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The Financial Crisis: An Inside View

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This paper reviews the events associated with the credit market disruption that began in August 2007 and developed into a full-blown crisis in the fall of 2008. This is necessarily an incomplete history: the paper is being written in the months immediately after I left Treasury, where I served as Assistant Secretary for Economic Policy from December 2006 to the end of the Bush administration on January 20, 2009.

The focus here is on key decisions made at Treasury with respect to housing and financial markets policies, and on the constraints faced by decision makers at Treasury and other agencies over this period. I will focus on broad policy matters and economic decisions and not go into the financial details of transactions such as with the GSEs and AIG. A key point of emphasis is to explain constraints on the policy process—legal, political, and otherwise—that were perhaps not readily apparent to outsiders such as academic economists or financial market participants.

Legal constraints were omnipresent throughout the crisis, since Treasury and other government agencies such as the Federal Reserve must operate within existing legal authorities. Some steps that are attractive in principle turn out to be impractical in reality—with two key examples being the notion of forcing debt-for-equity swaps to address debt overhangs and forcing banks to accept government capital. These both run hard afoul of the constraint that there is no legal mechanism to make them happen. A lesson for academics is that any time the word "force" is used as a verb ("the policy should be to force banks to do X or Y"), the next sentence should set forth the section of the U.S. legal code that allows such a course of action—otherwise, the policy suggestion is of theoretical but not practical interest. Legal constraints bound in other ways as well, including with respect to modifications of loans.

New legal authorities can be obtained through legislative action, but this runs hard into the political constraint—getting a bill through Congress is much easier said than done (we were all misled as children by the simplicity of the legislative process in the animated television short feature "I'm just a bill"). The difficulty of getting legislation enacted was especially salient in 2007 and 2008, the first two years after both chambers of Congress switched from Republican to Democratic leadership. A distrustful relationship between the Congressional leadership and President Bush and his White House staff made 2007 an unconstructive year from the perspective of economic policy,

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though it had the effect of making possible the rapid enactment of the early-2008 stimulus. More legislative actions were taken in 2008 as the credit crisis worsened and the economy slowed, but political constraints were a constant factor in the consideration of policy steps to address the crisis.

Political constraints were an important factor in the reluctance at the Treasury to put forward proposals to address the credit crisis early in 2008. The options that turned into the TARP were written down in an initial form at the Treasury in March of 2008—to buy assets, insure them, inject capital into financial institutions, or to massively expand federally guaranteed mortgage refinance programs in order to improve asset performance from the bottom up. But we saw little prospect of getting legislative approval for any of these steps in early 2008 (even a massive program to avoid foreclosures). The political constraint was such that legislative action would be possible only when Secretary Paulson and Chairman Bernanke could go to Congress and attest that the crisis was at the doorstep, even though by then it could well be too late to head it off.

Political constraints also affected the types of legislative authorities that could be requested in the first place, notably with regard to the initial conception of the TARP (Troubled Assets Relief Program). Secretary Paulson truly meant to acquire troubled assets in order to stabilize the financial system when he went up to Congress on Thursday, September 18, to request a $700 billion fund. One criticism of the initial "Paulson plan" is that it would have been better to inject capital into the system in the first place, since the banking system was undercapitalized and asset purchases inject capital only to the extent that too "high" a price is paid (this point is discussed more below). But if he had wanted to inject capital from the start, this would never have been approved by Congress. House Republicans would have balked at voting to allow the government to buy a large chunk of the banking system (such "nationalization" only came into vogue among Republicans in 2009), and Democratic members of the House would not have voted for such an unpopular bill without a reasonable number of Republican votes to provide the political cover of bipartisan action.

A final constraint was simply time. Decisions had to be made rapidly in the context of a cascade of market events. Certainly this was the case by the week of September 14 when Lehman and AIG failed, the Reserve Fund money market mutual fund "broke the buck" by having its value per share fall below the $1 par level and this sparked a panicked flight from money market mutual funds, and commercial paper markets locked up, with major industrial companies that relied on CP issuance telling others at Treasury that they faced imminent liquidity problems. This was the situation in which the TARP was proposed—and the decisions and actions surrounding the TARP must be understood in the context of the events of that week. Time constraints meant that sometimes blunt actions were taken, notably guarantees on the liabilities of AIG, of money market mutual funds, and several weeks later of banks' qualified new senior debt issues. A blanket guarantee is certainly not a preferred policy approach, but in the face of broad runs on the financial system, guarantees were needed to deal with problems in real time.

