Fair-Value Budgeting: Practical Issues

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Abstract

Fair-value budgeting represents a more comprehensive measure of cost for government activities than the measure required under current law. However, fair-value budgeting raises practical questions: Which government activities would benefit from fair-value estimates? How might they be used? How can agencies estimate fair value without observing market prices for government risks? The use of fair value could depend on three criteria:

- Commitment, whether the government makes commitments that it cannot shed through future legislation;
- Feasibility, whether fair-value costs can be estimated with accuracy; and
- Relevance, whether fair-value estimates convey meaningful additional information about costs.

Federal credit programs fulfill all three criteria in that they involve binding contractual commitments, their fair-value cost can be estimated with established methods, and the fair-value cost estimates for credit programs often differ in sign and magnitude from official cost estimates. The estimation of fair value for credit programs is subject to uncertainty because of the reliance on private proxies and the difficulty in disentangling credit risk and liquidity premiums. Nonetheless, fair-value estimates offer useful additional information to supplement official estimates.

Keywords: federal credit programs, fair value, discounting, uncertainty, risk premiums

JEL Classification: G00, H50, H81, H83

Contents

Financial risk is involved in many of the federal government's activities:

- Making loans and loan guarantees, at the risk of higher-than-expected rates of default;
- Insuring bank deposits and pension funds, running the risk of higher costs if many banks fail or if pension investments perform poorly; and
- Levying taxes, which generate revenues that fluctuate with the performance of the economy.

Likewise, spending automatically varies with economic variables in safety-net programs. Those activities lead to larger-than-expected deficits when the economy is weak. That risk is passed on to both beneficiaries of government programs and taxpayers for whom, as investors, it would have a cost.

The measures required under current law are governed by the Federal Credit Reform Act of 1990 (FCRA). Under FCRA, federal government agencies estimate the budgetary costs of loans and loan guarantees by discounting projected future cash flows to the present with Treasury rates. That present-value, or accrual, approach recognizes costs at the time that loans are made instead of when cash flows occur—as is done in budgeting for most other activities. Accrual measures succinctly convey whether policy changes are expected to increase or decrease the deficit over the long term. That approach facilitates comparisons of the net cost of programs with cash flows that differ in timing and potentially improves lawmakers' opportunity to control long-term costs when commitments are initially made. Agencies project future cash flows as averages of their possible values, weighting different outcomes by their probability.

Fair-value budgeting, by contrast, measures the costs of loans and loan guarantees more fully by using market prices—and could be used for other activities as well. Fair-value estimates include market risk, the cost associated with assets' tendency to perform well in good economic times and poorly otherwise. Fair-value estimates reflect people's tendency to place greater weight on scenarios in which the economy is underperforming.[1]

Some analysts have raised both conceptual and practical concerns with using fair value in budgeting. Separate publications address conceptual concerns.[2] This working paper answers the following questions:

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[1] See Congressional Budget Office, *Measuring the Cost of Government Activities That Involve Financial Risk* (March 2021), www.cbo.gov/publication/56778.

[2] See Michael Falkenheim, *Fair-Value Cost Estimation and Government Cash Flows*, Working Paper 2021-05 (Congressional Budget Office, April 2021), www.cbo.gov/publication/57062, and *Governmental Risk Taking Under Market Imperfections*, Working Paper 2021-07 (Congressional Budget Office, June 2021), www.cbo.gov/publication/57255.

- Which government activities would benefit from fair-value estimates?
- How could fair-value estimates be used?
- How can agencies estimate fair value without observable market prices?

Together, those questions cover most practical concerns that the Congressional Budget Office and other parties have raised about fair value. Although CBO has shown how fair-value estimates may be produced for federal credit programs to provide a more comprehensive measure of their costs, the agency has recognized that producing those estimates is more complex for other agencies with more limited analytical resources.[3] Some analysts have raised concerns that fair-value estimates may tip the scales against government activities for which they are used.[4] Those concerns are mainly related to the fact that fair-value estimates take into account the cost of market risk, which cannot be diversified away by investors and therefore adds to the cost estimate for any credit program.

Which Activities Would Benefit From Fair-Value Estimates?

By law, CBO has been required to use fair value as the official cost measure for a few activities in baseline projections of the federal budget. The agency also has produced fair-value estimates of legislative proposals as an alternative cost measure at the request of the Congress. Fair-value estimates can take significant effort to produce. For many types of government activity not involving financial risk, fair-value estimates might not differ much from traditional estimates. Thus, generating fair-value estimates for those government activities would be impractical. Ideally, clear and transparent criteria would determine when to estimate the fair-value cost of government activities involving financial risks. One trigger for estimating fair value could be the presence of binding commitments, such as the contractual obligations in federal credit programs. Fair value also could be reserved for situations in which it affects the cost estimate's sign and magnitude. Estimates under FCRA most often suggest the presence of a "free lunch," in which the government produces something of value to households or businesses at no budgetary cost, unlike fair-value estimates. Similarly, fair-value cost estimates avoid the impression that the government can reduce deficits by purchasing risky financial assets at market prices. A final criterion is whether fair-value estimates are feasible to produce.

