RESEARCH REPORT

The $300 Billion Question

How Should We Budget for Federal Lending Programs?

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September 2014

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Acknowledgments

Thanks to Sandy Baum, Laurie Goodman, Tracy Gordon, Doug Hamilton, Chris Papagianis, Kim Rueben, Ellen Seidman, Sarah Rosen Wartell, and several others for helpful comments and conversations and to Cindy Zheng for excellent research assistance. As usual, any errors are my own.

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Executive Summary

This paper introduces a better way to budget for federal loans and loan guarantees. Congress currently measures their fiscal effects as the net present value of expected cash flows. Analysts have vigorously debated whether those values should be calculated using US Department of Treasury borrowing rates, as required by the Federal Credit Reform Act (FCRA), or market interest rates, an alternative known as *fair value*. Under FCRA, federal lending for student loans, mortgage guarantees, and the Export-Import Bank appears to make taxpayers more than $200 billion over the next decade. Under fair value, the same lending appears to cost taxpayers more than $100 billion. This $300 billion discrepancy does not affect loan performance, but it confuses policy discussions and suggests policymakers may base decisions on misleading information.

Both approaches collapse a loan's budget effects into a single number, the net present value at origination. Policy debates treat that number as the loan's fiscal effect at origination, over the budget window, and over the loan's life and as the subsidy to borrowers. But no single number can measure all four. The debate between FCRA and fair value is largely over which of these four is most important.

FCRA does a good job measuring lifetime fiscal effects but therefore cannot measure fiscal effects at origination or over the budget window or the subsidies given to borrowers. In fact, FCRA's *negative-subsidy* estimates suggest the government profits at borrowers' expense even when it offers subsidized loans. Fair value does the reverse; it measures subsidies well but therefore cannot measure fiscal effects over the budget window or the loan's life. Policymakers care about subsidies and fiscal effects, so neither approach provides a complete basis for budgeting.

The solution is to project a loan's financial returns year by year rather than collapse them into a single present value. This approach, which I call *expected returns*, combines the best of FCRA and fair value. Like FCRA, expected returns recognizes that the government makes money when lending returns are greater than its borrowing costs; the expected fiscal gains are taxpayers' compensation for bearing financial risk minus any subsidies to borrowers. Like fair value, expected returns recognizes that such gains do not happen instantly and that taxpayers start off behind when the government makes subsidized loans. Expected returns correctly measures fiscal effects over any period and provides a natural way to distinguish subsidies from the financial returns to bearing risk. Expected returns thus gives policymakers a more accurate assessment of the fiscal effects of federal lending than either FCRA or fair value.

Introduction

The federal government pursues many policies by extending direct loans, loan guarantees, and other forms of credit to individuals and businesses. Notable examples include student loans, mortgage guarantees, the Troubled Asset Relief Program, and the Export-Import Bank. Together, these and other credit programs account for more than $1 trillion in outstanding loans and more than $2 trillion in guarantees (Office of Management and Budget 2014).

Congress budgets for most activities by projecting their cash inflows and outflows over time. Such cash budgeting usually works well, but it can be misleading for lending programs. The Federal Credit Reform Act of 1990 (FCRA) thus requires that budget effects be calculated in a special way: as the net present value of expected cash flows at the time that a loan or guarantee is made. This approach puts loans and guarantees on a more level playing field and, it was hoped, with other federal programs.

FCRA requires that net present values be calculated using US Department of Treasury borrowing rates as the discount rates. As a result, loans often appear to bring in a profit the moment they are made. Such instant profits, which occur whenever expected returns exceed the government's borrowing rate, are troubling to many analysts, most notably those at the Congressional Budget Office (CBO). Making loans, particularly subsidized ones, does not instantly increase the government's wealth or give it new budget resources. Moreover, FCRA records many loans as offering a *negative subsidy* even though borrowers are getting a below-market interest rate and thus are being subsidized.

CBO and other analysts have proposed a fair-value alternative that avoids the instant profits and negative subsidies that FCRA reports. In this approach, present values are calculated using market interest rates that reflect the financial risk of the expected cash flows. Fair-value estimates show that loans involve subsidies whenever they are made at below-market rates; they thus make lending appear less profitable than it does under FCRA. In fact, fair-value estimates often indicate a loan will cost taxpayers even if current FCRA standards show it making money.

CBO bases its official budget estimates on FCRA requirements but also publishes fair-value estimates as supplementary information. CBO (2014) recently applied both approaches to the student loans issued by the US Department of Education, single-family mortgage guarantees by the Federal Housing Administration, and commercial loans and guarantees by the Export-Import Bank. Together, those three programs will account for almost $4 trillion in new obligations and commitments over the next decade (table 1).

TABLE 1

Taxpayers Make $200+ Billion from Federal Lending or Lose $100+ Billion

Budget effects of major lending programs, 2015–24 ($ billions)

		Budget Gain or Loss	
	New obligations or commitments	**FCRA**	**Fair value**
Major student loan programs	1,174	135	-88
FHA single-family mortgage insurance	2,232	63	-30
Export-Import Bank loans and guarantees	376	14	-2
Total	3,782	212	-120

Source: Congressional Budget Office, "Fair-Value Estimates of the Cost of Selected Federal Credit Programs for 2015 to 2024" (Washington, DC: Congressional Budget Office, 2014).

CBO projects that these programs will make taxpayers $212 billion over the next decade under FCRA budgeting, but they will cost $120 billion under fair value. The choice of valuation method thus has a major effect on how these programs appear in budget discussions.

This discrepancy does not affect loan performance; using FCRA does not make loans perform better than under fair value. The problem is that the $300 billion measurement gap confuses policy discussions and suggests that policymakers may be basing decisions on misleading information.

Both FCRA and fair value collapse the fiscal effects of a loan into a net present value at the time it is made. Policy debates treat the resulting value as the loan's fiscal effect at origination, over the budget window, and over the loan's life and as the subsidy to borrowers. But no single number can measure all four. The debate between FCRA and fair value is largely about which is most important.

FCRA does a good job measuring lifetime fiscal effects, but it therefore cannot measure fiscal effects at origination or over the budget window or the subsidies given to borrowers. In fact, negative-subsidy estimates lead some observers to mistakenly believe the government is profiting at borrowers' expense.[1]

Fair value does the reverse; it measures subsidies well but therefore cannot measure fiscal effects over the budget window or the loan's life. Because policymakers care about subsidies and fiscal effects, neither of these approaches provides a complete basis for budgeting.

Expected returns correctly measures fiscal effects over any time period.

The solution is to project a loan's financial returns year by year, rather than collapse them into a lump sum at origination. This approach, which I call *expected returns*, combines the best features of FCRA and fair value. Like FCRA, expected returns recognizes that the government makes money when lending returns are greater than borrowing costs; the expected fiscal gains are taxpayers' compensation for bearing financial risk minus any subsidies to borrowers. Like fair value, expected returns recognizes that such gains do not happen instantly and that taxpayers bear costs when the government makes subsidized loans. Expected returns correctly measures fiscal effects over any period and provides a natural way to distinguish subsidies from the financial returns to bearing risk. Expected returns thus gives policymakers a more accurate assessment of the fiscal effects of federal lending than either FCRA or fair value.

I develop this recommendation in eight steps. First, I illustrate how a simple loan would appear under FCRA, fair value, and a version of cash budgeting. This comparison demonstrates that none provides a sound basis for projecting the loan's fiscal effects.

Second, I illustrate how the same loan would appear if we project its expected returns year by year. This expected-returns approach provides a more intuitive and useful look at the loan's fiscal effects. Expected returns correctly identifies subsidies and accurately tracks the loan's fiscal effects over time. Expected returns thus out-performs FCRA, fair value, and cash budgeting.

Third, I show how to apply expected returns to loans in general. Like any lender or investor, the government makes returns from a loan's net interest payments and from any capital gains or losses as the loan's value changes over time. By tracking these returns year by year, expected returns yields more accurate budget projections than FCRA, fair value, and cash budgeting.

