The Financial Crisis and the Recession: What is Happening and What the Government Should Do

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Highlights

- Low interest rates in the early part of the decade were responsible monetary policy to head off deflation, not an irresponsible contribution to a housing price bubble
- The most important fact about the economy today is the collapse of spending on home building and the resulting recession
- Securitization and other factors separating ownership of mortgages from origination are not an important contributor to the crisis—Britain lacks securitization but has an even worse crisis
- The aggressive response of financial policy seems to have contained the effects of the financial crisis on some key elements of spending, especially plant and equipment investment, through the third quarter this year
- The government is wasting money by not stating a formal guarantee of Fannie Mae's and Freddie Mac's debt
- Proposed and active programs for helping beleaguered homeowners reach only a small fraction of those in trouble and focus on the wrong goals
- The top policy priority is a large stimulus to the overall economy rather than actions aimed just at housing

Introduction

During the remainder of the financial crisis and recession, we plan to update this description of what has happened in the U.S. economy since the crisis began in 2007 and to give a commentary on the events and on actual and recommended policies to deal with financial stress and recession. We provide a lot of relevant data on these topics, with sources. Links in the text are to source information at the back of the document. You can also consult a spreadsheet at our website containing all of the data in this document. We intend the document to be read on a computer, so we make extensive use of internal links that are not available in a printed version.

Summary

Of the 111 million households in the United States, about 76 million own their homes, and of these, just over 50 million have a mortgage. The one-third of families that have no mortgage are mainly those old enough to have lived in one house long enough to pay off their loans.
Because the amount owed on the mortgage loan does not depend on the value of the house, a decline in a house value below the amount of the mortgage has two important effects. First, a family with no remaining home equity may walk away from the house, abandoning the house to the lender instead of making any further payments—although most do not, especially among prime borrowers. If house prices fall and a family decides to abandon its house and loan, the family suffers the loss of equity and the cost of moving to another house. Second, the lender suffers a decline in the value of the mortgage as house prices fall. When a family moves out, either by walking away or because the lender foreclosed and forced the family out, the lender fixes the house up and sells it. The process is costly to the lender, because the foreclosure process takes 6 to 9 months. During that time, the family is effectively no longer the owner of the house and anticipates only a few more months in the house, so the house may suffer from neglect. The lender pays for the fix-up and receives a low price from a distress sale. Even before any of these harmful events are imminent, house-price declines raise the probability of future defaults and lower the value of the mortgage today.

In the past two years, house prices have fallen by at least 5 percent and probably more on the average, and much more in parts of Florida, Arizona, Nevada, and California. Mortgages have declined in value substantially. Financial institutions that borrowed to hold mortgages directly or to hold mortgage-backed securities not guaranteed against default found themselves in trouble. These institutions included not only commercial and savings banks—traditional holders of mortgages—but also investment banks, insurance companies, and the two giant government-sponsored mortgage-owning institutions, Fannie Mae and Freddie Mac. Two large savings banks (IndyMac and Countrywide) and one major investment bank (Lehman Brothers) failed. The government bailed out the largest commercial bank (CitiGroup), one investment bank (Bear Stearns), a huge insurance company (AIG), and Fannie and Freddie. During the period of episodic chaos from August 2007 onward, financial institutions in general—even those not suffering mortgage losses—stopped trusting each other, and credit markets froze. The government stepped in, offering institutions about $1.1 trillion in new liquidity and hundreds of billions of dollars in new capital. Given these remarkable steps, credit markets began to function again. Declining house prices caused a financial crisis that could only be relieved by aggressive government action.

The other big response to declining house prices was a collapse of house-building. From the beginning of 2006 to the fall of 2008, spending on house construction fell by $350 billion, a huge hit to the overall economy. Total employment began to fall at the beginning of 2008, and by the middle of the year it was apparent that the economy was in recession. All current signs are that output and employment are falling rapidly now and will continue to fall until perhaps the middle of 2009. The recession may be the worst of the past 60 years. Values in the stock market have fallen in half, an extreme reaction to lowered expectations of profits.

The policy response to the financial crisis focused first on providing liquidity—the Fed and other arms of the government made loans to financial institutions secured by mortgages, making up for
the dysfunction of normal mark
et for such loans. After seeing that additional liquidity was not
enough to repair trust among financial institutions, the government provided capital as well. The
federal government has injected capital into commercial banks, an insurance company, and
Fannie and Freddie. These moves have kept the financial crisis under control, in great contrast to
the crisis of 1929 to 1933, when the financial system collapsed for lack of suitable government
action.

On the macro side, there is a strong case for a broad stimulus that would take effect quickly and
remain in effect just long enough to get the economy on its feet. Not only would the stimulus
help restore full employment and offset the recession, but it would help lift house prices and the
condition of institutions holding mortgages, and thus contribute to ending the financial crisis.
Two types of broad stimulus are under consideration in the new administration—tax cuts to
improve consumer purchasing power and government spending on infrastructure. Both have the
defect of failing to concentrate their effects when stimulus is most needed—in the coming six
months. Consumers tend to save a substantial fraction of tax cuts, thus deferring their spending
increases until later years. Infrastructure investments take time to launch and they tend to have
the character of pork-barrel spending. We propose types of tax cuts that include powerful
incentives for immediate increases in consumer spending and in employment.

The immediate focus of new policy in the financial area is relief for homeowners facing
foreclosure. Lenders, with a lot of pressure and some assistance from government, are modifying
mortgages to keep families in their existing homes. More than half of homes with defaulted
mortgages are beyond the reach of these programs because (1) they are owned by investors, not
occupants, (2) the default is a repetition of an earlier default (a subprime borrower defaulted on a
loan, got the mortgage re-financed, and is defaulting for the second time), or (3) the owners have
already walked away. The main support that the government has offered so far is to guarantee
modified mortgages so that the government, not the lender, bears the cost of a default after
modification. Subsidizing defaults will do some additional damage, as a good policy would
discourage defaults, not subsidize them. Another questionable policy is a moratorium on
foreclosures. Houses deteriorate rapidly when occupied by people who think they are going to be
evicted. Policies that do not encourage true home ownership, where occupants have full
incentives to take care of the houses they live in, risk additional deterioration to the housing
stock. Nonetheless, several states have adopted moratoriums and there is talk of a long
moratorium imposed by the federal government. The logic for helping borrowers who are in
trouble is that they were often deceived or manipulated by those lending and selling to them.
Policy needs to respond to this concern in a way that does not cause unnecessary further decline
in housing values. Looking to the future, the government needs to reform the mortgage process
so that borrowers have much better understanding of the initial and especially future obligations
they are taking on.

Many observers believe that securitization and the general pattern of the separation of origination
of mortgages from their ultimate ownership was an important source of financial instability.
According to this view, mortgage brokers and other originators had no concern about the quality of the loans and the truthfulness of the applications supporting them, because they passed the loans on to investors in mortgage-backed securities. Many experts have called for reforms to limit securitization and require originators to retain some interest in the loans they originate. We disagree on the diagnosis and question the wisdom and effectiveness of such a reform. One crucial piece of evidence is that Britain has had a mortgage-led financial meltdown even more destructive than ours, but securitizes few of its mortgages. The fact that the majority of British mortgages are held by their originators did not save the country from a financial disaster.

The Housing Market in This Decade

The boom-bust cycle in housing is the cause of both the financial crisis and the recession. While contractions in home building have been serious in several recessions in the past 60 years, the current recession is the only one in which the bursting of a house price bubble led to falling home prices, defaulting borrowers, and the decline in homebuilding that is a major cause of the recession. We start with a review of the mortgage market that provides the borrowed funds that most people use to buy houses.

Mortgage Finance

Mortgages are important in both the owner-occupied and the landlord-owned sectors. About 50 million of the nation’s 76 million home-owning families have mortgages. The great majority of rental properties also have mortgages. The most common form of mortgage commits the household to make equal monthly payments for 30 years, though most of these mortgages pay off within 10 years because the household sells the property or refinances the mortgage. Interest rates on 30-year fixed mortgages for borrowers with prime credit ratings were in the range of 5.75 to 8 percent throughout the current decade. The principal amount of a mortgage as fraction of the value of a house—the loan-to-value ratio—could be close to 100 percent during the boom years. Further, borrowers without verifiable incomes could borrow at slightly higher rates in the alt-A segment of the mortgage market and those with poor credit ratings in the subprime segment, sometimes at much higher rates.

Over recent decades, the mortgage market moved from its traditional model to become increasingly organized as a network of independent organizations linked by contracts. Under the traditional model, a borrower applied to a bank and, if approved, received money from the bank and made payments to the bank, which held the mortgage as an asset. In the most elaborate form of the new model, the borrower applies to a mortgage broker, receives money from a wholesale lender, and makes payments to a servicer. The servicer passes on each payment to a master servicer, who pays it out to holders of a mortgage-backed security (MBS), who pass it on again to the administrator of a collateralized debt obligation (CDO), who passes it on to investors in the CDO. Every variant of this model is important: Many mortgages, particularly adjustable-rate mortgages (ARMs) and jumbo mortgages (those for more than about $500,000), are held by originating lenders. In the conventional market, a large fraction of originated loans are
securitized as MBSs and held by financial institutions, often their originators, without becoming part of more complex securities.

Recent years have seen great improvements in data, especially the introduction of credit scores, which gave lenders new powers to forecast mortgage defaults and to adjust interest rates offered to prospective borrowers. In 1990, credit scores were rare; by 1996, they were standard. From credit scores, lenders learned that past behavior in the credit market was at least as powerful in predicting defaults as was loan-to-value ratio. Statistical models of defaults, based on information about borrowers and properties, have made it possible to estimate the premium over ordinary interest rates that it would take to cover the higher default rates of subprime borrowers. These models pay particular attention to the likelihood of price declines for the property securing the mortgage. Defaults are expensive to lenders in two ways: First, because borrowers seldom default unless the property is worth less than the remaining loan balance, and second, because a defaulting homeowner lives rent-free in the home for up to a year and often allows the property to deteriorate. When the lender is finally able to sell a house in foreclosure, the selling price is 10 to 25 percent lower than it would have been at the same time for the same house, with a voluntary sale rather than a foreclosure. (source) Typical total losses to lenders on foreclosed loans, from both the decline in value that caused the default and the extra loss from neglect during foreclosure are 30 to 35 percent. Default probabilities are a primary concern of investors who hold subprime MBSs. The lenders’ ability to set terms for mortgages that appeared to cover the higher default cost of subprime loans expanded the population eligible to borrow. Actual defaults on subprime mortgages from the middle of the decade have been far in excess of projections, not because of any misunderstanding of the behavior of subprime borrowers given house price changes, but because the price changes were so unexpectedly negative.

