# How Much Do Guarantees and Bailouts Cost the Government?

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Summary:

Governments in advanced economies absorb a large and growing share of aggregate credit risk. That exposure arises from explicit and implicit contingent liabilities such as the ones that culminated in bailouts during the Global Financial Crisis (GFC) and from loan guarantees extended during the Covid-19 pandemic. Despite the growth of credit policy as a crisis response tool and substitute for traditional fiscal assistance, governments continue to underreport the associated costs and risks. More comprehensive and timely cost estimates, produced using a fair value framework, would increase transparency and discourage overreliance on these policies. Such cost estimates for the GFC bailouts and Covid-19 pandemic guarantee programs reveal costs that were an order of magnitude lower than the risk exposures those policies entailed but nevertheless were large enough to call into question whether less expensive and less risky policy alternatives could have achieved the same goals.

Key findings:

1. The major GFC bailouts—the rescues of Fannie Mae, Freddie Mac, Citigroup, AIG, and other large institutions; expanded FHA mortgage insurance; the Federal Reserve's emergency liquidity facilities; and expanded FDIC insurance—exposed taxpayers to trillions of dollars of potential losses and had a fair value cost of about $500 billion.

2. The Covid-19 pandemic loan guarantee programs exposed governments in advanced economies to more than $4 trillion of potential losses and to costs totaling $330 billion.

3. The direct beneficiaries of these policies vary significantly over time. At the onset of a crisis, existing debt holders and uninsured depositors reap the gains. During normal times, bank equity holders, customers and borrowers benefit from lower funding costs.

Center Affiliation: Center for Financial Innovation and Stability

Federal Reserve Bank *of* Atlanta

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## About the Author:

**Deborah Lucas** is the Sloan Distinguished Professor of Finance at the MIT Sloan School of Management and director of the MIT Golub Center for Finance and Policy. Lucas's research lies at the intersection of finance and policy with a focus on fair value cost measurement, risk assessment, and evaluation of government financial policies. Projects include modeling and estimating financial subsidies to state-owned enterprises and development banks, valuing "too-big-to-fail" guarantees on large banks, evaluating the fiscal and macroeconomic implications of credit support and forbearance programs, and analyzing government financial products such as reverse mortgages and credit risk transfer securities. She is a research associate at the National Bureau of Economic Research and a member of the Shadow Open Market Committee. She is an elected member of the National Academy of Public Administration and the National Academy of Social Insurance. She serves on an advisory board for the Urban Institute and is on the editorial board of the *Annual Review of Financial Economics*. She is an independent board member of the Chicago Mercantile Exchange and P/E Investments and a consultant for the Congressional Budget Office. Lucas received her BA, MA, and PhD in economics from the University of Chicago.

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# 1    Introduction

Governments in advanced economies absorb a significant share of aggregate credit risk. Some of that exposure comes from standing credit support policies, such as the ongoing provision of guarantees on mortgages or from student loan programs. During financial or economic crises, government credit risk exposures often escalate with the expansion of existing guarantee programs or the introduction of new ones, as well as from obligations arising from explicit and implicit contingent liabilities, including the need to bail out banks and other institutions that are too big or too systemic to fail (TBTSTF).

These various credit policies differ from one another in their goals and structural details. They also elicit very different reactions from the public, policymakers, and economists. The term "bailout" tends to be used pejoratively, and actions perceived as bailouts often are viewed as arising from policy failures. By contrast, government guarantees that lower the cost of borrowing in support of objectives like increasing access to higher education and homeownership, or that protect small depositors and pensioners, are generally viewed more positively. Nevertheless, what all of these policies have in common is that they create contingent government liabilities that are often very large and opaque.

In the United States, the federal government's exposure to credit risk has grown rapidly during the last quarter century, with the largest increases occurring in the aftermath of the 2007–08 financial crisis and during the Covid-19 pandemic. Figure 1 shows the growth of outstanding principal in traditional credit programs, which by 2021 had reached about $5 trillion. This amount includes more than 100 individual loan guarantee and direct lending programs that appear in the federal budget and that were created to support home ownership, higher education, agriculture, small businesses, clean energy, export assistance, and so forth. Adding to that are the growing principal amounts insured by the Federal Deposit Insurance Corporation, Fannie Mae and Freddie Mac, the Pension Benefit Guarantee Corporation, and the Federal Home Loan Banks. Taken together, these obligations bring the total federal credit risk exposure to more than $20 trillion or about 86 percent of 2021 GDP. Adding to those explicit exposures are those from implicit guarantees such as those for TBTSTF businesses and financial institutions.

Governments in most other advanced economies rely less heavily on standing credit facilities. However, they too have significant risk exposures arising from contingent liabilities associated with financial system protections, and from one-off interventions such as the very large credit guarantee and loan forbearance programs introduced in response to the Covid-19 pandemic.

What are the costs to governments of taking on these risk exposures, and what principles should guide how those costs are measured? Despite the increasing use of credit policy as an alternative to traditional fiscal assistance and as a crisis response tool,

governments generally provide very limited information about the costs and risks of those policies in advance of their adoption. Importantly, costs are underestimated or excluded entirely from budget estimates, where the information is often most decision-relevant. The United States is unusual in that there is partial upfront budgetary recognition for most credit programs, but the rules governing how costs are estimated cause the costs to be systematically understated. In most other countries, losses from credit guarantees are officially recognized only after cash is paid out, long after an irrevocable commitment has been made. More fundamentally, there is a lack of conceptual agreement on how the costs should be measured, or even on what constitutes a cost.

**Figure 1:** Face Value of Federal Credit Outstanding
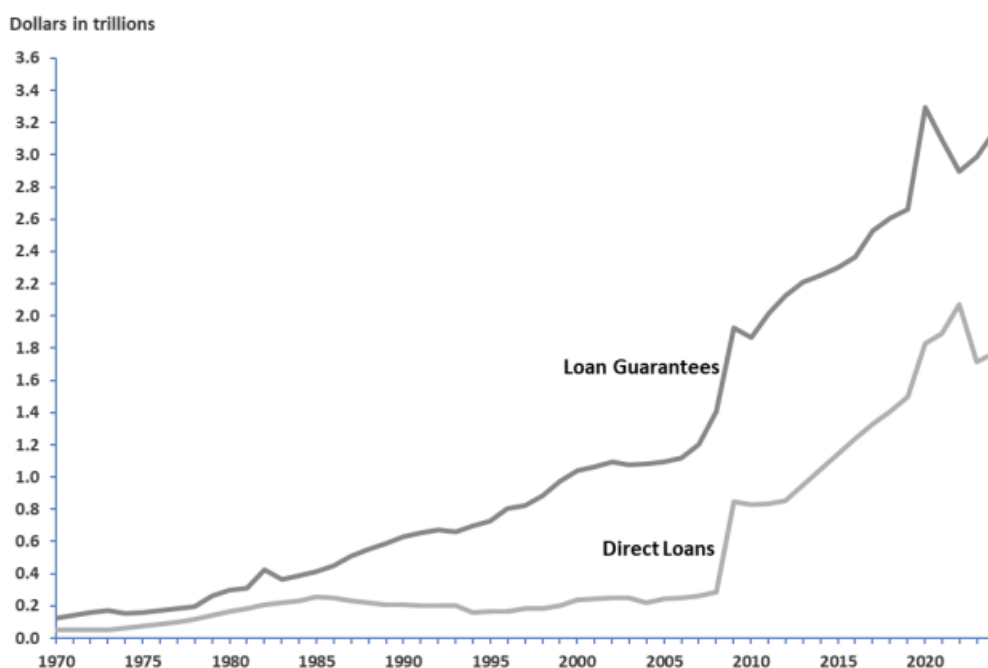


Source: 2024 US federal budget, Analytical Perspectives

The unrecognized costs of contingent liabilities make it more difficult to achieve consensus about whether the associated benefits of such policies justify the costs, or to meaningfully compare such policies with other alternatives for achieving the same goals. Importantly, the absence of explicit cost recognition creates an incentive for policy makers to favor the creation of contingent liabilities over more transparent alternatives for providing assistance. The result is a buildup of fiscal risk that is most likely to materialize in the form of large payouts just when the economy is at its weakest and government resources are already strained.

