FEDERAL SUBSIDIES AND THE HOUSING GSEs

The Congress of the United States
Congressional Budget Office

NOTES

Numbers in the text and tables may not add up to totals because of rounding.

All years referred to in this study are calendar years.

Preface

This study responds to a request from Congressman Richard H. Baker—in his capacity as Chairman of the Subcommittee on Capital Markets, Insurance, and Government Sponsored Enterprises, House Committee on Financial Services—that the Congressional Budget Office (CBO) update its May 1996 study *Assessing the Public Costs and Benefits of Fannie Mae and Freddie Mac*. That study provided an estimate of the value of the federal subsidy to Fannie Mae and Freddie Mac. Congressman Baker also asked that CBO extend the estimate to include the Federal Home Loan Banks and to update its estimate of the portion of the subsidy that the government-sponsored enterprises (GSEs) retain.

Congressman John M. Spratt, Ranking Member, House Committee on the Budget, separately requested an explanation of the methods and assumptions that CBO used in preparing its updated estimate. In addition, Senator Robert F. Bennett, Chairman, Subcommittee on Financial Institutions, and Senator Wayne Allard, Chairman, Subcommittee on Housing and Transportation, both of the Senate Committee on Banking, Housing, and Urban Affairs, jointly requested that CBO review two critiques of its previous work that were prepared under contract for Fannie Mae and Freddie Mac. This study also responds to those requests.

Deborah Lucas and Marvin Phaup prepared this study, with the assistance of David Torregrosa and Lauren Marks and under the direction of Steve Lieberman and Roger Hitchner. Barry Anderson, Charles Capone, Arlene Holen, Angelo Mascaro, John McMurray, Eric Warasta, and Rae Roy of CBO also contributed to the report. Many people outside CBO provided assistance, including staff of Fannie Mae and Freddie Mac, Joe MacKenzie of the Federal Housing Finance Board, Patrick Lawler and Robert Seiler Jr. of the Department of Housing and Urban Development's Office of Federal Housing Enterprise Oversight, Edward DeMarco and Mario Ugoletti of the Department of the Treasury, Wayne Passmore of the Federal Reserve Board, Ron Feldman of the Federal Reserve Bank of Minneapolis, Bill Shear of the General Accounting Office, and Barbara Miles of the Congressional Research Service.

Under contract with CBO, Brent Ambrose and Arthur Warga prepared a report in support of this study: *An Update on Measuring GSE Funding Advantages,* which is available from CBO's Microeconomic and Financial Studies Division. Also, David Torregrosa authored the supporting CBO paper *Interest Rate Differentials Between Jumbo and Conforming Mortgages, 1995-2000.*

John Skeen edited this study, and Christine Bogusz proofread it. Kathryn Quattrone prepared it for publication, Annette Kalicki prepared the electronic versions for CBO's Web site, and Lenny Skutnik did the initial printing. Kathryn Quattrone, with the assistance of Binh Thai, designed the cover. This study and other CBO publications are available at CBO's Web site (www.cbo.gov).

Dan L. Crippen
Director

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Introduction and Summary

Fannie Mae, Freddie Mac, and the Federal Home Loan Bank (FHLB) System were established and chartered by the federal government, as privately owned entities, primarily to facilitate the flow of credit to mortgage borrowers. Their special legal status as government-sponsored enterprises (GSEs), which includes tax and regulatory exemptions, enhances the perceived quality of the debt and mortgage-backed securities (MBSs) that they issue or guarantee and translates into a federal subsidy. By the Congressional Budget Office's (CBO's) estimates, the total subsidy grew steadily from $6.8 billion in 1995 to approximately $15.6 billion in 1999; it dropped slightly, to $13.6 billion, in 2000, reflecting a slowdown in the growth of the GSEs' activities (see Table 1). Although the single largest source of the subsidy is the implicit guarantee on the GSEs' debt issues, in recent years the value of tax and regulatory exemptions has become significant, totaling an estimated $1.2 billion in 2000.

The ultimate beneficiaries of that subsidy include conforming mortgage borrowers; the shareholders of (and other stakeholders in) Fannie Mae and Freddie Mac; and the stakeholders in the FHLBs and member institutions, including other borrowers at member banks.[1] A little more than half ($7.0 billion)

of that total subsidy in 2000 passed through to conforming mortgage borrowers, CBO estimates.

The Housing GSEs

Fannie Mae, Freddie Mac, and the Federal Home Loan Banks—collectively, the housing GSEs—were created to provide liquidity and stability in the home mortgage market, thereby increasing the flow of funds available to mortgage borrowers.[2] The oldest of these enterprises, the FHLBs, were chartered in 1932 to provide short-term loans (called advances) to thrift institutions to stabilize mortgage lending in local credit markets. Fannie Mae was originally created as a wholly owned government corporation in 1938 to buy mortgages, primarily from mortgage bankers, and hold them in its portfolio. Although it was converted into a GSE in 1968, Fannie Mae continued the practice of issuing debt and buying and holding mortgages. Freddie Mac, created in 1970 as part of the Federal Home Loan Bank System, bought

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1. For Fannie Mae and Freddie Mac, conforming mortgage borrowers and shareholders are the primary beneficiaries of the subsidy. A portion of the subsidy also accrues to other "stakeholders," which include any other party that benefits from those GSEs' special status. CBO has estimated the total subsidy and the subsidy accruing to mortgage borrowers and therefore has not distinguished between shareholders and other stakeholders. FHLB stakeholders are de-

fined as all beneficiaries of the subsidy that are not conforming mortgage borrowers.

2. In general, GSEs are financial institutions established and chartered by the federal government, as privately owned entities, to facilitate the flow of funds to selected credit markets, such as residential mortgages and agriculture. In addition to Fannie Mae, Freddie Mac, and the Federal Home Loan Banks, the Farm Credit System and Farmer Mac are GSEs. The Student Loan Marketing Association (Sallie Mae) is in the process of converting from being a GSE to being a fully private entity.

Table 1.
Federal Subsidies to the Housing GSEs, 1995-2000 (In billions of dollars)

	1995	1996	1997	1998	1999	2000
Subsidies by GSE and by Source						
Fannie Mae						
Debt	1.7	1.5	1.8	3.2	3.3	3.6
Mortgage-backed securities	1.5	1.7	1.7	2.3	2.1	1.9
Tax and regulatory exemptions	0.3	0.4	0.4	0.5	0.6	0.6
Freddie Mac						
Debt	0.8	1.1	0.8	3.3	2.4	2.4
Mortgage-backed securities	1.0	1.3	1.1	1.1	2.1	1.8
Tax and regulatory exemptions	0.2	0.2	0.2	0.3	0.4	0.4
FHLBs						
Debt	1.2	1.1	2.0	2.6	4.5	2.8
Tax and regulatory exemptions	0.2	0.2	0.2	0.2	0.2	0.2
Total	6.8	7.4	8.1	13.5	15.6	13.6
Subsidies by Recipient						
Conforming mortgage borrowers[a]	3.7	4.1	4.0	7.0	7.4	7.0
Fannie Mae and Freddie Mac	1.8	2.2	2.1	3.9	3.9	3.9
FHLB stakeholders[b]	1.3	1.1	2.0	2.6	4.3	2.7
Total	6.8	7.4	8.1	13.5	15.6	13.6

SOURCE: Congressional Budget Office.

NOTE: The subsidies to GSE debt and mortgage-backed securities are present values. The annual savings from tax and regulatory exemptions are for the current year only.

a.   Conforming mortgages are loans that are eligible for purchase by Fannie Mae and Freddie Mac with an original principal amount no greater than a stated ceiling, which is currently $275,000 for single-family mortgages.

b.   The estimates assume that conforming mortgages financed by FHLB members were a constant share of members' portfolios from 1995 to 2000.

mortgages primarily from thrifts. Rather than holding the mortgages in its portfolio, Freddie Mac pooled them, guaranteed the credit risk, and sold interests in the pools to investors—creating mortgage-backed securities.

The debt issued and MBSs guaranteed by the housing GSEs are more valuable to investors than similar private securities because of the perception of a government guarantee and because of other advantages conferred by statute. That added value is the primary means by which the federal government con-veys a subsidy to those GSEs.[3] Because of competitive forces, a large part of the subsidy passes through them and other financial intermediaries to the intended beneficiaries—primarily mortgage borrowers,

3.   Alan Greenspan has noted that "The GSE subsidy is unusual in that its size is determined by market perceptions, not by legislation. Indeed the prospectuses of the debentures issued by GSEs explicitly state that they are not backed by the full faith and credit of the United States government. Accordingly, the extent to which the subsidy is exploited is determined by the extent to which GSEs choose to issue debt and mortgage-backed securities, not by legislation." Letter to Congressman Richard H. Baker, August 25, 2000.

but also other borrowers of FHLB member institutions. However, the shareholders and stakeholders of Fannie Mae and Freddie Mac are able to retain a portion of that subsidy because the special legal status of those GSEs puts them at a competitive advantage over other financial institutions in the market for fixed-rate conforming mortgages. Similarly, to the extent that competition is not perfect, stakeholders in the FHLBs and member institutions retain a portion of the subsidy to the banks.

Risk, Return, and Financial Structure

The economic turmoil of the late 1970s and early 1980s demonstrated that the risks of financing a mortgage portfolio can differ significantly from those of guaranteeing MBSs or providing short-term loans. High inflation, interest rate volatility, and recession weakened Fannie Mae and the savings and loans. Those conditions eroded the value of 30-year conforming mortgages held in portfolio and simultaneously drove up the cost of financing. Freddie Mac and the FHLBs were much less exposed to the risk of declines in the value of mortgages and, hence, were less adversely affected than Fannie Mae.

   Beginning in 1982 and continuing for the next decade, Fannie Mae rapidly increased its reliance on MBSs, reducing the growth of its exposure to the types of risks that threatened its solvency in the early 1980s. Then in the early 1990s, Fannie Mae changed its practices and again began to buy and hold mortgages (financed by debt issues) in addition to guaranteeing MBSs, and Freddie Mac subsequently followed. Consequently, for both GSEs, the ratio of mortgages held in portfolio to MBSs guaranteed but held by other investors greatly increased (see Figure 1). To support their mortgage portfolios, Fannie Mae and Freddie Mac currently have $1.1 trillion of outstanding debt at interest rates below those on comparable private debt. Although the increased reliance on portfolio holdings represents an increase in risk taking, Fannie Mae and Freddie Mac now hedge many of those risks. Nonetheless, their portfolios have become a large and growing source of profits for both enterprises.

Figure 1.
Fannie Mae's and Freddie Mac's Ratio of Outstanding Debt to Mortgage-Backed Securities, 1986-2000
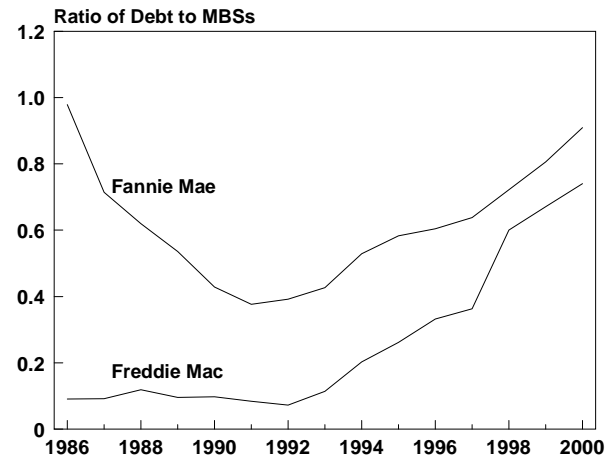
SOURCE: Congressional Budget Office.

NOTE: MBSs = mortgage-backed securities.

   The portfolios of Fannie Mae and Freddie Mac may augment their government-legislated mission to provide liquidity, although at the cost of greater risk exposure than if they only guaranteed MBSs. By buying and holding mortgages, especially those originated in distressed areas such as Texas in the late 1980s and New England in the mid-1990s, they directly enhanced liquidity in those markets. More generally, the profits from their portfolios provide funding for improving mortgage financing for consumers. However, whether the costs of that growth in their portfolios are commensurate with the additional contributions to the home mortgage market is unclear. If the housing GSEs were to continue to grow at the rate of gross domestic product (GDP), their total subsidy would exceed $20 billion in 2011. Fannie Mae and Freddie Mac have demonstrated the feasibility of increasing the liquidity and stability in local housing markets by integrating them into a single national system. In the process, they have attracted private imitators, firms that pool mortgages and sell MBSs without the benefit of federal backing.

