

RECENT DEVELOPMENTS IN TREASURY FINANCING TECHNIQUES

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In all but three fiscal years since 1931, Federal government expenditures have exceeded receipts so that deficits resulted in the Federal budget. The last surplus was in **1969**, and deficits since then have been quite large by historical standards. Deficits over the 1970-76 period have averaged \$25 billion, with a low of \$2.8 billion in fiscal year 1970 and a record high of \$65.6 billion in fiscal year 1976. Deficits of \$49 billion and **\$58 billion** are projected for fiscal years 1977¹ and 1978, respectively.

The Federal government can finance the excess of expenditures over receipts by drawing down the Treasury's accumulated cash balances or by borrowing in the credit markets. While cash balances may be an important source of funds in the short run, they cannot meet longer term financing needs. Thus, most deficit financing must be

done through borrowing. The Treasury borrows not only to raise new cash to cover current deficits but to raise funds to pay down or refund maturing debt obligations incurred to finance past deficits.

When the Treasury borrows, it issues public debt securities, which are direct and guaranteed obligations of the U.S. Government. These obligations consist of both marketable and nonmarketable **issues**.² Nonmarketable securities outstanding at the end of March 1977 amounted to \$233 billion or about one-third of the public debt. (See Table 1.) Nonmarketable issues include U.S. savings and retirement plan bonds—the only nonmarketable issues generally available to the public—the Government account series, the foreign government series, the depository series, the investment series, and other series. Marketable securities amounted to \$435

¹ Title V of the Congressional Budget Act of **1974** changed the fiscal year from July 1 through June 30 to October 1 through September 30, commencing with the fiscal year **1977**. The act also established a 3-month transitional period from July 1 through September **30, 1976**, between fiscal years **1976** and **1977**. The deficit during the transition quarter was **\$12.7 billion**.

² The total Federal debt includes marketable and nonmarketable public debt issues and specially authorized Federal agency securities. At the end of **1976**, these Federal agency securities amounted to **\$11 billion** but accounted for only **1.7 per cent** of the Federal debt. Securities are also issued by Government corporations and other agencies which are not included in the Federal budget, but these are not direct obligations of the U.S. Government.

Table 1
PUBLIC DEBT SECURITIES OUTSTANDING
(In billions of dollars)

END OF FISCAL YEAR OR MONTH	1970	1971	1972	1973	1974	1975	1976	T.Q.* 1976	March 1977
Total interest-bearing public debt	369.0	396.3	425.4	456.4 ^a	473.2	532.1	619.3	633.6	668.2
Nonmarketable issues	136.4	150.8	168.2	193.4	206.7	216.5	226.7	225.9	232.8
Marketable issues	232.6	245.5	257.2	263.0	266.6	315.6	392.6	407.7	435.4
Treasury bills	76.2	86.7	94.6	100.1	105.0	128.6	161.2	161.5	164.3
Notes	93.5	104.8	113.4	117.8	128.4	150.3	191.8	206.3	229.6
Bonds	63.0	54.0	49.1	45.1	33.1	36.8	39.6	39.8	41.5
MEMO: Totals for fiscal year or period									
Change in public debt securities	17.2	27.3	29.1	31.0	16.8	58.9	87.2	14.3	34.6 [†]
Change in cash and monetary assets	-1.6	0	-2.5	-0.8	2.5	-0.3	-7.8	-2.9	7.9 [†]
Other means of financing deficit*	-12.8	-4.2	-3.4	-15.7	-16.0	-15.0	-13.8	1.3	-1.0 [†]
Federal budget deficit	-2.8	-23.0	-23.2	-14.3	-3.5	-43.6	-65.6	-12.7	-41.5 [†]

*Transition quarter between fiscal years 1976 and 1977.

†October 1976 to March 1977.

*Includes borrowing through agency securities, investments of Government accounts, transactions not applied to year's surplus or deficit, and other means of financing.

SOURCE: Treasury Bulletin.

billion in March 1977, about double the amount outstanding a decade earlier. Most of this increase has occurred since 1970.

This article focuses on the financing **techniques used** by the Treasury when issuing marketable securities. The article describes the types of securities issued, the means of purchasing them, and the terms of offerings. The methods of selling securities are discussed with particular emphasis on new techniques developed to issue the large volume of securities sold in the 1970's.

PURCHASING MARKETABLE SECURITIES

The Treasury currently issues three types of marketable securities—bills, notes, and bonds. The Treasury places new securities with investors directly rather than using

dealers to underwrite new issues as is done in the corporate and municipal bond **markets**.³ At original issue, Government securities can be purchased directly from the Treasury or from its fiscal agents, the Federal Reserve Banks and Branches. Following announcement of a new issue, tenders or bids are accepted from the public at Federal Reserve Banks and, from individuals only, at the Bureau of the Public Debt in Washington, D.C., usually up to 1:30 p.m., Eastern **time**, on the day of the sale.

