

March 2012

# DEBT MANAGEMENT

## Buybacks Can Enhance Treasury's Capacity to Manage under Changing Market Conditions

Revised on March 21, 2012 to clarify information on page 17.  
The corrected section should read: Agence France Tresor  
officials told us that the flexibility of bilateral trades helps them to  
minimize borrowing costs.



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## Why GAO Did This Study

The U.S. Treasury market is the deepest and most liquid debt market in the world. Liquidity is important to a well-functioning Treasury market and for lowest cost borrowing over time. Exploring various debt management tools can assist Treasury in maintaining liquidity as budget and market conditions change.

To help maintain an efficient Treasury market, Treasury needs the ability and flexibility to actively manage the mix of outstanding securities and respond to market disruptions. Debt buybacks—the redemption of marketable securities prior to their maturity dates—were used to manage declining debt during a time of budget surpluses. However, other countries use buybacks and similar tools even during times of deficit. GAO assessed: (1) the budget and market conditions under which debt buybacks could help Treasury achieve its debt management goals, (2) the operational features of buyback programs that would support these goals, and (3) other debt management tools used by case study countries to achieve similar objectives. GAO examined both the U.S. program and those of Canada, France, Germany, and the United Kingdom and analyzed the costs and benefits.

## What GAO Recommends

To have flexibility to respond to potential changes in market conditions, GAO recommends that Treasury build the capacity for buyback and switch auction programs as well as bilateral trades or debt exchanges.

Treasury concurred with the findings and said the report would be very useful in analyzing tools that increase their flexibility.

View [GAO-12-314](#). For more information, contact Susan J. Irving at (202) 512-6806 or [irvings@gao.gov](mailto:irvings@gao.gov).

March 7, 2012

## DEBT MANAGEMENT

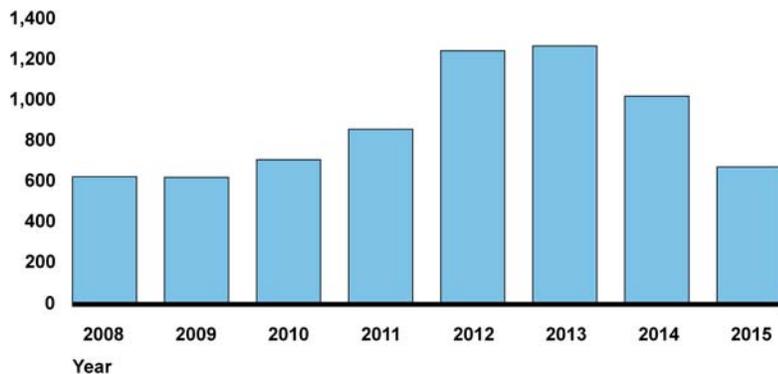
### Buybacks Can Enhance Treasury's Capacity to Manage under Changing Market Conditions

## What GAO Found

Debt buybacks can help advance Treasury's goals under a variety of budget and market conditions. For example, Treasury currently faces rollover peaks—large increases in the amounts of maturing debt that must be refinanced at a given time (see fig.)—which expose Treasury to the risk of refinancing large amounts of debt when interest rates are less favorable. All four of our case study countries use debt buybacks to mitigate rollover risk. Buybacks can also be used to enhance liquidity, which can be adversely affected when the growth in borrowing slows rapidly and issue sizes decline significantly. GAO's illustrative analysis of Treasury's past buyback program showed that, had Treasury refinanced the debt by simultaneously issuing new debt, it could have captured a liquidity premium—the additional price investors are willing to pay for securities that can be easily traded—which would reduce interest costs.

**Treasury Notes and Bonds Maturing**

Dollars (in billions)



Source: GAO analysis of data from [www.treasurydirect.gov](http://www.treasurydirect.gov) through Dec. 31, 2011.

Note: Does not include future debt issuance to refinance maturing debt or finance new borrowing needs.

Implementing a well-designed buyback program could help Treasury minimize borrowing costs over time. Other countries have used both reverse auctions—a process in which participants submit competitive offers to sell particular securities—and bilateral trades—transactions between the government and specific holders of a security. Of these, reverse auctions are most consistent with Treasury's principles. However, if certain features of bilateral trades were modified, they could be useful for responding to unforeseen market disruptions. Participation in a buyback program would be encouraged by a regularly scheduled program, with a clear purpose and timely announcement of operations. Also, because greater participation fosters competition, broadening the eligibility to participate beyond primary dealers should be explored.

Switches and debt exchanges—tools similar to buybacks that involve early redemption of securities in exchange for liquid benchmark securities—could also be used to manage rollover peaks and help maintain liquidity. They could also have the added advantage of broadening Treasury's investor base by appealing to investors that want to maintain the average maturity of their portfolios in ways that minimize market risk.

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## Abbreviations

CAD	Canadian dollars
CBO	Congressional Budget Office
CRSP	Center for Research in Security Prices
FRBNY	Federal Reserve Bank of New York
OECD	Organisation for Economic Co-operation and Development
TAAPS	Treasury Automated Auction Processing System
TRAPS	Trading Room Auction Processing System
Treasury	U.S. Department of the Treasury
U.K.	United Kingdom

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United States Government Accountability Office  
Washington, DC 20548

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March 7, 2012

The Honorable Timothy F. Geithner  
Secretary of the Treasury

Dear Mr. Secretary:

The U.S. Treasury market is the deepest and most liquid government debt market in the world. This assists the U.S. Department of the Treasury (Treasury) as it seeks to finance the federal government's borrowing needs at the lowest cost over time. Today—in part due to the economic slowdown and global financial crisis that brought about a flight to quality—interest rates on U.S. Treasury securities are at historic lows. Nevertheless, exploring the benefits of various debt management tools can assist Treasury in the continued achievement of its debt management goal in future years as economic and market conditions change.

As part of our ongoing work on debt management issues and under the Comptroller General's authority, we examined debt buybacks—a debt management tool that enables debt managers to actively manage the mix of outstanding Treasury securities by redeeming particular marketable securities prior to their maturity dates using a voluntary process. The United States used debt buybacks from 2000 through 2002 as part of managing declining debt during a time of surplus; other countries use them to address debt management issues even during times of deficit or increasing debt. Specifically, we assessed (1) the budget and market conditions under which debt buybacks could help Treasury achieve its debt management goals, (2) the operational features of buyback programs that would support these goals, and (3) other debt management tools used by case study countries to achieve objectives similar to those of a U.S. buyback program.

To address these objectives, we examined Treasury's 2000-2002 buyback program as well as the buyback programs and similar debt management tools used in Canada, the United Kingdom (U.K.), France, and Germany. We selected countries that are members of the Organisation for Economic Co-operation and Development (OECD) and whose sovereign debt markets are most similar to the United States in terms of size and liquidity. We analyzed the cost of Treasury's buybacks, including the extent to which Treasury could have reduced its interest costs had it "re-financed" its buybacks by simultaneously issuing new debt. We largely used data from Treasury and the Center for Research in

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Security Prices (CRSP) for this analysis. To assess the reliability of CRSP data, we compared them to another published source of similar data and discussed any differences with the data providers. We determined that such differences were likely due to methodological differences between the two sources and were consistent with industry practices. To assess the reliability of the Treasury data, we also compared them to another published source of similar data and found them consistent. Based on these assessments, we determined that the Treasury and CRSP data were sufficiently reliable for our purposes. We interviewed officials from Treasury's Office of Debt Management and the Bureau of the Public Debt and from the Board of Governors of the Federal Reserve System and the Federal Reserve Bank of New York (FRBNY)—one of the Federal Reserve Banks serving as Treasury's fiscal agent. We also interviewed officials from the Canadian Department of Finance and the Bank of Canada, the U.K. Debt Management Office, Agence France Tresor (France's debt agency), and the German Finance Agency.<sup>1</sup> The experiences of our case study countries are not generalizable, but they provide illustrative examples of the use of buybacks and other debt management tools. We obtained perspectives from market participants, including four primary dealers and two large investors, and two market analysts. To assess the operational features that would support Treasury's borrowing goals, we analyzed the extent to which features of Treasury's past buyback program and the features of other countries' buyback programs are consistent with Treasury's debt management goals and principles. See appendix I for more information on our scope and methodology. On December 13, 2011, we briefed Treasury officials on our findings and expected recommendations.

We conducted this performance audit from November 2010 to March 2012 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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<sup>1</sup>We interviewed officials from Canada's central bank because of the large role the central bank plays in buybacks. We did not interview central bank officials from the United Kingdom, France, or Germany because their buybacks role was limited.

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## Background

To achieve its primary debt management objective of financing the federal government's borrowing needs at the lowest cost over time, Treasury issues debt through a regular and predictable schedule of auctions across a wide range of securities. Treasury marketable securities consist of bills that mature in a year or less, notes with original maturities of more than 1 to not over 10 years, and bonds with original maturities of more than 10 years.<sup>2</sup> Treasury seeks to appeal to a broad range of investors and to provide the market with a high degree of stability in the amount issued of each security, particularly for longer-term securities.<sup>3</sup> Financing across the yield curve (that is, issuing short-, medium-, and long-term debt) appeals to the broadest range of investors, mitigates refunding and market rate risks, and provides the market with a pricing mechanism for setting interest rates. These all contribute to overall market liquidity and promotion of efficient capital markets. In a liquid market, trading can be completed at will and the offer and purchase prices differ only slightly. Liquidity is important to Treasury because liquid securities can be auctioned at lower rates and thus minimizes Treasury borrowing costs.

The mix of outstanding Treasury securities can significantly influence both rollover risk and the federal government's borrowing cost. Longer-term nominal securities typically carry higher interest rates, primarily due to investor concerns about interest rate risk, part of which is inflation for nominal securities. In general, risk premiums and therefore interest rates are higher for longer-term debt than for shorter-term debt. In contrast, shorter-term securities generally carry lower interest rates but add uncertainty to the government's interest costs and require Treasury to conduct more frequent auctions to refinance maturing debt, which increases rollover risk—the risk that Treasury will have to refinance its debt at less favorable interest rates.

