

The Cost of the Financial Crisis: The Impact of the September 2008 Economic Collapse

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Introduction

The United States pulled back from a financial market meltdown and economic collapse in late 2008 and early 2009—but just barely. Not until we came to the edge of catastrophe were decisive actions taken to address problems that had been building in financial markets for years. By then it was too late to avert a severe recession accompanied by massive job losses, skyrocketing unemployment, lower wages, and a growing number of American families at risk of foreclosure and poverty.

This paper quantifies the economic and budgetary costs resulting from the acute stage of the financial crisis reached in September 2008. This is important on its own, but it can be seen as well as giving a rough indication of the potential value of reforms that would help avoid a future crisis.

On a budgetary level, the cost of the stage of the crisis reached in mid-September 2008 is the net cost to taxpayers of the policies used to stem the crisis. This includes the programs undertaken as part of the Troubled Assets Relief Program (TARP), as well as steps taken by the Federal Reserve and the Federal Deposit Insurance Corporation (FDIC) to guarantee bank liabilities. Actions to support Bear Stearns and the two government-sponsored entities, Fannie Mae and Freddie Mac, were taken before the worst part of the crisis, but their costs continued past September and are considered by many to be part of the fiscal costs of the crisis.

The costs of the crisis to society, however, go beyond the direct fiscal impacts to include the effect on incomes, wages, and job creation for the U.S. economy as a whole. The crisis reduced U.S. economic growth and caused a weaker job market and other undesirable outcomes. A key challenge in

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quantifying such a macroeconomic view of the costs of the financial crisis is to identify the particular effects of the crisis and to separate those impacts from other developments.

The broadest perspective would look at the overall changes in the economy from the start of the crisis to the end, and perhaps even include an estimate of the long-run future impacts. Implicit in such a calculation would be a decision to include both the effects of the crisis itself and any offsetting impacts from policy responses such as easier monetary policy or fiscal stimulus. A broad accounting of the costs of the crisis could also include the decline in government revenues resulting from the crisis, enactment of policies such as the 2008 and 2009 stimulus packages, as well as the impacts of regulatory changes that came about in the wake of the crisis. Under such a view, the financial crisis had large and long-lasting impacts on the U.S. economy. The Organisation for Economic Co-operation and Development (OECD), for example, estimates that the financial crisis will lead to a 2.4 percent reduction in long-term U.S. GDP, anticipating that both the reduction in employment and the increased cost of capital resulting from the crisis will last far into the future.²

The approach taken in this paper is narrower: to distinguish and quantify costs incurred so far that are directly related to the crisis and, in particular, to focus on the impact of events from the collapse of Lehman Brothers in the middle of September 2008 through the end of 2009. This is the period in which the grinding slowdown associated with the credit disruption that began in August 2007 turned into a sharp downturn. This approach produces smaller estimates for the cost of the crisis than the broad view, because the calculations quantify the costs of the acute phase of the crisis between September 2008 and the end of 2009, and not the overall impact of events both preceding and following that time period. Both approaches are valuable, and this paper is best seen as a complement to the literature on the overall cost of financial crises. This distinction is revisited in the conclusion.

The results in this paper complement economic research by Reinhart and Rogoff (2009) that assesses the broad overall costs of banking crises across countries.³ Reinhart and Rogoff find that deep economic

² OECD, 2010. *Going for Growth*, Chapter 1, Box 1.1, pp. 18-19, March.

³ Carmen M. Reinhart and Kenneth S. Rogoff, 2009. "The Aftermath of Financial Crises," *American Economic Review*, vol. 99(2), pages 466-72, May.

downturns “invariably” follow in the wake of crises; they quantify the average impact across countries on output, asset prices, the labor market, and government finances. Their results are also discussed below.

The cost of the crisis as measured here includes both the fiscal cost and the effects on economic measures such as output, employment, wages, and wealth. The difficulty in quantifying these economic impacts is to isolate the effects of the most acute stage of the crisis—the severe downturn in consumer and business spending that took place following the failure of Lehman Brothers in September 2008. The U.S. economy was already moving sideways in the first half of 2008 and most forecasters expected slow growth to continue for the balance of the year and into 2009. But the events of the fall and the plunge in economic activity that resulted were unexpected.

This paper isolates the impact of the acute phase of the crisis by comparing the Congressional Budget Office (CBO) economic forecast made in September 2008, just before the crisis, with actual outcomes. The approach is to compute the difference between the decline in GDP in late 2008 and 2009 and the forecast published by CBO in its “Budget and Economic Outlook: An Update,” published on September 9, 2008—the Tuesday before Lehman filed for bankruptcy on Monday, September 15. The difference between actual GDP in the five quarters from October 2008 to December 2009 and the CBO forecast made just on the cusp of the crisis is taken as the unexpected impact of the crisis on GDP. This GDP impact is then used to calculate the impact of the crisis on other measures, including jobs, wages, and the number of foreclosures. The accuracy of CBO economic forecasts is similar to that of the Blue Chip consensus.⁴

While this approach works to isolate the impacts of events from September 2008 forward, it is necessarily imprecise because it is impossible to know a) how accurate the CBO forecast would have been absent the crisis; b) whether the relationships between growth and other economic variables such as employment changed during the crisis; and c) the impact of other events from September 2008 forward that are not related to the crisis. Moreover, the calculations in the paper start with the fourth

⁴ Congressional Budget Office, 2006. “CBO’s Economic Forecasting Record,” November 2006.

quarter of 2008 and thus do not attribute to the crisis any output or jobs that were lost in the two weeks of September immediately following the collapse of Lehman Brothers (these are still counted and appear in the charts below, but not as part of the cost of the post-Lehman crisis). The results in the paper should thus be taken as providing a rough approximation of the impact of the crisis. This is hugely meaningful, however, with American families suffering thousands of dollars of losses in incomes and wages and enormous declines in the value of their assets, including both financial assets, such as stock holdings, and real estate properties, such as family homes. These losses run into the trillions of dollars and on average come to a decline of nearly \$66,000 per household in the value of stock holdings and a loss of more than \$30,000 per household in the value of real estate wealth (though the inequality in wealth holdings means that the losses will vary considerably across families). These impacts on incomes, jobs, and wealth are all very real effects of the crisis.

