

STABILIZATION POLICY: TIME FOR A REAPPRAISAL?

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The combination of rampant inflation and distressingly high unemployment over the last few years represents the worst conjuncture of economic events since the Great Depression of the 1930's. These events have brought severe distress to many individuals and organizations and shaken the foundations of some economic and financial institutions that were thought to be invulnerable. They have also shaken the confidence of the economics profession and caused many economists to question some of the basic premises of economic stabilization theory. One of the long-time practitioners of the "dismal science" recently summed up the feelings of many of his professional colleagues when he woefully commented that "The old rules no longer apply." Reflecting this attitude, some economists are calling for a re-examination of stabilization theory and for new approaches to economic stabilization policy.

This widespread confusion and self-doubt are of rather recent origin. Only a little more than a decade ago economists seemed supremely confident of their ability to control the level of economic activity and to achieve a nice balance among the objectives of economic growth, high-level employment, and price stability. With an extraordinary degree of confidence, practitioners of what became known as the "New Economics" spoke of their ability to "fine tune" the economy. The *Economic Report of the President* transmitted to the Congress in January 1965, for example, noted that in the effort to achieve balanced growth in the year ahead "Fiscal and monetary policies must be continuously adjusted to keep the aggregate demand for goods and services in line with the economy's growing capacity to produce them." One can picture a group of economists, seated before a huge console, feverishly twisting dials in order to achieve just the right mix of policies that will produce the optimum combination of economic results.

It should be noted at this point that while the questioning of basic premises is rather widespread, it is by no means unanimous. Indeed a number of economists would question the proposition that there has been any change in the economic fundamentals, and they would deny that there is anything approaching a crisis in stabilization policy. The old rules have not changed, they say, and all we have to do is return to the old-time religion. On the other hand, there are a few economists who contend that the entire body of contemporary economic theory is without substance and largely irrelevant. But there are a great many economists who have been sorely troubled by the events of recent years and who fear that important institutional changes over the last several decades have altered the way the economy responds to traditional stabilization actions. More importantly, perhaps, the unfortunate combination of strong inflation and high unemployment has caused an important segment of the American public to question the efficacy of our economic system and even our form of government.

The purpose of this article is to review, briefly and in a nontechnical fashion, the historical development of stabilization theories and to describe the recent developments that have caused some economists to begin to reevaluate these theories.

The Classical Period Prior to the Great Depression of the 1930's, the majority of economists were not much concerned with what we would call stabilization theory and policy. The so-called classical and neoclassical school of economic thought was dominant throughout the century and a half between the publication of Adam Smith's *Wealth of Nations* and the economic collapse of the early 1930's. There was a gradual growth and refinement of the basic body of economic thought over this period, and, of course, at

any given time significant differences might be found in the thinking of the individuals comprising the classical school. Thus, it is difficult to summarize in a few brief paragraphs the thinking of this large and important group of economists without doing injustice to individual members of the group. Nevertheless, most of the members of the classical school adhered to certain basic principles, and it may be possible to describe those aspects of the classical system that were relevant to the question of economic stabilization.

The classical and neoclassical economists believed the economy was inherently self-stabilizing. A basic feature of their system was the concept of long-run full-employment equilibrium toward which the economy tended to move. From time to time exogenous shocks would disturb the basic equilibrium of the system, but there were powerful forces, operating through the market system, to return it to a new equilibrium. Prices, wages, and interest rates were generally assumed to be highly flexible in response to changes in supply or demand, although some of these economists recognized the possibility of problems arising from sticky prices or wages.

In a system possessing these characteristics, unemployment of resources would be only a transitional phenomenon, at worst. Flexible interest rates would tend to equate savings and investment at the full-employment level, and flexible prices and wages would insure that markets for goods and labor would be cleared. Beyond temporary transitional periods, changes in aggregate demand for goods and services would not affect the level of output and employment; they only changed the general price level. An increase in aggregate demand at a pace faster than the growth in productive capacity would simply raise the levels of prices. A fall in aggregate demand would not cause unemployment; it would merely reduce prices and wages.

Even the most orthodox of the classical economists recognized the obvious fact that in the real world depressions and inflation did occur, and that from time to time aggregate demand might be inadequate to insure full employment. These rather frequent periods of depression were usually considered to be the result of temporary disturbances of markets caused by such things as speculative excesses, a general loss of confidence, an abnormal contraction of credit, or a sharp decline in the money stock. In the longer run,

the classicists believed, powerful forces were at work to restore full-employment equilibrium. The unemployment that accompanied depressions was considered to be one of two types: It might be frictional unemployment caused by people changing jobs, ignorance of job opportunities on the part of workers, or some other temporary imperfection in the labor market. Or it could be caused by collusion on the part of labor in a stubborn refusal to accept employment at a wage equal to their marginal productivity. Unemployment of the latter type was considered "voluntary." Some orthodox economists even described the massive unemployment of the 1930's in these terms.

It is clear from the foregoing that government stabilization policies played no role in the classical scheme of things. Indeed, the doctrine of *laissez-faire*, one that called for a minimum of government intervention in the economic affairs of the nation, was the dominant philosophy during this period. The classical writers would have considered government intervention not only a threat to individual freedom, but also a destabilizing force in the economy. The strength of the *laissez-faire* philosophy is indicated by the fact that Herbert Hoover was the first American President to attempt to use the powers of the central government to alleviate the harmful effects of a depression.

It would be a serious mistake to conclude, however, that the classical and neoclassical doctrine went unchallenged from the days of Adam Smith to the Great Depression of the 1930's. As a matter of fact, critics abounded from the earliest days of the period. Some of these, working within the great mainstream of classical thought, contributed to the growth and evolution of this school of thought. Others attacked the classical doctrine from without. In addition, Wickcell and some of the other great continental economists were pursuing quite different approaches to economic analysis, and in the United States Veblen, Commons, Mitchell, and the other institutionalists were questioning all economic theory.

As time went on, the orthodox economic theory seemed to conform less and less to economic reality, and efforts to construct an alternative increased. As Hansen notes, this activity became especially strong following the turn of the present century, particularly among the economists who began their professional lives in the period

around World War I.¹ Much of this work was related to the problem of economic fluctuations, and there were many attempts to refute the central tenet of neoclassical analysis, the premise that there is a basic tendency for the economy to move automatically toward full employment. But the problem faced by these economists was that "You can't beat something with nothing." Critics of the classical system had no generally acceptable body of theory to take its place. Even some of the more effective dissenters, such as J. M. Clark, continued to use the classical analysis.

The Keynesian Revolution An alternative theoretical approach was provided in 1936 with the publication of a book by the English economist, John Maynard Keynes. His *General Theory of Employment, Interest and Money* is a rather poorly written and sometimes confusing book, but with the exception of Marx's *Das Kapital* it was perhaps the most influential book on economics since Adam Smith.

Keynes attacked head-on the central tenet of the classical theory, i.e., the tendency of the economy to move constantly toward a condition of full-employment equilibrium. As expounded by a leading classicist of that day, A. C. Pigou, this tendency toward full employment rested on two conditions: (1) flexible interest rates would insure full use of resources by equating saving and investment, and (2) flexible wage rates would ensure full employment, regardless of the level of total demand.

Keynes contended that both of these principles were fallacious. Saving and investment are two entirely separate processes and are not mutually determined by any single variable, such as the interest rate. Saving, he said, is determined by the level of income; the level of investment depends on the relationship between the rate of interest and the return on investment. If planned investment fell short of the level of saving at full employment, realized saving and investment would be equalized through a fall in income (and saving). It is possible, therefore, for equilibrium to be attained at a level of income below full employment. Flexible wages, even if they existed, would not ensure full employment. A fall in money wages would reduce consumption outlays and thus reduce total demand for goods and ser-

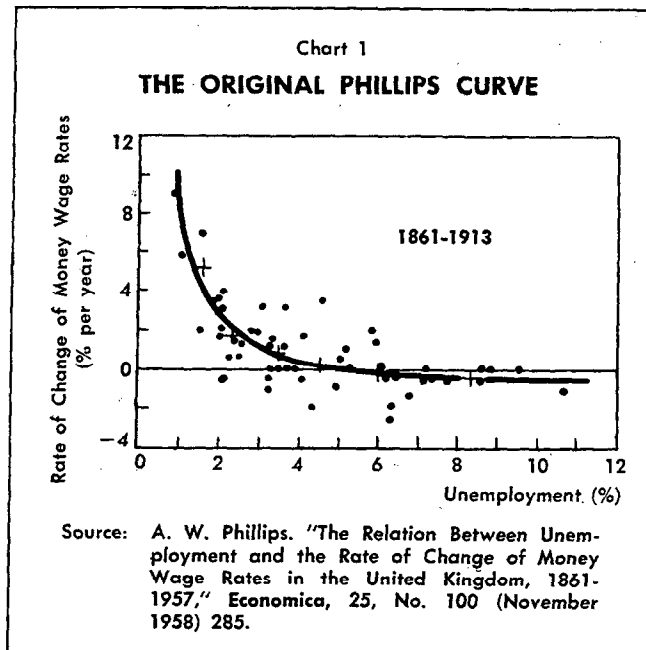
vices. The lower level of demand for goods and services would lower the derived demand for labor and therefore would not eliminate unemployment.

It is not our purpose here to discuss the details of the Keynesian system. This has been done many times over the last forty years, and in the process many features of the system have been changed and some that Keynes considered important have been ignored. But the importance of the *General Theory* is that it focused attention on the level of aggregate demand as the determinant of the level of output and employment. Moreover, it provided theoretical justification for the use of governmental actions to influence employment and prices by manipulating total demand. Fiscal policy was justified on the grounds that government spending is an important element of aggregate demand, while changes in taxes affect the private components of demand. Monetary policy could affect the investment component of demand by changing the level of interest rates.