Other aspects of the decision-making were self-imposed hurdles rather than external constraints. Notable among these hurdles was chronic disorganization within the Treasury itself, and a broadly haphazard policy process within the Administration (and sometimes strained relations between Treasury and White House staff) that made it difficult to harness the full energies of the administration in a common direction. To many observers, Treasury also lacked an appreciation that the rationales behind actions and decisions were not being explained in sufficient detail; without understanding the motivation for each decision, outside observers found it difficult to figure out what further steps would be taken as events unfolded. Part of this was simply the difficulty of providing adequate explanation in real time as decisions were taken rapidly, while another part was the simple lack of trust in Treasury and the administration—many journalists and observers at times did not believe simple (and truthful) explanations for actions such as the switch from asset purchases to capital injections (a response to market developments). It was too easy—and wrong—to believe that Secretary Paulson was looking out for the interests of Wall Street rather than the nation as he saw it, or of one particular firm. Whatever the reason, such communication gaps led to natural skepticism as Treasury's approach to the crisis evolved in the fall with the switch from the original TARP program of asset purchases to capital injections. There were valid reasons behind the initial plan to purchase assets (even if many people found them inadequate) and also valid reasons for the switch to capital injections. But the insufficient explanations of these moves led to skepticism and growing hostility in Congress and beyond to the rescue plan actions.

Notwithstanding these criticisms with regard to the Treasury, a paper such as this will inevitably be seen as defensive, if not outright self-serving. Since this is unavoidable, I simply acknowledge it at the front. Moreover, this account is necessarily incomplete: I do not address here every decision made and every issue considered at Treasury during the crisis but focus instead on aspects of policymaking that seem of most interest to economists. Other accounts of the credit crisis will come out in due course and can be correlated with the discussion of events here.

On the Verge of Crisis

Secretary Paulson on his arrival in summer 2006 told Treasury staff that it was time to prepare for a financial system challenge. As he put it, credit market conditions had been so easy for so long that many market participants were not prepared for a financial shock with systemic implications. His frame of reference was the market dislocations that had taken place in 1998 with the Russia and LTCM crises.

From summer 2006, Treasury staff had worked to identify potential financial market challenges and possible policy approaches, both near term and over the horizon. The longer-range policy discussions eventually turned into the March 2008 Treasury Blueprint for Financial Markets Regulatory Reform that provided a high-level approach to financial markets reform. Consideration of near-term situations included sudden crises such as terror attacks, natural disasters, or massive power blackouts; market-driven events such as the failure of a major financial institution, a large sovereign government default, or huge losses at hedge funds; or slower-moving macroeconomic developments such as energy price shocks, a prolonged economic downturn that sparked wholesale corporate bankruptcies, or a large and disorderly movement in the exchange value of the dollar that led to financial market difficulties. None of these were seen as imminent in mid-to-late 2006, and particularly not with the magnitude that would eventually occur in terms of the impact on output and employment.

Rather than trying to prepare plans for particular scenarios, the focus at Treasury was on risk mitigation beforehand and on preparing broad responses in the event that a crisis developed, while recognizing that the details would vary with the situation. To help ensure smooth teamwork in the event of a problem, Secretary Paulson reinvigorated the President's Working Group on Financial Markets (PWG) that had been formed after the October 1987 stock market crash. The PWG brought together senior officials from the Treasury, Fed, SEC, and CFTC to discuss financial and economic developments and potential problems. Regular meetings took place of the heads of the agencies, with frequent and routine interaction at the staff level. Secretary Paulson also talked regularly about the need for financial institutions to prepare for an end to abnormally loose financial conditions.

Treasury staff recognized that changes in financial markets since 1998 would affect the contours of a new financial crisis and the policy response. These developments generally had positive impacts in contributing to increased financial markets efficiency, but often at the cost of increased complexity. Such developments included:

- Deeper international capital market integration. This led to lower financing costs for the United States given our low national saving rate and need to bring in capital to fund spending. But under some views of the international financial architecture, capital market integration also contributed to the housing bubble that sparked the crisis.