Fourth, I discuss the relationship between financial risk and fiscal projections. I show how expected returns avoids the most compelling argument against fair value—that the cost of bearing financial risk is not a fiscal cost. I also argue that the government's ability to bear financial risk is relevant for policymaking but not for projecting fiscal effects. The fiscal effects of lending are the same regardless of the government's tolerance for risk.

Fifth, I show how the four approaches compare when evaluating a multiyear series of loans. FCRA prematurely reports fiscal gains that will not happen until after the budget window. Expected returns reports fiscal effects as they occur in the budget window and thus again yields more accurate and useful budget projections than FCRA, fair value, or cash budgeting.

Sixth, I argue that policy would be elevated if budget projections distinguished the two policy decisions raised by lending: whether to take on more financial risk and how much to subsidize potential borrowers. I show how expected returns can make this distinction by separately measuring the fiscal gains that taxpayers receive as compensation for bearing financial risk and the fiscal costs they bear from subsidies to borrowers. FCRA combines these gains and costs into a single number, so its so-called *subsidy* measure does not measure subsidies. Fair value measures only subsidies and thus excludes any compensation for bearing financial risk.

Seventh, I discuss how the returns to bearing risk should be handled in the budget process and how the government should manage its financial risk. Recent debates often conflate these process issues with the technical issue of measuring fiscal effects, but they are distinct. Expected returns resolves the measurement issues, but these process issues remain unsettled and deserve further discussion.

Finally, I summarize the insights from this analysis.

Budgeting for a Simple Loan

The clearest way to compare budgeting approaches is to see how each would handle an example loan. We begin with a case in which the government charges a market interest rate and thus provides no subsidy to borrowers. The government usually offers below-market interest rates, so this scenario is not typical, but it sometimes happens (e.g., government purchases of publicly traded corporate bonds and mortgage-backed securities), and it makes this example as simple as possible.

The government lends $1,000 at a 6 percent annual interest rate for four years. The full principal will be outstanding until the end of the loan (i.e., there is no prepayment or loan amortization). There is a chance that the borrower will default on some or all interest payments; on average, expected defaults, net of any recoveries, equal 1 percent of the outstanding principal each year. The government thus expects a 5 percent net return on the loan (6 percent less the 1 percent defaults). To get the money to make the loan, the government borrows by issuing $1,000 of Treasury bonds that pay 2.5 percent interest. It thus anticipates making a 2.5 percent spread on the loan (5 percent expected return less the 2.5 percent cost of financing it). In financial markets, loans with these characteristics pay interest of 6 percent, equivalent to a 5 percent expected return after defaults, exactly what the government is charging.[2]

Congress typically budgets by projecting the fiscal effects of policy proposals over a 10-year budget window; for purposes of this example, we use a five-year window. The loan is made on the last day of the first fiscal year in the budget window and will be repaid on the last day of the fifth year. The budget effect in the first year will then reflect what happens at the moment the loan is originated, and the budget effects in years two through five will reflect any returns from holding the loan.

This example involves several simplifying assumptions, such as constant Treasury borrowing rates, defaults of interest but not principal, and no fees. Changing these assumptions would alter the numerical results but not the basic findings. The example excludes the administrative costs of making and servicing this loan, which should, of course, influence both private and government lending rates. Such costs are currently budgeted outside FCRA, however, so I exclude them here. That exclusion is problematic and deserves attention as well (CBO 2012).

Table 2 shows the expected cash flows of the loan and the debt issued to finance it. Positive numbers represent cash flowing into Treasury, and negative numbers represent cash flowing out. The upper section shows the cash flows of the loan. The government would lend $1,000 to the borrower at the end of the first year and be repaid at the end of the fifth year. Scheduled interest payments are $60 (6 percent × $1,000) annually, and expected annual defaults are $10 (1 percent × $1,000). Net, the loan is expected to bring in $50 annually, for a total of $200 over its life.

TABLE 2

Cash Flows from Making a Simple Loan (dollars)

	Years					
	1	**2**	**3**	**4**	**5**	**Total**
Loan						
Principal						
Disbursement	-1,000	0	0	0	0	-1,000
Scheduled repayment	0	0	0	0	1,000	1,000
Subtotal	-1,000	0	0	0	1,000	0
Interest and defaults						
Scheduled interest	0	60	60	60	60	240
Expected defaults	0	-10	-10	-10	-10	-40
Subtotal	0	50	50	50	50	200
Loan total	-1,000	50	50	50	1,050	200
Treasury financing						
Principal						
Debt proceeds	1,000	0	0	0	0	1,000
Debt repayment	0	0	0	0	-1,000	-1,000
Subtotal	1,000	0	0	0	-1,000	0
Interest	0	-25	-25	-25	-25	-100
Financing total	1,000	-25	-25	-25	-1,025	-100
Total	0	25	25	25	25	100

Note: The government borrows $1,000 at 2.5 percent and lends expecting a 5 percent market return.

To get that $200 return, the government must borrow $1,000 (as shown in the lower section of table 2). The government pays $25 (2.5 percent × $1,000) in interest each year, totaling $100. The government's net expected return on the loan is thus $100: the $200 expected return on the loan less the $100 cost of financing it.

Before reading further, you may want to consider how you would budget for this investing opportunity if it were available to you, your employer, or an organization that you support. What pattern of projected cash flows would best inform you about how lending and borrowing on these terms would affect your future finances?

FCRA, Fair-Value, and Cash Budgeting

Until the early 1990s, the federal government budgeted for loans using a cash method similar to what it uses for other programs. Under this approach, budget projections would reflect principal disbursement and repayment, interest received, and expected defaults but not any increase in Treasury interest costs; the example loan would appear to bring in $200 over its lifetime.

This approach is highly flawed. By including all loan payments but excluding the government's financing costs, it makes almost any loan appear profitable. All that is necessary is for interest receipts to exceed defaults. If defaults are low enough, the government could appear to make money by lending at interest rates lower than its borrowing rate.

For that reason, the old cash method is not a useful benchmark for thinking about budgeting for lending programs. An improvement to this method would include the government's financing costs and thus report the net fiscal effects of lending. This version, which I simply call *cash budgeting*, accurately portrays Treasury's borrowing needs.[3] When the government first makes the loan, it borrows $1,000 to finance it (table 3). In the second through fourth years, net interest less defaults allow Treasury to pay down $25 of the outstanding debt. In the fifth year, Treasury receives $1,025 and thus can pay off the remaining $925 in debt and have $100 to spare.

TABLE 3

Three Unsatisfactory Ways of Projecting the Fiscal Effects of a Loan

Annual budget effects of government lending (dollars)

	Years					
	1	**2**	**3**	**4**	**5**	**Total**
Cash	-1,000	25	25	25	1,025	100
FCRA	94	0	0	0	0	94
Fair Value	0	0	0	0	0	0

Note: The government borrows $1,000 at 2.5 percent and lends expecting a 5 percent market return.

This cash presentation is straightforward, but it has several drawbacks for budgeting. It shows the loan creating a large fiscal drain in year one and a large inflow at maturity. The loan's apparent effects over a budget window may thus differ greatly from its lifetime effects. If policymakers use a three-year budget window, for example, this loan would appear to *cost* $950 even though it would *make* $100 over its five-year lifetime. Although correct for debt management, this difference is a problem for budget policymaking.

A loan's up-front cash cost can also distort comparisons with other policy options. A loan guarantee could accomplish the same goal, but its fiscal effects typically have gains up front (when lenders pay fees) and costs later (when borrowers default). If policymakers care about initial budget effects, cash budgeting may lead them to unnecessarily favor loan guarantees over direct loans. Focusing on the initial cash cost can also distort comparisons with noncredit policies, such as direct grants. A $1,000 grant may appear similar to a $1,000 loan, even though their ultimate budget effects differ by $1,100. Cash budgeting thus creates significant challenges in budgeting for loans and guarantees, even though it makes sense for most other activities.

The Federal Credit Reform Act addressed those problems by creating today's net present value approach to budgeting for lending programs. Under FCRA, the budget effect of a loan is expressed as a lump sum in the year that it is made. That lump sum is calculated as the net present value of the loan's expected cash flows, discounted using Treasury borrowing rates of appropriate maturities.

