Hutchins Center
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# CREDIT SCORING AND SCORING OF RISK

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# BACKGROUND

Programs involving credit are scored differently from most other federal government programs.  The Federal Reform Credit Act of 1990 (FCRA) requires that credit programs be scored by calculating the net present values of loans or guarantees over time, rather than the expected annual cash flows.  The Congressional Budget Office argues that a different method, the Fair Value Approach, provides a superior measure of the actual cost of credit programs, because it accounts for the cost to taxpayers of the risk associated with credit programs.  OMB disagrees, preferring FCRA over Fair Value.

These different methods, which are explained below, can produce very different cost estimates.   Some programs that appear to make money for taxpayers when FCRA is used can show a net cost to taxpayers under Fair Value.  For example, CBO reports that, under FCRA, the government would be reported as saving $135 billion dollars on the student loans made between 2015 and 2024, but would be reported as losing $88 billion under Fair Value scoring (See Figure 1). Similarly, CBO found that that the Export-Import bank's six largest credit programs over this same time period would generate budgetary savings of $14 billion under FCRA, but would cost $2 billion on a fair-value basis.

## Estimated Total Budgetary Costs under FCRA and Fair Value, 2014 to 2024

Billions of dollars
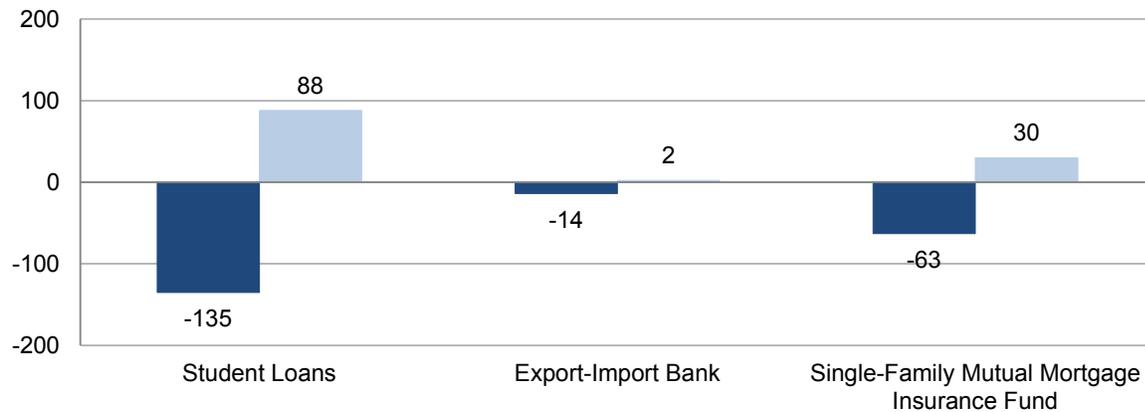


Source: CBO   ■ FCRA  ■ Fair Value

CBO's current policy is to produce two sets of cost estimates for credit programs—the official estimate using FCRA, and its preferred estimate using Fair Value. Some policymakers support a policy change that would mandate Fair Value instead of FCRA. In both 2012 and 2014, for example, the House of Representatives passed legislation that would require CBO to use fair value accounting in their official budget score.1 In addition, during the financial crisis, Congress took the unusual step of requiring that official budget scorekeepers discount expected cash flows using a market-based rate of return in their evaluation of TARP, which is the risk associated with investments tending to do better when the economy is booming and worse when it declines.

Using Fair Value instead of FCRA accounting for student loans, the Export-Import Bank, and the single-family mortgage insurance would increase the deficit by more than $300 billion over the next decade, with the FCRA estimate totaling to $212 billion in budgetary savings but Fair Value estimate amounting to a budgetary loss of of $120 billion dollars. The table below lists the federal programs for which CBO currently produces Fair Value Estimates.

