

The financial crisis bailouts:
What they cost taxpayers and who reaped the direct benefits

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1. Introduction and summary of findings

Following the wave of emergency policy actions taken in response to the financial crisis of 2008, there has been a resurgence of interest in bailouts and their consequences. Perhaps the dominant view among academic economists is that given the available alternatives at that time, the bailouts of critical financial institutions were necessary to avert even greater economic harm. However, consensus remains elusive.¹ Some have argued that more aggressive rescue policies (e.g., of Lehman Brothers or of underwater homeowners) were clearly called for (e.g., Ball, 2018). Others believe that more institutions should have been allowed to fail, at least temporarily, so as to shift more costs to unsecured creditors. Popular perceptions about bailouts also are mixed. One commonly heard narrative is that ordinary taxpayers were forced to pay huge sums to rescue rich bankers. Others point to tallies showing net costs to taxpayers that were modest or even negative. Certainly political distaste for bailouts influenced key provisions of the Dodd Frank Act of 2011, which made sweeping changes to the regulatory landscape with the stated intent of forever ending bailouts.²

Perhaps the most fundamental question about bailouts is whether and when their benefits justify their costs. Bailouts have both direct and indirect costs and benefits. I use the term “direct” to refer to the value transfers associated with bailouts arising from government subsidies, implicit guarantees and administrative rule-makings. Direct costs are generally borne by taxpayers, while direct benefits accrue, in varying proportions in different instances and at different times, to the shareholders, debtholders, customers and employees of the rescued institutions. Indirect costs include *ex ante* distortions to managerial incentives for risk-taking; the lasting economic distortions from bailing out some institutions and not others, and from the consequences of some regulatory responses; and the public aversion to subsidizing private financial institutions and wealthy investors. Indirect benefits include staving off financial panics

¹ Emblematic of the disagreements is the 2011 report of the Financial Crisis Inquiry Commission, which had been tasked with reaching consensus but in the end published a report that included two dissenting opinions along with the majority view.

² “An Act to promote the financial stability of the United States by improving accountability and transparency in the financial system, to end “too big to fail”, to protect the American taxpayer by ending bailouts, to protect consumers from abusive financial services practices, and for other purposes.”

and damage to the real economy; and preserving jobs and organizational capital in institutions with positive externalities.

The focus here is on meaningful measurement of the direct costs of bailouts, and identifying the recipients of the corresponding direct benefits. Accurate cost assessment is important for several reasons. It is an essential input into any cost-benefit analysis of bailout-related policies, and 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? More broadly, credible cost assessments may reduce political and policy discord by helping to reconcile widely divergent perceptions about fairness, and the size and incidence of costs and benefits. Importantly too, it is much more feasible to put dollar values on direct costs and benefits than on indirect effects, where disagreements are less likely to be resolved because effects are harder to identify and quantify.

Drawing selectively on existing cost estimates, and augmenting those with additional calculations, I conclude that the total direct cost on a fair value basis of crisis-related bailouts in the U.S. was about \$498 billion. Table 1 shows the breakdown of costs across major policy actions.³

As discussed in detail in the Appendix, the conceptually best way to think about the direct costs (and benefits) of bailouts is more subtle than is generally appreciated and not easy to execute or explain. As a consequence, popular accounts of bailout costs tend to severely overstate or understate their economically relevant value. The cost estimate here stands in sharp contrast to popular narratives claiming the bailouts were free because the monies were recovered, or that their costs ran into the tens of trillions of dollars.

³ Included in “Other” is the Small Business Lending Fund, which functioned as a mini-TARP for small financial institutions, and the large expansion of Income-Driven Repayment options in the federal student loan programs at amounted to a partial bailout of those borrowers.

Table 1: Summary of Fair Value Bailout Costs	
Institution	Cost (billions)
Fannie & Freddie	\$311
FHA	\$60
TARP	\$90
Small Business Lending Fund	\$6
Federal Reserve	\$21
FDIC	\$10
TOTAL	\$498

In my view, the total cost is big enough to raise serious questions about whether taxpayers could have been better protected. It also is small enough to ask whether the goal of eliminating bailouts entirely might be more costly in terms of regulatory burdens than it is worth, and underscores the value of revisiting the regulations that were sometimes hastily put into place after the crisis. I believe these conclusions would hold even taking into account the broader effects of bailouts not discussed here.

As for the incidence of benefits, at the time the bailouts occurred, the largest direct beneficiaries were the unsecured creditors of large financial institutions, most significantly, of Fannie Mae and Freddie Mac. Shareholders benefited less than the popular perception, as most were wiped out. To the extent that shareholders benefit from bailouts it is before they occur, when explicit or implicit government guarantees allow institutions to borrow at lower rates than they otherwise would.