For this loan, that net present value is $94 (see appendix A for calculations). FCRA thus reports the loan as creating a $94 budget gain in the first year and nothing thereafter. That gain is often called a *negative subsidy*, since it appears that the government is making money rather than subsidizing borrowers, but this is misleading. By design, this loan does not provide a subsidy.

The Congressional Budget Office and other analysts believe that FCRA does not fully reflect the burden taxpayers bear from the financial risks of lending. FCRA correctly accounts for expected losses, in this case 1 percent each year, but it does not consider the riskiness of those losses. If the economy is particularly weak, for example, those losses could be much larger. People do not like bearing such risks and require compensation for doing so. That is why stocks return more than bonds, on average, and corporate bonds return more than Treasuries. To take account of the cost of risk, the Congressional Budget Office also estimates budget effects using a fair-value approach.

Fair value operates like FCRA except that it uses market interest rates, which reflect the cost of financial risk, rather than Treasuries to discount the expected cash flows. In this case, the market rate is 5 percent, the expected return on the loan. That rate is higher than the 2.5 percent rate on Treasuries, so the net present value of the loan's cash flows is lower. In fact, the net present value of making this loan is exactly zero, as the $1,000 value of the loan itself exactly offsets the $1,000 cost of financing it. The government is lending at market rates, so there is no subsidy. Fair value thus reports a $0 subsidy in the first year and nothing thereafter.

Comparing the Three Approaches

These three approaches provide strikingly different budget projections for this market-rate loan. Cash budgeting reports a net of $100 with front-loaded costs and back-loaded gains, FCRA reports an immediate $94 gain, and fair value reports no fiscal gain whatsoever. These differences pose three important questions.

Why Do FCRA and Fair Value Report Lower Lifetime Gains than Cash Budgeting?

FCRA and fair value are often described as replacing cash budgeting with an accrual approach that reports fiscal effects when they are incurred, not necessarily when cash changes hands. But cash and accrual approaches differ in *when* activities get reported, not in *how much* those activities eventually cost or save. If a business invests $20,000 in new computer equipment, it might record that cost immediately in its financial statements (cash) or depreciate $5,000 a year over four years (accrual). Either way, its financial statements will record the equipment as costing $20,000.

In this case, however, FCRA and fair value both report lower lifetime fiscal effects than does cash budgeting. Thus, neither is truly an accrual alternative to cash budgeting.[4] Instead, they are net present value approaches that change both the timing and amount of reported fiscal effects. FCRA reduces the lifetime fiscal effect of lending because of the time value of money (see appendix B for details), and fair value further reduces the fiscal effect to reflect the cost of financial risk. FCRA and fair value thus evaluate credit programs using different budget yardsticks than Congress uses for other federal activities.

For lending programs, a single value cannot accurately represent both taxpayer costs and fiscal effects.

Does It Make Sense for FCRA to Report an Instant Budget Gain at Origination?

No. This is FCRA's *magic-money-machine* problem. FCRA makes it appear as though the government gets an instant profit on the loan before the ink is even dry. But taxpayers have not earned anything at that point. The value of the loan is exactly offset by the value of new Treasury debt. The government expects gains in the future if it holds onto the loan. Like any lender or investor, however, it must be patient to receive those returns. It must hold the loan and bear the associated financial risk. The government could sell the loan before maturity and give up any later returns, so gains should not be attributed to the moment of origination. Such front-loading distorts the budget process by making the gains from lending appear more rapidly than they would from other comparable policies; it is as though a spending cut of $25 annually in years two through five were reported instead as a $94 spending cut in year one.

Does It Make Sense for Fair Value to Report No Fiscal Effect?

Again, no. This is fair value's *missing-money* problem. The government expects to come out $100 ahead on this loan. By discounting future returns at the market rate, fair value makes those gains disappear. This happens because fair value is calculating the subsidy at origination, not the fiscal effects of this loan. The subsidy is zero, so fair value is measuring it correctly. But that accuracy means fair value sacrifices any information about the loan's fiscal effects.

That tradeoff illustrates the fundamental challenge of budgeting for lending programs. Taxpayer costs and fiscal effects are usually identical. A proposal to increase taxes by $1 billion, for example, would cost taxpayers $1 billion and would reduce the deficit by $1 billion. But this equivalence does not hold when the government lends or invests. The example loan would reduce the deficit by $100 over its life, yet it would not impose a cost on taxpayers. For lending programs, a single value cannot accurately represent both taxpayer costs (what fair value measures) and fiscal effects (what FCRA measures).

Expected Returns Budgeting

These problems can be solved with a budgeting approach that tracks the year-by-year returns from lending. Done correctly, such an approach can measure the initial subsidy and the fiscal effects in the origination year, over the budget window, and over the life of a loan. The idea is to focus on the year-by-year stream of net returns that the loan is expected to generate.

In the first year, the government's expected returns are zero. When it makes the loan, its assets go up $1,000 (the value of the new loan), but its liabilities go up the same amount (the value of the new debt). The government's net worth is unchanged, so there is no immediate financial gain or loss and thus no fiscal effect. In year two, the government expects $60 in interest payments less $10 in defaults and $25 in extra borrowing costs, making the expected return $25. The same is true in years three through five. Under the expected-returns approach, the fiscal effects of the loan would thus be $0 in year one and $25 in each of the next four years (table 4).

TABLE 4

The Expected Returns Approach to Projecting the Fiscal Effects of a Loan

Annual budget effects of government lending (dollars)

	Years					
	1	**2**	**3**	**4**	**5**	**Total**
Expected returns	0	25	25	25	25	100

Note: The government borrows $1,000 at 2.5 percent and lends expecting a 5 percent market return.

Expected-returns projections are a thing of beauty compared with the other three approaches—they are intuitive and accurately report budget effects over any period.

- Expected returns correctly shows that the government should expect to net $100 from this loan. FCRA misses $6 of this gain (because of the time value of money issue), and fair value misses all of it (the missing-money problem).
- Expected returns correctly shows that the government does not immediately gain by issuing this loan. At origination, the government borrows $1,000 and then lends that amount at market rates. Its liabilities go up by $1,000 (the new debt), and its assets go up by $1,000 (the new loan). The government is no richer or poorer than it was before issuing the loan. In contrast, FCRA front-loads the gains, often years before they might happen (the magic-money-machine problem). Fair value correctly reports no gain at origination.
- Expected returns correctly shows the budget effect over any budget window. If Congress uses a three-year window, expected returns shows a budget gain of $50, reflecting the net returns the government expects during those years. FCRA reports an artificially high amount, $94, because it claims all future gains the moment that the loan was made, including those beyond three years. Fair value reports no gains whatsoever.
- Expected returns correctly reports that the borrower receives no subsidy. Like fair value, expected returns shows a $0 effect in year one, when the subsidy is incurred; later budget gains reflect taxpayers' compensation for bearing financial risk. FCRA, in contrast, makes it appear that the government is collecting a negative subsidy, profiting at borrowers' expense.
- Expected returns presents the loan's fiscal effects in a way directly comparable with other policies. The government might compare this loan with increasing taxes by $25 annually over the next four years or cutting spending by $25 annually. Those policies would have the same fiscal effects as this

loan, increasing the budget balance by $25 each year. Expected returns makes this fiscal equivalence clear, unlike FCRA, fair value, or cash budgeting.

For this market-rate loan, expected returns surpasses both FCRA and fair value in projecting fiscal effects and subsidies and thus informing policy debates.

Budgeting for a Below-Market Loan

I now consider how to apply expected returns to other loans, in particular the more typical ones with below-market rates. Consider a loan identical to the first example except the government charges 5 percent interest rather than 6 percent. The government's expected annual return is thus 4 percent, higher than its cost of borrowing (2.5 percent) but lower than the comparable market rate (5 percent).[5] If the government holds the loan for four years, it expects to earn $15 each year ($1,000 × the 1.5 percent spread) for a total of $60. The $100 return from the unsubsidized loan has fallen to $60 because borrowers receive a $40 subsidy.