If one accepts the idea that the economy does not move automatically toward full-employment equilibrium (indeed that equilibrium at less than full employment is quite possible) and that the government possesses the power to determine the level of employment and prices, then the exercise of that power becomes inevitable. And this is what happened in the years following the publication of the *General Theory*. Keynes's emphasis on the use of fiscal policy received an important boost when government spending during World War II wiped out the heavy unemployment that had persisted throughout the 1930's and the government commitment to stabilization policy was officially recognized in the Employment Act of 1946.

The Phillips Curve Many early Keynesians seemed to think of the "full-employment" level of aggregate demand as a relatively narrow range. At most points below full employment, a change in the level of aggregate demand would change employment with little or no effect on prices. At points above the full employment level, a change in aggregate demand would change prices with little or no effect on employment. As time passed, however, economists generally came to perceive the "stabilization band" as comprising a rather wide range, and this view received theoretical

¹ Alvin H. Hansen, *A Guide to Keynes* (New York: McGraw-Hill Book Company, Inc., 1953), pp. 4-11.



support with the publication of a paper in 1958 by the British economist A. W. Phillips.² Applying statistical analysis to wage and unemployment data for the years between 1861 and 1913, Phillips discovered an inverse relationship between these two variables. That is, there was a tendency for the rate of increase in wages to be high in periods when unemployment was low, and vice versa. These somewhat unsurprising findings became embodied in what was called the "Phillips curve."

Although expressing an unspectacular and rather commonsense idea, the Phillips curve was of considerable importance in the evolution of stabilization policy. Since the rate of change of prices is closely related to the rate of change of wages, the Phillips curve provided intellectual underpinning for the concept of a trade off between inflation and unemployment. The policymaker was given a choice over a wide range of combinations of unemployment and inflation. Because of the shape of the curve (see Chart 1), the higher the rate of unemployment, the lower would be the cost in terms of additional inflation of reducing the unemployment rate; conversely, the higher the rate of inflation, the less would be the cost in terms of additional unemployment of policies designed to restrain inflation. The role of the policymaker, therefore, was to choose the

"optimum" combination of unemployment and inflation given the Phillips curve confronting him. The actual choice, of course, would be a reflection of the values of the policymaker and, perhaps, important political considerations.

Something similar to the Phillips curve analysis has probably been the basis of economic stabilization policy since World War II, but it was not until the early 1960's that it received its most explicit statement as a guide to stabilization policy. In the *Economic Report of the President* transmitted to Congress in January 1962, a 4 percent unemployment rate was adopted as a "temporary" target. In a later discussion of this goal, a member of the President's Council of Economic Advisers in 1961 stated, "Four percent was chosen with an eye on the Phillips curve, specifically the 4 percent inflation that accompanied 4 percent unemployment in the mid-1950's."³

Recent Developments The concept of some sort of trade off between inflation and unemployment continues to play an important role in economic stabilization policy, but in recent years this idea has come increasingly into question. First of all, Phillips' work has been subjected to searching criticism with respect to theoretical and methodological considerations.⁴ But more importantly from the viewpoint of practical policy, it has become more and more difficult to reconcile the recent behavior of prices and unemployment with the idea of a smooth trade off between the two. As one economist notes ". . . there is as yet no convincing way of fitting the phenomenon of stagflation into the framework of post-Keynesian economics."⁵

A number of explanations have been advanced as to why the postulated trade off between inflation and unemployment may no longer be valid. One school of thought explains this in terms of the formation of expectations. According to this theory, expectations of future price behavior are formed on the basis of past price experience. If, following a period of price stability, the economy expands rapidly, wages may

² A. W. Phillips, "The Relation Between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom, 1861-1957," *Economica*, Vol. 25, No. 100 (November 1958), 285.

³ James Tobin, *The New Economics One Decade Later* (Princeton: Princeton University Press, 1972), pp. 16-17.

⁴ See, for example, M. Desai, "The Phillips Curve: A Revisionist Interpretation," *Economica*, Vol. 42, No. 165 (February 1975), 1-19.

⁵ Hendrik S. Houthakker, "Incomes Policies as a Supplementary Tool," in *Answers to Inflation and Recession: Economic Policies for a Modern Society*, ed. by Albert T. Sommers (New York: The Conference Board, 1975), p. 73.

be bid up and unemployment fall below some "natural" rate. Prices will begin to rise, and the price expectations of workers and businessmen will be disappointed. As the inflation continues, people's expectations will be revised; and this results in an upward shift in the Phillips curve, so that each rate of unemployment is now associated with a higher rate of inflation. For any given rate of inflation, unemployment will gradually rise back to the natural level, and the temporary stimulative effect of inflation will vanish. In the long run, unemployment will return to its equilibrium level, and the inflation rate will stabilize. An attempt to halt the inflation by reducing aggregate demand will initially cause a rise in unemployment. But persistent expectations of inflation may cause the Phillips curve to continue to shift to the right, and the response of inflation to a reduction in aggregate demand may be excruciatingly slow.

Another approach explains the recent "stagflation" in terms of institutional characteristics of product and labor markets. Okun, for example, distinguishes between what he calls "customer" product markets and "career" labor markets, on the one hand, and the "auction" markets postulated in traditional economic analysis on the other.⁶ In customer product markets, prices do not equate supply and demand. For most products, the price is set by the seller and the quantity sold is determined by demand conditions in the market, but the price is not established in the expectation of clearing the market. Because shopping is costly and bothersome, a continuing relationship is usually established between the customer and the supplier. In a similar fashion, long-term employer-employee relationships are established in labor markets. A firm's wage rates (and number of employees) may be influenced very little by short-run changes in demand, and Okun emphasizes the concept of "fairness" in the determination of long-run wage levels. Fairness in this case is defined in terms of the relationship of the firm's wage structure to other wages, or to the price of the firm's product, or to the workers' cost of living. According to this approach, the appearance of excess demand will first be reflected in a rise in prices in the "auction" markets and will then spread to customer product markets

and career labor markets only with a lag. Because of the stickiness of many wages and prices, inflation is slow getting started but it tends to gather momentum as it progresses, and wages and prices may continue to increase, with an adverse impact on employment, long after excess demand is removed.

These two explanations of the recent instability of the Phillips curve are not mutually exclusive, of course, and there is little doubt that both help to explain the recent failure of prices and unemployment to conform to the expected Phillips curve configuration. One of the weaknesses of the expectations approach, perhaps, is that it puts too little emphasis on the institutional aspects of the problem. The fact is, most prices and wages in our economy are not determined in the manner described in many economics textbooks. Producers of a great many products do not think of themselves as facing some market-determined price, and indeed they are not. They set their own prices, and the most important determinant of any price is the producer's estimate of current unit costs and anticipated future changes in costs. Wages of a great many workers are the result of a collective bargaining process where the most important factors are the relative bargaining powers of the participants. As Okun notes, however, wages in other firms and industries, the firm's profit picture, and changes in the workers' costs of living are important considerations. Moreover, prices of most products are not changed very often, while wage contracts often cover a period of several years.

Implications for Policy All of this has important implications for the conduct of stabilization policy, but just as there is no general agreement on the basic cause of the problem, there also is no agreement on the proper direction of policy in the kind of situation that prevails today. Those who attribute all of the instability of the Phillips curve to expectations of inflation believe that all that is needed to achieve price stability is to eliminate inflationary expectations and gradually to move unemployment back to the "natural" rate. For many of the economists emphasizing expectations, inflation is always and only a monetary phenomenon, and the most important factor in the control of inflation is the proper use of monetary policy to prevent it from getting

⁶ Arthur M. Okun, "Inflation: Its Mechanics and Welfare Costs," *Brookings Papers on Economic Activity*, No. 2 (1975), pp. 351-90.

started. Once it is started, however, and inflationary expectations are firmly embedded in the minds of businessmen and consumers, the only way to deal with it is to hold aggregate demand below the full-employment level until these expectations are eliminated. And because of the manner in which expectations are formed, this can be done only over an extended period of time. In a period like the present, those who stress the expectations factor would caution against an attempt to achieve a rapid recovery because of fears of creating new inflationary expectations.

Many economists acknowledge the importance of expectations in prolonging and strengthening the inflationary process, but they argue that institutional factors also play a role. They believe that fundamental changes in our society, our economy, and in the role of government have seriously weakened the traditional stabilization techniques insofar as the control of inflation is concerned.⁷ Some of these changes have helped to create an inflationary bias in our economy, while others have reduced the effectiveness of monetary and fiscal policy in controlling inflation. Foremost among these changes would be the decline in price competition in both product and labor markets. This, of course, has weakened the link between monetary and fiscal actions, on the one hand, and prices and wages, on the other. In addition, welfare programs and income maintenance policies of government and private industry have reduced the incentive for workers to search diligently for employment or to accept employment at a reduced wage. At the same time, minimum wage laws contribute to the inexorable rise in wage rates and, some believe, they may price many unskilled workers out of the labor market, thereby aggravating the unemployment problem. Regulatory policies of governmental agencies sometimes make price competition in the regulated industry impossible and contribute significantly to the downward inflexibility of prices.

Finally, our economy has become increasingly subject to influences originating outside our own borders. The elimination of barriers to international trade and financial flows over the last two decades has served to tie our economy

much more closely to economies abroad, with the result that economic developments in foreign lands may have an important impact on conditions in our economy. Some believe, for example, that the worldwide economic boom of the early 1970's, coupled with crop failures abroad, the temporary disappearance of the anchovies off the coast of Peru, and the sharp devaluation of the U. S. dollar, contributed greatly to the inflation experienced in the United States. These developments were followed by the sharp boost in energy prices imposed by the OPEC cartel, an illustration of our growing dependence on foreign sources of fuel and raw materials.