Finally, the paper looks briefly at broader impacts on society, notably the effect of the crisis in boosting foreclosures and potential impacts on human factors such as poverty.

Direct costs to taxpayers of financial interventions

A host of government interventions were aimed at stabilizing banks and other financial sector firms, ranging from loans from the Federal Reserve to the outright injection of public capital into banks through the Treasury's Troubled Assets Relief Program (TARP). The direct budgetary cost of the crisis is taken to equal the expected net losses of these programs. The fiscal impact of the crisis considered here does not include the lower revenues and increased government spending that followed the crisis. Instead, the focus is on the costs of interventions undertaken in direct response to the acute phase of the crisis that began in September 2008, notably the cost of the TARP and related programs to guarantee bank liabilities put into effect by the Federal Reserve (Fed) and the Federal Deposit Insurance Corporation (FDIC). These costs are tallied in Tables 1 and 2, below. These cost estimates are from the January 2010 CBO estimate of TARP commitments and expected losses, and the February 2010 estimate by the Congressional Oversight Panel of the Fed's commitment to several programs run jointly by the Treasury and the Fed (the table provides references to the sources). The TARP authority was part of the Emergency Economic Stabilization Act of 2008 (EESA) enacted on October 3, 2008; this was used by the

Treasury Department for a variety of purposes, including capital injections into banks, guarantees for assets of certain banks, foreclosure relief, support for the AIG insurance company, and subsidies to prevent foreclosures.

CBO estimates that \$500 billion of the \$700 billion capacity of the TARP will end up being used or committed, with programs now in existence having a \$73 billion net cost to taxpayers. As shown in Table 1, the TARP was used to support a range of activities, including the purchase of stakes in banks under the capital purchase program (CPP); special assistance to Citigroup, Bank of America, and AIG; support to automotive industry firms; support for programs to boost securitization of new lending through the Term Asset-Backed Securities Loan Facility (TALF) run jointly with the Fed; the Public-Private Investment Partnerships (PPIP) to deal with illiquid “legacy” assets such as subprime mortgage-backed securities; and the Home Affordable Program aimed at reducing the number of foreclosures. TARP assistance to banks on the whole is projected to generate a \$7 billion profit for taxpayers (even though some banks that received TARP funds have failed or stopped paying dividends to the Treasury). Other programs, notably aid to auto firms, AIG, and homeowners at risk of foreclosure, are projected to result in substantial losses of TARP funds, with an overall net cost of \$73 billion. As part of the Congressional budget process, the CBO estimates as well that there could be future uses and losses involving TARP resources, but they would not be directly related to the crisis of September 2008.

In addition, the Federal Reserve lent \$248 billion as part of TARP-related programs to support AIG and to foster securitization through the TALF. These Fed loans are generally well-secured—indeed, Fed lending related to AIG is now over-collateralized (the TARP having replaced the Fed in the risky aspect of the AIG transaction)—but it is possible in principle that there could be future losses and thus further costs.

Table 1: Direct Costs of the TARP
(\$ billions)

| | Distributed or Committed by Treasury | Net Cost (profit if negative) | Federal Reserve Commitment |
|-----------------------|---|----------------------------------|-------------------------------|
| Total TARP | 501 | 73 | 248 |
| CPP (Bank capital) | 205 | -3 | |
| Citigroup | 25 | -2 | |
| Bank of America | 20 | -2 | |
| AIG | 70 | 9 | 68 [†] |
| Autos | 81 | 47 | |
| TALF (Securitization) | 20 | 1 | 180 |
| PPIP (Illiquid MBS) | 30 | 3 | |
| HAMP (Foreclosures) | 50 | 20 | |

Sources: Congressional Budget Office, "The Budget and Economic Outlook: Fiscal Years 2010 to 2020," January 2010, Box 1-2, pp. 12-13, and TARP Congressional Oversight Panel "February Oversight Report," February 10, 2010, pp. 176-177. Treasury commitments and costs or profits are from the Congressional Budget Office; Federal Reserve commitments as of December 31, 2009 are from the Congressional Oversight Panel February 2010 report.

[†] The \$68 billion reported by the Congressional Oversight Panel represents the amount of AIG-lending extended by the Federal Reserve, but not the net cost of this lending. The Federal Reserve Bank of New York reports that the outstanding balance of Federal Reserve lending related to AIG as of September 30, 2009 totaled \$36.7 billion with a fair market value of \$39.7 billion for the collateral behind the lending, implying that the lending is overcollateralized on a mark-to-market basis. In effect, resources from the TARP replaced part of the initial Fed lending to AIG, leaving the TARP with losses and the Fed's remaining loans over-collateralized.