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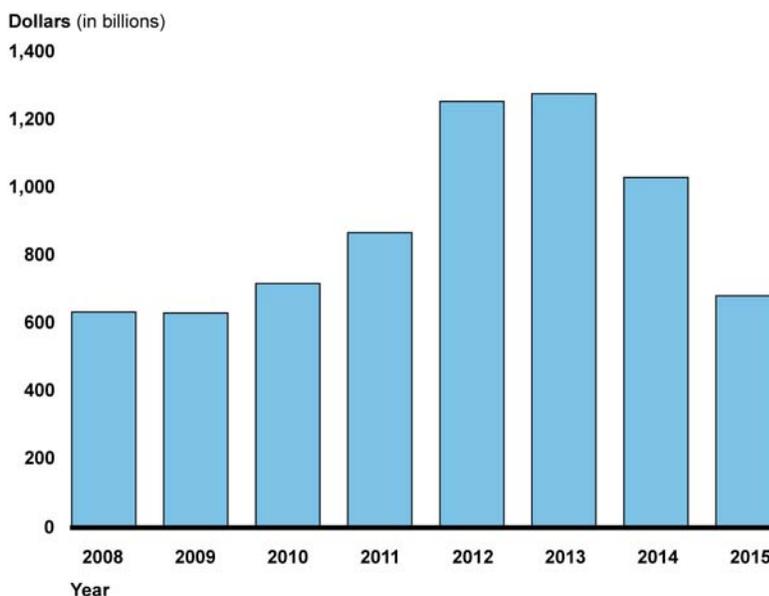
<sup>2</sup>Treasury issues both nominal and inflation-adjusted notes and bonds. In addition to marketable securities—which can be resold by whoever owns them—Treasury issues nonmarketable securities, such as savings securities and special securities for state and local governments that cannot be resold.

<sup>3</sup>We have previously reported on the benefits of diversifying Treasury's investor base and collecting information to gauge investor demand. See GAO, *Debt Management: Treasury Inflation Protected Securities Should Play a Heightened Role in Addressing Debt Management Challenges*, [GAO-09-932](#) (Washington, D.C.: Sept. 29, 2009) and *Debt Management: Treasury Was Able to Fund Economic Stabilization and Recovery Expenditures in a Short Period of Time, but Debt Management Challenges Remain*, [GAO-10-498](#) (Washington, D.C.: May 18, 2010).

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One of the debt management challenges that Treasury will continue to face in the next several years will be rollover peaks—large increases in the amounts of maturing debt that must be refinanced at a given time (see fig. 1). Such peaks expose Treasury to the risk of refinancing an especially large amount of maturing debt at a time when interest rates are less favorable. Current interest rates on U.S. Treasury securities are at historical lows, in part because of the global economic downturn and investors’ demand for liquid, risk-free assets; interest rates are, however, expected to increase as the economy recovers.

**Figure 1: Treasury Notes and Bonds Maturing**



Source: GAO analysis of data from [www.treasurydirect.gov](http://www.treasurydirect.gov) through Dec. 31, 2011.

Note: Does not include future debt issuance to refinance maturing debt or finance new borrowing needs. Therefore, the amounts maturing in 2014 and 2015 do not reflect any 2- or 3-year notes that will be issued in 2012 and 2013.

The rollover peaks Treasury faces are primarily the result of increased short-term borrowing following the onset of the economic recession in

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December 2007.<sup>4</sup> In 2008 and 2009, in response to the recession and the financial crisis, Treasury dramatically increased issuance of bills and 2-, 3-, and 5-year notes. These actions shortened the average maturity of the Treasury's debt portfolio and are now resulting in large amounts of debt maturing in 2012 and 2013. For example, the amount of notes and bonds maturing in 2011 was \$866 billion and the amount in 2012 is \$1,253 billion. Treasury has taken steps to extend the average maturity of the portfolio and reduce rollover risk. For example, Treasury reduced bills as a share of its debt outstanding since 2009. Although the average maturity of the portfolio has lengthened from 55 months in December 2007 to slightly more than 62 months in December 2011, it is still shorter than that of other developed countries.

Liquidity is important to a well-functioning Treasury market. Liquidity is also important to Treasury because investors are willing to pay more for liquid securities that can be easily traded, resulting in lower borrowing costs for Treasury.<sup>5</sup> Liquidity can be adversely affected when the growth in borrowing slows and issue sizes decline significantly. Even at very high (and growing) levels of outstanding debt, there would be a decline in net borrowing needs when federal deficits decline. Federal deficits have been at record highs in recent years, reaching \$1,413 billion in fiscal year 2009. Both a projection assuming continuation of current law and an alternative fiscal scenario that assumes recent policies continue show deficits declining below \$1 trillion in the next several years; the rate of decline differs depending on the assumptions used (see fig. 2). Federal tax receipts would grow and spending on programs like unemployment benefits would decrease with economic growth. In addition, the waning of spending to support the economic recovery and the mechanisms imposed by the Budget Control Act of 2011,<sup>6</sup> such as discretionary spending caps and sequestration, will also likely reduce federal spending. Nevertheless, we cannot "grow our way out of" the long-term fiscal challenge; the

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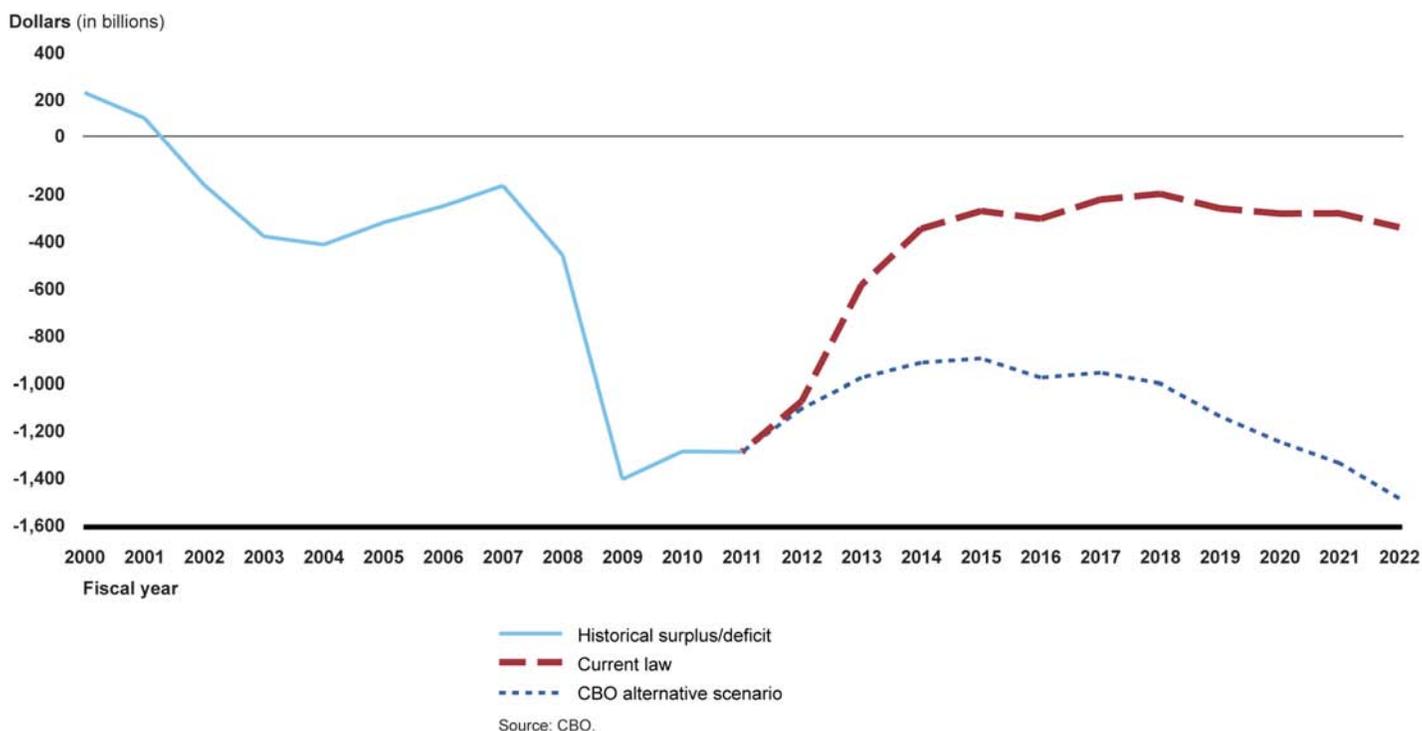
<sup>4</sup>The economic downturn along with the federal government's response to it and other actions taken to stabilize financial markets contributed to a rapid buildup in federal debt held by the public—increasing from roughly 36 percent of gross domestic product at the end of 2007 to roughly 68 percent at the end of fiscal year 2011.

<sup>5</sup>For example, we reported in 2009 on the impact of illiquidity on the cost of borrowing using Treasury Inflation Protected Securities. See [GAO-09-932](#).

<sup>6</sup>Pub. L. No. 112-25, 125 Stat.239 (Aug. 2, 2011).

declines in the deficit are projected to be short-lived and borrowing needs projected to increase again.<sup>7</sup>

**Figure 2: Deficits Decline in Next Several Years under Different Assumptions**



Note: Data are from the Congressional Budget Office (CBO), *The Budget and Economic Outlook: Fiscal Years 2012 to 2022* (January 2012). The current law projections reflect sharp increases in revenues that will occur if tax provisions expire as scheduled and sharp reductions in Medicare’s payment rates for physicians’ services scheduled under current law. However, those assumptions differ from historical policy actions. In CBO’s alternative fiscal scenario, certain tax provisions that have expired or are set to expire are extended, the alternative minimum tax exemption amount is indexed to inflation, and Medicare payment rates for physician services are held constant.

Treasury can take several steps to respond to a decline in net borrowing needs, including reducing the size of new issues, reducing the frequency of auctions, and eliminating the offerings of certain securities. However,

<sup>7</sup>See GAO, *The Federal Government’s Long-Term Fiscal Outlook: Fall 2011 Update*, [GAO-12-28SP](#) (Washington, D.C.: October 2011).