While the costs of Fannie Mae, Freddie Mac and TARP have gotten a fair amount of attention in other places, a goal of this analysis is to highlight the significant bailouts that arose via standing federal guarantee programs, including the FHA, FDIC, and federal student loans, and also from Federal Reserve emergency actions.

FHA is particularly noteworthy because of its similarity to Fannie and Freddie in having provided large volumes of underpriced mortgage guarantees and then realizing exceptionally large losses when house prices crashed. The silent \$60 billion bailout of FHA occurred under the cover of the relatively opaque way the program is budgeted and accounted for.

Evaluating the bailout element of the FDIC's expanded coverage also is tricky. Using existing statutory authority, the FDIC temporarily increase the cap on insured deposits from \$100,000 to \$250,000 in October 2008. A month later it created the Temporary Liquidity Guarantee Program (TLGP) that provided unlimited coverage of transaction accounts to banks that opted in. Clearly these actions significantly increased the FDIC's loss exposure. However, the FDIC is required by statute to recover losses with *ex post* assessments on solvent financial institutions when the Deposit Insurance Fund is depleted. The Treasury provides a backstop in the form of a credit line. Along with the expansion of FDIC coverage, Treasury increased the FDIC credit line from its normal level of \$100 billion to \$500 billion. 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, and because of below-market rates charged by Treasury. Those possibilities suggest that the expanded FDIC coverage qualified as a bailout, though not a large one.

Another issue that has gotten relatively little attention is how to think about the Federal Reserve's emergency facilities. The conclusion here, based on CBO (2010a), is that although the facilities put trillions of dollars potentially at risk, the bailout element was small. Some programs involved large amounts of collateral and short loan maturities that protected the Federal Reserve from losses. Others, like the Maiden Lane facilities, exposed the Federal Reserve to considerable credit risk. However, most of those transactions were carried out on a fair value basis or through an auction mechanism that suggested the subsidies, a critical

ingredient for an action to be counted as a bailout, were negligible. Importantly, the Federal Reserve was shielded from losses on some of its riskier transactions by TARP funds that were put in a first-loss position.

The rest of this note, structured as an Appendix, explains in more detail the theoretical considerations behind the construction of the estimates. It also provides more information about the calculations that make up each component of the total estimated cost. It is included for completeness and for the interested reader, but it also can comfortably be skipped.

Appendix

A.1 What is a bailout?

Although most economists seem to recognize a bailout when they see one, the term “bailout” is not a well-defined economic concept. A sensible starting point is offered by Wikipedia, which defines a bailout as “a colloquial term for the provision of financial help to a corporation or country which otherwise would be on the brink of failure or bankruptcy.” However, not all financial help constitutes a bailout. The working definition of what is and isn’t a bailout that will be used here is this:

- 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 distinguishes between rescues arising from insurance that is paid for either *ex ante* or *ex post*, and episodes where the costs fall on taxpayers--the former is not a bailout while the latter is. However, the distinction is not always clean. An example of the grey area is when borrowers pay a subsidized insurance premium to the government, as for Federal Housing Administration (FHA) mortgage guarantees. The losses incurred by that program might be considered payouts on an insurance policy because of the premiums that were collected. However, because the premiums were subsidized, a portion of the losses represent a bailout.

For certain types of government assistance, such as support provided by the Federal Deposit Insurance Corporation (FDIC) or under the Terrorism Risk Insurance Act (TRIA), the law provides for cost recovery from the affected industry *ex post*. Such *ex post* collection mechanisms can be optimal when there is significant uncertainty about the probability and size of losses, when governments are unable to prevent premiums from being diverted to other uses, and when moral hazard is not an important consideration. Optimality aside, such mechanisms greatly reduce the likelihood and cost of taxpayer-funded bailouts. However, they do not eliminate them when there is the possibility that the industry will be unable to fully meet its obligations. A more subtle issue is whether such arrangements are effectively also a tax when program participation is mandatory for firms in an industry. This is essentially the situation for FDIC-insured financial institutions, which are compelled to participate in the program.

A.2 Measuring bailout costs—some theoretical considerations

The conceptually best way to think about the direct costs (and benefits) of bailouts is more subtle than is generally appreciated, and as a consequence popular accounts of bailout costs tend to severely overstate or understate their economically relevant value.

The direct cost of a bailout is the difference between the value of resources provided to the rescued entity by the government and the value of potential recoveries. For example, under the Troubled Asset Relief Program (TARP) the government provided banks with capital in exchange for preferred stocks and warrants, and the bailout cost for a given institution was the excess of the capital provided over the value of the stocks and warrants received.

For a bailout cost measure to be economically meaningful, it has to be evaluated as of a fixed point in time and take into account all potential outcomes. In most cases, the natural point in time is the year the bailout is announced or shortly thereafter once it is clear what actions will be taken. The cost is then an estimate of the market value of the net transactions. More technically, it is the net present value of associated stochastic future cash flows, evaluated using a market or fair value methodology. This is the preferred approach when it is feasible to apply it. It takes into account the distribution of possible future outcomes, time value and the cost of the associated risks.

