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FINANCING THE NATIONAL DEBT: TIME FOR INNOVATION

INTRODUCTION

The U.S. Treasury is faced with financing record federal budget deficits for a number of years at least. This is in addition to refinancing record amounts of maturing securities from an outstanding debt swollen by a long succession of large annual deficits. At yearend 1981, the interest-bearing federal debt totalled $1,029 billion, double that of only seven years earlier. In 1981, the Treasury raised some $100 billion in new cash and refinanced an additional $607 billion. Although new cash borrowings will be higher, the overall borrowing estimates for 1982 are not greatly different. The high interest rates have made interest payments a large component of federal expenditures and, paradoxically, a major cause of the deficits. In fiscal year 1981, interest payments were $83 billion and represented 12.6 percent of total budget outlays, up from $38 billion and 9.5 percent in 1977. The percentage is expected to jump to 14.4 percent in fiscal 1982 and above 15 percent in fiscal 1983.

In such an environment, the Treasury must sell its debt as widely as possible at the lowest possible perpetual interest cost. It is useful, therefore, to examine current Treasury financing practices, recent innovations or "creative" financing in the private sector, and innovations in Treasury financing.[1]

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[1] This paper does not consider nondebt means of financing federal deficits, such as the sale of government assets, including land. For an analysis of asset sales see Catherine England, "Surplus Federal Property: It's Time to Sell," Backgrounder No. 187 (Washington, D.C.: The Heritage Foundation) June 4, 1982.

In analyzing Treasury financing practices, it should be noted that the Treasury is both similar to and different from private borrowers. It differs from private borrowers in at least five important ways:

1. its debt is the highest quality debt in the country, if not the world, and forms the cornerstone of the national and international securities market;

2. its financing needs are much larger and more frequent;

3. its financing needs are independent of the interest costs paid and are not postponable;

4. its financing decisions importantly impact on the level and structure of other interest rates, on investor expectations, and possibly on levels of economic activity; and

5. it must consider the consequences of its financing strategy on current and future tax revenues.

As a result, the Treasury is more constrained in its financing decisions than are most private issuers.

The Treasury currently sells three basic types of debts:

1. marketable debt to the general public;

2. nonmarketable debt to segments of the public, e.g., households, retirement accounts;

3. nonmarketable debt to government agencies and trust funds, foreign governments, and state and local governments.

The critical question is: in financing the nation's debt, can the Treasury adopt strategies that will enable it to do so at lower interest rates? If the Treasury could borrow at lower rates--and prospects seem favorable--it not only would reduce the interest-paying burden on the budget (and hence the taxpayers), but might also help bring down general rates of interest. The prospect of this should be prompting the Treasury to evaluate critically its current financing methods. It is particularly important that Treasury consider innovative and creative means of carrying its debt burden. Through their creativity, private sector firms have developed new types of securities that have permitted them to raise funds with minimum interest expense--even in an age of high interest rates. Treasury should be equally aggressive.

TREASURY FINANCING PRACTICES

This analysis considers primarily marketable debt, which represents about 75 percent of the total dollar value of the

Treasury's debt. Individual debt securities are basically differentiated from each other by variations in their term to maturity, risk of default, and special features, such as option provisions, permissible changes in coupon rates, and the presence or absence of coupon payments. Because the Treasury is always in a position to repay, at least the nominal value of its debt at maturity, Treasury securities have no risk of default. The Treasury sells securities throughout the maturity spectrum from less than three months to thirty years. (As of April 1982, the longest bond outstanding matures in 2011. It was issued in 1981.)

The choice of maturity depends first on the estimated length of time for which the funds are required. Treasury financing needs are of two types: 1) seasonal needs that arise because expenditures in the accounting year may precede the receipt of expected tax revenues or the sale of long-term debt; the basic strategy for financing this need is to match inflows to expected cash outflows, and short-term issues are sold weekly (generally on Mondays); 2) longer-term needs because tax revenues are expected to fall short of expenditures for the entire accounting year, i.e., an annual budget deficit, or the need to refinance maturing debt sold to finance earlier deficits.

In periods of budget deficits, the two types of financing are intertwined. For a given projected deficit, the decision as to the maturity of the debt depends on:

1. expected interest costs,

2. marketing costs,

3. market receptivity, and

4. outstanding amounts in various maturity sectors.