In published and ongoing work with various coauthors, I suggest how standard valuation principles and methodologies from financial economics and accounting can be

adapted to address the conceptual and practical challenges of measuring the upfront cost of credit risk exposures for governments, and then apply the proposed methods to a wide variety of programs and policies. Lucas (2014a and b) and references therein provide a summary and examples. Although the most appropriate methodology will vary across different types of credit policies and with the availability of information, the fair value framework serves as a conceptual anchor across all of these analyses.[1] A fair value approach generates consistent and comprehensive cost estimates that align with economic theory, and it has the practical advantage in a policy setting of prescribing practices that are well-established in the private sector.

The GFC and the Covid-19 pandemic are notable for the unprecedented volume and scope of the credit-related policy responses and the size of the associated risk exposures for governments. In this paper, I present estimates for the costs for two types of policies that were prevalent during those episodes—bailouts and loan guarantees—and discuss the key assumptions behind the reported estimates.[2] The heightened uncertainties about economic and policy outcomes during such times make cost estimation more challenging than under normal economic conditions, and the uncertainty surrounding any point estimate is greater than usual. Nevertheless, the analyses suggest bounds on the range of plausible costs that also can inform the policy debate. Notably, for the 2008 policies that were popularly viewed as bailouts, my preferred cost estimate of $500 billion suggests that neither the perception that the policies paid for themselves, nor that they cost taxpayers trillions of dollars, was accurate.

The estimated upfront cost to government also serves as the best measure of the value of subsidies conferred to the beneficiaries of credit assistance policies. Who receives the direct benefits of credit subsidies? The answer is important for the design and evaluation of credit policies. It is also necessary to understand the incentives created by those policies. The incidence of credit subsidies is examined here in the context of some of the GFC and Covid-19 credit policies. The incidence often is not obvious; it varies with the structural details and timing of a policy intervention and with the competitiveness of financial and product markets. Notably, the bailouts of financial institution during the GFC primarily benefited debtholders, whereas the standing provision of underpriced deposit guarantees primarily benefits bank shareholders and customers. Although the Covid-19 loan guarantee programs were largely aimed at helping small and medium-sized businesses, the banks that intermediated those programs also benefited from the subsidies and from a reduction in default rates on existing loans.

As is true for any type of policy evaluation, estimates of government cost provide policymakers with necessary but insufficient information to make a well-informed decision

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[1] A fair value approach equates value with competitive market prices and uses approximations of market prices when comparable market prices are unavailable or unreliable.

[2] The reported estimates and analysis draws heavily from Lucas (2019) and Hong and Lucas (2024).

about whether to support a given policy action. That decision also requires consideration of the broader social and economic costs and benefits that a policy entails, including externalities, the incentives of public and private sector actors, and distributional and macroeconomic effects. Much has been written about these important issues and the implications for policy. (See, for example, Feldman and Stern 2009 for a cogent analysis of TBTSTF guarantees and Wall 2021 on the history of government absorption of tail risk in the US financial sector.) In this paper I briefly discuss some of the broader costs and benefits commonly associated with credit guarantees and bailouts, including the effects on incentives for risk-taking, avoiding systemic risk, and improving credit market access. However, a discussion of how those broader issues pertain to the specific policy actions during the GFC and the Covid-19 pandemic is beyond the scope of this analysis.

The rest of the paper is organized as follows: Section 2 briefly summarizes the theoretical and practical reasons for using a fair value approach as a unifying framework to estimate the cost of government credit support. Section 3 presents estimates of the cost of the GFC bailouts and highlights some of the conceptual and practical challenges of doing so. Section 4 presents cost estimates for the guarantee programs introduced in response to Covid-19 in advanced economies and discusses the drivers of the differences in cost rates. Section 5 considers the incidence of benefits and the factors that affect it. Section 6 touches on the broader economic costs and benefits of credit policies. Section 7 concludes with some policy implications.

## 2      Principles for Cost Measurement

The principles of financial economics underlie the estimated cost of government loan guarantees and contingent liabilities that are reported in this paper. Importantly, the estimates incorporate the idea that the cost of risk reflected in market prices represents a real cost to society, and that the cost of capital for a given investment or commitment includes the cost of the associated risk. The cost estimates also reflect the budgetary principle that government costs should be measured on an upfront and comprehensive basis, taking into account the cash flows over the lifetime of a commitment. These principles are operationalized using a fair value framework, which emphasizes the information about value embodied in market prices.

While valuation and accounting practices in the private sector generally align with these principles, the idea that the price of market risk is also relevant to government investments is less widely accepted and often ignored in government practices. Its relevance follows from the observations that: (1) taxpayers and other government stakeholders ultimately will bear the costs and risks incurred by the government, and (2) market prices are usually the best available measure of social value or opportunity cost. As a practical matter, market prices are the accepted measure of cost for most government expenditures, such as for purchases of goods and services. Therefore, accounting for credit-related subsidies in a manner that is "grant-equivalent"—that is, adopting a measurement standard that is consistent across credit

and noncredit policies—suggests using market prices as the basis for assigning costs to credit policies.

To briefly elaborate on why the cost of market risk is relevant, an important observation is that taxpayers (and other stakeholders) are effectively conscripted equity holders in all risky government investments. Even if a government can borrow large sums at low interest rates, it is physically impossible for any entity, public or private, to fully fund a risky investment with risk-free debt; there must be some residual claimant that absorbs the risk. For example, when a government guarantees the debt of a financially distressed bank, any losses incurred ultimately must be covered by increases in taxes or cuts to other government spending. Taxpayers shield holders of government debt from the risk of loss, and hence the assumption of risk largely does not affect the interest rate on government debt. When the government takes on credit risk, it exposes taxpayers to market (also known as aggregate, systematic, or undiversifiable) risk because credit losses are larger and more probable during downturns. To voluntarily bear the associated risk of a loan guarantee or bailout, taxpayers would require a compensating risk premium on top of payment for expected losses. Hence, taking market risk into account is particularly important for informing policy makers and the public about the economic cost of the contingent liabilities arising from credit guarantees.

Most governments violate these basic economic principles by equating their cost of capital to their own borrowing rate, regardless of the risk of the activity undertaken. The omission of the cost of market risk causes official estimates of guarantee costs to be downward biased even when they are forward looking.[3] In the United States, the budgetary treatment of credit programs is governed by the Federal Credit Reform Act of 1990 (FCRA). FCRA requires analysts to capitalize expected future cash flows using maturity-matched Treasury rates. That rule captures time value and expected losses, but it neglects the cost of risk-bearing. Federal insurance programs, such as those covering deposits and private sector defined benefit pensions, give risk to large contingent liabilities whose costs ideally also would be recognized upfront. However, like other insurance programs, the commitments of the Federal Deposit Insurance Corporation (FDIC) and Pension Benefits Guarantee Corporation are accounted for on a cash basis. Although constrained by FCRA for its official budget estimates of the cost of credit guarantees, the US Congressional Budget Office (CBO) regularly produces supplemental fair value cost estimates to provide more comprehensive information to policy makers and the public. Those CBO analyses are the source for many of the estimates reported here.