- The rise of securitization across asset classes, from credit cards to auto loans and residential and commercial real estate mortgages. Securitization reduced finance costs and contributed to improved aggregate demand; it also meant that the risks of lending in terms of a deterioration of asset performance was more diversified across market participants than would have been the case had loans remained on bank balance sheets. These benefits, however, came with the downsides of increased complexity and diminished transparency—in the event of problems with mortgage performance, the bundling of mortgages into securities made it difficult to gauge the distribution and magnitude of credit losses.

- The growth of private pools of capital, including hedge funds and private equity. The rise of non-traditional asset managers on the whole would be expected to increase the efficiency of financial markets—having asset management approaches that include both long and short positions rather than just long would be expected to improve liquidity and efficiency. But these funds tend to be non-transparent; indeed, calls for increased disclosure of their trading positions is at odds with the hedge fund business model. Particularly in Europe, hedge funds were seen as the source of the next financial markets crisis. Many hedge funds suffered massive losses in 2007 and 2008 and their deleveraging certainly contributed to the downward spiral in asset markets. But hedge funds do not appear to have been the fundamental source of the financial markets problem.

- The growth of financial derivatives, including credit default swaps (CDS). These financial instruments contributed to increased financial market efficiency in that they allowed market participants to better hedge risks of underlying assets such as commodities, bonds, equities, or currencies. But derivatives added complexity and reduced transparency, and further facilitated increased leverage. A result of this combination was that by September 2008, worsening performance of securitized housing assets such as mortgage backed securities led to rapid and massive deterioration at firms such as AIG and Lehman. Derivatives also led to increased interconnectedness of markets, as the over-the-counter nature of CDS trades and many repo transactions meant that difficulties at financial institutions such as Bear Stearns, Lehman, and AIG could have broad impacts through their role as counterparties to derivative transactions. These considerations were to play important roles in decisions made throughout 2008 regarding the deployment of public funds to "bail out" particular institutions.

Broadly speaking, these financial innovations were viewed at Treasury as fundamentally a good thing in that they added to the liquidity and efficiency of capital markets and made it easier for firms and investors to lay off risk. Even so, the concern was that it was not clear how the financial system would perform under stress. Undersecretary of Domestic Finance Robert Steel talked about the challenge of trying to figure out in advance how correlations between asset classes would change in a crisis. His metaphor was that before the terror attacks of September 11, a reasonable way to diversify a real estate portfolio would have been to invest in high-rise office buildings in different cities—but returns on these investments became correlated in the wake of 9/11. Thus it would be in a time of crisis—financial structures that had worked before would break down in unexpected ways.

Finally, Secretary Paulson and Undersecretary Steel tried hard but did not succeed in the fall of 2006 in getting a GSE reform bill through Congress that would give the regulator more power. The push on this issue came over the opposition from some White House staff, who took the reasonable position that no deal on GSEs was better than an inadequate one that appeared to strengthen the implicit government backing of the entities without fully strengthening their regulator.

My in-person introduction to the building credit bubble was a talk I gave early in 2007 to a group of financial industry participants in commercial real estate—the firms that build, fund, and invest in office buildings, factories, shopping centers, apartments, and so on. Participants explained to me that there was such incredible liquidity that any deal could be done and any building financed. While this talk was alarming, economic indicators seemed to back it up—GDP growth had slowed in the second half of 2006 but looked to be strong again in 2007 (as it was in the middle two quarters) and the labor market upswing that had taken hold in mid-2003 remained in force. Indeed, Secretary Paulson's public rhetoric was that growth was unsustainably strong and that it would be no surprise to have a period of slower growth as the U.S. economy settled into a more normal pattern.