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[3] For example, see Congressional Budget Office, Answers to Questions for the Record Following a Hearing on the Oversight of the Congressional Budget Office Conducted by the Senate Committee on the Budget (November 18, 2016), pp. 14–17, www.cbo.gov/publication/52155, and testimony of Douglas W. Elmendorf, Director, Congressional Budget Office, before the House Committee on Financial Services, Estimates of the Cost of the Credit Programs of the Export–Import Bank (June 25, 2014), www.cbo.gov/publication/45468.

[4] See Paul N. Van de Water and Joan Huffer, *House "Budget Transparency" Bill Would Make Budget More Opaque* (Center on Budget and Policy Priorities, June 2013), https://tinyurl.com/vhuwteuf.

Past and Present Use of Fair Value in Cost Estimates

The Congress has required the use of fair value in a few cases. The Emergency Economic Stabilization Act of 2008 required that purchases and sales of financial assets through the Troubled Asset Relief Program be recorded in the budget with an adjustment for market risk, an equivalent to fair value. In addition, certain contributions to the International Monetary Fund are accounted for in the budget on an accrual basis with a market risk adjustment, following the direction in the authorizing legislation. The Congressional Oversight Panel also used fair value to assess whether the taxpayer was receiving a "fair deal" for purchases under the Troubled Asset Relief Program.[5]

CBO produces fair-value estimates in other cases at the request of the Congress and when fair value offers a useful perspective on an activity's cost. For example, the Senate's annual budget resolution for fiscal years 2015 and 2016 required CBO to produce a fair-value estimate in addition to the estimate required under FCRA for any legislative proposals affecting federal student loans and mortgage guarantees.[6] Annually, CBO produces fair-value estimates for all credit programs subject to FCRA. After consulting with the House and Senate Budget Committees, CBO estimates the fair-value cost of the activities of Fannie Mae and Freddie Mac, which CBO treats in baseline cost estimates as though they were conducted by a government agency. CBO also develops fair-value measures in published cost estimates in certain cases at the Congress's request. For example, CBO estimated the cost of a proposal to lend money to multiemployer pension plans on a fair-value as well as a FCRA basis at the request of a Member of Congress.[7] CBO also often uses fair-value estimates in reports that present policy options.[8]

Criteria for Using Fair Value: Commitment, Feasibility, and Relevance

The risk of costs' differing from expectations in credit programs is comparable to that of entitlement programs. Most credit programs are funded through a discretionary appropriation but have permanent indefinite authority for cost overruns. When their cost is underestimated, money automatically becomes available to cover the higher-than-expected cost, as with mandatory programs. Thus, mandatory programs such as unemployment insurance present risks to the budget similar to those of credit programs. Tax revenue, which varies with the economy, also is a source of risk in the budget. Despite those similarities in risk, fair value has been used mostly for credit programs, with a few exceptions.

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[5] See Congressional Oversight Panel, *February Oversight Report: Valuing Treasury's Acquisitions* (February 2009), https://go.usa.gov/x6fJw.

[6] See budget resolution for fiscal year 2016, S. Con. Res. 11, 114th Cong. (2015), https://go.usa.gov/x67EF.

[7] See Congressional Budget Office, letter to the Honorable Mike Enzi on the Potential Effects of H.R. 397, Rehabilitation for Multiemployer Pensions Act of 2019 (September 6, 2019), www.cbo.gov/publication/55599.

[8] See Congressional Budget Office, *Accounting for Fannie Mae and Freddie Mac in the Federal Budget* (September 2018), www.cbo.gov/publication/54475.

In general, budgeting does not follow a single uniform set of procedures for all activities. For example, budget projections use different approaches to estimate costs of discretionary and mandatory programs. The budget makes a distinction between operating and capital leases that creates a threshold for whether agencies must budget for the full cost of a lease up front or on a year-by-year basis. That distinction was designed to capture the fact that a lease can effectively acquire an asset if it covers its entire useful life. Budget resolutions and parliamentary rules create many other thresholds that result in inconsistent treatment of economically similar activities. For example, that occurs in considering costs outside CBO's typical 10-year window for projecting the federal budget. Because cash budgeting was distorting the choice between direct loans, loan guarantees, and grants, FCRA carved out an accrual measure for credit programs that differed from the cash treatment applied to the rest of the budget but that did not include market risk. Different budgeting practices for different activities recognize the disadvantages of one-size-fits-all measures in the face of time and information limitations on agencies that produce budget estimates. Producing conceptually ideal estimates is not always feasible, and doing so is not always meaningful to policymakers.

As an illustration, accrual budgeting is used only in limited cases in which it might be theoretically useful. Accrual budgeting recognizes costs at the time that commitments are made instead of when cash flows occur—as is done in the "cash" budgeting for most other activities. Fair-value budgeting is a form of accrual budgeting that treats both risk and timing differently. CBO developed criteria for when accrual measures might be suitable based on the nature of the government's commitment, the relevance of accrual measures to understanding overall budgetary effects, and the feasibility of developing the measures.[9] Additional reports explored the possibility of applying accrual budgeting to government employee retirement programs and insurance programs, recognizing that doing so had advantages and disadvantages.[10]

Similar advantages and disadvantages exist for applying fair-value budgeting more broadly than just for credit programs. The same criteria used to evaluate when applying accrual budgeting is useful—commitment, feasibility, and relevance—could be used for fair-value estimates as well.