Longer-term issues are sold according to a regular calendar for the maturity involved, e.g., monthly or quarterly.[2]

Unless the yield curve of interest rates is flat, the interest cost of bonds of different maturities at their time of sale may be expected to differ. If the yield curve were upward sloping, so that short-term rates were lower than longer-term rates, short-term debt would appear to be cheaper. But this might turn out to be misleading on further analysis of the alternative maturity options over the same borrowing period. The shape of the yield curve is widely believed to depend on market participants' expectations of future short-term interest rates. The long-term rate at any time is viewed as an average of the current short-term rate and of all short-term rates expected in the future until the maturity of the long-term bond. It follows that

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[2] A more detailed description of Treasury financing procedures is provided in Treasury Department, "U.S. Treasury Debt Management" (N.D.).

if expectations of future short-term rates were reasonably close to that of the market's, the expected average interest cost of debt over a given period would be the same regardless of the maturities selected. If current short-term rates were below long-term rates, so that the yield curve sloped upward to the right, the initial lower costs of issuing short-term debt would be offset by the expected higher rates incurred when this debt was rolled over.

However, a particular borrower's expectations may differ from the market. The maturity of the securities would then affect the expected longer-run interest cost. If short-term rates were expected to increase less in the future than was consistent with the current market long-term rates, it would pay to issue short-term debt and roll it over at the lower expected future short-term rates rather than to become locked-in at the current high long-term rate.

An alternative explanation of the yield curve focuses on supply and demand conditions for credit in each maturity sector. Yields on any maturity are not affected by expectations of yields on any other maturity. Thus, borrowers must predict supply and demand conditions in maturity sectors other than for fixed coupon rate bonds with maturities (more accurately durations) equal to the borrowing period, which for the Treasury is indefinite or, realistically, infinite. For these bonds, the yield to maturity approximates the return for the period as a whole. Private borrowers generally make one or the other type of prediction in formulating their borrowing strategy. As is discussed later, such a procedure has been proposed for the Treasury, so that its expectations of future market conditions should help determine the maturity strategy it adopts. It can be argued further that the maturity structure adopted by the Treasury affects the shape of the yield curve, so that the implications of the maturity strategy selected should be taken into account if the shape of the yield curve is a policy objective.

Of course, expectations might not be realized so that the actual realized borrowing costs of alternative maturity strategies over a given period might be neither the same as those anticipated nor the same for all maturity strategies. Actual borrowing costs might be higher or lower than expected depending on whether interest rates were higher or lower than expected. But this could not be known at the time the bonds were sold.

The Treasury has not lacked creativity in managing the public debt. It has offered the public bonds with a variety of options. Most long-term bonds are callable at par within five years of the final maturity date. Thus, in periods in which interest rates decline, the Treasury may redeem the bonds early and refinance at lower interest rates. Investors typically charge an interest rate premium to compensate them for this disadvantage. Because interest rates have mounted steadily in the past two decades, calls have not been exercised since World

War II. However, because the deferment period on these bonds is very long, it is unlikely that investors demanded a significantly higher return or that the bonds sold at significantly higher yields. Although call provisions are a common feature of its long-term bonds, the Treasury has apparently not conducted a thorough study of the additional cost or cost saving of including a call provision on its bonds.

The Treasury has also used three types of "put" provisions. In 1957, the Treasury issued two intermediate-term note issues that investors could resell to the Treasury at par, halfway to their date of final maturity, upon three months' written notice. Few of these bonds were actually resold to the Treasury at cash, although simultaneous exchange offers for these bonds makes it difficult to analyze what proportion may have been put, in the absence of the exchange option. Through 1971, the Treasury issued long-term bonds that could be sold to the Treasury at par for the settlement of estate taxes if the investor died (flower bonds). Finally, the Treasury permits holders of nonmarketable savings bonds to redeem their bonds at any time at par plus accrued interest to the date of redemption.

Because bonds with puts are advantageous to investors, they may be issued at lower yields. Of course, this advantage is offset if the bonds are later put, and the Treasury must refinance at higher interest rates. The Treasury appears not to have completed any rigorous analyses of the interest cost saving or expense of incorporating the different types of put provisions in its issues.

The Treasury has also issued zero coupon securities in limited quantities in the form of nonmarketable savings bonds and marketable bills with maturities of less than one year.[3]

APPLICABILITY OF INNOVATIONS IN FINANCING TO THE TREASURY

In recent years, numerous innovations have been introduced in the private bond market, including variable coupon rate (floating) bonds, zero coupon (original issue discount bonds), indexed (to foreign currency and commodities) bonds, convertible (into real commodities) bonds, putable bonds, and bonds with warrants to buy future bonds at a given yield. These have been developed to tailor the securities to the particular and changing needs of both issuer and investor and thereby reduce interest rates. It has been suggested that the Treasury might also be able to reduce its interest costs and broaden its market by adopting some of

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[3] The Treasury has also experimented with a number of auction techniques and advance refunding of low coupon long-term debt with few years remaining to maturity into longer-term securities. These techniques are not discussed in this paper.

these innovations. Before analyzing the pros and cons of the applicability of the major types of such innovations to Treasury financings,[4] a few introductory words of caution are in order.