³ In the early 1960's, the Treasury did sell some issues of long-term bonds to underwriting groups, who in turn sold the bonds to the public. However, the amount of long-term debt that could be marketed under this technique was relatively small and the sale created a number of problems for the underwriters.

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Investors may also make their purchases through a commercial bank, broker or dealer, or other financial institution offering investment services. Some dealers and large commercial banks also purchase new securities to maintain trading inventories for secondary market dealings. After original issue, investors can purchase Government securities from the institutions that trade in the secondary market.

Marketable Treasury securities are available in registered, bearer, or book-entry form. Registered securities are securities inscribed with the owner's name and held by the owner. Ownership is recorded on the books of the Treasury Department and interest is paid by check to the owner of record; coupons are not attached. The security is payable at maturity to the owner. Registered securities may be transferred by assignment by the registered owner or his authorized representative.

Bearer securities are payable to the holder of the securities and ownership is not recorded. Title is passed by delivery without endorsement and without notice to the Treasury. A "coupon" security is a bearer security with interest coupons attached. The coupons must be detached and presented at a Federal Reserve Bank or at the Treasury for payment when interest is due. Individuals usually submit coupons to the financial institution from which they purchased the securities. Bearer securities pose the greatest risk of loss. Both registered and bearer securities must be presented at a Federal Reserve Bank or at the Treasury for redemption or in payment for new securities at maturity or call date. A check is issued by the Treasury for the face amount of redeemed securities.

Book-entry securities are not issued in the form of engraved certificates but are held as entries in accounts at Federal Reserve Banks in the names of member banks of the Federal

Reserve System. Member banks, in turn, keep accounts of their own security holdings and those they hold for their customers and financial institutions for which they act as correspondents. The commercial banks can credit customer accounts for interest and for the face amount of securities immediately upon maturity. They can also handle transfers of book-entry securities if the investor desires to sell prior to maturity, and they can reinvest funds at maturity. Of course, book-entry is the safest form in which to hold securities.

Book-entry accounts may also be maintained at the Treasury Department for investors who do not want to deal through a commercial bank or other financial institution. The Treasury does not charge for this service, but a Treasury account has certain disadvantages since it is designed primarily for investors who wish to hold their securities to maturity. A deposit for the full face amount of securities applied for must accompany tenders submitted for Treasury book-entry accounts. Securities held on a Treasury account cannot be used as collateral and cannot be sold without first being transferred to a member bank book-entry account. Transfers cannot be made until 10 business days after the date of issue nor later than 30 days before the maturity date. The Treasury must be notified to reinvest a maturing security at least 10 days before maturity. At maturity, the Treasury mails a check to the investor redeeming a security. Any marketable security can be held in book-entry form, and more than 80 per cent of the marketable public debt is in this form.

The Federal Reserve Banks and the Treasury provide a number of services for investors in Government securities. Treasury securities are eligible for Federal Reserve wire transfer, thus facilitating their sale before maturity. Investors may exchange securities for a like face amount of a different

denomination (i.e., a **\$100,000** bill for 10 **\$10,000** bills) at a Federal Reserve Bank or the Treasury Department. Exchanges may also be made among book-entry, bearer, and registered securities. In some cases, the Treasury aids investors who have suffered the loss, theft, destruction, mutilation, or defacement of their U.S. securities either before or after maturity by replacing the securities or by making a monetary payment.⁴

TREASURY FINANCING TECHNIQUES: BILLS

The three types of Treasury securities outstanding—bills, notes, and bonds—are distinguished primarily by the period to maturity at the time of their issuance. They also differ in the methods and terms under which they are sold and the computation of interest payments.

Treasury bills are the shortest term marketable U.S. obligations offered and, by law, cannot exceed 1 year to maturity. In fiscal year 1976, the **U.S.** Government sold \$367 billion of Treasury bills, and redeemed \$334 billion of bills, raising a net of \$33 billion. (See Table 2.) Since fiscal year 1970, bills have accounted for 85 per cent of all marketable offerings and 46 per cent of net funds raised. Bills are sold on a discount basis with the face (or par) amount payable at maturity without interest. No coupons are attached and no interest payments are made between issue and maturity. The difference between the price paid and the par value represents the accrued **interest**.⁵

Regular Offerings of 3- and 6-month Bills

The most frequent and most popular bill issues are the 3-month (representing an

⁴ The Treasury paid about **\$12** million in relief in 1975. However, the Treasury cannot pay all claims in full, and it is usually very **difficult** to obtain relief for the loss of coupons. Also, in most cases, the Treasury requires an indemnity bond to protect it from loss. Thus, investors are encouraged to purchase securities in book-entry form for their own protection.

additional amount of original 6-month maturity bills) and 6-month maturities which are offered on a regular weekly basis. In fiscal year 1976, the Treasury offered \$318 billion in regular weekly bills. Both the 3- and 6-month bills are sold at auction on a discount basis under competitive and noncompetitive bidding. Bids or tenders for both issues are usually invited about a week prior to the auction, and the amount offered and the terms of offering are announced then, with the terms for the two issues being similar.