Under the improved version of cash budgeting, this loan would appear as you would expect, with a $1,000 outflow at origination, three years of $15 in net interest less defaults, and a final-year inflow of $1,015, for a total fiscal gain of $60. Under FCRA, the present value at origination is positive, since the expected return is above the government's borrowing rate, but less than before. FCRA values this loan at $1,056. After subtracting $1,000 in new borrowing, the up-front fiscal gain is $56 (appendix A). Under fair value, the loan is worth only $965, less than the $1,000 cost of making it, because the expected return is less than the market return. Fair value thus reports an up-front loss of $35.

These figures again demonstrate that FCRA and fair value are measuring different things. FCRA measures the lifetime fiscal effects of the loan, falling just short ($56 versus $60) because of the way the present value calculation handles the time value of money (appendix B). Fair value measures the subsidy given to borrowers, again falling just short ($35 versus $40) because of the present value calculation.

Now for the tricky part: Based on the first example, you might think expected returns would project a $15 gain annually over the life of the loan. But reality is more complex. That *smoothed-returns* approach would correctly report the lifetime gains from the loan but not their yearly pattern. Smoothed returns has some intuitive appeal and would be an improvement over FCRA, but it misses the fact that taxpayers start off behind when the government makes a below-market loan. At that moment, the loan is worth only $965, less than the $1,000 in debt needed to finance it. If the government sold the loan, it would realize a loss of $35, not break even as smoothed returns suggests.

Making a below-market loan sets taxpayers back immediately because that is the moment that the commitment to the subsidy occurs. The loan is a binding contractual obligation that cannot be broken or avoided by selling. A loan subsidy is thus different from ones provided by tax credits or direct spending. Tax and spending subsidies can be, and often are, reversed by future Congresses and should be treated as spread across time. When the government lends at below-market rates, however, it creates an irrevocable commitment.

Fair value calculates the value of that subsidy, in this case $35, and reports it as the loan's cost at origination. That is correct as far it goes. But it is not the whole fiscal story. The value of the loan is expected to increase each year, reaching the full $1,000 needed to pay off the debt at the end of the fifth year. The government expects to come out ahead financially because the expected return on the loan is greater than its borrowing rate. Compensation for bearing financial risk will eventually overtake the cost of subsidizing borrowers.

To implement expected returns, I track the value of the loan over time, including the initial subsidy, net interest less defaults, and gains from the loan value recovering (table 5). To do this, I apply the fair value approach to each year of the loan's life, not just the first year. The loan is worth $965 at origination, calculated as the net present value of expected cash flows using the 5 percent expected market return. Using the same approach, the loan's projected worth will be $973 at the end of year two. The government thus expects a capital gain of $8 ($973 - $965). The government thus expects to make money on the loan in two ways: $15 in net interest payments less defaults and $8 in capital gains from the increased value of the loan, for a total of $23.

Similar gains accrue in the following years as the value of the loan rises to $981 (year three), $990 (year four), and $1,000 (just before repayment in year five). The initial $35 subsidy cost of the loan is exactly offset by the capital gains over the loan's life, and the lifetime fiscal effect equals the cumulative amount of net interest less defaults.

Expected returns accurately tracks the path of gains and losses through time, recognizing both the up-front subsidy to borrowers and the subsequent fiscal return to bearing risk.

There are two reasons the year-by-year capital gains occur. The first is basic arithmetic. Lending at below-market rates costs more, and thus provides more subsidy, the longer you do it. A four-year loan at a below-market rate provides a greater subsidy than a three-year, a three-year more than a two-year, and so on. As the remaining life of the loan diminishes, the remaining subsidy declines and the value of the loan increases.

TABLE 5

Expected Returns for a Below-Market Loan

Annual budget effects of government lending (dollars)

	Years					
	1	2	3	4	5	Total
Value of the loan and Treasury debt						
Loan	965	973	981	990	1,000	
Debt	-1,000	-1,000	-1,000	-1,000	-1,000	
Net	-35	-27	-19	-10	0	
Components of expected returns						
Capital gains or losses	-35	8	9	9	10	0
Loan interest	0	50	50	50	50	200
Expected defaults	0	-10	-10	-10	-10	-40
Debt interest paid	0	-25	-25	-25	-25	-100
Expected returns	-35	23	24	24	25	60

Notes: The government borrows $1,000 at 2.5 percent and lends expecting a 4 percent return, below the 5 percent market return. Figures may not sum because of rounding.

The second explanation is basic finance. The loan is worth $965 at origination because investors would require a 5 percent annual return to be willing to buy it. At the end of the second year, investors would expect to have $1,013 ($965 × 1.05), a $48 gain. That gain corresponds to the $40 in interest less defaults on the loan plus an $8 capital gain, just as expected returns reports.

Like all lenders and investors, taxpayers are compensated for bearing risk over time. In this case, taxpayers expect a fiscal gain if the government owns the loan long enough. At the end of the third year, for example, $47 in cumulative expected returns more than offset the original $35 cost. If the government holds the loan to maturity, the expected gain will be the entire $60. That is $40 less than taxpayers would have earned if the government had lent at market rates, but $60 more than if the government had done nothing.

Expected returns again provides a more helpful and accurate portrayal of the loan's effects than do FCRA, fair value, or cash budgeting (table 6). FCRA accelerates potential gains from bearing financial risk to the moment a loan is originated (the magic-money-machine problem), while fair value ignores those returns entirely (the missing-money problem). In contrast, expected returns accurately tracks the path of gains and losses through time, showing both the up-front subsidy to borrowers and the subsequent fiscal return to bearing risk.

TABLE 6

Budget Projections for a Below-Market Loan

Annual budget effects of government lending (dollars)

	Years					
	1	2	3	4	5	Total
Expected returns	-35	23	24	24	25	60
FCRA	56	0	0	0	0	56
Fair value	-35	0	0	0	0	-35
Cash	-1,000	15	15	15	1,015	60

Notes: The government borrows $1,000 at 2.5 percent and lends expecting a 4 percent return, below the 5 percent market return. Figures may not sum because of rounding.

The same is true if the government makes a loan with expected returns that are below Treasury rates, such as one with an expected return of 2 percent (table 7). Such loans are known as *positive-subsidy* loans under FCRA, meaning that they are scored as costing the government money.

TABLE 7

Budget Projections for a Below-Treasury Loan

Annual budget effects of government lending (dollars)

	Years					
	1	2	3	4	5	Total
Expected returns	-106	20	21	22	24	-20
FCRA	-19	0	0	0	0	-19
Fair value	-106	0	0	0	0	-106
Cash	-1,000	-5	-5	-5	995	-20

Notes: The government borrows $1,000 at 2.5 percent and lends expecting a 2 percent return, below the 5 percent market return. Figures may not sum because of rounding.

The budget projections for this below-Treasury loan show a similar pattern as the previous ones. FCRA shows the net fiscal effects occurring at origination, a loss of $19. This loss is conventionally described as the subsidy, but that terminology is again misleading because it combines the subsidy with the government's expected compensation on the loan. Fair value reports the correct value of the subsidy at origination, $106, but it misses all the later returns. Only expected returns correctly shows both the initial subsidy and the subsequent returns.

BOX 1

Budgeting for Loan Guarantees

Guarantees make up most of federal credit activity. In a typical guarantee, the government charges an up-front fee in return for covering any future defaults. If the lending market is sufficiently competitive, the value of the guarantee less any fees is passed on to borrowers. By setting the fee below the guarantee's market value, the government can thus reduce borrower interest rates.

Suppose the government wants private lenders to charge borrowers 5 percent on our example loan, rather than the market rate of 6 percent. If the lending market is sufficiently competitive, the government could fully guarantee the loan in return for a $94 up-front fee. Under cash budgeting, this loan would appear as generating a $94 inflow in the first year, followed by $10 in expected outflows each year to cover defaults. The net fiscal gain would be $54. (This is the same as the $60 earned on the below-market direct loan except for the time value of money. If desired, cash budgeting could be adjusted to report identical, lifetime fiscal effects for equivalent loans and guarantees; the same is true for expected returns.)