   The FHLBs also borrow at rates below those on comparable private securities because of the market perception of a government guarantee on their debt. Originally, the FHLBs made advances directly to

members, which were mostly savings institutions that specialized in mortgage lending. In so doing, the FHLBs passed through most of the subsidy to their members, who in turn distributed the subsidy primarily to home buyers. The regulatory reform that followed the savings and loan crisis broadened membership in the FHLB System to include banks and thrifts that operate the way banks do. Consequently, the FHLBs' subsidy is now spread more widely among lending institutions and is not confined to housing finance.

CBO's Estimation Procedure

The total subsidy to the GSEs on their debt is estimated using three steps. First, the yield advantage on GSE debt is estimated by comparing GSEs' yields with the higher yields on comparable issues from other financial institutions.[4] Second, that difference is multiplied by the amount of new debt issued in the current year. That yield advantage is also multiplied by the amount of new debt estimated to remain outstanding in future years. Those future annual reductions in borrowing cost represent subsidies secured in the current year but expected to be realized in the future. Finally, current and future annual subsidies are capitalized at a discount rate equal to the GSEs' borrowing cost, producing the current year's total subsidy.[5] This calculation produces a total subsidy to debt issued in 2000 of $8.8 billion. An analogous procedure yields a total subsidy to MBSs of $3.7 billion in 2000.

This capitalized subsidy measure recognizes benefits when securities are issued and mortgages are purchased or securitized. That measure of the incremental benefit of new securities issued and mortgages financed is consistent with the objectives of

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4. The comparison is based on debt issues by 70 of the largest banking-sector firms rated either A or AA during the period of 1995 to 1999 and issues by the GSEs over the same period. For details, see Brent Ambrose and Arthur Warga, *An Update on Measuring GSE Funding Advantages* (prepared for the Congressional Budget Office, November 6, 2000), Table 1.

5. CBO's 1996 estimate applied the yield advantage to the total outstanding debt, rather than to incremental debt, but only for a single year. Therefore, the subsidy estimates here are not directly comparable with those from the earlier study.

Figure 2.
Growth in the Housing GSEs' Outstanding Debt and Mortgage-Backed Securities, 1995-2000
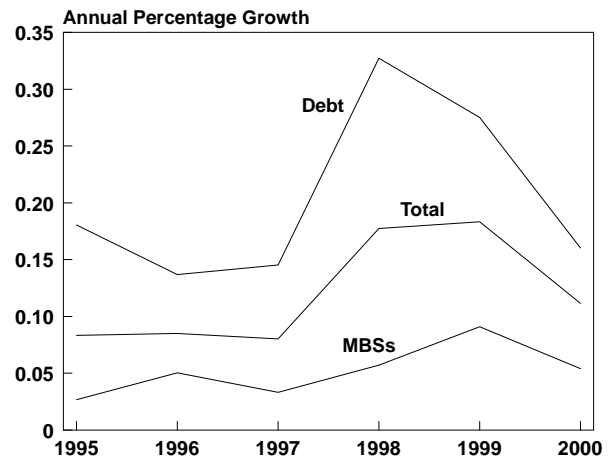
SOURCE: Congressional Budget Office.

NOTE: MBSs = mortgage-backed securities.

generally accepted federal accounting principles and budgetary practices but represents a methodological change from previous estimates, including CBO's last estimate of the subsidy to the GSEs. The principal advantage of the current approach is that it ties the measure of the subsidy to the GSEs' new activities, not old commitments. For example, the current measure of the subsidy rose sharply in 1998 and 1999, which were years of rapid growth in the volume of securities issued by Fannie Mae, Freddie Mac, and the FHLBs, but declined in 2000, when the rate of growth fell back to the pre-1998 pace (see Figure 2).

CBO has also estimated the division of the subsidy among the major beneficiaries, including the portion of the subsidy that reaches conforming mortgage borrowers in the form of lower interest rates. On the basis of the estimated differential between rates for jumbo fixed-rate single-family mortgages (ones that are above $275,000 in 2001) and conforming mortgages (ones that are $275,000 and below in 2001 and are eligible for purchase by Fannie Mae and Freddie Mac) and an adjustment for the FHLBs' influence on the rates for jumbo mortgages, CBO estimates that interest rates on mortgages are reduced by one-quarter of one percentage point (0.25 percentage points, or 25 basis points) as a result of the federal subsidy. A small portion of that subsidy (3 basis

points) is provided on jumbo mortgages via the FHLBs, which pass it through to their members, who in turn pass it through to their customers. The subsidy on jumbo mortgages is relatively small because it is spread across the total business of FHLB members and jumbo mortgages make up a small portion of that business.

The estimated savings to conforming mortgage borrowers are also expressed as a capitalized amount, reflecting the fact that the benefit from lower mortgage rates lasts over the life of the mortgage. About $7.0 billion of the total subsidy of $13.6 billion was passed through to conforming mortgage borrowers by the housing GSEs in 2000. Of that $7.0 billion, the subsidy to borrowers from mortgages financed by Fannie Mae and Freddie Mac was $6.7 billion. Because conforming mortgages are Fannie Mae's and Freddie Mac's only major line of business, CBO assumes that the portion of the subsidy not passed through is retained by shareholders and other stakeholders. Subtracting the amount of subsidy passed through by Fannie Mae and Freddie Mac from their total subsidy ($10.6 billion minus $6.7 billion in 2000) leaves $3.9 billion (or about 37 percent) as the amount that they retained.

Determining the disposition of the subsidy to the FHLBs is more complicated because their member banks engage in a variety of lending and other activities. CBO estimates that their conforming mortgage borrowers receive $0.3 billion out of the $3.0 billion total subsidy, assuming that the reduction in rates passed through is the same as for loans purchased by Fannie Mae or Freddie Mac and recognizing that about 15 percent of member banks' assets are conforming mortgages. CBO assumes that the balance reduces borrowing rates on other types of loans and accrues to other FHLB stakeholders.

As for all such calculations, data limitations and the complexity of the issues about which judgments must be made suggest that there is significant uncertainty surrounding those point estimates. The sensitivity analysis described in the last section of this study shows that changing some of the key parameters could significantly raise or lower the subsidy estimates. An important question is whether the approximation errors in the sensitivity analysis are offsetting. Certain assumptions that CBO has made may result in a downward bias: analyzing short-lived rather than long-lived subsidies; relying on an average funding advantage over time rather than acknowledging that the GSEs adjust the amount of debt they issue according to the size of the funding advantage; and not attributing an advantage to the GSEs in the derivatives markets. Other assumptions, such as basing the yield advantage largely on a sample of firms that have a lower credit rating than Fannie Mae and Freddie Mac and attributing no borrowing advantage to the efficiency of the GSEs' operations, may result in an upward bias. CBO believes that on balance its estimates present a fair picture of the total subsidy, its distribution, and its growth over time.

In preparing its estimates, CBO considered the comments of Fannie Mae, Freddie Mac, and their consultants on CBO's 1996 study. Some of their suggestions were incorporated into the present analysis, but disagreements remain on several fundamental issues. Appendix A summarizes the main points raised and CBO's responses.

The Housing GSEs' Structure and Function

Government-sponsored enterprises are financial intermediaries, established and granted preferential treatment by federal law to increase the flow of funds to specific uses but owned by investors to whom they owe a fiduciary responsibility.[1] Three GSEs facilitate the financing of residential housing: the Federal National Mortgage Corporation, or Fannie Mae; the Federal Home Loan Mortgage Corporation, or Freddie Mac; and the Federal Home Loan Bank (FHLB) System. Fannie Mae and Freddie Mac are publicly owned entities whose shares trade on the New York Stock Exchange. The 12 Federal Home Loan Banks are cooperatives, which operate somewhat independently of one another, and are owned by member institutions, primarily privately owned savings and loans, savings banks, commercial banks, and other lenders that finance home mortgages and other household and business debt.

All of the housing GSEs are financial intermediaries. They raise funds in the capital markets and make the money available to retail lenders, who in turn provide financing for their customers. Fannie Mae and Freddie Mac are largely restricted to financing conforming mortgages, which are high-quality loans secured by residential real estate whose original principal amount is no greater than the conforming ceiling, currently $275,000 for single-family mortgages.[2] Fannie Mae and Freddie Mac supply funds to the conforming mortgage market in two ways: they borrow money by selling debt securities and use the funds to purchase mortgages from lenders. In addition to buying mortgages and holding them as investments, Fannie and Freddie also guarantee mortgage-backed securities, which are then sold to investors. The principal business activity of the FHLBs is to borrow in the capital markets and make loans (called advances) to member institutions. All three activities affect the supply of funds available for mortgage lending and are likely to reduce interest rates on loans secured by residential real estate, but each does so through different financial channels.

The Housing GSEs' Borrowing, Investing, and Lending

As their balance sheets show, Fannie Mae and Freddie Mac are heavily invested in mortgages and depend on debt securities for funding. The FHLBs have two-thirds of their assets invested in advances to member banks and similarly depend on debt securities for funding (see Table 2). The GSEs' second

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1. For a discussion of the evolution of GSEs, see the Statement of Thomas Woodward, Congressional Research Service, before the Subcommittee on Capital Markets, Securities, and Government-Sponsored Enterprises, House Committee on Banking and Financial Services, and the Subcommittee on Government Management, Information, and Technology, House Committee on Government Reform and Oversight, July 16, 1997.

2. Fannie Mae and Freddie Mac adjust the conforming ceiling annually for the change in house prices. In 2000, the ceiling was $252,700.

Table 2.
Balance Sheets for Fannie Mae, Freddie Mac, and the Federal Home Loan Banks, December 31, 2000
(As a percentage of total assets)

	Fannie Mae	Freddie Mac	FHLBs
Assets			
Mortgage portfolio	90	84	2
Investments	8	11	29
Advances	n.a.	n.a.	67
Other assets	2	5	2
Total Assets	100	100	100
Liabilities and Capital			
Debt securities	95	93	91
Other borrowing	2	4	4
Equity	3	3	5
Total Liabilities and Capital	100	100	100
Total Assets (In billions of dollars)	675	459	654

SOURCE: Congressional Budget Office.

NOTES: As of December 31, 2000, Fannie Mae and Freddie Mac had contingent liabilities for outstanding mortgage-backed securities of $707 billion and $576 billion, respectively.

n.a. = not applicable.

largest category of assets, investments, includes commercial paper (a type of short-term corporate debt); overnight bank loans; and, for the FHLBs, holdings of mortgage-backed securities. (Fannie Mae and Freddie Mac report their investments in MBSs as a part of their mortgage portfolios.)[3]

The GSEs profit from simultaneously borrowing and lending, because the income they earn from assets is higher than the interest they must pay on debt plus their other operating costs. In 1999, Fannie Mae reported an average annual yield on its mortgage portfolio of 0.90 percentage points, or 90 basis points (bps), greater than the cost of its outstanding debt.[4] Freddie Mac reported a yield spread on mortgages over debt of 80 bps. And the FHLBs, which special-

ize in making low-interest loans to members, reported a spread on earning assets over debt securities of 22 bps. Thus, by selling general obligation debt to investors, Fannie Mae and Freddie Mac are able to profitably hold large portfolios of mortgages that they purchase from lenders.[5] The FHLBs earn a smaller, but positive, yield based on the spread between the higher rates on loans to members and the lower rates that the banks pay on their debt.

Fannie Mae, Freddie Mac, and the FHLBs issue debt securities in both noncallable and callable forms and with various maturities. In addition, the GSEs use derivative instruments such as interest rate swaps to alter the effective maturity of their debt. Noncallable, or "bullet," issues pay interest semiannually, but the principal is redeemed only at the stated maturity of the debt. Callable debt securities differ from noncallable debt in that the principal may be repaid at a GSE's option on or after a specified call date and

3.   Fannie Mae's and Freddie Mac's contingent liabilities for guarantees of outstanding MBSs are classified as "off-balance-sheet" and disclosed elsewhere in their financial statements.

4.   According to Fannie Mae's 1999 annual report, the average yield on its net mortgage portfolio was 7.08 percent, and the average cost of outstanding debt was 6.18 percent.