**Fannie and Freddie**

Fannie Mae and Freddie Mac are quasi-governmental companies, now under federal conservatorship, that perform two roles in the mortgage market, both on huge scales. First, they securitize prime mortgages, forming MBSs for sale to investors, all of which they guarantee against default risk in exchange for a guarantee fee. All loans securitized by Fannie or Freddie must have loan-to-value ratios of 80 percent or less or carry mortgage insurance for losses for the exposure to loss above 80 percent of LTV. On Fannie and Freddie MBSs, investors bear the interest rate risk of early payments (if interest rates fall) or extended durations (if interest rates rise), while Fannie and Freddie take on the credit risk. Second, Fannie and Freddie hold whole loans, MBSs, and pieces of MBSs in their portfolios. Their charters preclude them from securitizing or buying individual subprime loans, so their subprime exposure comes only from their holdings of subprime MBSs securitized by others, often called Private Label Securities (PLS).

To finance their portfolio holdings, Fannie and Freddie borrow in the bond market. Even prior to the financial crisis, Fannie and Freddie were widely thought to enjoy the backing of the federal government. Though the Treasury has declared that Fannie and Freddie are implicitly guaranteed
by the U.S., no government authority has declared that there is an explicit guarantee, and their borrowing costs are farther above the corresponding interest rates that the U.S. Treasury pays than prior to the emergence of the crisis or Treasury’s declaration of an implicit guarantee.

Fannie and Freddie’s size has generated intense controversy and opposition. Together they hold about $1.7 trillion dollars worth of mortgages in their portfolios, including $175 billion in subprime and Alt-A (loans to borrowers with good credit scores but little documentation of income) loans (total $50 billion for Fannie, $125 billion for Freddie). Together they have guaranteed another $3.6 trillion in prime mortgages behind MBSs held by others. Combining their portfolios and MBSs, the two stand behind $5.6 trillion in mortgages. The two companies have operated with slender capital for many years—that is, the amount they owe on their debt is only slightly below the value of the mortgages they own. As of the third quarter of 2008, Freddie Mac’s book equity (assets minus liabilities) was negative, and Fannie’s was slightly positive. (sources)

When Fannie and Freddie were taken into conservatorship, both were asked to issue preferred stock to the U.S. Treasury in exchange for the Treasury’s promise of support. So far, the Treasury has not injected any funds into Fannie or Freddie, but an injection for Freddie may not be far off given Freddie’s negative book equity as of the third quarter of 2008.

**MBSs**

Nearly all of the MBSs issued by Fannie and Freddie are backed by 30-year fixed-rate mortgages. All Fannie and Freddie MBS are guaranteed against default risk, but investors bear the interest rate and prepayment risk. Most of these MBS are held by institutions that are under the Federal umbrella (banks, thrifts, and Fannie and Freddie) in the U.S.. Freddie’s and Fannie’s bonds are held in substantial quantities by foreign investors, but not their MBSs.

MBSs issued by institutions other than Fannie and Freddie do not have a blanket guarantee against default. For private-label MBSs, holders bear the default risk. Many potential investors for private-label MBS can only hold AAA-rated securities. The securitization industry accommodated them by slicing pools of mortgages into tranches. Tranches that had the first claim on the cash flowing from the mortgages were rated AAA because of the high likelihood of repayment, while tranches whose repayment had lower priority had lower credit ratings. Hedge funds and other unconstrained investors, including the investment banks that created the MBS, held these lower-quality “toxic-waste” tranches.

**Interest Rates and Inflation**

Coming out of the recession of 2001, both interest rates and inflation were low—see Figure 1. The two went together. The Fed used low rates to stimulate the economy to keep inflation from going negative. Deflation was a prime concern of monetary policy because, once inflation becomes established at a negative rate, monetary policy loses its expansionary power. The Fed struggled successfully to avoid the deflation trap in 2002. Except for the food and oil bulge in the first half of 2008, the Fed has kept inflation at the desirable level of around two percent
throughout the decade. Like other successful central banks, the Fed has dedicated its interest-rate policy to the single objective of stabilizing inflation at a low positive level, a policy that has the healthy side effect of calling for stimulus in recessions and moderation in booms.

![Rate of Inflation and Rate of Interest, 2000 to 2008.](image)

**Figure 1. Rate of Inflation and Rate of Interest, 2000 to 2008.** Sources

As in the 1990s, when critics thought the Fed should compromise inflation performance by discouraging the stock-market boom, many pundits believe that the Fed made a huge mistake by stimulating a housing boom with its policy of low interest rates. In our view, this critique is
badly mistaken: Had the Fed pursued a high-interest policy in the late 1990s to cool off the stock market, deflation would certainly have occurred, creating an intractable problem. Similarly, the economy would have slipped into deflation again in 2002 under a higher-interest policy attempting to head off a housing bubble. Mark Gertler made this point a while ago (link). Monetary economists who respect the success of the Fed and other central banks in delivering stable low inflation are lonely voices challenging the consensus that the Fed should have used higher interest rates to keep house prices under control.

House Prices

Figure 2 shows the FHFA (formerly OFHEO) index of house values, the best—but still far from satisfactory—measure of national house prices. Prices rose rapidly in the middle of the decade and began to decline in 2007. As of today, they are still falling. The decline in house prices is by far the most important fact lying behind the financial crisis and recession.

![Figure 2: Index of House Prices, 2000 to 2008. Sources](source)

The creation of an index of house prices is a huge challenge. One approach uses the average of the prices of houses that sell in a given market in a given month. This approach is way too sensitive to the mix of houses that sell. If mostly cheap houses turn over, the measure will show a false decline. In principle, the repeat-sales approach takes care of the problem. This approach infers the trend in prices from, say, April 2002 to September 2008, from data on houses that sold on the first date and again on the second date. Using a statistical procedure, the approach blends data from millions of pairs buying and selling prices for individual houses to infer the overall trend of prices. Because the approach always compares the prices of the same house, it seems to be free from mix effects. Unfortunately, using the same house does not fully standardize and avoid mix problems. The biggest issue is foreclosures. As we mentioned earlier, houses lose value at high rates during the months a house is in foreclosure. Because the houses sold in 2008
were disproportionately distress sales from foreclosures, a big mix effect depresses the index if foreclosure transactions are treated just like any other house sale.

The S&P Case-Shiller house price index includes foreclosed houses and shows a tremendous decline in national average prices—see Figure 3. The FHFA index in Figure 2 excludes foreclosed houses and shows a smaller decline, 12 percent for the nationwide index from its peak in the April 2007 to October 2008. Another important difference between the Case-Shiller index and the FHFB index is that FHFB includes transactions on all houses with values under the conforming loan limit (except for foreclosure transactions), while Case-Shiller tracks prices on all houses in 20 cities (those with more volatile than average prices). The truth lies somewhere between the two indexes. An index computed by Fannie Mae shows nationwide house prices down 10 percent from their high in 2006 as of September 2008, and forecasts that the entire decline, including the 10 percent so far, before house prices stabilize will be 15 to 19 percent. (source)

Figure 3: S&P-Case-Shiller Index of Home Prices, 2000-2008. Source

Despite the problems in measuring house prices, the basic picture is clear. House prices rose gently from 1990 to 2003, then rapidly until 2006 or 2007, and then turned downward. National house prices had not fallen in any significant or prolonged way in the previous 40 years. The belief that average prices tended upward became deeply ingrained in common thinking about the economics of housing and mortgages. Homeowners made decisions about how much house to buy and how large a mortgage to carry on the presumption of appreciation. Lenders evaluated borrowers and offered them interest rates based on the belief that nationwide housing price declines were unlikely but not impossible.

Subprime

Prior to 1980 there were no subprime mortgages because usury laws precluded charging enough interest to cover default losses on them. Even after the law was changed, subprime lending was
negligible until lenders began analyzing credit scores in the 1990s. From 1993 through 2003, new subprime loans averaged less than 10 percent of all new loans. In 2004, subprime loans were 28 percent of new loans, then 36 percent in 2005, and 40 percent in 2006. Subprime lenders, based on their experience in the previous decade, assumed that borrowers would take a new mortgage within two or three years, based on a lower loan-to-value ratio as the home appreciated and borrowers’ credit improved or that the borrower would sell the house.

**Homebuilding**

Construction of new houses boomed during the years from 2003 to 2006. Low interest rates, rising incomes, the expectation of capital gains from ownership, and cheap mortgages increased the demand for new houses. Builders responded accordingly. Figure 4 shows the volume of construction of new houses, condominiums, and rental units over the decade.

![Figure 4. Index of Residential Construction from the National Income and Product Accounts, 2000-2008. Source](image)

**The Financial Crisis**

**Signs of Stress**

In normal times, banks and bank-like financial institutions can all borrow at close to the same rates, because lenders have complete confidence of repayment. Interest rates for lending to these institutions are not far above rate for the soundest borrower of all, the U.S. federal government. Lending rates are sensitive indicators of stress. The spreads between bank lending rates and rates for the government are widely watched metrics of financial conditions. One measure of bank lending rates is the effective federal funds rate, reflecting the rates that smaller U.S. banks pay.
Another is the London Interbank Offered Rate, or LIBOR, reflecting the rates that large international money-center banks pay for dollar-denominated loans. Figure 5 shows the spreads between those rates and the Treasury bill rate. Prior to the summer of 2007, the two spreads were low and moved together. Banks could borrow at essentially the same rates as the federal government. Lenders made little distinction between large and small banks.

