

# Government Debt Financing – Its Effects in View of Tax Discounting

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**T**HE virtues of a balanced government budget have long been a subject of controversy among economists, politicians, and the general public. Debate on this subject again has heated up in view of the persistence of inflation and what some consider the inadequate growth of private investment and the excessive growth of government. Recently, a widespread movement has developed to institutionalize the balanced budget doctrine via a constitutional amendment.<sup>1</sup>

The current debate provides an opportunity to examine the issue of debt- versus tax-financed government expenditures. The discussion centers on the differential economic effects of debt versus tax financing of a *given* level of government expenditures.<sup>2</sup> In particular, this article will show that the difference between public debt financing and current taxes depends upon whether taxpayers correctly anticipate the future taxes that debt issuance implies. This dis-

ussion has important implications for the presumed evils of debt issuance including reduced investment and economic growth, debt burden on future generations, increased inflation, and greater growth of the government sector, as well as the efficacy of fiscal policy actions. In addition, to the extent that movements in interest rates are related to changes in government borrowing, the issue of debt financing versus current taxation has important implications for the conduct of monetary policy due to the use of interest rate targeting by the Federal Reserve.

## *The Rise in Federal Debt*

The amount of government debt outstanding is the total of past expenditures financed by the issuance of government debt instead of current taxes. Outstanding gross Federal debt at the end of 1978 stood at about \$750 billion.

Until World War II, there was a marked tendency to incur deficits during wartime and to run surpluses following wars to reduce the size of the outstanding debt. Following World War II, little attempt was made to reduce the debt; in fact, debt issuance became a standard means for the Federal government to finance

<sup>1</sup>Many supporters of the constitutional amendment to require a balanced Federal budget are interested in reducing the level of government expenditures rather than simply eliminating the possible adverse effects of debt financing.

<sup>2</sup>The assumption of a given level of government expenditures allows the discussion to center solely on the differential impacts of taxes and debt, and thus, to avoid the possible effects of changes in the composition or level of government expenditures on the economy.

part of its budget outlays.<sup>3</sup> For example, the Federal budget on a unified basis has been in surplus only twice in the past 20 years and, since 1970, the amount of Federal debt has more than doubled.<sup>4</sup>

### TRADITIONAL VIEWS ON GOVERNMENT DEBT VERSUS TAXES

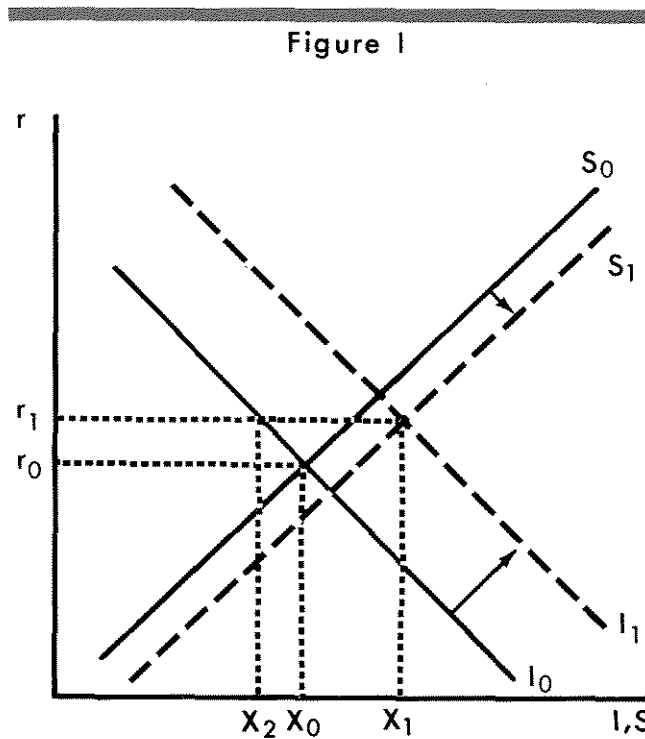
Government can finance a given amount of outlays by either levying taxes in the current period or by issuing interest-bearing debt.<sup>5</sup> Virtually all economists consider the choice of debt versus taxes to have different economic effects, although differing views have developed about the specific economic consequences.

#### Investment and Economic Growth

Some economists have emphasized the negative effects of deficit financing on private investment.<sup>6</sup> In their view, debt issued by the public sector adds to and competes with the private sector (investment) demands for saving. As a consequence, interest rates are bid up and some crowding out of productive private investment occurs.