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any rapid decline presents some debt management challenges.<sup>8</sup>

Shrinking the size of some new issues could reduce Treasury's flexibility to sustain liquid markets across the wide variety of instruments desired by potential investors. Further, changes in the frequency of auctions or in the types of securities auctioned can reduce the regularity and predictability of Treasury operations; this would be especially problematic if the trend in borrowing needs turned out to be short-lived and the changes would have to be reversed. Both Treasury and market participants place a high value on the regular and predictable nature of Treasury's approach to financing the government.

Market disruptions—or illiquidity in particular maturities—can occur when there are supply-demand imbalances in the Treasury market. For example, demand may increase when investors flee other holdings in search for safety or fall when they rebalance their portfolios through purchases of riskier assets offering a higher return. While rollover peaks and a decline in borrowing needs pose foreseeable risks to Treasury, market disruptions are more difficult to anticipate. There were significant supply and demand imbalances in the Treasury market during the financial crisis in 2008.<sup>9</sup> To help maintain an efficient Treasury market that promotes lowest cost borrowing over time, Treasury must have tools that provide for sufficient flexibility to respond to any market disruptions.

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<sup>8</sup>We previously reported on the challenges of managing declining debt. See GAO, *Federal Debt: Debt Management in a Period of Budget Surplus*, [GAO/AIMD-99-270](#) (Washington, D.C.: Sept. 29, 1999) and *Federal Debt: Debt Management Actions and Future Challenges*, [GAO-01-137](#) (Washington, D.C.: Feb. 28, 2001).

<sup>9</sup>Demand for Treasury securities increased because lenders became reluctant to lend against mortgage-related securities, demanding higher-quality collateral. At times during the crisis, unusually high demand for certain Treasury securities resulted in negative yields on those securities.

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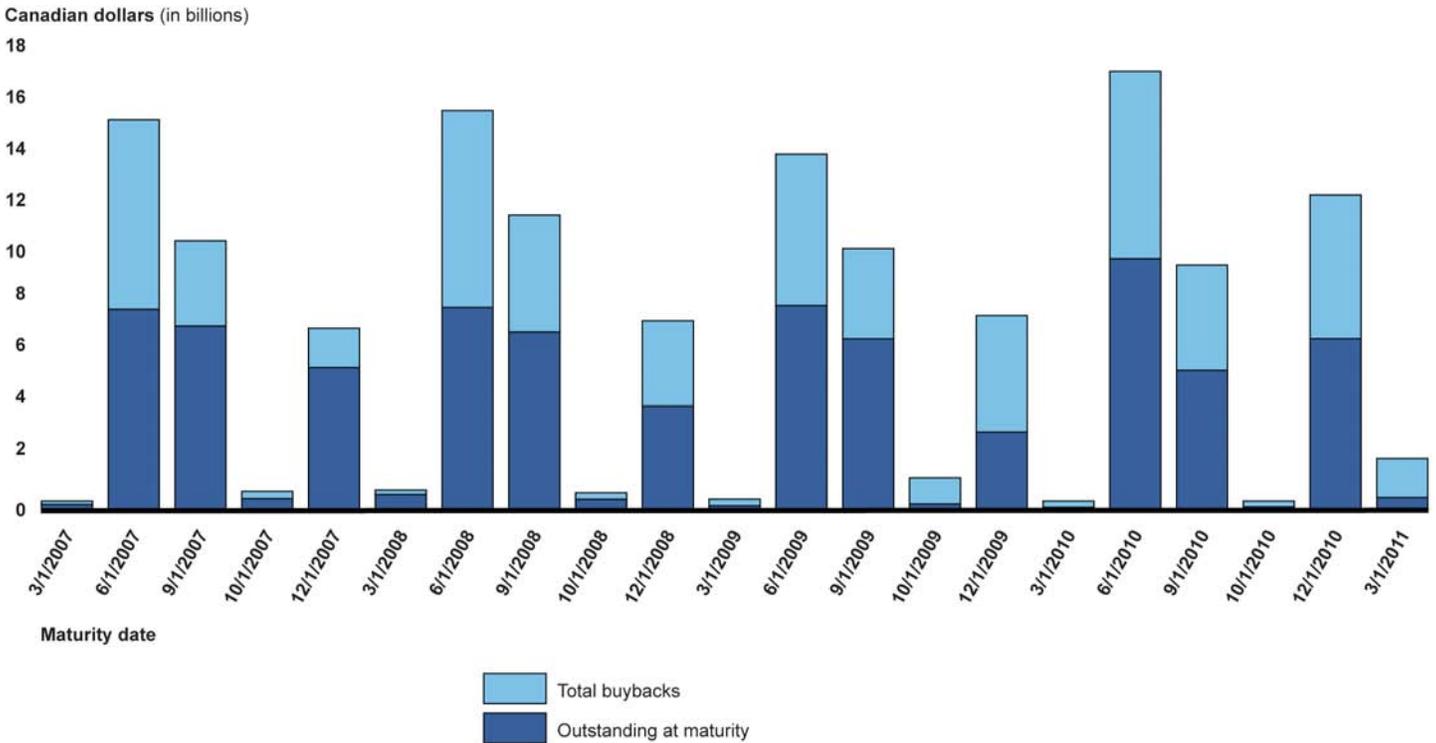
## Debt Buybacks Can Help Advance Treasury's Goals under a Variety of Budget and Market Conditions

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### Debt Buybacks Help Mitigate Rollover Risk and Can Enhance Liquidity when Net Borrowing Needs Decline and when There Are Market Disruptions

Debt buybacks can be used to mitigate rollover risk while also promoting liquidity. All four of the countries we studied—Canada, France, Germany, and the United Kingdom—use buybacks to smooth peaks in their maturity profile, even in times of budget deficits. The U.K. Debt Management Office buys back securities with 6 or fewer months remaining to maturity to smooth maturity peaks. France also uses buybacks to smooth maturity peaks. According to officials from Agence France Tresor, this practice helps them avoid having to issue abnormally large amounts of debt on a particular day to raise the funds to pay the maturing securities. Similarly, the German Finance Agency buys back debt to smooth maturity peaks, although it does not limit those trades to securities with a specific time remaining until maturity. The Canadian government buys back securities with 18 or fewer months remaining to maturity to smooth maturity peaks. For example, in its 2010/2011 fiscal year, Canada bought back \$21.9 billion in this cash management bond buyback program. According to officials from the Canadian Department of Finance, buying back securities from key maturity dates helps reduce the high levels of cash balances needed for large maturity dates and helps smooth variations in their bill auction sizes over the year. For example, in 2010, early redemptions (including both buybacks and switches, discussed later in this report) reduced the size of Canada's June 1, September 1, and December 1 bond maturities by 44 percent (see fig. 3).

**Figure 3: Impact of Buybacks on Amounts of Maturing Canadian Securities**



Source: GAO analysis of data from Canada Department of Finance, *Debt Management Report 2010-2011*.

The challenges rollover peaks pose to U.S. Treasury debt managers differ from those faced by our case study countries. Because other countries have smaller sovereign debt markets than the United States, some rely more heavily on fewer key maturity dates to enhance liquidity. For example, until recently, Canada concentrated its securities around four large single-day bond maturities and coupon payment dates: March 1, June 1, September 1, and December 1. According to Canadian officials, such concentration is helpful in maintaining benchmark liquidity, particularly in an environment of declining debt issuance, but also increases rollover risk. Market participants pointed out that Treasury’s regular and predictable schedule of auctions spread throughout the year, across maturities, and in different products (nominal coupons, Treasury Inflation Protected Securities, and bills) mitigates this risk and helps to keep monthly rollover peaks at a manageable size, though rollover peaks may still exist due to historical issuance patterns. Also, some market participants said that Treasury’s bill market can provide the necessary

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flexibility to adjust issuance for these peaks. As discussed earlier, Treasury faces annual—rather than monthly or daily—rollover peaks in the next several years. In fiscal year 2011, Treasury funded the budget deficit of \$1,296 billion with net marketable borrowing totaling \$1,104 billion. Because the deficit is estimated to decline to \$585 billion in fiscal year 2013 under current law, if Treasury held net issuance constant, it would have excess funds that it could use to buy back debt to reduce maturity peaks in coming years.

Debt buybacks can help Treasury minimize changes to its regular auction schedule and maintain or enhance liquidity in times of declining, albeit still high, budget deficits. Prior to Treasury's past buyback program, it initially responded to declining deficits by reducing the number of coupon auctions, eliminating the offerings of some securities, and reducing auction sizes, particularly of bills. However, this raised concerns about maintaining liquidity in the remaining issues and increasing the average maturity of Treasury's debt portfolio. Buybacks enable debt managers to delay or avoid making further changes to the auction calendar and to maintain issuance of its benchmark securities in greater volume than would otherwise be possible. Over the long run, this enhanced flexibility should help minimize borrowing costs by increasing the predictability of Treasury's debt issuance. According to Canadian debt management officials, Canada used bond buybacks to minimize or smooth changes to the auction schedule not only during years of surplus but also when net borrowing needs were low. Also, because Treasury could continue to increase new issue sizes and use the proceeds to buy back older off-the-run securities that are generally less liquid,<sup>10</sup> overall market liquidity was maintained or improved.<sup>11</sup> Enhanced liquidity promotes more efficient capital markets and so reduces the government's cost of borrowing.

Buybacks can also help increase liquidity during market disruptions. For example, Treasury officials and others told us that buybacks could have provided additional liquidity to the market during the 2007-2009 financial

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<sup>10</sup>A security is "off-the-run" when it is not the most recently auctioned security of a given maturity. Conversely, an "on-the-run" security is the newest issue of its maturity. On-the-run securities are normally more liquid than their off-the-run counterparts because as securities age they find their way into buy-and-hold investor portfolios and are less actively traded.