Table 2 also shows certain direct budgetary costs related to the crisis that commenced before September 2008, notably Federal Reserve lending related to the collapse of Bear Stearns in March 2008, and cost to the Treasury of support for the two housing-related GSEs, Fannie Mae and Freddie Mac. These are not directly the result of the September 2008 stage of the crisis, but are shown since they are closely related to those financial market events. The financial rescue of Fannie Mae and Freddie Mac cost taxpayers \$91 billion in fiscal year 2009 (October 2008 to September 2009), according to the Congressional Budget Office, and CBO forecasts a total cost to taxpayers of \$157 billion through 2015 (these figures are from Table 3-3 in the CBO January 2010 Budget and Economic Outlook). These costs are related to the broader financial crisis, since the activities of the two firms underpinned parts of the housing market that were at the root of the crisis. There is a sense, however, that these costs were the result of losses that largely predated the events of September 2008—namely losses on mortgages

guaranteed by the two firms, and losses on subprime mortgage-backed securities they purchased prior to the failure of Lehman Brothers. While the costs grew as a result of the September 2008 crisis and the subsequent economic collapse, it is likely that much of the losses were built into these firms' balance sheets before September 2008. As shown in Table 2, Fed lending related to Bear Stearns involves a loss of \$3 billion on a mark-to-market basis—this is the net of the \$29 billion in non-recourse lending from the Fed minus the estimated value of the collateral behind those loans as of September 30, 2009 (the most recent date for which estimates are available).

Table 2: Other Financial Commitments Related to the Crisis
(\$ billions)

| Agency | Type of Commitment or Assets Purchased | Amount guaranteed or purchased |
|-----------------|---|--------------------------------|
| FDIC | TLGP (guarantees for bank debt) | 577 |
| | | |
| Federal Reserve | GSE debt purchases | 175 |
| | Mortgage-backed securities purchases | 1,250 |
| | Treasury securities purchases | 300 |
| | Bear Stearns-related lending | 29 [†] |
| | | |
| Treasury | GSEs – Support for Fannie Mae and Freddie Mac | 157 |

Sources: FDIC: TARP Congressional Oversight Panel "February Oversight Report," February 10, 2010, pp. 176-177. FDIC Temporary Loan Guarantee Program is the amount of senior bank debt covered by FDIC guarantees. Federal Reserve purchases are from www.federalreserve.gov/monetarypolicy. These figures are total (gross) amounts of liabilities guaranteed by the FDIC and assets purchased by the Federal Reserve; they do not provide the net cost or gain to taxpayers. The FDIC and Federal Reserve programs are all likely to make positive returns. Treasury costs for GSEs are from Congressional Budget Office, "The Budget and Economic Outlook: Fiscal Years 2010 to 2020," January 2010, Box 3-3, p. 52.

[†] The Federal Reserve Bank of New York reports a fair market value of \$26.1 billion for the collateral behind the \$29.2 billion loan balance related to Bear Stearns as of September 30, 2009, implying a \$3 billion loss on a mark-to-market basis.

Other monetary policy actions undertaken by the Federal Reserve in the fall of 2008, such as programs to support commercial paper markets and money market mutual funds, are not included in this tally. These might well have positive budgetary impacts as the Fed collects interest and fees from users of these liquidity facilities. Similarly, the stimulus packages enacted in early 2008 and early 2009 were both arguably brought about because of the impact of the financial crisis on the economy, but these did not directly address financial sector issues and are not included here.

In sum, the direct budget costs from efforts to stabilize the financial system following the events of mid-September 2008 are meaningful—with net costs of \$73 billion and hundreds of billions of public dollars deployed or otherwise put at risk of loss. These figures, however, are only a modest part of the cost of the financial crisis. The larger impacts are those that affected the private sector as a result of the significant decline in economic activity that followed the crisis. These are tallied by calculating the impact of the September 2008 financial crisis on output, employment, wages, and wealth.

Economic costs: Lost wages, incomes, jobs, and wealth

The U.S. economy was already slowing in the first half of 2008, as the slide in housing prices that began in 2006 and the tightening of credit markets from 2007 both weighed on growth. High oil prices added another headwind in 2008. The economy entered a recession in December 2007; while this was not yet announced when the crisis became acute in mid-September 2008, it was clear that growth would remain subdued even under the best of circumstances while the U.S. economy worked through the challenges of housing, credit, and energy markets. Even so, the financial crisis in September 2008 clearly exacerbated the pre-existing economic slowdown, turning a mild downturn into a deep recession. In effect, the events of September and October 2008 were a severe negative shock to American confidence in the economy, and in the ability of our government and our political system to deal with the crisis. All at once, families and businesses across the United States looked at the crisis and stopped spending—even those who had not yet been directly affected by the mounting credit disruption that started in August 2007 put a hold on their plans. Families stopped spending, while firms stopped hiring and paused investment projects. As a result, the economy plunged, with GDP falling by 5.4 percent and 6.4 percent (at annual rates) in the last quarter of 2008 and the first quarter of 2009—the worst six months for economic growth since 1958.

Assessing the economic costs associated with the acute phase of the crisis in September 2008 requires separating the impacts of the events of fall 2008 from the pre-existing economic weakness. While this is not possible to do with precision, one practical approach is to take as a baseline the GDP growth forecast published by the CBO on September 9, 2008—just before the crisis. The difference between

actual GDP, and the CBO forecast for GDP in the balance of 2008 and over all of 2009, is then taken to reflect the “surprise” impact of the crisis. This is an imperfect measure since there is no reason to expect the CBO forecast to have been completely accurate had it not been for subsequent events such as the collapse of Lehman.