This scenario is demonstrated by the saving and investment diagram in Figure I. Investment is assumed to be negatively related to interest rates, whereas saving is assumed to be positively related to both the interest rate and the level of disposable income. The initial saving and investment schedules ( $S_0$  and  $I_0$ ) are drawn under the assumption that government expenditures are tax-financed and that the economy is at full employment.

When debt is substituted for taxes to finance a given level of government expenditures, the increased government demand for funds is added to that of the private sector, as shown by the shift in the investment schedule from  $I_0$  to  $I_1$ . In addition, as a result of the



substitution of debt for currently levied taxes, current disposable income in the private sector is increased. If the private sector perceives this change to represent solely an increase in current disposable income, saving will increase by only a small percentage of the increase in disposable income. As a result, the shift in the saving schedule, shown by the movement from  $S_0$  to  $S_1$ , will not be as large as the shift in the investment schedule.

The effects of a substitution of debt for taxes are an increase in interest rates (from  $r_0$  to  $r_1$ ) and a reduction in private investment (from  $X_0$  to  $X_2$ ). With a given level of total income, as assumed in this example, private consumption will be increased (by the amount  $X_2X_0$ ). Thus, private capital formation is lower in the debt-financed government expenditure case than in the tax-financed one and the growth rate of the economy is reduced.<sup>7</sup>

Unlike the classical views described above, Keynesian economists have argued that the economy does not automatically self-adjust to full employment. These economists stress the short-run impact of government budgetary policies and deemphasize the potentially adverse longer-run effects of debt financing on investment and economic growth.

<sup>3</sup>Some analysts blame the views of Keynes and his followers on deficit financing as the key ingredient in changing the traditional approach of reducing government debt outstanding following periods of wars. See J. M. Buchanan and R. Wagner, *Democracy in Deficit: The Political Legacy of Lord Keynes* (Academic Press, New York, 1977).

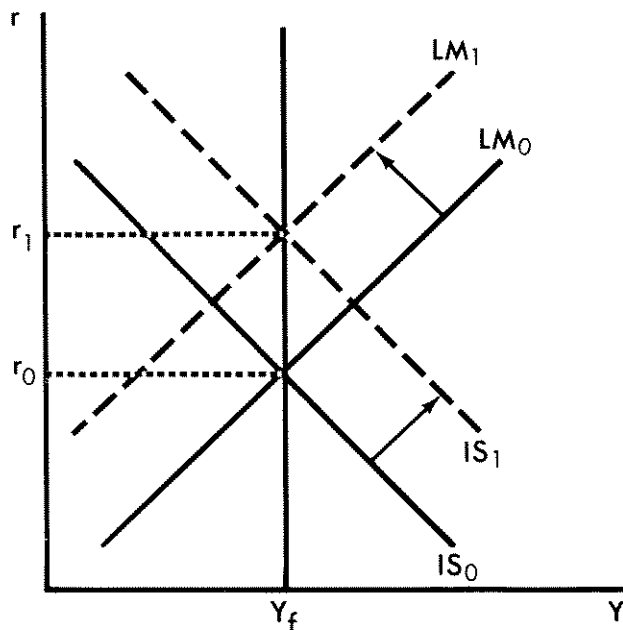
<sup>4</sup>Although the Federal debt has grown rapidly in recent years, Federal debt when measured relative to Gross National Product (GNP) has not grown. In fact, the Federal debt outstanding as a percent of GNP has generally fallen since World War II. In 1978 Federal debt was about 36 percent of GNP, down slightly from 1970, and down substantially from 62 percent in 1958 and 98 percent in 1948.

<sup>5</sup>A third alternative, money creation, is not discussed here.

<sup>6</sup>For a presentation of the classical theory of public debt, see Richard A. Musgrave, *The Theory of Public Finance* (New York: McGraw-Hill Book Company, Inc., 1959), Chapter 23.

<sup>7</sup>If saving is responsive to interest rate changes, but investment completely unresponsive, debt financing results in a reduction in consumption and no change in investment.

Figure II



In the context of an *underemployed* economy with rigidity in wage rates, for example, Keynesians view debt-financed government expenditures as an important tool for achieving a level of aggregate demand consistent with full employment and price stability. When debt is substituted for taxes, they argue, consumer incomes will be increased by the amount of the tax cut and, since resources are not fully employed, crowding out of private expenditures by higher interest rates would not occur.

