank will have no other alternative to finance the Government's deficits but to reduce the amount of credit available to private banks. This action will be taken because of the inflationary risk involved in the creation of "new" money in excess of trend. Therefore, the whole process of "crowding out" takes place and private investment is reduced.[20]

The only way in which this process will not occur is if the private sector borrows from international money markets. This borrowing will take place only when the interest rate differential becomes significantly important so that the foreign interest rate plus the "risk" factors involved in foreign borrowing are lower than the domestic rate. The effect that such borrowing has on the change of international reserves depends on changes in imports, exports, and the amount of debt the Government decides to float in international markets.

Summing up, the four main endogenous variables in the system are private investment, imports, taxes, and credit. All are determined mainly by the behavior of GDP which, in turn, is heavily dependent on Government expenditures. The Keynesian multiplier will work fully if Government spending is financed with "new" money, but the ultimate impact will be decreased if any amount of funds is taken from the private sector. Also, the multiplier is influenced by the behavior of imports, since part of the increased demand will be transferred to the external sector with no further multiplier effect on the domestic economy.[21]

Table I

EMPIRICAL RESULTS OF THE FISCAL MODEL — 1970

(First differences, billions of pesos)

Variable	Actual	Predicted	Percent Error
Demand Deposits	2.774	2.740	— 1.2%
Bonos (Quasi-Money)[1]	3.601	3.274	— 9.1
Money (M_1)	1.604	1.621	10.0
Non-Liquid Liabilities	15.513	15.319	— 1.3
Total Liabilities	27.520	27.736	8.0
Bank Credit to Private Sector	20.259	19.870	— 1.9
Total Revenue	34.185	34.182	—
Income Tax	7.103	7.239	1.9
Indirect Tax	4.148	4.207	1.4
Import Tax	3.971	3.774	— 5.0
International Reserves	1.513	1.258	—16.9
Total Foreign Capital	12.589	12.009	— 4.6
Total Imports	50.476	50.150	— 0.7
Imports of Raw Material	9.974	9.772	— 2.0
Imports of Industrial Goods	14.185	13.415	— 5.4
Imports of Consumption Goods	13.914	14.174	1.9
Imports of Services	2.121	2.442	15.1
Private Investment	67.000	70.732	5.6
Gross Domestic Product[2]	48.250	50.561	4.8

[1]Defined as $M_2 - M_1$

[2]The "actual" GDP data series in this table may not necessarily agree with that reported in Table III. The discrepancy is primarily the result of revisions in the data subsequent to formulation of the fiscal model yet prior to the development of the monetary model.

Empirical Results of the Fiscal Model

This model offers a far more detailed breakdown than that mentioned above, but it was not considered relevant to the argument of this paper. There is a breakdown by type of imports, by taxes, and by the main assets and liabilities of the banking system. The user of the model might find these helpful in understanding the behavior of the aggregated variables, and they will also be useful if the model is used for policymaking purposes.

The estimation of the model was made with annual figures. Due to the considerable number of variables involved (41 endogenous and 63 exogenous), and the availability of data, it was not possible to estimate it using quarterly data, as was possible in the monetary model. Therefore, the simulation was done on an annual basis as was the 1973 forecast.

In Table I the 1970 simulation is compared with the observed data. We can see that most of the variables show acceptable results, with an average error of 10 percent. To judge these results one should keep in

[20]See Franco Modigliani, "Long-Run Implications of Alternative Fiscal Policies and the Burden of National Debt," *Economic Journal* (December 1961), and Albert Burger, *The Money Supply Process* (Belmont, California: Wadsworth Publishing Company, Inc., 1971). The monetary base in this case would have an additional term for international reserves so the definition of the base would be: Base (B^a) = total bank reserves (R) + international reserves − private bank borrowing (A) + currency (CP); B^a = R − A + CP + international reserves.

[21]The reader will notice that this model does not include an explicit consumption function. There were two main reasons for this: a) the bad behavior of such an equation due mainly to statistical deficiences and b) such an equation is estimated implicitly when we estimate domestic savings.

mind that the forecast is done in first differences, so an error of estimation between actual and simulated values of 10 percent is equivalent in many variables to less than 1 percent in terms of their levels.