## SELECTED PROGRAMS

| | OMB | CBO |
|---|---|---|
| Fannie Mae and Freddie Mac[2] | Cash Basis | Fair Value |
| Export-Import Bank | FCRA | Fair Value, FCRA |
| Student Loans | FCRA | Fair Value, FCRA |
| Federal Reserve Earnings | Cash basis[3] | Fair Value[4] |
| Federal Mortgage Guarantees (non-GSE) | FCRA | Fair Value, FCRA, |
| Small Business and Farm Credit Programs | FCRA | Fair Value, FCRA |
| TARP[5] | FCRA, Fair Value, cash | Fair Value |
| Loans and loan guarantees offered by the Department of Energy | FCRA | Fair Value, FCRA |

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[1] The Budget and Accounting Transparency Acts of 2012 and 2014. Neither bill has been passed by the Senate.
[2] OMB only reports Treasury outlays to GSEs. CBO treats Treasury outlays to the GSEs as inter-governmental cash transfers. See CBO (2010a)
[3] See OMB (2015b, pp. 364).
[4] See CBO (2010B, pp. 14).
[5] Section 123 of the Emergency Economic Stabilization Act of 2008 required that TARP be scored using a net present value calculation with a discount rate that incorporates market risk.

# BROOKINGS

# THE ECONOMIC AND POLITICAL ISSUES BEHIND THE CREDIT SCORING CONTROVERSIES

## TRADITIONAL BUDGET ACCOUNTING

For most types of legislation, the cost or revenue estimate---the budget "score"-- is simply the expected changes in annual spending or revenues arising from that legislation over a specified budget window. But when policies have very different effects within the budget window than outside the budget window, this approach may not provide a very useful measure of the real costs or savings associated with a particular policy.

Consider a direct student loan with a 20-year maturity. Using a standard cash flow budgeting approach, the loan would appear quite costly, as it would show a net outflow in year 1 when the loan is disbursed, only partially offset by interest receipts in years 2 – 10 of the budget window.  However, when the loan is paid off, in year 20, much of the initial cost would be recouped. Thus, the cash flows in the 10-year budget window overstate the cost of the loan.

In contrast, policymakers could offer a loan guarantee that would enable students to borrow in the private marketplace, and this guarantee could be structured so as to be economically equivalent to a direct student loan.  However, the loan guarantee would appear to be much less costly during the budget window, as only the costs of the guarantee itself would count, and there would be no big first-year outlays.

## FEDERAL CREDIT REFORM ACT OF 1990 (FCRA)

To prevent lawmakers from choosing guarantees over economically-equivalent loans purely for budget scoring purposes, Congress passed the Federal Credit Reform Act of 1990 which required CBO to score credit programs on the basis of the net present value of the expected lifetime costs to the government. The net present value calculation is a form of accrual accounting that books the expected costs or revenues when the loan is made rather than when the cash is disbursed. The net present value calculation depends on both expected cash flows as well as the discount rate used to convert future cash flows into current dollars. FCRA requires that the CBO discount expected future cash flows using the rates on U.S. Treasury securities with similar terms to maturity as the credit programs being discounted.

## THE FAIR VALUE APPROACH

The Congressional Budget Office argues that FCRA mismeasures the costs of credit programs, because it discounts risky future cash flows by the Treasury rate, which is a risk free rate that is only appropriate for cash flows that are known with certainty.  Although the FCRA approach does incorporate the <u>expected</u> default rate on a loan, it does not take into account the <u>utility</u> costs of the uncertainty surrounding the default rate, that is the evidence that most people are risk averse. They prefer certainty over uncertainty, even when the expected payoffs are equal.

For example,if given the choice between receiving a $100 reward with certainty and a reward that could be either $50 or $150, depending on the results of a coin toss, most people would choose the guaranteed $100.  But people might be indifferent between receiving a $90 reward with certainty and the $50/$150

uncertain reward. In this case, we would say that $90 was the certainty equivalent of the uncertain $50/$150 reward. Or, in other words, the expected value of the risky bet would have to be $10 higher than the certain reward in order for people to be indifferent between the two rewards.

But some risks can be diversified away, and the risk eliminated.[6] Because of this, standard finance theory suggests that only risks that cannot be eliminated through diversification receive a premium in the market place. Because everyone does poorly in recessions, these risks are not diversifiable. Thus, cash flows that are larger when the economy is good than when it is bad are worth less than cash flows that, even if variable from year to year, are independent of the state of the economy. According to this viewpoint, loans and loan guarantees expose the government to market risk because loan repayments tend to be lower when the economy is weak and resources are highly valued.