By early 2007, we were well aware of the looming problems in housing, especially among subprime borrowers as foreclosure rates increased and subprime mortgage originators such as New Century went out of business. Undersecretary Steel took the lead in organizing a series of interagency meetings to discuss the situation in housing. As part of this, he asked for forward-looking analysis on housing prices, home sales and starts, and foreclosure rates—how bad would it get and what would be the economic implication. Treasury and Fed economists separately did empirical work that related foreclosures to economic conditions such as the unemployment rate, housing prices, and past foreclosures (the Fed work looked at a panel of pooled states; the Treasury model was time series, looking at the nation as a whole and at key states with high or rising foreclosure rates—the Midwest, Gulf Coast, and bubble states such as California and Florida). We then used blue chip forecasts for future economic data and ran a dynamic forecast for future foreclosures. The prediction we made at an interagency meeting in May 2007 was that we were nearing the worst of it in terms of foreclosure starts—these would remain elevated as the slowing economy played a role and the inventory of foreclosed homes would build throughout 2007, but that the foreclosure problem would subside after a peak in 2008.

What we missed was that the regressions did not use information on the quality of the underwriting of subprime mortgages in 2005, 2006, and 2007. This was something pointed out by staff from the Federal Deposit Insurance Corporation (FDIC), who had already (correctly) pointed out that the situation in housing was bad and getting worse and would have important implications for the banking system and the broader economy.

As shown in Figure 1, default rates on subprime adjustable rate mortgages originated in 2005, 2006, and early 2007 were substantially higher than in previous years, and the defaults were coming quickly—bad loans were showing up within months of origination. The problems were baked into the mortgage at origination in a way not present before 2005; they were not a function of the economic situation as captured by the unemployment rate and other independent variables in the regressions. Rising defaults did reflect the economic situation in the sense that the end of easy mortgage terms and the reversal of home price gains removed the possibility of refinance for subprime borrowers. It is interesting to note as well that the default rates in Figure 1 do not have an inflection point upward at the 24 month mark when the interest rate typically adjusts upward in a "reset." There was, however, a marked propensity for borrowers to refinance at the reset date. These facts further indicate that the problem in the 2005-2007 loans was the initial underwriting, not the interest rate reset. It was not that these borrowers could not afford the higher interest rate after the reset—the rapid defaults suggested that borrowers could not afford the initial home payment, or perhaps (rationally) did not want to keep paying the monthly bill once their home price declined and their mortgage balance was greater than the value of the house. This situation of "underwater borrowers" and policy considerations is discussed at length below.

August 2007: The Vacation of the Blackberry

The initial time for an urgent Treasury-wide response came in August 2007, when asset-backed commercial paper markets locked up as investors grew skeptical about the business model of banks' off-balance sheet special investment vehicles, which relied on short-term funding to finance longer term assets. Many Treasury officials, including myself, were not in Washington, DC, when the crisis first broke. I was at the beach in Rehoboth, Delaware, where up and down the boardwalk one could see that the blackberry was as much toted around as suntan lotion.

Many papers have now examined the economic and financial factors that led to the crisis; Brunnermeier (2009) provides a discussion. Within Treasury, the financial market disruption was seen as the aftermath of twin credit and housing bubbles, with the repricing of risk across asset classes and consequent deleveraging across financial institutions coming about as information on the poor underwriting quality in the past several years became more widely understood (this is discussed in detail by Gorton (2008)) and as several financial institutions announced results reflecting the losses suffered as the result of subprime housing investments. As noted above, the focus here will be on the policy response rather than to go into depth into the factors behind the crisis.

Two main policies aimed at financial markets emerged from August: the so-called MLEC "Super SIV" under which banks would hold their illiquid assets in a common vehicle, and a mortgage information database that would provide granular information on the quality of underwriting and subsequent performance of mortgages and thereby facilitate analysis of complex mortgaged backed securities and their derivatives. Neither of these efforts came to fruition, though the American Securitization Forum (ASF) independently began to work on a mortgage database and is still doing so today under the rubric of their "Project Restart." A byproduct of the August credit meltdown that did come to fruition was the formation of the Hope Now Alliance aimed at reducing foreclosures. This is discussed further below.

