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POLICY INFLUENCE ON THE MONEY STOCK IN 1971

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Changes in the growth rate of the narrowly defined money stock—currency in circulation plus demand deposits—have major implications for our nation's financial and economic conditions. To some extent, the Federal Reserve System can and does control growth of the money stock through open market operations and other policy actions.

In 1971, the annual growth rate of the money stock showed wide variation, with a high of 14.1 percent in May and a low of −2.1 percent in September. What's more, higher rates were concentrated in the first seven months of the year, when the average annual growth rate amounted to 9.8 percent, while low rates were concentrated in the last five months, when the money stock grew at an annual rate averaging 0.8 percent. There has been considerable discussion among economists over the extent to which this fast-slow pattern of money growth was the result of Federal Reserve actions.

One way of examining this issue is through mathematical models that relate growth of the money stock to certain policy and nonpolicy variables. This article reviews the results of five such models. The models suggest that policy was the dominant influence on growth of the money stock in much of 1971 in the sense that policy accounted for a major share of actual money stock growth. Further, each of the models examined indicates that policy contributed to slowing the rate of growth of money at some time during the year. But there is no agreement among these models about the monthly timing of policy—or nonpolicy—influence on the money stock. Unless one is somehow committed to the validity of a particular model of money stock determination, no conclusion emerges about the extent to which policy makers were responsible for the fast-slow pattern of the money stock's monthly growth rate in 1971.

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* *The author is indebted to Lorraine E. Duro, Charles W. Hall, David A. Pierce, and Professor Michael V. McCarthy, Case-Western Reserve University, for assistance in this project, especially in calculating measures of policy influence on M_1. This article is based on a more technical paper presented at the meeting of the Committee on Financial Analysis of the Federal Reserve System held in Cleveland in May 1972.*

Wide swings in the monthly growth rate of the narrowly defined money stock (M_1) were observed in 1971. Annual rates of growth varied between 14.1 percent in May and −2.1 percent in September, and averaged 6.1 percent over the twelve months. What's more, high rates were concentrated in the first seven months of the year, when M_1 growth averaged 9.8 percent annually, while low rates were concentrated in the last five months, when M_1 growth averaged 0.8 percent. Explanations abound for this fast-slow pattern, ranging from a shifting demand for precautionary M_1 balances to a shifting supply of M_1 brought about by variations in the monetary base. In particular, conflicting interpretations of Federal Reserve policy influence on M_1 behavior in 1971 deserve reconciliation. This article has one objective: to quantify and compare various explanations of policy influence on M_1 in 1971 as viewed from the perspectives of alternative monthly models of M_1 determination.[1] The results of five alternative ways of defining and measuring policy and non-policy ("market") influence on M_1 are compared in the major section of the article. The final section suggests some implications of the 1971 experience.

Briefly stated, the conclusions are that: (1) the amount of M_1 growth in any particular month in 1971 that can be attributed to policy influence depends on one's definition of policy; (2) regardless of one's definition, policy contributed to a slowing in the rate of growth of M_1 during the year; (3) the rapid rate of growth of M_1 early in 1971 may have occurred because of, or in spite of, the role of the Federal Reserve, depending on how one measures policy's contribution to the rate of growth.

A note of caution must be sounded here. The comparisons of alternative formulations of M_1 determination in 1971, which are the substance of this exercise, should not be interpreted as general tests of the validity, or forecasting ability, of alternative models of M_1 determination. For the purposes of this article, all five models are accepted on an equal footing. The purpose here is to use alternative models that are assumed to be equally plausible in order to compare alternative estimates of policy influence on M_1 growth.

DEFINITIONS AND MEASURES OF POLICY INFLUENCE

It is sometimes asserted that money is precisely controllable by Federal Reserve operations. As will be seen below, this assertion is not supported by 1971 experience. Actual variations in the growth of the money stock sometimes deviated widely from what reasonably could have been predicted on the basis of a number of different models of M_1 determination. The nub of the issue in explaining policy influence on money lies in defining and measuring policy influence. Unfortunately, there is no unambiguous, generally accepted measure of policy influence on money, or on other intermediate targets or ultimate goals of policy.

The measures of policy influence examined here are of two general types. The first includes three measures that estimate the impact of what the Federal Reserve *did* on the monthly growth rate of M_1 (Chart 1). That is, given an estimated model of the relationship between M_1 and certain policy and nonpolicy variables, these measures represent the calculated direct or indirect impact of variations in the policy variables on M_1. Each of the three models specifies different policy

[1] No claims are made about either the importance or appropriateness of the M_1 growth pattern in 1971 for economic conditions—there can be substantial disagreement on these issues as well.

variables as well as a different relationship between M_1 and the policy and nonpolicy variables; therefore, the calculated impact of policy on M_1 differs among the three measures.

The second type includes three measures that estimate what Federal Reserve policy actions *allowed to happen* to the monthly growth rate of M_1 (Chart 2). That is, these are measures of the rates of growth of M_1 that were predicted to occur by alternative models of M_1 determination, given the settings of assumed policy variables, plus projections of nonpolicy variables influencing M_1. The presumption here is that, if policy makers can predict what M_1 will be, then they can achieve a desired rate of growth of M_1 by altering policy variables. The difference between predicted and actual M_1 can be said to represent nonpolicy influence on M_1 because, by definition, policy makers could not predict its value.

What Policy Did

Three measures of the effect of policy actions on the monthly rate of growth of M_1 are shown in Chart 1. Each is based on a different definition of policy. Although the measures frequently diverge widely from one another and from the actual rate of growth of M_1, there is a general tendency both for the policy measures and for the actual rate of growth of M_1 to decline over the course of 1971. That is, as the actual rate of growth of M_1 declined over 1971, all three estimates of policy contribution to that actual rate of growth indicate that policy promoted higher rates of growth early in the year, and lower rates of growth later in the year.

The Monetary Base Model. This model of policy influence and M_1 determination identifies the unborrowed monetary base (currency, plus unborrowed reserves of the banking system) as the variable uniquely determined by policy makers. M_1 is assumed to be a simple multiple of the unborrowed monetary base. This multiple is assumed to be largely a market determined variable that reflects demands for different classes of bank liabilities and the willingness of banks to supply them, demands for currency, and bank demands for excess reserves. A change in M_1 in any month can be broken down into: the change in the unborrowed monetary base times a multiplier unchanged from its actual value in the preceding month, reflecting policy influence with unchanged market forces (P_1); the change in the multiplier times an unchanged base, reflecting market influence with unchanged policy; an interaction term—the change in base times change in multiplier—which is trivial and may be ignored. The sum of these three terms (each seasonally adjusted) is precisely equal to the observed change in M_1. The first term, reflecting policy influence and expressed as a monthly seasonally adjusted annual rate of growth of M_1, is shown in Chart 1 as P_1.