Tenders must be for a minimum of **\$10,000** and in multiples of **\$5,000** over that. Bills are issued in par value denominations of **\$10,000**, **\$15,000**, **\$50,000**, **\$100,000**, **\$500,000**, and **\$1** million. Prior to March 5, 1970, the minimum acceptable tender was **\$1,000** for all bill issues and denominations of **\$1,000** and **\$5,000** were available. The 6-month bills, formerly available in bearer form, have been issued only in book-entry form since June 2, 1977. The 3-month bills are issued in bearer and book-entry form but will be available only in book-entry form beginning September 1, 1977.⁶

Banks and certain "recognized and responsible" securities dealers may submit tenders at the auction for the accounts of their customers, stating the customers' names in the

⁵ It is possible for Treasury bills to be sold at a premium resulting in an effective rate of interest that is negative. This phenomenon occurred during some weeks in the 1939-41 period when commercial banks dominated the bill market and special factors increased bank demand so much that they were willing to pay a premium. However, the payment of a premium is not **likely** to occur in today's broadly developed market, especially in light of the higher interest rates available on investments.

⁶ The 13-week issues will complete the transition of **bill** issues to the total book-entry system. However, a limited exception to the total book-entry offering will be **continued** for those institutional investors required by law or regulation to hold **definitive** securities. Definitive bills in the \$100,000 denomination will be available to such investors for all issues through December 1978.

Table 2
ISSUES OF MARKETABLE TREASURY SECURITIES
(In billions of dollars)

FISCAL YEARS	1970	1971	1972	1973	1974	1975	1976	T.Q.* 1976	Oct.-Mar. 1977
	Gross Amounts Issued (Par Value)								
Total marketable securities	226.1	252.2	278.2	277.3	285.2	356.4	447.7	119.5	221.0
Treasury bills	191.4	209.2	243.6	244.2	262.9	295.2	367.0	91.7	176.7
Regular weekly (3- and 6-month)	155.3	172.4	211.3	218.4	224.7	253.4	317.9	82.9	152.4
Regular monthly (52-week)†	19.4	20.4	20.4	21.2	23.4	26.5	38.8	8.8	22.3
All other	16.7	16.4	11.9	4.5	14.8	15.7	10.3	—	2.0
Cash management	—	—	—	—	—	—	8.3	—	—
Notes and bonds	34.7	42.9	34.6	33.2	22.3	61.1	80.7	27.8	44.3
Yield auctions	—	—	—	—	—	43.9	64.9	18.3	43.3
Price auctions*	—	4.3	16.2	17.4	22.3	17.3	2.6	—	1.0
Subscription offerings	10.7	3.4	—	—	—	—	13.2	9.5	—
Exchange offerings	24.0	35.2	18.4	15.7	—	—	—	—	—
	Net Funds Raised								
Total marketable securities	6.4	12.8	11.8	5.8	3.6	49.0	77.0	15.1	27.7
Treasury bills	7.8	10.4	8.0	5.4	5.0	23.6	32.6	0.3	2.8
Regular weekly (3- and 6-month)	5.2	7.4	11.6	3.1	2.2	19.8	21.6	-0.5	0
Regular monthly (52-week)†	0.8	1.0	0	2.5	0.2	4.9	12.3	0.7	0.7
All other	1.8	2.0	-3.6	-0.2	2.6	-0.9	-1.6	—	2.0
Notes and bonds	-1.3	2.4	3.8	0.4	-1.4	25.5	44.3	14.8	25.0
Yield auctions	—	—	—	—	—	22.2	38.2	11.8	24.0
Price auctions*	—	4.3	7.2	3.5	-0.4	4.0	1.6	—	1.0
Subscription offerings	2.2	2.3	—	—	—	—	5.5	4.4	—
Cash redemptions	-3.6	-4.3	-3.5	-3.2	-1.0	-0.8	-0.9	-1.4	—

*Transitlon quarter between fiscal years 1978 and 1977.

†Prior to August 1973, regular monthly bills include 9-month and 1-year issues.

‡Price auctions include conventional price auctions and uniform price auctions.

SOURCES: Treasury Bulletin and Annual Report of the Secretary of the Treasury on the State of the Finances.

tenders. All others are permitted to submit tenders only for their own account. Tenders are accepted from commercial banks and trust companies and from securities **dealers** without deposit. Others must submit the full face amount of book-entry bills applied for or 2 per cent of the face amount of bearer bills applied for.