Other events that satisfy the working definition of a bailout have a less well-defined starting point. Ongoing subsidized government guarantee or direct loan programs, such as for mortgages and student loans, gave rise to enormous losses to the government in the years following the financial crisis. In such cases, a conservative measure of bailout costs is the NPV of the subsidy at the time the credit support is extended, but prior to the realization of a crisis. This second approach is referred to below as an *ex ante* bailout cost. It also takes into account the distribution of future outcomes, time value, and the cost of risk.

The third approach adds together all realized cash flows between the government and the bailed out entity, positive and negative. This approach is not theoretically justifiable because it neglects time value and risk adjustment, and most importantly the possibility that the outcome could have been different than what transpires. Nevertheless, it is most frequently how costs are calculated in popular accounts and government reports. It is referred to here as *ex post* cash accounting.

The preferred measure, the NPV at the time of a bailout, tends to be larger than either of those alternatives. Not only does it take into account the possibility of low recoveries, but the cost of shortfalls is magnified by risk adjustment because they are most likely to occur when the economy remains depressed and the value of consumption is high. The *ex ante* NPV tends to be smaller because bailouts are unlikely events. The *ex post* cash cost also tends to be smaller because in most instances the economy recovers after a crisis, but that is not a sure thing.

Valuation methods that rely on market prices, or on fair value approximations to market prices, are the natural way to operationalize the first two approaches to cost measurement. The presumption that the costs incurred by governments should be evaluated using market prices rests on the logic that ultimately losses are borne by taxpayers and other government stakeholders, for whom market prices are the best measure of opportunity cost. When governments assume risk, such as when they guarantee the debt of a financially distressed institution, any losses incurred eventually must be covered by increases to future taxes or cuts to other spending. Importantly, risky government investments cannot be funded entirely with risk-free government debt, taxpayers are effectively equity holders in such transactions. Hence a weighted average cost of capital that recognizes the cost to taxpayers as risk-bearing equity holders should be the same as the private sector weighted average cost of capital, at least as a first approximation. Despite that logic, governments often take their borrowing cost to be their cost of capital, and use it to discount risky cash flows. In such cases, officially reported guarantee costs are biased downward. For a detailed discussion of these issues, see Lucas (2014) and references therein.

A.3. Incidence of direct benefits

The identity of the direct beneficiaries from bailouts differs depending on the time frame considered.

At the time of a bailout, the largest beneficiaries are the unsecured and uninsured debtholders of the rescued institution, not its equity holders. At that point, equity is typically close to being wiped out and the value of debt-related claims has fallen to reflect expected losses. 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 preferred stock that is issued to the government in exchange for the assistance. The primary beneficiaries in such cases are existing unsecured or uninsured creditors, who assets increase in value with the announcement of government backing.

By contrast, direct benefits measured on an *ex ante* basis accrue primarily to stock holders or to customers and other stakeholders such as employees, depending on the competitiveness of the market in which the firm operates and its management practices. The possibility of a future bailout lowers the cost of borrowing to the guaranteed entity as long as it remains solvent. In a competitive debt market, the rents from lower interest rates accrue to the borrowing firms. If product market competition is limited, then equity holders or other stakeholders such as employees can capture the rents. In competitive product markets the rents should go to customers, for instance through lower prices.

To the extent that bankers are primarily affected by bailouts as equity holders and stakeholders of the affected institutions but not as debt holders, this line of reasoning suggests that by the time bailouts materialize, the main beneficiary of those actions are not the bankers. Rather the

unsecured or uninsured creditors of banking institutions stand to gain. It would therefore be interesting to explore the financial and demographic make-up of that group, but to my knowledge no study has been conducted on this subject.

For bailouts of government programs like the FHA and student loans, the direct beneficiaries are the borrowers that were able to obtain credit at a lower cost than they otherwise could in the private market.

A.4. Cost estimates in practice

The press typically reports bailout costs on an *ex post* cash basis. For example, ProPublica, a highly regarded non-partisan news organization, created a “Bailout Tracker” that has been keeping a running tally of government asset purchases and cash receipts under TARP and from the bailout of Fannie Mae and Freddie Mac. In their update dated September 27, 2018, they report a total net government “profit” of \$97 billion. Policymakers also tend to cite *ex post* cash results. For example, in 2012 former president Barack Obama claimed that, “We got back every dime used to rescue the banks.” Some news outlets ran articles expressing skepticism about such claims, for instance in the National Review, but news organizations generally lack the financial acumen or resources to produce credible cost estimates of their own.