Some, but by no means all, of those economists who emphasize institutional factors and market imperfections advocate some kind of incomes policy. These proposals range from guideposts and jawboning, to control of certain basic materials prices, to full-scale wage, price, and profit controls. Some advocate temporary use of these powers during periods of inflation on the ground that their use would speed the adjustment of price expectations. Others advocate a permanent system of controls on the ground that it is needed to offset the market power of large corporations and labor unions. A great many economists question the efficacy of permanent, full-scale wage and price controls. Such controls, they argue, would seriously distort the functioning of the economy and lead to the inefficient allocation of resources. Some are skeptical of temporary controls on the ground that they are ineffective.

Economists of all persuasions favor some type of "structural" reform that would eliminate many of the institutional features that contribute to the inflationary bias in the economy or tend to reduce the response of wages and prices to traditional stabilization policies. But not surprisingly, there is little agreement on the specific list of items to be included in these reforms. A great many of the proposed reforms affect powerful vested interests, and the political obstacles to any significant action in this area are formidable.

Conclusion Recent experience clearly indicates the need for a serious reappraisal of our approach to economic stabilization policy. Such a reappraisal should recognize first that the problems we have had do not call for a scrapping of traditional stabilization tools. Indeed, some would

⁷ See, for example, an address by Arthur F. Burns, "The Real Issues of Inflation and Unemployment," delivered at the University of Georgia, September 19, 1975.

say that most of our recent problems resulted from ineptitude in the use of these traditional tools. But demand management is still necessary because inadequate demand can cause unemployment and excess demand can create or exacerbate inflation. At the same time, the limitations of these tools should be recognized. They are primarily effective in dealing with economic instability arising from an excess or deficiency of aggregate demand. They are not very effective in dealing with price increases arising from crop failure, the actions of an oil cartel, or against the cost-push price pressures so prevalent in our economy today. If used to combat this type of inflation they can be very costly, not only in terms of unemployment and lost output, but also in terms of a weakening of the social and political fabric of our society.

Efforts to control inflation and achieve an acceptable level of employment have not been very successful in recent years. This has been partly because of the extraordinary nature of some of the disturbances that have rocked the economy and partly because of the stubborn persistence of

inflationary expectations. In the absence of other approaches to economic stabilization, perhaps too much has been expected of the traditional techniques. This seems to have been particularly true of monetary policy. Some of the more ardent champions of monetary policy have claimed more for that policy than it can deliver, with the result that the central bank has been subjected to a great deal of criticism. Such exaggerated claims may seriously impair the ability of the Federal Reserve System to perform its traditional functions.

It may be that the recent problems of economic stabilization are a passing phenomenon, but if they are not, new policy approaches may have to be developed. The most obvious first step would appear to be the elimination of artificial barriers to competition in labor and product markets and the alteration of structural features that reduce the flexibility of the economy. But in order to achieve a reasonable degree of economic stability in the years ahead it may be necessary to develop new policy tools to supplement those presently in use.

A REVIEW OF THE MUNICIPAL BOND MARKET

Richard H. Rosenbloom

Recent developments in the municipal bond market have increased public awareness of the problems state and local governments face in obtaining debt financing.¹ Of special concern to many interested observers is the recent steep rise in the yields on municipal bonds relative to those on corporate bonds with the same credit rating. This article undertakes to assess the significance of this development through an evaluation of recent trends affecting both the supply of and demand for municipal bonds and the resulting effects on the borrowing costs of state and local governments. The discussion focuses on the primary (new issue) market for municipal bonds with emphasis on market participants, market trends over the past fifteen years, recent market developments, and the probable future course of the market.

Measurement of Municipal Bond Market Conditions Municipal bonds have generally the same investment characteristics and attributes as corporate bonds with one fundamental exception. The interest income from municipal bonds is exempt from Federal income taxation.² This tax-exempt feature makes municipals sufficiently different from corporates that it is uncommon to find the two types of bonds together in the same portfolio. The purpose of the tax-exempt feature is to lower the borrowing costs of state and local governments by enabling them to offer investors a lower yield that is competitive with the after-tax yield available on corporate bonds.

The relationship between the yields on equal credit-rated municipal and corporate bonds differs for investors in different income brackets since the value of the tax-exempt feature, given a progressive income tax structure, increases as taxable income moves into brackets for which the

tax rate is higher. The investor in tax bracket "t" would be indifferent between investment in corporates and in municipals when:

$$(1) R_m = R_c(1-t)$$

where R_m = the yield on municipal bonds, R_c = the yield on corporate bonds, and t = the marginal tax rate at which the after-tax yields on municipal and corporate bonds are equal. Given t and R_c , equation (1) determines the minimum municipal yield necessary to induce investors in tax bracket t to buy municipal rather than corporate bonds. When transposed, the equation can be solved for t as follows:

$$(1a) t = 1 - R_m/R_c.$$

This equation says simply that given the relationship between yields on municipals (R_m) and yields on corporates (R_c), the marginal tax rate at which investors are indifferent between the two types of bonds is automatically determined. The relationship between R_m and R_c can be affected, of course, by factors other than the value of the tax exemption to investors. Relative risks and call protection, for example, could be major factors. However, the risk factor has been minimized in the discussion by using both Aa-rated corporate and Aa-rated municipal bonds and by assuming the risk relationship between them has remained stable. The call protection factor has been minimized by the use of corporate and municipal bonds with approximately the same call protection.

The relationship R_m/R_c is a widely used measure of conditions in the municipal bond market relative to other capital markets and specifically to the corporate bond market. High levels of R_m/R_c are taken to indicate relatively tight credit conditions in the municipal bond market, while low levels of R_m/R_c indicate comparatively easier credit conditions for municipal borrowers.

¹ Municipal bonds are any tax-exempt debt security of a state or local government, agency, or special authority.

² In many cases, the interest income is also exempt from state and local taxation in the issuing state and/or locality.

The course of Rm/Rc over the past fifteen years is shown in Chart 1. As can be seen, the movements are quite erratic with no long-term trends. There are, however, a number of conspicuous short-term movements that merit examination along with the general volatility of the series.

The Supply of Municipal Bonds Municipal bonds are issued by state and local governments and their special governmental agencies and authorities primarily to finance capital outlays that are too large to be financed out of current revenue. In many cases a new agency or authority, such as a transportation authority, is created solely to issue bonds for a specific project and, perhaps, to administer the project upon completion.³

There are two general types of municipal bonds—general obligation bonds and revenue bonds. General obligation bonds are “full faith and credit” obligations of the issuing body. As such, they are secured by the taxing power of the issuer. These long-term debt obligations are usually issued as serial bonds⁴ with maturities from 1 to 30 years. Revenue bonds are issued primarily by governmental authorities that have no taxing power. They are secured solely by the revenue collected from the users of the particular capital project funded by the debt issue. Thus, the credit quality of a revenue bond is directly related to the ability of the issuer to collect revenues from the project involved. In the case of a well established sewer authority this credit quality is likely to be high, whereas the bonds of a new mass transit authority in a low-density city, for example, might be more speculative. These obligations consist largely of one or two long-term issues with a smaller amount of serial bonds with shorter maturities. One type of revenue bond worth noting is the “moral obligation bond.” This type of bond is secured by earmarked revenue and by a promise from the issuing government to appropriate funds from general revenues to cover debt service if revenues prove insufficient. The credit quality of these bonds is as good as the promise or moral obligation to redeem them.

Occasionally, state and local governments will issue short-term debt in the form of tax, revenue, or bond anticipation notes, which generally have

³ In many cases special authorities are established to provide services “off-budget,” thereby bypassing state constitutional requirements for balanced budgets.

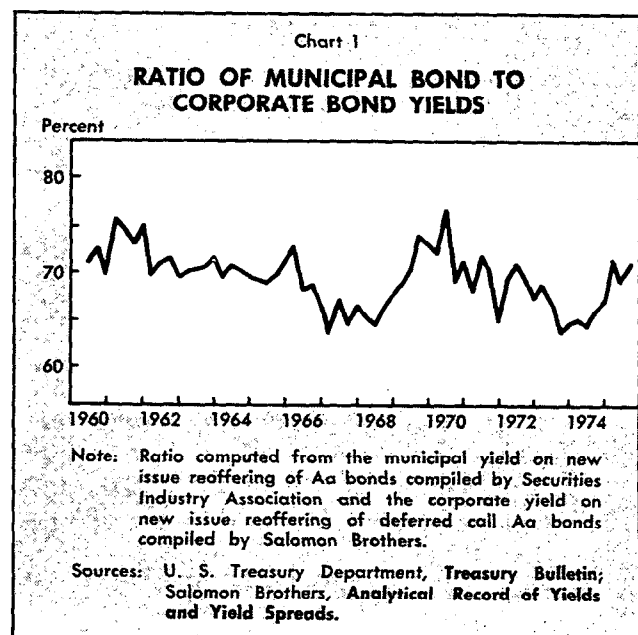
⁴ Serial bonds are single bond issues comprised of many different maturities, as opposed to a term bond issue in which all the bonds have the same date of maturity.