The model has three primary areas of difficulty. (1) One such problem appears in the GDP equation where the regression coefficients are not significant ("t" statistics are very small) for the first differences of the Government expenditure variable. So the level of such expenditures was used to obtain a better result. This shortcoming means that the Keynesian "multiplier" is not a significant variable for explaining changes in total nominal expenditures. The significance of the dummy variable shows the need to try other explanatory variables in this equation, incorporating monetary actions in a more direct form than the one presented here in which interest rates enter only indirectly in the process of determining private investment. (2) The estimated financial equations are heavily dependent on interest rates, which are assumed exogenous and not significant for the changes in nominal GDP, contradicting the endogeneity expected in this model. (3) The model does not include a price equation because no satisfactory results were obtained, even though different approaches were tried. All the variables in this model are expressed in nominal terms, assuming that such variables have the same behavior in real terms, prices being relatively stable (which has been the experience in the sample period and was typical of most of the early versions of Keynesian models).[22]

In spite of these limitations, the model performs within a reasonable degree of confidence. An application of the model to a forecast for 1973 is presented in Table II.

Table II

FISCAL MODEL FORECAST — 1973

(First differences, billions of pesos; percent increase in parentheses)

	Case A: Government expenditure increase of 35 billion pesos (25%)	Case B: Government expenditure increase of 16 billion pesos (10%)
Nominal GDP	138 (24%)	68 (11%)
Imports of Goods & Services	14 (24%)	7 (13%)
Current Account Deficit*	9 (11%)	2 (3%)
Tax Revenue	22 (18%)	10 (9%)
Government Deficit	13 (58%)	6 (26%)
Financing of Government Deficit:		
Private Domestic Bank Credit	3 (50%)	3 (50%)
Foreign Credit	2 (25%)	1 (20%)
International Reserves (Decrease)	5 (25%)	2 (10%)
Central Bank Credit	3 (50%)	—

*Exports were determined exogenously as an average of the last 10 years.

A Summary of the Monetary Model Structure

The main exogenous variable in this model, in contrast to the fiscal model, is the money supply, which is defined as currency plus demand deposits held by the nonbank public. It follows the monetarist's view that the rate of monetary expansion is the main determinant of total spending, in this case measured as nominal gross domestic product.

Changes in total spending are reflected as movements in "real" output and prices (see Exhibit II). If the rate of growth of nominal GDP is not accelerated greatly beyond its trend, prices will not be affected and increased real GDP growth will be possible as existing capacity will be used more efficiently.

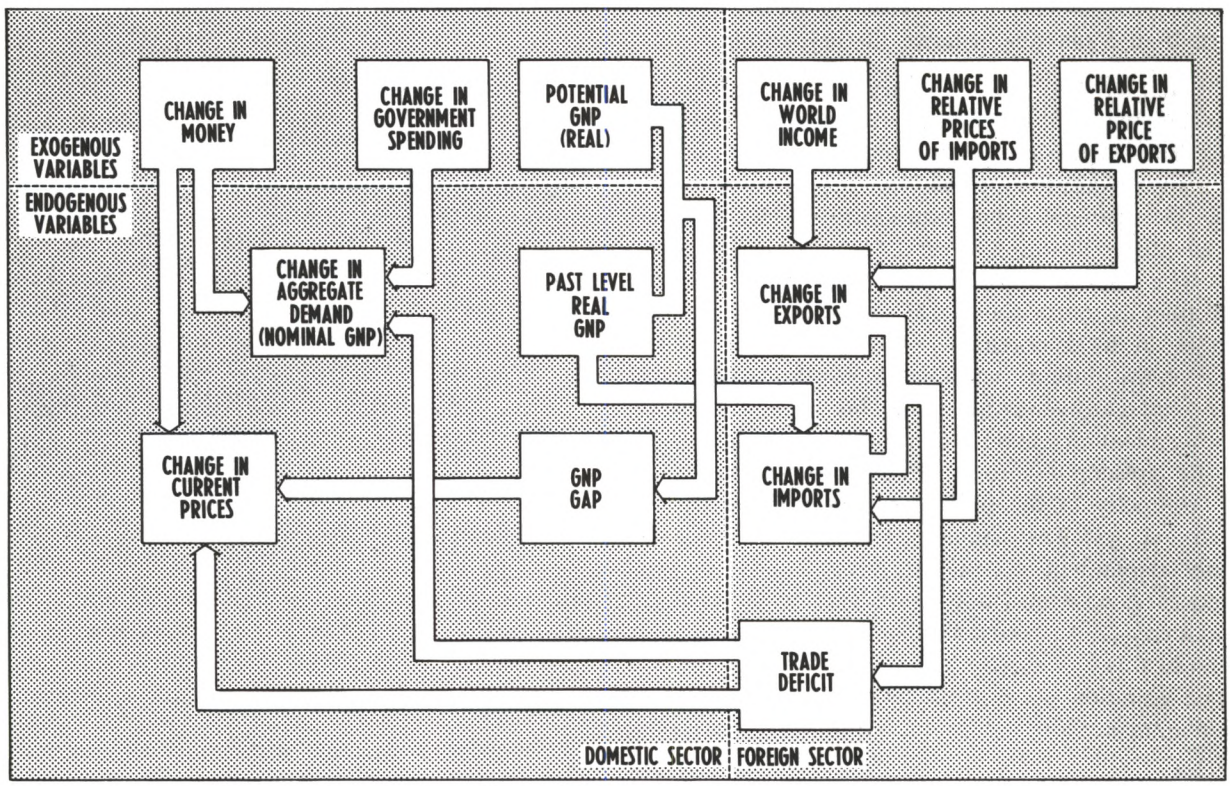
Special consideration is given to the external sector due to its impact on the level of spending. An increase in imports over exports means that domestic demand for goods and services exceeded domestic supply and, therefore, part of the spending stream was directed to the "rest of the world." This would mean that the balance of payments in an open economy like Mexico plays an important role in total spending; but it also affects the changes in the stock of money. If there is a deficit in the balance of payments, international reserves will flow out of the country, producing a contraction in the monetary base and consequently in the money stock if not offset by other actions of the central bank or by a corresponding inflow of foreign debt.