In the case of *full* employment, of course, the effects of substituting debt for taxes are similar to those of classical analysis, except that Keynesians view this substitution as inflationary unless accompanied by a reduction in the money stock. This can be shown by the standard IS-LM analysis used in most economic textbooks.<sup>8</sup> Assuming a given level of government expenditures, a tax decrease results in an increase in disposable income and, in terms of the IS-LM model, the IS curve shifts to the right (to  $IS_1$  in Figure II). If, by assumption,  $Y_f$  represents full employment, then income has been increased beyond a level consistent with stable prices. In order to keep

prices from rising, the money stock must be reduced, which results in a shift of the LM curve to the left. If a reduction in the money stock shifts the LM curve precisely to  $LM_1$ , income is reduced to a level consistent with full employment,  $Y_f$ . However, interest rates would be raised from  $r_0$  to  $r_1$  and the mix between private consumption and investment is altered in a fashion similar to that described by classical analysis.

### Inflation

Classical economists viewed the choice between debt and taxes as unimportant in determining inflation. Since debt financing, in their view, results in the crowding out of private investment, no additional demands are created with debt-financed over tax-financed expenditures. Inflation, in their analysis, is directly related to the growth rate of the money stock. So long as this growth in money is not altered, inflation is not affected by the debt/tax choice.<sup>9</sup>

Both modern-day Keynesians and modern-day followers of the classical school (sometimes known as monetarists) often connect deficit spending with inflation—for entirely different reasons, however. Keynesian analysis, as noted earlier, implies an increase in aggregate demand when substituting debt-financing for current tax-financing of government expenditures. If resources are fully employed, this increase in demand tends to raise nominal income and prices.

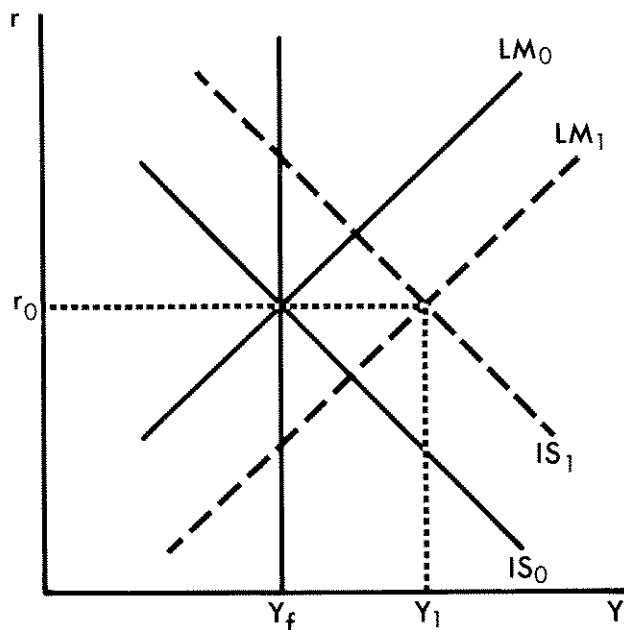
Some monetarists, on the other hand, have noted an indirect mechanism relating an increase in deficit financing to inflation.<sup>10</sup> To the extent that deficit spending leads to an increase in credit demands, upward pressure on interest rates results. If the central bank operates with an interest rate target and is reluctant to raise this target when credit demands increase, the increased deficit will become financed in

<sup>9</sup>An assumption often made in the classical framework is that the velocity of money (or the demand for money) is constant and, in particular, is not responsive to changes in interest rates. In terms of the IS-LM model shown above, the classical assumption can be shown by a vertical LM curve.

<sup>10</sup>“Federal deficits tend to produce pressure for monetary expansion. Increased Federal borrowing when added to the credit demands of the private sector, places upward pressure on interest rates. The monetary authority, however, can resist these pressures for a short period of time by buying government securities. Thus, to the extent that ‘low’ interest rates assume a role as an objective of the monetary authorities, deficit financing tends to accelerate the rate of monetary expansion.” Keith Carlson, “Large Federal Budget Deficits: Perspective and Prosperity,” this *Review* (October 1976), pp. 2-7.

<sup>8</sup>For a standard treatment of the IS-LM model, see Colin Campbell and Rosemary Campbell, *An Introduction to Money and Banking* (Holt, Rinehart, and Winston, 3rd Edition, 1978) Chapters 18 and 19. For a more sophisticated presentation of the IS-LM model, see Thomas M. Havrilesky and John T. Boorman, *Monetary Macroeconomics* (AHM Publishing Corporation, 1978), Chapters 11-13.