Competitive bidders in the auction submit

tenders stating the quantity of bills they wish to purchase and the price they are willing to pay. A subscriber may enter more than one bid stating the quantity of bills he is willing to take at various prices. The prices bid are stated on the basis of 100, with not more than three decimals (for example, 99,567); and fractions may not be used. The annual rate of return associated with the price is calculated on the

bank discount basis⁷ as:

$$\frac{\text{par} - \text{price}}{\text{par}} \times \frac{360}{\text{number of days to maturity}}$$

For example, a 182-day bill priced at 97.567 would yield an annual rate of return of 4.813 per cent, computed as follows:

$$\frac{100 - 97.567}{100} \times \frac{360}{182} = .04813 = 4.813 \text{ per cent.}$$

Noncompetitive bids are usually entered by small investors unable to judge market conditions precisely enough to compete with large investors. These bids are entered without a stated price. The noncompetitive tenders are often submitted through a commercial bank or dealer so that a tender from one of these institutions may include a competitive bid for their own account as well as the sum of its customers' noncompetitive bids. Government accounts and Federal Reserve Banks, for themselves and as agents of foreign and international monetary authorities, also may enter noncompetitive tenders for new bills up to the amount of maturing bills they hold.

⁷ The bank discount rate is not strictly comparable with the rate on a coupon issue of equivalent maturity since rates on coupon issues are calculated on the basis of a 365-day year and are based on the purchase price rather than par. Thus, the equivalent coupon rate for a 182-day bill priced at 97.567 would be 5.00 per cent, or

$$\frac{100 - 97.567}{97.567} \times \frac{365}{182} = .05 = 5 \text{ per cent.}$$

The equivalent coupon rate is always higher than the bank discount rate.

Another formula for converting the bank discount rate to the equivalent coupon rate is

$$R_C = \frac{R_D(365)}{360 - R_D(N)},$$

where R_C equals coupon equivalent rate, R_D equals bank discount rate, and N equals number of days to maturity. Thus, for the above example:

$$5.00\% = .05 = \frac{.04813(365)}{360 - (.04813)(182)}.$$

Due to changes in issue dates because of holidays, maturities vary on the 3-month issues from 90 to 92 days and on the 6-month issues from 181 to 183 days. The appropriate number of days to maturity should be used to calculate the yield.

The 3- and 6-month bill auction usually takes place each Monday or when a holiday falls on Monday, the auction is held on Friday with the announcement of the sale being made on the preceding Friday. After the auction closes, bids are forwarded to the Treasury Department in Washington and tabulated for each issue. First, the volume of noncompetitive awards is subtracted from the total amount to be issued. Government and Federal Reserve Bank tenders, which are noncompetitive, are accepted in full. Noncompetitive tenders of private investors are accepted in full up to \$500,000 for any one bidder. (Until May 22, 1975, noncompetitive awards were accepted in full only up to \$200,000.) The remainder is allocated among competitive bidders beginning with those that bid the highest prices and ranging down in price until the total amount is issued. The lowest accepted price is called the "stop-out" price. Since a number of bids may have been entered at the stop-out price, the Treasury may award each of the bidders at this price only a portion of the amount requested.

After the auction on Monday, the amount and price range of accepted bids are announced, and competitive bidders are advised of the acceptance or rejection of their tenders. Competitive bidders pay the price that they bid while noncompetitive entries pay the weighted average price to three decimals of accepted competitive bids. The average price is usually closer to the lowest accepted price (or highest yield) than to the highest price (lowest yield). As an indication of the competitiveness of the market, the high and low prices have differed by a maximum of \$.029 per \$100 in auctions in the first half of fiscal year 1977.

Payment for accepted tenders and delivery are made on Thursday, the date of issue. Payment must be made or completed at the Federal Reserve Bank or Branch, or at the

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Bureau of the Public Debt, in cash or other immediately available funds or in a like face amount of Treasury bills that have matured on that date or earlier. The Treasury issues checks for the difference between the par value of maturing bills accepted in exchange and the issue price of the new bills.

'Regular Offerings of 52-week Bills

One-year bills, or 52-week bills, have been issued every 4 weeks since August 28, 1973, when they replaced the Treasury's end-of-month offerings of 1-year bills and 9-month bills (a reopening of 1-year bills). The Treasury issued a total of \$39 billion in 52-week bills in fiscal year 1976. (See Table 2.) The 52-week bills are offered at a discount by the auction method under **terms** similar to those for the regular weekly bill sales. The 52-week bills have been issued only in book-entry form since December 14, 1976.

Tenders for the 52-week bills are usually invited on Thursday prior to the auction. The auction **is** held on the following Wednesday, and allotments are made at that time by the same procedures used for the regular weekly bills. Payment for the bills must be completed on the date of issue. Despite the longer period to maturity, the rate is still computed on a bank discount basis of 360 days, the same as on other issues of bills.'