Balance-of-payments deficits will be possible only if the stock of money exceeds the amount demanded. This excess supply will ultimately lead to higher prices of domestic goods and/or to additional purchases of foreign goods, services, and assets, with the consequent loss of reserves by the central bank. This loss of reserves, if not offset by the central bank in the next period, would result in a reduction of the money supply (or an equivalent inflow of foreign capital). Otherwise, the process of increased spending in domestic and foreign goods and services would go on. Since a deliberate policy has been followed in Mexico to acquire the foreign capital necessary for the develop-

[22]In the monetary model a price equation was estimated, and its results are acceptable. This equation was found after numerous disappointing trials, but by that time the fiscal model had been completed. A future version of the fiscal model should include such an equation.

Exhibit II

Mexican Monetary Policy Model



ment process, the deficit is considered endogenous in the model.

Imports and exports are endogenous variables, which, when netted, produce a balance-of-trade deficit, and act as an exogenous influence on spending in the following period. Therefore, only indirectly (by changes in real GNP) can a deficit in the balance of payments be affected by policymakers.

Fiscal actions are introduced in the model as Government expenditures.[23] However, if such Government expenditures are not financed by monetary expansion, but by taxes or private borrowing from the public, we would expect a "crowding out" of private expenditures to take place and this variable to have little effect on total spending.

This point is really the motivation for the econometric exercise presented here. The Mexican experience demonstrates that during the inflationary period when budget deficits were financed with "new" money, total expenditures were growing at rates faster than in the period of stability. But the increased expenditures of the first period were transferred in part to imports and to prices, because real output could not keep pace with nominal spending. Therefore, Government expenditures were behind the inflation and balance-of-payments deficit, even though it acted as a stimulus to the growth of real GDP.

In the recent period when budget deficits have been financed through the "crowding out" process, the fiscal deficit becomes ineffective on total spending because it only substitutes private outlays for Government outlays, and no considerable inflationary pressure is exerted on the economy. Therefore, the money supply becomes the key variable in short-term economic policy, a fact that probably has not yet been generally recognized in Mexico. This is probably because the central bank has followed a policy of sustaining a fixed rate of growth in the money stock while financing increased Government deficits with funds that would otherwise be directed to the private sector. The experience of 1971 makes this behavior clear. When money supply was not reduced as sharply as Government expenditures, pressure on prices did

[23] It was not possible to estimate the equivalent to a "high employment budget" which would have been a preferable variable in this equation.

Table III

EMPIRICAL RESULTS OF THE MONETARY MODEL

(Billions of Pesos)

Variable	Actual	Predicted	Percent Error	Standard Error
		1970		
GDP[1]	46.100	42.277	— 8.3%	2.421
Prices	5.300	4.644	—12.4	0.578
Exports[2]	17.519	17.809	1.7	0.181
Imports[2]	30.741	28.529	— 7.2	0.220
		1971		
GDP	34.500	38.475	11.5	2.421
Prices	3.500	2.846	—18.7	0.578
Exports[2]	18.768	18.741	— 0.1	0.181
Imports[2]	30.088	30.314	0.8	0.220

[1]First differences from IV/1969 — IV/1970. The "actual" GDP data series in this table may not necessarily agree with that reported in Table I. The discrepancy is primarily the result of revisions in the data subsequent to formulation of the fiscal model yet prior to the development of the monetary model.