Another approach that has contributed to the confusion is the claim that all at-risk government funds are the cost of bailouts. For example, a 2015 guest article in Forbes stated that the “total commitment of government is \$16.8 trillion dollars with the \$4.6 trillion already paid out.” This shares with *ex post* cash accounting the problems of ignoring risk adjustment and time value. On top of that, it fails to recognize the high probability that not all available monies will be drawn upon, and that funds that are drawn upon are likely to be repaid at least in part.

Budget estimates are of particular importance for informing policy makers about the prospective cost of authorizing financial assistance. However, budget estimates of the cost of financial policies also typically deviate from economic principles in their construction. In the U.S., the law governing federal budgetary accounting for credit requires capitalizing expected future cash flows associated with federal credit or loan guarantees at Treasury rates. That rule captures time value and cash flow uncertainty, but neglects the cost of market risk. The FDIC is treated in the budget as an insurance program rather than a credit guarantee, and as such is accounted for on a cash basis. Many other countries report no upfront cost for the sorts of contingent liabilities that arise from bailouts (Lucas, 2014).

Why are incorrect approaches to cost measurement so prevalent? Probably one reason is that they are much easier to implement than fair value analyses, and also superficially more intuitive and easier to explain. Perhaps another is that economists have not drawn sufficient attention to the issue of cost mismeasurement in this area. It is also likely that some metrics are adopted because they provide answers that comport with prior beliefs.

Fortunately, there are several credible sources that have estimated fair value costs for some of the major bailouts associated with the 2008 financial crisis. The analysis that follows draws heavily on those analyses. The estimates that conceptually conform most closely to the cost concept used here come from the U.S. Congressional Budget Office (CBO). The fair value treatment of TARP was called for as part of the legislation, and for consistency CBO analyzed the assistance to Fannie and Freddie on the same basis. CBO has continued to provide fair value estimates for all major credit support activities of the U.S. government, including an analysis of emergency actions by the Federal Reserve, and of the Small Business Lending Fund. The Congressional Oversight Panel, a bipartisan organization that was created by Congress in 2008 to oversee TARP, as part of their investigation commissioned Duff and Phelps to undertake a fair value analysis of TARP assistance provided to large financial institutions. Several estimates by academics and policy analysts also provide useful information on fair value costs for certain bailout actions.

A.5. Post-2007 bailouts in the U.S.

We now turn to evaluating the direct costs, beneficiaries, and payors for the major post-2007 legislative and administrative actions in the U.S. that satisfy the above definition of a bailout. Those actions include capital injections into Fannie Mae and Freddie Mac; capital infusions to banks, other private firms, and mortgage borrowers provided by TARP and the Small Business Lending Fund (SBLF); the government losses arising from subsidized Federal Housing Administration (FHA) mortgage guarantees; the subsidized support provided to the capital markets by some of the Federal Reserve's emergency facilities; the partial forgiveness of student loans arising from the expansion of income-driven repayment; and the FDIC's expanded coverage of previously uninsured depositors. The assistance to Fannie, Freddie and other financial institutions under TARP account for about 85 percent of the total costs identified.

A.5.1 Fannie Mae and Freddie Mac⁴

Prior to the crisis, Fannie and Freddie (the Government Sponsored Enterprises or GSEs) together bore the credit risk on over \$5 trillion of U.S. mortgages and a substantial share of the associated interest and prepayment risk. Their bailout was made possible by the passage of the Housing and Economic Recovery Act of 2008 (HERA). Congress passed HERA in response to increasing investor concerns about the GSEs' solvency, and the prospect of a collapse in supply of mortgage credit if those institutions were allowed to fail. Under that authority the GSEs were soon placed into federal conservatorship, where they remain to this day. Those actions

⁴ This section draws heavily on my essay, "Valuing the GSEs' Government Support," available at <http://shadowfed.org/wp-content/uploads/2017/05/LucasSOMC-May2017.pdf>. There I suggest that the different cost measures are also telling for the debate over whether the government would make or lose money by privatizing the GSEs.

effectively transferred ownership and control of those too-big-to-fail entities to the government.⁵

Senior Preferred Stock Purchase Agreements (henceforth “PS”) were the mechanism established to ensure the GSEs’ solvency. That arrangement called for Treasury to pay cash to the GSEs in exchange for shares of preferred stock, with a combined cap of \$445 billion. Treasury is obligated to make purchases in amounts that would prevent the GSEs’ net worth from turning negative for as long as cumulative purchases remain under the cap.

The PS agreements also called for dividends to be paid to Treasury. The rules determining the dividends were administratively modified over time. Initially, Treasury received a 10% dividend on its PS holdings regardless of profitability. Because the GSEs’ free cash flows were often insufficient to cover a 10% dividend payment, the dividends were partly or fully paid for by further draws on the PS lines. In effect Treasury was paying dividends to itself and the lines were being depleted, a situation that diminished the remaining size of the federal backstop, and that increased confusion about whether Treasury was making or losing money on the GSEs. In 2012, the “3rd Amendment” to HERA ended those circular payments by replacing the requirement to pay a 10% dividend with a sweep of all GSE profits to the Treasury. That decision sparked lawsuits from private shareholders, but to date the courts have upheld the legality of those actions.