Special Bill Issues

In addition to regular bill offerings, the Treasury has found it necessary from time to time to meet short-term financing needs by selling special issues of Treasury bills. In August 1975, the Treasury introduced cash management bills, also known as Federal funds bills or short-dated bills. These bills are designed to raise funds quickly and for only a brief period. There have been nine cash management bill issues ranging from 9 to 20 days maturity and designed to raise from \$0.6 billion to \$4.5 billion. In fiscal year 1976, the

Treasury sold \$8.3 billion in short-dated bills. With the issuing of cash management bills, the Treasury discontinued its use of tax anticipation bills (**TAB's**) and additional issues of strips of outstanding series as a means of raising short-term funds in the bill market.⁹ The last issues of **TAB's** and strips were made in December 1974.

A cash management bill offering is announced 1 to 10 days prior to the auction and only competitive tenders are invited. The offering usually represents an additional amount of an outstanding issue with an original maturity of 6 months, although additional amounts have been issued for original 52-week maturity bills. The minimum acceptable bid is \$10 million with increments of \$1 million over that amount. Tenders are

⁸ As in the computation of the interest rate for 6-month bills, the rate for 1-year bills is biased downward compared to the equivalent coupon rate. However, since interest on coupon issues of more than 6 months to maturity would be compounded, the bank discount basis of computing interest results in an upward bias in the rate. The upward bias resulting from the lack of compounding is more than offset by the downward bias from using the bank discount method so that the equivalent coupon rate is still always higher than the bank discount rate. For example, the yield on a 364-day bill priced at \$94.596 per \$100 would be 5.345 per cent on the bank discount basis. A simple conversion to the equivalent coupon yield would result in a rate of 5.73 per cent. However, taking the effects of **compounding** into account, the 5.345 per cent rate converts to a rate of 5.275 per cent compounded semiannually. Converting 5.275 per cent to the equivalent coupon yield results in a rate of 5.65 per cent. Since issue dates may be altered due to holidays, the original period to maturity for **52-week bills** varies from 363 to 365 days.

⁹ Tax anticipation bills were issued to help the Treasury smooth out its tax receipts, and they could be submitted in payment of income taxes. Commercial banks were usually permitted to make payment for **TAB's** by crediting Treasury tax and loan accounts and thus became underwriters for these issues. About 28 TAB offerings were made during the 1970-74 period, and they ranged in maturity from 23 to 273 days.

A bill strip is a reopening of a number of issues of outstanding bill series. Strips enabled the Treasury to raise a large amount of short-term funds at one time rather than spreading out receipts through additions to weekly bill auctions. In the 1970-74 period, nine strips of bills were issued ranging from additions to 5 series to additions to 15 series and averaging 22 days to 131 days to maturity.

accepted only at Federal Reserve Banks and Branches (in some cases, only at the Federal Reserve Bank of New York), and tenders may be submitted by wire or telephone at the discretion of each Reserve Bank. The time between the auction and the date of issue may be as short as 1 day (although it has been as long as 5 days), and payment must be made in immediately available funds on the date of issue. Denominations issued, calculation of interest, determination of acceptable competitive bids, and other features of a cash management bill sale are similar to those for regular bills. Since there are no issues maturing at the time of these sales, Treasury and Federal Reserve Bank accounts do not participate in the auction.

In addition to cash management bills, the Treasury has issued some special bills of longer maturities when additional funds were needed for less than 1 year. There have been five issues of special bills since August 1974 with maturities ranging from 132 days to 299 days. Federal Financing Bank bills are also special issues that have all the characteristics of Treasury bills. There has been only one issue of FFB bills—an issue in July 1974 with a 244-day maturity.

FINANCING TECHNIQUES: NOTES AND BONDS

Notes are U.S. Government coupon obligations with an original maturity of 1 to 10 years. The maximum length to maturity has been raised twice—from 5 to 7 years in 1967 and to 10 years in 1973. Notes bear interest at a fixed rate payable semiannually. Bonds are long-term issues with an original maturity of more than 7 years from the date of issue, when the principal amount becomes payable. Bonds may be issued with a call option meaning the Treasury can request that they be redeemed before maturity on or after specified dates upon 4 months' notice. Bonds bear interest at a fixed rate, payable semiannually. Interest ceases

when the principal amount becomes payable, whether at maturity or on an earlier call date. Bonds are subject to an interest rate ceiling of 4% per cent, but Congress has allowed exemptions from this limitation. Currently, the Treasury can issue up to \$17 billion in marketable bonds to the public without regard to the interest limit. The Treasury sold \$80.7 billion in notes and bonds in fiscal year 1976 and redeemed \$36.4 billion in maturing securities, raising \$44.3 billion in new funds.

Notes and bonds are issued in bearer, registered, or book-entry form in denominations of **\$1,000, \$5,000, \$10,000, \$100,000,** and **\$1 million.** Commercial banks and recognized dealers may submit tenders for the accounts of their customers, but others may submit tenders only for their own accounts. Commercial banks are prohibited from making loans to cover the deposit requirement submitted with the tender, and other lenders are requested not to make such loans.