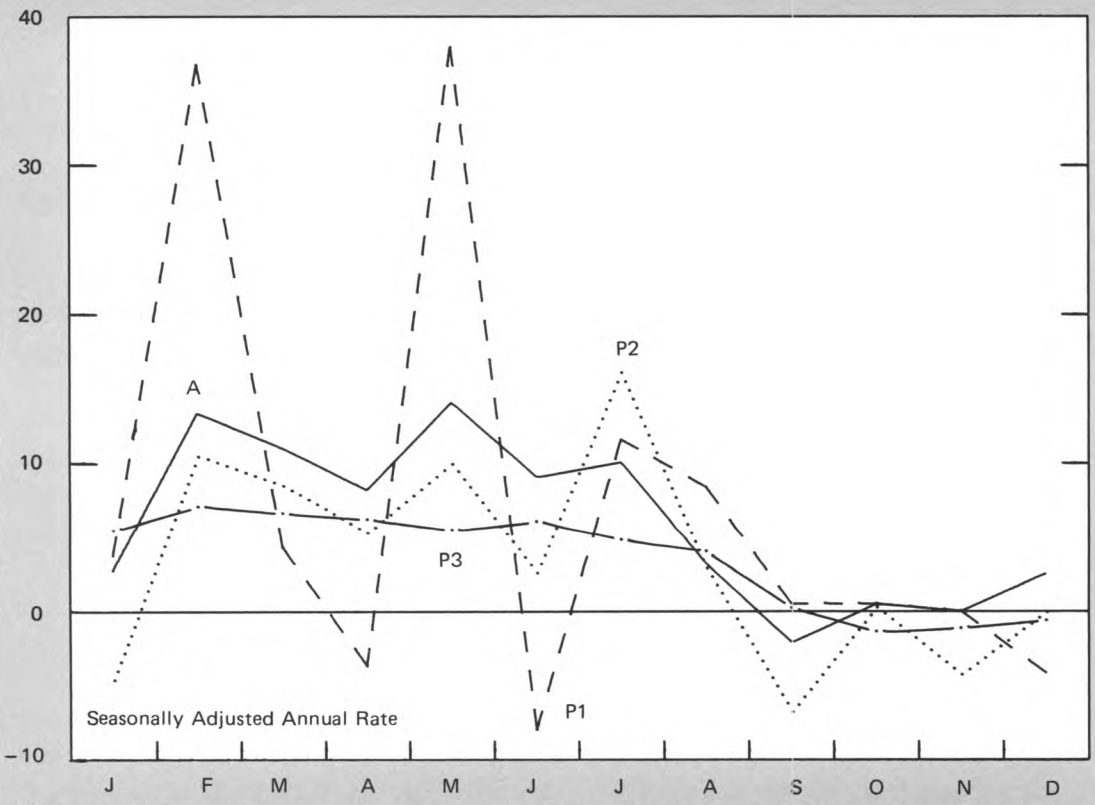
According to simulations with this definition, policy accounted for an average annual growth rate of 11.8 percent in the first seven months of 1971, and of 1.0 percent in the last five months. The enormous month-to-month swings in the P_1 measure reflect substantial fluctuations in the monetary base. Large swings in P_1 relative to actual growth of M_1 attest to the offsetting short-run variability of the assumed market determined multiplier in this model.

Policy Residual Model. This model calculates policy influence (P_2) on M_1 indirectly. Actual monthly levels of M_1 are broken down into two components: one related to the level of economic activity, assumed to be independent of current policy, and the other a residual (positive or negative)

CHART 1
ALTERNATIVE MEASURES OF POLICY INFLUENCE ON THE RATE OF GROWTH OF M_1 IN 1971

What Policy Did

Percent



NOTE: A — Actual rate of growth; P1 — Monetary base model; P2 — Policy residual model; P3 — Money market model simulation.

Last entry: December 1971

Sources: Board of Governors of the Federal Reserve System and Federal Reserve Bank of Cleveland

between actual M_1 and the activity-related component, assumed largely to reflect current policy. The activity-related component is calculated from an equation estimating the average past relationship between M_1 and a monthly measure of economic activity.[2]

[2]This concept for measuring policy influence derives from Patric Henderschott's "Neutralized Money Stock," For a discussion of the derivation and testing of a measure similar to the one presented in Chart 1, see David A. Bowers and Lorraine E. Duro, "An Alternative Estimation of the Neutralized Money Stock," *Journal of Finance,* Vol. 25, No. 1, March 1972, pp. 61-64.

According to simulations with this definition, policy accounted for an average annual growth rate of 7.3 percent in the first seven months of 1971, and of −1.1 percent in the last five months. This measure almost completely matches the direction of change in the actual rate of growth of M_1, and without the wide swings in policy influence found in P_1.

Money Market Model. This model calculates policy influence (P_3) on M_1 by estimating the average past relationship between M_1 and certain policy variables—assumed to be the Federal funds rate and the discount rate. The estimated relation was derived by simulation experiments with a twelve simultaneous equation model of the money market.[3] The rationale for considering the money market interest rates as the policy variables, rather than some measure of bank reserves or the monetary base, is simply that policy makers, in addition to setting discount rates, specified short-run operating targets for open-market operations in terms of the Federal funds rate in 1971.[4] This model of M_1 determination attributes to market factors the difference between the actual change in M_1 in any month and the value of the change in M_1 predicted from the average relationship between M_1 and policy variables.

According to these simulations, policy variables accounted for an average annual growth rate of 6.0 percent in the first seven months of 1971, and of 0.2 percent in the last five months. An interesting feature of the model underlying P_3 is that the effects of policy actions are spread over many months, reflecting the estimated time it takes for changes in the Federal funds and discount rates to influence other markets and for portfolio adjustments to be made, including increased or decreased holdings of M_1 in response to reductions or increases in rates on competing assets. This characteristic of the model is indicated by the relatively smooth month-to-month pattern of policy influence on M_1 in early 1971. It is also indicated by the finding that policy influence on M_1, as measured by P_3, only began to tighten appreciably after June, even though the Federal funds rate rose continuously (on a monthly basis) from March through August.

Some Conclusions About What Policy Did. The distinguishing aspect of M_1 growth in 1971 was the rapid rate of growth through July, and the slow rate after July. According to the results of all three models (summarized in the Table), policy contributed more to the rate of growth of M_1 through July than after, although these models differ on the precise contribution both month-to-month and on average. There is also disagreement on the extent to which nonpolicy or market factors influenced the rate of growth of M_1 (see Table).[5] P_2 and P_3 indicate that market factors reinforced policy influence by contributing to a slower rate of growth of M_1 in the last five months of the year than in the first seven months. But P_1 indicates the reverse: that market factors retarded the rate of growth of M_1 by a smaller amount in the last five months of the year

[3] The model used was a version of one originally developed by Thomas D. Thomson and James L. Pierce, "A Monthly Econometric Model of the Financial Sector," presented at the Federal Reserve System Committee on Financial Analysis meeting in May 1971.

[4] For further discussion of this, see "Open Market Operations and the Monetary and Credit Aggregates—1971," *Federal Reserve Bulletin,* April 1972, pp. 340-362.

[5] The effect of market factors is calculated as the average of the monthly difference between the policy measure and the actual rate of growth of M_1.

Contribution of Policy and Market Influences to the Money Stock
1971

	January-July		August-December	
Actual Growth Rate	9.8%		0.8%	
	Contribution of:		Contribution of:	
	Policy	Market	Policy	Market
Monetary Base (P_1)	11.8%	−2.0%	1.0%	−0.2%
Policy Residual (P_2)	7.3	2.5	−1.1	1.9
Money Market (P_3)	6.0	3.8	0.2	0.6

NOTE: All figures are average annual rates.

Sources: Board of Governors of the Federal Reserve System and Federal Reserve Bank of Cleveland

and by a larger amount in the first seven months.

The message of P_1, P_2, and P_3 is threefold. How policy is defined makes a difference: in any given month there can be a wide divergence among alternative measures of policy influence. No matter which measure is used, policy influence promoted higher rates of growth in the first seven months of 1971 than in the last five months. But, at least as measured from P_2 and P_3, market factors also contributed more to growth in these early months than in the later months.

What Policy Allowed to Happen

If monthly rates of growth of M_1 are predictable—on a judgmental or econometric basis—then it may be appropriate to investigate policy's contribution to M_1 growth by reference to what policy allowed to happen to M_1. That is, if policy makers have the ability to forecast monthly rates of growth of M_1 with reasonable accuracy, then whatever rate of growth actually occurs in any month does so because policy makers choose not to change this rate by adopting alternative settings of policy variables. This assumes both that a trustworthy forecasting model is available and that sufficient policy actions can be taken, and have their effects on M_1, within the time span after predictions are made—both debatable points.