In August 2007, both spreads widened substantially. Lenders distrusted banks, especially big banks. The spread for small banks fell back to almost its normal level in the spring of 2008 while the big-bank spread remained about half a percentage point higher than normal. Then in September, the big-bank spread jumped to an alarming level, while the small-bank spread rose only moderately. These movements trace out the key events in the crisis to date. These spreads will remain useful indicators of financial stress as the financial crisis plays out in future months.

![Figure 5. Spreads between Bank Borrowing Rates and the Federal Government’s Borrowing Rate, 2001 to 2008. Sources](image)

**Early Effects of Declining Values of Mortgages**

Most experts believe that the cause of the financial crisis was the decline in value of mortgages and the claims on mortgages, MBSs and CDOs. Declines occurred in many countries, including those like Britain where financial institutions held most mortgages directly and securitization of mortgages was rare. Concern about potential losses on low-credit-quality mortgages values began in 2005 and intensified in 2006. The first significant indication of stress in banks showed in the summer of 2007. On August 7, 2007, hedge funds holding mortgage instruments began
forced selling of assets to meet the demands of lenders concerned about the ability of the hedge funds to repay their loans—the banks and other lenders required that the hedge funds post cash which they could obtain only by selling assets. The financial crisis began that day.

**Runs on Financial Institutions**

Some financial institutions borrow with a promise to repay the moment the lender wants the money back. In banks, these are called demand deposits, but non-bank institutions also borrow in this way. In particular, investment banks borrowed large sums from hedge funds and other investors under demand arrangements. These arrangements invite instability—if the lenders have any doubt at all about the ability of the borrower to repay, they will immediately exercise their rights to be repaid. Hedge funds withdrew large amounts of money from investment banks when those banks were under suspicion. Another important type of borrowing with similar instability is overnight credit. Most of the time, overnight lenders will extend or roll the lending for another day, but if they have any doubt about repayment, they decline to roll and the borrower must repay. Lehman collapsed when its lenders refused to roll over its overnight borrowings.

When word gets about that an institution may not be able to meet all of its short-term obligations to repay demand and overnight borrowing, the lenders will rush to collect whatever they can before the available funds go to another lender ahead in line. When the lenders are individuals with deposits in banks, they literally form a line outside the bank to try to recover their money. A run on a financial institution occurs if the institution cannot convince its creditors that it is capable of paying them all back.

In late 2007, the Federal Reserve became concerned that banks might face withdrawals that they could not meet from holdings of cash and readily saleable securities such as Treasury debt. Normally, banks would be able to sell other assets to meet withdrawals, but the purchasers of those assets, especially the mortgage instruments held in large volumes by banks, were only offering prices well below what those assets appeared to be worth. Banks faced the prospect of losing large amounts of value from forced sales of assets. The Fed diagnosed the problem as a lack of liquidity. In normal times, with normal liquidity, buyers will offer prices for immediate purchases that are essentially the same as those that the seller might find later, or the value they could achieve by holding assets to maturity. When liquidity is scarce, fire-sale prices fall below those longer-term prices.

To add liquidity to the market for the assets that financial institutions needed to sell, the Fed launched what became a huge expansion of its normally small programs for lending against those assets. Figure 6 shows the major components of the Fed’s balance sheet in recent years. Some things have remained the same—contrary to the many claims that the Fed has been printing money like crazy in the past few months, the amount of currency in circulation has risen only slightly more than normal. The really big change is the expansion in the Fed’s ownership of assets other than in the traditional form of Treasury securities. The Fed has increased its holdings of non-Treasury assets by about $1.7 trillion. Some of the assets are loans to banks and other financial organizations secured by financial assets and others are direct holdings of financial
claims. The Fed has bought up financial assets because investors appeared to be shunning them. The Fed feared the consequences of attempts to sell these assets in markets without buyers who valued them.

The Fed financed these investments by selling about $300 billion of Treasury securities it owned and by borrowing huge amounts from the Treasury (currently about $400 billion in deposits from the Treasury at the Fed) and from banks, in the form of vastly expanded reserves (almost $800 billion at yearend). Reserves are just another form of borrowing at this point and have no special role in the monetary system. The reason that many commentators have mistakenly thought that the Fed was printing money was that reserves used to function like money, under previous monetary institutions.

![Federal Reserve Assets and Liabilities](image)

**Figure 6. Federal Reserve Assets and Liabilities.** [Source](image)

The first major event in the financial crisis was a run on Bear Stearns in March 2008. Though many experts believe that the company was solvent, in the sense that the value of its assets in a non-fire-sale situation would more than pay off its debts, it faced a run. Bear Stearns was not a commercial bank with ordinary depositors, but a large fraction of its debts rolled over every day or faced repayment on demand. The Federal Reserve went beyond providing liquidity for the
first time when arranging for Bear Stearns to meet its short-run obligations—the Fed purchased mortgage-backed assets as part of a deal that put the company in the hands of J.P. Morgan Chase. In July 2008, a large savings bank, IndyMac, faced a classic bank run from its depositors. The federal government stepped in and made good on its deposit insurance, a step that cost the taxpayers about $6 billion.

Figure 5 shows that bank borrowing spreads fell after March 2008. The crisis came roaring back in September when the big-bank spread spiked. Runs on a number of key financial institutions struck in September and October.

Early in September, Fannie and Freddie encountered growing troubles, borrowing to continue to hold their large portfolios of MBSs. The federal government placed them in conservatorship, a limbo that provided some relief from their borrowing problems, though the spread they pay over the Treasury’s rock-bottom borrowing rate continued to rise. The conservatorship did not include any explicit promise that the government would make good on Fannie and Freddie’s debts. The action perplexed many economists, because when the government does make good on the debts, the holders of the high-interest bonds, now equivalent to Treasury bonds, will make substantial capital gains. The U.S. Treasury’s obligation to Freddie and Fannie’s bondholders, if it comes to pass that it must pay them, will be larger because the Treasury was not more forceful in assuring investors that it does stand behind their bonds.

Lehman Brothers, an investment bank, was unable to roll over large amounts of overnight borrowing. Though its situation was similar to Bear Stearns’s, the government did not bail Lehman out. Its failure intensified the crisis. The big-bank borrowing spread reached an all-time high the day after Lehman failed. Lenders had grave concerns about the ability of many financial institutions to meet their obligations, at least in part because they were not sure which institutions were holding Lehman debts.

The same week, the giant insurance company AIG faced another type of stress akin to a run. We discuss AIG in detail later in the paper (here). AIG was unable to come up with enough cash in time. The federal government took control of AIG and became its major stockholder.

At the same time, two major banks came under attack. The government took over Washington Mutual, one of the largest mortgage lenders, under the threat of a failure to meet its obligations to depositors. Wells Fargo, a sound bank, bought Wachovia Bank, which was in potential similar trouble.

As the crisis advanced, it became apparent that many financial institutions lacked not just liquidity, but capital. Capital is the difference between the value of an institution’s assets and the amount the institution owes its creditors. A capital shortfall arises when an institution suffers permanent losses in asset values, while a liquidity problem arises when the assets retain their permanent value but have diminished value in an immediate sale. The Fed’s policies before September 2008 focused mainly on restoring liquidity by lending on assets. The owners of the assets still bore the burden of longer-run declines in the value of the assets.
In late November, the largest commercial bank, CitiGroup, came under suspicion for lack of capital. Its value in the stock market fell to a low level. The government made a complicated deal to stabilize the bank, with injections of capital and guarantees of the values of its assets shared by a number of federal agencies.

**The TARP**

The Troubled Assets Relief Program, or TARP, plans to recapitalize a range of financial institutions. It has invested in banks, AIG, and General Motors for a total of $178 billion so far (data). The investment is mainly in the form of a quasi-permanent loan. For example, the Bank of America received $25 billion, for which it pays 5 percent interest for the next 5 years and then 9 percent over the indefinite future. B of A has the right to repay the loan under certain favorable conditions and also has the right to defer the payments, so long as it is not paying dividends. The Treasury also received an option to buy some stock in AIG. An expert estimate of the value the Treasury received for its $125 billion of initial bank investment is about $100 billion (Zingales). Because the institutions receiving TARP money do not have to pay it back until convenient, it adds to their capital cushion. The added capital makes them more willing to lend, by reducing their fears of inability to meet their obligations should asset prices decline.

Though the TARP was intended to recapitalize financial institutions, one non-financial company, General Motors, has a TARP injection. Presumably others are to follow.

**Lending to Consumers**

Consumers borrow from financial institutions in three main ways: mortgages, including home equity loans, credit-card balances, and car loans. The financial crisis has affected all three adversely, though in most cases not as seriously as one might think from dire accounts in the financial press.

For mortgages, the best measure of the effect of the crisis is the increase in mortgage interest rates. The appropriate benchmark here is the 10-year Treasury bond interest rate, because the average 30-year mortgage pays off in about 10 years. The rate on fixed-rate, prime 30-year mortgages was normally about 1.5 percentage points above the Treasury rate, reflecting two factors that make mortgages less desirable than Treasury bonds to investors: even prime borrowers sometimes default, and borrowers tend to pay off mortgages early if interest rates fall, a step the Treasury has committed not to take. As a result of the decline in house prices and the resulting financial crisis, the spread has risen to about 2.3 percent. (data) Spreads for jumbo, alt-A, and subprime mortgages have risen substantially more.

Observers believe that standards for mortgage approval have tightened as well, though we lack metrics in this area. Lenders require more documentation and are less likely to approve applications. Except by government-affiliated organizations, the securitization of mortgages has essentially ceased.
One of the Fed’s new investments is in the debt of Fannie and Freddie. By supporting the market for their debt, the Fed has reduced their borrowing costs. The reduction has passed on to borrowers eligible for loans guaranteed by Fannie and Freddie. Mortgage rates have fallen recently both because interest rates in general are lower and because the premium for mortgages has fallen, thanks to the Fed’s action.

Almost no useful information about interest rates or lending volumes is available from public sources about car loans and credit cards. Again, observers believe, without reference to any systematic data, that both types of lending have tightened, with higher interest-rate spreads and stiffer standards.