The most innovative types of debt securities are, on the whole, considerably more complex than the traditional option-free fixed coupon rate bond. They frequently incorporate two or more effectively separate securities, such as a straight debt issue and an option to sell the security at a predetermined price and/or an option to convert the security into another security at a predetermined price. The tax treatment is also more complex. Because they are more complex in construct, they are more difficult for both issuers and investors to understand, they consume more of the issuers', investors', and security dealers' time, and are considerably more difficult to price correctly.[5]

Second, as noted earlier, the Treasury differs in some important ways from private borrowers. A number of the recent innovations on the private market reduce interest costs by reducing the investors' or issuers' tax liabilities. The Treasury, however, is a tax-exempt issuer and must be concerned with the tax revenue implications of its bonds. A reduction in interest costs would not be beneficial if the cost savings were offset by reduced tax revenues from investors.

In recent years, returns on long-term bonds have been highly volatile and frequently negative as interest rates have fluctuated around an upward trend. Treasury bonds issued at par have declined in value by as much as 40 percent. Because the Treasury bond market was traditionally viewed by investors as not risky or, at least, less risky than the stock market, many investors feel "burned" and are skeptical about additional commitments in the market. Fixed income securities have been found to have neither fixed nor at times even positive income! If bond investors wanted to assume risk, they would buy stocks. As a result, long-term saving has been discouraged and investors have charged

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[4] The analysis was aided by interviews with a cross-section of participants in the Treasury security market. These persons are credited at the end of the study.

[5] Because of the complexity, a number of Treasury security dealers have expressed serious reservations about the appropriateness of more innovative securities for the Treasury. They believe that the Treasury market should be as simple, clean, liquid, and free of "gimmicks" as possible. Moreover, fine tailoring to the needs of small sectors of investors, which may be efficient for private issuers who sell only in relatively small and infrequent amounts, would not necessarily be efficient or reduce interest costs for the Treasury, which sells in relatively very large and almost continuous amounts. On the other hand, their colleagues in the corporate market have contributed significantly to the development and widespread use of "creative" techniques.

interest premiums, because of uncertainty about inflation, when investing in longer maturities. This has been increasing the cost of long-term debt to all borrowers, including the U.S. Treasury.

Variable Coupon Rate (Floating) Bonds (VRBs)

Variable coupon rate bonds, sometimes referred to as floaters, protect the investor against unexpected increases in interest rates that would decrease the market value of a fixed coupon rate bond. Conversely, they protect the issuer against unexpected decreases in interest rates that would increase the opportunity cost of fixed-rate debt by discouraging refinancing at lower interest costs. The coupon rate on VRBs is tied to a market interest rate index, or reference rate, in such a way that the two rates move lock-step together and, if designed correctly, that the market price of the VRB is at all times equal to that of a hypothetical fixed-rate bond with the chosen index rates as its coupon. Thus, if the index rate were a short-term rate and there were no limitations on the permissible changes in the coupon rate, the market price of a VRB would remain close to its par value. The longer the term of the reference rate to which the VRB is tied and the interval at which the coupon rate on the VRB may change, the more its market price can move away from par value. Variable coupon bonds effectively provide price protection for shorter-term bonds and low marketing costs for longer-term bonds.

To the extent inflationary expectations are impounded in market rates of interest, VRBs indexed to short-term interest rates protect investors against expected increases in the rate of price inflation after the initial purchase of the bond. However, if the expected rates of inflation impounded in the interest rates at the time the bonds are purchased are not realized, variable coupon rate bonds leave investors either more or less protected than is warranted by the actual realized inflation rate. Because it is easier to predict inflation over shorter than longer periods, investors are less likely to charge inflation uncertainty premiums on top of expected inflation interest premiums on VRBs than on fixed rate bonds of equal maturity. If interest rates change for other, noninflation related reasons, the rate on the variable rate bond also changes.

The VRBs offer several advantages to Treasury and the public:

1. A lower initial interest cost relative to long-term fixed rate bonds as any inflation risk premium will be lower.

2. A broadened long-term market by attracting risk averse investors who wish to preserve capital.

3. If constructed correctly, a more easily understood format for investors.

There are, however, disadvantages:

1. Interest costs would be no less than on fixed rate short-term bonds with the same index rate, and marketing costs of fewer rollovers would not be significantly lower, particularly for larger denomination bonds.

2. For instance, the Treasury would have paid significantly higher interest rates throughout most of the last two decades if it had issued VRBs rather then long-term fixed rate bonds. This would have more than offset any interest cost saving when the bonds were first sold.

3. Treasury would be in competition for small depositors with other financial institutions, in particular, thrift institutions.

In sum, the VRBs would be a useful addition to the Treasury's arsenal of securities if issued in small denominations, say under $100,000, tied to a one-, two-, or three-year reference interest rate, and tailored to households and other small investors who experience high transaction costs in the purchase and rolling over of short-term debt for which the Treasury incurs high marketing costs. There is less need for large denomination VRBs, as larger investors can stay short economically and should be better equipped to assume interest rate risk.