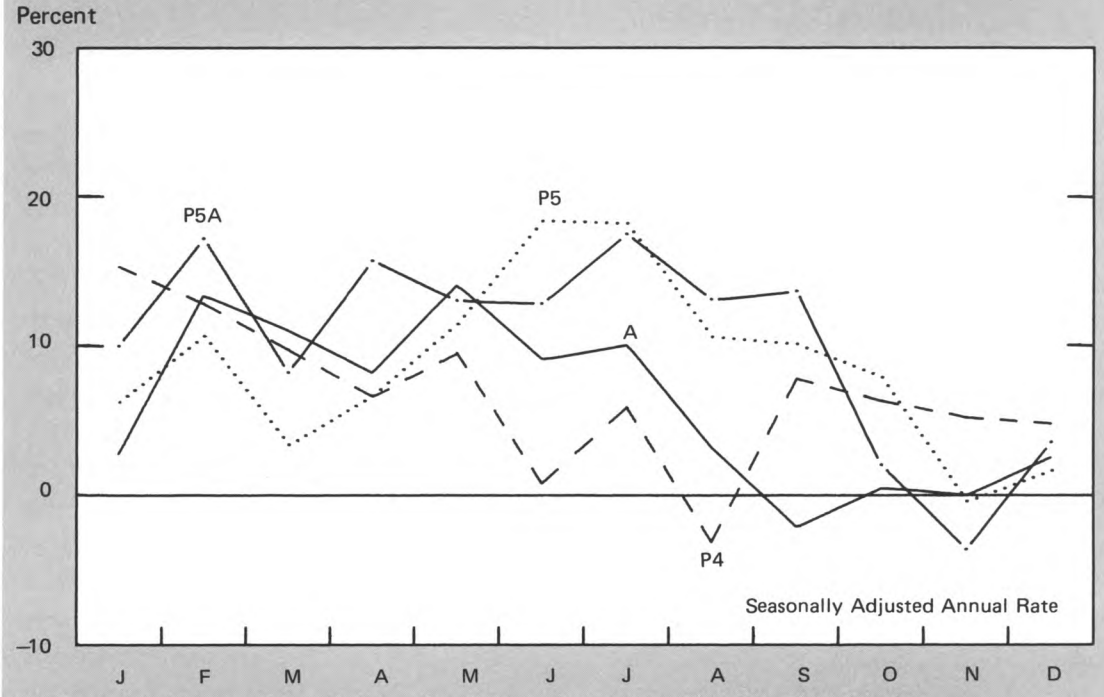
Three measures of what policy allowed to happen to monthly growth of M_1 in 1971, derived from two forecasting models, are shown in Chart 2. In general, the conclusion drawn from these measures is similar to that of Chart 1: policy contributed to a slowing of the rate of growth of M_1 between the early months and later months of 1971. The average value of each of the three measures in the last five months of the year is about half of its value for the first seven months of the year. However, the measures differ over the timing of this influence and over the periods during which actual growth of M_1 corresponded to what policy makers could have predicted would happen to growth of M_1.

No forecasting model can be expected to predict M_1 without error, so monthly differences between actual and predicted M_1 may simply reflect an irreducible minimum of random forecasting error. Similarly, the average difference between actual and predicted M_1 growth in the first seven and last five months of 1971 may be a meaningless reflection of random errors. However, persistent over- or under-estimates of M_1 growth in successive months of 1971 may be interpreted as indicating atypical market behavior—that is, behavior different from what past experience should have led forecasters to expect. It is these persistent differences between actual and predicted M_1 growth that cannot be attributed to policy influence.

Monetary-Base Forecasting Model. This measure, P_4, of what policy allowed to happen to M_1 represents the predicted monthly rate of growth of M_1 calculated from a monetary base-multiplier

CHART 2
ALTERNATIVE MEASURES OF POLICY INFLUENCE ON THE RATE OF GROWTH OF M_1 IN 1971

What Policy Allowed to Happen



NOTE: A — Actual rate of growth; P4 — Monetary base forecasting model; P5 — Money market forecasting model ("ex ante"); P5A — Money market forecasting model ("ex post").

Last entry: December 1971

Sources: Board of Governors of the Federal Reserve System; Federal Reserve Bank of St. Louis; Federal Reserve Bank of Cleveland.

forecasting technique.[6] P_4 is the product of the actual unborrowed monetary base and the predicted value of the multiplier. The predicted value of the multiplier is a weighted average of: a three-month moving average of past values of the multiplier, the error in predicting the previous month's multiplier, seasonal factors, and an adjustment for changes in reserve requirements.[7] Values of P_4 shown in Chart 2 represent "ex post" predictions of M_1 in that the values of the unborrowed monetary base are those actually

[6] See Albert E. Burger, Lionel Kalish, III, and Christopher T. Babb: "Money Stock Control and It's Implications for Monetary Policy," *Review,* Federal Reserve Bank of St. Louis, Vol. 53, No. 10, October 1971, pp. 6-22.

[7] The weights were estimated monthly by a least-squares regression on values of variables in the preceding 36 months.

observed with hindsight, rather than values targeted by policy makers—because no such target was used by policy makers. Also, the multiplier estimate is based on final actual past values of M_1 and the base, rather than preliminary estimated past values that actually would have been used in a true forecast of M_1.

According to simulations based on this definition of policy, actual M_1 growth for February through August (9.9 percent annual rate) persistently exceeded the rate of growth that policy makers might have thought they were allowing to happen as defined by P_4 (6.0 percent).[8] On the other hand, September through December M_1 growth (0.2 percent) persistently fell short of the rate policy makers might have thought they were allowing to happen (8.0 percent). That is, unpredictable market factors (shifts in demand and/or supply of M_1) persistently accelerated growth of M_1 through August and retarded growth after August, offsetting what policy was allowing to happen.

Money Market Forecasting Model. This measure, P_5, of what policy allowed to happen to M_1 represents the monthly rate of growth of M_1 forecast by the simultaneous equation model described under P_3 above. The forecasts[9] actually were made during the month preceding the forecast month and required projections of the expected values of a number of variables, including among others the value of M_1 for the month during which the forecast was made, and, for the succeeding month, retail sales, industrial production, Moody's BAA corporate bond rate, as well as the Federal funds and discount rates.

According to the forecasts underlying this definition of policy, actual growth of M_1 for February through May (11.9 percent annual rate) persistently exceeded the rate of growth that policy makers would have thought they were allowing to occur as defined by P_5 (8.0 percent). On the other hand, actual growth of M_1 for June through October (4.2 percent) persistently fell short of the rate policy "allowed" (13.0 percent). Except for timing, the implication is similar to the one drawn from P_4—unpredictable market factors persistently accelerated the rate of growth of M_1 for four months early in 1971 and retarded the rate of growth later in the year. There are two possible reasons for this. One is simply that, given the model relating policy and other variables to M_1, market behavior is not always perfectly predictable. The second is that projection errors (in projecting future values of variables required in the forecast of M_1) resulted in an inaccurate forecast. In the case of P_4, this second source of deviation between actual and forecast M_1 did not arise because P_4 was calculated "ex post." In the case of P_5, an "ex post" forecast also can be constructed.

Re-estimating P_5 "ex post"—that is, on the basis of final actual values of all variables required to predict M_1—changes the conclusion to be drawn from this model about the source of high rates of growth of M_1 in early 1971. The reestimated prediction is shown as P_{5A} in Chart 2. With the benefit of hindsight, forecasts of the monthly rate of growth of M_1 do not persistently understate M_1 growth in the February-May period. Had

[8] It should be emphasized that these values represent computed rates and not operating targets provided by the Federal Open Market Committee. This also applies to the subsequent discussion on the behavior of the P_5 measure.

[9] These forecasts were simply the result of one of several experimental forecasting devices tracked by various personnel in the Federal Reserve System.

forecasters and policy makers been adherants of this model, and not subject to projection errors, they could have foreseen rapid rates of growth of M_1 in early 1971. However, the same conclusion does not apply as forcefully to the latter part of 1971. While the "ex post" forecast gives predictions much closer to actual M_1 growth in June and October, still July, August, and September M_1 growth was persistently and substantially slower than this model predicted.