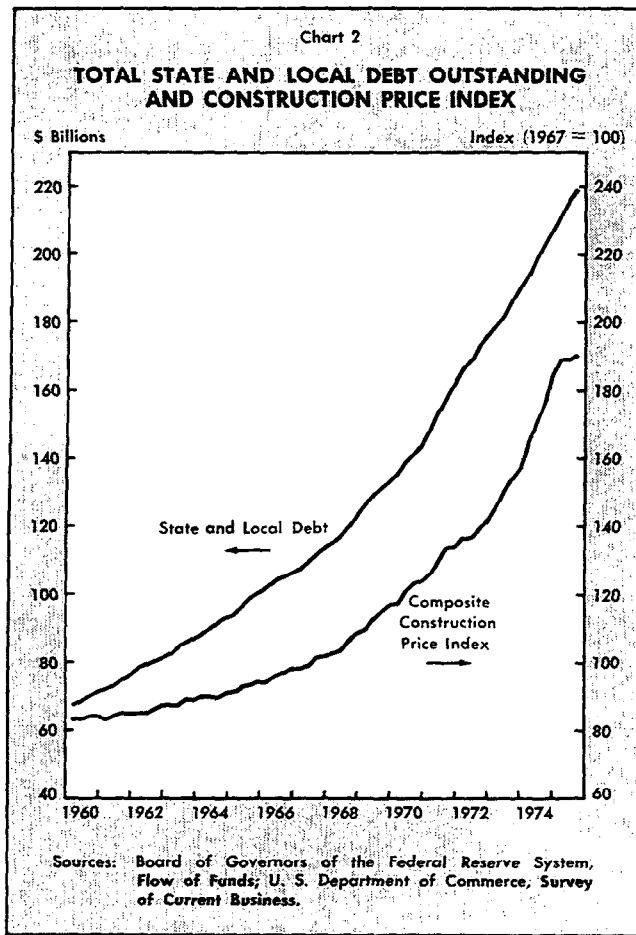
a maturity of less than one year. As the name implies, tax and revenue anticipation notes are issued to aid cash flow while waiting for taxes and revenues to come in, at which time the debt is retired. Bond anticipation notes are generally issued to finance a project during periods of tight credit conditions to prevent getting locked into a high rate, long-term debt obligation. When more favorable credit conditions develop, the short-term debt is refinanced by a bond issue.⁵

The growth in the dollar amount of total state and local debt outstanding is shown in Chart 2. Examination of this time series reveals a remarkable stability in the growth of outstanding municipal debt. The quantity outstanding increased in every quarter from 1960 through 1975. From early 1960 to the middle of 1968, the growth was nearly constant at an average annual rate of approximately 6.8 percent. In the middle of 1968 a significant shift in the growth path occurred. The average growth rate accelerated from 6.8 to approximately 8.4 percent per year. Late in 1970 the growth rate again accelerated, in this instance from 8.4 to 10.4 percent per year.

These sharp increases in the growth of the supply of municipal bonds offered each year might be explained by the acceleration in the pace of inflation in 1968 and again in late 1970, particularly the acceleration of construction costs. This development had two effects. First, as

⁵ See J. E. Petersen, “Response of State and Local Governments to Varying Credit Conditions,” *Federal Reserve Bulletin*, March 1971, p. 209.





shown in Chart 2, it increased the cost of construction, thus requiring a larger bond issue to finance any given project. Second, to the extent inflation impacts on expenditures more rapidly than on revenues, it increased the costs of providing government services, which are payable out of current receipts. This reduced the availability of funds from current receipts to help finance capital projects. Consequently, more bonds were issued to help fill this gap. The growth in state and local debt may also have been affected by the entry of New York City into the long-term market to finance operating expenditures and by sharp increases in short-term debt issuance by New York City and New York State.

The stable and continued growth of the total supply of outstanding municipal securities masks some changes in the composition of the total supply that warrant examination. As shown in Chart 3, the percentage of total municipal debt outstanding accounted for by short-term debt is small but increasing. It is a highly volatile function but seems closely related, with a small lag,

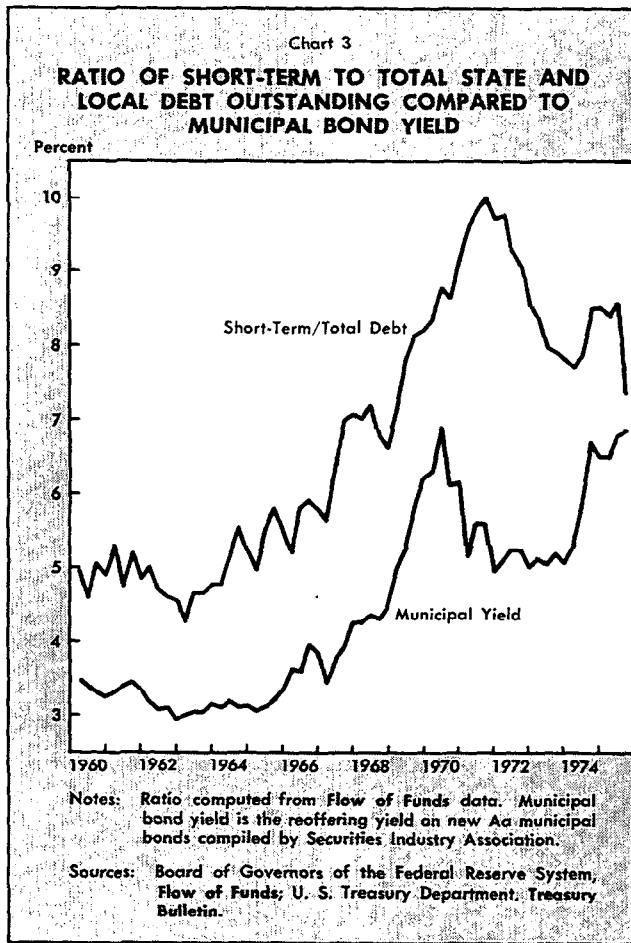
to the yield on municipal bonds. When yields are stable, little short-term financing is used. As yields rise, short-term bond anticipation notes are increasingly used while finance officers await lower rates, which sometimes fail to materialize. As yields turn lower, the short-term debt is retired by the issuance of bonds.

Another interesting development concerning the supply of municipal bonds is the increasing use of revenue bonds as opposed to general obligation bonds. In 1960 revenue bonds accounted for approximately 27 percent of total bonds issued. By 1975 this percentage increased to nearly 40 percent.

This increasing use of revenue bond financing reflects two influences. The first is the apparently growing reluctance of taxpayers to pay higher taxes for debt service and, thus, their disinclination to approve new general obligation bond issues. Accordingly, state and local governments have increasingly resorted to revenue bonds, which do not require voter approval. The second influence is the enlarged concept of what constitutes a proper government service and the growing feeling that, as much as possible, the users of particular government services should pay for them. This enlarged concept of government services is particularly evident in the growing use of tax-exempt financing to obtain funds for pollution control and industrial development projects, which are then leased or sold to private businesses. The governmental unit is, in effect, an agent of industrial tax-exempt borrowing. Ostensibly the government service is the attraction of business enterprises to provide employment. More frequently, therefore, government-sponsored corporations or authorities are created to issue bonds, provide services, and collect the revenues to retire the bonds. Revenue bonds are likely to continue to be of growing importance in the municipal bond market.

To sum up, the supply of municipal bonds has grown at a steady pace with no apparent relationship to the business cycle. While there have been some structural changes in the component mix of the supply of municipal bonds, there seems to be no reason to believe that supply phenomena in the municipal market are responsible for the movements in the ratio of the yields on like-rated municipal and corporate bonds.

The Demand for Municipal Bonds Due to the tax-exempt nature of municipal bonds, investors



are generally those persons and institutions subject to high marginal income tax rates. Chief among these are commercial banks, individuals and individual trusts, fire and casualty insurance companies, and to a lesser extent, nonfinancial corporations and life insurance companies. Although not immediately apparent, the market for municipal bonds is rather narrow and has become more so since 1960. While all the previously mentioned groups participate in the market, individual demand and commercial bank demand are of prime importance. In 1960 individual and commercial bank holdings of municipal bonds accounted for 67 percent of the total amount outstanding; by the third quarter of 1975 this percentage had risen to 78 percent.

The nature of the demand for municipal bonds may offer a reasonable explanation for the erratic movements in municipal bond market conditions relative to other capital markets shown in Chart 1. An examination of the patterns of investment behavior by various types of municipal bond in-

vestors in recent years may, accordingly, prove instructive.

Commercial banks Of fundamental importance to the understanding of developments in the municipal bond market is the fact that the demand for municipal bonds by commercial banks is a residual demand, i.e., banks purchase municipals with any funds remaining after commitments to other borrowers have been met.⁶ The primary investment outlet for commercial banks is loans, and much of the variation in commercial bank participation in the municipal bond market can be explained by variation in loan demand.⁷