The idea behind the mortgage information database was to directly address the lack of transparency and information behind the August lockup of the markets for asset-backed securities. A database could be organized to provide market participants with loan-level information on mortgage origination and ongoing performance. The data would be anonymously tagged with an identification number akin to a CUSIP on a security. This could be done on a forward-looking basis for new mortgages as they get securitized into MBS, or on a backward-looking basis for existing MBS. This latter would be much more difficult—servicers were already overwhelmed by the tide of loan modification requests and did not want to be diverted by a backward-looking project. Information in the database could be used by investors to carry out analyses of the performance of MBS and

CDOs containing the mortgages—this would have allowed analysis to pierce complexity (as I put it in a speech in February 2008 that mentioned the database idea). Ultimately, the database would allow investors to assess the performance of mortgages originated by particular firms or even particular loan officers—this would create a "reputational tail" so that originators would have a connection to the future performance of mortgages even after they had been offloaded from their books through the securitization channel. This reputational tail could be a less intrusive alternative to the suggestion that lenders be required to keep an actual piece of the loans they originate—that they keep actual "skin in the game." A database could also have helped overcome the informational problem posed by second liens, which were often not visible to the servicer of the first mortgage and posed an obstacle to a loan modification. The paradox was that this database did not exist already—that investors in mortgage-backed securities had not demanded the information from the beginning.

With the lockup in the asset backed commercial paper market leaving assets in banks' special investment vehicles (SIV's, also known as conduits), officials in the Treasury Office of Domestic Finance developed the MLEC plan as a temporary "bridge" structure to provide participating institutions with time to reprice and reassess risk. The idea was that the value of the complex securities held by banks' SIV's was not well understood and that it would be useful for institutions to be able to hold their illiquid assets in a common pool until there was more clarity on asset performance so that the assets could be sold off over time. An orderly disposal of the illiquid assets, it was thought, would avoid banks having to rapidly unwind their structured investment vehicles by selling off assets into a thin market at fire sale prices. The concern was that such a disorderly unwind would have adverse impacts on banks, investors, and the overall economy. Under the MLEC proposal, banks would agree on a multilateral pricing mechanism for the illiquid assets and take pro-rata shares of a common pool, which would then turn into something close to a buy-and-hold investment vehicle—with the intent being to unwind the portfolio slowly as credit markets improved and asset values rebounded. The MLEC concept implicitly rested on the assumption that trading had ground to a halt because of uncertainty about asset performance that gave rise to a huge liquidity premium in housing-related asset backed securities—the metaphor of choice was the "mad cow disease": it was not possible to readily tell which asset-backed securities were toxic, so investors chose not to touch any of them. MLEC would provide a breathing space under which conditions would return to some new "normal" (not a new bubble) and bid-ask spreads would narrow and trading naturally resume. Of course, this pause is of little use if the problem is fundamentally one of capital, not liquidity—as turned out to be the case.

Officials in the Office of Domestic Finance brought together market participants at a Sunday meeting at Treasury to discuss MLEC. The meeting and the whole MLEC concept were something of a mystery to many Treasury senior staff—myself included—until the following Monday's senior staff meeting. MLEC was seen within Treasury and portrayed to the world as a private sector solution. Some doubtful banks, however, saw it as something being forced on them; indeed, a number of economists at investment banks wondered if the supposed utility of the idea in the first place rested upon a violation of the Modigliani-Miller theorem (meaning that they did not see the utility). MLEC never got off the ground; in the end, banks preferred to take the SIV assets back onto their balance sheets—demonstrating the tenuous nature of the off-balance sheet treatment in the first place and ensuring that this sort of regulatory arbitrage will be the subject of future reform efforts at financial market reform. While banks dealt with the problem on their own, the MLEC episode looked to the world and to many within Treasury like a basketball player going up in the air to pass without an open teammate in mind—a rough and awkward situation. Ironically, however, one of the elements of the Treasury bank rescue plan unveiled by the Obama administration in late March 2009 has elements of MLEC in that institutions are teaming with the federal government to purchase pools of assets, though with the (huge) advantage of being able to fund the purchases through low-cost government financing and with taxpayers assuming much of the downside risk.

Housing policy and Foreclosure avoidance

Throughout 2007, staff at Treasury and other government agencies had prepared numerous analyses and memos on the situation in housing. There was a keen awareness of the serious problems facing households with subprime mortgages, and rising concerns that households with prime mortgages would soon exhibit a similar pattern of rising delinquencies and foreclosures. There was also awareness that there were two types of housing problems. In some states in the Midwest and along the Gulf Coast, high delinquency and foreclosure rates reflected weak economies or the continued aftermath of the hurricanes. This was a traditional problem, in which the causality ran from the economy to housing. The other problem was found in states that were on the downside of housing bubbles, notably Arizona, California, Florida, and Nevada. In these areas, foreclosures reflected the steep declines in house prices and limited availability of credit for marginal buyers, which together put at risk subprime borrowers who had bought homes in 2004 to early 2007 in the expectation that rising home prices would give them equity with which to refinance out of a subprime adjustable rate loan. The end of the bubble had closed off this option and left borrowers in danger.