The three approaches to cost measurement laid out earlier can be applied to the bailout of Fannie and Freddie. The results are dramatically different between them, ranging from a cost of \$311 billion on the methodologically preferred fair value basis at the time of the bailout, to a profit of \$58 billion on an *ex post* cash basis.

A.5.1.1 Fair value cost of Fannie and Freddie bailout at time of crisis

The cost under the preferred measurement approach—the fair value around the time of the bailout of \$311 billion—is based on CBO (2010b). The CBO estimate involved projecting cash flows based on models yielding projected defaults, recoveries and prepayments, and discounting at rates inferred from the jumbo mortgage market.⁶ The high cost reflects the very elevated rate of expected defaults and reduced recovery rates in the face of the crash in house prices, and uncertainty about whether and how much more house prices would fall and the speed of recovery.

The direct beneficiaries at the time of the 2008 bailout were primarily the debt holders of Fannie and Freddie. Prior to the passage of HERA, yields spreads GSE debt had widened,

⁵ For an analysis of the bailout and its economic impacts, see Frame et. al. (2014) and the references therein.

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 over that year how the government would choose to use its expanded authorities.

depressing its value. The capital infusions caused debt prices to recover and liquidity was restored to the market. By contrast, common stock holders were essentially wiped out.⁷ 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 claims.

The precise identity of the debt holders that benefited does not appear to be public information. However, it was well-known that the debt was widely, and that foreign governments were significant investors. For example, the Wall Street Journal reported that China held \$454 billion of long-term U.S. agency debt as of June 30, 2009.

A.5.1.2 Fair value cost of Fannie and Freddie bailout *ex ante*

Concerns about an implicit federal guarantee of the GSEs, its potential costs, and its effects on incentives and the housing market, have a long history (e.g., Feldman, 1999). Several studies, including Lucas and McDonald (2006 and 2010), Passmore (2005) and Stiglitz et. al. (2002), offered estimates of the value of the implicit guarantee to Fannie and Freddie prior to the crisis. All assumed that for these too-big-to-fail institutions, a bailout would occur in the event of significant financial distress, but the methodologies and cost estimates varied widely. Lucas and McDonald (2006), using a contingent claims model that incorporated dynamic capital structure rebalancing and that was calibrated with GSE financial and stock price data, provides an estimate of the *ex ante* NPV of future bailouts as of 2006. The estimated cost to the government over a ten-year horizon is about \$8 billion (much more than Stiglitz et. al., and much less than Passmore).

That *ex ante* estimate is a small fraction of the \$311 billion cost measured as of the time of the bailout. In part, the difference is due to the small probability of a bailout from the perspective of the benign market conditions of 2006. The realized severity of the bailout also turned out to be an outlier relative to the distribution of outcomes predicted by the model, which can be attributed to the modest implied volatility in stock prices in those *ex ante* calculations.

The beneficiaries of the implicit guarantee *ex ante* were the shareholders of Fannie and Freddie and possibly their customers. The perception of an implicit guarantee allowed the GSEs to issue debt at lower yields than had they been standalone entities. The debt holders bore less risk, but receive a commensurately lower return, and hence did not benefit on an *ex ante* basis. 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 created by the stream of interest rate savings.

⁷ Lawsuits by equity holders claiming they were illegally deprived of their dividend rights have to date been unsuccessful.

A.5.1.3 *Ex post* cost Fannie and Freddie bailout on a cash basis

Data on annual cash flows between the government and the GSEs are available in their annual reports. 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. Specifically, cash payments from Treasury totaled \$116 billion to Fannie and \$71 billion to Freddie. Treasury collected \$147 billion from Fannie and \$98 billion from Freddie. As explained earlier, interpreting this tally as a cost measure is conceptually flawed for several reasons. Wall (2014) also discusses 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 shareholders. He also notes that there is value to the continuing government backing from the PS agreements, which is not taken into account on a cash basis of accounting.

A.5.2 FHA Mortgage Guarantees

The purpose of FHA’s guarantee program is to make mortgage credit available and affordable for low-income and first-time homebuyers. Prior to the crisis its market share had been on the decline for several years, as subprime lenders attracted potential FHA borrowers with lower rates. Post-crisis the FHA quickly became, and remains to this day, the country’s largest subprime lender.

The cost of the statutorily broadened authority of the FHA during the crisis, and the deep losses it experienced on its outstanding mortgage guarantees, have received much less attention than the bailout of the GSEs. Nevertheless, the FHA’s bailout is notable. The costs were considerable; and evaluating the bailout of an ongoing federal guarantee program involves conceptual challenges that have applicability to other situations (such as flood insurance and student loans), but that appear not to have been analyzed in the literature.