FCRA would report this guarantee as generating a $56 gain in the first year, equal to the $94 fee less the $38 net present value of expected defaults. Fair value would report the guarantee as generating a $35 loss, equal to the $94 fee less the $129 market value of the guarantee at origination. In both cases, the reported effects are identical to those for the equivalent direct loan.

Under expected returns, the guarantee would be recorded as generating a $35 loss in the first year—the initial subsidy to borrowers—followed by four years of gains as the guarantee's life shortens and its value declines. From the government's perspective, the guarantee is a liability. By accepting a $94 fee in return for taking on a guarantee worth $129, the government starts out behind by $35. Over time, the value of the remaining guarantee declines, yielding the equivalent to the capital gains that occur for the below-market direct loan. Expected returns ultimately shows the guarantee bringing in $54, the same as under cash budgeting. All the benefits of using expected returns for loans thus exist for guarantees as well. Expected returns correctly identifies the initial subsidy and accurately reports the fiscal gains that accrue over time.

Budgeting and Financial Risk

Recent years have witnessed healthy debate between FCRA and fair-value supporters. Important contributions include Kamin (2013), Kogan, Van de Water, and Horney (2013), and Reischauer,[7] who favor FCRA, and CBO (2012, 2014), Delisle and Richwine (2014), Financial Economists Roundtable (2012), and Lucas and Phaup (2008, 2010), who favor fair value. Dylan Matthews provides a light-hearted survey.[7]

Two issues have achieved particular prominence in that debate: whether financial risk creates fiscal costs and whether and how the government's ability to bear financial risk should affect fiscal projections.

Does Financial Risk Create a Fiscal Cost?

Fair-value advocates believe financial risk imposes a cost on taxpayers that should be included in budget projections (CBO 2012). FCRA defenders believe financial risk may be a cost in a societal sense but not in a fiscal sense.[8] As Reischauer puts it, "A society's aversion to risk may be an appropriate factor for policymakers to take into account in a cost-benefit assessment of any spending or tax proposal, but adding a cost to the budget does not make sense."[9]

This criticism of fair value is correct when thinking about lifetime fiscal effects. Cash budgeting, unsullied by any present values, estimates that the below-market loan will bring in $60 over its lifetime, but fair value reports it as costing $35. That large difference exists because fair value includes a *lifetime* cost of risk that does not exist under cash budgeting and thus cannot be a fiscal cost.

Expected returns does not suffer fair value's *missing-money* problem. In fact, expected returns reports slightly larger fiscal gains than FCRA. But expected returns, like fair value, does consider risk. So how does expected returns avoid the missing-money trap?

One answer is that fair value reflects the cost of risk, but expected returns includes risk and reward. As its name implies, expected returns includes the fiscal gains that come from bearing financial risk and thus correctly measures the lifetime fiscal effects of lending.

The government's ability to bear financial risk has no bearing on how we should measure the fiscal effects of federal lending.

Another answer is that expected returns treats financial risk as temporary. Like fair value, expected returns recognizes that the government starts off behind when it lends at below-market rates. The below-market loan, for example, is worth $965 at origination, less than its $1,000 cost, so the initial fiscal effect is a $35 loss. But the value of the loan rises over time, eventually reaching the $1,000 face value, as its maturity shortens and the remaining subsidy narrows. When the loan reaches the end of its life, its financial risk no longer exists and thus no longer has fiscal effects. Financial risk affects the timing of fiscal effects, but not their lifetime amount.

A final, more fundamental, answer is that expected returns and fair value measure different things. Fair value measures borrower subsidies, while expected returns measures fiscal effects.

Does Government's Ability to Bear Risk Matter?

Analysts also debate whether the government has special ability to bear financial risk and, if so, whether that should affect budget projections. The government's ability to bear financial risk is an important issue when considering whether the government should make loans, but it is irrelevant when estimating their fiscal effects. That observation is at odds with parts of the FCRA–versus–fair value debate, so let me repeat it: *the government's ability to bear financial risk has no bearing on how we should measure the fiscal effects of federal lending*. It is relevant to whether and how the government should extend credit, but it should not influence how we construct budget projections.

Instead, the important factor is how risk affects the value of a loan. Expected returns thus asks how much a loan would be worth to potential buyers. Just as the value of your home depends on what other people would be willing to pay for it, not how much you enjoy it, the value of the loan depends on what other people would be willing to pay for it. To answer that question, we look to financial markets, where investors' willingness to bear risk, not the government's ability to do so, determines value.

To drive this home, consider an analogy from personal life. Suppose two almost-identical houses are for sale. One is worth $250,000, the other $200,000. There are only two differences. First, the less valuable house is next to a railroad, and most people do not want to live with the noise. Second, your uncle owns the less valuable house, while a stranger owns the other one.

Suppose your uncle asks you to buy his house for $230,000, saying that it's a $20,000 discount compared with the other house on the market. How would you, your financial advisor, and your bank think about the financial implications of that proposal? You would all agree that the deal would cost you $30,000 not make you $20,000. You might want to do it to help your uncle—a key issue in your personal cost-benefit analysis—but in purely fiscal terms, buying the house at that price would effectively give $30,000 to your uncle and impose a $30,000 cost on you.

This calculation is true regardless of your personal tolerance for living by the railroad. Perhaps you hate railroad noise. Perhaps you are indifferent. Perhaps you are a trainspotter and living there would be a dream come true. Those feelings are relevant to your decision whether to buy the house. But they are irrelevant to the finances. If you buy that house for $230,000, you are giving a $30,000 subsidy to your uncle, regardless of your railroad tolerance.

The same is true for federal lending. The value of a loan depends not on the government's tolerance for financial risks, but on the tolerance of potential buyers who would have to bear them. To measure this tolerance, we look to financial markets that price financial risks, just as we look to housing markets to learn how amenities are priced. For fiscal purposes, a $200,000 house is worth $200,000 regardless of your personal tolerance for railroad noise, and a $965 below-market loan is worth $965 regardless of the government's tolerance for bearing risk.

Lending and the Budget Window

I now examine how the different budgeting practices portray loan programs that operate over multiple years with returns that stretch beyond the budget window. Specifically, I consider a program that originates a below-market loan in each of the next five years (table 8).

These projections drive home the differences among the budgeting methods. Under FCRA, the loan program generates a consistent series of budget gains because returns beyond the five-year budget window are brought forward to when the loans are made. In fact, the loan made just before the budget window ends is scored as bringing in just as much as the first loan, which is fully paid off by the end of the window. Fair value shows a persistent series of losses, reflecting the initial subsidy on below-market loans but omitting any gains those loans may subsequently generate. The first loan, which provides four years of returns, is scored as costing just as much as the loan made just before the budget window ends. Under cash budgeting, the loan program appears to generate enormous losses since most repayments are pushed outside the budget window.

TABLE 8

Budget Projections for a Series of Below-Market Loans

Annual budget effects of government lending (dollars)

	Years					
	1	2	3	4	5	Total
Expected returns	-35	-12	11	35	60	59
FCRA	56	56	56	56	56	282
Fair value	-35	-35	-35	-35	-35	-177
Cash	-1,000	-985	-970	-955	60	-3,850

Notes: The government borrows $1,000 at 2.5 percent and lends expecting a 4 percent return, below the 5 percent market return. Figures may not sum because of rounding.

Only expected returns gives an accurate presentation of fiscal effects. In its early years, the loan program generates losses as the government issues below-market loans. Starting in the third year, however, the subsidy costs of new loans are more than offset by the expected returns on the outstanding portfolio of loans. By the fifth year, the loan program is estimated to bring in $60 annually, a figure that would continue in later years if the program continued at this pace. Expected returns reports the gains the government makes by lending as they accrue; it neither excludes them (as fair value does) nor claims benefits that happen beyond the budget window (as FCRA does).