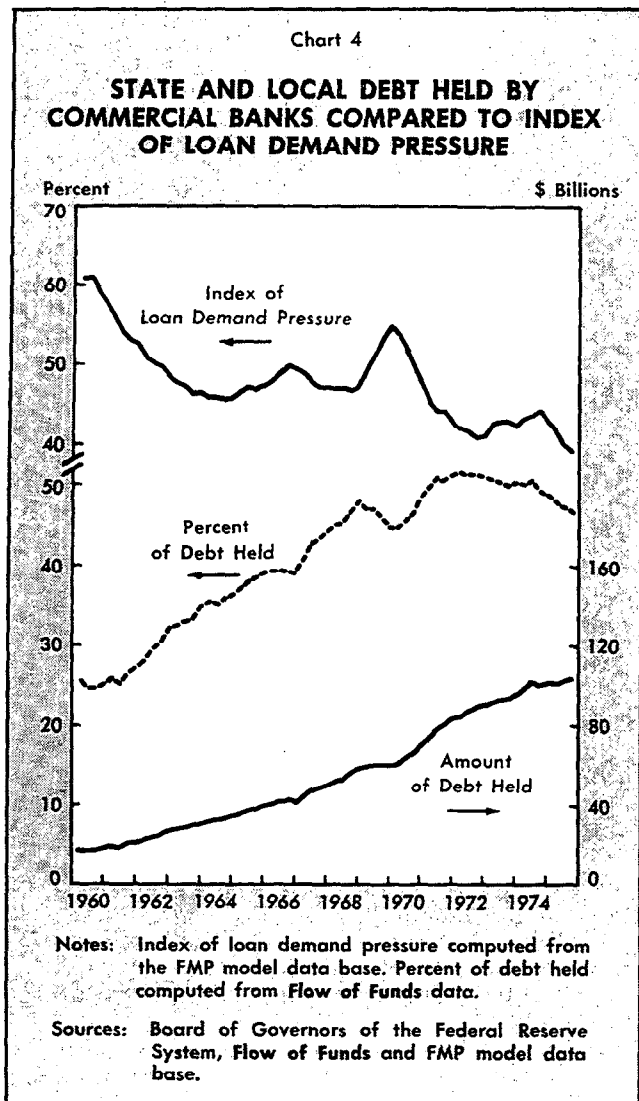
Chart 4 shows an index of loan demand pressure expressed as the ratio of commercial loans to time deposits.⁸ This ratio is intended to measure the extent to which banks have residual funds available. The relationship between the loan demand pressure and commercial bank participation in the municipal market is quite clear, particularly during the tight credit conditions of 1968-69. Generally as loan demand pressure falls, demand for municipal bonds by banks rises. As loan demand pressure rises, due to either a rise in loans or a runoff of time deposits, municipal bond demand by banks stabilizes or falls. A notable exception to this tendency, however, has developed since the third quarter of 1974. During that period both loan demand pressure and bank demand for municipals have declined. This recent experience suggests the presence of a new influence tending to reduce bank demand for municipal bonds, a development which will be discussed later.

Commercial banks are presently the primary holders of municipal bonds, although this was not always true. To maintain liquidity, banks tend to prefer short- or intermediate-term bonds. Chart 4 shows the municipal bond investment record of commercial banks, both absolutely and relative to the entire market. The dollar amount of bank holdings has trended generally upward, but not without interruption. Prior to 1961 the

⁶ For a discussion of commercial bank demand for municipal bonds as a residual demand see Donald R. Hodgman, *Commercial Bank Loan and Investment Policy*, (University of Illinois: Bureau of Economic and Business Research, 1963), pp. 38-45; and Stephen M. Goldfeld, *Commercial Bank Behavior and Economic Activity*, (Amsterdam: North-Holland Publishing Company, 1966).

⁷ See Hodgman.

⁸ This measure was chosen because it is used as a portfolio balance variable in explaining municipal bond demand in many econometric models. In the FMP model (a large econometric model used by the Federal Reserve System), for example, the commercial loans/time deposits ratio is used in the equation determining the municipal bond yield.



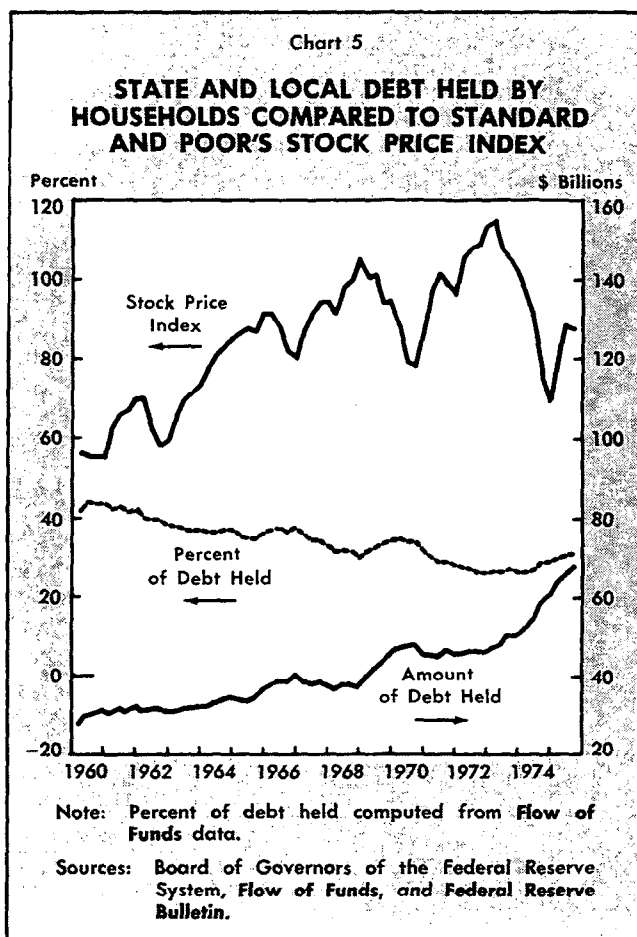
participation of commercial banks in the market was limited and erratic. From mid-1961 to late 1968 holdings grew steadily with the exception of one quarter of liquidation during the tight credit conditions of 1966. In the latter part of 1968, due to increasing loan demand pressure, banks sharply curtailed new purchases of municipal bonds and did not resume them until early 1970. As will be seen, their departure from the market at this point was responsible for a rise in Rm/Rc much like that experienced from the second quarter of 1974 through the first quarter of 1975. The growth in holdings then continued from early 1970 until early 1974, when banks again essentially pulled out of the new issue market. They have yet to return in any significant way.

As shown in Chart 4, the percentage of total municipal debt outstanding held by banks in-

creased from 25 percent in early 1960 to over 50 percent in 1972. Tight credit conditions in 1966 and in 1968-69 temporarily interrupted this rising trend, especially in the latter period. More recently, the percentage has declined since the middle of 1972, with the decline accelerating since the spring of 1974.

Individuals and individual trusts For individual investors the principal investment alternatives to the municipal bond market are the stock and corporate bond markets. The reasons for this are that capital gains are taxed at a lower rate than regular income and corporate bonds can provide an income-producing alternative to municipals, depending, of course, on the individual's tax bracket. While there is probably a hard core of high income, risk-averse individuals who seldom seek investment alternatives to municipal bonds, changes in stock prices and the corresponding changes in opportunities for capital gains may cause other, less risk-averse individuals to alternate between stocks and municipals.

The variation in individual participation in the municipal bond market can be explained to a



large degree by variations in stock prices and in the level of municipal bond yields relative to yields on other bonds (R_m/R_c). The data in Chart 5 indicate a pronounced inverse relationship between stock prices and individual holdings of municipals. As stock prices rise, bond holdings are increased at a slower rate or are liquidated; the reverse seems to be the case when stock prices fall. This reverse relationship is particularly evident during the periods of generally declining stock market prices from the fourth quarter of 1968 through the second quarter of 1970 and from the first quarter of 1973 through the third quarter of 1974.

The relative level of bond yields (R_m/R_c) is important to individual demand for municipals, because as the yield ratio increases the number of potential individual investors rises. Unlike the institutional investors, most of whom face approximately the same income tax rate, individual investors face different tax rates. As R_m/R_c rises, t (the tax rate of indifference) falls, lowering the marginal tax bracket at which investment in municipals becomes attractive to individuals. For this reason when banks or other institutional investors leave the market, yields rise until t falls sufficiently to encourage enough individuals to fill the gap in the demand for municipal bonds and thereby clear the market.

Individuals and individual trusts are now the second most important source of demand for municipal bonds, having fallen from the dominant position that they held during the first half of the 1960's. These investors tend to hold the longer maturities of an issue. Chart 5 shows the municipal bond demand by individuals in absolute and relative terms. Although there is a general upward trend in the dollar volume of total bonds held by households, its movement is much more erratic than that displayed by bank holdings and shows many periods of liquidation.

In relative terms, household demand for municipal bonds has exhibited a general downward trend since 1960. Individual holdings declined from 43 percent of total outstandings in 1960 to a low of 26 percent in 1972-73. Recently, however, this fraction has increased to 30 percent, largely as a result of the decline in the market share of commercial banks and the introduction of municipal bond funds that facilitate investment by individuals.

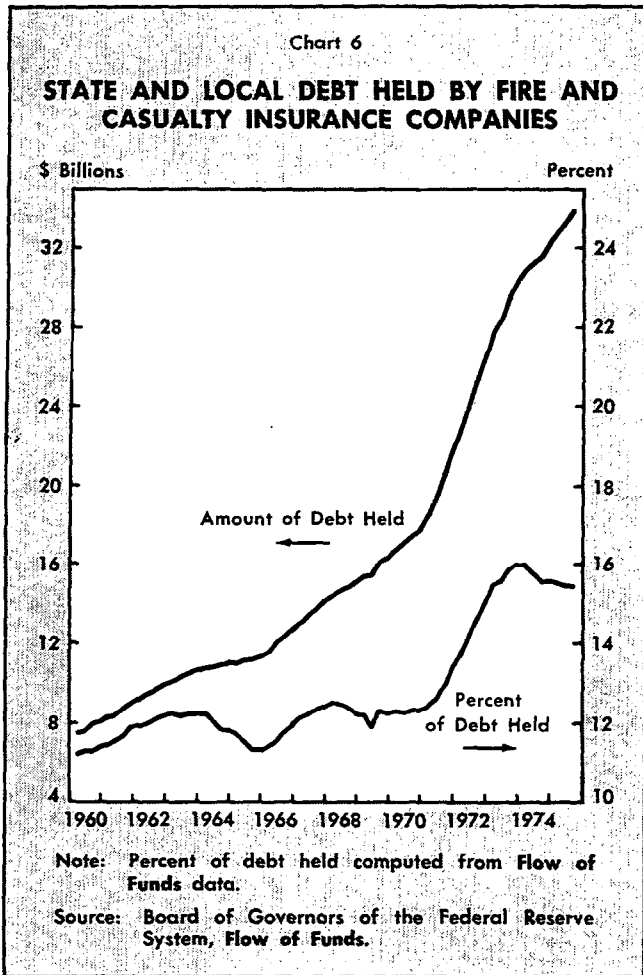
Generally speaking, the high rate of inflation in recent years may be expected to have reduced

the attractiveness of fixed income securities. But, combined with a progressive tax structure a high inflation rate raises the marginal tax bracket of many individuals, thereby increasing the value of the tax-exempt feature of municipal bonds through a reduction in the effective after-tax yield on taxable securities. Chart 5 suggests strong demand for municipals by individuals in recent months. This demand may be associated with high municipal yields relative to taxable bond yields and to uncertainty about the extent of the stock market recovery.⁹ The present high level of demand by individuals for municipal bonds is easily understood when it is realized that investors in marginal tax brackets as low as 30 percent (i.e., $t \leq 30$) receive a return on municipal bonds greater than the after-tax yield available on corporate bonds.