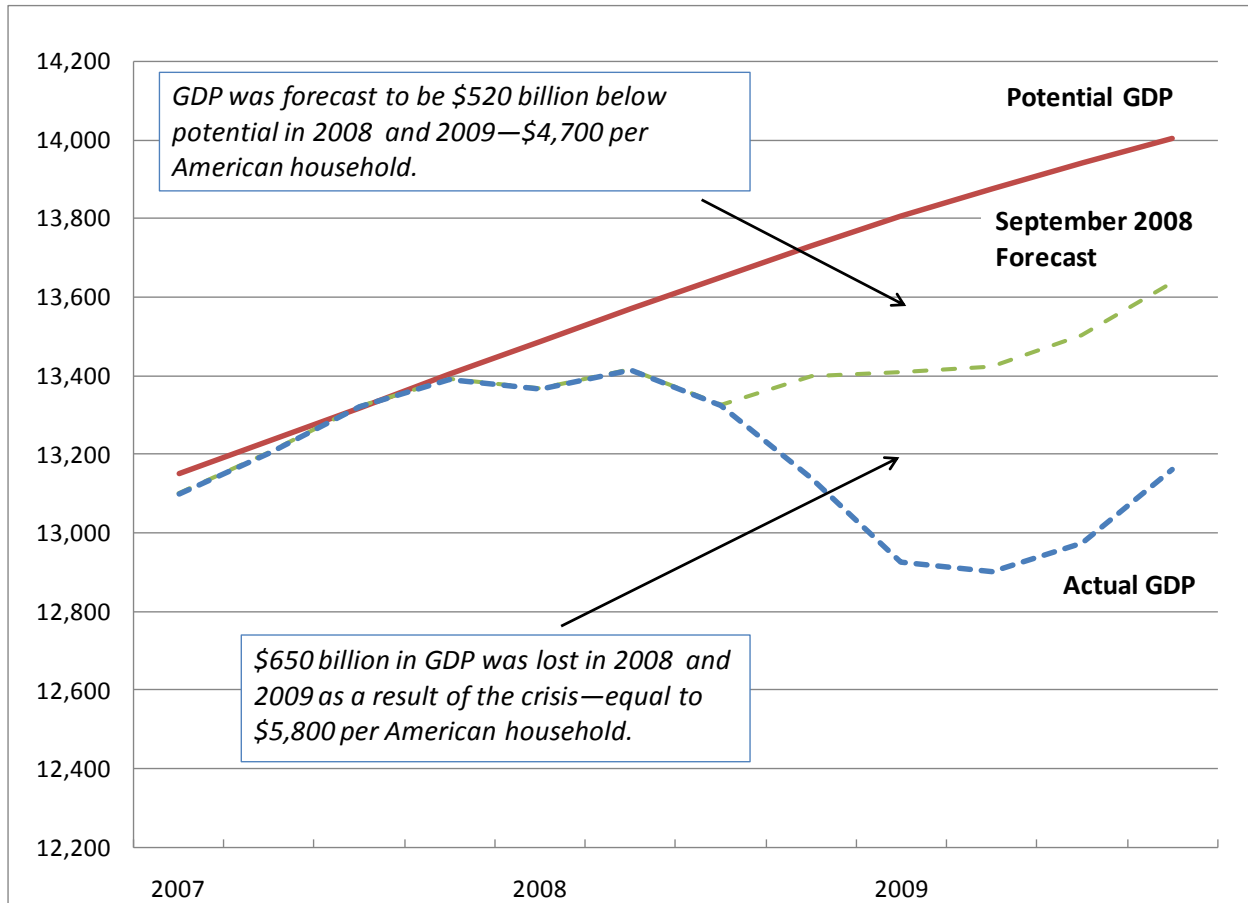
With these caveats in mind, the September 2008 CBO forecast remains plausible as a guide for what would have happened absent the financial crisis of September 2008. The CBO forecast 1.5 percent real GDP growth in 2008 as a whole, followed by 1.1 percent growth in 2009. With the first half of the year already recorded, 1.5 percent growth for the year as a whole implies that CBO expected GDP to decline at a 0.25 percent annual rate in the second half of 2008.⁵ That is, CBO expected growth to be weak and even slightly negative in the latter part of 2008 but then pick up in 2009—indeed, the CBO forecast implies quite strong growth by the end of 2009.

Figure 1 plots actual real GDP against GDP as implied by the CBO forecast from September 2008 and the CBO’s calculation of potential GDP—the level of GDP that would be consistent with full utilization of resources.⁶ As shown on the chart, GDP plunged at the end of 2008 and into early 2009, falling by 5.4 percent and 6.4 percent in the last quarter of 2008 and the first quarter of 2009, against CBO expectations of a nearly flat profile for output over this period. The difference between the CBO forecast and the actual outcome for GDP comes to a total of \$648 billion in 2009 dollars for the five quarters from the beginning of October 2008 to the end of December 2009, equal to an average of \$5,800 in lost income for each of the roughly 111 million U.S. households.

⁵ GDP data for 2008 have been revised since the CBO forecast was made; the implied negative GDP growth of 0.25 percent at an annual rate is computed using the GDP data that were available to the CBO in September 2008.

⁶ The CBO forecast uses the growth rates in the September 2008 CBO forecast, adjusting the past levels of GDP for subsequent revisions to GDP data that were known prior to September 2008.