5.   The annual return on equity from 1995 to 2000 averaged 24.3 percent for Fannie Mae and 23.5 percent for Freddie Mac.

before the maturity date. The GSEs offer debt across the full range of maturities, from a few days to 30 years and with both fixed and variable interest rates. The wide range of debt securities that the GSEs issue is intended to appeal to a variety of investors and to minimize funding costs to the enterprises. The need to manage risk also affects the maturity composition of the debt.[6]

Fannie Mae's and Freddie Mac's Guarantees of Mortgage-Backed Securities

Mortgage-backed securities are created when a financial institution purchases individual mortgages but then, rather than holding them on its balance sheet as assets, bundles them into a pool of mortgages and sells shares of the mortgage pool to investors. The claims sold to investors are mortgage-backed securities. MBSs differ from traditional debt instruments that promise a series of predetermined payments to investors. Instead, MBSs pay a share of the often uneven and somewhat unpredictable cash flows from the underlying pool of mortgages. A third party's credit guarantee of an MBS provides assurance to the investor of receiving payments when due, but actual cash flows depend on the speed of underlying mortgage prepayments. If, for example, mortgage interest rates fall sharply, mortgage borrowers are more likely to prepay their mortgages, as a result of either selling or refinancing their homes, than if rates had stayed unchanged or risen. Investors in the MBSs will then receive their payments of principal more quickly than they may have expected. Thus, investors in MBSs, like investors in insured whole mortgages, are subject to a risk that investors in traditional debt instruments avoid: the risk associated with the uncertainty of the speed of repayment, or prepayment risk. Partly as a consequence of that risk, interest rates on MBSs (and whole mortgages) are higher than on debt securities of comparable credit quality.[7]

Fannie Mae and Freddie Mac are actively involved in the production of MBSs. (The Federal Home Loan Banks issue only debt securities.) While the operating details differ sufficiently to cause Fannie Mae and Freddie Mac to describe their activities variously as "credit guarantees" (Fannie Mae) and "mortgage securitization" (Freddie Mac), both entities effectively provide a guarantee of timely payment on MBSs. In both cases, the GSE assumes the credit or default risks (for a fee), and the investor accepts the prepayment risk (in exchange for a higher rate of return than on a noncallable debt security). Because Fannie Mae and Freddie Mac are not required to report on their balance sheets the MBSs that they guarantee but do not hold in portfolio, important elements of risk and return are missing from those balance sheets.[8] A more complete picture would include the substantial volume of liabilities for outstanding guarantees of MBSs. Fannie Mae and Freddie Mac had more than $1.2 trillion in MBSs outstanding at year-end 2000 (see Table 3). Those guarantees are important sources of risk and of fee income for the two enterprises.

In recent years, the housing GSEs have also become major investors in MBSs guaranteed by themselves and others. By purchasing MBSs, the GSEs increase their risk and potential returns. When Fannie Mae and Freddie Mac purchase MBSs they have already guaranteed, they transform off-balance-sheet liabilities into on-balance-sheet assets and on-balance-sheet liabilities for debt securities issued to finance the purchase. In doing so, they take on the prepayment, interest rate, and liquidity risks in addition to the credit risk they had already assumed. When they invest in MBSs guaranteed by others, they are taking on prepayment, interest rate, and liquidity risks but little incremental credit risk.

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6.   Like other financial institutions, the GSEs are exposed to interest rate risk when the effective duration of their assets and liabilities does not match. The enterprises select debt maturities in part to offset that risk.

7.   Like other investors in debt, investors in MBSs also face interest rate and liquidity risks. Interest rate risk is due to the effect of changing market rates on the value of debt securities. Liquidity risk is the risk that an active secondary market will not be available when an investor wants to sell a security quickly.

8.   However, the enterprises do disclose their guarantees of MBSs in various financial statements.

Table 3.
The Housing GSEs' Outstanding Mortgage-Backed Securities and Debt, Year-End 1985-2000
(In billions of dollars)

| | Fannie Mae | | Freddie Mac | | FHLBs' | Total | Total |
	MBSs[a]	Debt	MBSs[a]	Debt	Debt	MBSs[a]	Debt
1985	55	94	100	13	74	155	181
1986	96	94	169	15	90	265	199
1987	136	97	213	20	116	349	233
1988	170	105	226	27	137	396	269
1989	217	116	273	26	137	490	279
1990	288	123	316	31	118	604	272
1991	355	134	359	30	108	714	272
1992	424	166	408	30	115	832	311
1993	471	201	439	50	139	910	390
1994	486	257	461	93	200	947	550
1995	513	299	459	120	231	972	650
1996	548	331	473	157	251	1,021	739
1997	579	370	476	173	304	1,055	847
1998	637	460	478	287	377	1,115	1,124
1999	679	548	538	361	525	1,217	1,434
2000	707	643	576	427	592	1,283	1,662

SOURCE: Congressional Budget Office based on data from the Department of Housing and Urban Development's Office of Federal Housing Enterprise Oversight.

a.   MBSs = mortgage-backed securities; excludes holdings of the enterprise's own MBSs held in its portfolio.

The Regulatory Environment

In common with commercial banks and savings institutions, the GSEs are subject to regulations that affect their business operations, capital holdings, and participation in lending to low-income borrowers, as well as other activities. Fannie Mae and Freddie Mac are regulated by the Department of Housing and Urban Development's (HUD's) Office of Federal Housing Enterprise Oversight (OFHEO), and the Federal Housing Finance Board oversees the Federal Home Loan Banks.

In accord with their housing mission, Fannie Mae and Freddie Mac are limited primarily to financing conforming mortgages. That limitation, however, excludes them from only about 10 percent to 20 percent of the residential mortgage market. Lending by the FHLBs is largely restricted to collateralized loans to member institutions. Eligible collateral includes home mortgages, mortgage-backed securities, Treasury and agency securities, and deposits with the

FHLBs.[9] Those collateral requirements are intended to ensure that most lending by the FHLBs supports targeted investment activities, but because member institutions have more eligible collateral than advances from the FHLBs, the requirements are thought to not be effective in targeting the use of those funds.[10]

The housing GSEs are subject to minimum capital requirements. OFHEO sets the capital standards for Fannie Mae and Freddie Mac, and the Federal

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9.   For commercial member banks with less than $500 million in assets, the Gramm-Leach-Bliley Act of 1999 repealed a requirement that 10 percent of their total assets be mortgage-related and revised the definition of eligible collateral to include small business and small farm loans. For the details and projected effects, see Robert N. Collender and Julie A. Dolan, "Small Commercial Banks and the Federal Home Loan Bank System" (paper presented at the North American Regional Science Association International Meeting, Chicago, Ill., November 2000).

10. At year-end 1999, FHLB member institutions held $1.1 trillion in residential mortgages, while advances were $400 billion. Therefore, members were able to borrow against existing excess collateral and use the funds to finance the most attractive lending opportunities, which may or may not have been mortgages.

Housing Finance Board has responsibility for ensuring that the Federal Home Loan Banks maintain the mandated level of equity capital.[11]

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11. Mandated capital levels are lower for the GSEs than for commercial banks, but interpreting those differences is difficult because the risks borne by those two types of institutions also differ significantly.

The housing GSEs are charged with increasing the availability of mortgages for low- and moderate-income borrowers. HUD establishes goals for financing such mortgages for Fannie Mae and Freddie Mac, and the FHLBs are required by law to devote 10 percent of net income to the Affordable Housing Program, which offers subsidized mortgages to targeted borrowers. Any additional benefits to low-income borrowers (beyond the estimated rate reduction on their conforming mortgages) are not estimated here.

Federal Subsidies

T he housing GSEs receive two distinct, but related, benefits from the government. First, a number of regulatory and tax exemptions reduce the GSEs' operating costs. Second, federal backing enhances the perceived credit quality of debt issued and mortgage-backed securities guaranteed by the GSEs. Those benefits result in lower borrowing costs and higher profits than a similarly structured enterprise without a GSE charter would realize.

CBO has estimated the costs of those subsidies in two parts: First, there is the direct cost from the fees and taxes that otherwise would be collected by federal, state, and local governments. Second, there is the opportunity cost of providing free credit enhancement to the GSEs, because competing financial institutions would be willing to pay to receive similar treatment. To the extent that the government assumes credit risk, there is also the cost of expected losses, but quantifying that potential exposure is beyond the scope of this estimate.[1]

As requested by Congressman Baker, CBO's estimate breaks down the distribution of those subsidies among various beneficiaries. They include the GSEs' stakeholders, conforming mortgage borrowers who are financed via the GSEs, and other entities (for example, nonmortgage borrowers at FHLB member banks). The GSEs may indirectly affect borrowing rates for other financial market participants as well. For instance, rates on conforming mortgages obtained from intermediaries that are not GSEs are lower than they otherwise would be because of the competitive presence of the GSEs, benefiting those borrowers. At the same time, credit that is diverted from other markets to the conforming mortgage market tends to raise costs to borrowers in those markets—for instance, for the U.S. Treasury and for businesses investing in capital goods. The subsidies may also increase the price of housing if home buyers use the savings on their mortgages to bid more for houses. This study does not include estimates of most of those indirect benefits or costs because they are not directly related to the size or distribution of the subsidies to the GSEs, which is the focus of this analysis.

Direct Benefits from Special Legal Status

The law treats the GSEs as instrumentalities of the federal government, rather than as fully private entities. They are chartered by federal statute, exempt from state and local income taxes, exempt from the Securities and Exchange Commission's (SEC's) registration requirements and fees, and may use the Federal Reserve as their fiscal agent. In addition, the U.S. Treasury is authorized to lend $2.25 billion to both Fannie Mae and Freddie Mac and $4 billion to

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1. Because investors value the perceived protection from credit risk, its value is already largely reflected in the estimate of the borrowing advantage on debt and MBSs. In any event, the estimated exposure under current law would be small because there is no explicit commitment to cover losses. More generally, the estimated exposure would depend on assumptions made about the strength and extent of any implicit guarantees.

the FHLBs. GSE debt is eligible for use as collateral for public deposits, for unlimited investment by federally chartered banks and thrifts, and for purchase by the Federal Reserve in open-market operations. GSE securities are explicitly government securities under the Securities Exchange Act of 1934 and are exempt from the provisions of many state investor protection laws. Those advantages have not been granted to any other shareholder-owned companies. Some of those provisions of law result in direct monetary savings to the GSEs, estimates of which are reported below.

Indirect Benefits That Lower Borrowing Costs

The special treatment of GSE securities in federal law signals to investors that those securities are relatively safe. Investors might reason, for instance, that if the securities were risky, the government would not have exempted them from the protective safeguards it put in place to prevent losses of public and private funds. This implied assurance appears to outweigh the explicit disavowal of responsibility in every prospectus for GSE securities.[2] The GSEs therefore enjoy lower financing costs than would private financial intermediaries, were they to hold similar levels of capital and take comparable risks.[3]

As a consequence of those provisions, GSE obligations are classified by financial markets as "agency securities" and priced below U.S. Treasuries and above AAA corporate obligations. The super-

AAA rating reduces borrowing costs for the GSEs, in part by promoting institutional acceptance of the securities. Decisions by portfolio managers to invest in GSE securities do not have to be justified in terms of credit risk. General acceptance of the securities increases investors' willingness to buy them and enhances their liquidity. Those characteristics of acceptability and liquidity contribute to the relatively high price investors are willing to pay for GSE securities. CBO assumes that those advantages are captured in its estimate of the spread between the rates on GSE debt and the rates on comparable debt from other financial institutions, so CBO makes no separate estimate of the value of liquidity.[4]

The Subsidy to Mortgage-Backed Securities

A similar combination of federal regulatory provisions and implied guarantees enhances the credit standing, market acceptance, and liquidity of MBSs guaranteed by Fannie Mae and Freddie Mac. For example, risk-based capital requirements for banks are lower for GSE-guaranteed MBSs than for privately guaranteed MBSs. Federal backing also enables Fannie Mae and Freddie Mac to offer a credit guarantee that the market perceives as more valuable than any similar guarantee by a private company. The enhanced quality of the guarantee reduces the rate of return that investors require on GSE-guaranteed MBSs below the rates required on similar privately guaranteed MBSs. That lower rate permits a mortgage pooler to pay higher prices for mortgages and pass along lower interest rates to borrowers. That competitive advantage on GSE-guaranteed MBSs also enables Fannie Mae and Freddie Mac to charge higher guarantee fees than private guarantors.

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2. A typical disclosure from a Fannie Mae prospectus states, "The Certificates, together with interest thereon, are not guaranteed by the United States. The obligations of Fannie Mae are obligations solely of the corporation and do not constitute an obligation of the United States or any agency or any instrumentality thereof other than the corporation."