Rising foreclosure rates for subprime borrowers led to pressures—both political and economic—for Treasury and the administration to do something to assist families at risk of foreclosure. The chairman of the FDIC, Sheila Bair, correctly identified the rising foreclosure problem early on and pushed for the administration to take action.

Housing policy was seen as involving two main dimensions: a "forward-looking" one relating to measures that would boost demand for housing, including through housing-specific policies such as a tax credit for homebuyers (possibly just first-time buyers) or as part of a general economy-wide stimulus; and "backward-looking" policies to help existing homeowners at risk of foreclosure.

The Administration response as of September 2007 included three main proposals, all of which required Congressional action. The first was a set of changes to the Federal Housing Authority (FHA) that would allow additional low- and moderate-income homeowners to refinance into FHA-guaranteed loans.[2] This was on top of a program known as FHASecure that allowed refinancing by borrowers who became delinquent because the interest rate on their adjustable-rate loan had increased. All together, proposals involving the FHA were seen as helping perhaps 500,000 families. FHA had gained substantial market share as private sector subprime lending disappeared in 2007, and there were concerns that the agency was near its capacity, not least because Congress had not approved funding requested by the Administration to update its dated computer systems.

The second proposal was a change to the tax code, eventually enacted, that forgave the tax assessed on the cancellation of debt by a lender, such as when a borrower walked away from a home without paying the full mortgage amount. This change did not boost housing demand or prevent foreclosures, but was seen as avoiding an unfair tax bill for people who had just lost their home.

The third proposal was the long-standing effort by the administration to improve the regulation of the government-sponsored enterprises (GSEs), Fannie Mae and Freddie Mac. The talking point version of this proposal was that a strong and independent regulator could better assure the safety and soundness of the two companies, and thereby help ensure that they had the financial wherewithal to provide continued financing to mortgage markets. GSE reform was finally enacted as part of the summer 2008 housing bill, by which time it was too late to avert insolvency at the two enterprises.

These three proposals might all have been worthwhile—indeed, all eventually were enacted in one form or another—but they were dissatisfying in their small scope.

The initial focus of housing policy was on the difficulties faced by homeowners in subprime adjustable rate mortgages (subprime ARMs) facing an interest rate reset, typically two years after origination (or sometimes after three years). As explained by Gorton (2008), one way to look at these subprime ARM products is that they essentially provided the lender with an option every two or three years as to whether to roll over financing and allow a family to stay in the home at a low interest rate. The concern by mid-2007 was that many families would not be able to afford the higher payments associated with the interest rate reset (the term "payment shock" was used, though this is a misnomer of sorts, since the interest rate hike was not a surprise but instead the central feature of the mortgage). FDIC Chairman Sheila Bair, for example, expressed concerns that up to 1.75 million homeowners could benefit from freezing adjustable rate 2/28 and 3/27 subprime mortgages at their initial rate. We calculated that about 1.8 million subprime ARMs would face resets in 2008 to 2010. Our assessment, however, was that the driver of foreclosures was the original underwriting, not the reset. Too many borrowers were in the wrong house, not the wrong mortgage. As the Fed cut interest

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[2] The FHA package included lowering required down payments, raising loan limits, and allowing for risk-based pricing of insurance premiums so that the FHA could insure loans to yet riskier borrowers by charging them higher insurance premiums. Such risk-based pricing was a political red line for many in Congress, who saw it as unfair to charge more to the people in the worst financial condition and thus in the greatest need of assistance.

rates in late 2007, the rates to which mortgage resets were tied came down as well, reducing or even eliminating the payment shock for many subprime borrowers.

Treasury convened meetings in the fall with groups of housing industry participants, including lenders, servicers (the agents of lenders who collect monthly payments and deal with delinquent homeowners including initiating foreclosure when necessary), non-profit housing counselors, and organizations representing investors in mortgage-backed securities. What became apparent through this dialogue was that frictions and communication gaps between housing industry participants meant that some homeowners faced foreclosure unnecessarily. The Hope Now Alliance was formed to address these issues.