The FHA bailout arose from two distinct sources: (1) HERA authorized the FHA to guarantee up to \$300 billion in new 30-year fixed rate mortgages for subprime borrowers if lenders wrote down principal loan balances to 90 percent of current appraisal value. It also increased the cap on insured mortgages from \$363 thousand to \$625 thousand. (2) Treasury absorbed large losses on outstanding FHA-backed mortgages that had been insured at below-market rates.

Evaluating the cost at the time of the bailout of the additional lending authority requires an estimate of how much of that additional authority would be used, and the fair value subsidy rate on the incremental guarantees (dollar subsidy cost per dollar of principal insured). To my knowledge, no estimate of this cost is available in the academic literature or from government or other sources. The rough estimate offered here suggests the likely magnitude of the associated cost. I assume that in 2008, (1) the size of the residential mortgage market is \$10 trillion; (2) sub-prime makes up 12% of the total (source: Federal Reserve Bank of San Francisco); (3) 20% of those mortgages are distressed; (4) lenders will write down 10% of

distressed mortgages that qualify for the program; and (5) that 70% of subprime mortgages qualify (e.g., were below the principal limit). Multiplying together those percentages, the principal amount of mortgages refinanced by FHA under the increased authority would be \$16.8 billion, much less than the authorized increase in lending. The other component to the subsidy calculation is the subsidy rate. CBO (2006, 2011) provides estimates of fair value subsidies for FHA loans by extrapolating from pricing data from private mortgage insurance and adjusting for other differences from FHA loans. The high end of the CBO range for 2006 is 5%, and the central estimate for 2012 is 6%. CBO did not provide subsidy rates for 2008 or 2009. Applying a probably conservative 6% subsidy rate to the \$16.8 billion yields a bailout cost of \$1 billion from the expanded authority.

The beneficiaries of FHA program expansion were the subprime borrowers that are able to lower their principal balance and possibly their interest rate; and the lenders that chose to participate and hence believed that writing the loans down to 90% of appraised value would yield more than continuing to hold the mortgages. As it turned out, program participation was much lower than predicted by these calculations.⁸

The much larger costs characterized here as a bailout of the FHA arose from its existing guarantees, which at loan origination were at below-market rates. Before turning to those calculations, there are several conceptual issues to address. The FHA is an agency within the federal government, not a private financial institution. Does it make sense to describe the government as bailing itself out? The logic that FHA was bailed out rests on several observations: First, sovereign rescues by other sovereigns are routinely described as bailouts (e.g., Greece by the IMF; or potentially state and local pension funds by the federal government), the term does not just apply to private entities. Second and most importantly, the FHA's guarantee business was very similar to that of Fannie and Freddie as was the ultimate impact on taxpayers--FHA guaranteed MBSs at below-market premium rates. While there is unlimited budget authority to cover unexpectedly high FHA losses, ultimately taxpayers and stakeholders bear the costs when Treasury resources are depleted by losses.

Another issue regards timing. The underpricing of FHA guarantees occurred over many years, with a severity that varied across cohorts with market conditions and programmatic changes. Hence there was not a well-defined date which can be identified as the event of the bailout, nor a uniform subsidy across cohorts. The approach used here, which is arguably a conservative one, is to use the idea of *ex ante* cost to account for underpricing before the realized bailout. Specifically, outstanding mortgages insured by the FHA totaled \$322 billion in 2007, shortly before the start of the crisis. Multiplying the mid-point of the subsidy rate range for pre-crisis years of 3.5% (CBO, 2006) by the outstanding principal, the *ex ante* cost is \$11.3 billion. That figure represents the fair value of the uncompensated subsidy shortly before the crisis. On top

⁸ Lenders wrote down relatively few mortgages under this or other programs, a fact that has been attributed to various institutional constraints and economic incentives.

of that, the \$800 billion of FHA guarantees made from 2008-2010 had a higher estimated subsidy rate of 6% (CBO, 2011), yielding an additional estimated cost of \$48 billion.

In total then, the estimated FHA bailout totaled about \$60 billion. The direct beneficiaries of FHA subsidies were the mortgage borrowers that had been able to obtain funds at a below-market rate.

There is also some complexity in evaluating FHA costs on an *ex post* cash basis. The government accounts for FHA using a mix of cash and accrual accounting, with accruals calculated using Treasury rates for discounting projected net cash flows. For federal credit programs, budget “re-estimates” track the difference between the original budgetary cost--an accrual estimate of the present value of net losses over the life of a cohort of loans--and an update of the estimate that reflects realized cash outcomes and updated accrual assumptions on defaults, recoveries, etc. Adding together the re-estimates for FHA mortgage guarantees on loans originated between 1999 and 2009, as of 2016, FHA guarantees cost taxpayers \$63 billion more than was originally budgeted for.