3. See Congressional Budget Office, *Government-Sponsored Enterprises and the Implicit Federal Subsidy: The Case of Sallie Mae* (December 1985) and Douglas O. Cook and Lewis J. Spellman, "A Taxpayer Resistance, Guarantee Uncertainty, and Housing Finance Subsidies," *Journal of Real Estate Finance and Economics*," vol. 5, no. 2 (1992), pp. 181-195.

4. Fannie Mae and Freddie Mac have argued that the greater liquidity is the result of operating efficiencies rather than a subsidy. To the extent that this viewpoint is correct, the estimate of their subsidies will be biased upward. However, the large financial institutions with which they are compared also manage their debt to enhance its liquidity.

Estimating the Subsidies

CBO has estimated the total subsidy derived from the special relationship that the GSEs have with the federal government by combining the benefits provided directly through specific exemptions and privileges with the benefits of reduced borrowing costs and higher guarantee fees resulting from the market's reaction to their special status. CBO has then divided that total subsidy between the portion retained by GSE shareholders and stakeholders and the portion benefiting the conforming mortgage borrowers who are financed by the GSEs.

The Direct Benefits of Regulatory and Tax Exemptions

By CBO's estimate, the savings from the exemption from state and local income taxes, the exemption from SEC registration, and the lower cost of obtaining credit ratings for debt and MBS issues had a combined value of about $1.2 billion in 2000 (see Table 4).[1] In general, the estimated value of those benefits increases with the size of the GSE's earnings. Other special provisions of law, such as the right to use the Federal Reserve as a fiscal agent or the line of credit at the Treasury, may result in substantial savings to

the GSEs, but CBO has made no attempt to directly estimate those savings here. Because investors value GSE securities more highly as a result of those provisions, some of their value is reflected in the borrowing advantage on debt, which is calculated below.

The Subsidy to General Obligation Debt Securities

The largest component of the total subsidy is the reduction in borrowing rates on the GSEs' general obligation debt securities. Estimating this rate differential requires comparing the rates paid by the GSEs with the rates paid by comparable financial institutions. Identifying a set of appropriate securities for comparison is the first step in this calculation. Factors that CBO has taken into account include credit rating, maturity, call features, and prevailing market conditions.

CBO assumes that without GSE status, the housing enterprises would have a credit rating in the range of AA to A. That assumption is based on the following:

o   In 1997, Standard & Poor's assigned a rating of AA- to Fannie Mae and Freddie Mac as a measure of their risk to the government. In February 2001, Standard & Poor's again assigned a rating of AA- to both agencies. The Federal Home Loan Banks have not been rated on a

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1.   Consistent with CBO's standard practices, all estimates are on a before-tax basis.

Table 4.
Annual Value of Tax and Regulatory Exemptions for the Housing GSEs, 1995-2000 (In millions of dollars)

	1995	1996	1997	1998	1999	2000
Fannie Mae						
State and Local Taxes	239.6	312.4	347.0	371.6	435.2	478.6
SEC Registration	55.3	79.4	70.7	139.7	122.2	85.0
Rating Fees	5.3	6.7	8.0	9.3	11.0	12.7
Subtotal	300.2	398.5	425.7	520.6	568.4	576.3
Freddie Mac						
State and Local Taxes	126.9	143.8	157.1	188.5	252.9	282.7
SEC Registration	39.9	53.0	44.8	92.7	96.4	66.5
Rating Fees	5.3	6.7	8.0	9.3	11.0	12.7
Subtotal	172.1	203.5	209.9	290.5	360.3	361.9
FHLBs						
State and Local Taxes	104.0	106.4	119.4	142.2	170.2	176.9
SEC Registration	41.6	42.5	49.6	83.9	68.0	50.4
Rating Fees	5.3	6.7	8.0	9.3	11.0	12.7
Subtotal	150.9	155.6	177.0	235.4	249.2	240.0
Total	623.2	757.6	812.6	1,046.5	1,177.9	1,178.2

SOURCE: Congressional Budget Office.

NOTE: SEC = Securities and Exchange Commission.

comparable basis, but a higher credit rating for them seems unlikely.[2]

o Freddie Mac used an average of yields on AA and A debt to calculate the funding advantage for Freddie Mac and Fannie Mae in 1996.[3]

o The U.S. Treasury assumed that Fannie Mae and Freddie Mac would be rated A in a 1996 study, noting that the rating is typical of large high-quality fully private financial firms holding portfolios of residential mortgages.[4]

The assumed credit rating provides an essential benchmark for estimating the subsidy to GSE debt. The interest rates paid on securities issued by other financial intermediaries and rated AA and A are the rates that Fannie Mae, Freddie Mac, and the Federal Home Loan Banks would probably pay on their debt in the absence of the federal government's implied guarantee.

A recent study commissioned by CBO of securities issued from 1995 through 1999 is the basis for

2. See Congressional Budget Office, *The Federal Home Loan Banks in the Housing Finance System* (July 1993). For instance, the quality of FHLB capital is lowered by the right of member banks to redeem shares at par (the price they initially paid) in anticipation of financial trouble.

3. See Federal Home Loan Mortgage Corporation, *Financing America's Housing: The Vital Role of Freddie Mac* (June 1996), p. 33.

4. See Department of the Treasury, *Government Sponsorship of the Federal National Mortgage Association and the Federal Home Loan Mortgage Corporation* (July 11, 1996).

the agency's estimate of the GSEs' borrowing advantage on debt issues with an original maturity of more than a year.[5] According to that study, the housing GSEs paid significantly less on noncallable debt with a maturity of greater than 300 days than banking institutions rated AA and A paid on comparable debt. Several features of the estimates in that study require further elaboration. The study's authors calculated yield spreads:

o Largely on the basis of market rates on the day when a GSE or comparison security was issued and, hence, most liquid;

o For noncallable, or "bullet," debt only;

o By averaging observed spreads over the entire estimation period; and

o On the basis of a sample of high-quality national financial institutions.

Timing of Issues

By calculating yield spreads from observed rates on securities on the day when the securities were issued, this study avoids the errors that can be introduced from using indices, matrix prices, or yields observed on secondary-market trades. Bond indices mix old and new issues and therefore combine liquid with illiquid issues; matrix prices (prices based on interpolations by market participants from current transactions) introduce approximation error; and secondary-market trading reflects the effect of a loss of liquidity from the aging of securities and, more importantly, does not reflect the interest rates that borrowers actually pay.

Spreads Based on Noncallable Debt

CBO attributes the same funding advantage to bullet and callable GSE debt.[6] There are some logical and

practical reasons to treat those securities similarly, although doing so arguably introduces a downward bias into the estimated spread. Financial market participants view callable debt as a combination of straight debt and a call option and generally calculate the value of callable debt using that type of decomposition. Because the GSEs may have only a small advantage in the options market (owing to their higher credit quality, which enhances liquidity), the prices that they pay for options should be only slightly lower than those paid by other market participants. Thus, the advantage on the callable debt is likely to be dominated by the subsidy on its straight debt component. The practical reason for approximating the funding advantage of callable debt by the estimated advantage of bullet debt is that data on comparable callable bonds are difficult to obtain. There are few private issues available for comparison, and the more complicated structure of callable bonds tends to add noise to any estimate of yield differentials. In sum, although attributing the same funding advantage to callable and noncallable debt probably has led to an understatement of the subsidy, CBO chose to rely on an estimate based on more reliable data.

Long-Term Average Spreads

The spread between GSE and comparable private securities varies over time. For instance, in times of market stress, there may be a "flight to quality," which reduces rates on U.S. Treasury and GSE securities relative to private rates. An increase in demand for safe, government-backed securities, therefore, increases the gross subsidy to the GSEs and widens the spread between rates on GSE debt and conforming mortgages. Such episodes—two have occurred since mid-1998—provide the GSEs with highly profitable opportunities to increase their portfolio holdings of mortgages, and they appear to have done so.[7] Although yield spreads observed during a short period are useful in gauging current conditions, an average of spreads observed over a wide range of market conditions is a more statistically reliable, as well as a more conservative, indicator of the long-term benefits of GSE status.

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5. See Ambrose and Warga, *An Update on Measuring GSE Funding Advantages*.

6. CBO's 1996 estimates of the subsidy on GSE securities used a higher subsidy estimate for the GSEs' callable debt than for their noncallable debt.

7. See, for example, Kenneth Posner, *Finance: Specialty and Mortgage*, Morgan Stanley Dean Witter, March 13, 2001, p. 5.

In fact, although the historical spread fluctuates, it shows no apparent trend over time. On the basis of that observation, CBO assumes that the spread was fixed over the estimation period and going forward will equal the average observed spread in the past.

With the supply of Treasury securities shrinking, however, the demand for GSE debt securities may rise in the future, further widening the spread between GSE rates and those paid by AA and A banking institutions. Furthermore, using a time-averaged spread without adjusting for changes in the amount of debt issued over time neglects the fact that the GSEs tend to increase debt issuance when spreads are high and decrease debt issuance when spreads are low.

They also adjust the volume of MBSs and debt in response to changing market conditions. A more accurate measure of the federal subsidy, therefore, would calculate the funding advantage as the average of observed spreads weighted by the volume of securities issued at each spread. That approach would increase the contribution of the most favorable observed spreads to the "average" benefit. Alternatively, the funding advantage could be permitted to vary for each period. However, the variance of the estimated spreads is often large relative to the year-to-year changes in the advantage. Accordingly, CBO uses the unweighted average of observed funding advantages for the period even though doing so is likely to undervalue the benefits of GSE status.

Comparison Sample

The funding advantage for the housing GSEs is calculated by comparing rates on GSE debt with rates on debt issues from a sample of 70 large national financial institutions, eight of which were rated AA+, AA, or AA- and 62 of which were A+, A, or A-. Both Fannie Mae and Freddie Mac have obtained a hypothetical rating of AA- under the assumption that they would operate as they do currently and would hold an unchanged amount of capital if they were fully private. The FHLBs have not received a comparable rating but it appears unlikely that they would receive a higher rating than Fannie Mae or Freddie Mac or a rating lower than A. Thus, all three GSEs are within the range covered by the sample.

The hypothetical AA- rating for Fannie Mae and Freddie Mac lies between the A and AA ratings of those comparison firms. Very few AA-rated financial firms are available to be included in a comparison sample because most financial companies find it advantageous to operate in a way that results in an A rather than an AA rating on their long-term debt. Taken together, the handful of private AA financial institutions issued fewer than four comparable bonds in four of the five years studied; and in one of those years, there were no comparable AA issues. Inferences about funding advantage drawn from such a small sample would be subject to large errors. Hence, CBO chose to base the analysis on the broader sample.[8] CBO also performed a sensitivity analysis based on the full sample of firms, giving equal weight to the small number of AA issues and the large number of A issues. This weighting reduced the estimated funding advantage on debt by considerably less than the bounds reported in the sensitivity analysis in the last section of this study.

The Subsidy Rate on Effective Short-Term Debt

The rate reduction on GSE securities may vary with the maturity of the security issued, in part because default risk is lower over a short horizon than over a longer time period. Even though the Ambrose and Warga study found no systematic pattern in spreads as a function of maturity for debt issues with a maturity of more than 300 days, spreads could be lower for issues with a shorter maturity. For example, a study commissioned by Freddie Mac estimates the advantage on short-term debt to be between 10 and 20 bps, relying on index value data.[9] Accordingly, CBO uses an estimate of the spread on effective short-term debt of 15 bps.

Determining the fraction of effective short-term debt issued by the GSEs is not a straightforward cal-

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8. This approach follows Freddie Mac's own example in calculating the GSEs' funding advantage based on both A and AA issues in its report *Financing America's Housing: The Vital Role of Freddie Mac*.