**Lending to Business**

A recent debate broke out between a group of Minneapolis economists (paper) and two groups of Boston economists (papers) about the behavior of bank-lending to business. The middle ground seems to be that bank-lending to business has grown normally during the crisis, but the composition of the lending has shifted—more occurs because businesses are drawing on previously established lines of credit and less from new lending relationships. The implications of the shift are not yet clear. The financial press reports with one voice that banks have stopped lending altogether, but that is clearly not the case. For example, numerous articles have reported that debtor-in-possession financing is totally unavailable, but Circuit City obtained $1.1 billion following its recent bankruptcy from a group of banks led by the Bank of America.

**Inflation**

Many economists have become concerned that the Fed’s huge expansion of liquidity amounts to a monetary expansion that will lead to an explosion of inflation. We believe that this concern is totally misplaced, but the explanation is a bit complicated. Perhaps the best evidence against the view is that the consensus among forecasters calls for inflation in the coming year to be low, around 1.5 percent, not explosive. Inflation was negative in August, September, October, and especially November of 2008, as oil and food prices slid back from high levels earlier in the year. According to widespread reports, consumers paid remarkably lower prices toward the end of the Christmas season.

If the Fed wants to stimulate inflation—as it did when deflation threatened in 2002—it buys Treasury securities from financial institutions and pays for the securities by increasing balances in banks’ reserve accounts at the Fed. Banks generally prefer not to hold reserves above a fairly low level. Until recently, the reason was that reserves paid no interest. Now the Fed pays interest on reserves, but at rates below what banks can earn on their money by, for example, lending to other banks. As banks trade away from their excess reserves, they bid down interest rates, simulate economic activity, tighten markets for goods and services, and drive up inflation. The Fed keeps inflation on track by adjusting reserves. Because reserves fluctuate for many reasons, the Fed—and almost all other central banks—keeps its eye on the interbank lending rate rather than the quantity of reserves. The Fed lowers the rate if it thinks inflation is below target and
raises the rate when it is above target. This feedback approach has delivered reasonably stable inflation for the past 25 years.

A liquidity expansion is different from a monetary expansion. In a liquidity expansion, the Fed sells Treasury securities and uses the proceeds to buy assets from financial institutions. No change in reserves occurs directly from this step. In a monetary expansion, the Fed buys Treasury securities and issues new reserves, thus expanding the volume of reserves outstanding. In normal times, when most financial assets are safe and trusted, a liquidity expansion would have almost no visible effect. During a financial crisis, a liquidity expansion drives down the elevated spread between non-government financial assets and Treasury securities.

The purpose of a liquidity expansion is to save the economy from the consequences of a financial meltdown, which otherwise would lead to diminished economic activity with the side effect of lower inflation or even serious deflation, as occurred in the Great Depression. But a liquidity expansion will not lead to inflation if no monetary expansion occurs. Rather, as it gains its desired effect of restoring normal conditions, its effect on the economy disappears—a liquidity expansion can save the economy from deflation but cannot ignite inflation. Only bad monetary policy can cause inflation. There are no indications today that the Fed will depart from its 25-year policy of using monetary policy to keep inflation at low levels.

The Recession

Now we turn to conditions in the broad economy. The economy is in recession, with declining spending by consumers and homebuilders and rising unemployment. We will examine the categories of spending and comment on evidence about the causes of changes over the past year, as the recession unfolded. The National Bureau of Economic Research confirmed on December 1 that recession is definitely underway. It began a year ago, in December 2007.

Figure 7 shows consumer spending on durables—cars, furniture, and the like—adjusted for price declines. Spending stopped growing in mid-2007 and plunged in the summer of 2008. The plunge followed steep gas price increases and the financial stress of the spring. Most of the drop was in motor vehicle sales. Financial stress appears to have had a role in the collapse of car sales, but it would be hard to separate it from the adverse effects of higher gas prices. Notice that the volume of purchases rose in November—widespread reports of declining spending were based on the dollar amounts, which declined substantially, but did not consider the reductions in prices people were paying. Figure 8 shows consumer spending in other categories—services and nondurable goods. Only a modest overall decline is visible, but this part of consumer spending is so much bigger than durables spending that the decline is actually larger in dollar terms. Declines in this type of spending, which includes large stable items such as health, have been rare over the past 60 years. The decline indicates a serious recession. Again, however, the volume of purchases rose in the last reported month, November.
Figure 7. Spending on Cars, Furniture, and Other Consumer Durables, Adjusted for Price Declines. Source

Figure 8. Consumer Spending on Non-Durables and Services, Adjusted for Price Declines. Source

Figure 4 showed the most spectacular decline in spending, that for new houses. Residential investment was in free fall for the entire period. The decline of $250 billion (inflation-adjusted dollars of 2000) is by far the biggest negative influence on spending. Financial stress had something to do with the decline, later in the period—the spread of mortgage interest rates over
10-year Treasury bonds rose substantially. But it would appear that most of the decline was the result of the boom-bust cycle in housing and not its later financial repercussions.

Figure 9 shows quarterly data on investment in plant and equipment. There is no sign that any of the adverse factors have yet influenced this component, though forecasters believe it is falling substantially now and will continue to fall in 2009.

![Figure 9. Business Spending on Plant and Equipment, Adjusted for Inflation. Source](image-url)

Figure 10 shows net exports, the difference between exports and imports. The economy received enough stimulus from net exports in the period from 2006 to 2008 to offset all of the adverse effect of declining homebuilding. Imports fell and exports rose by roughly equal amounts. This stimulus is unlikely to continue. A factor driving the rise was the weakness of the dollar, which raised the price of imports to Americans and lowered the price of exports to customers in other countries. The dollar has risen in relation to European currencies in recent months. Further, many countries that are important purchasers of American exports are already in recession, ahead of and deeper than the U.S. recession. The financial crisis has generally been deeper in Europe, including Britain, than in the U.S. In a number of European countries, house price declines appear to be larger than here. Not only has the European recession cut spending on American products, but it is also responsible for the rise in the dollar.
Figure 10. Net Exports Adjusted for Inflation. Source (current to November 25, 2008)

The combined effect of the collapse of homebuilding and declines in consumer spending have just offset the favorable effect of higher net exports, as of the most current data on the components of spending. Total spending on domestically produced goods, as measured by real GDP, was constant between the second and third quarters of 2008, after growing slowly earlier in the year. But productivity advanced throughout the year. As a result, employment has fallen substantially, as shown in Figure 11. By the employment measure, the economy has been in recession since the beginning of 2008. The decline from the peak in December 2007 is now 1.2 million workers. To sustain full employment over that period, employment would need to have risen by about one million workers. Unemployment is up sharply because of the shortfall in employment.
Figure 11. Employment, Thousands of Workers on Payrolls. Source.

Table 1 shows estimates of components of spending in the third quarter of 2008 relative to trend. A positive number means that the component grew faster than normal from the first quarter of 2006 to the third quarter of 2008 and negative number indicates a shortfall. By far the biggest negative factor in the table is the $351 billion decline in residential construction. Thus the housing cycle is the dominant factor in the decline—the $351 billion shortfall in housing is bigger than the total decline in GDP of $313 billion. The other big negative factor is consumer spending. Durables fell because of high gas prices and declining furniture purchases with the collapse of the expansion of the stock of houses. Other consumer spending declined relative to trend for a variety of reasons, including the diminished ability of consumers to borrow from home equity. An important fact about the economy in the early fall of 2008 was the absence of any shortfall in spending on plant and equipment—despite the adverse effect of any part of the financial crisis not offset by aggressive policy, businesses continued to buy new capital goods on a normal track. The growth of exports and decline in imports both provided a major offset to the negative effects from consumer spending and homebuilding. Inventory investment fell off by $107 billion. Government remained right on trend, to nobody’s surprise.
### Table 1. Spending Components Relative to Trend, Third Quarter, 2008 (see spreadsheet)

<table>
<thead>
<tr>
<th>Component</th>
<th>Excess over trend (billions of dollars)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Consumer durables</td>
<td>-85</td>
</tr>
<tr>
<td>Consumer non-durables and services</td>
<td>-190</td>
</tr>
<tr>
<td>Residential construction</td>
<td>-339</td>
</tr>
<tr>
<td>Plant and equipment</td>
<td>8</td>
</tr>
<tr>
<td>Inventories</td>
<td>-94</td>
</tr>
<tr>
<td>Imports</td>
<td>166</td>
</tr>
<tr>
<td>Exports</td>
<td>224</td>
</tr>
<tr>
<td>Government</td>
<td>-3</td>
</tr>
<tr>
<td>Real GDP (sum)</td>
<td>-306</td>
</tr>
</tbody>
</table>

We believe that the most important negative influence on the U.S. economy today is the collapse of housing construction. Other influences are higher gas prices, which contributed to the decline in motor-vehicle purchases, and the financial stress that occurred despite the government’s aggressive efforts to preserve a functioning financial system. Nothing here answers the counterfactual of how the economy would have evolved if the government had not thrown in 1.5 trillion dollars of support.

### The Outlook

Forecasters expect a substantial contraction of the economy in the current quarter, continuing less ferociously in the first half of 2009 (sources). Specifically, real GDP will decline by 2 to 4 percent at annual rates (that is to say, an actual decline of 0.5 to 1 percent) in the fourth quarter, with smaller declines in the first two quarters of 2009. Real GDP for all of 2009 is forecast to decline about one percent from its 2008 level. These forecasts would make the recession one of the worst since the Great Depression. The forecasts show a recovery beginning in the second half of 2009.

### Immediate Policy

#### Financial Bailouts

The Treasury currently has $330 billion in TARP authorization, of which $185 billion is in the hands of banks and AIG, another $125 billion is committed to bank capital infusions, and $60
billion is uncommitted. The Treasury may draw another $350 billion subject to approval from Congress.

Further contributions of capital to Fannie and Freddie are likely. The Treasury has authority separate from TARP to inject capital as needed to stave off bankruptcy. We are not aware of independent expert valuations of the government’s investments in Fannie and Freddie.

**Non-Financial Bailouts**

The $390 billion remaining in the total TARP limit of $750 billion is a tempting target for favored industries seeking federal support. In retrospect it was plainly an error to adopt the high total, as it creates the impression that the funds are available and need to be spent. In fact, federal borrowing pays for all of TARP and any other increases in federal outlays and any shortfall of repayments form institutions that have borrowed from the Fed or Treasury will be repaid from higher future taxes.