CBO's preferred approach to credit scoring, the fair value approach, uses market-based rates for discounting instead of Treasury rates, where the market-based rate depends on the characteristics of the program and the borrower.[7] That is, the fair-value approach uses the interest rate that a borrower would receive in the private market to discount the cash flows. Because market-based rates are typically significantly higher than Treasury rates, this makes credit programs appear more expensive for the government.

### FCRA VS. FAIR VALUE VS. OTHER REFORMS?

There is much disagreement about the best way to score credit programs. The general goals of credit scoring are to provide lawmakers with information about the budgetary costs of credit programs and to improve resource allocation by scoring credit programs on a comparable basis to other forms of federal spending. Experts disagree to what extent FCRA and Fair Value further these goals.

Broadly, there are two separate issues related to credit scoring, one related to the timing of when costs should be recognized, and one related to the treatment of risk. These issues are separable, and we consider each in turn.

*Timing: Cash Accounting, Accrual Accounting, or Marron's "Expected Return" Accounting*

The accounting method used dictates the timing of when spending and revenues are recorded. Accrual accounting includes a measure of the net expected cost or profit of a loan or loan guarantee in the year the loan is made, whereas cash accounting spreads that out over time. This brings up several issues.

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[6] For example, if 1,000,000 people faced the 50/$150 uncertain reward, but decided beforehand to share the proceeds of the coin tosses equally, everyone would be virtually guaranteed to receive $100, and the risk would be eliminated.

[7] For most loan guarantees, the CBO employs option-pricing methods to determine the fair value of a program. Intuitively, the fair value of a federal loan guarantee represents the amount that would have to be paid to a private entity to assume that liability in an open market.

<u>Does accrual accounting reasonably allocate away costs within and beyond the budget window?</u>

Unlike cash accounting, accrual accounting brings future payments forward. For example, if a loan program produces income for the government over the long run, under FCRA, it is treated as if it lowers the deficit in the year the transaction is initiated.

Donald Marron argues that this is FCRA's "magic-money-machine" problem, in that it allows policymakers to book "an instant profit on the loan before the ink is even dry." [8] He proposes an alternative, "the expected returns" approach, that essentially spreads the net present value estimate over the life of the loan. So, for credit programs that show a profit under FCRA, Marron's approach would show positive values for every year the loan is outstanding.

<u>Is the mixing of accounting systems—cash for some items, accrual for others—problematic? Why is accrual accounting limited to credit programs?</u>

For many policies, the differences between cash flow and accrual accounting are quite minor. For example, for spending programs, an accrual accounting system might book expenditures in the year a contract is written, rather than in the year the funds are disbursed. For many taxes, an accrual system would account for the revenues in the year income is earned, rather than in the year that taxes are paid. But there would not be much difference, in general, within the 10-year budget window.

However, there are a number of other policies that pose the same questions related to timing as credit programs, such as tax policies related to pensions and IRAs[9] Consider a traditional IRA compared to a Roth IRA. The regular IRA allows an upfront deduction for the IRA contribution, and then taxes the entire proceeds when withdrawn. Thus, tax revenues are lower in the year of the IRA contribution, but higher later on—typically, in years outside the budget window.[10]

In contrast, a Roth IRA does not permit an upfront deduction, but also does not tax the retirement funds when withdrawn. Thus, a Roth IRA appears close to free within the budget window, whereas the traditional IRA appears costly. Although these two policies may be economically equivalent, they have very different budget effects within the window.[11]

Other potential examples include changes in the Social Security tax base that boost tax revenues in the short run but increase benefits in the longer run; a temporary tax cut offset by a future tax increase; and infrastructure projects funded by user fees, which would involve an outflow of funds up front offset by revenues in the out years.

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[8] Marron (2014).

[9] Auerbach, Gokhale, and Kotlikoff (1991) argue that the deficit itself is an artificial construct. The government can "run any fiscal policy it chooses while simultaneously reporting any size deficit or surplus… simply through the choice of how it labels its receipts and paymentsIf Social Security taxes were relabeled as loans to the government, for example, and social security benefits were relabeled loan repayments, the measured deficit would be much greater than currently reported. This problem is one of the reasons they believe that generational accounting – which takes present values of all projected expenditures and receipts—is the only economically meaningful way to assess the government' long-run fiscal position.