9. See James Pearce and James C. Miller III, "Freddie Mac and Fannie Mae: Their Funding Advantage and Benefits to Consumers" (prepared for Freddie Mac, January 9, 2001), available at www.freddiemac.com/news/analysis/pdf/cbo-final-pearcemiller.pdf.

culation because of their extensive use of derivative securities such as swaps, which effectively transform short-term borrowing into long-term borrowing and vice versa. In order to calculate the *effective* quantity of the GSEs' short-term debt, their positions in derivative securities also must be analyzed. That information is not publicly available, nor would it be easy to interpret if it were. However, Fannie Mae and Freddie Mac report that the percentage of total debt that was effectively short-term after "synthetic extension" at year-end 1999 was, respectively, 13 percent and 7 percent.[10] Those amounts contrast with the figures for nominal short-term debt of 41 percent and 49 percent reported on their respective balance sheets. Percentages of effective short-term debt reported for earlier years are higher—between 20 percent and 30 percent. In its estimate, CBO sets the fraction of effective short-term debt at 20 percent, in line with past practice but weighted toward current practice, and assumes that it remains at 20 percent going forward in time.[11]

Computation of an Average Spread

CBO estimates an overall funding advantage of 41 basis points on all GSE debt securities. A weighted average, the estimate considers effective short-term debt to be 20 percent of outstanding debt and to have a 15 bp advantage, and effective long-term debt to be

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10. As an example of the synthetic extension process, a GSE may borrow $100 million by issuing a one-year security and intend to maintain that $100 million outstanding over five years using a succession of one-year securities. That short-term borrowing is transformed to long-term borrowing using an interest rate swap. Under the swap contract, the GSE agrees to make five years of fixed-rate interest payments based on a $100 million principal value in exchange for receiving five years of floating rate payments. The GSE can use the floating rate payments received from the swap to pay its obligations in the one-year market and in effect it is left with a fixed-rate interest obligation.

11. CBO assumes that the funding advantage on effective long-term debt equals the funding advantage on original-issue long-term debt. Fannie Mae and Freddie Mac have asserted, to the contrary, that the funding advantage on synthetically extended debt is no greater than that on short-term debt because the GSEs have no advantage in the swap market. If so, however, Fannie Mae and Freddie Mac finance the synthetically extended portion of their debt at only a 15 bp advantage, when a 47 bp advantage is available on otherwise similar securities that they could issue. Although it is possible that Fannie Mae and Freddie Mac do not always choose the most advantageous funding, such behavior is implausible in the face of such large rate differentials. Accordingly, CBO's estimates of the funding advantage are based on the assumption that the GSEs fully exploit their funding advantage.

80 percent of outstanding debt and to have a 47 bp advantage.

Converting Yield Spreads to Subsidy Values

CBO's calculation of the total benefit from lower borrowing costs employs a methodology designed to capture the total subsidy associated with new credit extended in a given year, or the "capitalized subsidy." It contrasts with a "subsidy-flow" calculation, a single-year subsidy calculated by multiplying the reduction in borrowing costs by the total amount of outstanding GSE debt, which CBO used in its 1996 study.

As a measure of the federal benefit and its change over time, the subsidy-flow methodology suffers significant shortcomings. First, it recognizes subsidies conferred today only gradually over many years, rather than in the year that the commitment to funding is made. Second, it records subsidies today for funding from years earlier. When GSE debt is priced and sold, the benefits of a lower interest rate are secured for each year the financing is expected to be outstanding, not just for the current year. Similarly, a mortgage borrower locks in the benefit of lower rates over the life of the mortgage. The subsidy flow, therefore, understates the value that has been transferred by the government in the current year, while including some of the benefits of previous years' transactions. A more timely measure would recognize all of the current and future benefits of this year's transactions but exclude subsidies from past commitments.

A related shortcoming of the subsidy-flow measure is bias: downward when the GSEs are growing rapidly, upward when they are expanding slowly. In recent years, the debt issued by the housing GSEs has been growing at an annual rate of more than 20 percent, although that growth slowed to 12 percent in 2000. Throughout this high-growth period, the subsidy-flow method would have underestimated the size of the benefits conferred. Conversely, if the GSEs were to stop growing, the subsidy-flow measure would continue to show net new subsidies to the GSEs, even though they would primarily be receiving deferred benefits from past transactions.

CBO's decision to use the capitalized subsidy measure is also consistent with the objective of the Credit Reform Act of 1990, which is to recognize and disclose the costs of long-lived credit transactions when the commitment to that assistance is made. Through law and generally accepted accounting principles, the federal government requires that the present value of all future benefits conveyed by new loans and guarantees issued in the current year be recognized.[12] The subsidy estimates here differ in some respects from the treatment of financial guarantees under the Credit Reform Act to reflect that there is no explicit guarantee to the GSEs. Instead, the calculations closely follow private-sector capital budgeting practices, which were similarly designed to reflect the present value of future commitments.

The more forward-looking approach to measuring subsidies adopted in this study has been recommended by several observers.[13] That method can be illustrated by a familiar example. If a home buyer obtains a 30-year fixed-rate $100,000 mortgage at 7.75 percent, rather than 8 percent, the first year's savings is $250 (0.25 percentage points times $100,000). But the borrower will also enjoy interest savings each year thereafter until the mortgage is paid off. The sum of lower interest payments in all years is sometimes (incorrectly) used as the savings from the lower mortgage rate, but that figure overstates the benefit to a borrower because it treats a future dollar saved as equal in value to a dollar saved today.[14] To adjust for differences in the value of money over time, future interest savings must be discounted with an appropriate interest rate. Capitalization refers to the process of discounting and summing annual benefits.

Although the basic procedure is straightforward, its use raises the question of the life of the subsidy

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benefit. The GSEs finance mortgages with initial maturities that are usually 15 or 30 years but that may be shorter, with debt ranging in maturity from a few days to 30 years. Maturing or prepaid mortgages are almost always replaced with new mortgages, extending the effective life of the subsidy.

CBO has considered two maturity horizons—seven years and perpetuity—that provide lower and upper bounds, respectively, for the subsidy estimates. However, to link the subsidy more explicitly to the mortgages acquired or guaranteed in a given year, all subsidy estimates reported in this study use the lower bound estimate unless otherwise indicated.[15] That maturity is considerably shorter than the 15- or 30-year term of a typical new mortgage because a large fraction of mortgages are paid off early through refinancing or the sale of houses. Because the GSEs structure their debt financing to match expected mortgage cash flows, it is reasonable to expect that the borrowing advantage on debt is also locked in on average over that seven-year period.[16]

For the seven-year horizon, incremental borrowing in a given year has two components. One component is the increase in the total debt that is outstanding. The second component is an estimate of new mortgages that are replacing mortgages maturing in the current year, called the "rollover amount" (which is absent when the maturity horizon is considered to be perpetuity). The subsidy estimate therefore reflects the average life of new mortgages acquired in a given year, incorporating the sum of new growth and the rollover of maturing mortgages. To calculate the rollover amount, CBO assumes a distribution of lifetimes for new mortgages and uses this distribution to

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12. Credit Reform Act of 1990 and Statement of Federal Financial Accounting Standards 2.

13. Robert S. Seiler Jr., "Estimating the Value and Allocation of Federal Subsidies to Fannie Mae and Freddie Mac" (paper presented at the American Enterprise Institute conference "Fannie Mae and Freddie Mac: Public Purposes and Private Interests," Washington, D.C., March 24, 1999), revised April 1, 1999, and Alden L. Toevs, "A Critique of the CBO's Sponsorship Benefit Analysis" (report submitted by First Manhattan Consulting Group to Fannie Mae, September 6, 2000).

14. A dollar in 30 years is equivalent to only $0.23 today because $0.23 invested at 5 percent today would grow to $1 in 30 years.

15. Over time, the anticipated average life of a mortgage varies because of variations in the interest rate environment that affect prepayment rates. In recent years, the average life of a typical mortgage has been less than seven years. Using seven years as the basis for the subsidy calculations is conservative, however, because the high probability that maturing mortgages will be replaced by new mortgages implies a much longer effective life of new commitments.

16. Conceptually, the focus is on the life of the mortgages financed, rather than on the life of the supporting debt, because mortgage borrowers are the intended beneficiaries of the estimated subsidy and that subsidy is received over the life of the mortgages. The average maturity of liabilities rather than of assets could be used to determine the subsidy horizon and would lead to similar results. Fannie Mae and Freddie Mac maintain that their interest rate risk is limited by their hedging strategies. Accordingly, the effective maturity of their liabilities is close to that of their assets.

Table 5.
Subsidies to GSE Debt, 1995-2000 (In billions of dollars)

	1995	1996	1997	1998	1999	2000
Capitalized Subsidies[a]						
Fannie Mae	1.7	1.5	1.8	3.2	3.3	3.6
Freddie Mac	0.8	1.1	0.8	3.3	2.4	2.4
FHLBs	1.2	1.1	2.0	2.6	4.5	2.8
Total	3.7	3.7	4.5	9.1	10.2	8.8

SOURCE: Congressional Budget Office.

a.   The subsidies to GSE debt are present values.

update the assumed maturity distribution of debt-financed mortgages.[17]

An assumption of perpetual life for new obligations implies only that the GSEs' assets do not decline over time.[18] If there is no growth, the GSEs retire individual securities as they come due and issue new securities to replace those that are maturing. In fact, GSE securities consistently have shown year-over-year increases in recent decades,[19] while the overall conventional mortgage debt secured by one-to four-family houses has increased every year in the United States since World War II. The continuous addition of new stock and the rollover of existing properties ensure that even without inflation, total mortgage debt will grow. If the GSEs merely maintained a constant share of housing finance, they would grow indefinitely, as this case assumes.

The capitalized subsidy is calculated in two steps. First, the annual incremental benefit is ob-

tained by multiplying the net increase in debt outstanding during a year plus any assumed rollover of debt by the reduction in interest rates from the federal subsidy. Second, the present value of the annual benefit is determined by discounting those annual flows over the assumed horizon, using the cost of funds to the GSEs.[20]

For example, the subsidy from lower borrowing costs on the debt issued by the housing GSEs in 2000 is calculated as follows:

1.   Multiply the interest rate reduction (0.0041) by the net increase in debt that remains outstanding in a given year, plus any assumed rollover amount: this increase in subsidized debt is $375 billion if the maturity horizon is assumed to be seven years and $227 billion over a perpetual horizon.[21] In the latter calculation, the figure implies an annual interest savings of $0.93 billion in every future year. Similarly, in the former calculation, the figure implies a benefit of $1.54 billion in the first year and a decreasing amount over the next 30 years (consistent with an average life of seven years), because the

17.   More precisely, CBO's calculations are based on the assumption that mortgages are paid off at 275 percent PSA, which implies an average life of just under seven years. The PSA scale, devised by the Public Securities Association, is an industry standard used to describe the rate and pattern of prepayments over time.

18.   Assuming a perpetual horizon does not lead to an infinite subsidy value because of the effect of discounting. As a result, the estimated subsidy based on a 30-year horizon differs by only a few percentage points from a subsidy based on a perpetual horizon.

19.   There have been years in which the outstanding debt of an individual GSE has declined (for example, Freddie Mac's dropped slightly in 1992), but the growth of total GSE debt has been consistently positive since 1990. The growth of total outstanding MBSs has been positive in every year since 1980.

20.   Using a discount rate that does not reflect risk would be consistent with standard government accounting practices but at variance with the standard capital budgeting practice of using risk-adjusted discount rates. A risk-free rate would increase the estimated value of the subsidy. The rate selected reflects the reasoning that the risk of the subsidy is similar to that of GSE debt, and, hence, that the debt rate is appropriate for discounting.

21.   The difference in the two cases is the estimated rollover amount, which is based on reported assets in past years and the assumed distribution of repayments.

Table 6.
Subsidies to Mortgage-Backed Securities Guaranteed by Fannie Mae and Freddie Mac, 1995-2000
(In billions of dollars)

	1995	1996	1997	1998	1999	2000
Capitalized Subsidies[a]						
Fannie Mae	1.5	1.7	1.7	2.3	2.1	1.9
Freddie Mac	1.0	1.3	1.1	1.1	2.1	1.8
Total	2.5	3.0	2.8	3.4	4.2	3.6

SOURCE: Congressional Budget Office.

a. The subsidies to MBSs guaranteed by Fannie Mae and Freddie Mac are present values.

principal that is outstanding is reduced by amortization and prepayment.

2. Convert those annual flows into a present value by discounting at the GSEs' average cost of debt financing: that rate is estimated to be 6.3 percent in 2000. Thus, when a perpetual horizon is assumed, the capitalized subsidy is $14.6 billion. With a seven-year horizon, it is $8.8 billion.

The gross value of federal subsidies on GSE debt securities, calculated using the capitalized measure with a seven-year horizon, ranged from $3.7 billion in 1995 to $10.2 billion in 1999, before dropping in 2000 (see Table 5).