A fair value approach is consistent with the principles of financial economics and provides practical guidance on how to operationalize those principles in a disciplined way.

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[3] For a more detailed discussion of these issues, see, for example, Lucas (2014a and b) and Hong and Lucas (2023).

International Financial Reporting Standard (IFRS) 13 defines fair value as the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. Under standard accounting practices, fair values are equated with market prices when a comparable market price is available and reliable. When those conditions are not met, the first alternative is to interpolate using market prices for similar but more liquid securities. When interpolation is also not feasible, the approach calls for the use of models to approximate market prices in an orderly market.

The flexibility that a fair value approach provides to deviate from market prices is particularly important during financial upheavals, when observed prices may be depressed for reasons unrelated to the value of the asset being assessed. For instance, concerns about counterparty risk can lower the transactions price even for a safe asset. Market prices may also be unobservable, such as when trading dries up or when the government administratively sets certain prices. The flexibility is also important because government credit products often have no direct parallel in the private sector. Although the accuracy of fair value estimates is sometimes questioned, there is no obviously better alternative for generating unbiased cost estimates when markets are missing or malfunctioning.

The specific methods used to estimate cost for the policies considered below differed across the types of obligations and with the information available. Comparable market prices or interest rates were used when they were observable, but often they were not. The model-based cost estimates typically involved projecting the distribution of net cash flows over the horizon of the obligation or security and then discounting at risk-adjusted rates. Some guarantee costs were inferred from credit spreads and the equivalence of a loan guarantee with directly making the risky loan and borrowing the present value of the promised cash flows at a risk-free rate. Because credit guarantees and other contingent liabilities are options, options pricing models are in principle a natural tool for cost estimation. However, for most of the policies considered here, standard options pricing models were not applicable because of the complexity of the obligations, and an options-pricing approach was only used in a few instances.

## 3    Estimating the Cost of the GFC Bailouts

The emergency federal assistance extended to most of the largest financial institutions in the United States during the GFC put a spotlight on bailouts. Concerns about the fiscal and broader economic costs and risks of those actions led to the passage of the Dodd-Frank Act, which included sweeping regulatory measures aimed at reducing the likelihood of similar events in the future.

Assessing the cost of bailouts is conceptually and practically more challenging than it is for routine types of credit assistance. To interpret the cost estimates presented below, and to understand why they differ so dramatically from estimates reported in popular accounts, it is

necessary to first understand the conceptual underpinnings of alternative estimation approaches. This section begins with a discussion of those issues. It then reports on the estimated costs for each of those programs and briefly describes the nature of the bailouts and sources for the cost estimates.

## Conceptual and practical challenges

Because the term is colloquial, the first challenge is to establish what is and what is not classified as a bailout for the purpose of assessing government bailout costs. Note that the line between credit guarantees and bailouts can be a fuzzy one. Consider a distressed bank that is rescued by the government guaranteeing its debt and uninsured deposits. Is this a bailout, a credit guarantee, or both? To answer the question of what counts as a bailout, my working definition is that:

- A bailout involves a value transfer arising from a government subsidy or an implicit guaranty that is triggered by financial distress, or a value transfer arising from new legislation passed in response to financial distress.
- A value transfer from the government is not a bailout if a fair or market value insurance premium was assessed and collected ex ante, or if there is a credible structure for recovering the full value of the assistance from the industry ex post (with some caveats).

This definition, taken from Lucas (2019), distinguishes between rescues that have been paid for with insurance premiums or guarantee fees or where full recovery of any payouts is highly probable, and those whose costs fall on taxpayers. Only the latter are classified as bailouts.

However, a large grey area remains. Importantly, guarantee fees had been paid on the hundreds of billions of dollars in outstanding federal mortgage guarantees at the onset of the GFC, but the fees had been set at subsidized rates. In the estimates presented here, the costs attributable to the underpricing of existing guarantees, along with the underpricing of new guarantees extended, are included in the large bailout costs reported for the Federal Housing Administration (FHA). Including the FHA in the list of entities that were bailed out raises a further conceptual question: can a bailout involve a government covering the losses incurred by one of its own agencies? The conclusion is that it can, just as it would be considered a bailout if the federal government were to rescue a state or local government at risk of default. In addition, the similarities between the federal risk exposures arising from explicit FHA guarantees and from implicit guarantees of Fannie Mae and Freddie Mac suggest treating the cost of assistance symmetrically.

A second conceptual issue is timing. Estimated bailout costs are highly sensitive to the point in time at which the assessment of cost is made. A common but misleading choice is to take a backward-looking perspective and equate bailout costs with the sum of realized

payouts and recoveries. This violates the principle that cost assessment should be forward looking, and take into account the probability distribution of all possible outcomes, not just the outcome that is observed after the fact.

The principle of upfront cost recognition suggests either conditioning estimates on information that is available before a crisis has started, or on information that is available after the onset of the crisis when a specific bailout policy is being proposed or put into place but before the outcome is known. The estimated costs in those two cases will be very different. Under normal economic conditions, the likelihood of a costly bailout occurring is low. Therefore, the prospective cost of a standing policy to provide bailouts in extreme circumstances is fairly small. By contrast once a crisis is under way, there is the likelihood of very large payouts that might not be recovered, and correspondingly much higher estimated costs.

Evaluating bailout costs either before the onset of a crisis or at the point of a specific intervention both provide useful information. The observation that most of the time the prospective fiscal cost of bailouts is low suggests that regulatory policies aimed at eliminating bailouts entirely could be counterproductive and overly restrict risk-taking. However, for the purpose of evaluating the fiscal consequences of a specific bailout policy, the more relevant question is its estimated cost at the time it is put into place. The costs reported below for GFC bailouts are largely of this latter variety, albeit with some look-ahead bias introduced by taking realized values of some variables such as participation rates as a proxy for expected values.

A practical challenge is that bailouts often coincide with severe market disruptions during which market prices may be unreliable or unavailable. At such times it is particularly difficult to identify the fair value of guarantees. Following the principle that fair value estimates should be based on prices in orderly markets, the estimates reported here avoid using discount rates inferred from highly distressed market prices.

## GFC bailouts and their costs

The policies classified here as bailouts include: capital injections into Fannie Mae and Freddie Mac authorized by the Housing and Economic Recovery Act (HERA); capital injections and payments to banks, other financial institutions, and mortgage borrowers authorized by the Troubled Asset Relief Program (TARP) and the Small Business Lending Fund (SBLF); and the realized and prospective payouts arising from subsidized and expanded Federal Housing Administration (FHA) mortgage guarantees. Also counted as bailouts are the subsidies created by some of the Federal Reserve's emergency facilities and those from the FDIC's expanded coverage to previously uninsured depositors. The assistance to Fannie, Freddie, and other financial institutions under TARP account for about 85 percent of the total costs reported. A more expansive estimate of bailout costs also includes the value of the partial forgiveness of

student loans arising from the use of administrative authority to expand income-driven repayment and the new subsidized guarantees extended via standing credit programs.