Commitment. Credit programs differ from mandatory programs as a result of the time lags between commitments—firm legal contracts for credit programs—and their cash flows. Loan guarantees, for example, involve contracts for which the government could be sued in the case of a breach and ordered to make good on its guarantee. Noncredit mandatory programs generally do

[9] See Congressional Budget Office, *Cash and Accrual Measures in Federal Budgeting* (January 2018), www.cbo.gov/publication/53461.

[10] See Congressional Budget Office, *Measuring the Costs of Federal Insurance Programs: Cash or Accrual?* (December 2018), www.cbo.gov/publication/53921, and *Accounting for Federal Retirement and Veterans' Benefits: Cash and Accrual Measures* (September 2019), www.cbo.gov/publication/55499.

not involve significant time lags between a legal commitment and cash transactions.[11] Commitments for other obligations are not usually contractual, except for some insurance programs. For example, if the Social Security trust funds' balances fell to zero and current revenues could not cover benefits specified in law, Social Security would no longer be permitted to pay full benefits when they were due. Current law does not specify how outlays would be reduced. However, those obligations might involve other, softer commitments that could be perceived as an implicit promise by the government to beneficiaries. And the Congress often makes good on those implicit promises—for example, by authorizing payments to the multiemployer pension system in the American Rescue Plan Act of 2021, which is backstopped by a government insurance fund that was projected to run out of money.[12]

The government may be justified to incorporate the cost of risk in evaluating a commitment that occurs well before a cash transaction. Similarly, not doing so may be justified when projecting spending in a program for which no advance contractual commitment is specified under current law. In that sense, the case for a special treatment of risk in credit programs is the same as a case for the special treatment of the time value of money that already exists under FCRA.

Feasibility. In general, producing fair-value estimates for credit programs with well-established approaches is possible, although those estimates are subject to uncertainty (as discussed later). Fair-value estimates also are well grounded in established methods when applied to financial assets such as those acquired in the Troubled Asset Relief Program and other emergency lending programs. A significant amount of research has addressed how to produce fair-value estimates for insurance commitments such as obligations of the Federal Deposit Insurance Corporation and Pension Benefit Guaranty Corporation.

Estimating fair value would require more novel approaches for revenue and many mandatory programs, although research into those approaches is under way. Research has shown how to value claims on labor income.[13] That research could be used to estimate the cost of pension and

[11] However, some government activities might make a firm of commitment that is not legally binding. Retirement programs are an example of a commitment that is not legally binding but might be of some consequence if ever broken.

[12] See Congressional Budget Office, cost estimate for H.R. 1319, American Rescue Plan of 2021 (March 10, 2021), www.cbo.gov/publication/57056.

[13] See Mark Huggett and Greg Kaplan, "How Large Is the Stock Component of Human Capital?" *Review of Economic Dynamics*, vol. 22 (October 2016), pp. 21–51, https://doi.org/10.1016/j.red.2016.06.002; and Luca Benzoni, Pierre Collin-Dufresne, and Robert S. Goldstein, "Portfolio Choice Over the Life-Cycle When the Stock and Labor Markets Are Cointegrated," *Journal of Finance*, vol. 62, no. 5 (October 2007), pp. 2123–2167, https://doi.org/10.1111/j.1540-6261.2007.01271.x.

Social Security obligations by using fair value.[14] The value of capital gains taxes can theoretically be valued using options pricing methods because capital gains taxes resemble a financial option.[15] Taxes on dividends represent a stake in companies that resembles company stock and can be valued as such.

Relevance. Fair-value estimates are relevant to understanding the full budgetary costs of a government activity. CBO suggested that accrual measures might be relevant when they change the sign or significantly change the magnitude of cost estimates.[16] That same approach can help determine when fair-value estimates are relevant.

Fair-value estimates commonly differ in sign or magnitude from FCRA estimates for credit programs. In fact, the total cost of all credit programs on a FCRA basis is negative and its fair value is positive.[17] Thus, fair value will probably make a meaningful difference for the cost estimates of credit programs because it incorporates market risk. Similarly, fair value is likely to substantially change the cost of insurance programs, as shown by CBO analyses of insurance obligations such as those of the Pension Benefit Guaranty Corporation, which are subject to market risk. Because of that substantial effect, fair-value estimates might change the calculus of the Congress when it is trying to decide whether to support a private-sector activity by making loans to the affected individuals and businesses or by supplying money through grants.

Fair value also makes a meaningful difference when the government purchases financial assets as an investment. When the budget uses estimates of average cash flows, it can appear to benefit when the government buys such assets at market price. But under fair value those transactions have a neutral projected effect on budget projections. For that reason, the Office of Management and Budget (OMB) and CBO budgeted for investments by the National Railroad Retirement

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[14] See John Geanokoplos and Stephen P. Zeldes, "Market Valuation of Accrued Social Security Benefits," in Deborah Lucas, ed., *Measuring and Managing Federal Financial Risk* (University of Chicago Press, 2010), pp. 213–233, https://tinyurl.com/u3r5mcs6; and Deborah Lucas and Stephen P. Zeldes, "Valuing and Hedging Defined Benefit Pension Obligations—The Role of Stocks Revisited" (September 2006), https://tinyurl.com/39985nsn.

[15] See David Kamin, "Risky Returns: Accounting for Risk in the Federal Budget," *Indiana Law Journal* vol. 88, no. 2, article 9 (2013), p. 723, www.repository.law.indiana.edu/ilj/vol88/iss2/9/. Capital gains taxes resemble a financial option because the Treasury shares in the gains of the taxpayer but has limited exposure to losses because deductions of capital losses from income are limited. A financial call option gives the holder the right, but not the obligation, to buy an asset at a specified price, resulting in a gain when the market price is above that level but no loss when below.