Fire and casualty insurance companies Fire and casualty insurance companies are ranked third in importance in the municipal bond market. These companies, like commercial banks, are subject to the standard corporate income tax rate and thus desire the tax-exempt income municipal bonds can provide. Unlike life insurance companies, fire and casualty insurance companies cannot accurately predict their probable losses; thus their net taxable income, as well as their cash needs, are highly variable. For these reasons, the demand for municipals of any fire and casualty insurance company is unstable. However, while any particular company may be highly erratic in its purchases, fire and casualty insurance companies as a group are the most stable source of demand in the market. Chart 6 shows a steady upward trend in holdings of this group since 1960, with no periods of liquidation. In the first quarter of 1971, fire and casualty insurance companies markedly increased their rate of purchases, and their percentage of the market also began to rise. Their market share stabilized again in the third quarter of 1973, however.

The percentage of total municipal outstandings held by fire and casualty insurance companies was remarkably stable from 1960 through 1970 at approximately 12 percent. By 1973, this market share had increased to its present level of 15 percent. Recent reductions in purchases appear to be due to lower industry profits and should prove temporary.

⁹ Municipal bond funds, a primary bond investment instrument of individuals, set an all-time sales record of \$1.05 billion in the first half of 1975 compared to \$1.26 billion in all of 1974.



Nonfinancial corporations and life insurance companies Both individually and as a group, nonfinancial corporations and life insurance companies are relatively insignificant buyers of municipal bonds. Life insurance companies buy few municipals because they are unable to take full advantage of the tax exemption, due to the low effective tax rate on these companies. In 1960, nonfinancial corporations held roughly 3 percent of outstanding municipals, while life insurance companies held 5 percent. The market share of each fell to roughly 2 percent by the first quarter of 1975. The participation of these investors is the most erratic of any in the market. Nonfinancial corporations primarily buy short-term obligations to meet cash management needs. For most of the 1960's, life insurance companies were a supply factor in the secondary market rather than a demand factor in the new issue market, although their purchases of new issues have recently increased. In general, these two investor groups have little impact on the municipal bond market.

Past Experience in the Municipal Bond Market Due to the residual nature of the demand for municipal bonds by the commercial banks, the overall composition of demand is highly sensitive to developments in other capital markets and in the economy generally. The participation of various investor groups changes greatly over short periods as well as over the longer term. This variation in the composition of demand for municipal bonds seems to be a major factor explaining movements in R_m/R_c .

Figure 1 illustrates the mechanism through which changes in demand composition affect R_m/R_c and the municipal market in general. An increase in the level of demand for municipal securities among institutions subject to high marginal tax rates (e.g., an increase in commercial bank demand triggered by a decline in loan demand pressure) causes municipal bond prices

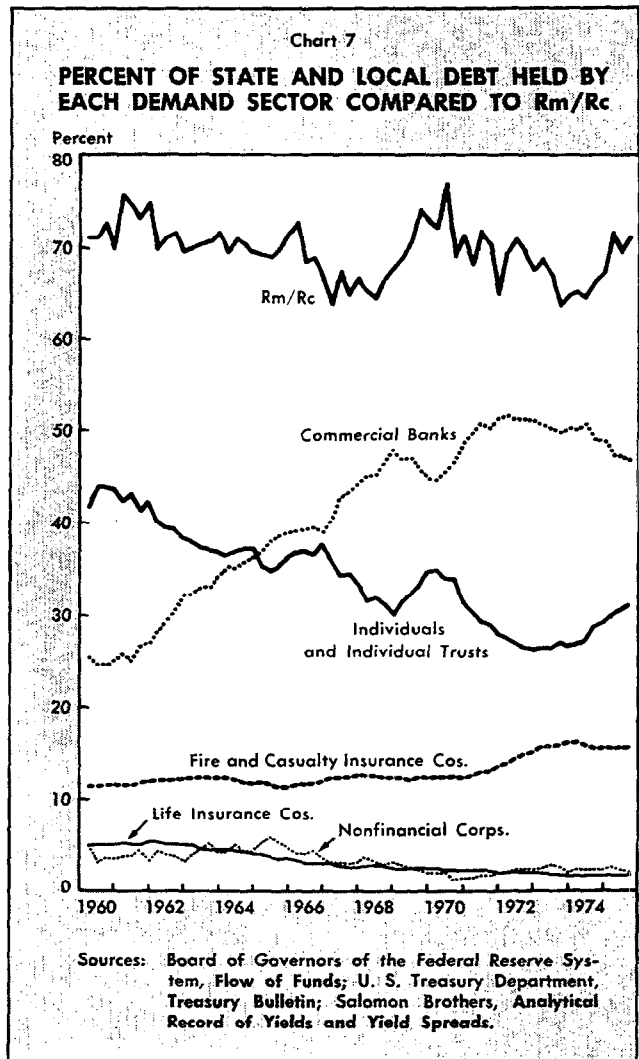
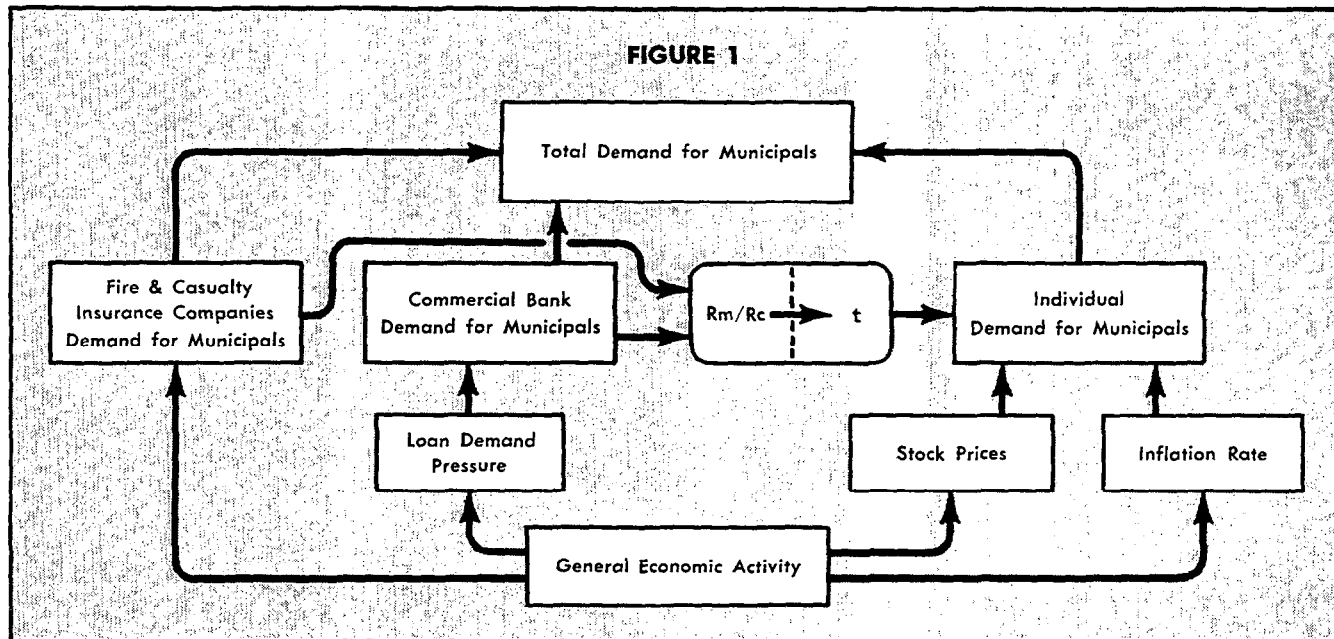


FIGURE 1



to rise, resulting in lower levels of R_m/R_c and thus higher levels of t . At the higher levels of t , the relative attractiveness of municipal bonds declines along with the value of the tax exemption. Individual demand for municipals falls as many individual investors forego purchases of municipal bonds in favor of alternative investments in stocks and corporate bonds. Under these circumstances most investors are in the same tax bracket as the marginal investors, and all receive a yield very near the after-tax yield available on corporate bonds.

When demand for municipal bonds declines among tax-exposed institutional investors, as when loan demand pressure rises, the situation is reversed. Municipal prices fall, causing R_m/R_c to rise and t to fall. This falling level of t increases the value of the tax exemption and the demand for municipal bonds among investors in lower tax brackets, thereby inducing individuals and tax-sheltered institutions to enter the market. Due to progressive taxation, a larger number of individual investors will be in tax brackets above the marginal tax bracket (t) of the marginal investors. Thus, in this situation, many more investors receive a tax-exempt yield considerably greater than the after-tax yield available on corporate bonds.