Table 1 summarizes the GFC bailout costs for each program and in total, estimated on a fair value basis and evaluated as of the time that a program was enacted or that benefits were conferred to identified recipients. Estimated costs were about $500 billion in total, in 2008 dollars. A rapid and widespread meltdown in house prices was the root cause of the crisis, and almost 75 percent of the total cost is associated with mortgage defaults whose losses were absorbed by Fannie Mae, Freddie Mac, and the FHA. The next most costly intervention was TARP, where support of AIG and Citigroup accounted for about half of the total program cost of $62.5 billion. Although the risk exposures of the Federal Reserve and the FDIC expanded by trillions of dollars from policies intended to maintain liquidity in the payments system and to limit the spread of distress to additional financial institutions, the cost of those actions was relatively low because collateral requirements and other protections greatly mitigated the likelihood and size of potential losses. A narrower definition of bailouts, which only includes support that primarily benefits private sector investors (such as the equity and debtholders of private sector financial institutions), yields an estimate of costs totaling about $418 billion.[4] A more expansive definition of bailouts that includes the additional subsidies provided through other federal credit program expansions, such as for student loans, would increase the estimated total by $60 billion to $120 billion.

| Table 1: Government Cost of GFC Bailouts | |
| --- | --- |
| **Institution** | **Cost (billions)** |
| Fannie and Freddie | $311 |
| FHA | $60 |
| TARP | $90 |
| Small Business Lending Fund | $6 |
| Federal Reserve | $21 |
| FDIC | $10 |
| TOTAL | $498 |

Source: Lucas (2019)

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[4] That reduced estimate subtracts from the original total the $60 billion reported for FHA and the $20 billion worth of assistance provided to Fannie and Freddie that was incurred after the government took them into conservatorship.

We now turn to brief descriptions of the individual bailouts and the sources for the cost estimates shown in table 1.

***Fannie Mae and Freddie Mac.*** Prior to being bailed out, these were public companies traded on the New York Stock Exchange, with federal charters granting them special privileges and responsibilities related to the secondary market for residential mortgages. At the onset of the crisis, the GSEs bore the credit risk on more than $5 trillion of residential mortgages and also a substantial share of the associated interest rate and prepayment risk. Although they had no explicit government protections beyond a line of credit at the Treasury, their debt was widely perceived as implicitly guaranteed. That expectation came to pass in 2008. Congress passed HERA to allay investor concerns about solvency, heading off the prospect of a collapse in the supply of mortgage credit if those institutions were allowed to fail. Both were quickly placed into federal conservatorship, where they remain to this day. Those actions effectively transferred ownership and control of those TBTSTF entities to the government.[5]

As for almost all of the GFC bailouts of financial firms, cash assistance or guarantees were provided in exchange for claims on the company's future profits, such as grants to the government of preferred stocks or stock warrants. Determining the value of these very risky claims on future profits is challenging, and it is a major source of the uncertainty surrounding estimates of these bailout costs.

In the case of the GSEs, Senior Preferred Stock Purchase Agreements (PS) were granted to be government in exchange for capital infusions of up to $445 billion. Another major source of uncertainty was how much of the $445 billion would be drawn upon. The PS agreements mandated that the GSEs pay a regular dividend to Treasury. Subsequent amendments to HERA replaced the initial 10 percent dividend with a sweep of all GSE profits to Treasury. That decision sparked lawsuits from private shareholders, but to date the courts have upheld the legality of that change.

The fair value cost for the GSEs reported in table 1 is based on estimates reported in CBO (2009a) and is explained in CBO (2010). CBO used models of defaults, recoveries, fees, and prepayments to infer cash flows to and from the government over the life of the mortgages and then discounted expected net cash flows at rates inferred from the jumbo mortgage market.[6] The total bailout cost is $311 billion, the sum of obligations arising the GSEs' existing book of business through the end of 2009 at $291 billion, plus new subsidies on mortgages guaranteed in 2010 of $20 billion. The high price tag reflects the elevated rate of expected defaults and reduced recovery rates, uncertainty about whether and how much more house

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[5] For an analysis of the economic impact of this bailout, see Frame et al. (2014).
[6] Perhaps ideally, the exercise would have occurred at the time of passage rather than with an additional year of information, but this is the earliest available estimate on a fair value basis. An advantage of the delay is that it became much clearer during that year how the government would choose to use its expanded authorities.

prices would fall and the speed of recovery, and the assumption that the GSEs would continue to underprice risk after 2009.

The case of the GSE provides a quantitative example of how the size of estimated bailout costs depends critically on the timing of when the estimate is made and illustrates why the estimated cost is much higher conditional on already being in a crisis than it is from the perspective of normal economic conditions. Several studies looked at the prospective cost of the implicit guarantee of the GSEs before the crisis. For example, Lucas and McDonald (2006) developed a contingent claims pricing model and calibrated it with market and accounting data. They estimate the fair value cost of the implicit guarantee over a ten-year horizon to be about $8 billion, a tiny fraction of the $311 billion cost estimated at the time of the bailouts. That earlier analysis also suggests that the losses experienced by Fannie and Freddie during the GFC were an outlier on the high side of what could have been anticipated from consideration of their stock price volatility.

The case of the GSEs also illustrates the problems of equating *ex post* realized cash flows with cost. Adding up the realized differences between Treasury purchases of preferred stocks and dividend payments received in the post-HERA period suggests a "profit" to the government of $58 billion as of 2014, and many commentators focused on such calculations. Wall (2014) emphasizes the shortcomings of this approach, which has been used to argue that the government has been more than fully repaid and that value should be returned to the private shareholders. He further notes that the continuing government backing from the PS agreements has value that is not reflected in tabulations of realized cash flows.

***Federal Housing Administration (FHA)****.* The FHA increases the availability and affordability of mortgage credit for low-income and first-time homebuyers through the provision of mortgage credit guarantees. Prior to the GFC, FHA's market share had been falling as subprime lenders offered many potential FHA borrowers more favorable terms. Post-GFC, the FHA has continued to serve as the country's largest subprime lender.

The costs of expanded FHA guarantee authority, along with the deep losses it experienced on its outstanding and newly originated mortgage guarantees during the crisis, have received much less attention than the bailouts of the GSEs. Nevertheless, the legislative expansion of FHA's guarantee authority amounted to a bailout of many subprime borrowers and the banks that had lent them money. It also significantly expanded the capacity for that program to provide new guarantees at highly subsidized rates, both during the crisis and in its aftermath. The associated government cost is estimated to be about $60 billion, suggesting it was one of the largest bailouts of the crisis. The assumptions behind that estimate are reported in detail in Lucas (2019).[7]

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[7] See also CBO (2006) and CBO (2011) for a discussion of subsidy cost estimates for FHA.

**Troubled Asset Relief Program and Small Business Lending Fund**. The Emergency Economic Stabilization Act of 2008, signed into law in October 2008, created the Troubled Asset Relief Program (TARP), which was arguably the most visible and controversial of the GFC bailouts. It authorized the US Treasury to purchase or insure up to $700 billion of troubled assets to bring stability to the financial system. Rather than purchasing distressed mortgages, most of the money was used to bolster the capital of large financial institutions. The Capital Purchase Program (CPP) provided $178 billion of the early assistance provided. Under the CPP, financial institutions received cash infusions in exchange for preferred stock and warrants. The largest infusions were to JP Morgan Chase, Wells Fargo, Bank of America, Morgan Stanley, and Goldman Sachs. In addition, TARP funds were provided to more than 100 smaller banks.

Estimating the upfront cost of the CPP commitments required assumptions about the value of the preferred stock and warrants that would be received. The most detailed fair value estimates of the net costs were produced by the CBO and by Duff and Phelps under the auspices of the Financial Oversight Commission. Reassuringly, both teams of analysts came to similar conclusions, and the estimates reported here are drawn from those analyses (CBO 2009b and Financial Oversight Commission 2011). Readers are referred to those reports and Lucas (2019) for a more detailed description of the calculations. Veronesi and Zingales (2011) provide estimates of benefits as well as of costs.