Distinguishing between Subsidies and Financial Returns

The budget projections thus far share an important limitation: they do not fully distinguish between the financial returns that the government receives from lending and the cost of subsidies that it provides to borrowers. Budget deliberations would be better informed with a presentation that makes that distinction. Such a presentation would make clear that extending federal credit involves two separate decisions: whether to take on more financial risk and whether and how much to subsidize potential borrowers.

The federal government could decide to make loans at market rates (e.g., by buying corporate bonds on the open market) as a way to invest in risky assets and, if things go well, increase future fiscal resources. This decision would increase taxpayer exposure to financial risk, but it would not create subsidies. Alternatively, the government could subsidize credit without extending new credit. Indeed, it already does so through policies such as the tax exemption for state and local bonds, Build America Bonds, and the mortgage interest deduction.

Extending credit and subsidizing credit are separate activities. Policy debates should clearly distinguish them. The budget presentation in table 9 offers a natural way to do so under expected returns using the below-market loan analyzed earlier. The first row shows the compensation the government would expect if it made a comparable loan at fair market rates; in other words, it shows the expected returns on an unsubsidized loan. The third row shows the expected returns on the below-market loan, our measure of its fiscal effects. The second row, which shows the subsidy to borrowers, is the difference between the first and third rows; the small amounts in years two through five bridge the gap from the $35 present value recorded at origination and the $40 lifetime subsidy.

This presentation makes clear that the government could have made $100 by lending at market rates, but it gave up $40 of that potential and expects to net only $60. It also makes clear that the government is not profiting at the expense of borrowers. Borrowers come out $40 ahead because they get to pay below-market interest rates, while taxpayers come out $40 behind what they could have earned by lending at market rates.

TABLE 9

Distinguishing between Subsidies and Compensation for Bearing Risk

Annual budget effects of government lending under expected returns (dollars)

	Years					
	1	**2**	**3**	**4**	**5**	**Total**
Compensation for bearing risk	0	25	25	25	25	100
Subsidy to borrowers	-35	-2	-1	-1	0	-40
Expected returns	-35	23	24	24	25	60

Notes: The government borrows $1,000 at 2.5 percent and lends expecting a 4 percent return, below the 5 percent market return. Figures may not sum because of rounding.

BOX 2

How Should We Measure Subsidies?

Identifying subsidies is a recurring confusion in analyzing federal lending programs. The way to settle this confusion is to select a benchmark against which to measure how much of a subsidy borrowers receive.

FCRA uses Treasury borrowing rates as the benchmark. As we saw with the three example loans, it reports a subsidy only when a loan's expected returns are less than Treasury rates. This approach has a perverse implication: the government can offer borrowers below-market loans, yet FCRA reports those loans as though the government is profiting from borrowers rather than subsidizing them. The reason is that FCRA does not measure subsidies; instead, it measures the returns the government expects to net on the loan, which equal the government's compensation for bearing financial risk less any subsidies.

Another approach is to use private lending rates as the benchmark. From that perspective, the borrower gets a subsidy whenever the government offers to lend on better terms than private lenders. That approach identifies all cases in which borrowers benefit from federal lending. But it is not right either. As an extreme case, suppose that a loan shark manages to stifle competition and charge 20 percent interest on our example loan. If the government offers the same loan at 19 percent, we would not say the borrower is receiving a 1 percent subsidy. We would say that the government is a slightly nicer loan shark profiting at borrowers' expense.

The right benchmark is the rate that a competitive private lender would charge. That is what analysts estimate when they look to financial markets to determine how cash flows and risks are priced. If the loan shark bundled together his 20 percent loans and sold them as a security on financial markets, investors would be willing to accept a 5 percent expected return. That rate is the right benchmark for identifying and measuring subsidies because it is the rate of return that the government could otherwise earn by taking on this risk. Expected returns uses that market rate as the benchmark for identifying and measuring subsidies.

Budgeting for Fiscal Gains and Managing Financial Risk

The debate over credit budgeting often conflates budget measurement (what is the best way to report the fiscal effects of lending) and budget process (how should policymakers handle those fiscal effects in budgeting, and how should policymakers account for financial risk). Expected returns answers the measurement question, but it does not and cannot answer the process question.

One of the most important criticisms of FCRA is that it invites policymakers to view subsidized lending as a way to create fictional budget resources that they can then use to pay for spending increases or tax cuts. As Lucas and Phaup (2010) write, "booking the market-risk premium as expected profit, an offset to program expenses, should be avoided. Otherwise, the appearance of an arbitrage opportunity from selling Treasury securities and buying risky securities would reward increased risk-taking and perhaps encourage increased spending from illusory resources."[10]

This argument is correct for the immediate gains reported under FCRA. Budget projections should not include phantom arbitrage opportunities like FCRA's magic money machine. Those immediate gains are illusory.

This argument does not apply, however, to gains expected in the future as a reward for patience and bearing risk. Those future gains are not necessarily illusory, and thus, with careful budgeting, it may be appropriate to take them into account.

Another example from personal life makes this vivid. Suppose you had saved $50,000 in your 401(k) but for some reason had it all invested in a money-market fund earning 1 percent in interest. One day your spouse comes home and announces, "Good news, honey, I moved our money into a broadly diversified, corporate bond fund, which the experts say has higher expected returns. We should earn a lot more over the next two decades. And with our expected gains, I bought this new Tesla!" You would rightly be aghast.

Alternatively, suppose your spouse comes home and announces, "Good news, honey, I moved our money into a broadly diversified, corporate bond fund, which the experts say has higher expected returns. We should earn a lot more over the next two decades. If all goes well, we'll be able to stay in this home when we retire, rather than move to a less expensive one." In that case, you would give your spouse a hug and perhaps think how nice it would be for your grandkids to visit the family home.

If policymakers worry that the potential gains from lending and investing may be misused, they could subject the gains from taking financial risk and the subsidies provided to borrowers to different budget rules.

Budget projections should not encourage lawmakers to act like the Tesla buyer; that is a flaw in FCRA. But budget projections should not rule out investing for the future either. Fair value omits that possibility by excluding the potential fiscal gains from lending or investing. Fair value thus combines a choice about budget measurement with a choice about budget process. But those two choices should be made separately.

Expected returns avoids these problems. It neither reports premature gains nor rules out future gains as a fiscal reward to patience and bearing risk. Instead, expected returns projects all the fiscal effects and leaves it to policymakers to decide how to use them.

Should policymakers be able to use the expected gains from lending programs (or, more generally, investing in financial assets) to offset the budget costs of new spending programs or tax cuts? This question has long divided budget analysts and remains unresolved. The argument for allowing this is simple: from a fiscal perspective, all dollars are created equal, whether they come from lending returns, investing returns, revenues, or spending reductions. The fact that lending returns come with risk does not change this; many federal programs—from food stamps to capital gains taxes—involve similar risks. It would be peculiar for policymakers to treat the risks from lending as different from those in other programs. As long as policymakers respect the timing of potential returns, rather than buying Teslas with illusory instant profits, returns to lending could be fair game in budgeting.

On the other hand, there is widespread concern that legislators may misuse this power. Some worry policymakers will expand lending programs too far. Others worry policymakers may attempt to resolve Social Security's long-term imbalance by investing in stocks and other financial assets. For these and other reasons, many analysts believe that purely financial transactions, such as earning fair market returns on loans and financial investments, should be separated from the regular budget process.

Such concerns deserve attention, but they are not measurement issues. Congress should measure the fiscal effects of lending and investing the same way, regardless of one's view on these issues. If policymakers worry that the potential gains from lending and investing may be misused, they could distinguish between the gains from taking financial risk and the subsidies provided to borrowers and subject the two to different budget rules. Lawmakers could put potential gains from financial risk off-budget, where they cannot be used to pay for new spending or tax cuts, while borrower subsidies are on-budget and thus subject to usual budget requirements. Or gains from bearing financial risk could be attributed to the general government, while subsidies are attributed to specific programs. Such process choices can guide how Congress uses budget figures without distorting projections of expected fiscal effects.