[16] See Congressional Budget Office, *Cash and Accrual Measures in Federal Budgeting* (January 2018), www.cbo.gov/publication/53461.

[17] See Congressional Budget Office, *Estimates of the Cost of Federal Credit Programs in 2021* (www.cbo.gov/publication/56285).

Investment Trust (NRRIT) by using a method akin to fair value. According to the fiscal year 2003 *Analytical Perspectives*:

> The difference between the expected return of a risky liquid asset and the Treasury rate is equal to the cost of the asset's additional risk as priced by the market net of administrative and transaction costs. Following through on this insight, the best way to project the rate of return on the Fund's balances is probably to use a Treasury rate. As a result, the budget treats equivalently NRRIT investments with equal economic value as measured by market prices, avoiding the appearance that the budget would be expected to benefit if the government bought private sector assets.[18]

The approach to the NRRIT set a precedent for how OMB and CBO viewed proposals in 2005–2006 to replace Social Security benefits with private accounts.[19] Some proponents of private accounts argued that they could generate savings by investing Social Security contributions in risky assets instead of the Social Security trust funds. Those risky assets would on average earn a premium for risk. Including that premium in projections would have given the impression that private accounts might lower the estimated cost to the government of supplying a given level of Social Security benefits. However, under a risk-adjusted approach such as the one that OMB and CBO used for the NRRIT, private accounts would not generate any financial benefit simply by purchasing risky private-sector securities with contributions that would otherwise have been destined for the trust funds.

How Could Fair-Value Estimates Be Used?

In the federal budgeting process, CBO and other agencies develop estimates for various purposes:

- Budget execution;
- Cost estimates (estimates of effects of legislative proposals on spending, revenue, and the deficit);
- Projections of spending and the deficit under current law; and
- Projections of the debt under current law.

Fair-value estimates could be used for some or all of those purposes. Fair-value estimates could be published for additional informational purposes. The advantages of fair-value estimates might be largest in budget execution and cost estimates, which are the tools used to allocate scarce

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[18] See Office of Management and Budget, *Budget of the U.S. Government, Fiscal Year 2003: Analytical Perspectives* (February 2002), p. 440, www.govinfo.gov/app/details/BUDGET-2003-PER.

[19] See Congressional Budget Office, *Evaluating Benefit Guarantees in Social Security*, Background Paper (March 2006), www.cbo.gov/publication/17632.

resources among competing priorities. If fair value is included in baseline projections of spending under current law, market risk will flow through to deficit and debt projections unless reversed by an accounting entry (see the appendix). Publishing fair-value estimates for informational purposes would result in more comprehensive measures of budgetary costs while avoiding that complication.

Budget Execution

Budget execution entails measuring spending of government agencies against amounts authorized or appropriated by the Congress and ensuring that total spending falls under those limits. For discretionary credit programs, execution involves estimating the "credit subsidy"—the present value of projected cash flows of loans and loan guarantees—and then charging an amount of budget authority equal to that credit subsidy. Because of that process, the volume of loans that an agency can originate depends on the estimated subsidy cost per dollar of loan, known as the credit subsidy rate. Agencies would almost always require more appropriations to cover the cost of a given volume of loans or loan guarantees under fair-value estimates because they include the concept of market risk, which results in higher estimated costs than estimates under FCRA.[20] The estimated subsidy rates under FCRA for credit programs are often negative and the appropriation itself does not limit the volume that can be originated, though in those cases authorizing statutes can do so. In such cases, fair-value estimates, if positive, might lead to limits on program volumes where they might not otherwise exist.

Cost Estimates

One relatively limited way to use fair-value estimates would be to apply them only in initial cost estimates, budget execution, and estimates associated with modifications where agencies change the terms of existing loans. Under that approach, the Congress and the executive branch would use fair-value estimates to allocate scarce resources against targets. The purpose of cost estimates is to inform the Congress and the public about the effect of proposals on the budget and on other outcomes of interest. In particular, cost estimates can help lawmakers choose between alternative means of serving program participants, such as through grants or credit programs.

Estimates of Baseline Spending, Deficits, and Debt

Budget projections include estimates of future deficits and debt, with the deficit measuring the excess of spending over revenue and the debt measuring the amount that the government needs to finance through borrowing. Baseline estimates are helpful for illuminating the current overall fiscal position and its trajectory, assessing whether it might be sustainable, and estimating the

[20] See Congressional Budget Office, *Estimates of the Cost of Federal Credit Programs in 2021* (www.cbo.gov/publication/56285).

effect of the budget on the economy. However, if baseline estimates for spending use fair value and thus incorporate market risk, the effect of market risk will flow through to projected deficits and debt unless offset in the projection by another variable.

Using any accrual estimate can create changes in debt projections that do not correspond to projected deficits, creating a need for reconciliation. The effect of fair value in debt projections can be offset in several ways (see the appendix). One way is to offset the effect of fair value in "other means of financing," a category of borrowing that does not correspond to deficits. Projected debt at the end of the year is equal to its value at the start of the year plus the deficit and other means of financing. Other means of financing are used to offset the effect of any government transaction that requires an increase in the debt without an increase in the deficit. For example, when the Treasury borrows to increase its balance of cash held, that borrowing is classified as other means of financing and not counted in the deficit.