Table 2 on the following page shows the infusions to large financial institutions under the CPP and the estimated cost of that support. The ratio of cost to the size of the infusion shows large variation because there were large differences in financial conditions across the participating financial institutions. Those differences underscore that the very large costs reported by some analysts, which were based only on the amounts put at risk, vastly overstated the true costs. Equating cost with the amount of money put at risk neglects the value of recoveries, which for the healthier institutions were a large share of the cash infusions.

Beyond the CPP, at that time additional TARP disbursements were viewed as highly likely. The funds were available to use for a variety of purposes, including to back the contingent liabilities of the Federal Reserve and the FDIC. To roughly account for the cost of the remaining exposures, in Lucas (2019) I assume an expected $100 billion of additional disbursements, and I apply to that amount the average subsidy rate estimated by CBO on existing disbursements. That puts the total fair value cost at the time of the bailout at $90 billion. In fact, TARP was subsequently used to fund Treasury purchases of preferred stock at a subsidized price from the General Motors Acceptance Corporation and to absorb the credit risk on loans made at subsidized rates to Chrysler and GM. After that, most of the remaining funds eventually were used for grant programs aimed at preventing foreclosures on home mortgages. In total, CBO (2018) reports that $439 billion of the $700 billion available had been disbursed.

The realized cash cost of TARP turned out to be considerably less than the fair value cost of the program estimated at the time of the bailouts because most of the assistance to financial institutions was eventually recovered from redemptions of the preferred stocks and warrants. However, although the headline payouts to the big banks and the GSEs were recovered, the amounts extended to AIG, the auto manufacturers, and the mortgage grant programs resulted in a net cash loss of about $30 billion.[8]

**Table 2**: **TARP Subsidies to Large Financial Institutions**

| Institution | Capital Infusion (billions) | Subsidy (billions, fair value) |
|---|---|---|
| AIG | $40.0 | $25.20 |
| Bank of America | $15.0 | $2.55 |
| Citigroup | $25.0 | $9.50 |
| Citigroup | $20.0 | $10.0 |
| Goldman Sachs | $10.0 | $2.50 |
| JPMorgan Chase | $25.0 | $4.38 |
| Morgan Stanley | $10.0 | $4.25 |
| PNC | $7.6 | $2.05 |
| U.S. Bancorp | $6.6 | $0.30 |
| Wells Fargo | $25.0 | $1.75 |
| | Total cost: | $62.47 |

Note: Subsidy amounts are based on midpoint of Congressional Oversight Panel estimates of preferred stock and warrant values.
Source: Lucas (2019)

A TARP-like program that received much less attention was the Small Business Lending Fund (SBLF), created by the Small Business Jobs Act of 2010. It made government capital infusions available to qualifying community banks and community development loan funds. Under that program, Treasury purchased preferred stock with a dividend that was contingent

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[8] Although CBO was directed in the legislation to report costs on a fair value basis, it nevertheless reported realized losses on a cash basis and refers to them as the costs. For that reason, only the estimates in CBO's 2009 report, which are on a fair value basis, are used in the calculations of costs at the time of the bailouts.

on the amount of new small business lending by an institution. The estimate reported in table 1 equals the fair value cost of $6.2 billion that CBO estimated shortly before the authorizing legislation was enacted.[9]

**Federal Reserve emergency facilities.** The Federal Reserve created new emergency facilities during the GFC aimed at stabilizing and providing liquidity to the financial system. Although by design the facilities were largely shielded from credit losses, trillions of dollars potentially could have been put at risk. Figure 2, reproduced from CBO (2012), shows how the drawn balances on the facilities evolved over time.



**Figure 2: Funding Provided through Selected Federal Reserve Programs**
(Billions of dollars)
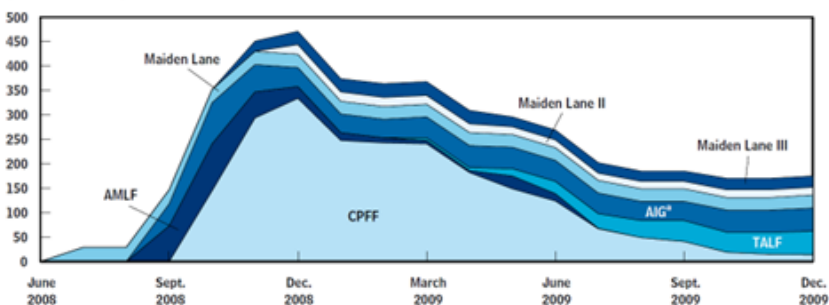
Source: Congressional Budget Office based on data from the Federal Reserve.

Notes: Further information on the programs can be found in Appendix A.

TALF= Term Asset-Backed Securities Loan Facility; AMLF = Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility; CPFF = Commercial Paper Funding Facility.

a. The data for the American International Group (AIG) comprise the outstanding balance on the line of credit plus equity holdings in AIA Aurora Limited Liability Company (LLC) and ALICO Holdings LLC.

> The Maiden Lane facilities involved purchases of mortgage-backed and CDO securities from Bear Stearns and AIG at fair value. The Term Asset-Backed Securities Loan Facility (TALF), Commercial Paper Funding Facility (CPFF), and Money Market Mutual Fund Liquidity Facility (MMLF) all provided loans that were backed by collateral assets. The data for the American International Group (AIG) comprise the outstanding balance on a line of credit and some other obligations.

To what extent should the introduction of those facilities be considered a bailout? Like the TARP CPP program, some of the facilities provided a source of funds to institutions (For example, money market mutual funds) that might not have been available elsewhere or that would have entailed much higher costs to obtain. Regardless of whether one classifies the creation of these facilities as a bailout or not, consideration of the various structures and risks suggests that the facilities did confer subsidies to market participants.

CBO (2012) estimates that the fair value cost of those subsidies over the expected life of the emergency facilities, at the time they were opened, was $21 billion, a cost that is modest relative to the trillions of dollars potentially put at risk. Most of the facilities minimized government exposure to credit risk by requiring large amounts of collateral and restricting

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[9] https://www.cbo.gov/sites/default/files/111th-congress-2009-2010/costestimate/hr5297housepassed0.pdf

borrowing to very short maturities. Other emergency actions, such as the Maiden Lane facilities, exposed the Federal Reserve to considerable credit risk from the purchase of risky assets. However, most of those transactions were carried out on a fair value basis or through an auction mechanism that suggested the subsidies conferred, and hence the fair value costs, were small. Furthermore, for some of the transactions intermediated by the Federal Reserve, TARP funds put in a first loss position to largely absorbed the risk (and hence the associated costs are attributed to TARP and not the Federal Reserve). The most notable exception was the Term Asset-backed Loan Facility, which accepted risky collateral, had TARP protection that was capped at less than potential losses, had administratively set interest rates, and allowed terms extending for months or years.

***Expanded FDIC coverage.*** The FDIC significantly expanded deposit insurance coverage during the GFC to avoid runs on weakened banks by uninsured depositors. Under its existing statutory authority, it temporarily increased the cap on insured deposits from $100,000 to $250,000 in October 2008.[10] Soon afterward, it created the Temporary Liquidity Guarantee Program (TLGP), which guaranteed newly issued bank debt. The TLGP also provided unlimited coverage of transaction accounts to banks that opted in, initially at no cost to the banks, and then in exchange for fees. To accommodate those increased risk exposures, the Treasury increased the FDIC credit line from its normal level of $100 billion to $500 billion.