Some Conclusions About What Policy Allowed to Happen. Successive months of over- or under-prediction of M_1 growth—especially in an "ex post" forecast—are a reflection of atypical behavior in financial markets. The evidence in Chart 2 is mixed in assessing the extent to which policy might be held accountable for the pattern of M_1 growth in 1971. Based on P_4, the unborrowed monetary base-forecast multiplier model, actual M_1 growth persistently exceeded the rate of growth policy makers could have expected for all of the period February through August, one month after actual rapid rates of growth of M_1 ceased. On the other hand, based on P_{5A}, the multi-equation model based on Federal funds and discount rate policy variables, actual M_1 growth did not persistently exceed the rate of growth policy makers could have expected in the February-August period. For the latter part of 1971, both P_4 and P_{5A} imply that slowing in the rate of growth of M_1 was not entirely by policy design, but the two models differ in identifying the months in which actual M_1 growth persistently fell short of the rate policy makers could have expected. P_4 implies that M_1 growth was unaccountably slow for September through December, starting in the month after the New Economic Program (NEP) was announced. P_{5A}, however, implies that the unforeseeable slowdown in M_1 growth was predominantly in the July through September period, starting in the month prior to the NEP. After September, the rate predicted by P_{5A} corresponded rather closely to the actual rate of growth of M_1.

Policy Influence. To recapitulate, monthly M_1 behavior in 1971 can be attributed to two influences: policy, and nonpolicy factors. There is no universal agreement on a measure of policy influence, and so no unique way to assign responsibility for M_1 behavior to policy. Comparing the three alternative measures of what policy did to influence monthly growth of M_1 (P_1, P_2, and P_3) leads to the conclusion that both policy action and, in two out of three measures, nonpolicy factors contributed to a slowing in the monthly rate of growth of M_1 between the first and last parts of 1971. Comparing the three measures of what policy makers allowed to happen to M_1 (P_4, P_5, P_{5A})—leads to several conclusions. First, policy making may be hampered by incomplete information, as indicated by the difference between P_5 and P_{5A} attributable to projection errors. Second, abstracting from those errors, policy making may be hampered by less than perfect predictability of market behavior, as indicated by the difference between actual M_1 growth and both P_4 and P_{5A}. The model of financial behavior embodied in P_4 suggests that unpredictable market behavior caused higher than expected rates of growth of M_1 from February through August, and lower than expected rates of growth from September through December. On the other hand, the model embodied in P_{5A} suggests that unpredictable market behavior only can account for lower than expected rates of growth of M_1 from June through October; P_{5A} shows no persistent over- or under-statement of M_1 growth in other periods in 1971.

THE IMPLICATIONS OF 1971

Evaluating the reasons for variability of M_1 growth requires a theory of M_1 determination so that changes in M_1 can be apportioned among various contributing influences. The models examined here suggest that policy was the dominant influence on M_1 in much of 1971 in the sense that it accounted for a major share of actual M_1 growth. Further, each of the explanations indicated above—both of what policy makers did and of what they allowed to happen—suggests that policy influence contributed to slowing the rate of growth of M_1 at some time during the year. This is not surprising, for it is roughly consistent with the pattern sought by the Federal Open Market Committee as stated in The Record of Policy Actions for early May through September, 1971.[10] But there is no agreement among these explanations about the timing of this pattern, or about the timing of sustained non-policy influences on demand or supply of M_1 that might have supplemented a policy pattern to produce unusually rapid rates of growth prior to August, and unusually slow rates of growth after August.

Unless one is somehow committed to the validity of a particular model of M_1 determination, no conclusion emerges from these models about the extent to which policy makers were responsible for the pattern of M_1 growth in 1971. There are three reasons for this: (1) What policy makers did is not the same as what they allowed to happen. (2) Hindsight may put a different perspective on M_1 growth than foresight. If policy makers can predict M_1 growth with reasonable accuracy, then it seems reasonable to judge policy on the basis of what it allowed to happen. However, what policy makers might predict they are allowing to happen can differ from what they might have "predicted" with hindsight. (3) Different models of M_1 determination give rise to different assessments of the role of policy in allowing growth of M_1.

[10] See Board of Governors of the Federal Reserve System, *58th Annual Report: Principal Federal Reserve Policy Actions, 1971: Digest.*

THE MARKET FOR STATE AND LOCAL GOVERNMENT BONDS*

James L. Kochan

The municipal bond market is a major segment of the U. S. capital market. Because interest income from these state and local government issues is exempt from Federal taxation, they are usually considered attractive investments by both individuals and commercial banks. During the past decade, commercial banks have become the dominant ownership group, and their investment activities have had a major impact on both the primary and secondary markets for municipal bonds.

The large number and wide variety of outstanding issues has resulted in primary and secondary markets that are quite fragmented and, in some respects, inefficient, particularly when compared to the market for U. S. Treasury issues. Although the secondary market has developed rapidly over the past decade and many municipal issues are now actively traded, this market remains very sensitive to changes in credit conditions.

* *This article expands and updates an earlier treatment of this subject that appeared in the September 1969* Economic Review.

In recent years, about one-fourth of gross new issues of capital market securities in the United States have been accounted for by state and local governments. At the end of the calendar year 1971, these governments had $147 billion outstanding in long-term debt,[1] versus only $67 billion at the end of 1960 and $24 billion at the end of 1950. Since 1960, the volume of this debt has been increasing at a rate comparable to that of corporate bonds and mortgage debt, and four times the rate of increase of the Federal Government's debt. This article examines the market for long-term state and local government bonds (commonly referred to as "municipals") during the last decade, with emphasis on the demand for and supply of funds and the impact of credit conditions.

[1] Long-term municipal debt is generally defined as all debt maturing beyond one year. This definition is employed throughout this article.

TYPE OF INSTRUMENTS

Most state and local government obligations are general credit, or "full faith and credit," obligations of the issuing body. Payment of interest and principal is based upon the taxing authority of the

TABLE I

New Issues of Long-term State and Local Government Securities
By Type of Issue
1960-1970 and 1971
(Millions of Dollars and Percent Distribution)

	1960-1970		1971	
General obligation	$80,159	61.6%	$15,220	60.9%
Revenue	43,588	33.5	8,681	34.8
Public Housing Authority	4,272	3.3	1,000	4.0
U. S. Government Loans	2,245	1.7	62	0.2
Total	$130,229	100.0%	$24,963	100.0%

NOTE: Details may not add to totals because of rounding.

Source: Board of Governors of the Federal Reserve System

issuer, rather than on any assets pledged as security. As shown in Table I, general obligation bonds accounted for about 61 percent of all new long-term state and local government issues during the 1960-1971 period.

The other major group of state and local government obligations is composed of revenue bonds. The full faith and credit of the issuing body is not pledged to support these bonds; instead, revenue to pay interest and principal is derived from the sale of public services, such as water, or based on a lease with a public agency, such as a school district. After World War II, the relative importance of revenue bonds rose markedly—from 17 percent of new issues of state and local debt in 1946 to 30 percent in 1960.[2] Since 1960, about one third of new state and local government issues have been in the form of revenue bonds (see Table I). The postwar rise in revenue issues largely reflects a broadened concept of public services to include toll roads, transit facilities, utilities, etc.

Municipal obligations are available in a wide range of maturities. Most issues are serial bonds, which mature at regular intervals over the life of the issue and carry original maturities ranging from one to three years to 30 years or more. In addition to long-term bonds, short-term municipal notes are available. Notes are issued by state and local governments and public housing authorities, are of both revenue and general obligation type, and have an average maturity of eight or nine months. In recent years, state and local governments have sharply stepped-up their short-term borrowing. By the end of 1971, their short-term debt amounted to $19.2 billion and accounted for more than 10 percent of total state and local government debt.

DEMAND FOR FUNDS BY STATE AND LOCAL GOVERNMENTS

Proceeds of state and local government borrowing are used principally to finance capital expenditures. Although these governments are usually constrained by tradition or law to balance their current budgets, borrowing for capital purposes is widely sanctioned. Since World War II, about 50 percent of all capital expenditures by state and local governments have been debt financed.[3]

Purposes of Borrowing. The financing of capital expenditures for educational facilities, roads, and utilities accounted for almost 60 percent of all state and local long-term borrowing during the 1960's (see Table II). While the proportion of

[2] U. S. Congress, Joint Economic Committee, *State and Local Public Facility Needs and Financing, Vol. 2, Public Facility Financing,* "Patterns of Revenue Bond Financing," by Frank E. Curley, Joint Committee Print, (Washington, D. C.: Government Printing Office, 1966).