Policymakers should also devote more attention to the financial risks facing the government. Those risks cannot be shoe-horned into budget projections, and thus they warrant separate attention. It is perfectly reasonable for you to hope that the higher expected returns of investing your 401(k) in corporate debt may allow you to keep your home in retirement. But you should also consider the downside: there is a chance that you will do worse than if you had kept your investments in the money-market fund. Good decision-making requires you to assess that risk and revisit your financial position over time to make course corrections. Federal policymakers should do the same.

Conclusion

Budget projections should not favor or disfavor particular policies. Instead, they should provide unbiased information that lawmakers and the public can use to evaluate policy options. Current budgeting methods for federal lending fall short of that standard. FCRA front-loads potential budget gains and conceals subsidies and thus tilts the budget scales in favor of lending programs. The leading alternative, fair value, omits the fiscal returns to lending and thus tilts the scales against lending.

FCRA counts the government's fiscal chickens before they hatch, and fair value assumes they never hatch. Expected returns counts chickens when they are expected to hatch. By tracking the value of a loan and its cash flows through time, expected returns accurately captures lending subsidies and budget effects from origination through the budget window to full maturity. For budgeting purposes, it is grade A (table 10).

FCRA counts the government's fiscal chickens before they hatch, and fair value assumes they never hatch. Expected returns counts chickens when they are expected to hatch.

TABLE 10

Expected Returns Accurately Measures Subsidies and the Fiscal Effects of Lending

Measurement accuracy, A–F

Method	Subsidy to borrowers	Fiscal effects over budget window	Lifetime fiscal effects
Expected returns	A	A	A
FCRA	F	C	A-
Fair value	A-	C	F
Cash	F	F	A

FCRA and fair value trail far behind. FCRA gives a good portrayal of lifetime fiscal effects, falling just short of an A because it slightly understates them. It gets a C for measuring fiscal effects over the budget window because it takes credit for returns that happen years later, and it gets an F on measuring subsidies because it conceals their value. Fair value does the reverse: it does well with subsidies, just slightly understating them, but that advantage fades as it misses each year of fiscal gains. For measuring the lifetime fiscal effects of lending, fair value gets an F. Cash budgeting, finally, works well for debt management but is a disaster for budgeting unless we focus only on the loan's entire life.

The budget effects of a loan or guarantee cannot be fairly represented by a single lump sum whether calculated under FCRA or fair value. Expected returns solves that problem and gives policymakers and the public better information about federal lending programs.

Appendix A
Present Value Calculations

This appendix calculates the net present values reported in the main text. Table A.1 shows the FCRA calculations for the three example loans.

TABLE A.1

Present Value of Net Cash Flows, FCRA

	Years					
	1	2	3	4	5	Total
Present value factor[a]	1.00	0.98	0.95	0.93	0.91	
Market-rate loan[b]						
Expected cash flows	-1,000	50	50	50	1,050	
Present value of cash flows	-1,000	49	48	46	951	94
Below-market loan[c]						
Expected cash flows	-1,000	40	40	40	1,040	
Present value of cash flows	-1,000	39	38	37	942	56
Below-Treasury loan[d]						
Expected cash flows	-1,000	20	20	20	1,020	
Present value of cash flows	-1,000	20	19	19	924	-19

Notes: The government borrows $1,000 at 2.5 percent. Figures may not sum due to rounding.
[a] Present value at the 2.5 percent Treasury rate.
[b] 5 percent expected return.
[c] 4 percent expected return.
[d] 2 percent expected return.

FCRA looks at the cash flows over the life of the loan and converts them into equivalent dollar amounts at origination. Because the government borrows at 2.5 percent, each dollar in the second year has a present value of about 97.5 cents, each dollar in the third year is worth about 95 cents, and so on. Applying those present-value factors to the expected cash flows for the loan at market rates, FCRA scores making the loan as worth a net of $94, reflecting the $1,094 present value of expected loan cash flows (49 + 48 + 46 + 951) less the $1,000 cost of originating it. Similar calculations find that making the below-market loan is worth $56 and making the below-Treasury loan has a net cost of $19.

Table A.2 does the same calculations for fair value. The only difference is the discount rate; fair value uses the 5 percent market rate, whereas FCRA used the 2.5 percent Treasury rate. As a result, a dollar in the second year is worth only 95 cents, and a dollar in the third year is worth 91 cents. Applying those present value factors to the expected cash flows, fair value scores making the market-rate loan as worth a net of $0. The $1,000 initial value of the expected loan cash flows (48 + 45 + 43 + 864) equals the $1,000 cost of originating it. Similar calculations find that making the below-market loan has an up-front cost of $35 and making the below-Treasury loan has a cost of $106.

TABLE A.2

Present Value of Net Cash Flows, Fair Value

	Years					
	1	2	3	4	5	Total
Present value factor[a]	1.00	0.95	0.91	0.86	0.82	
Market-rate loan[b]						
Expected cash flows	-1,000	50	50	50	1,050	
Present value of cash flows	-1,000	48	45	43	864	0
Below-market loan[c]						
Expected cash flows	-1,000	40	40	40	1,040	
Present value of cash flows	-1,000	38	36	35	856	-35
Below-Treasury loan[d]						
Expected cash flows	-1,000	20	20	20	1,020	
Present value of cash flows	-1,000	19	18	17	839	-106

Notes: The government borrows $1,000 at 2.5 percent. The market rate is 5 percent. Figures may not sum because of rounding.
[a] Present value at the 5 percent Treasury rate.
[b] 5 percent expected return.
[c] 4 percent expected return.
[d] 2 percent expected return.

Table A.3 shows the present value calculations used in expected returns. Two things are different. First, a present value is calculated for each year of the loan's life. As a result, we need five streams of present-value factors. (These factors begin in different years but are otherwise identical because the market rate is assumed constant; if the market rate were expected to vary, these factors would differ.) Second, we are calculating the value of the loan—not the value of the loan less the debt that finances it. The cash flows here thus do not include the $1,000 outflow at origination. That is netted separately, as shown in table 5.

At origination, the below-market loan is worth $965, equivalent to the $1,000 amount of the loan less the $35 subsidy as calculated under fair value. Over subsequent years, that value rises to $973, $981, $990, and finally $1,000 just before the loan is retired. (The loan is valued each year *after* any interest payments but *before* any principal repayment.)

TABLE A.3

Loan Values under Expected Returns

	Years					
	1	2	3	4	5	Total
Present value factor[a]						
To year 1	1.00	0.95	0.91	0.86	0.82	
To year 2		1.00	0.95	0.91	0.86	
To year 3			1.00	0.95	0.91	
To year 4				1.00	0.95	
To year 5					1.00	
Below-market loan[b]						
Year 1						
Expected cash flows	0	40	40	40	1,040	
Present value of cash flows	0	38	36	35	856	965
Year 2						
Expected cash flows		0	40	40	1,040	
Present value of cash flows		0	38	36	898	973
Year 3						
Expected cash flows			0	40	1,040	
Present value of cash flows			0	38	943	981
Year 4						
Expected cash flows				0	1,040	
Present value of cash flows				0	990	990
Year 5						
Expected cash flows					1,000	
Present value of cash flows					1,000	1,000
Below-Treasury loan[c]						
Year 1						
Expected cash flows	0	20	20	20	1,020	
Present value of cash flows	0	19	18	17	839	894
Year 2						
Expected cash flows		0	20	20	1,020	
Present value of cash flows		0	19	18	881	918

TABLE A.3 CONTINUED

	Years					
	1	2	3	4	5	Total
Year 3						
Expected cash flows			0	20	1,020	
Present value of cash flows			0	19	925	944
Year 4						
Expected cash flows				0	1,020	
Present value of cash flows				0	971	971
Year 5						
Expected cash flows					1,000	
Present value of cash flows					1,000	1,000

Notes: The government borrows $1,000 at 2.5 percent. Figures may not sum because of rounding.
[a] Present value at the 5 percent Treasury rate.
[b] 4 percent expected return.
[c] 2 percent expected return.

At origination, the below-Treasury loan is worth $894, equivalent to the $1,000 amount of the loan less the $106 subsidy as calculated under fair value. Over subsequent years, that value rises to $918, $944, $971, and finally $1,000 just before the loan is retired.