Building on the insights in Merton (1977), researchers such as Marcus and Shaked (1984) have used options-pricing models to estimate the government's cost of deposit insurance and to suggest fair premium rates. Although an options pricing approach could be applied to value the GFC expansions, FDIC insurance has a structural feature that seems to largely mitigate the government's risk exposure: The FDIC is required by statute to recover losses with assessments on solvent financial institutions after the buffer from accumulated premiums in the Deposit Insurance Fund is depleted. Taxpayers would only realize losses if draws on the Treasury line were not fully repaid, for instance because surviving banks could not afford to repay the losses without becoming insolvent themselves, or more likely, because of below-market interest rates charged to the FDIC by Treasury.

The expansion of FDIC coverage satisfies the definition of a bailout because additional protections were extended to banks without fully charging for them. To roughly suggest the order of magnitude of the bailout costs, in Lucas (2019) I assume that at the time FDIC coverage was expanded, there was a 10 percent chance that the crisis would intensify and the entire line would be drawn, and in that event, only 80 percent of the draw would be recovered in present value terms. Under that fairly arbitrary but not implausible assumption, the bailout cost comes to $10 billion, the amount reported in table 1.

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[10] The Dodd Frank Act later made that temporary increase permanent.

**Student loans and other federal credit programs.** Federal credit programs provide subsidies to borrowers through below-market interest rates and other concessional terms. The stickiness of rates and terms in those programs causes increases in the size of subsidies and the corresponding cost to the government during periods of financial distress and economic downturns.

The only major credit category that did not contract during the GFC and its aftermath was federal student loans. Between 2008 and 2010, $319 billion in new loans were disbursed through the federal direct and guaranteed student loan programs.[11] As for the FHA, the decision to offer credit on highly favorable terms during the crisis period might be considered a bailout of new borrowers who otherwise would have faced much less favorable lending terms in the market, or who would have been unable to borrow at all. Applying a subsidy rate of 14 percent to those 2008–10 loans implies a cost of $44 billion (see Lucas 2019 for details).

The Department of Education in 2011 significantly expanded its Income-Driven Repayment option. Borrowers who took out their first loans in 2008 or later, and who took out at least one loan in 2012 or later, qualified for an annual cap on payments of 10 percent of income (previously capped at 15 percent), with loan forgiveness after 20 years of payments (previously 25 years) (Delisle and Holt, 2012). Those changes represent a partial bailout of students that had accumulated large amounts of debt during the financial crisis. DeLisle (2015) estimates that the cost of the program expansion on a fair value basis would rise to $11 billion annually by 2014.[12]

Despite the significant increase in costs of student loans and other federal credit programs during the GFC, those other programs are excluded from the total bailout costs reported in Table 1. There is a business-as-usual aspect of most of their activities (with some exceptions, such as the expansion of income-driven repayment for student loans) that makes it difficult to identify the portion of added costs that should be classified as a bailout.

## 4    Cost of Covid-19 Credit Guarantees

Governments around the world, and particularly in advanced economies, introduced emergency loan guarantee programs to ensure the continued flow of credit to businesses and households during the Covid-19 pandemic. The programs also benefited financial institutions by reducing defaults during this risky period. To a lesser extent, governments also relied on financial assistance in the form of direct lending and large-scale loan forbearance and payment moratoria programs, all of which entailed the assumption of significant credit risk.

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[11] Federal lending volumes can be found in the Federal Credit Supplement to the US budget, which is published annually by the federal government.

[12] https://www.newamerica.org/education-policy/edcentral/income-based-repayment-cost/

In Hong and Lucas (2023), we estimate the fair value of assistance provided by the largest credit programs introduced in the five largest countries in Europe (France, Germany, Italy, Spain, and the United Kingdom), Japan, and the United States. These programs supported businesses of various sizes, but most were aimed at SMEs. Many countries had multiple programs, and 17 separate subprograms are considered. The results of that analysis and its broader implications are summarized here.

As discussed earlier, most governments provide credit assistance without requiring a prospective estimate of the cost of doing so, and that was the case for the Covid-19 credit guarantee programs. However, information was available on the "credit envelope," which is the maximum amount of borrowing authorized under a program. The total credit envelope for the guarantee programs analyzed totaled nearly $4 trillion. Clearly, this represented a significant expansion in government credit risk exposure during an episode where credit risk was highly elevated.

Program take-up, measured by the principal amounts borrowed under the programs, turned out to be substantially less than the envelope in most programs. Figure 3, which reports both the envelope and the take-up by country, shows wide variation across countries in the share of take-up relative to the envelope. Although take-up rates positively correlate with the size of the estimated subsidies, much of the variation in take-up across countries cannot be explained either by borrower or by program characteristics.

**Figure 3: Credit Support Programs during Covid-19—Committed versus Unused Envelope**
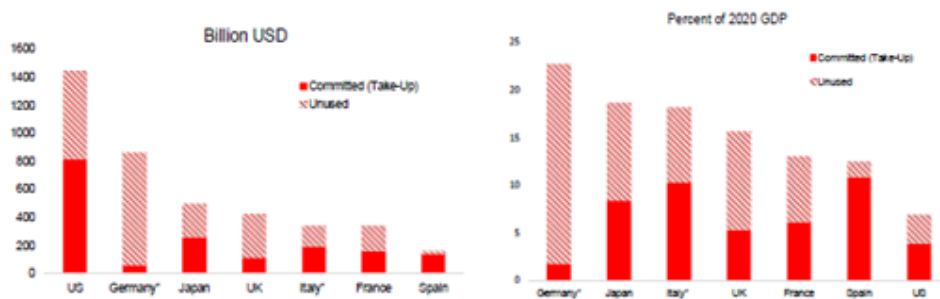


Source: Official sources for each country, IMF Fiscal Monitor Database of Country Fiscal Measures in Response to the COVID-19 Pandemic, and Anderson et al. (2021).

Note 1/ The following programs are included in each country's total envelope. Italy: "Cura Italia" guarantees and SACE Garantia Italia.; UK: BBLS, CBILS, CLBILS and the Bank of England's COVID corporate financing facility (CCFF); Spain: ICO loan guarantees, France: Prêt Garanti par l'État; Germany: KfW loans for small and large loans and a part of the increase in the economic stabilization fund (WSF) (400 billion euros) to provide additional state guarantees for firms; Japan: Safety Net No.4 and No.5; US: Paycheck Protection Program, Main Street Lending Program, Credit Support for Airlines and Critical Industries. Last observations were in January 2022, except for Japan (January 2021).

Note 2/ Some guarantee programs announced by Germany and Italy have uncapped legal limits to provide funds. The bars shown in the Figure show the cap on total guarantees provided by the government, rather than the actual injections to the guarantee funds.

Government costs are reported in terms of subsidy rates and in total dollar terms. The subsidy rate is measured as the fair value cost of a loan divided by its principal. It varies with

borrower and program characteristics and is a measure of a program's generosity. The estimates reported are conditioned on the information available around the time that the programs were put into place and not on subsequent loan performance. However, actual take-up is used as a proxy for expected take-up in the subsidy estimates.

Figure 4 shows subsidy rates by program. The differences in subsidy rates across programs reflect various program design choices. Many of the programs aimed at SMEs required lenders to do very limited screening and eligibility requirements were lax. Those programs offered 100 percent credit guarantees, rates that were far below market, and substantial subsidies to lenders. Many of the borrowers probably would not have been able to obtain credit without guarantees. All of these features contributed to their higher subsidy rates. Cross-country differences between other programs with the same guarantee share and target firm size are attributable to variations in maturities, amortization rules, fees, grace periods, and other concessions.