<sup>11</sup>M.J. Fleming, "Are Larger Treasury Issues More Liquid? Evidence from Bill Reopenings" *Journal of Money, Credit, and Banking*, Vol. 34, No. 3 (August 2002, Part 2), pp. 707-735.

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crises. During that time large banks were looking to free up balance sheet capacity to take on additional risk or increase lending. A buyback program could have enabled Treasury to repurchase off-the-run Treasury securities at significant discounts and simultaneously enhance secondary market liquidity. Several primary dealers suggested that the presence of a large buyer in the market can help address, or may actually help prevent, such market disruptions. One primary dealer said that the market now assumes that securities will become illiquid over time. If the market knows that Treasury will more actively manage liquidity, it will increase overall Treasury market efficiency and investors will pay more for Treasury securities upfront, thereby reducing Treasury's borrowing costs. They noted, however, that when the Federal Reserve conducts large-scale asset purchases, it plays the role of a large buyer so the Treasury would want to avoid buying at that time.

Alternatively, buybacks can be used to build liquidity of certain benchmark issues. In 2011 Canada reintroduced buybacks of 10- and 30-year bonds to support the size of new issue auctions for those specific securities, which were generally less liquid than Canada's 2-, 3-, and 5-year securities. An official from the Bank of Canada noted that there is high demand in the 10- and 30- year sectors from pension funds and insurance companies that want to match the time frames of their assets with their liabilities.

Two of our case study countries used buybacks more extensively during periods of budget surplus. Canada and the United Kingdom used buybacks to enhance liquidity during times of surplus in the early 2000s. By concentrating debt into fewer, larger benchmark issues, governments are able to capture a liquidity premium in the market that reduces their cost of financing.<sup>12</sup> In the early 2000s the United Kingdom had a buyback program. At that time, the United Kingdom was in budget surplus and revenues were higher than the debt management office had anticipated. The Canadian government began its buyback program in 1999 and used buybacks to promote liquidity more heavily in years when net borrowing needs were lower. For example, in fiscal year 2009/2010, when net issuance was over \$100 billion, the government did not buy back any debt for the purpose of enhancing liquidity by building benchmark

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<sup>12</sup>A liquidity premium is the incremental price market participants are willing to pay for securities that are part of large issues that can be easily traded.

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securities, but in fiscal year 2002/2003, when net issuance was about \$32 billion, the Canadian government bought back over \$7 billion for liquidity enhancement.<sup>13</sup>

In the early 2000s, a period of budget surpluses in the United States, Treasury used debt buybacks to manage the maturity structure of the debt portfolio. From 2000-2002, Treasury held 45 reverse auctions to redeem securities with 10 or more years remaining to maturity.<sup>14</sup> Treasury was able to finance these buybacks by maintaining issue sizes of its benchmark securities. By redeeming longer-dated securities and maintaining issuance of its shorter-term debt securities, debt buybacks helped Treasury limit the lengthening of the average maturity of the debt portfolio. For example, Treasury reported in November 2000 that buybacks limited the lengthening of the average maturity of the debt portfolio by 2 months. Treasury manages the average maturity of the debt portfolio to balance risk and borrowing cost.

Treasury and FRBNY staff also examined several measures of the performance of Treasury's past program. For example, coverage ratios—the ratio of offers made to those accepted—for the reverse auctions ranged from a low of 2.14 to a high of 8.98; one indicator of strong market demand for buybacks.<sup>15</sup> According to Treasury officials, the coverage ratios for buybacks in calendar year 2000 were generally larger than the ratio for auctions of Treasury securities. Also, Treasury's and other's studies indicated that Treasury bought the securities back at competitive market prices.<sup>16</sup>

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<sup>13</sup>In fiscal year 2002/2003 Canada also bought back \$12.9 billion of near maturity bonds for its cash management bond buyback program and redeemed \$5.0 billion in bonds early in switch auctions. In fiscal year 2009/2010, Canada redeemed \$2.1 billion in bonds early in switch auctions.

<sup>14</sup>A reverse auction is a process in which participants submit competitive offers to sell particular Treasury securities to the Treasury.

<sup>15</sup>K.D. Garbade and M. Rutherford, *Buybacks in Treasury Cash and Debt Management*, Federal Reserve Bank of New York Staff Reports, No. 304 (October 2007).

<sup>16</sup>B. Han, F.A. Longstaff, and C. Merrill, "The U.S. Treasury Buyback Auctions: The Cost of Retiring Illiquid Bonds" *The Journal of Finance*, Vol. 62, No. 6 (December 2007), pp. 2673-2693.

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## Buybacks Can Reduce Long-Term Borrowing Costs Even if Market Conditions Make Them Costly in the Short Term

The indirect cost reduction from the impact of buybacks on overall market liquidity is not the only way in which buybacks may reduce the government's borrowing cost over time. Buybacks also provide direct savings because investors are willing to sell their older, off-the-run securities at prices lower than the market price for otherwise comparable, on-the-run securities that are generally more liquid. All of the case study countries cited reducing overall borrowing costs as a benefit of their buyback programs. Although these direct savings were not a primary goal of Treasury's prior buyback program, they were a secondary benefit. We analyzed the results of Treasury's buybacks from 2000-2002 and estimate for illustrative purposes that if Treasury had financed the prior buyback operations by issuing additional securities of the same average duration as the securities bought back and at the prevailing market interest rates of the time,<sup>17</sup> it would have paid \$3 billion, or about 3.3 percent, less than the value of the repurchased debt (see table 1).<sup>18</sup>

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<sup>17</sup>Duration is a measurement of how long, in years, it takes for the price of a security to be repaid by its internal cash flows. Duration is affected by the time remaining to maturity, the schedule of coupon payments, and the coupon (i.e., interest) rate of the security.

<sup>18</sup>Although refinancing is a useful way to estimate the potential cost savings of buybacks, Treasury's practice of regular and predictable debt issuance creates operational and timing issues that preclude Treasury's ability to simultaneously fund buybacks with new issues equal to the average duration of securities repurchased.

**Table 1: Illustrative Estimate of Long-Term Cost Savings from Financing Treasury 2000-2002 Buybacks with New Debt**

Price paid & refinancing		Long-term savings	
Price <sup>a</sup> paid for repurchased debt (equal to the dollar amount of hypothetical newly issued debt <sup>b</sup> ) (dollars in billions)	Estimated present value <sup>c</sup> of repurchased debt (dollars in billions)	Value of reduced borrowing costs (dollars in billions)	Value of reduced borrowing costs (as % of value of repurchased debt)
88	91	3	3.3%

Source: GAO analysis of data from Treasury and the Center for Research in Security Prices.

<sup>a</sup>Includes accrued interest.

<sup>b</sup>For simplicity, we assume Treasury issued new debt in the same amounts as prices paid for the repurchased debt, with the same average duration—18.6 years on average—as repurchased debt, and at par values. We also assumed that Treasury’s additional issuance would not have altered market rates, which in all likelihood they would have done.

<sup>c</sup>Discounted to present values using estimated market rates for newly issued debt on the date of each buyback operation.

Even when buybacks provide interest savings over the long term, under some market conditions they are costly in the short term. Specifically, if interest rates at the time of the buyback are lower than the coupon rates on the securities being bought back, Treasury will have to pay a premium over the par value of the securities. In the 2000-2002 buyback program, Treasury paid \$87.3 billion to buy back \$67.5 billion in outstanding securities. The \$19.8 billion premium Treasury paid was a cost to Treasury during the buyback period. However, this premium was more than offset by reduced borrowing costs over the long term because Treasury avoided paying higher coupon rates for the remaining term of the bond. In contrast, if interest rates at the time of a buyback are higher than the coupon rates on the securities subject to buyback, Treasury would be able to buy back the securities at a discount from their par value. Such buybacks would show cost savings in the short term, but these savings would be offset by the payment of higher coupon rates on the newly issued bond over the long term. Regardless of the premium or discount paid during the buyback period because of relative interest rates, the key savings of a buyback program arise from being able to purchase older, off-the-run securities at a lower price because of their illiquidity relative to new issues.

The premium paid to buy back securities is recorded as a cost in the financial statements, but it does not affect the budget deficit or surplus. Budgetary treatment is neutral in that any premium or discount would be

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recorded as a “means of financing” in the year of the buyback and does not affect the budget deficit or surplus. Financial accounting, however, records the immediate loss or gain in the year of the buyback since financial statements provide information on the operating cost of government for a single year.<sup>19</sup> Over time both the financial statement and the budget would reflect lower borrowing costs, but the reduction would not be shown as attributable to any buyback program. Some of the case study countries take a different approach to accounting for buyback premiums and losses. For example, for its cash basis bond buybacks, Canada amortizes the buyback premium or discount over the remaining term-to-maturity of the security bought back or the related issuance, whichever is shorter. Such an approach would not be consistent with U.S. financial accounting standards.

Overall, market participants we spoke with thought a U.S. buyback program could help Treasury maintain a more liquid and efficient market and address market disruptions. One explained that the announcement of Treasury’s ability and willingness to use a buyback program to address illiquidity or potential market disruptions might actually help prevent such disruptions. Market participants would be assured that there is a large and consistent buyer of illiquid securities, which increases confidence in the Treasury market. We heard from primary dealers that having a large buyer in the market helps to maintain liquidity of outstanding securities. For example, three primary dealers noted that the Federal Reserve’s large-scale purchases of Treasury securities from 2009 through 2011 helped to enhance the liquidity of Treasury securities.<sup>20</sup>

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<sup>19</sup>U.S. generally accepted accounting principles state that gains and losses shall not be amortized into future periods (see Federal Accounting Standard Board codification 470-50-40-2).

<sup>20</sup>The Federal Reserve’s large-scale asset purchase program involves purchasing hundreds of billions of dollars of long-term Treasury securities and other financial instruments (e.g., mortgage-backed securities) to help bolster the economy. These purchases result in a reduction in interest rates, which reduces businesses’ cost of borrowing to finance new investments. For an analysis of the liquidity effects of the Federal Reserve’s earlier asset purchases, see J. Gagnon, M. Raskin, J. Remache, and B. Sack, “Large Scale Asset Purchases by the Federal Reserve: Did They Work” *Federal Reserve Bank of New York Staff Reports*, No. 441 (March 2010).