[2]Level prevailing at year end. Export and import data, as reported here, only include goods, whereas the trade data reported in Table I include goods and services.

not ease as much during 1971. However, the increased total spending together with increased monetary growth helped real output recover in 1972 and 1973.

Empirical Results of the Monetary Model

As was mentioned before, the estimation of this model was made with quarterly figures, which was possible given the availability of data in a small model (6 endogenous variables and 6 exogenous) like this. The simulation for 1970 and 1971, presented in Table III, was on a quarterly basis, but aggregated annually to make it comparable with the results obtained from the fiscal model. These results are also generally acceptable with a 10 percent average deviation from observed figures in first difference. The results for 1971 are not as good as those for 1970, but considering how atypical that year was in the sample period, the results are quite encouraging. It should also be noticed how much the simulation for nominal GDP improves in this model, with much fewer exogenous variables than the fiscal.

There are two shortcomings in this model. (1) Since there are no figures on unemployment in Mexico, the assumption was made that the economy will always be well below full employment with respect to the total labor force. But considering only the "skilled" labor force we could very well conclude that the Mexican economy often has reached "full employment." Therefore, the estimation of the gap between potential GDP and actual GDP was made on a totally arbitrary basis. Potential real GDP was measured as the average standard deviation from the maximum rate of growth of real GDP in the sample period.

(2) As a consequence of (1) the "high-employment budget" concept could not be used in the total spending equation, which would have been more adequate than Government expenditures. The use of Government expenditures instead introduces different elements of variability such as seasonal, postponement, advances, etc.

The price equation, which was obtained after many unfruitful trials, shows a well-defined pattern with the gap between potential and actual GDP. When the gap is reduced, prices tend to rise in a Phillips curve fashion. Also changes in the rate of growth of the money stock will affect prices in a meaningful way. Net imports act in a reversed pattern; that is, increases in the balance-of-payments deficit will remove inflationary pressures from the Mexican economy.

Probably the most encouraging result of the model is the total spending equation, which is one of the best of all the equations estimated for the two models. This equation has the advantage that it is potentially consistent with both Keynesian and quantity theory models. The results show that only changes in money significantly affect total spending. Government expenditures and the balance-of-payments deficit help in explaining such spending, but the regression coefficients are not significant.

The influence of monetary actions, besides being large, is also rapid as a three-quarter lag was found significant. The correlation was reduced when this lag was increased to 9 quarters.[24]

It seems that even though the Government is "totally free" to determine its level of expenditures, it only decides which sector will account for the increase in total spending. If the central bank does not offset the "normal" rate of growth of the money supply, given an increased Government deficit, total spending will continue at its pace – assuming that no structural changes attributable to the development process take place.[25]

[24]It is surprising how this equation followed the results obtained by Andersen and Jordan for the U.S. economy, but the nature of the method followed to finance Government deficits since 1959 in Mexico makes the results more "logical."

[25]Structural changes refer to changes in capital formation, production, natural resources, population, etc.

The models help us conclude that in the development process of Mexico the increasing role of the fiscal sector in economic policy proved healthy in early stages, making the economy better off than if the Government had not acted. This was particularly true in the early stages of Mexican economic development when the Keynesian multipliers acted fully. What remains to be seen is whether the multipliers will continue to operate in the future as they have in the past; with this knowledge we will be able to determine the suitability of existing economic policy to handle new goals. Of course, this will influence greatly the conclusions we draw about the effects of the Government sector's spending productivity compared to that of the private sector's, especially at a time in which more social type spending is necessary and the stage of heavy infrastructure investment is almost completed.

The questions that the policymakers will have to answer can be summarized as follows. Should economic policy forget about financing the budget in a non-inflationary way with the risk of reducing the rate of spending and eventually that of real economic growth in the future? Should the Government go back to financing this deficit with "new" money and increase spending in an inflationary way? Or should the Government enter the capital market and compete for funds, thus paying higher rates on its debt than those now paid to the private banks? The answers to these questions will have to be based on the long-term goals of economic policy, which in turn will have to be implemented in the short term. With the structure developed here the costs of alternative short-term actions can be approximated.

The 1973 forecast of this model (Table IV) as well as that presented for the fiscal model can give an idea of what large Government deficits financed with new money could do to the Mexican economy and also how a very restrictive monetary policy depresses the economy considerably.