Price Level Adjusted (Indexed) Bonds (PLABs)

Price level adjusted bonds, sometimes referred to as purchasing power or indexed bonds, also protect investors and issuers against unfavorable interest rate changes, but only those actually caused by inflation.[6] These bonds carry a basic fixed coupon at a rate that would exist for the particular maturity if there were no inflation (the "real" interest rate). The purchasing power or real value of the bond is protected against changes in the price level by corresponding changes in the value of both the nominal coupon payment and principal payment by an equal percentage. Unlike VRBs, which protect against expected changes in inflation, PLABs protect against actual (expected and unexpected) changes in inflation when the inflation occurs. This is particularly important to many issuers of regular fixed-rate bonds.

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[6] It is also possible to index bonds to prices other than the price level, e.g., gold, foreign currencies, etc. Such bonds have many of the characteristics of price level adjusted bonds but are more limited in their use and are not analyzed in this study. This was not always so. Before 1933, bonds indexed to gold appeared to have been more popular in the U.S. than those indexed to the price level. In its efforts to ban gold indexed bonds in 1933, Congress also banned price level indexed bonds. Both bans were repealed in 1977. J. Huston McCulloch, "The Ban on Indexed Bonds, 1933-77," American Economic Review, December 1980, pp. 1018-21.

Because nominal interest rates increase when inflationary expectations are revised upward, which is generally before the expected faster inflation rate actually occurs, the issuer will pay higher coupon rates on bonds that carry nominal interest rates before the faster inflation increases revenues. With PLABs, Treasury interest payments and tax revenues would move more closely in tandem. By protecting against changes in purchasing power, PLABs eliminate any risk premium that investors might charge for incurring such risk exposure. This would reduce interest costs in periods of uncertainty about inflation. Investors would incur only real interest rate risk. By increasing investor certainty, the long-term market should be strengthened. PLABs are in use in a number of countries that have experienced rapid price inflation, such as Brazil and Israel.

But PLABs are relatively complex securities for issuers to design properly and for investors to understand. As has become readily evident in recent years from attempts to index other payment programs, such as social security, it is critical to select the correct price index to which to index bonds. Selection of a price index that inaccurately reflects the true rate of inflation can result in significant over or under payments and unwarranted redistributions of income. As for VRBs, coupon increases on PLABs are generally designed to be subject to income taxes. Unlike VRBs, the principal value is also indexed and will increase with inflation, establishing a potential tax liability upon sale or maturity. Equal treatment with VRBs would require subjecting any such increments to ordinary income taxes. But alternative taxing schemes have been proposed. One bill, introduced in Congress by Representative James K. Coyne (R-PA), would exempt such gains (or losses) from federal income taxes.[7] Although possibly desirable on other grounds, such as encouraging saving, this tax treatment, by making PLABs superior to other Treasury bonds, would drive the others out of the market.

A criticism often leveled at PLABs, and indexing schemes in general, is that they tend to weaken both the government's and the public's resolve to restrain inflation. By taking out the "hurt," it is argued, the incentive to combat inflation is reduced. But the reverse may also be argued. If these bonds were indexed perfectly, with equal protection for everyone, inflation would do little, if any, economic or social damage and would reduce any advantage to the government, the frequent winner from inflation in nonindexed environments. The real strength of anti-inflationary resolve is questionable, however, in light of the economic policies adopted during periods when PLABs were not used. These policies aided and abetted the very inflation that gave birth to the pressures for indexing.[8]

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[7] "Long-Term Savings Restoration Act" (H.R. 4842), October 27, 1981.

[8] A good summary of the literature on PLABs is David F. Babbel, "Indexed Bonds: A Bibliography," International and Monetary Institute, San Francisco, N.D.

PLABs offer advantages to Treasury and the public:

1. They lower interest costs at the time the bonds are issued by eliminating both the inflation and uncertainty premiums.

2. They provide investors with fair protection against government-caused inflation.

3. They encourage long-term saving and support the long-term sector in periods of rapid inflation.

Among the disadvantages:

1. Determination of correct "real" interest coupon rates is difficult.

2. The correct treatment of increases in principal values over time, in connection with the federal debt ceiling, presents a problem.