Estimates for Informational Purposes

Given some of the difficulties posed by fair-value estimates, they could be produced only to supplement official estimates. That approach would permit the Congress to better understand how the cost of making loans to individuals and businesses might compare with other forms of assistance, such as providing money through grants, but avoid some of the complications in accounting and reconciliation. However, unless incorporated into its budget enforcement procedures, publishing fair-value estimates for informational purposes is likely to have a weaker effect on the allocation of resources.

How Can Agencies Estimate Fair Value Without Observable Market Prices?

One concern with fair-value budgeting is that market prices are not usually observed for the risks taken in federal government activities, making estimates of their fair-value cost harder to generate. To estimate fair-value cost for credit programs, CBO usually starts with the same process used to determine FCRA costs and adjusts the risk premium to incorporate the cost of market risk. That approach is typically the most convenient for CBO and federal credit agencies but is not the ideal approach identified by accounting standards governing valuation for private companies.

The adjusted discount rate approach requires two approximations, each of which creates uncertainty. First, the approach requires an assessment about which private obligations are most comparable to those of the federal credit program, so that the prices of those private obligations can be used as a proxy for market risk. Those assessments are subject to uncertainty and cannot be evaluated in the same way as the technical assumptions underlying FCRA estimates. Second, using adjusted discount rates requires disentangling liquidity and credit risk premiums, so that

liquidity premiums can be excluded from the cost estimate. As with any estimation, that process also is subject to uncertainty.

If fair value were to be employed for all credit programs in budgeting in the executive branch, its estimation may slightly increase the burden of credit program estimation and may complicate an already contentious process for some agencies. CBO releases a yearly fair-value estimation of federal credit programs, giving lawmakers that additional information. Automating the calculation of fair-value costs with standardized methods, such as those that CBO uses, could help reduce the burden of calculating fair-value estimates for agencies with limited analytical capabilities.

CBO's Usual Approach for Estimating Fair-Value Cost of Federal Credit Programs

CBO's usual process for estimating fair-value costs adapts the existing process to estimate costs under FCRA. For FCRA estimates of direct loans, CBO and other federal agencies project expected cash flows by adjusting scheduled (or "promised") cash flows for prepayment rates and expected default costs, through estimating default and prepayment rates. Those projected cash flows are then discounted, with Treasury interest rates, to the point in time that loans are made. For fair-value estimates, CBO adjusts the discount rate to reflect the cost of market risk. That adjustment is based on the market interest rate of fully private credit that is otherwise like the government loans or loan guarantees, after subtracting parts of the interest rate that compensate investors for the expected cost of default and liquidity risk.[21]

For loan guarantees, the process for producing fair-value estimates is slightly more complicated than for direct loans. For direct loans, the adjusted discount rate is applied directly to loan payments after adjustment for the cost of default. For loan guarantees, a standard approach relies on an estimate of the difference between the fair value of the loan with and without the guarantee. For a full guarantee, the government essentially transforms a loan with a risk of losses from default into a loan with that risk removed. Under the fair-value approach, the adjusted discount rate is applied to the loan without the guarantee, and the projected yield on Treasury securities is applied to the loan that has the guarantee.

That process for estimating fair value falls in the least preferred category of valuation approaches under private accounting standards. The accounting standard FAS 157 defines three levels of inputs to estimates of fair value, with a preference for the first and then second levels. The first two approaches would base fair-value estimates either directly on prices of identical assets or

[21] See Congressional Budget Office, *How CBO Produces Fair-Value Estimates of the Cost of Federal Credit Programs: A Primer* (www.cbo.gov/publication/53886).

extrapolate from market prices.[22] On occasion CBO can use methods that fall in those first two categories, allowing the agency to produce accurate estimates of fair value without projecting any cash flows of the asset or obligation. For example, the agency easily valued warrants giving the Treasury the right to purchase nearly 80 percent of companies that it assisted in the 2007–2009 financial crisis for a nominal price, simply by looking up the price of the outstanding shares of the company. Usually, however, CBO's approach uses parameters defined as "level 3" inputs by FAS 157. They are assumptions about the parameters that market participants would use if buying and selling federal loans and loan guarantees. CBO applies widely used and well-accepted approaches to estimating fair value in those cases. As a result, the agency develops estimates close to those that private entities would report in a similar situation.

Nevertheless, CBO's assumptions are subject to two main sources of uncertainty, which occur at different points in the estimation process:

- The choice of a market proxy for federal loans and loan guarantees to represent the yield that investors would charge federal program borrowers.
- The process used to adjust the yield for the effect of liquidity (CBO could subtract too little or too much from the yield).

Both sources of uncertainty can affect precision but do not lead to bias in the estimates themselves. CBO's estimates of fair-value cost are not likely to be consistently off in any particular direction, but they may be measured imprecisely.

Using Market Proxies

The key decision in fair-value estimates is how to match federal credit activity to comparable private credits. Usually, the federal government lends (or guarantees payment) to borrowers not receiving private credit in any form similar to what the government offers. Government credit programs are generally intended to fill gaps in private lending rather than duplicate it. When the government lends to borrowers not served by private lenders, no way exists to directly measure the price that private lenders would charge for market risk.