Payment for notes and bonds must be completed on or before the issue **date.**¹⁰ Since there is usually a long lag time between the sale of an issue and the date of issue, a number of ways can be chosen. Payment must be made in cash, eligible exchange securities which are accepted at par, in other funds immediately available to the Treasury by the issue date, or by check payable to the Federal Reserve Bank to which the tender is submitted or to the **U.S. Treasury** if the tender is submitted to it. Since checks take

¹⁰ Investors purchasing additional amounts of an outstanding security should be aware that they may have to pay accrued interest if the security is issued between quarterly interest payment dates. For example, on a 7 7/8 per cent note issued on November 15 with interest payable on August 15 and February 15, the Treasury would pay the investor the semiannual interest of \$39.375 per \$1,000. However, the investor has earned only \$19.6875 per \$1,000, since he has held the security for only half of the semiannual period. Thus, the Treasury requires a payment of \$19.6875 per \$1,000 at the time of issue.

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time to clear, they must be submitted no later than 3 business days prior to the payment date if drawn on a bank in the Federal Reserve District of the Bank to which the check is submitted, or the Fifth Federal Reserve District in the case of the Treasury, or a week prior to the payment date if the check is drawn on a bank in another District. If full payment is not completed, the Secretary of the Treasury may retain the deposit requirement for the amount of the securities allotted.

The sale of notes and bonds is somewhat more complicated than the sale of Treasury bills. Each time the Treasury needs to raise funds in the coupon market or refund maturing securities it must choose the maturities to be offered, the size of individual issues, and the method of sale. The **type** of security sold and the method of sale may in turn lead to decisions about price, interest rate, payment terms, call options, and other terms of financing. In recent years, however, the more routine scheduling of coupon offerings has limited somewhat the decisions on maturity of securities to be offered.

Offering Schedules for Notes and Bonds

Regular offerings of 2-year maturity notes were started in September 1973. Originally, these notes were issued with maturities at the end of each quarter, but reduced Treasury cash needs resulting from the sale of nonmarketables to foreigners interrupted the cycle after two issues. The quarterly cycle for 2-year notes was reinstated in September 1974, and beginning in March 1975, the Treasury changed the cycle to monthly offerings of 2-year notes. The cycle has continued, although the dates of the sales vary around the end of the month. Tenders for the 2-year notes are invited approximately 6 days prior to the sale. Delivery and payment are about 10 days to 2 weeks after the deadline for receipt of tenders. Unlike other note issues,

the **2-year** notes are offered in minimum denominations of \$5,000.

The Treasury also makes offerings of **4-** and 5-year notes. The 4-year note cycle was begun in June 1975. The notes are sold near the end of the calendar quarter and have maturity dates for the last day of the quarter. The 5-year note cycle began in January 1976, and a 5-year note has been issued in the early part of each calendar quarter since then. Most of these note issues will mature at the time of a mid-quarter financing. The exact timing of the 4- and 5-year note offerings is adjusted to accommodate other regular Treasury financing activities. The sales are announced about a week in advance for the 4-year notes and 10 days ahead of the sale for the 5-year notes. Payment generally must be completed on the issue date, which is about 2 weeks after the sale.

In addition to the regular note cycles, there is a major refunding operation near the middle of each quarter. This means that a large volume of securities is coming due and must be rolled over or paid off. In periods of rising cash needs, the Treasury can use the quarterly refunding operation to raise new cash as well as to roll over maturing debt. In recent years, the quarterly refinancings have usually included the three issues—a short-term note with a 3- to 4-year maturity, a long-term note maturing in 7 to 10 years, and a long-term bond. However, the recent May 1977 refunding included only the two longer term issues because of reduced cash needs. The long-term bonds issued at the quarterly financings have ranged in maturity from 9 years, 9 months, up to 30 years, and all have had call options of 5 years prior to final maturity. The quarterly issues are generally sold on consecutive days, with the longest maturity security being sold last. Tenders for the refunding series are invited about a week prior to the sale of the first security. The sales usually occur around the first of the

month with delivery and payment on February 15, May 15, August 15, and November 15, although this schedule is changed if those dates fall on holidays or weekends.

The Treasury has offered some issues outside of the regular coupon schedule when it needed extra cash. When bonds are issued at times other than the quarterly refunding, they do not have call options. The Treasury has tried in recent years to give more advance notice of its cash needs to the market and to limit the number of unanticipated coupon offerings.

Methods of Sale

A number of marketing techniques have been used to sell notes and bonds. The method used depends in part on the volume to be financed—which fluctuates throughout the year as cash needs vary—and other objectives the Treasury wishes to achieve, such as broadening investor interest or minimizing interest costs. In the early 1970's, only two methods were used to sell notes and bonds—the exchange offering and the subscription method. However, the auction method has now become the primary technique for selling notes and bonds as well as Treasury bills.