3. PLABs are complex for Treasury to design and for investors to understand.

4. Choice of the correct price index, a critical matter, is difficult.

5. Tax treatment is complex.

6. PLABs can be very costly to Treasury if inflation accelerates rapidly.

Zero Coupon (Original Issue Discount) Bonds (ZCBs)

Zero coupon bonds make a single cash payment at maturity. The return is derived from the annual appreciation (amortization) of the difference between the buying price and the maturity payment. For a positive return, the buying price has to be less than the maturity payment, and the bond must be sold by the issuer at a discount from its fixed maturity value. Because there are no coupon payments to reinvest, the yield to maturity on default and option-free ZCBs is guaranteed at the time the bond is traded. (The yield to maturity computation assumes the full reinvestment of all coupon payments at the initial interest rate.) Thus, there is no reinvestment risk due to interest rate changes after the purchase of the bond to cause the realized return on the bond to differ from the promised return if held to maturity.[9] This is an advantage to investors, who believe interest rates are likely to decline and would like to lock-in the current "high" rates. It is an advantage as well to issuers, who believe

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[9] George G. Kaufman, "The Case for the Long-Term Zero-Coupon Treasury Bond," The Bankers Magazine, Autumn 1973, pp. 35-39.

rates are likely to rise and would like to lock-in the current "low" cost of financing. By avoiding coupon reinvestment, investors also reduce transaction costs.

Zero coupon bonds offer other advantages. Because they do not spin off cash before maturities, they are longer-term bonds than coupon bonds of the same maturity. This makes them desirable to investors who wish to assume greater risk of price changes, to issuers who wish to postpone cash repayment as long as possible, and to financial intermediaries, such as life insurance firms and pension funds, who have scheduled liabilities to meet in the distant future. Moreover, ZCBs permit the latter types of institutions to match cash inflows to their scheduled cash outflows and to immunize themselves against unexpected interest rate changes. The demand for immunization on the part of these institutions has increased significantly in recent years as the unexpected increase in interest rates has severely depressed bond prices and the volatility in rates has increased their risk exposure. In the absence of zero coupon bonds, immunization becomes a relatively complex and costly undertaking. Investors effectively have to create artificial ZCBs out of existing coupon bonds. Unlike variable rate bonds (VRBs) or price level adjusted bonds (PLABs), zero coupon bonds offer no protection against changes in actual or expected inflation rates. Indeed, ZCBs increase interest rate risk exposure over coupon bonds of equal maturities.

In the past year, ZCBs have come of age on both the corporate and municipal bond markets. Their sudden popularity stems not only from the reasons cited, but also from tax advantages. Private taxable issuers are permitted to charge off the annual amortized appreciation of the original issue discount as interest expense against taxable income even though no cash outflow was incurred. (Until recently, the charge could be computed on the more favorable straight-line basis rather than on the accurate bond book or exponential basis.) This is equivalent to the issuer receiving an interest-free loan from the Treasury for the amount of the taxes due.

Taxable investors, on the other hand, must report the annual amortization of the original issue discount as interest income in the year it occurs even though there is no cash receipt until later and must pay ordinary income tax on this amount. Thus, they effectively make the Treasury an interest-free loan of the tax payment. This makes ZCBs an unfavorable investment vehicle for them. Tax-exempt investors, such a pension funds, life insurance companies, and IRA accounts, face no such disadvantage, however, and represent the primary buyers of these bonds. Because private taxable issuers can afford to sell ZCBs at higher pre-tax yields for the same after-tax cost as on regular coupon bonds and tax-exempt investors pay no taxes on the higher coupons, corporate ZCBs represent a potential revenue loss to the Treasury.

Municipal zero coupon bonds were developed after the success of the corporate counterparts. If sold correctly by the state or local government issuer, the original discount is considered coupon interest and exempt from federal taxes rather than capital gains subject to such taxes. Thus, these bonds are attractive to taxable investors in high marginal tax brackets. They involve no loss of tax revenue to the Treasury above that associated with tax-exempt bonds in general.

Zero coupon bonds issued by the Treasury are treated for tax purposes similarly to those of private issuers except that the tax on the annual amortization of the original issue discount, which is ordinary income, need not be paid by the investor until the bond is either sold or matures, whichever occurs first. Thus the effective tax rate is somewhat lower. However, this would still make Treasury ZCBs relatively poor investment vehicles for high marginal tax investors, although the tax deferral provision might make long maturities more attractive to these investors. But they would be attractive investments to tax-exempt investors, who prefer higher credit quality securities than corporates. (Treasury ZCBs might be at a slight interest rate disadvantage to corporate ZCBs relative to coupon issues because of the corporate issuers tax-free loan from the Treasury advantage, but this should be negligible.)

The recent dramatic growth in corporate ZCBs indicates that there appears to be a major and broad market for these securities ranging from large institutional investors to smaller investors with IRA accounts. The demand for ZCBs has been sufficiently great in recent months to bid up their prices to where they yield considerably less than comparable coupon issues.[10] Because sales to taxable investors would be a small percentage of total sales and these investors may be expected to be mostly in the lower marginal tax brackets, any loss of tax revenue by the Treasury from the tax deferment feature should be small relative to the sale of regular coupon issues. Of course, ZCBs are not good instruments for investors who require regular and known cash payments. (Large investors could obtain cash payments by selling off part of their portfolios of ZCBs, but would incur price risk.)