Chart 7 shows the composition of demand for municipal bonds and the ratio of municipal bond to corporate bond yields since 1960. R_m/R_c generally fell from 1961 through the second quar-

ter of 1968. This fall was due to the rising market participation of commercial banks (caused by generally falling or stable loan demand pressure), which also reduced the participation of individual investors. In the second quarter of 1968 R_m/R_c started a steep rise (steeper than the recent one) that lasted, with one interruption, through the second quarter of 1970. This period was one of high loan demand pressure on banks. To accommodate loan customers, commercial banks halted new purchases of municipal bonds. The departure of banks from the municipal market reduced institutional demand for municipals, causing R_m/R_c to rise and t to fall until individual demand for municipals, spurred both by rising R_m/R_c and falling stock prices, rose sufficiently to clear the market.

The rising participation of institutions caused R_m/R_c and the participation of individuals to generally decline from the second quarter of 1970 to the second quarter of 1974. Owing to easier loan demand pressure conditions, bank demand for municipals resumed in the first quarter of 1970 and rose through the first quarter of 1972. At that time a period of relative stability in bank demand for municipals began that lasted until the second quarter of 1974. Municipal bond demand by institutions was aided by the growth in municipal market participation of fire and casualty insurance companies from 1971 to 1973. This institutional demand supplanted a portion of the participation of individuals, whose market

share declined from the first quarter of 1970 to the third quarter of 1972, due both to falling Rm/Rc and rising stock prices, and then stabilized until the second quarter of 1974.

Recent Developments and Problems The second quarter of 1974 brought an increased awareness of the importance of commercial banks to the municipal bond market. While the financial problems of many cities have been widely publicized as the main reason for the recent steep rise in Rm/Rc, it would appear that the decline in commercial bank participation in the market, from the second quarter of 1974 to the present, is the primary cause. The rise in Rm/Rc has been further aggravated by a decline in the demand for municipals by fire and casualty insurance companies in the first quarter of 1975, because of a low level of industry profits.

The significant fact about the recent developments is that bank demand for municipals has fallen during a period of slack loan demand pressure, as is shown in Chart 4. This unprecedented situation indicates that a departure from traditional patterns of demand for municipal bonds by commercial banks may be occurring.¹⁰ Banks have found other profitable methods of tax-sheltering their income through leasing and foreign operations. Leasing operations enable banks to realize tax savings from the investment tax credit and deductions for depreciation. Foreign operations provide banks with deductions or tax credits for taxes paid to foreign governments. Recent additions to loan loss reserves and losses on security holdings have further reduced banks' taxable income. Since 1961 the effective Federal tax burden on commercial banks has fallen about 60 percent, with much of the decline occurring in recent years.¹¹ Banks have accumulated a significant amount of municipal debt and may have reached a saturation point. Finally, banks are increasingly concerned with their liquidity position. These developments suggest that banks have a reduced need and desire for the tax-exempt income from municipal bonds and thus may not buy the volume of municipals in the future that they have in the past.

¹⁰ This development will have an adverse impact on the validity of municipal bond demand and yield forecasts made by many econometric models that incorporate loan demand as an explanatory variable.

¹¹ Margaret E. Bedford, "Income Taxation of Commercial Banks," *Monthly Review*, Federal Reserve Bank of Kansas City, July-August 1975, p. 10.

It does not appear that the New York City financial crisis can be held primarily responsible for the recent rise in Rm/Rc. The rise in Rm/Rc began, prior to the general recognition of New York City's problems, under the same conditions that initiated and maintained a similar rise in Rm/Rc in 1968-69, i.e., a reduction in commercial bank demand for municipal bonds. These conditions have persisted throughout the recent experience. This is not to imply that the recent chaos and uncertainty in the market have had no impact. It is probable that the lack of information concerning state and local finances combined with the recent financial disclosures of some cities and states have resulted in some additional risk premium being demanded, i.e., investor discounting of credit ratings may have started or increased. However, this should be a short-term phenomenon until fuller financial disclosures are made by state and local government borrowers to allay any investor fears of municipal financial collapses occurring. The fuller disclosure and credit reexamination by municipal credit rating agencies may result in the downgrading of some municipal securities, as New York State's recent experience indicates, and the upgrading of others. Thus, in the long run the major impact of the New York City financial crisis on the municipal bond market will be the reexamination of state and local creditworthiness, and the possible regrading of some municipal securities, not a general rise in Rm/Rc for equal risk securities. However, the outcome of litigation concerning the New York City debt moratorium may have a substantial impact on the value of guarantees associated with general obligation bonds and hence the evaluation of their risk.

The immediate future does not appear to offer any substantial relief for municipal borrowers. For the time being banks will probably remain on the sidelines, especially as loan demand quickens with the economic recovery. Therefore, individuals will be the primary source of demand for new bond issues in the immediate future, aided by the recent entrance of thrift institutions into the market. As the stock market improves, individuals will demand higher yields to remain in the market. Thus state and local borrowing costs will likely remain relatively high, assuming the outstanding supply continues to grow at its historical pace.

One solution that has been suggested to the problem of high municipal rates relative to cor-

porate rates is a Federally-subsidized taxable municipal security.¹² The reasoning behind this plan is that the tax-exempt status of municipal securities was originally intended as a subsidy to municipal borrowers. However, as R_m/R_c rises, more and more of the subsidy goes to the investors. If the bonds were taxable, they would be competitive with corporate bonds of like rating and would be attractive to the growing number of tax-sheltered institutions. The subsidy could be returned to state and local governments through direct payments by the Federal Government. The funds would come primarily from the increased tax revenues resulting from the bonds' taxable income. Another suggested solution is to reduce the supply of municipal bonds by limiting the amount of, or disallowing the tax exemption on, industrial revenue and pollution control bonds. If R_m/R_c remains at its present high level, there will be an increasing call for one or both of these remedies.

Summary and Conclusion The ratio of municipal bond to corporate bond yields exhibits considerable variability, part of which takes the form of explainable short-term cyclical movements. An analysis of the municipal bond market indicates that while supply is steadily rising at a stable rate, demand is continually changing in composition. These changing demand patterns are primarily due to the influence of other capital markets on municipal bond investors, i.e., to the residual nature of commercial bank demand for

¹² See Peter Fortune, "Tax-Exemption of State and Local Interest Payments: An Economic Analysis of the Issues and an Alternative," *New England Economic Review*, Federal Reserve Bank of Boston, May/June 1973, pp. 3-20.

municipal bonds and to individuals' changing demand for municipals versus stocks and corporate bonds. The continual change in demand is responsible for the short-term volatility in the movement of R_m/R_c as well as its longer-term movements.

Commercial banks are of primary importance to the municipal bond market, as their non-participation from the fourth quarter of 1968 through the first quarter of 1970 and since the second quarter of 1974 has made clear. There are indications (e.g., low bond demand concurrent with slack loan demand pressure, additions to loan loss reserves, and the use of other methods to tax-shelter income) that the present low level of demand for municipal bonds by commercial banks may be longer lasting than similar situations in the past. If these indications are correct, new buyers of municipal bonds will have to be found. Steps in this direction are currently under way. The marketing efforts of municipal bond funds seem to have increased individual investor demand for state and local securities, as evidenced by the record sales figures municipal bond funds posted in the first half of 1975. The recent entrance of thrift institutions into the market is another positive development. Other possible solutions involve limiting the supply of some types of tax-exempt securities and the development of a Federally-subsidized taxable municipal bond. Nonetheless, one fact is clear. If state and local governments are to achieve any stability in their borrowing costs relative to their corporate counterparts, they must structure their bond offerings around a stable group of investors that will hold municipal bonds as a primary investment.

THE \$2 BILL RETURNS

Suzanne J. Stone

On April 13, 1976, the \$2 bill will be issued for the first time in ten years. This move will help fill the need for a currency denomination between the \$1 and \$5 bills. The last \$2 series was discontinued in 1966 after low production and the concomitant unpopularity of the bill resulted in insufficient use. This time, however, an ample number (400 million) of bills will be printed annually to permit widespread use of the \$2 denomination.

The New Design The Secretary of the Treasury is authorized by the Federal Reserve Act to determine the denomination and design of all currency. The front of the new \$2 bill features an engraving from a portrait of Thomas Jefferson painted in the early 1800's by the American artist Gilbert Stuart. Also on the front, as required by law, appear signatures of the Secretary of the Treasury and Treasurer of the United States, William E. Simon and Francine I. Neff, respectively. Unlike the last \$2 bill, which was a United States Note, the new bill is a Federal Reserve Note.¹ Therefore a Federal Reserve Bank seal replaces the number 2 to the left of the portrait, and the corresponding Federal Reserve Bank identification number is added on both the left and right sides. Date of the series is 1976.

The design of the back of the bill is completely new. The picture of Monticello, Jefferson's home in Virginia, that was on the earlier \$2 bill has been replaced by an engraving based on John Trumbull's post-Revolutionary painting "Signing of the Declaration of Independence."² Six figures

in the painting, four seated on the extreme left and two on the extreme right, have been omitted in the engraving for aesthetic and security reasons.³

Once it was decided that the \$2 bill would be reissued, widespread support was voiced for a bicentennial theme for the bill. Despite the 1976 issue date, however, the reissue of the bill is not intended as simply a commemorative act for this year, but rather it signifies the permanent addition of another U. S. denomination. Printing of this bill will continue in subsequent years, and there will be no "collector's" or other special issues of it.

Earlier \$2 Bills History of the \$2 denomination in U. S. currency goes back 200 years, just prior to this country's independence. On June 25, 1776, the Continental Congress authorized the issuance of \$2 denominations in "bills of credit for the defense of America."⁴ Under this power, 49,000 \$2 bills were issued. Almost a century later, on July 11, 1862, Congress acted to make the \$2 denomination part of the nation's legal tender. Since that time, it has appeared as oversized U. S. Notes, Silver Certificates, Treasury Notes, and National Currency. Portraits on the front have included those of Alexander Hamilton; Thomas Jefferson; James B. McPherson, Winfield S. Hancock, both Civil War generals; William Windom, Secretary of the Treasury under Presidents Garfield and Harrison; and George Washington. In 1928 the smaller, more familiar, \$2 U. S. Note was issued with Jefferson's picture on the front.