Figure III



part by monetary creation. As shown in Figure III when debt rather than current taxes is used to finance government expenditures, the IS curve shifts to  $IS_1$  and, as a result, the interest rate will rise. If the central bank attempts to maintain interest rates at  $r_0$ , it will expand bank reserves and, hence, the nation's money supply. The LM curve, which represents equilibrium points in the monetary sector, will shift to  $LM_1$ . This results in upward pressure on prices as aggregate demand expands above the level consistent with full employment at stable prices,  $Y_f$ .

### *Burden of the Debt*

Deficit financing, it has often been suggested, imposes a burden upon future generations. Other economists, primarily Keynesian, have argued that domestically-held debt imposes no such burden. These economists argued that government expenditures, whether debt- or tax-financed, result in a withdrawal of real resources in the period in which expenditures are made and that interest payments on domestically-held debt simply result in income transfers between taxpayers and debt holders rather than transfers from one generation to another.<sup>11</sup>

<sup>11</sup>E. J. Mishan, "The National Debt is a Burden," *Twenty-one Popular Economic Fallacies*, 2nd ed. (New York: Praeger Publishers, 1973), pp. 61-73.

This view of debt burden prevailed until 1958 when James Buchanan's book, *Public Principles of Public Debt*, was published. In the series of articles that followed the publication of this book, the view emerged that a burden on future generations could result from debt financing.<sup>12</sup> The "burden of the debt" literature revealed that, although the withdrawal of resources by government must occur in the period in which the expenditures are made, the method of financing government expenditures affects the level of income that future generations inherit. Thus, to the extent that deficit financing reduces private investment and, consequently, inherited capital, a burden is placed on future generations in the form of a lower capital stock (and a smaller income stream).

### THE CRITICAL ISSUE OF TAX DISCOUNTING

Recent economic literature has focused on the critical assumptions which give rise to the differential economic effects of debt versus tax financing. In the preceding discussion, it was assumed that disposable income rises by the amount of the reduction in taxes whenever debt is substituted for taxes. This occurs only if consumers treat this increase in income like any other increase in income. Recent discussion, however, centers upon whether and under what circumstances taxpayers would fully anticipate the future taxes implicit when the government issues interest-bearing debt. This issue, sometimes referred to as tax discounting, is critically important for the differential effects of debt versus taxes. As Bailey pointed out, "If indeed households foresee their own and their heirs future taxes, then given government expenditures have the same effect on private consumption whether they are financed by taxes or borrowing."<sup>13</sup>

### *Private Versus Government Debt*

The essence of the tax discounting issue can be demonstrated by contrasting private and public debt. Debt instruments are a mechanism for transferring saving (current income not spent on consumption goods) from one individual or organization to another. In the case of privately issued debt, the borrower

<sup>12</sup>A number of these articles are contained in J. M. Ferguson's book, *Public Debt and Future Generations* (Chapel Hill, North Carolina: University of North Carolina Press, 1964).

<sup>13</sup>Martin J. Bailey, "The Optimal Full-Employment Surplus," *Journal of Political Economy* (July/August 1972), p. 652.

gains purchasing power over currently produced goods and services, but at the same time incurs an obligation to pay back the loan to the lender in the future. Thus, on net, private debt creation does not result in the perception of increased wealth in the aggregate.

The partial t-accounts in Exhibit I demonstrate these statements. Suppose a large corporation decides to borrow \$1 million by issuing short-term notes, such as commercial paper, which promise to pay \$1 million plus interest to the lender. The lender, for instance, may exchange demand deposits for another asset, the commercial paper certificate. The borrower, on the other hand, receives \$1 million in bank deposits, but at the same time incurs a liability to pay back the borrowed funds. Thus, on balance, the owners of the corporation feel no wealthier than before.

The bottom of Exhibit I illustrates the case where government issues debt whose proceeds are redistributed in some manner back to the private sector. As in the case of private debt creation, the private lenders feel as wealthy as they did initially since the government promises to pay interest and principal to the private debt holders. Whether taxpayers foresee the *future* taxes that must be levied in order to service the debt, however, is unclear. In the case of private debt, the borrower feels no wealthier since an obligation to pay interest and principal of the loan is recognized. However, if taxpayers do not anticipate any of (part of) the future tax liability associated with the issuance of government debt, then all (part of) government debt is perceived as an addition to wealth.