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## A Well-Designed Buyback Program Can Promote Lowest-Cost Financing over Time

If and when Treasury decides to reinstitute a buyback program, it would again need to make decisions about operational features, which may vary depending on the purpose of the program. The key questions include the method for determining the price of repurchased securities paid by the government, schedule of buyback operations, communication about purpose and timing, eligible participants, and the securities targeted for early redemption.

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## Reverse Auction Method for Determining Security Prices Is Most Consistent with Treasury's Debt Management Principles, but Carefully Designed Bilateral Trades May Also Be Feasible under Certain Conditions

The price paid by the government is determined in part by the method in which buyback operations are conducted. Our case study countries use two different methods to buy back outstanding debt—reverse auctions and bilateral trades. Reverse auctions are transactions where securities are bought back in a competitive bidding process that provides equal access to eligible participants. In contrast, bilateral trades are transactions between a government's debt management office and specific holders of a security. In most of our case study countries, the price in a bilateral trade is either set up front by the debt management office or determined by offers in the secondary market. As conducted in our case study countries, bilateral trades are less transparent than reverse auctions. In reverse auctions, the targeted amount and eligible securities are announced in advance of the auction and the results are announced shortly after the auction. The amount purchased through bilateral trades in other countries is typically subjected to the debt management office's discretion and the results are not typically reported.

Of these two methods, reverse auctions are more consistent with Treasury's principles, which emphasize transparency and equal access in its transactions. Treasury used reverse auctions from 2000-2002. If, however, there are debt management challenges for which bilateral trades might be more useful than reverse auctions, certain features of bilateral trades could be modified to make such an approach more consistent with Treasury's debt management principles. For example, because market disruptions are unforeseen, it could be difficult to set up a reverse auction in such a circumstance. Bilateral trades could be useful to address certain unforeseen market disruptions because they could be conducted on short notice. Other countries have said that bilateral trades are more flexible and can be used to achieve this purpose. In addition, Treasury could use bilateral trades to buy back the most illiquid securities.

All our case study countries except Germany use or have used reverse auctions to manage their outstanding debt; Germany, France, and the United Kingdom currently use bilateral trades (see table 2).

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**Table 2: Buyback Methods Used by Case Study Countries**

<b>Country</b>	<b>Reverse auction</b>	<b>Bilateral trades</b>
Canada	X (currently)	
France	X (2000-2006)	X (currently)
Germany		X (currently)
United Kingdom	X (2000-2001)	X (currently)

Source: GAO analysis.

The French government used reverse auctions from 2000-2006 to manage its outstanding debt but now uses bilateral trades because it sees them as more flexible and easier to conduct than reverse auctions. These are not announced in advance. Rather, the primary dealers are generally aware of the debt management office's interest in buybacks and the debt management office purchases bonds over the counter when they receive offers. The current financing rate is the limit on what it would pay to buy back a security. Agence France Tresor officials told us that the flexibility of bilateral trades helps them to minimize borrowing costs.

Bilateral trades are also used by both the British and German governments. To smooth cash flow, the British government currently repurchases securities with only 6 months left to maturity. The U.K. Debt Management Office makes an offer in response to a request from a primary dealer; neither the price nor the results of individual trades is publicly reported. The Debt Management Office's offer takes into account money market conditions and its prevailing cash position. The British government used reverse auctions from 2000-2001 to maintain the liquidity of benchmark issues during a time of budget surplus. Officials from the U.K. Debt Management Office told us they reserve the right to reintroduce reverse auctions if deficits decline. The German Finance Agency is an active participant in the secondary market for German government securities and regularly uses bilateral trades to help smooth maturity peaks, enhance liquidity of specific bonds, and reduce government borrowing costs. The German Finance Agency does not announce the purpose or specifics of its buybacks in advance and does not report results of the bilateral trades. It determines which bonds to buy back based on market prices and the liquidity and maturity dates of the bonds.

Treasury has not conducted bilateral trades for its debt management operations in recent history, but this year it used them for the more limited purpose of selling certain assets. In March 2011 Treasury began selling

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its portfolio of mortgage-backed securities worth \$142 billion, at a rate of up to \$10 billion per month, as market conditions permit. These transactions are conducted on Treasury's behalf by a third party vendor. Eligible buyers can make offers for specific securities and the third party that manages the program has the option of accepting or declining their bids with a goal of maximizing value for the taxpayer. Treasury sees this method as appropriate for obtaining the best return for the taxpayer in selling the mortgage-backed securities.

It may not be feasible to provide the same amount of transparency, regularity, and predictability for bilateral trades as is done for reverse auctions in part because of the different nature of the debt management challenges for which bilateral trades are most likely to be useful in the United States. However, certain features of bilateral trades used by other countries could be modified to make bilateral trades more consistent with Treasury's debt management principles. First, the creation of a bilateral trade capability or facility could be announced in advance; the advance announcement could include the purposes of such a program and information on the circumstances in which it might be used. The announcement would need to be clear on how prices would be set in the absence of a competitive bidding process. For example, prices could be tied to the secondary market. Second, the results of the bilateral trades—including the amount bought back and the average price paid—could be publicly reported, similar to what is reported for regular and reverse auctions.

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### Regularly Scheduled Buybacks Promote Predictability

Just as regular and predictable auctions provide investors with greater certainty and better information with which to plan their investments, participation in any buyback program would be encouraged by a regular schedule and advance communication. During 2000-2002, Treasury used buybacks in part to limit the accumulation of large cash balances. Treasury generally held two reverse auctions in the second half of the month when cash balances were generally higher, with a few exceptions.<sup>21</sup>

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<sup>21</sup>Of the 45 reverse auctions, 7 auctions were held in the first half of the month. In 7 of the 26 months that the buyback program was active, Treasury held more or fewer than 2 auctions per month.

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Adding regularly scheduled buyback auctions to Treasury's auction schedule might seem to present a challenge. The frequency of Treasury auctions has increased in recent years along with borrowing needs. Treasury conducted 269 public auctions in 2011, up from 220 auctions in 2007. In November 2011, for example, an auction was held most business days of the month (see fig. 4). Both Treasury and primary dealers noted that it is best to avoid days when the Treasury market could be volatile, such as days when key economic data are released. Additionally, Treasury should consider when the FRBNY conducts open market operations to sell or purchase Treasury securities from primary dealers. Treasury also prefers not to conduct auctions on Fridays or around holidays because of low trading volume.<sup>22</sup>

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<sup>22</sup>FRBNY has the responsibility of conducting open market operations on behalf of the Federal Reserve.

**Figure 4: November 2011 Auction Schedule**

Sun	Mon	Tues	Wed	Thu	Fri	Sat
		1 4-week bill	2	3	4	5
6	7 13- & 26-week bills	8 4-week bill & 3-year note	9 10-year note	10 30-year bond	11 Holiday: market closed	12
13	14 13- & 26-week bills	15 4- & 52 week bills	16	17 9-year & 8-month note	18	19
20	21 13- & 26-week bills 2-year note	22 4-week bill 5-year note	23 7-year note	24 Holiday: market closed	25	26
27	28 13- & 26-week bills	29 4-week bill	30			

Source: GAO analysis of data from [www.treasurydirect.gov](http://www.treasurydirect.gov).

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Most of the primary dealers with whom we spoke emphasized the need for predictability of reverse auctions. This is especially important because, as some market participants noted, if they were sufficiently convinced that a buyback program marked a change in Treasury's regular and predictable framework, it could actually result in higher borrowing costs. Some market participants suggested that Treasury hold reverse auctions on the same day as regular auctions. This is similar to a practice used in Canada. The Canadian government conducts its cash basis bond buyback auction, which is used to maintain auction sizes and thereby enhance liquidity of securities, on the same day as its standard auctions. The bidding deadline for the buyback program is 20 minutes after the deadline of its standard auction. The Canadian debt management officials said the close timing reduces market risk for the participants.<sup>23</sup> Treasury officials said that while this would be possible it would require coordination with the market and the FRBNY so that auctions are conducted at a time when they would get complete dealer participation as well as not interfere with scheduled open market operations.

While bilateral trades conducted in other countries were not done on a regular schedule, they could be implemented in a manner that is consistent with Treasury regular and predictable principles. For example, Treasury could communicate with the market the rules for bilateral trades, including explicit criteria for the purpose of the program, how securities would be selected, and how prices would be determined. Such a format would allow participants to anticipate when such an operation might be used and plan accordingly.

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### Participation Is Promoted by Clarity of Program Purpose and Timely Announcements of Buybacks

Most of the market participants we spoke with said that transparency about the purpose would be important for any buyback program. They suggested that Treasury officials clearly announce the purpose of the buyback program well in advance to promote broad participation and more competitive bidding. By understanding the purpose of the program, especially in times of budget deficit, market participants could better predict when the buyback program would be used and the type of securities that might be targeted.

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<sup>23</sup>Market risk arises, in part, from changes in the level of interest rates.

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As with regular auctions, market participants said the specific details of an auction such as the securities eligible for buyback should be announced in advance, similar to Treasury's past practice and the FRBNY's large-scale asset purchase program from 2009 through 2011. Treasury used a phased announcement for its previous buyback program. In January 2000, Treasury announced that it would conduct a buyback program to maintain benchmark issue sizes and limit the lengthening of its portfolio. It said it would purchase as much as \$30 billion of securities with substantial remaining maturity through reverse auctions in calendar year 2000. As part of each quarterly refunding statement Treasury then announced both its expected funding requirement and the amount it would buy back for that quarter or year. For example, on November 1, 2000, Treasury announced that it would buy back \$9 billion in securities during the January to March, 2001 quarter. Treasury then announced more specific details—on the maximum amount and the specific securities eligible for repurchase—1 or 2 days before each auction.