Auction Sales. The Treasury had experimented with the syndicated auction of long-term bonds in the early 1960's, but the auction technique was first used to sell notes and bonds to the general public at the November 1970 refunding. Since the May 1973 refunding, the auction method has been the Treasury's only marketing technique except for the few subscription sales in 1976. The Treasury has developed a variety of auction methods and uses the one that suits its needs for the sale of the issue at hand.

Under all auction methods, competitive and noncompetitive tenders are invited. Tenders must be accompanied by a deposit of 5 per

cent of the face amount of securities applied for except that tenders are received without deposit from a number of exempt institutions.¹¹ Noncompetitive bids are accepted in full up to a maximum limit, and the amount of the maximum acceptable noncompetitive bid has been raised over time. Prior to June 1974, the Treasury varied the amount from \$200,000 to \$500,000 on notes, and the maximum amount on bonds was \$250,000. Beginning with the August 1974 refunding, the amount of the maximum noncompetitive tender was \$500,000 for all auction issues, and this was raised to \$1 million at the November 1976 refunding. The computation of price and yield for noncompetitive tenders varies with the type of auction method. The Treasury announces that if noncompetitive tenders absorb all or most of the offering, competitive tenders will be accepted to the extent necessary to provide a fair determination of yield or price. Competitive bidders are notified of the acceptance or rejection of their bids. Noncompetitive bidders are notified only when the tender is not accepted in full or when the price is over par.

The amount of securities offered in an auction includes only those to be issued to the public. After the auction, additional amounts are allotted to Government accounts and the Federal Reserve Banks in exchange for their maturing securities. Some securities may be issued for cash to Federal Reserve Banks as agents for foreign or international monetary authorities. Federal Reserve Bank and

¹¹ Subscriptions are accepted without deposit from commercial banks and other banks for their own account, federally insured savings and loan associations, states, political subdivisions or instrumentalities, public pension and retirement and other public funds, international organizations in which the United States holds membership, foreign central banks and foreign states, certain large Government securities dealers, Federal Reserve Banks, and Government accounts.

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Government accounts pay the price paid by noncompetitive bidders.

The yield **auction** was first used in 1974 and has been the primary auction method since then. Beginning in fiscal year 1975, 80 per cent of all marketable note and bond sales have been under the yield auction, and 57 per cent of total net funds raised through marketables have been acquired this way. Under this method, no coupon is set on the issue; the rate is determined in the auction. The Treasury announces the amount to be sold and invites tenders on a yield basis. Competitive entries express their bids in terms of an annual yield to two decimal places—for example, 6.05 per cent—rather than in terms of price.

After the auction closes, the Treasury allots competitive tenders after subtracting the volume of noncompetitive bids. The allotment is made by accepting bids with the lowest yield (highest price) first, ranging upward to higher yields to the extent required to attain the amount offered. The amount accepted at the highest yield is prorated among bidders at that yield if necessary.

After tenders are accepted, an average yield is determined on the **issue**—and the coupon rate is set at the nearest-one-eighth of 1 per cent to the average yield which also produces an average price at or below **par**.¹² Competitive bidders pay the price equivalent to the yield they bid with price calculations carried to three decimals. Noncompetitive bidders pay the price associated with the average yield on **competitive** tenders.

The traditional auction technique which the Treasury began using in 1970 was the **price auction**, and \$81.1 billion in notes and bonds

have been sold by this method. The price auction had been used in the Treasury bill market for a number of years and was quite easily adapted to the sale of notes and bonds, except that the sale of notes and bonds was not on a discount basis. In the price auction, the Treasury announces the amount to be sold to the public, and a few days prior to the auction sets a coupon rate and a minimum acceptable price. Competitive bidders state the price they are willing to pay on the basis of 100 to two decimals. These bids may be at par (\$100 per \$100 face), at a price below par (at a discount), or at a price above par (at a premium). The price bid would reflect the investor's judgment as to how attractive the coupon rate is compared to other market rates. The rate associated with a price of par is the coupon rate; paying a premium will result in a lower effective yield than the coupon rate; and buying at a discount will yield an effective return higher than the coupon rate. As in the Treasury bill market, the noncompetitive tenders are subtracted from the amount to be sold and the remainder is distributed by accepting the highest price bid on down until the amount of the issue is taken. Competitive bidders pay the price that they bid, and noncompetitive bids are accepted in full at the average price of competitive bids. However, since the competitive bids are not necessarily at par, the average price paid by noncompetitive bidders may be more or less than par and thus they will receive an effective yield somewhat different from the coupon rate. In fact, because bidding is so competitive, the accepted prices may be very close, resulting in several instances in all bids being accepted at a discount or all bids being accepted at a premium rather than being distributed on either side of par.

The fact that noncompetitive tenders sold at premiums caused some problems in Treasury financings in 1974. High announced coupon rates attracted a good deal of interest from small investors who bid on a noncompetitive

¹² The highest accepted yield cannot be such that it translates into a price less than the original issue discount limit of the tax laws. "Original issue discount" taxation laws become effective at a price below $100 - .25N$, where N equals the number of years to maturity. For example, the Treasury would state the minimum price for a 25-year bond as \$93.75 per \$100 face.

basis and did not understand that they might have to pay more than par. To alleviate such problems, the Treasury discontinued announcing coupon rates on issues and began to sell new issues under yield auctions. However, the conventional price basis is still used when additional amounts of an outstanding security are issued.