The leading favored industry is autos, where all three American brands have suffered large declines in sales, and organized labor is joining forces with industry lobbyists to push for TARP or other injections of federal aid. So far their requests have been fruitless.

State and local governments are also asserting claims on bailout money. Many states have highly progressive state income taxes that generate large amounts of revenue from the top one percent of taxpayers. Much of the revenue comes from capital gains taxation and so has fallen dramatically with the collapse of the stock market. Most states are also dependent on sales taxes, where declines in consumption have eroded revenue. State and local governments are clamoring to use TARP or other bailout funds to avoid painful tax increases, spending cuts, or borrowing.

The response to widespread pleas for federal bailout money is one of the tough issues that the Obama administration will decide in its first month in power.

**Aid to Beleaguered Homeowners**

More homeowners are strained to meet their mortgage obligations today than in normal times. Unemployment is above normal. Some homeowners signed up for mortgages that were financially unrealistic from the start and others for mortgages with increasing payments, though that appears to be a small factor overall. A major factor is that many recent purchasers lack a cushion for personal financial setbacks that was common in the past, the ability to borrow from increased equity thanks to house price appreciation. An owner of a house today that is worth less than when the owner took out the mortgage cannot usually borrow to deal with temporary lack of work or unusual financial burdens. Programs are in operation already to provide relief to homeowners in distress and many more are under consideration. Without help, many of them would default on their mortgages and face the loss of their homes.

Defaults are also occurring because homeowners who could continue to make their mortgage payments find it uneconomic to do so. By defaulting, they can continue to live in their houses for up to a year for free and then move to other housing that costs less than their mortgage payments.
Given this opportunity, they make the reasonable and prudent decision to take advantage of the opportunity to save on housing cost. The loss of their homes is part of their economic calculus. The objectives of a federal relief program are to keep people in their homes who are reasonably matched with them under new financial conditions, to help people make the transition to a better match in the housing market if they are badly matched, to limit the social and direct costs of foreclosures, and to limit vacancies. One obstacle to relief programs is the large number of people who are capable of meeting their existing mortgage obligations and remaining in their houses who would find federal relief money attractive. Another is that about 70 percent of subprime mortgages in default are beyond the reach of modification programs—the mortgages are on houses owned by investors rather than residents, are in a second default, or the owners have disappeared. The situation is not much better for prime and alt-A defaults. About 63 percent of all defaulting mortgages are beyond reach. (source) Yet another factor standing in the way of replacing or altering mortgages is the separation of the role of the servicer from the role of the mortgage owner.

A federal program called HOPE NOW will make some progress in achieving the objectives. Under this program, the FHA guarantees a new mortgage at the normal FHA interest rate for 90 percent of the new appraised value of a home. The existing lender agrees to take the proceeds as settlement in full for its loan, though the principal owed is greater. The homeowner pays the FHA an extra fee of 3 percent of the value of the mortgage at the outset and 1.5 percent each year. The FHA owns all of the 10-percent equity initially; this claim falls to 50 percent over 5 years. The FHA also receives half of any appreciation in the value of the property. The program will cover up to 400,000 homes (source). No information seems to be available about the number of completed refinancings under this program. As in all programs where lenders give up their rights to collect the contracted payments from borrowers, lenders are reluctant to participate because many people who apply would have made their payments on schedule if they did not have access to a program that allowed lower payments. HOPE NOW is unusually unfavorable in this respect—other programs and proposals compensate the lender for giving up the right to try to collect contract payments.

Sheila Bair, head of the Federal Deposit Insurance Corporation, the agency that pays off the deposit obligations of failed banks, has proposed a plan that tries to solve the main problem in HOPE NOW by sweetening the deal for lenders. A lender can make a new arrangement with a homeowner where the new principal of the mortgage can be up to 150 percent of the current value of the house and where the payments are in the range of 31 percent of the homeowner’s income. The sweeteners are that the lender does not have to surrender the right to payments based on a principal above 90 percent and that the FDIC would make good for part of the loss to the lender if the borrower defaults again. The concern about repeated defaults has been an important obstacle to voluntary relief. The FDIC is already operating this program at IndyMac. (source)
Christopher Mayer and Glenn Hubbard at the Columbia Business School have formulated a more ambitious proposal for mortgage relief. One entirely sensible part of their proposal is for the federal government to make an unambiguous promise to repay any part of Fannie and Freddie’s debt that the organizations cannot pay themselves. This move would lower their borrowing costs by about 1.5 percentage points. Fannie and Freddie dominate mortgage finance today, so this interest-rate cut would be available to most borrowers. Given the virtual certainty that the federal government would back the organizations, the federal government is throwing money away by making an entirely unmerited gift to the holders of Fannie and Freddie debt. The other part of the proposal is a system for refinancing all outstanding mortgages. Providing relief by refinancing rather than altering the terms of existing mortgages cuts through the problem of negotiating with mortgage owners, as all borrowers have the right to pay off their mortgages. But the proposal involves an element of compulsion on lenders—they are required to accept less than the full amount of the principal to settle the earlier mortgage. Specifically, the lender swallows half of the shortfall and the government pays the remainder. This program shares a defect with any relief policy that pays off lenders for part of the diminished value of the loans they made in the past few years. This money goes into the pockets of investors all around the world, without regard to any payoff to the people of the U.S from giving funds to those investors. Though mortgage relief seems focused on helping desperate homeowners, the beneficiaries may be hedge-fund investors and the shareholders of many kinds of financial institutions.

Harvard economist Martin Feldstein has made a proposal with a novel element—he would have the federal government make personal loans to homeowners to serve as 20-percent down payments for new mortgages. These loans would survive bankruptcy. Because of this status, the loans would suffer fewer defaults and thus bear lower interest than personal loans that disappear in bankruptcy. Feldstein believes that the interest rate could be as low as two percent without burdening the government, but this estimate seems optimistic. In exchange for the homeowner’s unconditional promise to repay the personal loan, the homeowner whose mortgage exceeded the value of the home would receive a substantial benefit: the lender would write down the existing mortgage to 80 percent of the current market value of the home. The lender would receive one third of the difference between the principal on the mortgage and the market value as a subsidy from the government. Thus the lender would swallow two thirds of the amount by which the mortgage was under water in exchange for a mortgage with a fairly low probability of default on the new mortgage, thanks to its 80 percent loan-to-value ratio. Unlike plans that subsidize future defaults by guaranteeing high LTV mortgages after relief, Feldstein’s plan substantially limits the likelihood of a default after mortgage relief. Limiting future defaults is a big selling point of the plan. But, like all plans calling for the government to make payments to lenders, this plan gives a lot of taxpayer money to mortgage investors. The likely scope of the program is small. Recall that only 30 percent of subprime mortgages are available for relief; the others are for investor-owned homes, repeat defaulters, and untraceable owners. Many distressed homeowners would find the risk of the resulting financial position unacceptable—the value of their houses could fall another 20 percent, leaving them with no equity in the house but an obligation to the
government that they could not escape. In general, obligations that survive bankruptcy are undesirable—bankruptcy insures families against bad events in a way that explicit insurance cannot. Bankruptcy gives families access to all of their post-bankruptcy earnings to meet their basic needs. A loan that does not vanish in bankruptcy invades this protection and may result in extreme distress in adverse contingencies. This problem is most severe for people with self-control problems, who take on more debt than is sensible. If the debt survives bankruptcy, they condemn themselves to penury in the future. Bankruptcy limits the harm they suffer from their propensity to take on too much debt.

In the meantime, individual lenders are granting relief to hundreds of thousands of underwater homeowners, trying to avoid the high cost of foreclosure by keeping the current owners in place, with lower payments. In some cases, the total value of present and future payments falls, while in others, the lender gives the owner lower payments for a few years in exchange for higher payments in the more distant future and less chance of recovering any equity upon sale. Some of these programs may be stimulated by a perception that a bank that grants some relief to its borrowers may have a better chance of receiving bailout money. One large program, by the Bank of America on behalf of Countrywide, which B of A recently acquired, is the result of a settlement of a legal case brought by borrowers against Countrywide, claiming predatory practices.

General Stimulus

Current forecasts have real GDP reach its lowest value in the second quarter of 2009, at 2.5 percent below its value in the third quarter of 2008. Normal growth over the three quarters would be 1.9 percent, so the shortfall would grow by 4.4 percent, or $627 billion, bringing the total shortfall to $932 billion. This figure provides a way to think about the magnitude of a stimulus. Trying to push spending and output up to its trend level in a short time, would probably be unwise, for fear of overshooting. Eventually, the corrective forces of the economy would bring spending and output back to its long-run growth path. Policy fits in somewhere between, hastening the return to normal.

The case for stimulus is particularly strong with deflation hanging over the economy. The Fed has exhausted its ability to stimulate further, with its target interest rate at essentially zero.

The Obama transition team is expected to make its stimulus proposal public within days. So far, all the leaks have referred to infrastructure spending, but, given the economists involved, we may look for some imaginative types of untraditional stimulus as well.

- Action by the Fed apart from its usual target interest rate
- Income tax cuts with rebates, as earlier this year
- Tax cuts that reduce the prices of consumer goods temporarily
- Tax cuts that reduce the cost of labor to businesses
- Increase in purchases of goods and services by state and local governments
Expansion by the Fed

Fed Chairman Ben Bernanke gave a speech on December 1 explaining the Fed’s plans for further expansion. He stated that the Fed might start buying longer-term Treasury securities. He did not describe how the Fed would pay for them. If the Fed expands reserves further, it would be taking the long-term Treasuries out of the market and replacing them with short-term federal debt, namely reserves. If the Fed and the Treasury cooperated, as they have for many other asset purchase and lending by the Fed, the Treasury would issue new debt, place the proceeds in its Fed account, and the Fed would use the funds to buy the long-term Treasuries. In any case, the effect would be the same as if the Treasury by itself retired long-term debt and replaced it with short-term debt. There is much to be said for this policy. Based on current interest rates, it would give investors what they want, more short-term Treasury debt, for which they require interest rates close to zero, and less long-term, for which interest rates are rather higher. The policy would probably save the taxpayers a lot of money. But nobody thinks that it would have much effect on interest rates. Notice that any downward effect on long-term rates would be offset by an upward effect on short-term rates. The federal government needs better coordination on this issue. At the same time that Bernanke said the Fed would buy long-term Treasury bonds and finance the purchase with short-term federal debt, the Treasury announced that it would sell 10-year bonds in the coming week. How much easier for the Treasury not to issue those bonds and to issue correspondingly more short-term debt! Although Chairman Bernanke did not use the term, the policy of substituting short- for long-term debt through the central bank is called “quantitative easing.” There are good reasons to go ahead with the policy, but it seems quite unlikely to give much net stimulus to the economy.