Figure 1: Impact of the Crisis on Economy-wide Output



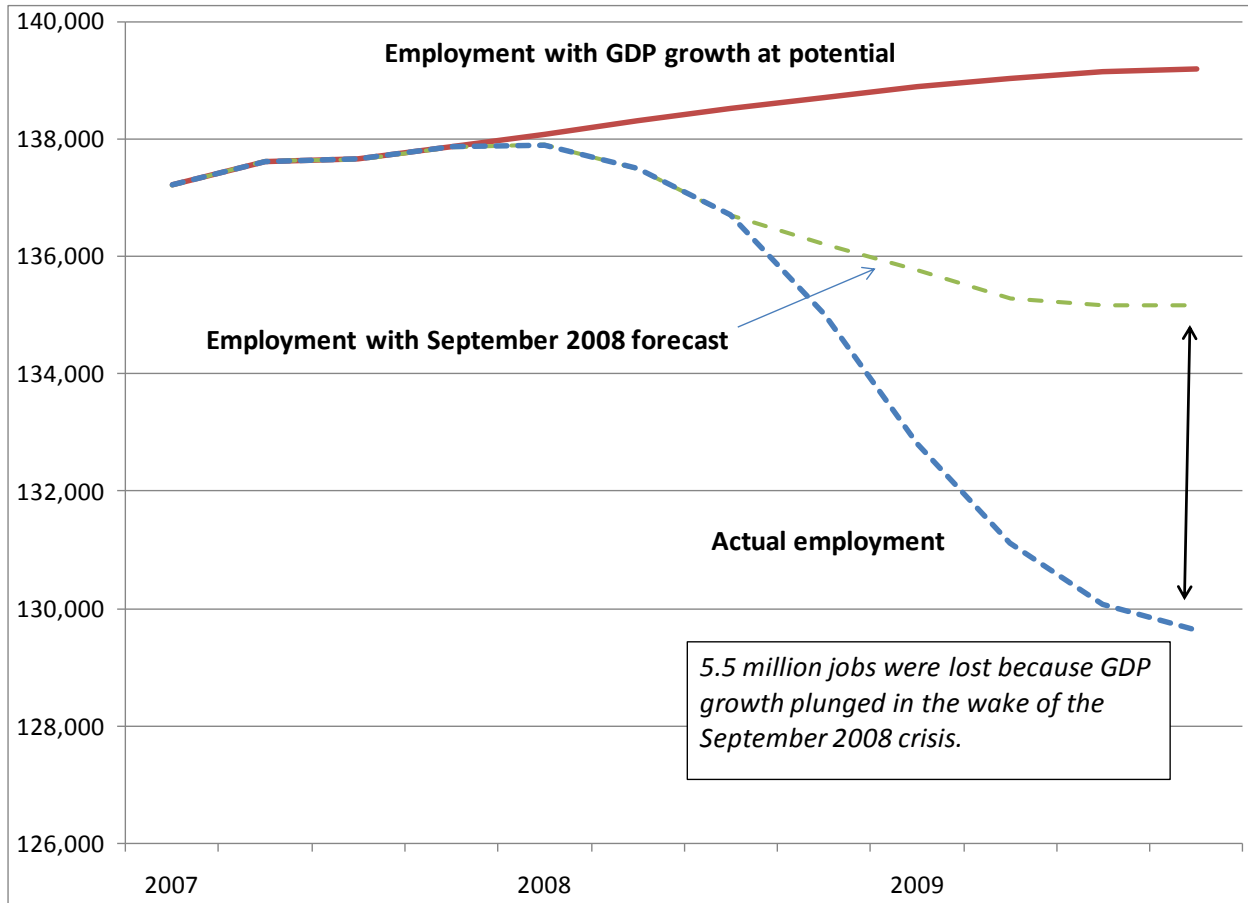
Note: GDP as plotted in the chart is in billions of 2005 (real) dollars at a seasonally adjusted annual rate. The dollar figures in the boxes, however, are translated into 2009 dollars.

The hit to GDP was matched as well across the economy, with declines in jobs, wages, and wealth. The next step is to translate the unexpected GDP decline into an impact on the labor market. To calculate the impact on employment, a statistical relationship is estimated between percent job growth in a quarter and real GDP growth over the past year. The four-quarter change in output is used to capture the fact that the job market is typically a lagging indicator, responding after some delay to an improving or slowing overall economy. The relationship is estimated as a linear regression for quarterly data from 2000 to 2007, capturing a complete business cycle. This regression provides an empirical relationship between GDP growth and job growth—an analogue of what economists term “Okun’s Law.” The

estimated regression is not a structural model, but an empirical relationship that can be used to back out employment under different GDP growth scenarios. The GDP figures corresponding to the CBO forecast are then used to simulate the level of employment that would have occurred with the CBO forecast made before the September 2008 crisis.

Figure 2 shows the impact of the acute stage of the crisis on employment: 5.5 million jobs were lost in the five quarters through the end of 2009 as a result of slower GDP growth compared to what would have been the case under the CBO forecast made in September 2008. Slow growth in the first three quarters of 2008 had left employment 1.8 million jobs lower than potential, and the CBO forecast for continued weak growth in the rest of 2008 and 2009 would have meant job losses until the last quarter of 2009, but at a much more moderate pace than actually occurred. Under the CBO forecast, employment by the end of 2009 would have been 4.0 million lower than with growth at potential, but the additional negative shock to GDP from the crisis knocked off another 5.5 million jobs, leaving employment at the end of 2009 9.5 million jobs lower than the potential of the U.S. economy.