The Subsidy to Mortgage-Backed Securities

The advantage conferred to MBSs guaranteed by the GSEs over MBSs guaranteed by private financial firms is difficult to measure with precision. In principle, the noncredit cost of providing a guarantee should be similar for the GSEs and for private guarantors, although the two types of guarantees are often structured differently.[22] The cost of providing a credit guarantee, however, is lower for the GSEs because of the perceived government backing. In particular, the market requires greater capital backing for a fully private guarantee, and providing that capital is costly to private firms. Consequently, Fannie Mae and Freddie Mac have the latitude to charge fees in excess of guarantee costs. CBO uses a point estimate of 30 basis points in calculating the total capitalized subsidy value on MBSs, and that total is divided between the portion retained by the GSEs and the benefit passed through to borrowers.

CBO's approach to estimating the subsidy rate on MBSs is largely deductive. Calculations described below show that the advantage passed through to conforming mortgage borrowers is approximately 25 bp. Because borrowers whose mortgages are eventually sold into an MBS compete for the most favorable rates with borrowers whose mortgages are held by the GSEs, the advantage passed through should be approximately equal in both cases. That benefit to borrowers is one component of the total subsidy to MBSs. The second significant component is the amount retained by the GSEs because of the higher guarantee fees that they can charge as a result of their special status. Currently, the GSEs charge approximately 20 bp for that guarantee, which puts an upper bound on the benefit that they can retain from this line of business. CBO assumes, following the analyses by Treasury and by Toevs (both cited earlier), that the GSEs retain 5 bps. Overall,

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22. Other financial firms usually enhance the credit of their MBSs through a structure of senior (guaranteed) and subordinated (guarantor) claims on income from the mortgage pool. The value of the guarantee is therefore a function of the extent of overcollateralization and the quality of the underlying assets. Fannie Mae and Freddie Mac, by contrast, issue blanket assurance (for a fee) that payments will be made to all MBS holders when due.

Table 7.
Total Federal Subsidies to the Housing GSEs, 1995-2000 (In billions of dollars)

	1995	1996	1997	1998	1999	2000
Subsidies to Debt and MBSs[a]						
Fannie Mae	3.2	3.2	3.5	5.5	5.4	5.5
Freddie Mac	1.8	2.4	1.8	4.4	4.5	4.2
FHLBs	1.2	1.1	2.0	2.6	4.5	2.8
Subtotal	6.2	6.7	7.3	12.5	14.4	12.4
Tax and Regulatory Subsidies[b]						
Fannie Mae	0.3	0.4	0.4	0.5	0.6	0.6
Freddie Mac	0.2	0.2	0.2	0.3	0.4	0.4
FHLBs	0.2	0.2	0.2	0.2	0.2	0.2
Subtotal	0.6	0.8	0.8	1.0	1.2	1.2
Total	6.8	7.4	8.1	13.5	15.6	13.6

SOURCE: Congressional Budget Office.

a.   The subsidies to GSE debt and mortgage-backed securities (MBSs) are present values.

b.   The tax and regulatory subsidies are savings for the current year only.

then, CBO estimates that the total subsidy to MBSs is 30 bps.

Several earlier studies estimated the federal subsidy to GSE-guaranteed MBSs by comparing the yield on senior guaranteed private securities with the yield on GSE MBSs. (The compared yields did not include the guarantee and other associated fees.) According to those studies, over the last several years, MBSs guaranteed by Fannie Mae and Freddie Mac have paid investors 20 to 40 bps less than the rates paid on privately guaranteed MBSs. In part, that broad range is due to the fact that the private and GSE securities often differ in other characteristics such as the quality of the underlying assets and the precise structure of the securities and guarantees.[23]

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23. Although CBO's estimate of a 30 bp advantage lies in the center of the range, such comparisons are a less satisfactory way to estimate the subsidy to MBSs because the estimate reflects only one source of difference, the interest rate required by investors. It neglects other differences that affect the total size and distribution of the subsidy, including differences in guarantee fees, rating fees, and operating costs.

In CBO's calculations, the gross subsidies to MBSs guaranteed by Fannie Mae and Freddie Mac are capitalized in the year of issue for the same reason that subsidies are capitalized for GSE debt issues. By CBO's estimates, gross subsidies to MBSs grew from $2.5 billion in 1995 to $4.2 billion in 1999 (see Table 6). That increase corresponds to the growth in MBSs outstanding plus any rollover amount guaranteed by Fannie Mae and Freddie Mac during this period. Slowed growth in 2000 reduced the estimated subsidy in that year to $3.6 billion.

Putting the Elements Together: The Total Subsidy

The estimated capitalized value of subsidies provided to all securities issued or guaranteed by the housing GSEs rose from $6.2 billion in 1995 to $14.4 billion in 1999, before falling back to $12.4 billion in 2000 (see Table 7). Combined with the current value of

Figure 3.
Total Subsidies to the Housing GSEs
Under Three Scenarios, 1988-2011
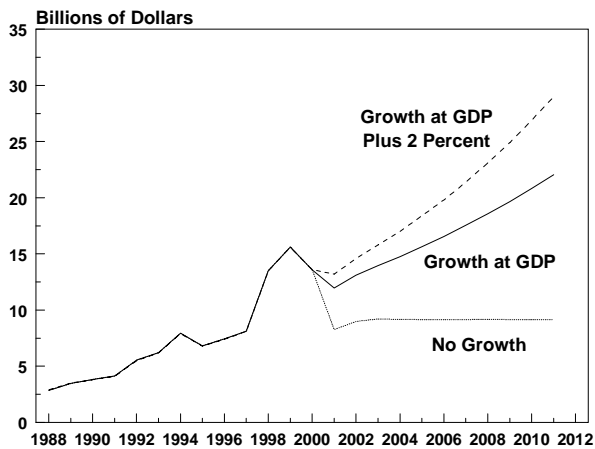
SOURCE: Congressional Budget Office.

the tax and regulatory exemptions provided to the enterprises—$1.2 billion[24] in 1999 and 2000—the total estimated subsidy was $15.6 billion in 1999 and $13.6 billion in 2000, up from $6.8 billion in 1995.[25]

The capitalized subsidy in any year depends critically on the growth rate of GSEs' borrowing and issuance of MBSs in that year. The total subsidy (including tax and regulatory benefits) would evolve differently in the next 10 years under three different scenarios for the growth of debt and MBSs: no growth, growth at nominal GDP (estimated by CBO to average 5.8 percent annually), and growth at nominal GDP plus 2 percent (see Figure 3). Under the no-growth scenario, there is a continuing subsidy because of the rollover of old mortgages. Under the high-growth scenario, the total subsidy would exceed $28 billion in 2011. Even the high-growth scenario assumes a growth rate that is significantly lower than the GSEs' growth in the last two decades and, hence, is conservative. Such conservatism is sensible because over the long term, growth that is significantly higher than nominal GDP is unsustainable under current policy, as the supply of conforming mortgages is limited.

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24.   This number is not capitalized because it is more closely related to current operating costs than to future commitments. Such treatment is consistent with that of administrative costs of credit programs under federal accounting standards.

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25.   CBO's current estimates are not directly comparable to its 1996 estimates because of methodological and other technical changes.

Estimated Distribution of Benefits

Not all of the subsidy is passed through to mortgage borrowers in the form of lower interest rates and fees on mortgages. The GSEs' stockholders and other stakeholders retain a portion of the subsidy from GSE status, and a portion of it also accrues to nonmortgage borrowers through FHLB member institutions. To quantify this division of benefits, CBO estimates the pass-through to conforming mortgage borrowers and assumes that the balance of the total estimated subsidy is retained by the publicly traded GSEs and the stakeholders of the FHLBs (see Figure 4).[1]

The actual distribution of the subsidy is difficult to determine deductively. Shareholders of the GSEs presumably provide management with incentives to retain as much of the subsidy as is feasible. Although Fannie Mae and Freddie Mac have a dominant position in the conforming mortgage market that confers considerable market power, competition between the two can force benefits to pass through to mortgage borrowers and originators.[2]

Determining the distribution of the subsidy to Federal Home Loan Banks is also complicated. The banks are cooperatively owned by retail financial institutions that have elected to become members of the FHLB System and are eligible to borrow from the FHLBs. Because members are both owners and customers of the FHLBs, it is likely that almost all of the benefit of GSE status is passed through to them, either in the form of concessions on advances or via dividends.[3] Because retail lending is a highly competitive industry, members may be forced to pass most of the benefit through to their own customers.[4] More specifically, CBO assumes that FHLB members use the benefit to match the subsidy that Fannie Mae and Freddie Mac pass through on conforming mortgages, and allocate the remainder in equal shares across the other assets they hold. Those assumptions lead to the conclusion, explained at greater length below, that the FHLBs reduce interest rates on jumbo mortgages by 3 basis points.[5] To the extent that

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1. Because the estimate of the pass-through is based on the amount of new debt and because the new debt is used in part to finance multi-family mortgages and some other assets, the estimate reflects the subsidy received by other borrowers as well as by conforming mortgage borrowers.

2. See Benjamin E. Hermalin and Dwight Jaffee, "The Privatization of Fannie Mae and Freddie Mac: Implications for Mortgage Industry Structure," in Department of Housing and Urban Development, Office of Policy Development and Research, *Studies on Privatizing Fannie Mae and Freddie Mac* (May 1996), pp. 225-302.
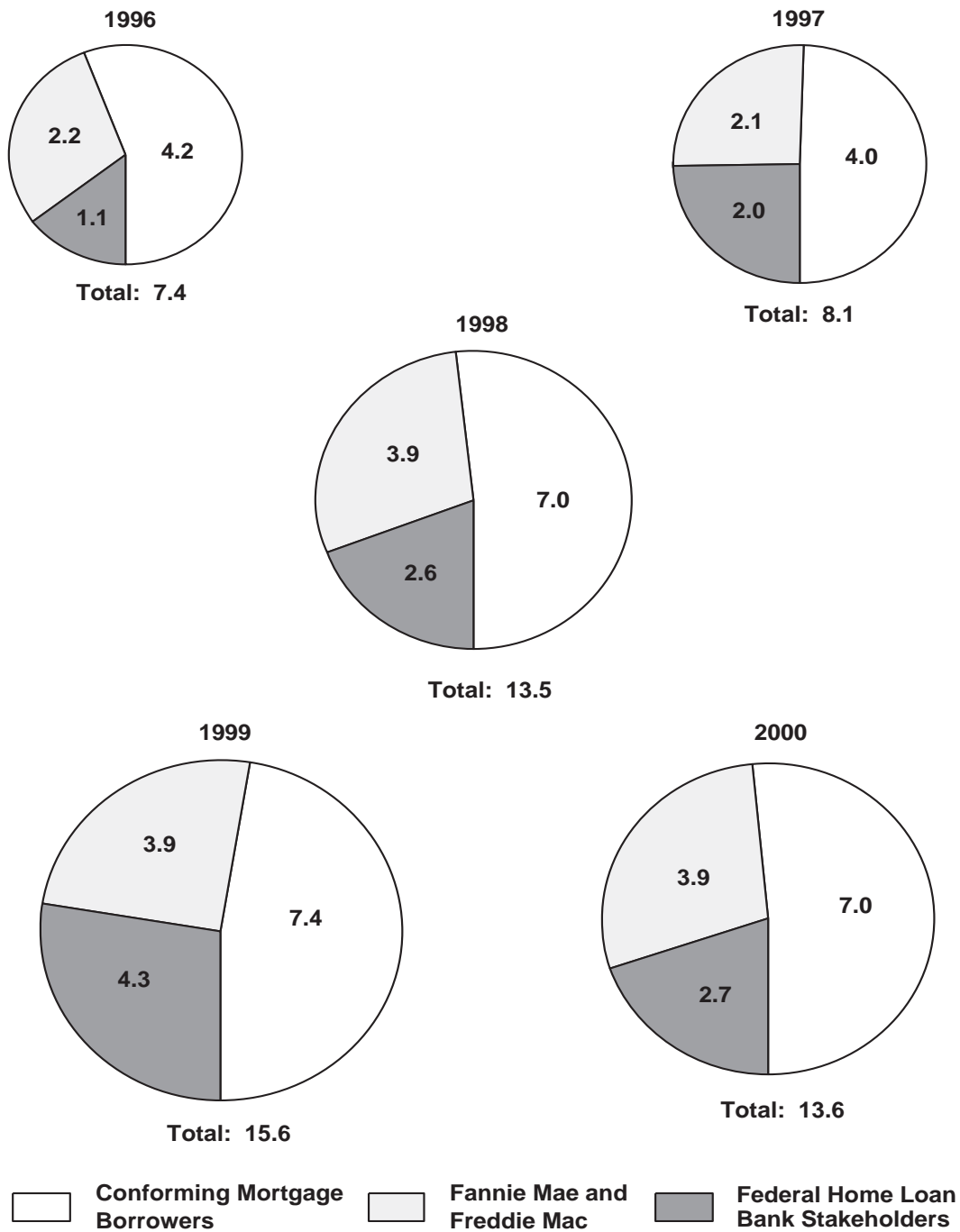
3. In 1999, interest rates on FHLB advances averaged 8 basis points above the interest rate on FHLB debt, and the banks paid an average dividend to members of 6.65 percent of paid-in capital.