The Fed has begun to buy the debt of Fannie and Freddie, with the intention (and actual effect) of lowering mortgage interest rates. This step is a good example of how the Fed can depart from its normal exclusive attention to its target interest rate, the Fed funds rate, and execute policies that influence other important interest rates. We may expect other policies focused on specific rates.

Income tax cuts with rebates

Last summer, consumers enjoyed a moderate tax cut paid out to most people as an immediate rebate. The experience demonstrated that the federal government is capable of a speedy fiscal action, but it also showed that consumers don’t go out and spend rebate money when they receive it. Instead, just as the received theory of consumption predicts, consumers smooth the spending increase, reserving most of it for future consumption, by saving it or using it to pay down debt. It raises their standard of living more than their immediate spending. It’s good news that most Americans do not have their backs to the wall financially, but it makes an income- tax rebate ineffective as a stimulus concentrated at the time most needed. Rather, rebates result in consumption increases spread well into the future. The following graph, created by John Taylor in a recent op-ed, shows what happened last summer:
Tax cuts that reduce the prices of consumer goods temporarily

The most desirable time-concentrated stimulus would raise consumer spending during 2009 without changing it much in future years. The government lacks the power to compel consumers to spend more, so it must rely on incentives. Britain has just cut its sales tax (VAT) by 2.5 percentage points for the next 13 months to provide a small incentive concentrated in the period when the recession is expected to be most severe.

An important article in the American Economic Review in September 1986 by James Poterba, Julio Rotemberg, and Lawrence Summers demonstrated the high potency of a sales-tax cut as a stimulus. They studied the reverse situation, where a big increase in the British sales tax caused a severe recession.

Because the U.S. lacks a national sales tax or VAT, the logistics of a temporary consumption subsidy would be a little more complicated. The Kotlikoff-Leamer proposal would operate through state sales taxes. All but a few small states have sales taxes—the exceptions are Alaska, Delaware, Montana, New Hampshire and Oregon. Under the plan, the federal government would buy out sales taxes for the period of the needed stimulus, say the year 2009. The states without sales taxes or with low sales taxes would receive comparable federal funds to cut other types of taxes. Sales tax revenue is currently $440 billion per year, so the proposal would cost around half of what the Obama administration appears to be planning to spend on stimulus.

The plan needs to take effect soon after it is announced. The announcement will cause consumers to defer purchases until the tax cut takes effect. Similarly, toward the end, they will accelerate
purchases and then buy less after the sales tax resumes. Phasing in the resumption might be a good idea.

Critics of consumer subsidies point out that some consumer goods are imported, so the stimulus benefits the producing country, not the U.S. Often that country is said to be China, though Japan is also a major source because of its dominance of the world car market. Given that the U.S. has pledged to engage in joint stimulus with its major trading partners, including China, the stimulus to the import source countries is entirely appropriate. But imports of consumer goods are only 18 percent of consumer spending on goods (excluding services), so the leakage into import stimulus is not a major consideration anyway.

We feel that a temporary elimination or reduction in sales taxes would be an effective stimulus to consumer spending, concentrated in the period when it is needed most and phased out later. It should be part of the stimulus plan.

**Tax cuts to reduce the cost of labor**

If the objective of a stimulus is to lift employment, why not operate directly on that margin, by lowering the cost of labor to employers? The federal government has a completely straightforward way to do this, because it levies a 7.65 percent rate on payrolls for virtually all employment. The tax yields just under $500 billion per year. Elimination of the tax for the year 2009 would provide a substantial incentive to employment concentrated during the year. As with the temporary removal of sales taxes, both anticipation effects and ending effects would occur. See the Bils-Klenow proposal.

One problem with the employment stimulus is that the funds go in the first instance to the owners of businesses and not to consumers generally. Ownership is highly concentrated in the U.S., so the distribution of the immediate benefits is skewed. By contrast, the consumer rebate can be directed to lower-income consumers because it is part of the income tax and the sales tax reduction at least is in proportion to purchases rather than business ownership.

If the response of employment to the payroll tax cut were strong enough, its contribution to the incomes of workers might be enough to overcome the disadvantage of its business-subsidy character. If business hiring responded aggressively to the subsidy, profits would decline as business put more output on the market and the winners would be workers rather than owners. Everything turns on the strength of the employment effect. But, alas, the strength of the effect depends on one of the most unsettled issues in macroeconomics, the role of supply increases in raising the quantity of output produced in the short run. One line of thought treats this issue just as one would in a standard market, where an increase in supply raises the quantity sold by the principles of the standard supply-and-demand diagram of elementary economics. Another line believes that special principles operate in the short run that makes demand the controlling factor—an increase in supply has little effect on the quantity sold in the short run in this view. We are among the few economists who regard this issue as still open. Most are doctrinaire believers in one or the other view. We are sufficiently concerned about the potential validity of the demand-
limiting view that we are reluctant to state with confidence that a supply-based stimulus such as the payroll-tax suspension would have a large effect on employment.

**Increase in construction spending by state and local governments**

President-elect Obama supports federal funds for state and local construction projects as an element of a stimulus package. Increases in spending are plainly attractive because the response of state and local governments to the federal willingness to support projects is likely to be enthusiastic. Government units have backlogs of projects waiting for funding. The questions are how big are the backlogs, how quickly spending can accelerate, and how beneficial are the projects.

State and local construction spending is currently $300 billion per year. The Obama team is hard at work trying to find out how much of a backlog is “shovel-ready” in the President-elect’s neat phrase. We are not aware of any easy source for this information.

Timing may be a problem, as it was in the old days when these kinds of projects were called public works. Complicated projects take time to ramp up to high spending and employment levels. Some interstate repairs can be executed in a year, as was the case in rebuilding the collapsed I-35 bridge in Minneapolis last year and in re-opening earthquake-damaged freeways in Los Angeles in 1994, while it took many years to reopen all the damaged roads in San Francisco after the 1989 earthquake.

The president-elect has also mentioned less conventional spending programs, including broadband facilities and online medical records facilities.

All of these proposals for stimulating state and local spending suffer from a common problem—they will end up generating employment for highly specialized businesses and workers, rather than stimulating economic activity more broadly. The consensus of macroeconomists across the spectrum is that a spending stimulus raises total spending by between 1.0 and 1.5 times the amount of the direct increase in spending. The follow-on or multiplier effects are between zero and half the direct increase in spending. Thus a program that funnels money to construction firms and their workers mainly raises their incomes and employment levels and has relatively little effect elsewhere. Rebuilding aging interstates and upgrading the energy efficiency of public buildings calls for highly specialized skills. A large-scale infrastructure program will drive up the profits of the limited number of firms capable of doing this type of work and drive up the wages of the skilled workers who know how to do the work.

It’s hard to imagine that a significant fraction of the large stimulus under consideration for 2009 will take the form of state and local construction and other infrastructure spending. We are hoping that discussion of stimulus will not become sidetracked over this part of the program and neglect the opportunities to stimulate consumer spending broadly without complicated, detailed, and time-consuming decisions.
Conclusions on stimulus
We foresee a mixture of stimulus policies for the coming year. Monetary policy can contribute by driving down mortgage and other interest rates. Income-tax rebates seem to have little support and would probably have relatively small effects within the year, with undesirable continuing effects in later years. We are enthusiastic about removing sales taxes for the year and perhaps somewhat longer, with a phaseout. We are not sure that an employment stimulus from a reduced business payroll tax would raise employment enough to be a contender as a stimulus and to prevent the flowing through of the funds to business owners rather than workers. We believe that some federal subsidies to state and local spending would make sense, but are concerned that too large a program would result in stimulus continuing past the time when it would be needed and that it would create excessive rents for contractors and skilled workers. Thus the sales-tax buyout seems to be the best way to spend the bulk of the stimulus dollars.

Effect of Infrastructure Spending
The Obama administration’s focus on infrastructure spending raises the natural question of the effect of government purchases on total GDP. Does government spending stimulate other categories of spending, especially consumer spending? Or does government spending displace other categories, so GDP rises by less than the amount the government spends?
Valerie Ramey has written a paper with the results of her recent work on the question and with a full bibliography of earlier work. Her answer is that consumption and other categories stay about the same when the government spends more. In other words, the increase in GDP is about equal to the increase in government spending. To focus on changes in government spending that are not themselves responding to conditions in the economy, she considers military spending. She finds that GDP rises by about the same amount as an increase in military spending.
The picture below shows GDP and government military spending during World War II, both adjusted for price changes, detrended, and rescaled to the level of the U.S. economy today. If you think that the Obama administration is ambitious in spending a trillion dollars over several years on infrastructure projects, note that military spending maxed out at $7 trillion per year during the war, rescaled to the current size of the economy. During the expansion, GDP rose pretty much the same amount as did military spending. Consumption and other components of spending neither rose under the military stimulus nor fell because of displacement by military spending. The two forces offset one another. Notice, however, that when military spending fell after the victory, GDP did not fall nearly as much. Consumption and other components expanded rapidly to take up the resources freed from military activities and there was little sign of adverse effects from the lower military spending.
The second picture shows the same variables for the buildup at the beginning of the Korean war. The story is much the same—equal increases in military spending and GDP.

Although military spending expanded in three other episodes—Viet Nam, the Reagan buildup, and post 9/11—none of these expansions was large enough to give much additional evidence on the response of GDP to increases in military spending.