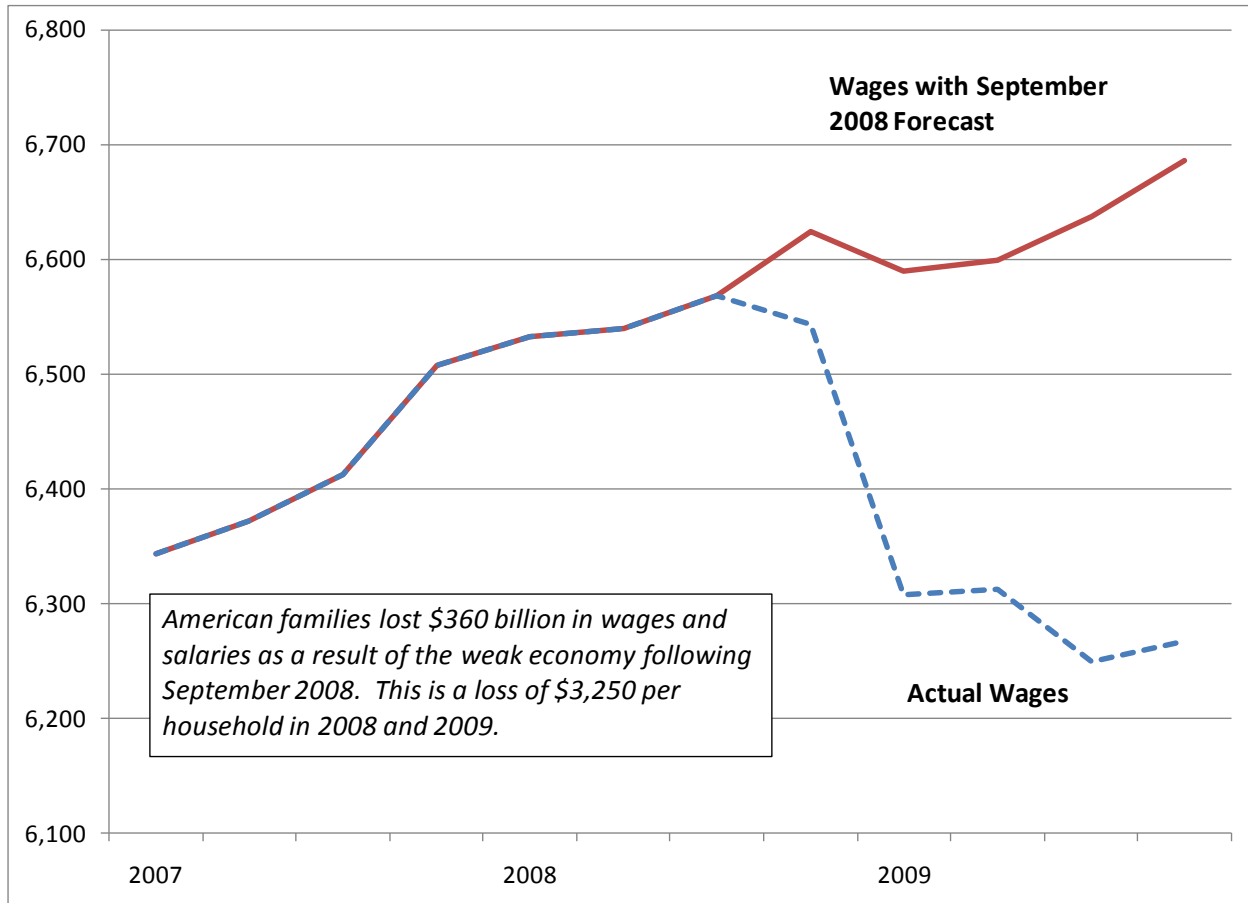
Figure 2: Impact of the Crisis on Employment



Note: Employment in thousands.

Figure 3 shows that the GDP hit and job losses correspond to lost wages for American families—a total of \$360 billion of lost wages in the five quarters from October 2008 through December 2009 as a result of slower growth following September 2008. This equals \$3,250 on average per U.S. household. Wage losses are calculated by taking actual wages with the lower growth and adding back both the wages for the jobs that would have existed with stronger growth and the increased wages per job for all jobs had growth not plunged in the fall and dragged down average wages. The additional wage growth per job is calculated using the trend wage growth before the crisis.

Figure 3: Impact of the Crisis on Wages



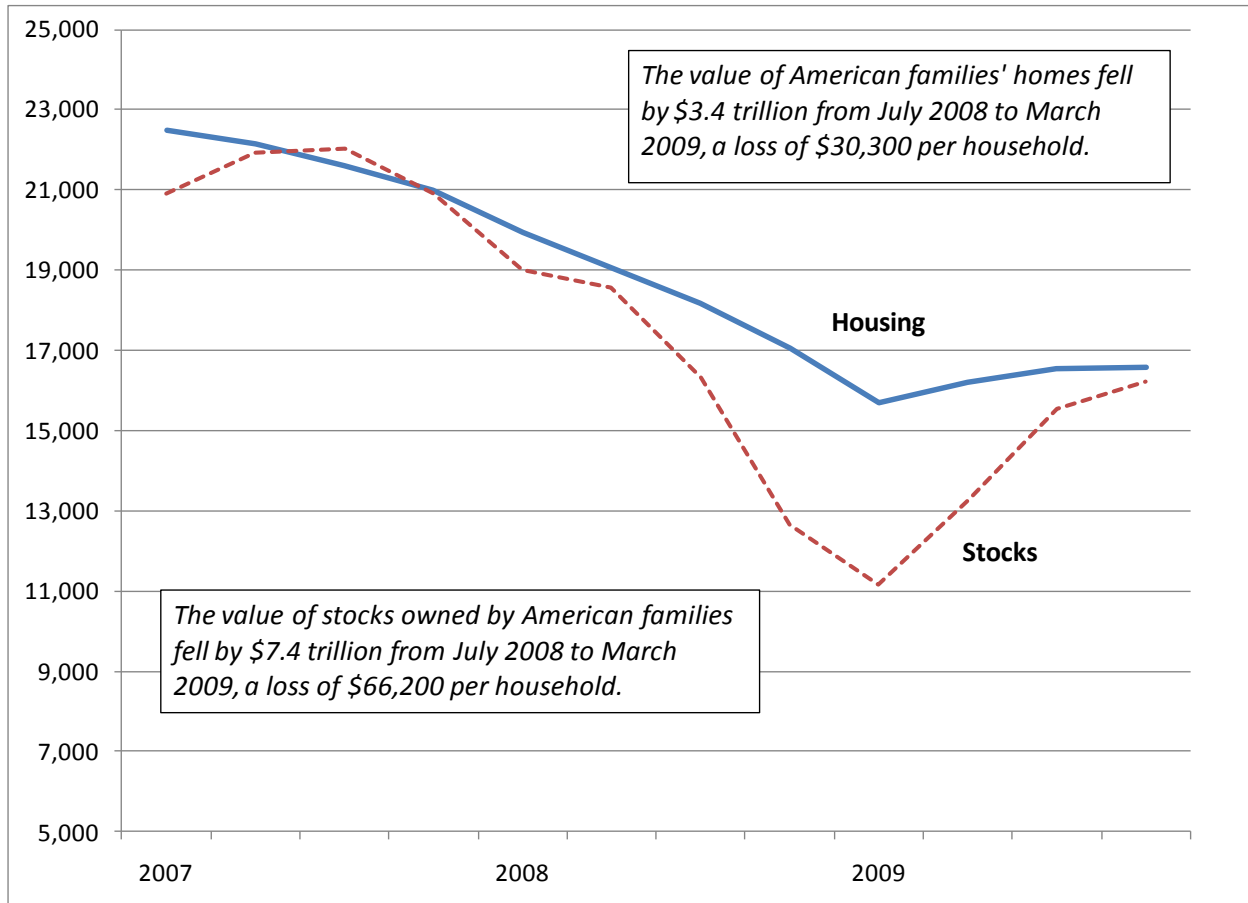
Note: Wages in billions of 2009 dollars.