4. Similarly, the assumption that mortgage borrowers rather than originators receive the subsidy passed through by Fannie Mae and Freddie Mac rests on the assumption that the origination business is highly competitive. To the extent that FHLB members or mortgage originators have market power, some of the subsidy assigned to nonmortgage borrowers is retained by members or originators.

5. In CBO's estimates, the subsidy to FHLBs is assumed to be spread over assets held by the member banks. To the extent that some of it benefits liability holders (for example, depositors and stockholders) through more branches and ATMs (automated teller machines) or in higher deposit rates, the pass-through estimated to accrue to borrowers of jumbo mortgages would be reduced. It has also been suggested that jumbo loan rates may be reduced by borrowers' substitution of conforming mortgages for jumbo loans, but a possibly offsetting effect is that the liquidity of the market for jumbo loans is reduced by the dominance and special status of conforming mortgages.

Figure 4.
Distribution of Subsidies by Beneficiary, 1996-2000 (In billions of dollars)

1996

2.2   4.2

1.1

Total: 7.4

1997

2.1   4.0

2.0

Total: 8.1

1998

3.9   7.0

2.6

Total: 13.5

1999

3.9   7.4

4.3

Total: 15.6

2000

3.9   7.0

2.7

Total: 13.6

☐ **Conforming Mortgage Borrowers**   ☐ **Fannie Mae and Freddie Mac**   ▨ **Federal Home Loan Bank Stakeholders**

SOURCE: Congressional Budget Office.

FHLB members are able to retain part of that benefit. CBO's method overestimates the pass-through to jumbo borrowers. However, that potential overestimate is unlikely to have a significant influence on the estimated benefit to conforming mortgage borrowers.

The traditional approach to estimating the distribution of the subsidy to the GSEs has been to compare interest rates on loans eligible for financing by them (that is, conforming mortgages) with rates on mortgage loans that are not eligible (that is, jumbo loans) and to attribute the difference to a pass-through.[6] CBO continues to use a variant of that approach, which incorporates statistical controls that reduce the biases inherent in a raw comparison of rates on jumbo and conforming loans.[7] CBO estimates that effective interest rates on jumbo mortgages averaged 18 to 25 bps higher than the rates on conforming mortgages during the period of 1995 through the second quarter of 2000; the point estimate is 22 bps.[8]

The influence of subsidies to the FHLBs on the rates on jumbo mortgages must be factored into the analysis to accurately measure the subsidy passed through to conforming mortgage borrowers. To do that, CBO assessed the extent to which the banks reduce the rate on jumbo mortgages and thus cause the jumbo/conforming spread to understate the pass-through to conforming mortgage borrowers. The logic is that the subsidy to the FHLBs passes through

to member institutions and to users of the financial system. At year-end 1999, members held $1.13 trillion in residential mortgages and $3.7 trillion in total assets. Using Pearce and Miller's estimate that 52 percent of members' mortgages are jumbo mortgages, CBO estimates that conforming mortgages accounted for $542 billion. Relying on the 22 bp estimate of the observed jumbo/conforming spread and calculating the reduction in rates on all other assets (including jumbo mortgages) that fully exhausts the FHLBs' subsidy, CBO concludes that the subsidy to the FHLBs reduces the rates on jumbo loans by 3 bps. Combining that reduction with an estimated jumbo/conforming differential of 22 bps produces an estimate of 25 bps for the pass-through on conforming mortgages.

If Fannie Mae and Freddie Mac are passing through 25 basis points of subsidy to borrowers, then they are retaining 16 bps (of the total 41 bps) of subsidy received on each dollar of debt. For MBSs, CBO assumes the same pass-through of 25 bps. Thus, a larger portion of the benefit, 25 of the total 30 bps, goes to borrowers, and Fannie Mae and Freddie Mac retain only 5 bps. One explanation for a lower retained benefit on MBSs is that the risk assumed by the GSEs is considerably less than on mortgages held in their portfolios. Because of risk considerations, the GSEs may be equating the marginal benefit of issuing debt and MBSs, even though the subsidy on debt is greater. Nevertheless, the difference in the subsidy may help to explain Fannie Mae's and Freddie Mac's increased use of debt relative to MBSs over recent years.

As is the case with subsidies to debt and to MBSs, the value of the subsidies provided to borrowers in a single year is measured by capitalizing future interest savings rather than a single year's savings. The capitalized subsidy going to the GSEs' conforming mortgage borrowers rose from $3.7 billion in 1995 to $7.4 billion in 1999 and fell back to $7.0 billion in 2000 (see Table 8).

Because Fannie Mae and Freddie Mac are restricted to operating in the conforming mortgage market, CBO assumes that the portion of the subsidy not passed through is retained by shareholders and other stakeholders. Subtracting the amount of subsidy passed through by Fannie Mae and Freddie Mac from their total subsidy ($10.6 billion in 2000) leaves $3.9 billion as the amount that they retained. For the

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6.　　See Patric H. Hendershott and James D. Shilling, "The Impact of the Agencies on Conventional Fixed-Rate Mortgage Yields," *Journal of Real Estate Finance and Economics*, vol. 2, no. 2 (June 1989), pp. 101-115; Robert F. Cotterman and James E. Pearce, "The Effects of the Federal National Mortgage Association and the Federal Home Loan Mortgage Corporation on Conventional Fixed-Rate Mortgage Yields," in Department of Housing and Urban Development, *Studies on Privatizing Fannie Mae and Freddie Mac*, pp. 97-168.

7.　　See Congressional Budget Office, "Interest Rate Differentials Between Jumbo and Conforming Mortgages, 1995-2000," CBO paper (May 2001).

8.　　CBO's estimate is close to the range of 18 to 23 bps recently estimated by Wayne Passmore, Roger Sparks, and Jamie Ingpen, *GSEs, Mortgage Rates, and the Long-Run Effects of Mortgage Securitization*, Finance and Economics Discussion Series, Federal Reserve Board (December 2000). The estimate is somewhat higher than the estimate of 19 bps reported in Toevs, "A Critique of the CBO's Sponsorship Benefit Analysis." One possible source of difference is that this CBO study uses nationwide data, including areas where the market for jumbo loans is small and inactive and jumbo rates tend to be higher.

Table 8.
Distribution of Subsidies by Intermediary and Beneficiary, 1995-2000 (In billions of dollars)

	1995	1996	1997	1998	1999	2000
Passed Through to Conforming Mortgage Borrowers[a]						
Fannie Mae	2.3	2.4	2.5	3.9	3.7	3.8
Freddie Mac	1.3	1.7	1.4	2.9	3.2	2.9
FHLBs[b]	0.1	0.1	0.2	0.2	0.4	0.3
Subtotal	3.7	4.2	4.0	7.0	7.4	7.0
Retained by[c]						
Fannie Mae	1.2	1.3	1.4	2.2	2.2	2.3
Freddie Mac	0.7	0.9	0.7	1.7	1.7	1.6
FHLB stakeholders[d]	1.3	1.1	2.0	2.6	4.3	2.7
Subtotal	3.2	3.3	4.1	6.5	8.2	6.6
Total	6.8	7.4	8.1	13.5	15.6	13.6
Memorandum:						
Percentage of Subsidies Retained by Fannie Mae and Freddie Mac	35	36	35	37	36	37

SOURCE: Congressional Budget Office.

a. The subsidies passed through to conforming mortgage borrowers are present values.

b. The estimates assume that conforming mortgages financed by FHLB members were a constant share of members' portfolios from 1995 to 2000.

c. Retained subsidies are gross subsidies less the amounts passed through to conforming mortgage borrowers.

d. Includes member institutions, the federal government, non-conforming-mortgage borrowers, and other borrowers.

FHLBs, CBO estimates that their conforming mortgage borrowers received $0.3 billion out of the $3.0 billion total subsidy. Presumably, the balance reduced borrowing rates on other types of loans, including jumbo mortgages, and accrued to other FHLB stakeholders.

Because other market participants must offer terms that are competitive with the GSEs in order to attract borrowers, interest rates on mortgages eligible for financing by Fannie Mae and Freddie Mac are reduced even if those mortgages are financed by others. Because that effect is costless to the GSEs, it is not part of CBO's subsidy estimates. Nevertheless, CBO has estimated its size, finding that in terms of a capitalized amount, there is no pass-through to mortgage borrowers that can be attributed to other inter-

mediaries. The result reflects the fact that the GSEs have increased their share of conforming mortgages to the point at which no new conforming mortgages are being made that are not subsidized by the GSEs. That is, the net increase in outstanding fixed-rate conforming mortgages for one- to four-family housing ($228 billion in 1999) is less than the net increase in conforming mortgages financed or guaranteed by Fannie Mae and Freddie Mac ($256 billion). Therefore, the calculation of the pass-through to borrowers from the GSEs reflects the entire benefit to new borrowers.[9]

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9. Appendix A includes further discussion of how much of the mortgage market is served by other financial institutions.

Sensitivity Analysis

As with all such calculations, data limitations and the complexity of the underlying processes imply that uncertainty surrounds CBO's point estimates. By consistently adjusting all of the parameter values in a single direction, the estimates can be forced significantly higher or lower. In assessing those estimates, therefore, it is important to note that when missing or insufficient data necessitate judgments about parameter values, those judgments are not consistently in one direction or the other. CBO has endeavored to balance those judgments so as to arrive at point estimates that are free of systematic bias.

Certain assumptions may have lowered the estimated subsidy. They include using a short time horizon over which to measure the benefit from securities issued in the current year; using a risk-adjusted discount rate, rather than a Treasury rate to convert savings into present values; attributing no benefit to the GSEs' ability to adjust their security sales and mortgage purchases to changes in yield spreads; and assigning a zero value to the benefit of federal backing for derivatives and call options.

Other assumptions may have raised the estimated subsidy. They include basing the funding advantage on GSE debt on a sample of non-GSE securities more heavily weighted toward A than toward AA issues (an approach made necessary by data limitations); assuming that the funding advantage is based solely on government backing rather than on an advantage in operating efficiency; and assigning the same funding advantage to short-term debt that is "effectively long" as assigned to long-term debt.

Exactly how all of those approximations have affected the estimated subsidy is impossible to determine, but it is possible to look at the sensitivity of the estimates to several of the key parameters. Those include assumptions about the horizon over which the subsidy to this year's activity continues, the borrowing advantage on debt, the rate differential between GSE-guaranteed and privately guaranteed MBSs, the discount rate, and the rate used to calculate the subsidy passed through to mortgage borrowers.

The effects of varying those factors within plausible bounds on the total subsidy estimates (or in one case the pass-through amount) are summarized in Table 9. The results show the effect of changing one factor at a time, while holding all other variables at their assumed values in the base case. The ranges chosen for each variable are based on the following considerations:

o   **Borrowing advantage on debt**. The variation in the borrowing advantage on long-term debt of 15 bps is based on standard errors reported in Ambrose and Warga's analysis. CBO assumes that the same uncertainty applies to the advantage on short-term debt. A plus or minus one standard deviation range implies a borrowing advantage of between 26 and 56 bps.