We believe that the one-for-one rule derived from wartime increases in military spending would also apply to increases in infrastructure spending in a stimulus package. We should not count on
any inducement of higher consumption from the infrastructure stimulus but we should also not worry that infrastructure spending might displace consumption and other categories of spending.

**Policy for the Longer Run**

Within a few months, we fervently hope, the nation will turn its attention to long-run policies to head off repetition of the financial crisis and the deep recession. We start with a quick summary of the conclusions earlier in this analysis. Low interest rates, rising income, and widely available mortgage lending with almost no money down resulted in a boom in housing prices and homebuilding. Way too many houses were built, so eventually homebuilding collapsed to well below its normal level. Recession ensued. The decline in housing prices caused the value of mortgages and mortgage-backed assets to fall. Financial institutions with far too little capital became insolvent because the asset-price declines caused their assets to be worth less than their debts. The debt-holders demand the return of their money and brought down Lehman, Bear Stearns, and several large banks. The government had to prop up Fannie, Freddie, and AIG. Financial markets stopped working briefly until the government provided huge amounts of liquidity and substantial amounts of capital. The financial crisis worsened the recession, cutting especially into consumer spending.

**Housing Prices**

The government lacks a policy instrument to stabilize house prices. We observed earlier that the Fed set low interest rates in 2002 and 2003 for a very good reason, even though low rates probably contributed to the housing price run-up. The government needs to take the same approach to house prices as to the stock market, another place where booms and busts occur periodically for reasons not well understood by economists. The goal is to prevent rising and then falling prices from causing financial havoc and from stimulating such large changes in spending.

**Mortgages**

The federal government has been involved in the mortgage market since the creation of the FHA and long-term fixed-rate pre-payable loans in 1934. Now the government has deepened its involvement. At present, the government stands behind the majority of new mortgages—in case of default, the government absorbs the loss, not the lender. The FHA, Fannie, and Freddie issue these guarantees. A policy that scrutinizes each mortgage carefully—as a lender committing its own money would—is imperative.

Improved consumer understanding of mortgages is another major goal of federal policy. Many defaults occur because borrowers do not understand their mortgages. Mortgage brokers exploit the vulnerability of borrowers; they should not be expected to give full, fair explanations of their products any more than a tire salesman does. Rather, the government should require that borrowers receive understandable information from unbiased sources before signing up for a mortgage. The FHA has a successful mandatory counseling program for reverse mortgages that
could serve as a model. The government should enforce disclosure requirements that result in genuine understanding of mortgage obligations. Today, borrowers are overwhelmed by voluminous and useless disclosures designed by lawyers seeking to keep lenders out of legal trouble. These are incomprehensible to most borrowers and, in any case, they do not see the disclosure until just before closing, when they are told that the papers are just formalities that they need not read. Instead, a borrower should read a simple, brief description of the mortgage early in the borrowing process. Law enforcement should prosecute brokers who sign up borrowers for mortgages that depart from the initial description. Counseling requirements are particularly important for mortgages with any form of deferred increase in payments. Finally, all prospective borrowers should receive a simple government-sponsored statement that it is important to shop for a mortgage by soliciting proposals from multiple brokers or lenders—they should be warned that brokers do not shop for them. They are merchants, not agents.

The subprime situation is especially of concern. Defenders of subprime lending point out that while 20 percent of subprime borrowers may default, 80 percent don’t, and remain homeowners. This is only part of the story. The Center for Responsible Lending, in its report Losing Ground analyzing subprime origination data, reports that few subprime mortgages remain outstanding for long. Most either default or refinance within a few years. Roughly 30 percent of a crop of new subprime borrowers refinance to a prime loan. The other 50 percent, who don’t default and don’t refinance to prime, refinance to another subprime loan. The fraction of a subprime cohort that ultimately defaults is 36 percent, not just 20.

With default likelihoods this high, one wonders if the borrowers had any idea of their odds of success as homeowners when they took out their loans. Jeanne Hogarth of the Federal Reserve research staff suggests that some financial products might be treated similarly to how drugs are treated by the FDA (link). Some drugs are fairly harmless and are allowed to be sold over-the-counter; the analog mortgage has a 30-year fixed interest rate, 10 percent or more down payment). Others are available with prescription (ARMs). Others are treated as controlled substances; here the analogs are ARMs with exotic indices or high potential for large payment changes, and perhaps all subprime loans. For the short term, it appears that subprime mortgage originations have again become fairly rare. But some serious policy thinking should be done about how to inform households of the risks they face prior to buying a home and getting a loan before subprime lending expands again.

**Mortgage-Backed Securities**

Pundits find fault with the “originate and distribute” organization of the MBS business—they believe it amounts to a chain of irresponsibility. They believe that mortgage brokers did not concern themselves with the true ability of their customers to perform on their mortgages, because they passed the risk on to lenders. Similarly, they believe that originating lenders ignored the issue because they passed mortgages on to investors through MBSs. The investment banks that structured the MBSs got assistance from inattentive rating agencies and from
institutions offering insurance against losses that were not regulated as insurance companies. The parties providing the insurance were derelict in not setting aside enough reserves to absorb losses if and when they occurred, according to this critique.

While there does appear to be irresponsibility at nearly all levels of the subprime mess, similar chains of responsibility in the prime mortgage market were present since the creation of Ginnie Mae in 1968, and have operated successfully. So has the securitization of other types of assets. The subprime failure is unique.

Moreover, the chain of irresponsibility is not present in other countries experiencing even more acute subprime meltdowns than we are seeing in the US. In the UK, there was also an explosion of subprime lending, also property price bubble that burst, and also substantial losses experienced by lenders, an ensuing crisis of confidence in financial institutions requiring intervention by the central banking authorities. But in the UK, the book of subprime loans was not securitized, chopped, wrapped or swapped. The loans are on bank balance sheets as whole loans. The chain of irresponsibility may have made the crisis worse, but it is not, by itself, the driving factor.

All products involve chains of responsibility. A supplier of crankshafts to Toyota cannot provide shoddy goods just because a failed crankshaft becomes Toyota’s problem. And Toyota cannot ignore the problem because it falls on the owner of a Toyota. Similar reputational considerations govern the chain of organizations involved in mortgages. Institutions that guarantee prime MBSs—notably Fannie and Freddie—discipline lenders who misrepresent the quality of mortgages in MBSs. Lenders stop doing business with brokers who get them in trouble by faking mortgage applications.

Longer term policy reforms will likely proceed on the belief that the chain of responsibility failed badly in subprime mortgage originations. See Adam Ashcraft and Til Schuermann, “Understanding the Securitization of Subprime Mortgage Credit” for details. In this view, loans were originated by mortgage brokers who bore no costs when loans defaulted, funded by financial institutions that then sold the loans to investment banks, retaining no risk of loss, who packaged the loans and chopped up the packages, wrapping some with guarantees in the form of credit default swaps. Failure on the part of rating agencies to detect risk correctly, failure of lenders and mortgage brokers to fully document borrower assets and income, and failure of investment banks to correctly disclose the exposure to risk in the various pieces of assets backed by subprime mortgages are identified by many observers to be the crux of the subprime mortgage meltdown and the credit crisis. We disagree. True, it is hard to see how these elements did not add to the confusion about which institutions were insolvent and make the crisis worse. But look at the UK, which also had a credit expansion into subprime loans, a subsequent property price bubble that burst, and has also had a credit seizure due to bank losses. There, all of the subprime loans are in the form of whole loans—no securitization, nothing chopped, wrapped, or swapped—right on bank balance sheets. This finding suggests that lengthy chains of responsibility are not the main factor behind financial problems today and thus that trying to alter
the chains through regulation preclude future crises arising from the bursting of price bubbles, either in the stock market or markets for other important assets like housing.

We believe that securitization of mortgages and the resulting efficiencies in the deployment of wealth to mortgage lending is a desirable feature of the mortgage business. We do not support limitations on securitization. Once other problems are fixed, notably lack of adequate capital in financial institutions holding mortgage-related assets, we look forward to a thriving and competitive MBS market.

**Fannie and Freddie**

The government was involved in organizing Fannie and Freddie as cooperatives of the lenders that sold mortgage loans to them. The cooperative structure provided incentives for the owners of the co-ops to limit the risk they took on. Today they operate essentially as banks do—as profit-seeking institutions with government backing and restrictions on their activities. As we noted earlier, it is absurd that they are borrowing money from investors as 1.5 to 2.0 percent above the rate that the Treasury pays for similar borrowing, despite the high likelihood that the government would make good on any default on their debt. The Fed has recently made a step toward correcting the absurdity, making up in a backhanded way for the government’s failure to clarify Fannie and Freddie’s status. The Fed will buy up to $100 billion of their debt and $500 billion of MBSs that they guarantee. Mortgage rates fell by a quarter of a percentage point the moment this program went into effect. The second part is notable, coming soon after the Treasury decided not to buy MBSs—the quintessential troubled asset class—under the TARP.

Fannie and Freddie are separate from the federal government in much the same way that banks are. Insured deposits are not counted as part of the federal debt just as Fannie and Freddie’s liabilities are not. But the federal government is exposed to the risks they take and the crisis is a good time to recognize how bank-like Fannie and Freddie are. We believe that they should continue to operate as businesses, not as government agencies, but that the government should supervise them as special-purpose banks, limit their activities more effectively than in the past five years, establish capital requirements for them, and guarantee their debt explicitly.

**Commercial Banks**

Policy for commercial banks has been mostly successful so far in the crisis—only CitiGroup has come under significant doubt about solvency. The philosophy of bank regulation is simple—because banks enjoy deposit insurance and the expectation that the government stands behind their other obligations, they must be required to hold capital at higher levels than they would choose on their own. The government imposes risk-based capital requirements on commercial banks, so that if risky assets lose value, the banks lose equity capital and do not look to the government. Under properly administered capital requirements, the cushion of capital protecting the government from making good on its guarantees is sufficient to make the probability of government payoff tiny. When a bank becomes under-capitalized, it must immediately raise more capital, sell itself to a better-capitalized owner, or liquidate.
Bank capital rose early in the decade, from 8.5 percent of assets in 2000 to 10 percent in 2005. It has been constant since 2005. (source) Even after the losses from mortgages, banks as a group retained the ability to absorb another 10 percent decline in asset value before the government would need to step in. Of course, some banks, probably including Citibank, are closer to the margin. The 10 percent is probably an overstatement, because not all assets are counted at market value. Loans to businesses are reported at face value until the businesses fall behind in their payments, yet the recession has increased the likelihood of future default for many loans that are still reported at face value.