The value of families' real estate holdings declined sharply over the crisis as well, with a loss of \$5.9 trillion from mid-2007 to March 2009, or a loss of \$3.4 trillion from mid-2008 to March 2009. These correspond to wealth losses of more than \$52,900 per household in the longer period, or \$30,300 per household for the shorter one. The modest rebound in the housing market in the latter part of 2009 has meant that the wealth loss from mid-2008 through the end of 2009 is \$1.6 trillion, or \$14,200 per household. Unlike the economic variables of output, employment, and wages, the wealth measures are not adjusted for the unexpected impact of the events of September 2008. This is because market-based measures of asset values in principle should already reflect the expectation of slower growth from the perspective of mid-2008. The unexpected plunge in the economy in late 2008 and into 2009 would not

be reflected in asset values, however, making these valid measures of the impact of the acute stage of the crisis on household wealth.

Figure 4 shows that the financial crisis exacted an immense toll on household wealth. The value of families' equity holdings fell by \$10.9 trillion from the middle of 2007 to the end of March 2009—the longest period of decline in the value of stock holdings. This equals a loss of \$97,000 per household. Looking at the decline in the value of stock holdings only from the middle of 2008 to the end of March 2009 gives a loss of \$7.4 trillion, or about \$66,200 per household. The measure of stock market wealth includes both stocks owned directly by families and indirectly through ownership of shares of mutual funds. Data on wealth holdings are from the Federal Reserve's Flow of Funds database and are available quarterly. The wealth declines are thus measured starting from the end of June 2008 since the next quarterly value is for the end of September of that year and thus after the acute stage of the crisis had already begun. Stocks have rebounded over 2009, with the value of household equity holdings at the end of the year back to the same level as at the end of June 2008.

Figure 4: Impact of the Crisis on Household Wealth



Note: in billions of dollars.

Table 3 summarizes the economic impacts of the acute stage of the crisis that began in September 2008. By all measures, the acute phase of the financial crisis had a severe impact on the U.S. economy, with massive losses of incomes, jobs, wages, and wealth.

Table 3: Economic and Fiscal Impacts of the Crisis

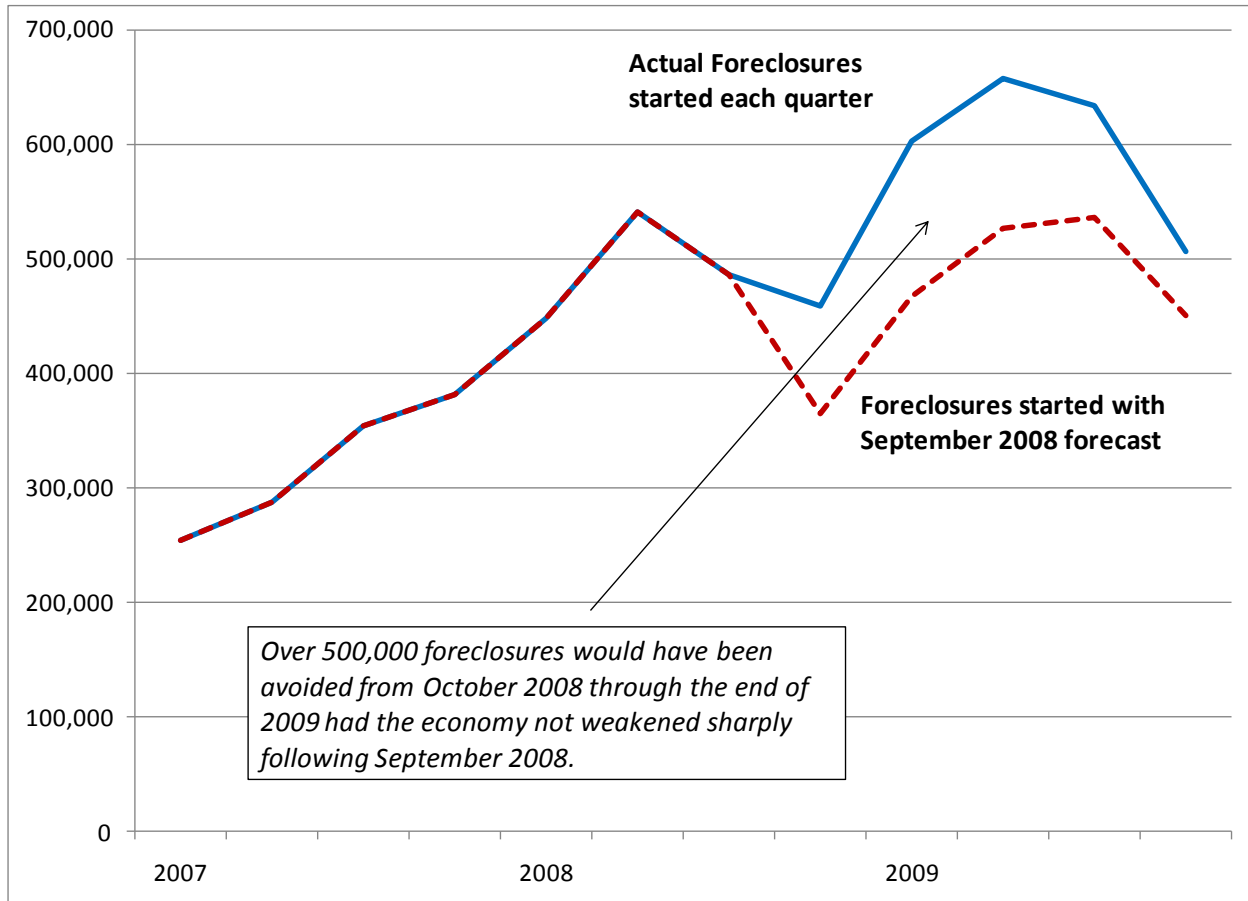
| | Total impact of the crisis | Per Household Loss |
|---------------------------------------|-----------------------------------|---------------------------|
| GDP (total lost income) | \$650 billion | \$5,800 |
| Employment (lost jobs) | 5.5 million jobs | |
| Wages (total lost wages) | \$360 billion | \$3,250 |
| Real estate wealth (July 08-March 09) | \$3.4 trillion | \$30,300 |
| Stock wealth (July 08-March 09) | \$7.4 trillion | \$66,200 |
| Fiscal cost (losses on TARP + GSEs) | \$230 billion | \$2,050 |