Literature suggests that the length of time between the announcement and the actual auction can affect the prices that Treasury pays to repurchase the security.<sup>24</sup> Some market analysts suggest that the market prices of the securities increase between the time of the announcement and the morning of the buyback operation—the so called “announcement effect” which would suggest that a shorter announcement period would be beneficial. However, market participants said that a longer period between the announcement and the buyback operation is beneficial to the market because it gives the market time to find holders of the securities and determine prices and is consistent with Treasury's standard auction practices. One primary dealer said that the longer announcement period might reduce a run-up in the prices of the securities because it would allow more time for price discovery.

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### Broadening the Eligibility for Bidding in Reverse Auctions Is Consistent with Treasury's Principle of Equal Access

Treasury officials have said that greater participation in its debt auctions fosters competition, thereby helping achieve its goal of lowest cost borrowing over time. Regular Treasury auctions are open to all market participants consistent with Treasury's principle of providing equal access for transactions. However, participation in reverse auctions could be

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<sup>24</sup>See K.D. Garbade and M. Rutherford, *Buybacks in Treasury Cash and Debt Management*, Federal Reserve Bank of New York Staff Reports, No. 304 (October 2007).

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limited because of current operational constraints. Direct participation in the 2000-2002 reverse auctions was limited to primary dealers largely due to system limitations. Because the buyback program was implemented quickly, Treasury used an existing Federal Reserve system, Trading Room Auction Processing System (TRAPS), which was capable of doing reverse auctions; it, however, could only accept bids submitted by primary dealers. Other investors could make offers to sell their Treasury securities in the reverse auctions through the primary dealers. Treasury officials said that the period of time between the announcement and the auction was sufficient for these other investors to participate through the primary dealers.

The more recently developed Treasury Automated Auction Processing System (TAAPS) used for standard auctions can accept bids from both primary dealers and direct bidders,<sup>25</sup> but it cannot currently conduct reverse auctions. Treasury officials told us it would take a year and a half to add this new functionality to TAAPS. Since the time of the prior buybacks, the Federal Reserve has replaced TRAPS with FedTrade, which has the capacity to conduct transactions, including reverse auctions, with a limited number of direct bidders; its capacity is greater than the number of primary dealers but not large enough to open up to all market participants. A decision by Treasury to expand eligibility for bidding in reverse auctions would require either TAAPS or FedTrade to be modified or Treasury to develop a process for determining which institutions beyond the 21 primary dealers would be allowed to participate in buyback auctions.

Expanding eligibility and allowing for broader participation in any future buyback auctions could reduce prices Treasury would have to pay. Furthermore, large investors with whom we spoke said it would be important for them to have the option of bidding directly. However, there are countervailing issues. The first is operational; auction resources and staffing would likely increase when Treasury sends people offsite to monitor auction operations, which was necessary during the previous buyback auctions. Also, because Treasury would have less control over

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<sup>25</sup>Direct bidders are financial institutions that, like primary dealers, can bid for and buy Treasury securities competitively at auction directly from Treasury instead of in the secondary market. Unlike primary dealers, direct bidders are not required to participate in all Treasury auctions. Most Treasury securities are bought at auction by primary dealers. A much smaller, but growing volume of securities is purchased by direct bidders.

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the delivery of securities than in a regular auction, Treasury would have to determine its likely response if successful bidders delay delivery or fail to deliver the agreed upon security on the agreed upon date. Another consideration has to do with market behavior. The majority of the primary dealers with whom we spoke said that expanding the auction to all participants could increase uncertainty about market demand and lead them to bid less aggressively, which could result in lower prices for the securities auctioned. In previous work, we have noted primary dealers' concerns about the volume of direct bidding in auctions.<sup>26</sup> In contrast, investors we spoke with supported broader participation, noting the benefits to Treasury of competition among holders. These disparate views suggest that the effects of broader participation need further exploration.

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### Targeting Fewer Securities and a Narrower Maturity Band Is Important

The number of securities eligible for buybacks can affect the competitiveness of dealers' bidding and consequently the cost of the buyback operation. For example, the Canadian government found it beneficial to limit buybacks to a predetermined size because when the announced size is too large relative to demand, dealers bid less aggressively. For the cash management bond buyback auctions the Canadian government made illiquid bonds ineligible in an effort to control the size of the auction and found that having 10-12 bonds eligible in each operation is a good number. Treasury made 51 bonds eligible for buybacks over the course of the previous program. However, Treasury officials found it more cost effective to limit the size of an operation to not more than \$2 billion and the set of eligible bonds to about 10-12 issues. When determining the size of the buyback operations, Treasury also considered the tradable supply of the eligible securities to encourage participation. One primary dealer said that having too many eligible securities available complicates the bidding process and creates more manual work. An analysis of previous Treasury buyback auctions shows that Treasury's buyback costs could increase with a large number of bonds included in the auction.<sup>27</sup> Treasury's analysis of the buybacks in 2000 found that Treasury generally paid market prices for the securities it

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<sup>26</sup>[GAO-10-498](#).

<sup>27</sup>B. Han, F.A. Longstaff, and C. Merrill, "The U.S. Treasury Buyback Auctions: The Cost of Retiring Illiquid Bonds" *The Journal of Finance*, Vol. 62, No. 6 (December 2007), pp. 2673-2693.

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bought back except for the auction in which 26 securities were eligible for repurchase. This auction was relatively expensive, but Treasury said it provided valuable information on the ability of market participants to make many simultaneous bids.

The competitiveness of dealers' bidding and consequently the cost of the buyback operation can also be affected by the type of securities eligible for buybacks. The primary dealers with whom we talked suggested that Treasury narrow the eligible securities to a specific sector or specific maturity at each auction. One suggested the bands of eligible securities be narrower for longer-term securities. Another primary dealer said that a wide range of maturities at the long end of the curve complicates the bidding process and could reduce the competitiveness of bids. Because the prices of longer-term securities are more sensitive to changes in the yield, changes in market yields during the bidding period require larger and wider ranging changes to the prices they would offer for a security. In the 2000-2002 buyback program, Treasury generally narrowed the range of eligible securities for each auction to securities maturing within 6 years or less of one another.

The securities selected for any buyback in the United States and other countries were based on the goal of the program. For example, the goals of the 2000-2002 buyback program were to limit the increase of the average maturity of the portfolio, which could result in unnecessarily high interest costs, and to enhance the liquidity of Treasury's benchmark securities, which market participants value. Treasury generally targeted off-the-run 30-year bonds with over 10 years remaining to maturity so that it could maintain issuance of its benchmark securities while maintaining the average maturity of its portfolio. The Canadian government also selects the securities eligible for repurchase based on the purpose of its buyback program. For example, the purpose of Canada's cash management bond buyback program is to smooth maturity peaks; therefore, Canada targets bonds with 18 or fewer months remaining to maturity. Canada reintroduced cash basis bond buybacks to support auction sizes and enhance liquidity for the 10- and 30-year bond as they were generally less liquid than the 2-, 3- and 5-year sectors. For this program, Canada targets illiquid high-coupon bonds and specifically excludes current issues being built as benchmarks.

The market participants we spoke with said that the securities targeted for any buyback should be clearly aligned with Treasury's goals for the program. While they understood that Treasury needed to adjust issuance

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in order to manage its long-term debt, they said that sporadic purchases of securities could confuse the market and would not be well received.

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## Switches and Debt Exchanges Could Also Be Used to Manage Rollover Peaks and Help Maintain Liquidity

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### Switches Can Help Manage Maturity Peaks and Address Future Liquidity Issues

Our case study countries have used a debt management tool called a switch for purposes similar to those of buybacks, including managing the maturity profile and helping to enhance liquidity of benchmark issues.<sup>28</sup> In a switch, the government buys back an outstanding security prior to maturity and delivers a reopened<sup>29</sup> liquid benchmark security via a competitive switch auction.<sup>30</sup> Bidders submit offers based on how much of the outstanding security they are willing to sell for the reopened benchmark security.<sup>31</sup> The government uses the bids to determine the

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<sup>28</sup>The U.S. Treasury used similar tools called exchange offerings and advance refundings in the 1950s and 60s. For more information, see K.G. Garbade, *The Emergence of "Regular and Predictable" As a Treasury Debt Management Strategy*, FRBNY Economic Policy Review (March 2007).

<sup>29</sup>In a security reopening, the government issues additional amounts of a previously issued security. The reopened security has the same maturity date and coupon interest rate as the original security, but with a different issue date and usually a different purchase price.

<sup>30</sup>In Canada, a small cash transaction adjusts for the premium or discount. The cash may be paid by the Canadian government or the successful bidder, depending on whether the outstanding or reopened security was more valuable.

<sup>31</sup>Bids for switches in the United Kingdom were for the amount of the outstanding security offered and the price for the reopened security. In France, bids were submitted as an exchange ratio. For example, the mean exchange ratio for its auction in 2008 was 82.57 securities bought back for 100 securities issued. In Canada, bids included the amount of outstanding securities offered and the difference in yields between the outstanding and reopened securities.

exchange ratio and thus the amount of the benchmark security each successful bidder receives.

The Canadian government has conducted switches as part of its regular auction schedule since 2002. Canada first used switches to maintain new issuance sizes during a budget surplus but has since focused more on enhancing liquidity and managing the maturity profile. For example, when cash-based buybacks were scaled back due to higher financing requirements in 2008-2010, the government continued to use switches to maintain liquidity in longer-term maturities. Canadian switches provide market participants with more frequent access to benchmark bonds. France and the United Kingdom have used switches on a more limited basis. France used a switch in 2008 to promote liquidity of 30-year bonds in response to a strong demand from investors. The United Kingdom conducted switch auctions of securities with similar terms to maturity from 1999 to 2001, during a period of budget surplus to maintain the supply of current benchmark securities in a low issuance environment and to manage maturity peaks. U.K. officials told us that switches remain available as a debt management tool, though there are no current plans to use them.

Table 3 shows the results of a switch in Canada (in Canadian dollars or CAD). In September 2011, the government repurchased and retired portions of two securities with less than 2 years remaining to maturity and delivered a reopened 2-year note.