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[10] For example, ZCBs maturing in 2002 sold by Hospital Corporation of America at the end of May 1982 and rated A by Standard and Poor's yielded 12.80 percent, about 300 basis points less than a 15 5/8 percent coupon HCA bond sold at the same time. While the coupon bond was estimated to yield 260 basis points above that on a comparable Treasury coupon bond, the ZCB was estimated to yield 40 basis points less. At least some of the yield difference between the two HCA bonds reflects the high call protection on the ZCBs (typically callable only at their par value). But this cannot explain their yielding less than the comparable Treasury bond. Caution must be used in comparing market yields to maturity on ZCBs and regular coupon bonds as the two yields are not mathematically comparable when the yield curve is not flat.

Because ZCBs are sold at discounts from their face amounts, use by the Treasury would require a modification in the wording of the statutory limitation on the amount of Treasury securities outstanding. The current wording specifies the limit in terms of "face amount." The wording could be changed to "amortized amount" without altering the intent of the statute.[11] A similar provision is now included for bonds sold at a discount but "redeemable prior to maturity at the option of the holder," e.g., savings bonds. In addition, an understanding should be reached with Congress concerning ZCBs' exemption from the current limit of $70 billion on Treasury bonds with coupons in excess of 4¼ percent. The Attorney General has ruled that original issue discount yields are exempt from this limitation. But it would be best for the Treasury to first clear this with Congress so that it would not appear as an end-run around a congressional limitation. Lastly, provision should be made for Congress to appropriate the required interest payments semiannually when due and not postpone the appropriation to the maturity date of the bond. That is, Congress should not be tempted to "balance the budget on the back of ZCBs." However, this would be a problem only when ZCBs are first issued. In time, the pattern of principal payments due at different dates could be made equivalent to the cash flow pattern that would have existed on the replaced coupon issues and could require the same annual congressional appropriations.

The introduction of zero coupon bonds by the Treasury would not be a radical departure from its current financing practices. As noted, both Treasury bills and savings bonds carry zero coupons. The Treasury bill was first introduced in 1929 to supplement coupon-bearing certificates of indebtedness, the major short-term financing instrument. It quickly became the preferred security of investors and the certificate finally was discontinued in 1966. Because ZCBs make only a single payment, both their pricing and tax treatment are considerably simpler than for coupon bonds, and they are efficient trading instruments.[12]

The following advantages to Treasury and the public are offered by zero coupon bonds:

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11 Alternatively, the ZCBs could be issued with a "face amount" of 100 and a provision that interest accumulates at a given rate and cannot be withdrawn until maturity, so-called "compound interest bonds," e.g., State of Washington bonds sold June 2, 1982. Bidders would bid on the final accumulation value at a given maturity date.

12 In mid-June, the Federal Home Loan Mortgage Corporation sold the first government agency zero coupon bond issue. Unlike Treasury OIDs, federal agency OIDs are taxed similarly to corporate OIDs and investors must pay ordinary income tax annually on the amortized appreciation. The 10-year ZCB is estimated to have sold at about 35 basis points below the yield on a comparable current coupon Treasury security and almost 100 basis points below the yield a current coupon FHLMC bond of the same maturity would have required.

1. They broaden the market and accommodate large and expanding needs for longer-term bonds with no reinvestment risk.

2. They reduce interest cost, at least in the current environment, relative to coupon issues of comparable durations.

3. They are simple instruments to understand.

4. They are a better credit risk, than are regular coupon bonds, relative to ZCBs from private issuers, for which repayment is far away and in one chunk.

Among ZCB drawbacks are:

1. The Treasury could incur a small loss of tax revenues.

2. ZCBs lock-in high interest rates even if inflation and interest rates decline.

3. They are not useful for investors who require regular cash inflows prior to maturity.

4. They require modification of the language of the federal debt ceiling statute.

5. They require an understanding with Congress concerning the limitation on issuance of new Treasury bonds with coupon rates above 4¼ percent.

In sum, the sale of zero coupon bonds in a wide variety of maturities and in both small and large denominations should be advantageous to the Treasury. Initially, the maturities might be 1½ (to supplement the current 1- and 2-year issues), 5, 10, and 20 years. Small denominations should be tailored for IRA accounts; larger denominations, for tax-exempt institutional investors.