In those cases, fair-value estimates for federal credit programs require a matching process in which analysts determine which private activity is most comparable. CBO matches federal credit programs to private counterparts on the basis of the sector, maturity, and level of default risk. For example, the agency matches business loans to bonds issued by private corporations as though a business loan would have the same yield spread as a corporate bond with the same default rate

[22] See Financial Accounting Standards Board, *Original Pronouncements, as Amended: Statement of Financial Accounting Standards No. 157, Fair Value Measurements* (Financial Accounting Foundation, 2010), www.fasb.org/pdf/aop_FAS157.pdf (477 KB).

and maturity. Such matching would depend on accurate measures of default rates. Furthermore, the extrapolation might introduce inaccuracies, if some major difference existed between corporations that issue bonds and smaller businesses that receive government loans that would cause the market to charge them different rates of interest even with similar default rates.

Disentangling Liquidity and Credit Risk Premiums

The market risk premium is the component of financial risk that remains even after investors diversify their portfolios as much as possible. CBO estimates that premium as the spread of private interest rates over risk-free U.S. Treasury securities minus a liquidity premium and compensation for the expected cost of default. If CBO subtracts too much or too little for the liquidity premium, the agency's fair-value estimates will under- or overestimate, respectively, the size of the market risk premium and the expected cost of default.

Liquidity represents the ability to sell an asset quickly without loss of value. The price of assets that can be sold quickly without loss is higher than that of assets that cannot be sold quickly without loss. That additional amount is known as a liquidity premium. Liquidity is related to risk but not perfectly correlated with it; many assets are illiquid because they are one of a kind and thus rarely sold. Physical assets such as artwork and timberland might be illiquid but not necessarily risky if they can be sold at a relatively steady price with enough time.

The government may be less concerned about liquidity than a typical investor and therefore might not want to include liquidity premiums in fair-value cost estimates. Other long-lived institutions have concluded that they can profit with little additional risk by holding illiquid assets and earning the associated premium.[23]

Because liquidity tends to correlate with risk, distinguishing between credit risk premiums and liquidity premiums is hard in practice. The clearest estimates of liquidity premiums come from relative spreads in the markets for government and government-guaranteed loans, in which credit risk is negligible. Even when the economy is strong, old Treasury issues (called "off the run") trade at a higher yield than newly issued ("on the run") Treasuries of similar maturities. For example, investors require a higher yield on 10-year Treasury securities issued 5 years ago with 5 years of remaining maturity than on newly minted 5-year Treasuries. Newly issued Treasuries tend to trade a lot, and sellers easily find buyers. The difference in yield is small but measurable, about one or two basis points.

Liquidity premiums tend to spike in times of crisis. Liquidity premiums on rarely traded (relatively speaking) Treasuries rose in the 2007–2008 crisis. Securities backed by government-guaranteed loans sometimes lost value in relation to Treasury securities despite

[23] See John Campbell, *Investing and Spending: The Twin Challenges of University Endowment Management*, *Forum Futures 2012* (Harvard University, June 2011), https://tinyurl.com/3bu4sbrb.

being free of credit risk. For example, asset-backed securities backed by student loans with a 97 percent government guarantee traded for 80 cents at the height of the crisis.[24] Other spreads, such as those between inflation-indexed Treasuries and conventional Treasury securities, exhibited behavior that seemed disproportionate to their relative risk and also was suggestive of liquidity premiums.[25]

Current methods for estimating risk premiums for federal credit programs would not lead the estimated cost of credit programs to swing with changes in liquidity premiums. Those estimates typically rely on long-term averages of risk premiums for comparable private securities, as opposed to observations from the recent past. Accordingly, when market risk premiums spike in a crisis, the cost estimates for credit programs rise only slightly because those spikes affect the long-term average only slightly.

Assessing Quality of Fair-Value Estimates

One of FCRA's strengths is a strong connection with average cash flows. Actual cash flows can be compared against the budget baseline, and errors in projected cash flows can inform improvements to technical assumptions that reduce future errors. By contrast, inaccuracies are harder to detect in the matching process and in extrapolation used in fair-value estimates. Typically, no realized values can be used to evaluate the accuracy of that matching and extrapolation. The actual private match of a federal loan activity is never observed.

However, the need to estimate unobservable values is not unique to credit programs. CBO regularly makes projections for cost estimates, which compare outcomes with and without a piece of legislation in place over a defined period. Those estimates usually cannot be fully validated because the counterfactual outcomes cannot be observed.

The difficulties government agencies face in implementing fair value could be substantially reduced if the calculation of fair value could be automated with a uniform method. That automation could be accomplished within the existing process used by credit agencies and OMB for generating credit subsidy estimates. That process is centered on an OMB-developed computer application called the credit subsidy calculator.[26] Credit agencies develop projections of disbursements, defaults, and prepayments for credit programs and load those projections into

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[24] See Maxime Roy, "On the Securitization of Student Loans and the Financial Crisis of 2007–2009" (Ph.D. dissertation, Tepper School of Business, Carnegie Mellon University, 2017), https://tinyurl.com/knnxexaf (PDF, 1.1 MB).

[25] See Matthias Fleckenstein, Francis A. Longstaff, and Hanno Lustig. 2014, "The TIPS–Treasury Bond Puzzle," *Journal of Finance*, vol. 69, no. 5 (October 2014), pp. 2151–2197, https://doi.org/10.1111/jofi.12032. Also see David Musto, Greg Nini, and Krista Schwarz, "Notes on Bonds: Illiquidity Feedback During the Financial Crisis," *Review of Financial Studies*, vol. 31, no. 8 (August 2018), pp. 2983–3018, https://doi.org/10.1093/rfs/hhy022.