A.5.3 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). That legislation gave the Treasury broad authority to purchase or insure up to \$700 billion of troubled assets to bring stability to the financial system. Within two months \$248 billion had been disbursed, and Treasury had announced the intention to use most of the remaining funds if needed. Under the Capital Purchase Program (CPP), which accounted for \$178 billion of the early disbursements, financial institutions received equity infusions in exchange for preferred stock and warrants. The largest disbursements were to JP Morgan Chase, and Wells Fargo, at \$25 billion each; Bank of America, at \$15 billion; and Morgan Stanley and Goldman Sachs, at \$10 billion each, but funds went to over 100 smaller banks as well. Preferred stock purchases also propped up AIG and GMAC, and subsidized loans were made to Chrysler and GM. TARP was also used to absorb potential losses from actions taken by the Federal Reserve and the FDIC, and later to fund grant programs aimed at preventing foreclosures on home mortgages.

Academic analyses of various aspects of TARP include Calomiris and Khan (2015), McDonald and Paulson (2015), and references therein. Veronesi and Zingales (2011) is most closely related to the analysis here. They consider the taxpayer cost of the assistance to large banks, and compare it to the value increase in the securities of those firms. They estimate that “...this intervention increased the value of banks’ financial claims by \$131 billion at a taxpayers’ cost of \$25 -\$47 billions with a net benefit between \$84bn and \$107bn.” They suggest that the direct benefits exceed the costs because of the reduction in the probability of costly bankruptcy.

More detailed fair value analyses of the costs of TARP were undertaken by CBO, which was required by TARP to provide annual updates on cost; and by the Congressional Oversight Panel, which hired Duff and Phelps to perform a fair value analysis of assistance to large financial institutions. The estimates here for the cost at the time of TARP-funded bailouts draw from those analyses.

CBO's 2009 TARP report put the fair value cost of TARP assistance disbursed through year-end 2008 at \$64 billion. The cost is based on difference between value of cash paid the estimated values of the preferred stocks and warrants received. The Congressional Oversight Panel independently estimated the fair value cost to be \$78 billion a few months later. Given the volatility and uncertainty about valuations at the time, the two estimates are remarkably consistent.

At the time of those estimates, further disbursements were viewed as likely. There was also the risk of large losses from the use of TARP to back contingent liabilities of the Federal Reserve and FDIC arising from their emergency facilities. To roughly account for all of this, I assume expected additional disbursements of \$100 billion, and apply 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.

CBO (2018) reports that \$439 billion of the \$700 billion available has been disbursed. The *ex post* cash cost of TARP was considerably less than the fair value cost at the time of the bailouts, as most of the assistance was eventually repaid. Incurred losses from AIG, the auto loans, and the mortgage grant programs resulted in a net loss of about \$30 billion.⁹

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 available government capital to qualifying community banks and community development loan funds at a below-market price. Under that program, Treasury purchased preferred stock with a dividend that was contingent on amount of small business lending by that institution. CBO estimated the fair value cost of the SBLF to be \$6.2 billion shortly before it was enacted.¹⁰

A.5.4 Federal Reserve emergency facilities

The Federal Reserve took a number of extraordinary measures during and after the worst of the financial crisis that exposed it to trillions of dollars of credit exposure. Figure 1 shows the realized balances on the facilities over time. To what extent did those actions constitute a bailout?

⁹ Although CBO was directed in the legislation to report costs on a fair value basis, they nevertheless report realized losses on a cash basis and refer to them as costs. For that reason, only the estimates in the 2009 report, which are on a fair value basis, are used in the calculations here of cost at the time of the bailouts.

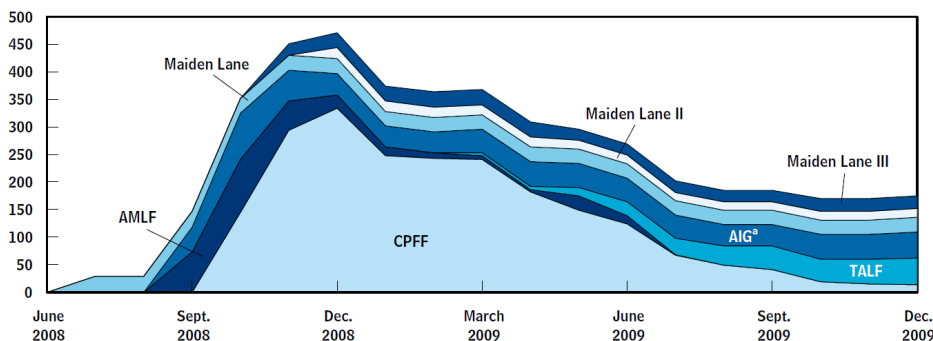
¹⁰ <https://www.cbo.gov/sites/default/files/111th-congress-2009-2010/costestimate/hr5297housepassed0.pdf>

CBO (2012) undertook an analysis to assess the present value of net payments from the government evaluated on a fair value basis over the expected life of the facilities, and also the budgetary impacts. That fair value estimate is conceptually consistent with the preferred measure of bailout costs here.