Putable Bonds

Putable bonds offer protection against significant capital losses from unexpected interest rate increases by permitting investors to sell the bonds back to the Treasury, on specified dates after a specified deferment period, at no less than a predetermined price at or below par (or for ZCBs, the amortized) value. The higher the put exercise price, the more valuable the put option to the investor, and the lower the interest rate that the investor is willing to accept. Thus, after the deferment period, a putable bond is similar to a consecutive series of shorter-term bonds, but the investor is protected against lower income from a decline in interest rates (and may experience some capital loss depending on how far the put price is below par or amortized value). As noted earlier, the Treasury put out two issues of regular put bonds in 1957. Put bonds have been recommended for Treasury use at this time for two primary reasons:

1. to permit increased sale of long-term maturities in today's depressed and uncertain markets and relieve the pressure of the short-term sector which impinges most on savings flows into thrift institutions;

2. to intensify pressure on the government to resist inflationary policies by putting into place the penalty of an overhang of immediately higher interest costs on a significant proportion of the outstanding debt, rather than simply on maturing debt, if inflation accelerates.

Opponents of Treasury putable bonds at this time argue that it is unlikely that an overhang of higher refinancing costs, even if substantial, would influence macroeconomic policy greatly and that the pressures from the short-term sector would not be greatly relieved. After all, the life of putable bonds is considered by investors to be as short as the term to the first permissible put date rather than to the final maturity date. The nearer the first put date, the effectively shorter term the maturity of the bond. Moreover, even if the pressure were relieved significantly, goes the argument, there is no credible empirical evidence that the shape of the yield curve could be substantially changed by altering the maturity structure of the debt. The last announced deliberate attempt to do this was in the early 1960s when "Operation Twist" was aimed at raising short- and lowering long-term rates. Analyses of this experience agree generally that it was not successful.

Putable bonds have been issued in recent years by at least one federal government agency--the Federal Home Loan Mortgage Corporation. Treasury should initiate a study of the costs and benefits of these bonds as well as the Treasury's own earlier putable bond issues.

Both Treasury and the public could gain from putable bonds:

1. They would lower immediate interest cost.

2. They would encourage long-term saving by offering investors protection against higher interest rates attributable to poor governmental economic policies.

3. They would broaden the long-term market and relieve the pressures of the short-term market.

4. They would encourage noninflationary government macropolicies.

5. They are an easily understood security.

6. They are not a new instrument for Treasury.

The main disadvantage is that there would be potentially higher interest costs if inflation and interest rates continued to rise.

In sum, there is some possible interest cost benefit from reintroducing bonds with regular put provisions, but the put exercise price should be considerably below par to provide protection against severe price declines, e.g., near 85 for 20-year 12 percent bonds which would require an interest rate increase from 12 to 14 percent before the put would become attractive. More important, this should strengthen the long-term sector by providing investors with a "safety-net" protection against a repeat of the carnage of recent years. If current anti-inflationary macro-policies are successful, final as well as initial interest costs of new debt may be reduced.

Selling Only Short-Term Debt

The arguments for the Treasury's selling only short-term debt at this time are based on confidence in the success of the government's current anti-inflationary economic policies. Proponents believe that the financial markets have not yet fully impounded either the past success in slowing the rate of inflation or the expected further success. Current long-term interest rates thus are higher than justified by the economic outlook, and the Treasury should not lock itself into these rates for long periods. Emphasizing short-term securities also would send a strong signal to the financial community that the Treasury is confident of the success of the anti-inflation programs. This alone might hasten the decline in market rates.

Opponents of this strategy argue that it would only intensify already heavy pressure on the short-term sector and, if anything, increase the disintermediation of funds from thrift institutions. Because retirement of the debt is unlikely so the needs of the Treasury are likely to be long-term, the Treasury should concentrate as much as is financially feasible on lengthening the maturity of its debt. The average maturity of the marketable debt is currently 4 years. Although this is above the low of 2½ years in 1975, it is shorter than the 5½ years in the 1950s, when retirement of at least some of the debt largely incurred during World War II was not imaginable. Almost one-half of the debt has a maturity of less than one year. Thus, if interest rates decline, the interest cost savings would be substantial, even in the absence of further shortening.

Opponents also doubt that the Treasury should be betting heavily on interest expectations and that the market would respond favorably to any implied anti-inflation signal associated with financing only short-term. It is unlikely that this signal would be any stronger than explicit verbal announcements or successful in changing investor expectations until the success of such policies became clearly evident for some period of time. The government has exhausted its credibility based on words; only specific policy actions and results will restore it significantly. Indeed, more words might have the opposite effect. Short-term debt is generally viewed as more liquid and thus as more inflationary than an equal dollar amount of long-term debt. If later,

the Treasury reentered the long market, would this signal that it expected rates to rise even more? Use of such a strategy in recent years would have resulted in considerably higher interest costs.

RECOMMENDATIONS

Major

The current financing needs of the Treasury are so large that it cannot afford to neglect any sector in search of the lowest interest rates. Nor should the impact on the market of the mode of Treasury financing be underestimated.

To the extent that new types of securities add to the arsenal of alternative instruments and permit the Treasury to better meet the demands of investors, thereby reducing interest costs, they should be given careful consideration. It is important, however, to keep the Treasury security market as simple, clear, understandable, and credible as possible. But this should not deter reasonable experimentation.