[3] U. S. Congress, *op. cit.*, "Introduction and Summary," by Arnold H. Diamond.

TABLE II

Use of Proceeds of New Issues of State and Local Government Long-term Securities
Selected Periods
(Percent Distribution)

Issues for New Capital	1960-1965	1966-1970	1971
Education	33.7%	29.5%	21.5%
Roads and bridges	10.5	10.0	10.8
Utilities	21.1	17.1	21.3
Housing	6.1	4.1	8.4
Other purposes	26.8	39.3	37.9
Refunding	1.8%	1.0%	1.9%

Source: Board of Governors of the Federal Reserve System

proceeds spent for roads and bridges and for refunding remained about the same over these years, the proportion spent for educational facilities, housing, and utilities declined, and the share used for other purposes increased.

Perhaps the most interesting change is the decline in spending on educational facilities. This represents a sharp reversal of a trend that began during the 1950's. The proportion of borrowed funds spent on education rose from 20 percent during the 1946-1955 period to over one-third during the first half of the 1960's, reflecting the increase in school-age population between these two periods and the demand for more and better educational facilities. The share of funds spent on facilities then declined during the second half of the 1960's and through 1971, probably because of a leveling off in the school-age population and a consequent decline in the level of construction of new educational facilities.

The proportion of borrowing for utilities, including water and sewer systems, declined throughout most of the 1960's before increasing in 1970 and 1971. Borrowing for housing, which includes urban renewal loans, declined throughout the decade but increased sharply in 1971. The proportion of total borrowing used for all other governmental functions increased substantially over the decade. This category includes borrowing for the purpose of building sports facilities, other recreational facilities, convention facilities, and transportation facilities other than roads and bridges.

Borrowing by Level of Government. State and local government units that borrow in the capital market vary widely in both size and nature. Virtually every state and local government unit is a potential long-term borrower. There are about 80,000 state and local governments in the United States, and roughly 25,000 have tapped the credit markets for funds.[4]

Municipalities accounted for the largest proportion of outstanding total debt in both 1960 and 1970, about one-third of the total (see Table III). State governments ranked second in the amount of outstanding debt—over one-fourth of the total amount. State debt grew relative to municipal debt between 1960 and 1970. In fact, *long-term* state debt equalled long-term municipal debt in 1970, and state governments accounted for an increased share of *short-term* debt between 1960 and 1970. School districts and special districts, such as water or sewerage districts (including statutory authorities), each accounted for about one-seventh of the total outstanding debt in both 1960 and 1970.

SUPPLY OF FUNDS BY INVESTORS

The interest income from state and local government obligations is exempt from Federal

[4] Roland I. Robinson, *Postwar Market for State and Local Government Securities* (Princeton, New Jersey: National Bureau of Economic Research, 1960), p. 54.

TABLE III

State and Local Government Debt
By Level of Government
Amount Outstanding
June 30, 1960 and June 30, 1970
(Billions of Dollars and Percent Distribution)

	June 30, 1960						June 30, 1970					
	Short-term		Long-term		Total Debt		Short-term		Long-term		Total Debt	
State Governments	$0.4	12.5%	$18.1	27.1%	$18.5	26.4%	$3.1	25.6%	$38.9	29.6%	$42.0	29.2%
Local Governments	2.7	87.1	48.7	72.9	51.4	73.4	9.0	74.4	92.5	70.4	101.6	70.8
Counties	0.1	3.1	5.0	7.5	5.1	7.3	0.8	6.6	10.5	8.0	11.3	7.9
Municipalities	1,3	40.6	21.9	32.8	23.2	33.1	4.9	40.5	38.9	29.6	43.8	30.5
Townships	0.1	3.1	1.0	1.5	1.1	1.6	0.5	4.1	1.9	1.4	2.4	1.7
School districts	0.3	9.4	11.8	17.7	12.1	17.3	1.1	9.1	21.3	16.2	22.4	15.6
Special districts and statutory authorities	0.9	28.1	9.0	13.5	9.9	14.1	1.8	14.9	19.8	15.1	21.6	15.0
Total	$3.2	100.0%	$66.8	100.0%	$70.0	100.0%	$12.1	100.0%	$131.4	100.0%	$143.6	100.0%

NOTE: Details may not add to totals because of rounding.

Source: U. S. Department of Commerce, Bureau of the Census

taxation.[5] This feature, which distinguishes municipals from other capital market instruments, makes these issues particularly attractive to investors who are subject to high marginal income tax rates.[6] It also accounts for the interest rates on municipals generally being lower than rates on other securities of comparable maturity and security (see Chart 1).

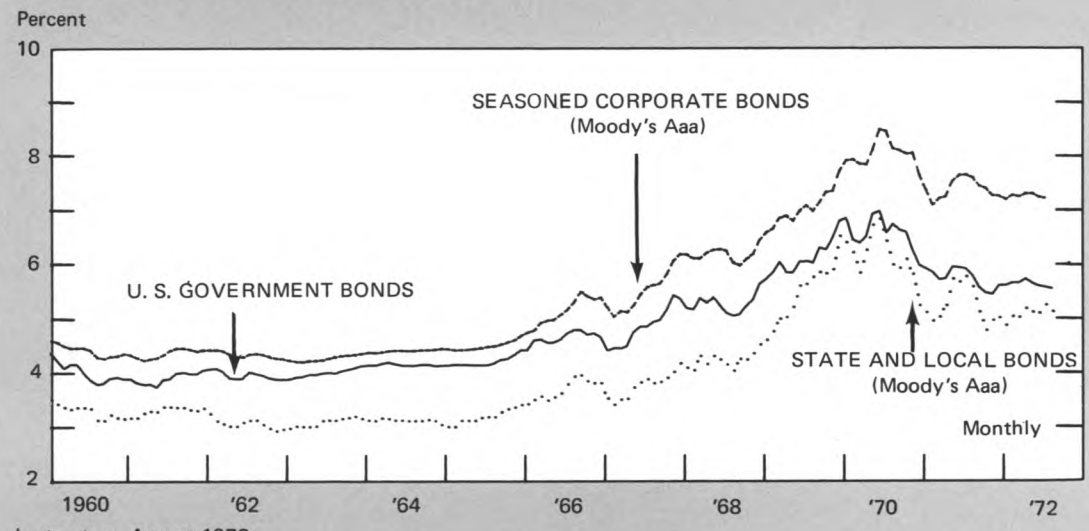
During the past decade, the ownership share of the two principal ownership groups—households and commercial banks—has remained at approximately three-fourths of the outstanding state and local debt, but the individual shares have changed markedly. In 1960, households held 44

[5]Since 1941, when the Federal government elected to tax interest on its own obligations, municipal bonds alone have carried this feature. There was some concern that the Tax Reform Act of 1969 would substantially alter or even remove the tax-exempt status of municipal bonds. This did not come to pass. Realized capital gains on municipal bonds continue to be subject to Federal taxation. For a discussion of the tax exemption of municipal bonds see Robinson, *op. cit.;* David J. Ott and Allan J. Meltzer, *Federal Tax Treatment of State and Local Securities* (Washington, D. C.: The Brookings Institutions, 1963); and U. S. Congress, *op. cit.,* "Comparison of the Interest Cost Saving and Revenue Loss on Tax-Exempt Securities," by the Treasury Department, Office of the Secretary.

[6]For example, for selected tax brackets the taxable equivalent yields of a tax-free municipal bond yielding 5 percent are:

20 percent tax bracket—6.28 percent
30 percent tax bracket—7.15 percent
45 percent tax bracket—9.12 percent
65 percent tax bracket—14.08 percent
75 percent tax bracket—20.20 percent

CHART 1
SELECTED CAPITAL MARKET YIELDS



Last entry: August 1972
Source: Board of Governors of the Federal Reserve System

percent of the outstanding municipals while commercial banks held about 25 percent; these ownership shares were approximately equal by 1964, and by 1970 the holdings of commercial banks had increased to about one-half, while the holdings of households had declined to about one-third (see Table IV).