[26] See Office of Management and Budget, *Preparation, Submission, and Execution of the Budget*, Circular A-11, sect. 185 (rev. April 2021), https://go.usa.gov/x6feF.

an input file for the credit subsidy calculator. It applies discount rates to that input file and returns an estimated subsidy cost. The calculator could be modified to also produce an estimate of fair-value cost based on the same input files now used for FCRA.

Under that approach, the calculator would approximate the cost of market risk solely from its inputs. One such approximation would make the cost of market risk a function of the subsidy's default component. Such a method would bring the added benefit of stability over time because the parameters translating the default component to market risk could be based on long-term average prices rather than real-time values.

CBO's annual report of the estimates of the cost of federal credit programs comparing the lifetime cost of credit programs on a FCRA and fair-value basis shows that such standard methods can be developed.[27] Selling federal loans periodically through competitive mechanisms could reveal whether fair-value estimates match actual fair values and improve those methods, if creating a competitive enough market is possible. For federal guarantees, purchasing reinsurance could yield information about the market value of the government's commitment.

Institutional Roles in Estimating Fair Value

The additional complexity of fair value could exacerbate an already contentious process of generating estimates for credit programs in the executive branch. Credit estimates are generated by agencies implementing credit programs and reviewed by OMB. Low cost estimates support higher loan volumes and more generous terms within an agency's budget authority and thus support the missions of credit agencies. By contrast, the OMB director is formally responsible under FCRA for controlling costs. Those roles, and differences in professional opinions, sometimes lead OMB and the agencies to opposing positions on many analytical issues that arise when developing cost estimates for credit programs. Those issues require discussion and often the direct involvement of agency leadership.

[27] See Congressional Budget Office, *How CBO Produces Fair-Value Estimates of the Cost of Federal Credit Programs: A Primer* (www.cbo.gov/publication/53886).

Appendix: Reconciling Fair-Value Estimates With Projections of Federal Debt

Fair-value budgeting would include market risk in projections of noninterest spending. To avoid including market risk in the projection of the debt, it needs to be offset somewhere else. The approach used for activities responding to the 2007–2009 financial crisis effectively subtracted market risk from net interest. Another approach would be to subtract it from other means of financing. Finally, creating a new entry might be possible, such as "financial returns to lending" as a way to reconcile spending projections that contain market risk and debt projections that do not.

The need to reconcile different estimates of uncertain cash flows does not indicate that fair-value estimates contain anything other than government costs. Instead, it means that many approaches to generating a point estimate for an uncertain cost can be valid.[1] Using different valid summary measures of a variable for different purposes is common. For example, using mean income and median income of households for different purposes does not indicate that either estimate of income is invalid or that the difference between the two represents something unrelated to income.

Approach Taken in Emergency Economic Stabilization Act

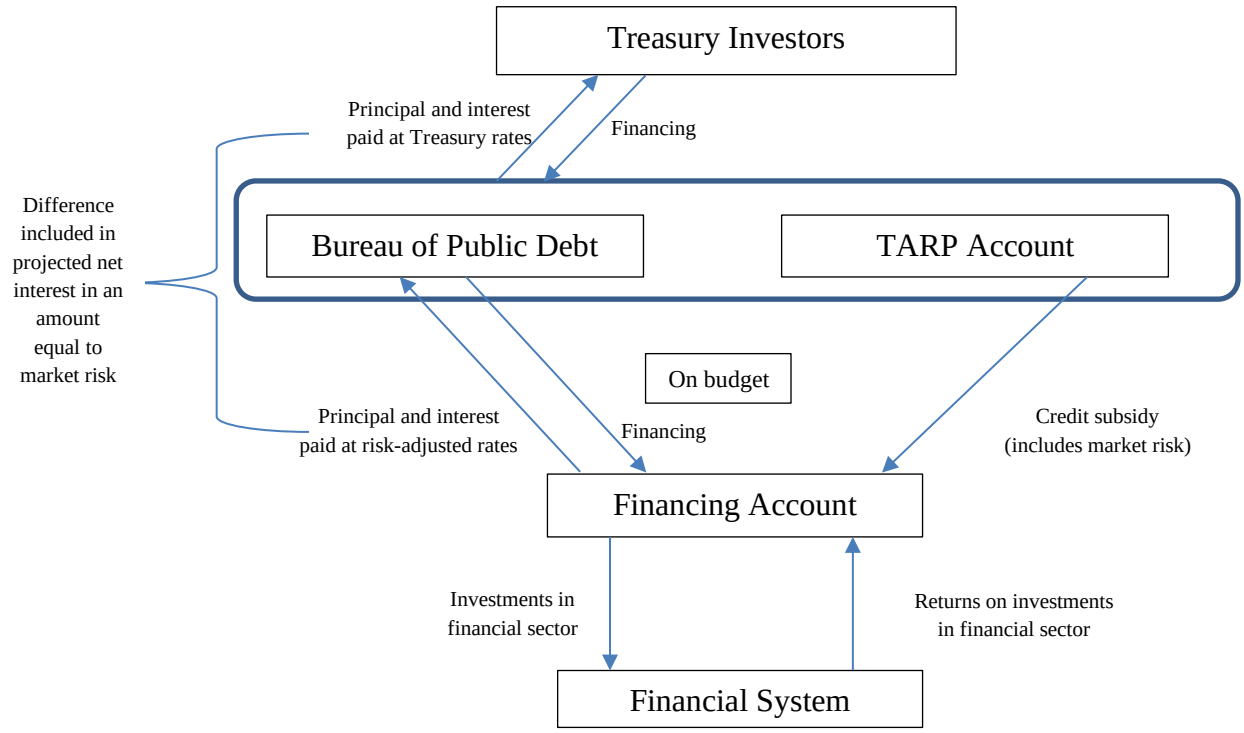
One approach to reconciling debt projections to fair-value estimates comes from the Troubled Asset Relief Program (TARP), which responded to the 2007–2009 financial crisis. The legislation implementing TARP, the Emergency Economic Stabilization Act, applied FCRA procedures. But the law required that average cash flows be discounted with a rate that incorporates market risk instead of the Treasury rates FCRA normally requires. That approach led to the projection of a stream of negative projected net interest that reversed the effect of including market risk on the debt.