**Table 3: Results of Canadian Switch Auction Held on September 28, 2011 (amounts in CAD)**

<b>Securities repurchased</b>		
Coupon rate	Maturity date	Amount repurchased
3.5%	June 1, 2013	\$1.17 billion
5.25%	June 1, 2013	\$0.05 billion
<b>Security reopened</b>		
Coupon rate	Maturity date	Amount issued
1.5%	November 1, 2013	\$1.0 billion

Source: Bank of Canada announcement of switch operation results.

Note: The amount of new bonds issued through switches does not necessarily equal the amount of old bonds bought back through those operations because the exchange is not based on par value, but rather is on a duration-neutral basis.

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In Canada, switch issuances are a small amount of total gross issuance. For example, in 2009-2010, the Canadian government used switches to issue \$2.3 billion CAD of its total gross issuance of \$102.2 billion CAD. The Canadian government tends to buy back a smaller amount through switches than it does through its regular buyback programs. For example, in 2009-2010, the Canadian government bought back \$2.1 billion CAD using switches and \$10.3 billion CAD using buybacks.

Switches can help maintain a liquid Treasury market. Some market participants we spoke with said that the current Treasury market was liquid and did not need an additional tool such as a switch to address liquidity. Nevertheless, both Treasury officials and most market participants we spoke with said that switches could help address future liquidity problems in individual securities or types of securities. For example, switches could help avoid disruptions in the Treasury market, which occur when any security is difficult to trade (i.e., illiquid), by targeting those securities for early redemption. One primary dealer we spoke with said switches that target specific securities could also increase liquidity across the entire Treasury securities market—a benefit to Treasury and investors—because participants would know that Treasury would be willing to make an exchange for their securities if they became highly illiquid. However, most market participants we spoke with said Treasury should limit the amount of the outstanding supply bought back to help ensure the security remains liquid enough to trade. The United Kingdom limits the repurchase quantity such that the amount repurchased does not reduce the amount outstanding to less than £4.5 billion.

Switches have been successful at enhancing liquidity in Canada. Participants in the Canadian debt market who were consulted by the debt management office reported that, as of 2009-2010, the liquidity of long off-the-run bonds had improved significantly due to switches of longer-term maturities.<sup>32</sup> Switches aimed at enhancing liquidity may achieve a secondary benefit of maintaining or reducing debt financing costs over time because bidders tend to pay higher prices for more liquid securities.

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<sup>32</sup>The Canadian government securities market is smaller and has had more of a challenge maintaining liquidity than the U.S. market.

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Switches that are duration-neutral could have the added advantage of broadening Treasury's investor base.<sup>33</sup> Duration-neutral switches minimize market risk because interest rate changes affect both securities similarly. They are also attractive to investors because duration-neutral switches allow them to maintain portfolio duration. Canadian switches are duration-neutral and therefore reduce participants' market risk at repurchase operations. There is broad interest in maintaining portfolio duration among investors in the Canadian government securities market, according to a Canadian government official. There are also such investors in the U.S. Treasury securities market. For example, one primary dealer we spoke with said that some investors have essentially asked them to broker duration-neutral exchanges involving the securities they offered to the Federal Reserve during its large-scale asset purchase program from 2009 through 2011.

Most market participants we spoke with said that any new Treasury program should be designed consistent with Treasury's principles of regularity and predictability. Treasury has been successful with and the market is accustomed to this approach. Implementing a switch program would also require consideration of the operational features below:

- Operating system: Neither Treasury's nor the Federal Reserve's auction systems support switch auctions. According to a Treasury official, Treasury could develop its own system to include switch auction capability or use the FedTrade system operated by the Federal Reserve, if the Federal Reserve modified that system. FRBNY officials told us that they would need to modify FedTrade to support switch auctions or develop or procure a new system that supports switch auctions.
- Scope of eligible bidders: As in their conventional auctions, the Canadian and U.K. governments limit direct participation in switch auctions to certain government-registered traders. The U.S. primary dealers with whom we spoke generally preferred limiting auction participation to primary dealers. However, the U.S. Treasury has a broader scope of direct bidders in its conventional auctions, consistent with its principle of equal access and objective to appeal to a broad

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<sup>33</sup>Because duration indicates how long, in years, it takes for the price of a security to be repaid by its internal cash flows, it measures the price sensitivity of a security to interest rate changes.

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investor base. (The earlier discussion about participation in buybacks is also applicable here.)

- Auction schedule: A switch auction would need to fit into Treasury's regular auction schedule. Market participants we spoke with suggested following Treasury's practice of regular auctions. The Canadian government holds switches of 30-year bonds during quarters in which there are no conventional 30-year bond auctions. (The earlier discussion about buybacks via reverse auction is also applicable here.)
- Announcements: Most market participants stated that Treasury could maintain its transparency by clearly communicating the purpose of a switch program. Consistent with Treasury's practice of announcing its auction schedule on a quarterly basis and announcing the specific securities it will auction several days in advance of the auction, the Canadian and U.K. governments publicly announce the details of their switch auctions. For example, the U.K. Debt Management Office announces the date of and securities involved in a switch auction in its quarterly auction announcement and, approximately 1 week prior to the auction date, announces the maximum amount of the outstanding security it is willing to buy.
- Targeted securities: Program goals and expected participation both influence the selection of securities for a switch. For example, Canada currently reopens 30-year bonds in exchange for buying back more illiquid longer-end bonds in line with its goal to promote liquidity in the long end of the maturity profile. One primary dealer we spoke with said that investors must be interested in purchasing the security being reopened, as well as hold the eligible outstanding security. Another primary dealer noted that participation may be limited if buy-and-hold investors hold a large portion of the eligible outstanding security, since they would be less likely to trade their securities.
- Rules for switch operations: Treasury's rule for buyback operations covers exchanging a security for cash but does not cover exchanging two securities. According to a Treasury official, Treasury would need to modify the existing buybacks rule or issue a new rule.

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### A Variation on Debt Exchanges Could Help Address Sudden Illiquidity Issues

A debt exchange is an exchange of securities whereby the government buys a certain amount of outstanding securities in exchange for the delivery of a certain amount of reopened benchmark securities at an exchange ratio set by the government. The U.K. government used debt exchanges from 1998 to 2002 to retire illiquid securities and build the size

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of new benchmarks.<sup>34</sup> The debt exchanges began upon initial announcement and continued for 3 weeks. Results were announced on the following business day, including the total amount of the outstanding security repurchased by the government, the total amount outstanding in the market, and the coupon rate and total amount of the reopened security issued.

Debt exchanges as conducted in the United Kingdom carry market risk to the government. Because the exchange ratio was fixed at the start of the exchange, the government was exposed to changes in the market value of the eligible securities that occurred during the length of time the securities were eligible for exchange. Market participants we interviewed agreed that debt exchanges would increase the government's risk exposure. A variable—rather than fixed—exchange ratio tied to movement in secondary market prices would reduce the risk associated with changing market prices and maintain transparency by having a government-announced exchange ratio.

In the United States, debt exchanges could be used to maintain or enhance liquidity on an ongoing or as-needed basis to address sudden illiquidity issues that a preannounced auction could not. We have previously reported that a wide-scale financial market disruption may require Treasury to take actions outside of its regular and predictable schedule.<sup>35</sup> However, they would need to be modified to fit Treasury's regular and predictable principles, including informing the market in advance of its plans to buy or sell debt. For example, the government could operate a regular or ongoing debt exchange via an open window with the market provided the Treasury publicly announces the purpose of the program and the securities it will exchange.

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## Conclusions

The U.S. Treasury market is the deepest and most liquid sovereign debt market in the world. Nevertheless, Treasury faces a number of debt management challenges, including some that may not be foreseeable at

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<sup>34</sup>The securities the U.K. government selected for buyback had an amount outstanding below a set threshold.

<sup>35</sup>See GAO, *Debt Management: Backup Funding Options Would Enhance Treasury's Resilience to a Financial Market Disruption*, [GAO-06-1007](#) (Washington, D.C.: Sept. 26, 2006).

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this time. Given the market uncertainties and the federal government's fiscal challenges, increasing Treasury's capabilities to respond to changing market conditions or potential disruptions in ways that minimize costs would be prudent. Buybacks are one such capability. Other countries have ongoing buyback programs—even in times of deficit—to address challenges, including rollover peaks, which the U.S. Treasury faces in the next several years. A buyback program would allow Treasury to maintain current issuance levels even as net borrowing needs decline. This would permit more gradual changes to the auction schedule and reduce rollover peaks. A buyback program could also help enhance liquidity, address market disruptions, and, as Treasury's previous experience shows, reduce borrowing costs over the long term. Building the capability to use switches and debt exchanges would provide Treasury additional flexibility to respond to changing market conditions, as well as the potential to broaden its investor base by appealing to investors that want to maintain the average maturity of their portfolios in ways that minimize market risk.

The design and implementation of any of these debt management tools has implications both for Treasury's ability to minimize borrowing costs over time and for the Treasury market in general. Several features of Treasury's previous buyback program were driven by the sudden need for a buyback program and Treasury's lack of experience at the time with such a program. Building the capacity to conduct a buyback program now can help ensure that Treasury is prepared to respond with a well-designed program using features similar to its regular auctions and consistent with its debt management principles. While the competitive bidding process of reverse and switch auctions is beneficial when the Treasury has sufficient advance notice to plan an auction and notify the market, bilateral trades or debt exchanges may provide Treasury with greater ability to respond to sudden illiquidity issues that would benefit from Treasury acting quickly. Treasury could examine ways to modify certain features of bilateral trades and debt exchanges to better align with Treasury's long-standing principle of transparency. A regular schedule of buyback or switch operations would help Treasury maintain its reputation of predictability, which the market values. Also important to predictability would be a clear communication about the purpose of the program, so that the market could anticipate the timing and securities targeted for early redemption. While the benefits of expanding eligibility for direct bidding in reverse and switch auctions to all auction participants need further exploration, it would be prudent to build in the capacity up front because allowing all market participants to directly participate would be consistent with Treasury's principle of equal access. Finally, while the

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securities selected for any buyback program would be tied to the purpose of the program, both past experience and market participants suggest that Treasury would benefit from targeting a limited number of securities at each auction and targeting a narrower band of maturities, particularly for longer-term maturities.