*Are Government Bonds Perceived As Net Wealth?*

Since David Ricardo, economists have recognized that, if taxpayers perfectly anticipate the future taxes associated with government debt issuance, tax financing and debt financing are essentially equivalent; that is, taxpayers would consider a tax levy of \$1 million today equivalent to the issuance of \$1 million in perpetual bonds. Taxpayers would recognize that, with the issuance of the \$1 million in bonds (at an assumed interest rate of 10 percent), they have incurred an obligation to pay \$100,000 per year in taxes — the present value of which is  $\$100,000 / .10$ , or \$1 million — the equivalent of the present value of \$1 million of taxes levied currently.

While economists have recognized the possible equivalence between debt and taxes, many economists

**Exhibit I**

**Private Debt Creation**

Lender		Borrower	
-\$1 million Bank Deposits		+\$1 million Bank Deposits	+\$1 million Commercial Paper Outstanding
Net Worth — unchanged		Net Worth — unchanged	

**Government Debt Creation**

Private Sector (Lender)		Government Sector (Borrower)	
-\$1 million Bank Deposits		+\$1 million Bank Deposits	+\$1 million Treasury Bonds
+\$1 million Treasury bonds		-\$1 million Bank Deposits	
Net Worth — up \$1 million		Liabilities — up \$1 million	

have assumed that the conditions under which complete discounting of the tax liability would take place are not likely to hold. For example, even if taxpayers correctly anticipate their share of the tax, complete discounting requires that they not be able to escape this liability either by dying or moving from the government's jurisdiction.<sup>14</sup>

In the case of a tax on property income, the tax most often used by local governments, this possibility is less of a problem since the levy of a tax on property income is likely to result in a decline in property values equal to the issuance of government bonds. Since the value of an asset is the discounted value of its future income stream, a tax upon that stream

<sup>14</sup>In the case of taxes on human income, the possibility exists that current taxpayers can avoid their share of future government taxes by moving from a government's jurisdiction. This option is extremely limited for citizens of a nation but less so for local government jurisdictions. The clearest case is that where currently produced government services are debt-financed. Current taxpayers will benefit from the currently provided government services but will bear little of the cost in terms of future taxes if they move from the area. In the case of deficit-financed capital expenditures, current taxpayers cannot necessarily shift the cost to other taxpayers, since the future taxes associated with debt finance will likely be incorporated into property values. The possibility that the cost of debt-financed government expenditures for current services can be shifted to others by moving out of the taxing jurisdiction of the government helps to explain why local governments often avoid deficit financing of current budget expenses. Local governments, instead, often use deficit financing for capital expenditures and rely on taxes from property income, both of which reduce the possibility that tax burden will be shifted disproportionately to others.

reduces its market value. For example, a perpetual asset that is expected to yield \$100 a year and for which the going interest rate is 10 percent has a market value of \$1,000 ( $\$100/.10$ ). A tax of 5 percent on the expected yearly income would reduce that income stream to \$95 a year, and the market value would fall to \$950 ( $\$95/.10$ ). For the economy as a whole, increasing government debt by \$1 million accompanied by an increase in property taxes of \$100,000 per year to pay the 10 percent interest rate on the increased debt would immediately reduce the value of this property by approximately \$1 million ( $\$100,000/.10$ ). In this case, the increase in government debt does not result in a perception of increased wealth; taxation and debt are equivalent.

It is less clear that full discounting of future tax liability of debt issuance occurs in the case of taxes levied on labor income, even when a taxpayer correctly anticipates his share of the tax liability. The individual taxpayer will not fully discount his tax liability to the extent that future tax payments lie beyond his life expectancy. He also will not fully take into account the welfare of his descendants. In this case, an individual taxpayer will perceive that his lifetime income has risen more (i.e. that he is wealthier) with debt financing than tax financing of government expenditures.

Suppose, for instance, that an individual's share of the government expenditure is \$1,000. The taxpayer is faced with the choice of a once-and-for-all tax of \$1,000 in the current period or \$100 a year to service interest on a \$1,000 government debt (at the assumed current interest rate of 10 percent). Under the tax-financed case, the individual meets the tax burden of \$1,000 by reducing his assets by \$1,000 (which are also assumed to yield 10 percent, the going interest rate). The taxpayer must forego an income of \$100 a year, as in the debt-financing option. But suppose that the individual expects to pay taxes for only 10 years. Under the debt-financed case, the present value of the tax claim for 10 years is only \$614; thus, the individual taxpayer perceives his wealth to be \$386 greater than in the tax-financed case. As a matter of arithmetic, the greater the life expectancy, the smaller the perceived wealth effect. For example, with a life expectancy of 20 years, the debt financing option results in a \$149 increase in wealth while a 30-year life expectancy yields a \$57 increase in wealth. In effect, wealth is created with debt issuance because some of the tax liabilities needed to pay future interest payments are shifted to members of later generations. To the extent that this increases the taxpayer's per-

ceived wealth or lifetime income stream, greater current expenditures result from debt financing than from tax financing.