Appendix B
The Time Value of Money

The budget process usually excludes Treasury borrowing costs when tallying the effects of particular policies. A proposal to increase taxes by $25 in each of the next four years, for example, would typically be described as raising $100, with no effort to add interest savings on the debt that could be paid down or avoided by the resulting revenues. A proposal to increase spending by $25 each year would similarly be described as costing $100, with no added interest costs from the additional debt needed to finance it.

The budget process thus excludes the time value of money. I have concerns about this approach (Marron 2010), but absent comprehensive reform it makes sense to handle lending programs the same way. Otherwise, we would be using different budget yardsticks for lending programs and regular programs. Unfortunately, identifying the consistent treatment is not always intuitive. In fact, questions arise under all four budgeting approaches.

Cash Budgeting

Conventional budget projections do not include changes in Treasury borrowing costs. As noted in the main text, this convention created problems for pre-FCRA cash accounting for lending programs. For example, a loan paying a 1 percent return could appear to make money even if Treasury had to pay 10 percent interest to finance it. To avoid that result, I thus focus on an improved version of cash budgeting that subtracts financing costs.

FCRA Budgeting

Lifetime fiscal effects under FCRA are close to those under cash budgeting. For the unsubsidized loan, cash budgeting reports $100 while FCRA reports $94; for the below-market loan, cash reports $60 while FCRA reports $56; and for the below-Treasury loan, cash reports -$20, while FCRA reports -$19. The closeness of these figures confirms that cash and FCRA budgeting both measure lifetime fiscal effects. The FCRA values differ from the cash ones, however, because FCRA measures all fiscal effects as a present value at origination and thus deducts some time value of money relative to cash budgeting.

If desired, that difference can be eliminated with a simple calculation that maintains the basic logic (or illogic) of FCRA but ensures that lifetime fiscal effects match those under cash budgeting (table B.1). To do so, we calculate the year-by-year returns implied by FCRA, not just the return in the first year. In the second year, the logic of FCRA implies that the government should receive a 2.5 percent return on the loan, which was worth $94 at the end of the first year. The government would thus get a $2.40 return. The value the loan creates at that point would thus be $96.40. Under cash budgeting, we know that the government would expect $25 in net interest less defaults. Consistent with the usual treatment of the time value of money, that amount would not generate any return (e.g., interest savings) in later years. So the new base value for calculating future years' returns is now $71.40 ($94 + $2.40 - $25). At 2.5 percent, that new base implies a $1.80 return in the third year. Doing the same calculations for the fourth and fifth years yields another $1.20 and $0.60 in returns, respectively.

Combining those figures with the original FCRA value yields exactly $100 in lifetime fiscal gains, matching the cash total. This is the accrual version of FCRA. It begins with the FCRA amount in the first year and then adjusts for the time value of money to match the correct cash total. Similar calculations bridge the gap between the $56 FCRA value for the subsidized loan and the correct $60 lifetime value. (The difference for the below-Treasury loan is small, -$19 versus -$20, so I do not report it here.)

TABLE B.1

Adjusting for the Time Value of Money in FCRA

	Years					
	1	**2**	**3**	**4**	**5**	**Total**
Market-rate loan[a]						
Net loan value, beginning of the year	0	94	71	48	24	
Fiscal effects under FCRA	94	0	0	0	0	94
Returns on net loan value at 2.5 percent	0	2	2	1	1	6
Adjustment for expected cash returns	0	-25	-25	-25	-25	-100
Net loan value, end of the year	94	71	48	24	0	
Accrual version of FCRA	94	2	2	1	1	100
Below-market loan[b]						
Net loan value, beginning of the year	0	56	43	29	15	
Fiscal effects under FCRA	56	0	0	0	0	56
Returns on net loan value at 2.5 percent	0	1	1	1	0	4
Adjustment for expected cash returns	0	-15	-15	-15	-15	-60
Net loan value, end of the year	56	43	29	15	0	
Accrual version of FCRA	56	1	1	1	0	60

Notes: The government borrows $1,000 at 2.5 percent. Figures may not sum because of rounding.
[a] 5 percent expected return.
[b] 4 percent expected return.

Subsidies under Fair Value and Expected Returns

Similar issues arise with fair value and expected returns. For the below-market loan, for example, the issue is how to bridge the gap between the $35 reported subsidy and the actual $40 cash amount. To do so, we follow the same approach except that we focus on lifetime subsidies rather than fiscal gains, and we use the 5 percent market rate rather than the 2.5 percent Treasury rate. This is the accrual version of fair value (table B.2).

The resulting estimates equal the subsidies calculated under expected returns (table 8, line 2).

TABLE B.2

Adjusting for the Time Value of Money in Fair Value

	Years					
	1	2	3	4	5	Total
Below-market loan[a]						
Net loan value, beginning of the year	0	-35	-27	-19	-10	
Subsidy under Fair Value	-35	0	0	0	0	-35
Returns on net loan value at 5 percent	0	-2	-1	-1	0	-5
Adjustment for expected cash subsidy	0	10	10	10	10	40
Net loan value, end of the year	-35	-27	-19	-10	0	
Accrual version of fair value	-35	-2	-1	-1	0	-40
Below-Treasury Loan[b]						
Net loan value, beginning of year	0	-106	-82	-56	-29	
Subsidy under fair value	-106	0	0	0	0	-106
Returns on net loan value at 5 percent	0	-5	-4	-3	-1	-14
Adjustment for expected cash subsidy	0	30	30	30	30	120
Net loan value, end of year	-106	-82	-56	-29	0	
Accrual version of fair value	-106	-5	-4	-3	-1	-120

Notes: The government borrows $1,000 at 2.5 percent. The market rate is 5 percent. Figures may not sum because of rounding.

[a] 4 percent expected return.

[b] 2 percent expected return.

Notes

1. John F. Tierney and Elizabeth Warren, "Student Debt is a National Emergency," *Salem News*, June 2, 2014, http://www.salemnews.com/opinion/article_2b3cca56-4475-596f-87e1-ba2bb13d931d.html.
2. You might wonder why the government would bother to lend at market rates. One real-world example occurs when the government purchases bonds and securitized loans in financial markets. But the why does not matter. How we measure the effects of government loans should be the same regardless of motivation. Under current law, purchases of publicly traded securities are sometimes handled under cash budgeting, sometimes under FCRA, and sometimes under fair value. The fiscal effects of such purchases, whether of debt or equity, should be measured in the same way as for direct loans and guarantees.
3. When I refer to the accuracy of budget estimates, I am focusing on the method by which fiscal effects are measured (e.g., FCRA or fair value). Another important issue is the accuracy of the underlying estimates of expected defaults, market interest rates, and other aspects of financial performance, but these are beyond the current scope.
4. Both approaches include truing up mechanisms for the historical budget, so FCRA ultimately matches cash historically, as would fair value. In that narrow sense, FCRA and fair value are accrual approaches. The focus here is the vastly more important issue of forward-looking budgeting, where they are not accrual approaches.
5. To keep the math simple, I assume that expected defaults and the market rate are unchanged.
6. Robert D. Reischauer, Letter to Representative Chris Van Hollen, January 23, 2012, http://www.offthechartsblog.org/reischauer-strongly-opposes-house-bill-to-inflate-cost-of-federal-credit-programs/.
7. Dylan Matthews, "Everything You Could Possibly Need to Know about Student Loan Budgets (with Gifs)," *WonkBlog, Washington Post,* May 22, 2013, http://www.washingtonpost.com/blogs/wonkblog/wp/2013/05/22/everything-you-could-possibly-need-to-know-about-student-loan-budgets-with-gifs/.
8. This argument is developed in most detail in Kamin (2013) and also emphasized in Kogan, Van der Water, and Horney (2013).
9. Reischauer, letter to Representative Chris Van Hollen.
10. To be precise, the authors are describing the views of CBO and Office of Management and Budget when they decided how to handle some investments in private securities, but the authors share that view.

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