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## Recommendations for Executive Action

Treasury should build the capacity for a buyback program that could be used to respond to potential changes in market conditions during times of deficit. Such a program should allow for broader direct participation beyond the primary dealers. In conducting any buyback operations Treasury should

- clearly articulate the purpose of the buyback program,
- conduct the buyback reverse auctions on a regular and predictable schedule consistent with the purpose of the buyback program, and
- target a few securities in narrow maturity bands at each reverse auction.

To further increase Treasury's flexibility to respond to potential changes in market conditions and improve its ability to continuously maintain liquidity among outstanding securities, Treasury should build the capacity for a switch auction program. In building this capacity, Treasury should allow for direct participation beyond the primary dealers. If Treasury chooses to implement a switch auction program, it should

- clearly articulate the purpose of the switch auction program and
- conduct the switch auctions on a regular and predictable schedule consistent with the purpose of the program.

To ensure that Treasury has the flexibility to respond to sudden and wide-scale market disruptions, Treasury should develop the capacity to use bilateral trades or debt exchanges. It would be especially important to carefully consider the design of such a program to ensure that the features of the program are consistent with our recommendations related to buybacks and switch auctions and consistent with Treasury's long-standing debt management principles. For example, the price-setting principle should be transparent and results of any activities should be reported to the market.

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## Agency Comments and Our Evaluation

We provided a draft of this report to the Secretary of the Treasury and Federal Reserve officials for comment. In oral comments from the Treasury Deputy Assistant Secretary for Federal Finance, Treasury

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concluded with our analysis and findings and said the report would be very helpful in analyzing tools that increase their flexibility for responding to changes in market conditions. Treasury and Federal Reserve officials also provided technical comments that were incorporated, as appropriate.

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We are sending copies of this report to interested congressional committees, the Secretary of the Treasury, and other interested parties. In addition, the report is available at no charge on the GAO website at <http://www.gao.gov>.

If you or your staff have any questions concerning this report, please contact Susan J. Irving at (202) 512-6806 or [irvings@gao.gov](mailto:irvings@gao.gov). Contact points for our Offices of Congressional Relations and Public Affairs may be found on the last page of this report. GAO staff making key contributions to this report are listed in appendix II.

Sincerely yours,



Susan J. Irving  
Director for Federal Budget Analysis  
Strategic Issues

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# Appendix I: Objectives, Scope, and Methodology

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As part of our ongoing work on debt management issues and under the Comptroller General's authority, we examined debt buybacks—a debt management tool that enables debt managers to actively manage the mix of outstanding Treasury securities by redeeming particular marketable securities prior to their maturity dates using a voluntary process. They are used in other countries to address debt management challenges but are not currently used in the United States. Specifically, we assessed (1) the budget and market conditions under which debt buybacks could help Treasury achieve its debt management goals, (2) the operational features of buyback programs that would support these goals, and (3) other debt management tools used by case study countries to achieve objectives similar to those of a U.S. buyback program.

To address these objectives, we examined Treasury's 2000-2002 buyback program as well as the buyback programs and similar debt management tools used in Canada, the United Kingdom (U.K.), France, and Germany. We selected case study countries whose practices and experiences with debt buybacks and other debt management tools used for similar purposes could provide useful insights about the potential benefits and risks of a debt buyback program for the United States. We selected countries that are members of the Organisation for Economic Co-operation and Development (OECD) and whose sovereign debt markets are most similar to the United States in terms of size and liquidity. We determined that, for our purposes and considering resource constraints, four is a sufficient number of case study countries.

We determined that a nongeneralizable sample is sufficient for our purposes because we will use the case study information to describe aspects and understand the context of the use of buybacks and other debt management tools, as well as to provide illustrative examples of our findings. The experiences of any one country are not necessarily generalizable to other countries. In analyzing other countries' experiences and identifying useful insights for the United States, it is important to consider the differences between the countries. For example, the public sector debt within the purview of the national debt management office varies among countries depending on the nature of their political and institutional frameworks. Furthermore, the United States has the world's largest economy, flexible markets, and stable economic and political systems. Some officials and market participants we interviewed noted that the Canadian sovereign debt market is much smaller than the Treasury market and has had more of a challenge maintaining liquidity. We previously reported that some debt management tools used abroad may be difficult to implement in a way consistent with U.S. values of

transparency, predictability, and equal access or may require the government to assume credit risk.<sup>1</sup>

To examine Treasury's past buyback program, we reviewed literature evaluating the program and related aspects of the Treasury market, analyzed the cost of the buybacks, and interviewed agency officials and others. We analyzed the cost of Treasury's past buybacks, including the extent to which Treasury could have reduced its interest costs over the long term had it financed its buybacks by simultaneously issuing new debt. To illustrate how much Treasury could theoretically have reduced its interest costs through such actions, we compared published auction results of the buyback operations Treasury conducted from March 2000 through April 2002 against Treasury note and bond secondary market price data from the Center for Research in Security Prices (CRSP) U.S. Treasury Database for the same periods.<sup>2</sup> Specifically, we calculated the invoice prices paid by Treasury for each auction.<sup>3</sup> We then simulated market rates that Treasury could theoretically have attained on the dates of the buybacks by extracting yield curves from forward rates based on the secondary market prices of on-the-run 2-year notes, 5-year notes, 10-year notes, and 30-year bonds, as well as market rates for 4-week bills.<sup>4</sup> We assumed that on the date of each buyback auction Treasury could have issued new debt with various terms to maturities subject to these simulated rates (1) in total face value amounts equal to the total invoice prices paid per buyback auction, and (2) in combinations such that the average duration (weighted by amount issued) matched that of the

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<sup>1</sup>[GAO-02-14](#).

<sup>2</sup> We obtained the secondary market price data from the CRSP U.S. Treasury Database through Wharton Research Data Services in April 2011.

<sup>3</sup>The invoice price is the actual price paid for a security and consists of the published price (known as the clean price) plus any interest accrued from the last coupon payment. We use the invoice price because this reflects the actual amount Treasury paid and would need to be covered with new debt issues in order for the transactions to be cash-neutral on net.

<sup>4</sup>A forward rate is the expected interest rate for some future period implied by current interest rates. We formed yield curves extending from 4 weeks to 30 years. Because on-the-run 30-year bonds in our analysis periods generally had terms to maturity several days short of a full 30-year term, we assumed that the yield curves would be flat after the knot points based on the on-the-run 30-year-bonds in our data.

repurchased securities.<sup>5</sup> Using yields to maturity based on the prices of the on-the-run securities, we calculated for each auction the present value of the cash flows of the off-the-run bonds repurchased.<sup>6</sup> We then calculated the value of the reduced interest costs for each auction by taking the difference between the present value of the cash flows associated with the off-the-run bonds repurchased and the present value of the cash flows of the hypothetical new issues (represented by the invoice prices Treasury paid for the repurchased securities).<sup>7</sup> Our illustrative estimate of the value of reduced interest costs for the buyback auctions as a whole is the sum of these per-auction differences. To assess the reliability of CRSP data, we compared them to another published source of similar data and discussed any differences with the data providers. We determined that such differences were likely due to methodological differences between the two sources and were consistent with industry practices. To assess the reliability of the Treasury data, we also compared them to another published source of similar data and found them consistent. Based on these assessments, we determined that the Treasury data and the CRSP data were sufficiently reliable for our purposes.

We interviewed officials from Treasury's Office of Debt Management and the Bureau of the Public Debt and the Board of Governors of the Federal Reserve System and the Federal Reserve Bank of New York (FRBNY)—one of the Federal Reserve Banks serving as Treasury's fiscal agent. We also interviewed officials from the Canadian Department of Finance and the Bank of Canada, the U.K. Debt Management Office, Agence France

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<sup>5</sup>We selected the coupons of the hypothetical newly issued securities such that, based upon the yield curve implied by the prices of the on-the-run securities, the valuations of the newly issued securities would be equal to par values.

<sup>6</sup>Consistent with market convention, we used the first callable date as the effective maturity date for callable bonds and yield-to-call in lieu of yield-to-maturity for those callable bonds bought back by Treasury where the bonds' coupon rates were higher than market yields. All the callable off-the-run bonds that Treasury purchased in its buyback operations met this criterion.

<sup>7</sup>The value of the hypothetical new issuances is equal to the invoice price of the debt repurchases paid by Treasury because of the assumptions described earlier about how Treasury would have constructed the portfolios of new issues and because the yield curve we use to discount the cash flows of the hypothetical newly issued securities is the same as the market rates we expect the new issues to attain.

Tresor (France's debt agency), and the German Finance Agency.<sup>8</sup> We obtained perspectives from market participants, including primary dealers and large investors, and market analysts. To assess the operational features that would support Treasury's borrowing goals, we analyzed the extent to which features of Treasury's past buyback program and the features of other countries' buyback programs are consistent with Treasury's debt management goals and principles. On December 13, 2011, we briefed Treasury officials on our findings and expected recommendations.

We conducted this performance audit from November 2010 to March 2012 in accordance with generally accepted government auditing standards. Those standards require that we plan and perform the audit to obtain sufficient, appropriate evidence to provide a reasonable basis for our findings and conclusions based on our audit objectives. We believe that the evidence obtained provides a reasonable basis for our findings and conclusions based on our audit objectives.

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<sup>8</sup>We interviewed officials from Canada's central bank because of the large role the central bank plays in buybacks. We did not interview central bank officials from the United Kingdom, France, or Germany because their buybacks role was limited.

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# Appendix II: GAO Contact and Staff Acknowledgments

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## GAO Contact

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## Staff Acknowledgments

In addition to the contact named above, Melissa Wolf (Assistant Director), Susan Etzel (AIC), Serena Agoro-Menyang, Richard Krashevski, Nicole McGuire, Lindsay Read, Cynthia Saunders, Albert Sim, Dawn Simpson, and Stacy Ann Spence all made contributions to this report.

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