This wealth effect from debt financing will disappear, however, if the tax liabilities shifted to future generations are taken into account when current taxpayers plan their bequests and other wealth transfers. Barro has demonstrated that "finite lives will not be relevant to the capitalization of future tax liabilities so long as current generations are connected to future generations by a chain of operative intergenerational transfers (either in the direction from old to young or in the direction from young to old)."<sup>15</sup> This is a complicated way of saying that parents and children can make wealth transfers at times other than death. For example, parents make transfers to their children in the form of education, living expenses, and bequests, and children sometimes provide support for their aged parents. In effect, these transfers between generations allow current taxpayers to act as if they are immortal. Barro argues that these intergenerational wealth shifts are sufficient to restore the balance of wealth across generations that would have been deemed optimal if all government expenditures had been financed by current taxes.<sup>16</sup>

## EMPIRICAL EVIDENCE FOR TAX DISCOUNTING

The issue of tax discounting cannot be settled solely by theoretical arguments. Recently, several empirical studies have attempted to discover the extent to which tax discounting actually occurs. Existing evidence is immense since each economic model that contains fiscal variables also generates implications for tax discounting. Several large models of the economy have found, for example, that tax reductions financed by debt issue have significant effects on income. This provides indirect evidence that less than complete tax discounting occurs. Evidence from some reduced-form models, such as the St. Louis model, shows that fiscal policy actions, as measured by the high-employment

<sup>15</sup>Robert J. Barro, "Are Government Bonds Net Wealth?" *Journal of Political Economy*, November/December 1974, pp. 1095.

<sup>16</sup>Other complications can result in the nonequivalence of debt and taxes including uncertainty about future taxes and imperfect capital markets. Barro analyzes these possibilities and concludes that "there is no pervasive theoretical case for treating government debt, at the margin, as a net component of perceived household wealth. The argument for a negative wealth effect seems, a priori, to be as convincing as the argument for a positive effect." *Ibid.*, p. 1116.

budget deficit, have no lasting effect on aggregate demand and income. This tends to provide indirect evidence in favor of full tax discounting.<sup>17</sup> This evidence, however, is inconclusive since fiscal effects can be washed out through such other mechanisms as the crowding out of private expenditures by higher interest rates.<sup>18</sup>

Recently, several studies have directly tested the extent of tax discounting by specifying consumption functions where such variables as the government deficit and outstanding government debt are tested for their effects upon consumption. One of the first of these was by Kochin.<sup>19</sup> His study was motivated by the casual observation that the saving rate as measured by National Income Accounts (NIA) data and the level of the deficit are positively correlated—an observation consistent with the notion of tax discounting. For example, when a deficit results from a tax cut, *measured* disposable income rises. In the case of full tax discounting, consumers realize that the debt issued to finance the deficit implies future taxes for themselves or their heirs and, accordingly, that their lifetime income or wealth is unaltered. Thus, consumption expenditures are unchanged and measured NIA personal saving, defined as disposable income minus consumption expenditures, rises.

Kochin specified consumption of nondurables and services as a function of disposable income, the Federal deficit, and lagged consumption. Using an equation estimated in first differences over the period, 1952-71, he found that a \$100 increase in the Federal deficit results in approximately an \$11 decline in consumption. Kochin interpreted this as an indication that consumers have at least partially taken into account the future taxes associated with government deficits.