Discounting with a market-adjusted discount rate resulted in a difference between the interest charged to TARP's financing accounts by the Bureau of the Public Debt and the interest rate that the bureau paid to the public. The financing accounts used to implement FCRA are considered off-budget, meaning that transactions between financing accounts and the public are not included in budget totals. The transactions between financing accounts and the Department of the Treasury are considered cash flows to and from the government. In implementing TARP, the Treasury charged financing accounts an interest rate adjusted for market risk, whereas the Bureau of the Public Debt borrowed the money at a Treasury rate (see Figure A.1). The projected

[1] See Michael Falkenheim, *Fair-Value Cost Estimation and Government Cash Flows*, Working Paper 2021-05 (Congressional Budget Office, April 2021), www.cbo.gov/publication/57062.

difference between those two interest rates resulted in a projected net negative stream of interest to the Treasury equaling approximately $80 billion in the years 2009–2016.[2]

Figure A.1.
Accounting for TARP Investments



Data source: Congressional Budget Office.

TARP = Troubled Asset Relief Program.

Other Approaches

Other approaches to reconciliation would reverse the effect of market risk on projected debt through an accounting entry called "other means of financing" or create a new accounting entry.

Other Means of Financing. Under FCRA, other means of financing reconciles the difference between the average cash flows affecting the debt and the present value of those same cash flows in the estimated deficit. For example, other means of financing have been used to account for the

[2] See Office of Management and Budget, *Analytical Perspectives: Budget of the U.S. Government, Fiscal Year 2010*, table 4, https://go.usa.gov/x6ftu (PDF, 7.7 MB).

more than $1 trillion that the government borrowed to fund direct loans to students pursuing higher education over and above the deficit effect of that activity. Under fair value, other means of financing or some other element of the budget would need to account for the difference between average cash flows used in projecting the debt and cost estimates that incorporate market risk.

For example, consider a no-interest loan program of $100 that repays in one year and is at risk of default. The statistical average payment (also known as the expected value) is $84 because of an average loss from default of $16. And suppose that on a market-value basis the cash flow is $63, meaning that if the government wanted to swap the uncertain repayment of the loan for a fixed amount it could lock in the $63, implying a market value of default risk of $37. Given a risk-free rate of 5 percent, the present value of that loan on a FCRA basis would be the $84 discounted at a 5 percent rate, or $80. The FCRA subsidy would thus be the disbursement of $100 minus that amount. The fair value of the loan would be $63 discounted at a 5 percent rate, or $60, and the subsidy cost measured on a fair-value basis would be $40.

Table A.1 summarizes how this program would be projected in the budget baseline under FCRA and how it might be projected under fair value.

Table A.1.
Projection of a $100 Interest-Free Loan Program Under FCRA and Fair Value
Dollars

		FCRA	Fair Value
Loan Disbursement Year	Deficit effect	20	40
	Change in other means of financing	80	60
	Debt effect	100	100
Loan Repayment Year	Deficit effect	0	0
	Change in other means of financing	–80	–80
	Debt effect	–80	–80

Data source: Congressional Budget Office.

FCRA = Fair Credit Reform Act of 1990.

In the year loans are disbursed, the change in other means of financing accounts for the difference between the deficit and debt effect. In the year the loan is repaid, the projected repayment represents the effect on the debt. For FCRA, the change in other means of financing in the loan repayment year exactly offsets the change in other means of financing in the disbursement year. For fair value, the two values do not exactly offset, reflecting the reconciliation of market value cash flows used in the deficit calculation and statistical cash flows in the debt calculation. Here the sum of debt effects classified as other means of financing is $20.

Financial Returns to Lending. An alternative to using the "other means of financing" for that amount would be to classify it as a "financial return to lending," as one analyst proposed as one facet of a broader overhaul of credit budgeting.[3] Then the difference between market value cash flows and statistical cash flows is recognized as a fair return on risk.

[3] See Donald Marron, *The $300 Billion Question: How Should We Budget for Federal Lending Programs?* (Urban Institute, September 2014), https://tinyurl.com/r3epvta7. That proposal would make other changes to budgeting for credit programs with the goals of better integrating budgeting for credit programs with cash accounting used for other programs.