¹ A chief difference between these notes is that the Federal Government must "make good" on United States Notes, while Federal Reserve Banks are liable for all Federal Reserve Notes. In addition, U. S. Notes are backed by gold held by the Treasury; both gold and U. S. Government securities back Federal Reserve Notes.

² The original painting is in the Trumbull Gallery, Yale University. In 1817, Congress commissioned Trumbull to reproduce his painting in a mural for the Capitol Rotunda. The only noticeable difference between the painting and the mural is that the foreground figures in the painting appear to be seated on a wooden platform, while a rug covers the platform in the mural.

³ Omitted on the left were: George Wythe, Virginia, lawyer; William Whipple, New Hampshire, merchant and judge; Josiah Bartlett, New Hampshire, physician and judge; Thomas Lynch, Jr., South Carolina, lawyer. Omitted on the right were Thomas McKean, Delaware, lawyer; and Philip Livingston, New York, merchant. Omission of these figures allowed greater detail in the engraving, thereby reducing the risk of counterfeiting.

⁴ U. S., Department of the Treasury, "Historical Narrative on the \$2 Bill," (Washington, D. C., November 3, 1975).

His picture has appeared on each series since then, as illustrated in Table I.

Prior to the April 13, 1976, reissue, the most recent \$2 series was the 1963 series, which was officially discontinued by the Treasury Department in August 1966. At that time the \$2 note accounted for approximately one-third of one percent of total currency outstanding. The average life of a \$1 bill is 18 months, of a \$5 bill is three years; when it was discontinued, the average life of the \$2 bill was six years. When pieces of currency are worn out, commercial banks return these "unfit" notes to Federal Reserve Banks for destruction. Upon receiving requests from commercial banks for additional money, the Reserve Banks ship them new, as well as "fit" (good used) money. Federal statutes require about \$320 million U. S. Notes to be outstanding at all times, and the 1963 issue of the \$2 note was

partly to meet the legal requirements.⁵ However, the limited quantity printed made the bill an extreme novelty, thereby contributing to public superstitions about it.

Reissuing the \$2 Bill As early as 1969, the Bureau of Engraving and Printing, a division of the Treasury Department, became interested in bringing back a \$2 denomination. Various other groups including Congress, the Federal Reserve System, and the bicentennial commission, as well as many individuals, have expressed support for its reissue. Great emphasis has been placed, however, on a sufficient quantity of such notes being available in order to help insure widespread public use of the bill. Accordingly, 225 million \$2 notes will be printed and some of these shipped to commercial banks for public distribution beginning April 13, the anniversary of Jefferson's

⁵ This requirement is now met entirely by \$100 U. S. Notes.

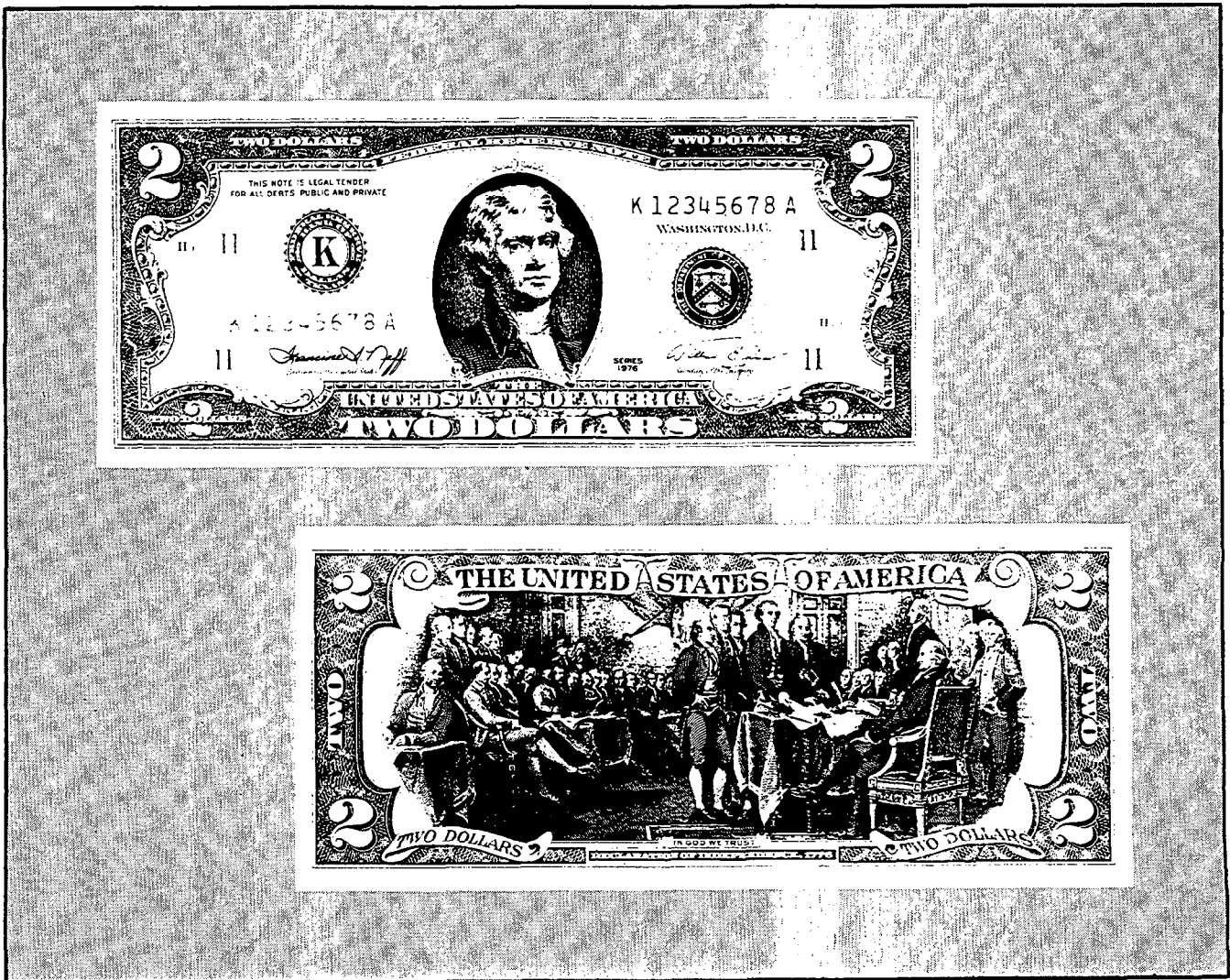


Table I

HISTORY OF EACH PRIOR \$2 BILL RELEASED**UNITED STATES NOTES—LARGE SIZE (LEGAL TENDER ISSUE)**

<u>Series Date</u>	<u>Total</u>	<u>Description</u>
1862	Not Available	Alexander Hamilton
1869	14,408,000	Thomas Jefferson
1874	11,632,000	Thomas Jefferson
1875	11,518,000	Thomas Jefferson
1878	4,676,000	Thomas Jefferson
1880	28,212,000	Thomas Jefferson
1917	317,416,000	Thomas Jefferson

TREASURY NOTES

1890 & 1891	24,904,000	James B. McPherson
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SILVER CERTIFICATES

1886	21,000,000	Winfield S. Hancock
1891	20,988,000	William Windom
1896	20,652,000	Allegorical Vignette
1899	538,734,000	George Washington

FEDERAL RESERVE BANK NOTE (NATIONAL CURRENCY)

1918	68,116,000	Thomas Jefferson
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NATIONAL BANK CURRENCY

<u>First Charter Period (No Series)</u>	<u>Not Available</u>	<u>Description</u>
1875	1,381,205	Allegorical Vignette

UNITED STATES NOTES—SMALL SIZE

1928-1928G	430,760,000	Thomas Jefferson
1953-1953C	79,920,000	Thomas Jefferson
1963-1963A	18,560,000	Thomas Jefferson

Source: U. S., Department of the Treasury, "Historical Narrative on the \$2 Bill."

birth. By July 4, 1976, an additional 150 million bills will be printed. This total is about 60 times greater than the average number of the last \$2 note printed. It is anticipated that about 400 million \$2 bills will be printed in subsequent fiscal years, further helping to provide an ade-

quate supply. The Federal Reserve Bank of Richmond estimates that its share of this year's production will total about \$92 million. This sum will be released through the Richmond Reserve Bank and its Baltimore and Charlotte branches.

The Bureau of Engraving and Printing, which prints all U. S. currency, began work on the new Federal Reserve Note in late summer 1975. Approximately seventeen weeks later, in December, the first bills rolled off the presses. To satisfy the initial requirement, 11 million \$2 bills are being printed each day. Production of the \$2 bill does not interfere with the printing of other denominations, which continue to be printed in their usual volume.

About \$75 million worth of bills of varying denominations are printed each day. The printing cost of any bill is 1.525 cents. "Ones" now account for 55 to 60 percent of the number of pieces of currency in circulation. By replacing about half the "ones" with an equivalent dollar volume of "twos", thus decreasing the number of bills in circulation, the Federal Government will save about \$27 million (in 1976 dollars) in printing, handling, storage, and shipping costs between 1976 and 1981. Similarly, individuals will need to carry fewer "ones", thereby facilitating small cash transactions and reducing the number of pieces of currency retailers and banks must handle. Decreased handling, in turn, will help to lower business operating costs.

Success of the \$2 bills depends on the public's reception of and demand for the new note. The bill should become more acceptable once the public realizes that the Treasury has made it a permanent component of U. S. currency. Its use can save the Government, and therefore all taxpayers, money and increase the convenience of cash transactions.

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