- o Zero Coupon Bonds

The Treasury should begin to sell zero coupon bonds (or equivalent compound interest bonds) as soon as possible. There appears to be a large and expanding market for such bonds in a wide range of maturities stretching from 18 months to 30 years. This market is comprised of large tax-exempt institutional investors, such as life insurance companies and pension funds, who demand high credit long-term single payment bonds for interest-rate immunization and minimization of reinvestment risk and costs; and smaller tax-exempt individual retirement funds (IRA and Keogh Plans), which want to lock-in current high interest rates on higher quality bonds than are currently available. If relative interest rates on Treasury zero coupon bonds are comparable to those on the corporate and municipal markets, the Treasury should, at least at first, realize significant interest cost savings and small, if any, revenue losses.

The rapid growth of zero coupon corporate and municipal bonds in the past 12 months suggests that there is little risk to the Treasury in selling ZCBs. However, sales by the Treasury may first require a minor wording change in the debt ceiling statute from "face" to "amortized" value for ZCBs, and the Treasury should confer with Congress concerning the relationship of yields on ZCBs to the 4½ percent coupon limitation on its long-term bonds. The Treasury should also amortize the interest payments semiannually and receive a guaranty from Congress that the interest funds will be appropriated when due.

o Variable Coupon Rate Bonds

The Treasury should sell long-term VRBs in smaller denominations, such as $1,000 to $100,000, designed for household investors. Interest rates should be somewhat lower than on regular fixed rate securities, say, at no less than 90 percent of the one-, two-, or three-year Treasury security rate, with the coupon rates changing at the maturity of the corresponding index rate, i.e., the coupon rate would change every two years if it were tied to a two-year rate. Such VRBs would provide households with a secure and relatively costless security protected against major loss in purchasing power from inflation, which is priced so as to draw funds out of thrift institutions (a stated objective of Treasury financing policy).

o Putable Bonds

The Treasury should give serious consideration to issuing long-term bonds with put options. Unlike its previous putable bonds, the put exercise price should be well below the par value (or amortized value in the case of zero coupon bonds), e.g., at 85 for a 20-year par bond at today's interest rates, to provide a "safety net" to protect investors only against relatively large increases in interest rates. Such bonds should provide some immediate interest cost reductions, encourage long-term saving, strengthen the long-term bond sector, and, possibly, provide additional incentive for the government to pursue effective anti-inflationary policies. The Treasury should conduct a thorough analysis of its experiences with put (as well as call) options on past issues.

o Price Level Adjusted Bonds

There is no immediate need for PLABs, if the Treasury issues small denomination variable coupon rate bonds. But PLABs may be desirable in the future, particularly if inflation accelerates, to encourage long-term saving and financing. The ability to match interest payments and tax revenues is less important for the Treasury, which can borrow efficiently in the short-term market, than for many private borrowers, such as households, who do not have this option. Because PLABs are more complex than most other types of bonds, require careful design to be efficient, and represent a more major innovation, the Treasury should begin a thorough study of the theoretical underpinnings of PLABs and the experiences of other countries with their use.

Minor

o The Treasury should continue to urge Congress to remove altogether the $70 billion ceiling on long-term bonds with coupon rates above 4¼ percent.

o The Treasury should restructure its nonbill sale calendar to concentrate all of its sales in only two weeks of every month,

say, the second and fourth weeks. This would not be a major adjustment from the current calendar, would increase market certainty, and would provide the market additional time to distribute and absorb the new issues, thus encouraging the lowest interest costs.

o The Treasury should reduce its minimum denomination on all issues to $1,000 from the present minimum of $5,000 on coupon securities less than three years to maturity and of $10,000 on bills. This would broaden the market to households and smaller investors, who must now use money market funds, and provide them with yields equal to those offered others. By broadening the demand for Treasury issues somewhat, it might reduce interest costs moderately. In today's environment, this reduction in denomination is unlikely to exert significant pressure on thrift institutions, and it would produce equal treatment of all investors regardless of size or influence.

Adoption of these recommendations should:

o ease the burden of the Treasury in financing the large federal deficits projected over the next few years and in refinancing the maturing debt;

o reduce the interest cost of the debt and thereby also the size of future deficits and the overall level of interest rates; and

o provide support for the long-term debt market and thereby encourage long-term personal saving.

While the achievement of these objectives is desirable at all times, it is particularly desirable at present, when the tremendous size of the federal government deficts are widely considered a major cause of the high levels of interest rates, crowding out private investment, and thereby possibly delaying and weakening economic recovery.

Prepared for The Heritage Foundation
by George G. Kaufman
Loyola University of Chicago

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Ed Yeo, III, Managing Director, Morgan Stanley