[10] Xanthopoulos and Schmitt (2011) argue that FCRA ought to be applied to the scoring of tax policies for retirement.

[11] It is noteworthy that, in 2013, the Bureau of Economic Analysis changed the National Income and Product Accounts accounting for employer-provided pensions from a cash basis to an accrual basis. See Rassier (2014).

Using accrual accounting for credit programs and cash accounting for IRAs arguably makes comparisons across policies difficult and could distort policymakers decisionmaking. One possible solution is to move the entire budget to an accrual system, as other countries do.

*Accounting (or not) for Risk in the Federal Budget*

The questions of whether and how to adjust the federal budget score for risk is a much more complicated, controversial, and deeper question than which accounting system to use. It is also separable from the question of the accounting system, because both cash and accrual accounting systems can account for risk.[12]

How should risk be measured?

Proponents of Fair Value believe that the best way to measure market risk is to use the interest rates available to borrowers in a well functioning private market, rather than the riskless Treasury rate. According to Delisle and Richwine (2014), unless one uses the private market rate to account for risk, "the government could buy out almost any private-sector asset at its current market price and claim an immediate profit. That profit would be equal to the market-risk premium that the private sector had priced into the loan's interest rate but that the government woud earn for 'free.'" They conclude, "that's budgetary alchemy, but it's required by law under FCRA."

But some opponents argue that the government is indeed better able to spread risks, and hence there **can** be a net gain from the government issuing more riskless assets (debt) and investing in more risky assets (student loans). The arguments for this viewpoint include the following:

- The government is better able to smooth consumption losses over time and over future generations than private markets.

  If the government response to an unexpected loan default is an immediate increase in taxes or a cut in transfer payments[13], then the government could be viewed as a pass-through agent for the taxpayer: it would be as if the taxpayers were the direct investors in the student loans. Under this condition, using private market risk premiums to measure the cost of the risk to taxpayers might be close-to or exactly right.

  But there is no need for the government to act in this way since the government can borrow in a "bad time" and therefore postpone any changes to taxes/transfers to a "good time."[14] Indeed, assuming that the government would change tax or spending policy in response to an unexpected default

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[12] Fair Value adjusts for risk by discounting future cash flows by a higher-than-Treasury discount rate. An alternative, and equivalent, way to account for risk is to risk adjust the cash flows and then discount them using a riskless rate. For example, instead of reporting the expected revenues from a tax change, JCT could report the risk-adjusted revenues which would just be the certainty equivalents discussed above. These would be calculated by equating the present value of the risk adjusted cash flow using the riskless rate as the discount factor to the present value of the unadjusted cash flows using the risky rate as the discount factor.

[13] It is not clear whether the risk cost to taxpayers would be the same if spending on public goods were cut in response to a loan default.

[14] If government counter-cylical spending is already optimal (a big if), then the government should raise taxes or cut spending when student loans default. But if there is too little counter-cyclical spending, then a student loan that defaults in bad times would be welfare improving.

would be assuming a change in future legislation. CBO does not do this when scoring a proposal. The cost estimate must implicitly assume that the response to an unexpected default will be an unexpected increase in the deficit. Under certain strict conditions (perfect capital markets, Ricardian consumers), taxpayers might be indifferent between an immediate increase in taxes during bad times and an increase in the deficit during bad times, but under most conditions, they would prefer an increase in the deficit, even though that entails some future unspecified change in taxes or spending. Thus, the risk borne by taxpayers when the government makes a loan is likely to be smaller than if the taxpayers were to make the loan directly.

- The marginal participant in financial markets has different attributes than the average taxpayer.

  The risk premium derived from private market prices represents the compensation for risk demanded by private investors, which is heavily skewed toward those with high incomes. Their required compensation for risk may be different than that of the average taxpayer or beneficiary of government spending. Some might argue that, since many Americans have little savings and no exposure to the stock market, they might benefit from having some exposure through the tax system, and thus, would demand less compensation for risk. On the other hand, others might argue that these people already face tremendous indirect exposure to market risk, because wages are correlated with the stock market, and hence might require more compensation for risk. (For a discussion of this issue, see Geanakoplos and Zeldes, 2009)

Should the government be viewed as risk neutral?