The **uniform price auction** or "Dutch" auction was developed to broaden investor participation by eliminating the risk of paying a price above what other market participants pay. This auction method has been used only four times to issue long-term bonds. In the Dutch auction, all accepted tenders are awarded at the price of the lowest accepted bid for competitive tenders. The coupon is set on the bonds prior to the auction, and competitive tenders must state a price for the bonds on the basis of 100, with two decimals in a multiple of **.05**—for example, 100.05, 100.00, 99.95. A minimum price is set on the bonds below which tenders will not be accepted. As in the conventional price auction, tenders are awarded by accepting the highest prices bid, after deducting noncompetitive awards, ranging down to the extent required to attain the amount offered. The price paid for all accepted tenders is the same for all investors and may be above, below, or at par.

Subscription Offerings. Subscription offerings were **first** used in the early **1960's** to raise new cash following exchange offerings, and their use continued through the August 1972 refunding. As the auction technique gained acceptance, the subscription technique was discontinued. However, the Treasury utilized this sale method in 1976 when it recognized the benefit of using the subscription method for issuing a large volume of securities at one time. In three offerings in 1976, the Treasury issued \$22.7 billion in notes and raised \$9.9 billion in new funds.

In a subscription offering, the Treasury announces the amount to be sold, the interest

coupon on the issue, the price of the issue (a **coupon issue** might be priced to sell slightly above or below par in order to permit closer pricing to the market rate on other instruments while maintaining coupon rates in standard eighths of a percentage point), deposit requirements, and the method of allotting the tenders. The Treasury reserves the right to change the amount sold and the allotment procedures after all subscriptions have been submitted. Additional amounts are issued to Federal Reserve and Government accounts after allotments to the public."

Investors enter subscriptions for the amount of securities they wish to purchase at the Treasury's given price and yield. Since investors may enter subscriptions totaling more than the amount offered by the Treasury, the allotment procedure becomes important for limiting the size of the issue. Allotments can be made by awarding a percentage of the amount of each tender or by setting a **maximum** dollar amount to be accepted for each tender.

The Treasury usually offers to accept some tenders in full on a preferred allotment basis. Preferred tenders are limited in size (up to \$500,000 in recent offerings) and must be accompanied by a deposit of 20 per cent of the face value of securities applied for. Deposit guarantees are not accepted. The normal 5 per cent deposit is required on nonpreferred subscriptions, except from exempt institutions, and these tenders are filled subject to allotment. **Any** subscriber may submit a preferred tender as well as a regular tender. In two of the three offerings in 1976, the terms for accepting preferred tenders were altered after

¹³ In most cases, the amounts issued to Federal Reserve Banks and to Government accounts are in exchange for maturing notes held by them, but allotments have been made for cash to Federal Reserve Banks for foreign and international accounts. When large oversubscriptions are received from the public, Government accounts may retire their maturing securities and replace them with nonmarketables. This enables the Treasury to hold down the size of an issue to a desirable level.

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subscriptions were tabulated. Nonpreferred entries were awarded no portion of the issue in one of the sales.

Exchange Sales. Exchange offerings give holders of selected outstanding issues" the right to turn in their securities for the same face amount of a new issue on which an interest rate is set prior to the sale. Holders of eligible securities who do not wish to invest in the new issue may sell their "right" to the new issue to other investors or turn in maturing securities for cash. Since exchange sales merely refund outstanding securities but do not provide new funds (and in the case of cash redemptions result in a net paydown), the Treasury turned to alternative sales techniques as cash needs rose in the 1970's. Thus, exchange offerings

¹⁴ The Treasury could accept maturing securities for new issues or it could accept securities that would not mature until sometime in the future, thus rolling over part of the debt in advance of maturity. The advance refunding of issues in the early 1970's included only issues due in less than 5 years, and advance refundings were discontinued when the exchange method was replaced by cash sales.

were discontinued with the February 1973 refunding.

CONCLUSION

The Treasury sold \$2.5 trillion in marketable securities from fiscal year 1970 through March 1977. Less than one-tenth of that amount represented new money; the bulk of the borrowing was done to roll over maturing debt. Bill issues accounted for \$2.1 trillion and notes and bonds accounted for \$382 billion of total marketable security sales.

In recent years, the Treasury has instituted a more routine offering schedule for notes and bonds and developed a variety of sales techniques. These two factors have enabled the Treasury to market a larger volume of coupon issues and to raise a larger proportion of new money through note and bond sales. From fiscal year 1975 through March 1977, the Treasury raised nearly two-thirds of new funds from marketables by the sale of notes and bonds.