Kochin's study generated several criticisms. Yawitz and Meyer criticized Kochin's study for misspecification because it did not directly include a government wealth variable.<sup>20</sup> Using a life-cycle model in which consumption is specified as a function of disposable

income, the market value of private sector holdings of government securities, and household net worth (other than government securities), Yawitz and Meyer observed small positive coefficients on the private wealth and U.S. Government debt variables which were not significantly different from each other. They interpreted these results to indicate that no discounting occurred since government debt outstanding appeared to have an effect on consumption similar to that of other private wealth. They pointed out that their results were "inconclusive," however, "because of the extremely narrow variability of the Government debt series."<sup>21</sup>

A review of the existing evidence on tax discounting (or, as they call it, debt neutrality) by Buiter and Tobin also criticized the Kochin study.<sup>22</sup> First, the authors noted that the negative coefficient on the deficit variable was not as large as the value on the disposable income variable, and thus the equation did not support complete discounting. They also objected to Kochin's equation because of the simultaneity problems with some of the variables used and the inclusion of the Federal deficit rather than the total government deficit. When they reran Kochin's equation, adding data for 1972-76, they found the results substantially changed; the coefficient on the deficit variable, although negative, was not significantly different from zero. When Buiter and Tobin made several refinements to Kochin's equation, transforming the variables into per capita terms and introducing the deficit of the public sector in addition to that of the Federal government, they found again that the deficit variable had the correct sign (—) but was insignificantly different from zero.

In another recent study, Tanner utilized a consumption function of the life-cycle type which also included a number of variables not specified in the Yawitz and Meyer study.<sup>23</sup> The unemployment rate was included to adjust disposable income for cyclical variation; the stock of consumer durable goods was added because it was expected to have a negative relationship with current consumption expenditures. Additional variables included were corporate retained earnings, pri-

<sup>17</sup>See Leonall C. Andersen and Keith M. Carlson, "A Monetarist Model for Economic Stabilization," this *Review* (April 1970), pp. 7-25, and Keith M. Carlson, "Does the St. Louis Equation Now Believe in Fiscal Policy?" this *Review* (February 1978), pp. 13-19.

<sup>18</sup>Keith M. Carlson and Roger W. Spencer, "Crowding Out and Its Critics," this *Review* (December 1975), pp. 2-17.

<sup>19</sup>Lewis A. Kochin, "Are Future Taxes Anticipated by Consumers?" *Journal of Money, Credit and Banking* (August 1974), pp. 385-94.

<sup>20</sup>Jess B. Yawitz and Laurence H. Meyer, "An Empirical Investigation of Tax Discounting," *Journal of Money, Credit and Banking* (May 1976), pp. 247-54.

<sup>21</sup>With only small changes in the real value of Government debt held by the private sector and given the low propensity to consume out of wealth, only minor effects on aggregate consumption could have been expected. *Ibid.*, p. 253.

<sup>22</sup>William Buiter and James Tobin, "Debt Neutrality: A Brief Review of Doctrine and Evidence" (Cowles Foundation Discussion Paper No. 497, Cowles Foundation for Research in Economics, September 15, 1978).

<sup>23</sup>J. Ernest Tanner, "An Empirical Investigation of Tax Discounting," *Journal of Money, Credit and Banking* (May 1979), pp. 214-18.

vate wealth as measured by the net stock of fixed non-residential business capital and residential housing, the total government surplus (or deficit), and the market value of government debt.

Again, the reasoning behind this equation, similar to that of Kochin's, is that "current Government deficits may depress current expenditures because these deficits imply higher future taxes. This hypothesis implies that current taxpayers will not consume at the expense of their heirs but rather will increase their personal savings so that their bequests, inclusive of the Government debt, would be the same as if the Government deficit had not occurred."<sup>24</sup> The hypothesis that full tax discounting occurs, or alternatively, that government debt is not perceived as net wealth implies a zero coefficient on outstanding government debt and a positive (negative) coefficient on the current government surplus (deficit). The coefficients for Tanner's equation estimated for U.S. data over the period 1947-74 are consistent with the complete discounting hypothesis. The coefficient on the government surplus variable was positive and significant; the coefficient on the Government debt variable was quite small and not significantly different from zero.

Tanner's study is subject to criticism, however, since the private wealth variable also does not have a coefficient significantly different from zero. This outcome is doubtful given the large amount of evidence that has found private wealth to influence current consumption expenditures. Tanner's result, however, may have resulted from the inclusion of retained earnings in his equation. Since retained earnings are a major source of change to the capital stock, this variable could well reduce the significance of the private wealth variable. Similarly, the inclusion of both the government surplus (or deficit) and the outstanding stock of government debt is a doubtful specification since the surplus or deficit largely represents the change in the government debt series.