Households. In addition to their declining ownership share, households have been irregular purchasers of municipal issues. For example, in 1960, households purchased almost two-thirds of the net change in municipal debt outstanding, while during 1967-1968, households reduced their holdings by $1.9 billion. In 1969, households absorbed almost one-half the net increase in state and local debt, but they only absorbed about one-fifth during 1970-1971. The irregularity of the acquisition of state and local securities by households suggests that these investors do not allocate a fixed proportion of their savings to municipals, but rather readjust their portfolios whenever relative yields make municipals more attractive. Tax-exempt yields have been highest during periods when commercial banks have experienced strong loan demand and reserve tightness and have, therefore, reduced their purchases of new tax-exempt issues. As banks limit their purchases, yields must increase enough to attract other buyers—the individual investors. Individuals, therefore, have been residual buyers in this market, increasing their participation when banks withdraw and reducing their holdings when yields decline.

The tax-exempt status of state and local government securities is clearly one of the most important influences on individual participation in the market. One study found that investment in state and local securities was generally not

TABLE IV

Ownership of State and Local Government Debt*
1960-1971
(Billions of Dollars)

Ownership Category	1960	1961	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971
Holdings												
Households†	$30.8	$32.2	$31.2	$32.7	$34.7	$36.4	$40.1	$38.4	$38.2	$45.0	$47.4	$52.3
Corporate nonfinancial‡	2.4	2.4	2.7	3.8	3.7	4.6	3.6	3.3	3.8	2.8	2.2	3.2
Commercial banks	17.7	20.5	26.2	28.7	33.7	38.9	41.2	50.3	58.9	59.9	70.2	82.9
Life insurance companies	3.6	3.9	4.0	3.9	3.8	3.5	3.1	3.0	3.2	3.2	3.3	3.5
Other insurance companies	8.1	9.1	9.9	10.6	11.0	11.3	12.6	14.1	15.1	16.3	17.8	19.3
Other	1.1	1.0	1.0	0.9	1.1	0.8	0.8	0.7	0.7	0.6	1.1	1.4
State and local governments§	7.1	7.1	6.4	5.6	5.1	4.8	4.6	4.5	4.6	4.5	4.3	4.0
Total	$70.8	$76.2	$81.4	$86.2	$93.1	$100.3	$106.0	$114.3	$124.5	$132.3	$146.3	$166.6
Percent												
Households†	43.5%	42.3%	38.3%	37.9%	37.3%	36.3%	37.8%	33.6%	30.7%	34.0%	32.4%	31.4%
Corporate nonfinancial‡	3.4	3.1	3.3	4.4	4.0	4.6	3.4	2.9	3.1	2.1	1.5	1.9
Commercial banks	25.0	26.9	32.2	33.3	36.2	38.8	38.9	44.0	47.3	45.3	48.0	49.8
Life insurance companies	5.1	5.1	4.9	4.5	4.1	3.5	2.9	2.6	2.6	2.4	2.3	2.1
Other insurance companies	11.4	11.9	12.2	12.3	11.8	11.3	11.9	12.3	12.1	12.3	12.2	11.6
Other	1.6	1.3	1.2	1.0	1.2	0.8	0.8	0.6	0.6	0.5	0.8	0.8
State and local governments§	10.0	9.3	7.9	6.5	5.5	4.8	4.3	3.9	3.7	3.4	2.9	2.4
Total	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

NOTE: Details may not add to totals because of rounding.

* Includes both long-term and short-term debt.
† Includes personal trusts and nonprofit organizations.
‡ Includes holding companies, closed-end investment companies, and real estate firms.
§ Includes state and local general funds and retirement funds.

Source: Board of Governors of the Federal Reserve System

attractive to families with an annual income of less than $25,000.[7] In contrast, 7 percent of the families in the $25,000 to $50,000 income bracket held municipal securities, 24 percent in the $50,000 to $100,000 income bracket, and 67 percent in the income bracket of $100,000 and over.

Furthermore, the study found that the importance of state and local government securities as a component of the total financial portfolio of an individual generally rose as income increased. The proportion reached a peak of 12.8 percent for the $50,000 to $100,000 income group. For the group with incomes over $100,000, however, the share of state and local obligations declined to 8 percent of the total portfolio. The highest income class invested a much larger share

[7] U. S. Congress, *op. cit.*, "Individuals as a Source of Funds for State and Local Governments," by Helmut Wendel.

of their total portfolio in common stocks than any other income group and showed decidedly less preference for all types of fixed income securities. On balance, it is apparent that individual participation in the market for state and local government securities is largely limited to households with high incomes that stand to benefit from the tax-exempt feature of municipal bonds.

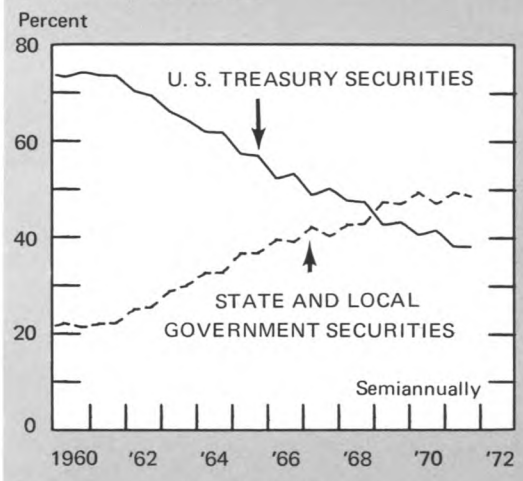
Commercial Banks. Since 1965, commercial banks have been the largest holders of municipal debt. The appeal of municipal bonds to commercial banks is based on a combination of factors, including the tax-exempt privilege,[8] the availability of intermediate-term maturities, the fact that banks may underwrite general obligation issues and certain types of revenue issues, plus the requirement of many governments that their bonds serve as collateral security for deposit of their funds.

Although commercial banks increased the dollar volume of their municipal holdings by $65 billion from 1960-1971, they were irregular buyers, accumulating rapidly during periods of reduced loan demand and relaxed credit conditions, but accumulating slowly (or actually liquidating) during periods of credit restraint. For example, commercial banks were heavy purchasers of municipal debt in 1967, 1968, 1970, and 1971. During the period of monetary restraint in 1969, however, banks sharply cut back the rate at which they accumulated municipal bonds and actually reduced holdings by almost $1 billion during the second half of the year.

CHART 2

DISTRIBUTION OF TOTAL INVESTMENTS

All Commercial Banks



Last entry: December 31, 1971

Source: Board of Governors of the Federal Reserve System

Despite this year-to-year variation in the acquisition of state and local government securities by commercial banks, municipals became an increasingly important investment outlet for banks during the 1960-1971 period. By the end of 1969, municipals displaced U. S. Treasury securities as the single most important form of investment holding (see Chart 2). This shift from Treasuries to municipals was due in part to the high growth rate of municipal debt relative to Federal debt during the decade of the 1960's—municipal debt increased more than 200 percent over this period while the Federal debt held by the private sector grew only 10 percent. The shift to municipals also reflects an attempt by banks to maintain earnings during a period of rising costs by channeling funds

[8] Commercial banks are subject to Federal income taxes at the full corporate tax rate but may not make certain types of investments that would reduce their tax liabilities, such as purchasing corporate equities or oil royalties. For a thorough discussion of commercial bank holdings of municipal bonds during the 1960's see "Bank Holdings of Municipal Securities" by Thomas E. Davis in *Monthly Review,* Federal Reserve Bank of Kansas City, December 1970.

TABLE V

Prime Municipal Bond Yields Compared with U. S. Government Bond Yields
Ten-Year Maturity
1960-1971

Year	Yield on U. S. Government Bonds: Before Taxes	Yield on U. S. Government Bonds: After Taxes	Yield on Prime Municipals	Yield Spread After Taxes in Favor of Municipals
				(Basis Points)
1960	4.13%	1.98%	2.90%	+92
1961	3.84	1.84	2.75	+91
1962	3.96	1.90	2.55	+65
1963	3.98	1.91	2.60	+69
1964	4.17	2.17	2.80	+63
1965	4.25	2.21	2.90	+69
1966	4.86	2.53	3.55	+102
1967	4.97	2.59	3.55	+96
1968	5.48	2.72	3.93	+121
1969	6.46	3.05	5.09	+204
1970	7.21	3.75	5.35	+160
1971	6.11	3.18	4.35	+117

Source: Salomon Brothers

into higher yielding assets. During the past fifteen years, yields on municipals have been substantially above the after-tax yield on Governments (see Table V). The smallest after tax spread over this period was 63 basis points, whereas this spread averaged only 33 basis points for the years 1950 through 1955.