Though the banking system has proven generally resilient, thanks to heightened capital requirements, there is a case for further increases in bank capital. No other industry operates so close to the margin of insolvency. Banks push as far as they can to take advantage of low borrowing costs associated with deposit insurance and implicit federal guarantees. To prevent banks from becoming unstable during periods of declining asset values, two types of regulation are imperative: properly enforced substantial capital requirements and limits on what risks they can take.

Non-Bank Financial Organizations

Financial brokers made no contribution to the financial crisis, for the simple reason that the government imposes and enforces fairly high capital requirements on them. They all had adequate cushions between asset values and debt, so that even fairly large declines in asset values left enough to cover the debt. Traditional insurance businesses also have substantial capital requirements and have remained solvent. These successes illustrate the importance of capital requirements.

Investment banks were another matter. Now that the government has made it clear that it will stand behind the debt of some investment banks, it is obviously time to reinstate capital requirements for them. In one of the most conspicuous policy errors of the decade, the government removed existing capital requirements for investment banks in 2004. At present, the country has no major investment banks, as Goldman-Sachs and others found it desirable to become commercial banks, subject to significant capital requirement. Because investment banks are likely to become an important force again in the future, imposing capital requirements today is essential.

Hedge funds and similar private financial players are another matter. The usual government stance for these organizations has been neglect, on the coherent ground that they enjoy no implicit government backing of their obligations. Should they be unable to meet their obligations, the sophisticated organizations that loaned them money will bear the brunt, not the government. The difficulty with this view, as the regulators learned in 1998 in the case of Long Term Capital Management, is that the lenders who swallow the losses from hedge funds who invested in assets with declining values are commercial banks, under the protection of the government. Thus the government may not ignore hedge funds. In our view, the best approach to this problem is on the bank side—banks should treat lending to hedge funds as risky and hold
substantial capital against the lending (see here and here for papers on measuring hedge-fund risk). Regulation took this approach after LTCM and it worked during this crisis so far—no bank has failed because of defaults by hedge funds. And hedge-fund insolvency has not been an important element of the crisis as a general matter, presumably because banks have limited their lending and not supported the extreme level of borrowing against assets that proved to be LTCM’s undoing.

One of the biggest ongoing challenges to regulation has been the huge financial entity that grew out of AIG. That insurance company enthusiastically entered the market for insuring debt. In this unregulated market, the owner of a debt instrument, such as a bond or an MBS, could pay AIG a premium in exchange for AIG’s promise to make good for losses on the debt. In normal times, the premiums were low and AIG and the debt owner would see little current probability that AIG would need to pay off on the insurance. Debt insurance was pretty much like the other kinds of insurance that AIG offered, on buildings and cars. All this changed in the crisis. AIG was committed to making much larger than expected payments for events that were suddenly much more likely, such as the downgrading of an MBS or default on a corporate bond. The insurance contracts provided that AIG had to prepay the debt owners in these cases, by giving the owner approximately the amount that would be paid if an adverse event occurred. These advance payments took the place of the capital that a regulated insurer would be required to hold.

In September 2008, AIG ran out of money to advance to insured debt holders. Dramatic increases in the likelihood of big payoffs from the insurance exhausted AIG’s capital. The government elected to invest enough money in AIG so that they could remain current on these advance payment obligations. The justification seems to be that banks and other sensitive financial institutions could not handle the loss of their insurance if AIG liquidated and dropped all of its coverage. Banks thought they had insured assets through AIG, so that the assets were close to risk-free. In the presence of the insurance, these assets were worth what the bank had paid. Without the insurance, their value would plummet immediately and would face the likelihood of further decline in the future. The government in effect took over the insurance role. In the process, the government extended insurance to numerous hedge funds, foreign banks, and other entities outside its umbrella of protection.

In retrospect, because AIG was insuring regulated banks and was critical to their satisfaction of their risk-based capital requirements, the government should have imposed capital requirements on AIG, just as other regulators required the company to hold substantial capital against its other insurance commitments.

The financial crisis is generating a clamor to extend regulation to all kinds of non-bank financial organizations. Few advocates of increased regulation have spelled out how the regulation should work. We believe it should start with the principle that banks require protection because the government stands behind their obligations. When another type of financial organization poses a threat to bank solvency, regulation should find the best way to insulate banks. For hedge funds, the right policy is already in place and is working—banks need to maintain substantial capital
against hedge-fund lending. For asset insurance, the right policy appears to be capital requirements on the insurer. Notice that the best regulation takes the simple form of capital requirements.
Sources for Figures:

Figure 1:
Consumer Price Index – All Urban Consumers,
http://data.bls.gov/cgi-bin/surveymost?cu
1-Year Treasury Constant Maturity Rate,
http://research.stlouisfed.org/fred2/series/GS1/downloaddata?cid=115

Figure 2:
http://www.fhfa.gov/ The new agency FHFA has taken over the functions of OFHEO. Look on this website for a publication called something like "House Price Index"

Figure 3:
http://www2.standardandpoors.com/portal/site/sp/en/us/page.topic/indices_csmahp/2,3,4,0,0,0,0,0,0,0,0,0,0,0,0,0,0,0.html From here you can download a variety of Excel spreadsheets with national and metro house price indexes.

Figure 4:
http://www.bea.gov/national/nipaweb/SelectTable.asp?Selected=N

Figure 5:
1-month Treasury Bill Rate:
http://www.federalreserve.gov/releases/h15/data/Monthly/H15_TCMNOM_M1.txt
Effective federal funds rate (borrowing rate for small banks):
http://www.federalreserve.gov/releases/h15/data/Monthly/H15_FF_O.txt
LIBOR (borrowing rate for large banks): http://www.fhlbdm.com/rg_history.htm

Figure 6:
Federal Reserve loans: http://www.federalreserve.gov/releases/h41/hist/h41hist4.txt

Figures 7 and 8:
http://www.bea.gov/national/nipaweb/SelectTable.asp?Selected=N . Select Table 2.8.6

Figures 9 and 10:
http://www.bea.gov/national/nipaweb/SelectTable.asp?Selected=N . Select Table 1.1.6

Figure 11:
Basic Housing Data

Results of Foreclosure
A paper that finds foreclosure costs of 32 percent:
http://ideas.repec.org/a/jre/issued/v9n31994p313-318.html
An analysis of FHA data that gets a smaller number, more like 10 percent:
http://ideas.repec.org/a/jre/issued/v13n11997p95-102.html

Fannie and Freddie
Fannie: http://www.sec.gov/Archives/edgar/data/310522/000095013308003686/0000950133-08-003686-index.htm
Freddie: http://www.sec.gov/Archives/edgar/data/1026214/000102621408000043/f65508e10vq.htm#111

Forecasts for the U.S. Economy
http://www.nabe.com/publib/macsum.html
http://www.conference-board.org/economics/stalk.cfm
http://www.kiplinger.com/businessresource/economic_outlook/

Bibliography
Here we sometimes provide URLs for authors’ websites, rather than for the specific papers, as those URLs may change frequently.

Housing market
http://www4.gsb.columbia.edu/cbs-directory/detail/494785/Charles+Calomiris
Christopher Foote, Kristopher Gerardi, Lorenz Goette, and Paul Willen, "Subprime Facts: What (We Think) We Know about the Subprime Crises and What We Don't”
http://www.bos.frb.org/economic/econbios/willen.htm
Financial crisis
Markus Brunnermeir, “Deciphering the 2007-08 Liquidity and Credit Crunch”
http://www.princeton.edu/~markus/
Willem Buiter, “Lessons from the North Atlantic financial crisis”
Giovanni Dell’Ariccia, Deniz Igan, and Luc Laeven, “Credit Booms and Lending Standards: Evidence from the Subprime Mortgage Market”
http://www.imf.org/external/pubs/cat/longres.cfm?sk=21900.0
John Geanakoplos, “Solving the Present Crisis and Managing the Leverage Cycle”
http://www.kc.frb.org/home/subwebnav.cfm?level=3&theID=10697&SubWeb=10660
David Greenlaw, Jan Hatzius, Anil Kashyap, and Hyun Shin "Leveraged Losses: Lessons from the Mortgage Market Meltdown (Final Report)"
http://faculty.chicagogsb.edu/anil.kashyap/research/
V.V. Chari, Lawrence Christiano, and Patrick Kehoe, “Facts and Myths about the Financial Crisis of 2008”
http://www.minneapolisfed.org/research/economists/staff_display.cfm?id=8
http://www.bos.frb.org/bankinfo/qau/wp/index.htm
David Scharfstein and Victoria Ivashina, “Bank Lending During the Financial Crisis of 2008” shows that overall lending has remained high, but mostly to lose with established bank relationships. http://www.people.hbs.edu/dscharfstein/, with a related op ed.
“Paulson’s Gift” estimates the actual value of the Treasury’s investments under TARP.
http://faculty.chicagogsb.edu/luigi.zingales/research/, with other commentary.
The Treasury reports its activities under TARP at http://www.ustreas.gov/initiatives/eesa/Data on 10-year Treasury bonds (constant maturity) and conventional mortgages:
http://www.federalreserve.gov/releases/h15/data.htm

Recession
http://www.macroadvisers.com/content/MA_Monthly_GDP_Index.xls

Immediate Policy
John H. Cochrane, “The monster returns” and other material at
http://faculty.chicagogsb.edu/john.cochrane/research/Papers/
HOPE NOW: http://www.hopenow.com/
Larry Cordell, Karen Dynan, Andreas Lehnert, Nellie Liang, and Eileen Mauskopf, “The Incentives of Mortgage Servicers: Myths and Realities”
Mayer-Hubbard proposal: http://www4.gsb.columbia.edu/realestate/research/mortgagemarket#Q1
Kotlikoff-Leamer on consumption subsidy: http://blogs.ft.com/wolfforum/2008/10/running-a-national-sale/