Table IV

MONETARY MODEL FORECAST — 1973

(First difference, billions of pesos; percent increase in parentheses)

	Case A: Money Supply Increase of 8 billion pesos (15%)	Case B: Money Supply Increase of 2 billion pesos (4%)
Nominal GDP	73 (14%)	27 (5%)
Real GDP	14 (4%)	3 (1%)
Prices	(10%)	(4%)
Exports	2 (10%)	2 (10%)
Imports	1.1 (3%)	0.6 (2%)

CONCLUSIONS

The purpose of this paper has been to develop two short-term econometric models of the Mexican economy based on the empirical evidence of the last 15 years. Recent theoretical and statistical developments in the field of short-term economic policy in industrialized countries are applied and evaluated. The models are framed around the two primary theoretical approaches to income-expenditure determination — the fiscal and monetary approaches.

In the fiscal model the hypothesis tested is that Government expenditures, which are exogenous, have wide and fast effects on economic activity. In the monetary model the stock of money is the exogenous variable assumed to have such effects on economic activity.

The particular way in which the Mexican economy has evolved in the last 15 years made the experiment feasible. The conditions of continuous growth in real GDP with price stability, free convertibility of the peso, and a rapidly growing financial sector are rare in developing countries. The absence of such conditions would have introduced severe restrictions in the models.

Both models utilize data from the 1960-1971 period. Even though the fiscal model uses annual data and the monetary model uses quarterly data, the simulation and forecasting results were not substantially different. In spite of great data limitations, both models perform well in general terms and there seems to be no considerable contradiction between them. In fact, both models supplement each other well and facilitate the analysis of Mexican economic policy.

The following conclusions can be drawn from this exercise.

(1) Government expenditures, although an important policy variable, do not affect the level of total spending (GDP); they primarily act as a substitute for the private expenditure that would have taken place otherwise, through the "crowding out" process.

(2) As mentioned earlier, Government deficits are financed to a great extent by the private banks, buying Treasury bills to cover reserve requirements, and therefore leaving less credit available to the private sector. Increased taxation has not been used widely as an offset since it is argued that taxes have large and potentially perverse allocation effects in the development process. As a result, the central bank

has seldom expanded the money supply beyond trend rates to finance Government deficits. Money supply has been increased at a rate consistent with the growth of real GDP, thus resulting in a "tolerable" rate of inflation (3 percent).

(3) The money stock, with its large and fast (3 quarters) influence on total spending, is a very important variable in short-term economic policy.

(4) At high levels of employment (small GDP gap), increased spending will be reflected rapidly in higher domestic prices and increased imports. Therefore, Mexican economic policy faces a trade-off between growth and price stability. If one of the two goals is pursued actively, the other will not be achieved. This trade-off is similar to that implied by the Phillip's curve.

(5) The balance-of-payments deficit is a built-in constraint to short-term economic policy because imports respond with an elasticity greater than unity to changes in the rate of growth of real GDP. The growth process requires increasing amounts of imports, mainly of capital goods. Also, imports of consumer goods respond to increased income, while exports depend on world demand and relative prices for Mexican products vis-á-vis the rest of the world.

(6) Large and abrupt changes in policy variables affect investment, imports, and prices. If real growth is promoted at very high annual rates (7% or more), pressures develop on prices and on the balance of payments. If the inflation and loss of international reserves accompanying this procedure are extended for a long period of time, it will eventually be judged as an excessive pressure and a contraction in the policy variables will be recommended. This action will slow economic activity and, again, if extended for some period of time, will become "too contractionary" and another swing in policy will be called for. This process, when carried out for a period of time, will produce uncertainty and imbalance in the forces involved in the economic process.

Based on these conclusions, the following short-term economic policy guidelines are recommended.

(1) Sharp changes in Government expenditures should be avoided and a stable rate of growth sustained so that real GDP will increase at about 6 or 6.5 percent – a rate which, historically, is not associated with excessive price pressure.

(2) Sharp changes in the growth of the money stock should be avoided. Even if recommendation (1) is not met, this would be possible as long as the past procedure for financing Government expenditures is continued in the future, or Government expenditure increases are offset by increases in taxes. If recommendations (1) and (2) are met, prices will increase at a moderate rate. Net imports and private investment will also respond in a desired fashion.

(3) Once the economy is put on the "right track," the structural problems of employment and income distribution can be attacked. This will undoubtedly require additional Government expenditures which, if financed by the "crowding out" process, will affect private investment, and consequently real growth. Even if the alternative of less real growth would be better income distribution, the Mexican economy may have a net gain in the long run and an increase in potential future growth.

The goal of better income distribution requires additional study of the industrialization process, the educational system, the "dual" agricultural system, and regional development, to mention just a few of the areas. It should be clear that any structural changes can take place only if the short-term goals of the economy are achieved. In addition, long-term policy targets must be realized in accordance with the available policy instruments if the prevailing economic system is to remain in operation.