Another factor contributing to the shift from Governments to municipals has been the development of more sophisticated portfolio management techniques by commercial banks, particularly in the area of liability management. Increasing reliance on issuance of certificates of deposit and borrowing in the Federal funds market and the Eurodollar market has provided a major alternative source of short-term funds with which to adjust bank reserve positions. The marked improvement in the secondary market for municipal obligations in recent years has also increased the liquidity of bank holdings of tax exempt issues, permitting banks to rely somewhat more heavily on them as a secondary reserves. Consequently, the importance of U. S. Government securities in providing a margin of liquidity in bank portfolios has been significantly reduced.

Insurance Companies. Insurance companies make up the third major group of owners of state and local government securities. In 1971, insurance companies accounted for about 14 percent of all holdings (see Table IV). Fire and casualty insurance companies have traditionally been more important than life insurance companies in the volume of these securities held, largely because of their greater exposure to Federal tax liabilities. A survey of mutual fire and casualty insurance companies found that the most important factor in the variation of holdings of municipal securities was the individual company's tax situation. It appears that since the early 1960's, life insurance companies have virtually withdrawn from the new issues market, perhaps in response to changes in the tax laws that made investment in tax-exempt securities somewhat less profitable for life insurance companies.[9]

PRIMARY MARKET

New issues of state and local government obligations are generally sold first to investment bankers who then distribute them to the

[9] U. S. Congress, *op, cit.,* "Relative Tax Advantages to Different Investor Groups in Acquiring or Holding Municipal Securities," prepared by Treasury Department, Office of the Secretary.

ultimate investors.[10] The bonds may be sold either by negotiation or by advertisement leading to open bids by prospective purchasers. Generally, the proportion of negotiated sales is higher for revenue bonds than general obligation bonds.[11]

More than 1,000 firms throughout the United States underwrite new issues of municipal bonds. Many of these dealer firms are very small one- or two-man operations whose primary market operations are limited to underwriting the relatively small (less than $1 million) bond issues of authorities within or near their operating area. If by submitting the lowest bid, or through negotiation, a small dealer wins the right to market a new issue, he will likely resell the securities to investors residing in the vicinity of the issuer. Local individuals and commercial banks are the logical customers for these issues because of familiarity with the credit-worthiness of the borrowing agency, interest in the economic health of the region, and the exemption from income taxes granted by many taxing authorities on the interest income from their own bonds. Consequently, the primary market for many municipal bond issues tends to be limited to the immediate geographical vicinity of the borrower.

Most intermediate and large-size bond issues are marketed by one or more of the large nationwide investment banking firms or by the municipal bond department of a large commercial bank. These issues, which account for most of the dollar volume of tax-exempt placements, are marketed in the major financial centers. A medium-sized issue (roughly $1 million to $10 million) will usually attract bids from the major banks in nearby financial centers and those investment banking firms with offices in the region. Bonds issued in substantial amounts by large, well-known governmental units (states, state agencies or universities, large cities and counties) attract competitive bids from syndicates drawn from the nation's major investment houses and dealer banks. Bidding on these issues is quite competitive; e.g., there is generally a small difference between the net interest cost (NIC) of the lowest and highest bid.[12] The winning syndicate then resells the bonds to investors throughout the nation. It is interesting, however, that even though a large issue may be sold in the national primary market, many of the bonds are purchased by investors residing in the borrowing state or municipality.

SECONDARY MARKET

Secondary marketing of municipal securities consists of the sale of such securities by one investor to another, usually through a securities dealer. Secondary markets exist because borrowers generally need funds for a longer period than investors, on average, are willing or able to grant. The secondary market for municipal bonds is a

[10] Investment banker is a term applied to a security dealer or a dealer bank that underwrites securities. For a discussion of the function of the investment bankers, see U. S. Congress, *op. cit.,* "Municipal Bond Underwriting," by John E. Walker.

[11] Investment Bankers Association of America, "Public Sales Versus Negotiation in the Marketing of Municipal Bonds," *IBA Statistical Bulletin,* Occasional Paper No. 2 (September 1962).

[12] For example, a recent offering of $40 million of state revenue bonds attracted bids from five syndicates, with NIC ranging from 5.286 percent to 5.348 percent. See *The Weekly Bond Buyer,* September 18, 1972, p. 3.

dealer market and is almost wholly contained in the organizational structure of the new issues market. That is, the investment bankers that underwrite new issues are usually the same firms that maintain continuing secondary markets in the securities.

A dealer maintains a market in a security when he stands ready to buy or sell that security either for his own account or as an agent for other investors. Without such market maintenance activity, an investor seeking to acquire (sell) a bond would be required to search out another investor willing to sell (buy) that security, a costly and inefficient procedure that would discourage investors from purchasing municipal bonds.

An efficient secondary market requires a large number of buyers and sellers with access to complete information regarding price, trading activity, and other market data (breadth); orders both above and below the current market (depth); and the ability to adjust quickly to supply/demand shifts; i.e., orders should appear in response to wide fluctuations in price so as to dampen or reverse these movements (resiliency). The most efficient sector of the capital market is undoubtedly the market for U. S. Treasury securities where only a small number of issues are outstanding, most of which are over $1 billion in size and all of which enjoy the highest credit rating. The municipals market, which enjoys none of these advantages, is highly fragmented by comparison and is therefore less efficient, as evidenced by the larger spreads, more volatile price movements, and an absence of published trading data.

Apparently the large dealer network, linked together by telephone and teletype, gives the municipals market adequate breadth. An investor is generally able to buy or sell almost any municipal security through his local dealer. However, the heterogeneity of the outstanding securities, the relatively small size of many dealer operations, plus the small size of most municipal issues mitigate against the development of a deep and resilient secondary market for the majority of state and local issues. Only those securities issued on the national primary market might be considered readily marketable in the secondary market.

The marketability of a bond is enhanced if it is issued by a major governmental authority because information about such units is easily and inexpensively obtained, more investors are familiar with the borrower, bonds are usually issued in large blocks, and the borrower will usually have a substantial amount of debt outstanding. The two latter factors are thought to reduce the thinness of the market for an individual bond issue and for the bonds of the borrowing authority.[13] The market for the large tax-exempt issues is regarded by many market observers as reasonably efficient. Approximately fifty national dealers maintain markets and conduct a large volume of trading in these issues, primarily with other financial institutional investors.

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[13] A study by K. Larry Hastie, "Determinants of Municipal Bond Yields," *Journal of Financial and Quantitative Analysis,* June 1972 found that bonds issued in large blocks sell at higher prices and lower yields than comparable issues sold in small blocks, suggesting that the former are more marketable. Most market observers also contend that, *ceteris paribus,* the marketability of a borrowing unit's debt also increases with the amount of debt that unit has outstanding. This hypothesis is supported in a study by Lerner and Carleton but not supported by the Hastie study. See W. T. Carleton and E. M. Lerner, "Statistical Credit Scoring of Municipal Bonds," *Journal of Money, Credit and Banking,* November 1969, pp. 750-764.

Many of these dealers, especially the municipal bond departments of the major banks, maintain substantial positions in large issues. Any dealer who is interested in purchasing a security either on behalf of a customer or for his own account will usually call some national dealers to obtain bids. Since he and the prospective sellers have some idea of the prevailing market yields in the active issues, he can be reasonably sure of obtaining the best price quotation after only a few phone calls. If, however, the purchasing dealer is dissatisfied with these bids, he may choose to advertise for bids over a teletype service that lists bonds currently offered for sale or in the *Blue List,*[14] which is published each business day; or he may contact a bond broker. Approximately a dozen firms, most of them based in New York, function as brokers of municipal bonds. Through a teletype or telephone network, a broker has contact with many dealers and can often bring buying and selling dealers together, earning a commission for this service.