**Figure 4: Total Subsidy Element by Subprogram (as a Share of Loan Principal)**
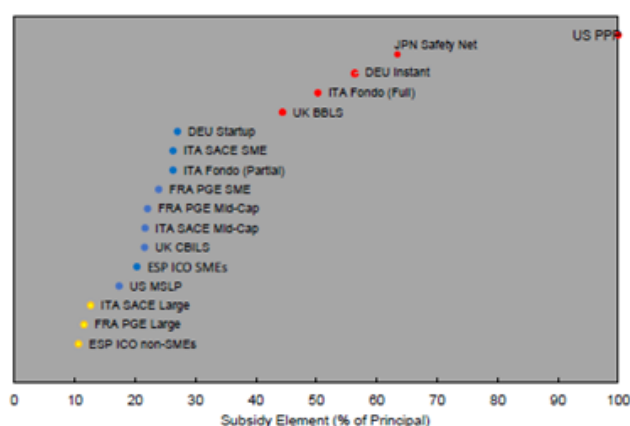


Note: The total subsidy element, the sum of borrower and lender subsidies as a share of loan principal, is plotted. Red dots refer to full guarantee programs. Blue dots refer to partial guarantee schemes for SMEs. Yellow dots refer to partial guarantee schemes for non-SMEs.

Source: Hong and Lucas (2023)

Figure 5 shows total government cost by country in dollars and as a share of GDP. The relatively high cost reported for the United States is due to the Paycheck Protection Program (PPP), which was authorized by the CARES Act. Under the program, banks provided $800 billion in uncollateralized, federally guaranteed loans that were 100 percent forgivable if the borrower retained its employees for a short period of time. The take-up rate was 100 percent. No recoveries were anticipated since loans would either be forgiven or defaulted upon. Effectively this was a grant program, and the US government budgeted for it as such. The other new credit facilities introduced in response to Covid-19 were much more modest. The Federal Reserve introduced 13 emergency facilities, including the Main Street Lending Program which provided subsidized loans to small and mid-sized businesses. As during the GFC, the programs

were structured so that the Treasury rather than the Federal Reserve would absorb most losses. Although the United States introduced fewer new large-scale guarantee programs than other advanced countries, loans made or guaranteed under its existing subsidized credit programs increased markedly. The moratorium on federal student loan payments also entailed significant costs, as did some of the moratoria and forbearance policies introduced in other countries.
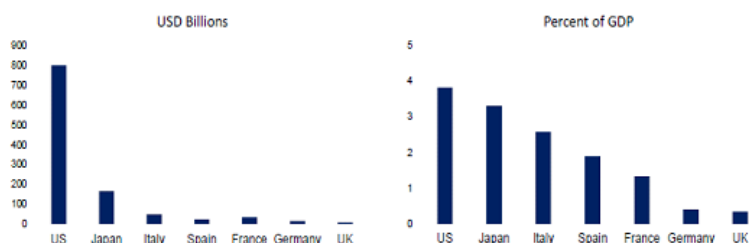


Source: Hong and Lucas (2023)

For these advanced economies, the total estimated fair value cost of guarantee programs of $330 billion (excluding the US PPP) is far less than the trillions of dollars in risk exposure suggested by the program envelopes. The average subsidy rate (the ratio of cost to loan principal) is 37 percent. Overall, the findings suggest that a well-designed guarantee program can be a relatively inexpensive way for governments to provide substantial amounts of funding to businesses during crisis periods. However, many caveats exist, including the potential for large losses and for resource misallocation.

Should these loan guarantee programs be classified as bailouts? With the notable exception of the US PPP, they were for the most part not perceived as such. However, the programs did satisfy the criteria for a bailout of providing a value transfer arising from new legislation passed in response to financial distress. Similar to earlier bailouts, the risks involved were large and the costs opaque. The widespread misperception that the cost of these programs was modest because *ex post* losses were small suggests that policy makers may be inclined to become overly reliant on these sorts of credit market interventions in future downturns.

# 5    Assessing the Incidence of Benefits

The direct benefits from bailouts and from the extension of contingent guarantees to financial institutions accrue in varying proportions to the shareholders, creditors, customers, and employees of the affected institutions. Loan guarantees benefit borrowers and financial intermediaries also in varying proportions.

For bailouts and contingent guarantees involving private sector financial institutions, the incidence of benefits will depend on whether the government liability is incurred before or

after a distress event occurs. By the time that it is announced that a distressed financial institution will be bailed out, the largest beneficiaries will be the rescued institution's unsecured and uninsured creditors, not its equity holders. The equity value of a distressed institution will already have fallen sharply, and the prices of its debt-related claims or uninsured deposits will also be depressed. The terms of a bailout often leave existing equity holders with little or no value, for instance because their ownership stake is subordinated to new claims that are issued to the government in exchange for assistance. Creditors benefit because the value of their claims is largely or fully restored.

However, the benefits from the prospect that a healthy firm would be bailed out in an extreme distress situation accrues to stock holders, customers, and other stakeholders; there is little benefit to its creditors. The division of benefits will depend on the competitiveness of the markets in which the firm operates and its management practices. In a competitive credit market, the added safety reduces the interest rate that creditors require, leaving creditors no better off. The rents from those lower interest rates accrue to other claimants on the firm. When product market competition is limited, equity holders (and in some cases managers and other employees) capture the rents. In competitive product markets, rents tend to be passed through to customers. When equity holders are expected to be the beneficiaries, policies or circumstances that increase (decrease) the perceived value of credit guarantees will cause stock prices to appreciate (depreciate).

Bailouts involving standing government credit programs benefit borrowers and financial intermediaries. Borrowers obtain larger amounts of funding on more subsidized terms. Private sector intermediaries (such as guaranteed lenders and servicers) benefit from increased business and sometimes from program rules that allow them to capture a portion of the subsidy.

These observations can be applied to assess the incidence of benefits from the major GFC bailouts, and from the associated contingent government liabilities prior to the bailout. The beneficiaries of the implicit guarantee of Fannie Mae and Freddie Mac prior to the crisis were their shareholders and customers. To the extent that the GSEs acted as a duopoly, it is likely that their equity holders were able to capture a significant portion of the rents.

When the implicit guarantee of the GSEs was made explicit in 2008, the direct beneficiaries of the bailout were primarily the existing holders of GSE debt and mortgage-backed securities. Prior to the crisis, the interest expense on Fannie Mae's long-term debt was less than 10 basis points more than the corresponding 10-year constant maturity Treasury rate. In 2008, just prior to the bailout the difference had widened to 200 basis points. The capital infusions caused debt prices to recover, and liquidity was restored to the market. By contrast, common stock holders were essentially wiped out. The value of the stock had already fallen to very low levels, and the dilution from the preferred shares issued to the government further reduced the value of existing equity claims. The identity of the debt holders that reaped

those benefits does not appear to be publicly available information. However, it was well-known that the debt was widely held and that foreign governments numbered among the significant investors. A significant but much smaller portion of the benefits accrued to new mortgage borrowers, who paid substantially lower guarantee fees than they would have in the absence of the government guarantee on the GSEs.

For the FHA guarantees extended during the crisis and its immediate aftermath, the decision to offer guarantees on highly favorable terms amounts to a windfall to those borrowers who otherwise would have faced much less favorable lending terms in the market, or would have been unable to borrow at all. Those administrative decisions had the equivalent effect of HERA for Fannie and Freddie, of allowing large numbers of significantly subsidized new mortgages to be originated. Banks that held nonperforming subprime mortgages benefited from the rule allowing subprime borrowers to obtain new FHA mortgages if the banks wrote down the loans to 90 percent of their remaining principal. Benefits also accrued to the purveyors of FHA mortgage–related services such as origination and servicing, whose incomes were bolstered by increased lending volumes.