Figure 1:

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.

Despite the trillions of dollars of new exposures, CBO estimated the total cost to be \$21 billion. There are several reasons that the cost was found to be modest. Some programs involved large amounts of collateral and short loan maturities that protected the Federal Reserve from losses. Others, like the Maiden Lane facilities, exposed the Federal Reserve to considerable credit risk. However, most of those transactions were carried out on a fair value basis or through an auction mechanism that suggested the subsidies were negligible. Furthermore, some of the transactions shielded the Federal Reserve by putting TARP funds in a first-loss position. The programs judged to involve fiscal costs, most notably TALF, involved loans from the Federal Reserve that were backed by risky collateral and that had TARP protection capped at less than potential losses. Also contributing to the subsidy is that interest rates were administratively set rather than at market-based interest rates, and that the commitments extended over horizons of months or years.

A.5.5 Expanded FDIC coverage

The FDIC significantly expanded deposit insurance coverage to head off the possibility of runs by uninsured depositors. There were two notable policy actions that were taken under its existing statutory authorities. The first was to temporarily increase the cap on insured deposits

from \$100,000 to \$250,000 in October 2008.¹¹ The second, finalized a month later, was to create the Temporary Liquidity Guarantee Program (TLGP). The TLGP had two components, a Debt Guarantee Program for newly issued bank debt, and a Transaction Account Guarantee Program that provided unlimited coverage of transaction accounts to banks that opted in, initially at no cost to the banks, and then in exchange for fees.

Estimating the fair value cost of those actions at the time they were announced would involve assumptions about the distributions of the expansion of covered deposits, the likelihood and severity of losses paid by the FDIC, premiums collected, and appropriate discount rates; and inputting those values into a pricing model such as Marcus and Shaked (1984), which builds on the insights in Merton (1977). To my knowledge, such an estimate has not been published for these programs.

However, for the FDIC such a prospective cost estimate would significantly overstate the cost to taxpayers. That is because the FDIC is required by statute to recover losses with assessments on solvent financial institutions *ex post* when the Deposit Insurance Fund is depleted. The Treasury provides a backstop in the form of a credit line. Along with the expansion of FDIC coverage, Treasury increased the FDIC credit line from its normal level of \$100 billion to \$500 billion.

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 because of below-market rates charged by Treasury. Those possibilities suggest that the expanded FDIC coverage qualifies as a bailout, though it was not a large one.

To suggest the order of magnitude of the bailout cost, assume that at the time FDIC coverage was expanded, there was a 10% chance that the crisis would intensify and the entire line would be drawn, and in that event, only 80% of the draw would be recovered in present value terms. In all other scenarios the Treasury would be fully repaid for any borrowing. Under those admittedly arbitrary but not implausible assumptions, the bailout cost is \$10 billion.

To the extent this is a bailout, banks are clearly the direct beneficiaries. However, because FDIC participation is effectively mandatory for banks, the expanded programs have the incidence of a tax on banks that pay premiums (*ex ante* and in expectation *ex post*) in excess of the cost of risk they impose on the system, and conversely riskier banks receive a net subsidy.

On an *ex post* cash basis, changes in the Deposit Insurance Fund track the cash flows to and from the FDIC over time. The fund stood steady at about \$52 billion from the 4th quarter of 2007 to the 2nd quarter of 2008. By the 4th quarter of 2008 it had fallen to \$34.6 billion, and by the 4th quarter of 2009 it had turned negative, to -\$8.2 billion. The fund reached its most negative point in the 1st quarter of 2010 at -\$20.9 billion, and slowly recovered from there. By the 4th quarter of 2012 it stood at \$25 billion, and in June of 2018 it had reached \$97.6 billion.

¹¹ The Dodd Frank Act later made that temporary increase permanent.

The FDIC had enough cash on hand to cover those negative fund balances without borrowing from Treasury.

This analysis casts doubt on the common perception that underpriced deposit insurance provides a significant subsidy to banks. In fact prospective costs to taxpayers are small, even during a severe financial crisis. The direct costs fall largely on strong banks, which through the system subsidize weaker ones. However, there may also be substantial indirect costs, for instance through incentive effects

A.5.6 Expanded income based repayment of student loans

Another administrative action, in this case by the Department of Education, amounted to a partial bailout of federal student loan borrowers. The department significantly expanded its Income-Driven Repayment Program (2009 and 2010). Delisle (2015) estimates the cost of the expansion on a fair value basis of \$11 billion.¹²

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

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