The case for doing **no risk** adjustment in evaluating the costs of a proposal depends on the government being risk neutral, meaning that the government only cares about the expected payoffs. So long as one assumes that the government is not risk neutral, then **some** accounting for risk – although perhaps using a different methodology than espoused by Fair Value–seems warranted.

But some observers might believe that it is a better approximation to treat the government as risk neutral than to treat it as having the same risk aversion as the marginal private investor. For, without this perspective, one would conclude that policies like automatic stabilizers (under which taxes automatically decrease and spending automatically increases during recessions) would be extremely costly and would provide no net social benefit.

But should that accounting for risk be part of the budget score?

There are a variety of different viewpoints about whether an ideal cost estimate would take risk into account, however it is measured. Some assert that the cost of risk is not a budgetary cost. For example, Kogan, Van de Water, and Horney (2013) argues that "the federal budget is supposed to record the amount that the government disburses in spending program and the amount it receives in revenues, and to show the difference as a surplus or deficit."

But when there is uncertainty, it is impossible to do that, because how much the government will disburse or what future taxes will be is unknown. There is a range of possible costs, and the official estimate must choose a way to best represent that range. Under FCRA, the cost is the expected value, which is simply the sum of all possible outcomes weighted by their probability. Under Fair Value, the cost is the certainty equivalent of that range, that is, the guaranteed amount that would provide the taxpayers the same disutility as the range of possible costs.

Some might argue that utility has no place in cost estimates, but others might note that, under FCRA, the government is assumed to act as if it is risk neutral, which is also an assumption about its utility function.

One problem observers have noted is that, under Fair Value, the costs of a loan program will change over time even if the actual default rates match the predicted ones. As the uncertainty diminishes, so too do the utility costs of that uncertainty. Thus, under Fair Value, credit programs are expected to become less costly over time. [15]

Which approach ensures that cost estimates are consistent across programs?

Most analysts agree that, in order for CBO to provide useful guidance to policymakers, cost estimates of different policies must be comparable – they must use the same baseline, the same assumptions, etc.. As Kogan, Van de Water and Horney (2013) note, "It is essential that $100 in costs for one program mean the same thing as $100 in costs for another program."

But analysts don't agree on whether FCRA or Fair Value does a better job in this area.

- *Fair Value Improves Comparability*
  The implicit use of certainty equivalents can be viewed as putting policies with different risk attributes on an equal basis, because policies with equal costs would be viewed by taxpayers as having the same utility cost (ignoring, of course, the potential for taxpayers to view the benefits sides of the policies differently.)   As CBO notes: "the budgetary costs of federal credit programs are almost always lower than those of other federal spending that imposes equivalent true costs on taxpayers."

- *Fair Value Diminishes Comparability*
  But, as discussed below, the federal budget is subject to enormous uncertainty, and most cost and revenue estimates represent point estimates chosen from a range of values. Expenditures for unemployment benefits, for example, move with the state of the economy, and hence private investors would demand a significant risk premium in order to provide that insurance. Similarly, taxes on capital income are in many ways no different from direct ownership of risky capital from the government, and yet are treated under current budget rules as riskless. Thus, adjusting only credit programs for risk diminishes comparability between the cost estimates for credit programs and other programs that also subject the taxpayer to risk.

  OMB takes this perspective, noting: "Scoring an uncertainty premium only for credit programs could distort decision making, placing a thumb on the scale against credit assistance."

Does risk evaluation belong in cost/benefit analyses?

Several opponents of Fair Value argue that, while they don't think cost estimates should account for risk "the concept of loss aversion can and should play a part in the *cost-benefit analysis* that

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[15] Don Marron's Expected Return approach models this explicitly.

policymakers should undertake in deciding whether a government program constitutes wise public policy."

But, if one accepts the Fair Value method of accounting for risk, which uses the private cost of risk as a measure of the government's cost of risk, then cost-benefit analyses are unaffected by risk considerations, because the increase in risk borne by the government is **fully offset** by the reduction in risk enjoyed by the beneficiaries.  For example, unemployment insurance is risky for the government because it increases deficits during bad times, but it is beneficial to the unemployed because it increases their income during bad times.

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