### IMPLICATIONS OF TAX DISCOUNTING

The implications of full tax discounting as suggested in Tanner's equation are quite important to the way economists have traditionally viewed a number of macroeconomic issues. Most basic is the effect of government debt upon the consumption/saving mix. As discussed earlier, with a given level of government expenditures, both classical and Keynesian economists thought that government debt financing dis-

couraged private investment relative to the alternative of current taxation. But, if taxpayers view government debt and taxes as equivalent, consumption is not altered from the tax-financed case, and private investment and economic growth is not hindered.

With full discounting, the effects of fiscal actions also disappear. In terms of the IS-LM model shown in Figure III, fiscal actions, such as a tax cut with government outlays unchanged, do not shift the IS curve to IS<sub>1</sub> as standard analysis shows. Rather, with full discounting, the subsequent increase in disposable income is not viewed by the public as an increase in net wealth, and therefore, demand for current consumption is not stimulated. On the other hand, less than full discounting of future taxes leaves open the possibility that fiscal actions have economic effects. Even in this case, fiscal policies do not necessarily have effects on aggregate demand. Various arguments other than tax discounting have shown how fiscal policies may be impotent in stimulating aggregate demand.<sup>25</sup>

The connection between government deficits and inflation is also questionable if the issuance of government debt is neutral. One connection between deficits and inflation relies on the premise that government-issued debt places upward pressure on market interest rates. When the Federal Reserve conducts monetary policy by targeting an interest rate, any upward pressure on interest rates will induce the Federal Reserve to make open-market purchases of government securities in order to maintain its target. As a result, undesirable increases in the money stock can result and eventually inflation will be exacerbated. If the tax liability associated with deficit spending is fully anticipated, however, the public will "save" commensurately with the increase in the demand for credit resulting from the issuance of government debt. In this case, interest rates are not bid higher than they would be in the case of tax-financed government expenditures, and therefore the connection between deficits and inflation via the reaction of the Federal Reserve to interest rate movements breaks down.

In addition, it has been argued that deficit spending encourages a larger government sector than would result from a balanced budget policy. In fact, this belief underlies the reasoning of many of the current supporters of the balanced budget constitutional amendment. Buchanan and Wagner, recent proponents of this view, argue that deficit financing reduces the perceived cost of government services to current

<sup>24</sup>Ibid., p. 215.

<sup>25</sup>See Carlson and Spencer, "Crowding Out," pp. 2-17.



taxpayers.<sup>26</sup> As a result, government services increase at a faster rate than actually desired by citizens. This explanation of the growing size of government depends crucially upon the assumption that less than full tax discounting occurs.<sup>27</sup>

## CONCLUSION

Traditionally, economic analysts have found that the choice between debt and taxes has a significant effect on the economy. To the extent that taxpayers do not take into account the tax liability associated with government debt, they will perceive increased income and wealth when government debt is substituted for current taxation. As a result, current consumption is encouraged and investment discouraged in comparison with tax-financed government expenditure. Under this scenario, private capital formation and the long-term growth of the economy are reduced.

Some recent theoretical and empirical studies have questioned the analysis underlying these results. These studies point out that taxes versus debt is really a choice between taxation today versus taxation tomorrow. If the future taxes required to service the debt

are widely perceived by the public, no increase in private wealth occurs with deficit financing. In this case, the choice between debt and taxes is essentially neutral and the presumed benefits of a balanced budget disappear.

Also, the argument for a link between inflation and deficits is not as strong if tax discounting is assumed. If the issuance of government debt does not result in the perception of increased wealth, a given level of government expenditures financed by debt is no more expansionary than the same outlays financed by taxes. Furthermore, since interest rates do not rise in this case, the mechanism by which deficits raise overall credit demands and encourage the Federal Reserve to expand the money supply at a greater rate is also suspect.

In essence, complete discounting of tax liabilities implies that the arguments over the relative merits of balanced and unbalanced budgets are irrelevant. With complete discounting, neither the potential of unbalanced budgets (changing taxes with a given level of government expenditures) to influence aggregate demand nor the adverse effects of unbalanced budgets on investment, inflation, or the size of government exist. Although recent theoretical and empirical studies lend support to the incorporation of tax discounting into the analysis of debt financing, the evidence does not appear strong enough for one to completely disregard the possibility of less than full discounting.

<sup>26</sup>J. M. Buchanan and R. Wagner, *Democracy in Deficit: The Political Legacy of Lord Keynes* (Academic Press, New York, 1977).

<sup>27</sup>For a study that finds evidence opposing these views, see William A. Niskanen, "Deficit, Government Spending, and Inflation—What is the Evidence?" *Journal of Monetary Economics* (August 1978), pp. 591-602.