The direct beneficiaries of TARP assistance were primarily the uninsured debt holders of the financial institutions receiving the assistance. For the reasons explained above, equity holders benefited less because of the dilution in the value of their claims from the warrants and preferred stock granted to the government.

The major expansion of FDIC insurance during the GFC benefited banks' current uninsured depositors and current debt holders. Future depositors and debtholders would be largely unaffected because the value of any additional continuing protection would be offset by lower interest rates or higher fees. Assessing the net benefits to bank equity holders is complicated by the distributional effects of FDIC rules. Equity holders, particularly of weaker banks, benefit from the preservation of franchise value from the reduced likelihood of a run. However, banks are charged premiums that are not fully risk-adjusted, and they have a contingent liability for losses that exceed the resources of the Deposit Insurance Fund. The equity holders of riskier banks benefit from the expansion of insurance, whereas the owners of safer banks bear much of the cost.

For the Covid-19 credit programs, the primary beneficiaries were the borrowers that were able to obtain funds on much more favorable terms than they could have without the guarantees. Lenders that participated in the programs also received rents to the extent they were able to capture a portion of the subsidies provided. Notably, many of the European programs explicitly required lenders to pass the value of the guarantees net of administrative costs through to borrowers. By contrast, for programs where the interest rate was fixed and the loans were fully guaranteed, lenders reaped a significant share of the subsidies provided. Lenders also benefited when their borrowers used the newly obtained loans to avoid defaulting on existing loans. The unusually low default rates during this period can be attributed to the

large volume of guaranteed loans and to the payment holidays that exempted banks from reporting loans with missed payments as nonperforming.

## 6      Broader Economic Costs and Benefits

The mechanisms by which bailouts can preserve liquidity in financial markets and help avert contagion and spillovers to the rest of the economy are well understood theoretically (see, for example, Gorton and Huang 2004). Their effectiveness at stemming runs and price meltdowns has been demonstrated many times in practice. However, much has also been written about the potential adverse consequences of bailouts and what might be done to limit those ill effects (for example, Stern and Feldman 2009 and Berger et al. 2022). Other commentaries include Acharya et al. (2014), who observe that bailouts convert bank risk into sovereign risk; Diamond and Rajan (2002), who show that poorly structured bailouts can increase systemic risk; and Farhi and Tirole (2012), who model the collective moral hazard that arises from imperfectly designed government support of financial institutions.

With regard to subsidized loan guarantees, it is well understood that government credit support can be used to overcome asymmetric information problems or limited commitment constraints that impede access to credit markets and reduce social welfare. There is also awareness of the potential for capital misallocation and heightened incentives for risk-taking.

The fact that bailouts and credit guarantees might create incentives for excess risk-taking by financial institutions has long been a major concern of economists and regulators. The simple story is that underpriced government guarantees and bailouts tend to reward greater risk-taking because governments absorb the increase in expected losses while private entities capture the increase in expected gains. Furthermore, insuring deposits and other liabilities of financial institutions weakens the incentives of creditors to monitor and discourage managers from excessive risk-taking.

However, what is often neglected is the fact that the incentives go in the opposite direction for healthy institutions.[13] Related to the earlier discussion of the incidence of benefits, the prospect of bailouts or underpriced guarantees creates a stream of future rents from reduced borrowing costs, which in turn creates franchise or charter value. The desire to protect charter value can flip the incentives of managers and shareholders from risk-loving to risk-averse. Whereas guarantees create an incentive to gamble for salvation by distressed institutions, charter value creates an incentive for solvent institutions to reduce risk, potentially to excessively low levels. Senior managers of solvent firms may also view keeping their jobs as a source of personal franchise value, further discouraging risk-taking even in the presence of guarantees.

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[13] That effect was first recognized in Robert Merton's early work on credit guarantees, and Marcus (1984) further developed the idea. Lucas and McDonald (2010) establish a related result in the context of the implicit precrisis guarantees of the GSEs. Panageas (2010) studies related issues.

Even though the prospect of bailouts and underpriced guarantees may not cause healthy financial institutions to take excessive risk, subsidized credit support can have other deleterious effects. The charter value created makes it harder for uninsured institutions to compete. That observation was suggested as an explanation for the persistent dominance of Fannie Mae and Freddie Mac in the decades leading up to the crisis and also for the relative growth of too-big-to-fail banks despite regulatory efforts to end that status. The anticompetitive effects of guarantees tends to increase the cost of financial services. It also exacerbates systemic risk by allowing too-big-to-fail institutions to become even bigger.

# 7    Conclusions and Policy Implications

Consideration of the broader costs and benefits associated with bailouts and loan guarantees suggests there are many possible consequences of these policies, both good and bad. The relative importance of the various effects will differ with circumstances, policy objectives, and the details of policy design. How one evaluates the tradeoffs also will depend on one's view of the appropriate role of government in risk management.[14]

Although some may view the measurement of fiscal cost as secondary to broader issues such as the effects on the macroeconomy, financial stability, and incentives for risk management, I come to the opposite conclusion. As for the many other government policies involving complicated tradeoffs and about which there is likely to remain considerable disagreement, information about cost is a vital input into the decision-making process. Accurate assessment of the direct cost of bailouts and credit guarantees is necessary to answer questions such as: Did the likely benefits of the policy justify the costs? Or, could the benefits have been achieved at a lower cost? Credible cost assessments also may reduce political discord by helping to reconcile widely divergent perceptions about fairness and about the size and incidence of costs and benefits. Importantly, reducing the opacity and systematic understatement of cost caused by current government account practices would discourage excessive reliance on policies that create new contingent liabilities and the accompanying buildup of very large fiscal risks and other distortions.

Here and in previous work I have outlined the case for why a fair value framework provides a comprehensive approach to cost estimation that can be applied consistently across different types of government commitments and that is consistent with the principles of financial economics. As a practical matter, the extensive private sector infrastructure that has been built to support and discipline fair value estimation could be employed to help governments transition to new procedures for cost measurement. The fair value approach to cost estimation is demonstrated here with applications to the US bailouts during the GFC and to the introduction of large-scale loan guarantee programs internationally in response to the

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[14] For example, Moss (2004) makes the case that Americans have revealed a preference for having the government to absorb tail risk.

Covid-19 pandemic. Costs could be similarly estimated for other recent episodes, such as the expansion of deposit insurance to all uninsured depositors following the collapse of Silicon Valley Bank.

The analyses presented of the GFC and Covid-19 pandemic credit policy responses juxtapose the enormous risk exposures taken on by governments during those episodes with the much more modest but still significant upfront cost of assuming that risk. The analyses also contrast the resulting cost estimates with the cacophony of opinions about costs voiced by policymakers and reported in the press. For the GFC bailouts, the government cost is estimated to total about $500 billion on a fair value basis, or 3.5 percent of GDP in 2009. The total is large enough to conclude that the bailouts were not a free lunch and even less so a profit maker as some politicians and commentators have claimed. At the same time, reports of costs to taxpayers in the multiple trillions of dollars were also clearly false. The estimated cost of $500 billion is small enough to raise questions about the wisdom of trying to end bailouts without seriously weighing the costs of doing so but large enough to ask whether there are better ways to protect taxpayers.

The analysis does not attempt to answer questions about whether any particular bailout or guarantee program during the GFC or Covid-19 was a good or bad policy choice. However, it does suggest that governments can and should adopt the cost accounting practices for credit policies that are widely used in the private sector. Increasing transparency is especially important in the face of the rapidly growing use of credit policies and the assumption of contingent liabilities as alternatives to traditional tax and transfer programs, both in the United States and internationally.

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