The spread between bid and asked prices is sometimes regarded as a measure of the marketability of a security. Ordinarily the spread on an actively traded municipal bond is between 1/2 and 3/4 of a point or $5.00 to $7.50 per $1,000 bond. This is well above the spreads on intermediate-term Treasury bonds and notes, which are generally around 4/32 of a point, but below the spread on smaller, inactive municipal issues, which may be as large as two points.

Bonds of smaller governmental units trade in a decidedly thinner and less efficient secondary market. Although an investor will almost always be able to find dealers willing to make a market in these issues (most likely dealers operating within the region of the bond issuer), he cannot expect to find the "best price" as easily as with actively traded issues, and he will almost certainly encounter a larger spread or gross dealer profit when making the transaction. Of course, the investor is usually rewarded for accepting the lower marketability of these issues in the form of a higher rate of return.

CREDIT CONDITIONS AND THE MUNICIPAL BOND MARKET

Although all borrowers are affected in some degree by changing credit market conditions, studies of the financial experience of state and local governments in the post-World War II era have shown that these borrowers are unusually sensitive to market conditions.[15] The volume of their bond offering has varied contracyclically, reaching high levels during business cycle troughs and receding before cycle peaks. This cycle results from the importance given to interest rate expectations by state and local governments in timing their borrowing; they often postpone offerings when bond yields are expected to fall and step up borrowing when bond yields are expected to rise. An additional factor during recent cyclical peaks has been the inability of many borrowers to issue bonds because of legal

[14] The *Blue List* is published every business day and lists bonds offered for sale, the yield or the asked price, and the dealer offering the security.

[15] The literature on this subject is extensive. Two examples are: Charlotte Phelps, "The Impact of Tightening Credit on Municipal Capital Expenditures in the United States," *Yale Economic Essays,* Vol. 1 (Fall 1961) and Paul F. McGouldrick and John E. Petersen, "Monetary Restraint and Borrowing and Capital Spending by Large State and Local Governments in 1966," *Federal Reserve Bulletin,* July 1968.

ceilings on the maximum rate of interest they may pay.

Large borrowing units have been primarily responsible for this cyclical pattern. The volume of debt issued by large governmental units (primarily states) has displayed greater interest rate sensitivity than that of small governmental units. This can be attributed to the greater availability of temporary, alternative means of financing for large government units, their stronger liquid asset position, which permits their borrowing to be timed to correspond with favorable credit market conditions, and perhaps their greater financial sophistication. In contrast, small governmental units are less inclined to speculate on interest rate fluctuations and are more inclined to see borrowing plans through.

The extent to which the municipal market is affected by cyclical changes in credit market conditions was graphically illustrated during the 1969-1970 period of credit restraint when many state and local governments were placed under severe financial pressure. Borrowing costs for municipal governments rose sharply when commercial banks reduced the rate at which they accumulated municipal securities during the first half of 1969 and began to liquidate them during the second half of the year. This was a result of both a restrictive monetary policy and a fear that the *Tax Reform Act of 1969* would remove or alter the tax-exempt status of municipal debt. Yields on municipal debt, as measured by the *Bond Buyer* 20-bond average, rose from 4.76 percent in December 1968, to 6.72 percent in December 1969, and to a peak of 6.92 percent in June 1970. As yields began to exceed the statutory ceilings of many state and local governments, it became impossible for many borrowers to sell bonds at legally permissible rates. An estimated $5.2 billion, or 28 percent of the planned long-term state and local government borrowing in fiscal 1969, was cancelled because of credit market conditions. State governments and school districts experienced the largest volume of cancellations.[16]

The combination of high yields and effective interest ceilings led to the only year-to-year decline in bond sales for new capital by state and local governments in the 1960-1971 period. Bond sales fell sharply from $16.2 billion in calendar 1968 to $11.5 billion in calendar 1969.

Long-term bond sales by state and local governments recovered sharply in 1970 to a record $18 billion and rose again in 1971 to $24 billion. Despite record high bond yields during the second quarter of 1970, the value of bonds sold by municipal governments in that quarter was almost double the value sold during the third quarter of 1969. This was made possible by the widespread relaxation of statutory interest ceilings that took place in late 1969. As bond yields declined during the second half of 1970, municipal bond sales accelerated sharply and continued at a record level through 1971.

The impact of changing credit market conditions is not limited to the primary market for municipal bonds. During periods of rising interest rates, investors may encounter difficulty making trades in outstanding issues. Sellers may be unable to find buyers, or the prices bid may be so low they are judged unrealistic by the sellers. Such episodes of market instability generally result when many dealers, faced with a deteriorating market, are

[16] See John E. Petersen, "Response of State and Local Governments to Varying Credit Conditions," *Federal Reserve Bulletin,* March 1971.

unable or unwilling to continue their market maintenance activities. The volatility of municipal bond prices creates the possibility of sizable capital losses in a falling market, and dealers, many of whom have limited capital positions, seek to avoid losses by withdrawing from the market. Their withdrawal, in turn, exacerbates the price volatility. Finally, commercial banks—the major source of demand for these bonds—practically withdraw from the market during periods of tight credit. In fact, large commercial banks as a group were net sellers of municipal bonds during the first quarter of 1966 and in the second half of 1969, when they sold municipals in order to satisfy strong loan demand. Even though a few strong dealers might continue to make markets during such periods, prices may fall precipitously.[17]

The secondary market might become less prone to instability during periods of credit tightness if a greater variety of investors were attracted to municipal bonds, thereby moderating the effects of commercial bank activity. This will probably occur naturally over time as the volume of bonds outstanding continues to increase, but a number of changes have also been suggested that would speed up the process. These include promoting municipal bond funds to sell shares to a wider spectrum of investors, reducing the heterogeneity among the thousands of bond issues through some type of Federal or state government insurance or guarantee program, assembling individual bond issues into blocks, which would be more marketable than small individual issues, and introducing taxable municipal issues, which would be attractive to investors such as life insurance companies and pension funds. Some changes along these lines that have already been introduced include the expansion of tax-exempt mutual funds and the development of state bond banks that provide some guarantee for issues of local taxing authorities of the state. Additional innovations of this type could improve the secondary market, reducing its instability during periods of credit market tightness.

SUMMARY

The growth of long-term state and local government debt kept pace with that of private capital market debt over the 1960-1971 period and greatly exceeded the growth of the Federal debt. State governments, municipalities, statutory authorities, and school districts were the heaviest borrowers in the capital market during the decade. Local government debt currently accounts for two-thirds of the dollar volume of outstanding long-term tax-exempt securities.

Municipal debt appeals primarily to those investors who are subject to high marginal rates of Federal income taxation. Over the decade of the 1960's, commercial banks replaced households as the largest holders of state and local government securities. With the exception of 1969, households have reduced their share of holdings in recent years.

State and local government borrowing is sensitive to credit market conditions. Changing credit conditions have a greater impact on the timing of municipal financing than on capital expenditures by municipal governments. During

[17] For a more detailed discussion of the performance of the secondary market during periods of rising interest rates, along with proposals for improving that performance, see "The Secondary Market for State and Local Governments," by William F. Staats, in *Reappraisal of the Federal Reserve Discount Mechanism, Vol. 3* (Washington, D. C., Board of Governors of the Federal Reserve System, 1972).

1969, the sharp drop in bond sales (especially by local governments) caused by rising interest rates in conjunction with effective statutory interest ceilings placed severe financial pressures on many municipal governments. This pressure subsided in 1970 as statutory interest ceilings were relaxed and bond yields declined.

Secondary market activity is also impaired during periods of rising interest rates because of the importance of commercial banks in the municipal market, the small size of most tax-exempt issues and the consequent thin trading market for individual issues, and the relatively small size and weak capital positions of many dealers. Proposals for improving the market involve attracting a greater variety of investors to municipal bonds and reducing the heterogeneity among individual bond issues. These changes should, in turn, result in a stronger dealer network and a stronger secondary market.

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