Table 9.
Sensitivity Analysis of CBO's Base Case of Federal Subsidies to the Housing GSEs (In billions of dollars)

Basis Points per Year	1999	2000
Changes in Total Subsidy		
(Base case = $15.6 billion in 1999 and $13.6 billion in 2000)		
Borrowing Advantage on Debt		
(Base case = 41 bps)		
26	-3.74	-3.21
56	3.74	3.21
Discount Rate		
(Base case = 660 bps on average)		
610	0.28	0.23
710	-0.28	-0.23
Borrowing Advantage on Mortgage-Backed Securities		
(Base case = 30 bps)		
25	-0.70	-0.61
40	1.40	1.22
Changes in Pass-Through to Conforming Mortgage Borrowers		
(Base case = $7.4 billion in 1999 and $7.0 billion in 2000)		
Rate of Pass-Through[a]		
(Base case = 25 bps)		
15	-3.90	-3.36
30	1.95	1.68

SOURCE: Congressional Budget Office.

a. Assumes no change in the total subsidy.

o   **Discount rate**. The variation in the discount rate is plus or minus 50 bps, which is approximately the spread between Treasury and AAA-rated securities.

o   **Advantage on MBSs.** The rate differential between GSE-guaranteed and privately guaranteed MBSs varies between 25 and 40 bps.

o   **Rate of pass-through to borrowers**. Under CBO's assumptions, the lower bound for the rate passed through to mortgage borrowers is 15 bps, and the upper bound 30 bps.[1] That range reflects the uncertainty in direct estimates based

on jumbo/conforming spreads and the divergence of views on how much competition affects the subsidy passed through.

o   **Horizon.** As discussed earlier, the GSEs' credit expansion appears to be permanent, providing an infinite upper bound on the lifetime of incremental debt and MBSs. Subsidy estimates using a perpetual horizon are reported in Appendix B. The lower bound assumes that the current commitment extends only seven years. The lower-bound estimates are the ones provided in the body of this report.

Among the variations considered, the greatest sensitivity is to the borrowing advantage on debt and to the pass-through to borrowers. Changes in the discount rate or the advantage on MBSs have less effect on the subsidy calculations.

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1.   The range is not symmetric around the base case because the upper bound of a symmetric range would imply a larger pass-through than the total subsidy to MBSs.

Appendixes

Responses to Analyses of the Congressional Budget Office's 1996 Subsidy Estimates

F annie Mae and Freddie Mac have questioned several aspects of the subsidy estimates reported by the Congressional Budget Office (CBO) in its mandated study *Assessing the Public Costs and Benefits of Fannie Mae and Freddie Mac*, released in 1996. Those objections are summarized below, along with CBO's responses.

Questions Addressed

In that 1996 study, CBO estimated:

o   The total subsidy accruing to Fannie Mae and Freddie Mac from their special status and

o   The division of that total subsidy among those government-sponsored enterprises' (GSEs') shareholders, mortgage borrowers, and other beneficiaries.

The current study revisits those same issues, as requested by Congressman Baker.

Fannie Mae, Freddie Mac, and their contractors have suggested that CBO focus on a different question: how big is the benefit to GSEs compared with the benefit to mortgage borrowers?[1] In their critiques of CBO's estimates, they often respond to that alternative question, stating that the benefit to borrowers exceeds the benefit to the GSEs.

CBO believes that the questions addressed in its studies not only reflect the questions asked by the Congress but also are a better way to look at the benefit provided by the federal government. The question that Fannie Mae and Freddie Mac pose and answer assumes that if the estimated benefit to borrowers exceeds the benefit to the GSEs, then the current distribution of the benefits is somehow appropriate. As CBO's approach emphasizes, the subsidy to the GSEs has two distinct components, the portion passing through to mortgage borrowers and the portion retained by shareholders and to a lesser extent other stakeholders. It is not clear what question can be answered by comparing the estimated gross benefit to the GSEs, which includes most of the subsidy to borrowers, with an estimate of the total subsidy to borrowers, which for some years includes a small number of additional borrowers who benefit from lower conforming rates but whose mortgages are not intermediated by the GSEs. One interpretation is that

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1.   See, for example, Pearce and Miller, "Freddie Mac and Fannie Mae: Their Funding Advantage and Benefits to Consumers"; Toevs, "A Critique of the CBO's Sponsorship Benefit Analysis"; and Federal Home Loan Mortgage Corporation, *Financing America's Housing: The Vital Role of Freddie Mac*, p. 33.

Table A-1.
Fannie Mae's and Freddie Mac's Estimated Share of One- to Four-Family Mortgages,
December 31, 2000 (In trillions of dollars)

All One- to Four-Family Mortgages	
Total mortgages	5.2
Minus federally insured mortgages	<u>-0.8</u>
Equals conventional mortgages	4.4
Minus jumbos	<u>-0.9</u>
Equals conforming conventional mortgages	3.5
Minus adjustable-rate mortgages (ARMs)	<u>-0.7</u>
Equals fixed-rate conforming conventional mortgages	2.8
One- to Four-Family Mortgages Financed or Securitized **by Fannie Mae and Freddie Mac**	
Portfolio holdings of conforming mortgages	0.9
Plus mortgage-backed securities	1.3
Minus federally insured and multifamily mortgages, and ARMs	-0.2
Equals fixed-rate conforming conventional mortgages	2.0
Memorandum: Fannie Mae's and Freddie Mac's share of fixed-rate conforming mortgages (Percent)	71

SOURCE: Congressional Budget Office.

NOTE: Conventional mortgages are those not guaranteed by a federal agency.

they believe it is appropriate for shareholders to retain a dollar for every dollar provided to home buyers.

A better question for the stockholder-owned GSEs would be the following: could the same benefits be delivered to home buyers even if shareholders received less? Many mechanisms (restrictions on the size of the GSEs' portfolios, charter auctions under which other financial institutions could bid for the same set of benefits, or guarantee fees) would reduce the share of the subsidy accruing to shareholders but leave the function of the GSEs largely unchanged. Although the GSEs have contributed to the efficiency of the mortgage market, future efficiency does not depend on shareholders' receiving dollar-for-dollar compensation for providing benefits to home buyers.

Another issue is whether the GSEs should be credited with "passing through" subsidies that are paid by other lenders. Through market dominance, the presence of Fannie Mae and Freddie Mac has reduced rates on all conforming mortgages, not just those that they hold in portfolio or have securitized. Because the market rate for fixed-rate conforming mortgages has been reduced about 25 bps by the GSEs, all lenders must accept a 25 bp reduction in yield on those mortgages.[2] However, Fannie Mae and Freddie Mac do not give up any of their retained

2.   The figure of 25 bps may overestimate the amount by which the GSEs lower rates on conforming loans. The measurement is based on current spreads between the rates for fixed-rate jumbo loans and those for conforming loans but does not take into account that the GSEs may crowd out some other market participants. Any rate reduction that would have been achieved by those other participants is attributed to the GSEs in this calculation.

subsidy to pay for the benefit of lower rates on mortgages financed by others. Those benefits come at the expense of lower income to non-GSE lenders. Accordingly, no credit is given for "passing through" a benefit whose cost has been shifted to others. As a practical matter, this argument is less important than in the past. As discussed earlier, non-GSEs have a shrinking share of the conforming market and, hence, provide no incremental subsidies to mortgage borrowers at this time.

Competition in the Secondary Market for Conforming Mortgages

Fannie Mae asserts that intense competition forces the pass-through of all subsidies and that none is retained by the GSEs. As evidence, Fannie Mae cites its estimate that—as of December 31, 2000—it and Freddie Mac together held only 22.7 percent of the fixed-rate single-family mortgages that are outstanding in the United States. However, the market that Fannie Mae uses for comparison includes jumbo mortgages—those whose original principal is above the conforming ceiling and therefore are not eligible for purchase by Fannie Mae and Freddie Mac. It also includes mortgages explicitly guaranteed by agencies of the federal government—the Federal Housing Administration, the Veterans Administration, and the Department of Agriculture's Rural Housing Service —that are eligible for securitization by the federally owned Ginnie Mae, which guarantees most securities backed by those mortgages. Removing the fixed-rate mortgages that are either ineligible or already federally insured reduces the size of the market in which Fannie Mae and Freddie Mac operate by one-third. Adding the GSEs' outstanding MBSs to their portfolio holdings increases Fannie Mae and Freddie Mac's share to 71 percent of the market (see Table A-1).[3]

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3. According to Department of Housing and Urban Development, Office of Federal Housing Enterprise Oversight, *2000 Report to Congress* (June 15, 2000), p. 10, "The enterprises dominate the secondary market for conventional mortgages." Further analysis of the structure of the secondary mortgage market can be found in Hermalin and Jaffee, "The Privatization of Fannie Mae and Freddie Mac: Implications for Mortgage Industry Structure," pp. 225-302.

Subsidies on Callable Debt

In the 1996 study, CBO estimated subsidy rates for callable and noncallable (or bullet) debt separately. Fannie Mae and Freddie Mac have argued that the subsidy rates applied to callable debt were implausibly high (105 basis points), especially in relation to the estimated subsidy rate on noncallable debt (46 basis points).

The ability to issue large amounts of callable debt, at interest rates that apparently decline as the volume of issues increases, is one of the advantages of GSE status. Indeed, according to market observers, issues of callable debt by private financial firms are sufficiently unusual that the liquidity advantage on GSE callables is greater than their liquidity advantage on bullet debt. Nonetheless, for the reasons cited earlier, CBO now makes the conservative assumption that the GSEs receive no more subsidy on callable debt than on noncallable debt and attributes the same funding advantage to all long-term debt.

Subsidies on Short-Term Debt

CBO's 1996 study used the same subsidy rate for short-term and long-term debt. Fannie Mae and Freddie Mac have asserted and CBO agrees that their funding advantage is lower on short-term debt. In the current estimate, CBO uses a lower funding advantage for short-term debt than long-term debt.

Adjustment for Liquidity

Although the GSEs' contend that liquidity is a major source of their funding advantage, CBO does not estimate the value of liquidity separately. Rather, it is assumed that the value of greater liquidity is reflected in the spreads used to estimate the subsidies on debt securities and MBSs; investors are willing to pay more for more liquid securities. More fundamentally, CBO attributes the greater liquidity of GSE securities over those of other financial firms to the implicit

guarantee, much as the government guarantee of Treasury securities is often cited as the reason for their liquidity. To the extent that the greater liquidity is a result of operating efficiencies that exceed those achieved by other financial institutions, this assumption imparts an upward bias to the subsidy estimate. It seems likely, however, that the sophisticated financial institutions with which the GSEs compete also manage their debt operations so as to capture any available gains from enhanced liquidity.

Subsidies to MBSs

In its 1996 study, CBO referred to the lower rates on GSE-guaranteed MBSs as "cost savings to the GSEs," some of which were characterized as "passed on to borrowers" and some as retained by the GSEs. Fannie Mae objected to that characterization on the grounds that the savings from lower interest rates on GSE-guaranteed MBSs pass directly from lenders to borrowers without going through a GSE.

The current study describes federal subsidies to securities issued or guaranteed by the housing GSEs and then categorizes those subsidies by their final recipient, either one of the GSEs or borrowers. That approach avoids the implication that Fannie Mae receives a benefit on its guarantees that exceeds its guarantee fee, but it has no effect on the estimated size or distribution of the subsidies.

Subsidy Estimates When Growth Is Permanent

A s discussed earlier, over the past two decades the housing GSEs' year-by-year credit expansion appears to be permanent, suggesting that assuming an infinite upper bound on the lifetime of incremental debt and MBSs provides a useful measure of the subsidies to the GSEs. The value of total subsidies and their distribution under this assumption are presented in Table B-1.

Table B-1.
Federal Subsidies to the Housing GSEs Using a Perpetual Horizon, 1995-2000
(In billions of dollars)

	1995	1996	1997	1998	1999	2000
Subsidies by GSE and by Source						
Fannie Mae						
Debt	2.7	2.1	2.5	6.7	6.3	6.2
Mortgage-backed securities	1.3	1.7	1.5	3.1	2.2	1.3
Tax and regulatory exemptions	0.3	0.4	0.4	0.5	0.6	0.6
Freddie Mac						
Debt	1.7	2.4	1.0	8.5	5.3	4.3
Mortgage-backed securities	-0.1	0.7	0.1	0.1	3.1	1.8
Tax and regulatory exemptions	0.2	0.2	0.2	0.3	0.4	0.4
FHLBs						
Debt	2.0	1.3	3.5	5.3	10.7	4.3
Tax and regulatory exemptions	0.2	0.2	0.2	0.2	0.2	0.2
Total	8.3	9.0	9.4	24.7	28.8	19.1
Subsidies by Beneficiary						
Conforming mortgage borrowers	3.8	4.8	3.8	12.4	12.4	9.4
Fannie Mae and Freddie Mac	2.5	2.8	2.2	7.2	6.5	5.6
FHLB stakeholders[a]	2.0	1.4	3.4	5.1	9.9	4.1
Total	8.3	9.0	9.4	24.7	28.8	19.1

SOURCE: Congressional Budget Office.

NOTE: Subsidies to GSE debt and mortgage-backed securities are present values over a perpetual horizon. The annual savings from tax and regulatory exemptions are for the current year only.

a. The estimates assume that conforming mortgages financed by FHLB members were a constant share of members' portfolios from 1995 to 2000.