The Human Dimension of the Crisis

Beyond dollars and cents, the financial crisis had substantial negative impacts on American families both at present and, likely, for decades to come as the hardships faced by children translate into changed lives into the future. The poverty rate, for example, increased from 9.8 percent in 2007 to 10.3 percent in 2008, meaning that an additional 395,000 families fell into poverty. There is not a simple relationship between economic growth and poverty, and poverty data are not yet available for 2009, but the weaker growth that resulted following the events of September 2008 surely sent thousands of additional families into poverty. And the crisis will have attendant consequences for other economic outcomes including the future prospects for employment and wage growth of those facing long spells of unemployment.

While it is not possible to count all of the ways in which the crisis affects the United States, a glimpse of the human cost of the crisis can be seen in the number of additional foreclosures started as a result of the severe economic downturn that began in September 2008. Millions of foreclosures were already likely even before the acute part of the crisis—the legacy of the housing bubble of these years was that too many American families got into homes that they did not have the financial wherewithal to afford. For other families, however, a lost job as a result of the severe recession translated into a foreclosure, and this can be estimated using a similar methodology as for the economic variables above.

Figure 5: Impact of the Crisis on Foreclosure Starts



With the economy projected to remain weak in the second half of 2008 and into early 2009, and with many people deeply underwater with mortgages far greater than the value of their homes, there would still have been millions of foreclosure proceedings started. But the weaker economy following the acute phase of the crisis worsened the problem, layering the impact of an even weaker economy on top of the already difficult situations faced by many American families on the downside of the housing bubble.

Conclusion

The financial crisis of 2007 to 2010 has had a massive impact on the United States. Millions of American families suffered losses of jobs, incomes, and homes—and the effects of these losses will play out on society for generations to come. This paper quantifies some of these impacts, focusing on the aftermath of September 2008 and attempting to isolate the effects of the crisis from other developments. The result was hundreds of billions of dollars of lost output and lower wages, millions of lost jobs, trillions of dollars of lost wealth, and hundreds of thousands of additional foreclosures.

An alternative perspective would be to look at the overall impacts of the crisis from start to finish. This would be a broad view but a less well defined calculation: one could calculate economic impacts, for example, from the start of the housing bubble or from its peak. Or one could seek to exclude the offsetting impact of monetary and fiscal policy measures taken in response to the crisis and attempt to isolate the impact of the crisis alone.

These are different (and difficult) calculations to make, but some evidence can be garnered on the broader impacts of the crisis from start to finish. The International Monetary Fund, for example, estimates that U.S. banks will take total writedowns of just over \$1 trillion on loans and asset losses from 2007 to 2010, including \$654 billion of losses on loans and \$371 billion of losses on securitized assets such as mortgage-backed securities.

The policy response to the crisis has involved massive fiscal costs, with U.S. public debt up substantially due to lower revenues and higher spending in response to the crisis, and this increase is forecast to continue under current law over the years to come. The declines in output and asset values and increases in U.S. public debt mirror the experience of other countries. As discussed by Reinhart and Rogoff (2009), banking crises across countries lead to an average decline in output of 9 percent, a 7 percentage point increase in the unemployment rate, 50 percent decline in equity prices, 35 percent drop in real home prices, and an average 86 percent increase in public debt.

Figure 1 of this analysis provides evidence connecting the results of this paper to this broader literature. One measure of the overall economic impact of the crisis is the output gap between actual and potential GDP. In 2008 and 2009 combined, this gap comes to \$1.2 trillion, or \$10,500 per household. This is a loss of nearly 5 percent of potential GDP in total over the two years—less than the 9 percent average loss across countries found by Reinhart and Rogoff, but the costs of the crisis calculated in this paper cover only part of the crisis and only through the end of 2009. As shown in Figure 1, GDP looks to remain below potential for years into the future, implying higher overall costs of the crisis.

The financial crisis of the past several years has had a massive economic cost for the United States—trillions of dollars of wealth and output foregone, millions of jobs lost, and many hundreds of thousands of families suffering hardship. These costs demonstrate the importance of taking steps to avoid future crises, and the value of reforms that help achieve this goal.