The Hope Now Alliance was launched by HUD and Treasury on October 11, 2007. As the organization puts it on their web site, Hope Now is an alliance between HUD-approved counseling agents, mortgage companies, investors and other mortgage market participants that provides free foreclosure prevention assistance. With football providing the metaphor of choice at the Paulson Treasury, an important part of the initial work done through Hope Now was seen as basic "blocking and tackling" in getting industry participants to work together and with borrowers more smoothly. The first step to avoid a foreclosure was for the servicer and borrower to talk to one another, but this was not happening in a surprisingly high proportion of instances—some estimates were that half of foreclosures started without contact between borrower and lender or servicer. Failures of outreach were in all directions: servicers were frustrated at the low response rate they had from borrowers to their letters and phone calls, while many borrowers who did reach out on their own found it difficult to get to get to the right person for help at their servicer or lender (and in some cases found that they could not get help until they were already substantially delinquent even if they knew that a problem was coming such as not being able to afford a future interest rate hike). Non-profit housing counselors had a valuable role to play since they were often seen by borrowers as a neutral party with which to interact, and counselors tended to report higher response rates from at-risk borrowers. But counseling was something of a patchwork, with uncertain funding and unclear relationships between counselors and lenders. Counselors would tell Treasury they worked well with some lenders or servicers but could not get in the door at others, while servicers had similar issues with uneven relationships in the other direction. For their part, servicers were still hesitantly exploring the legal room they had to modify loans, and faced resource constraints of their own in that servicer contracts did not envision the need for large-scale modification efforts to avoid foreclosures (issues regarding servicers are discussed in detail by Cordell, Dynan, Lehnert, Liang, and Mauskopf (2008)).

Hope Now brought together the leading subprime servicers, national counseling agencies (including the highly-regarded NeighborWorks organization), and industry and investor trade associations such as the Mortgage Bankers Association, the Financial Services Roundtable, the Securities Industry and Financial Markets Association (SIFMA), and the American Securitization Forum (ASF). The inclusion of industry associations was helpful, since these organizations provided a rapid channel through which to bring together the firms in the housing ecosystem. And having the servicers involved was essential, since they were the point of contact between the industry and individual borrowers. The alliance started with participation by servicers for about half of subprime mortgages and grew to cover better than 90 percent of subprime and 70 percent of all loans by mid-2008 (some banks service their own mortgages). This was backstopped by intense involvement by Treasury staff (particularly Neel Kashkari, who had come up with the initial idea) and substantial personal involvement by Secretary Paulson. Participants in Hope Now committed to creating a unified plan to reach and help homeowners avoid foreclosure.

Hope Now initially focused on outreach—the blocking and tackling above—with the goal of reaching borrowers early enough so that modification decisions could at least be contemplated. This involved a national foreclosure counseling hotline (888-995-HOPE) and a publicity campaign to advertise it, featuring public service announcements and public events with government officials including President Bush. Hope Now arranged for servicers to provide funding for the non-profit counselors (who had previously relied on government and foundation resources), standardized communication protocols between counselors and servicers, and collected systematic data on the number of people helped and the modifications made. Participants in Hope Now agreed to provide subprime borrowers with information about their reset four months in advance, and to send high-visibility letters to all borrowers who became 60 days delinquent urging them to call the Hope Now hotline. Again, this sort of outreach sounds basic, but it was unprecedented for the industry. Hope Now reported that the call volume on its hotline surged in late 2007 and into 2008. The next step was to follow up these activities with a systematic approach to help at-risk borrowers refinance or obtain a loan modification that would avoid a foreclosure.

The fundamental goal was to "avoid preventable foreclosures." As Secretary Paulson and others were to say repeatedly, this meant that Treasury was looking for ways to help homeowners who were struggling with their mortgage payments but both wanted to stay in their home and had the basic financial wherewithal to do so. Wanting to stay in their house meant that a homeowner would not walk away from a home when they could afford the monthly payment. The second part about basic financial wherewithal meant that Treasury efforts were aimed at getting mortgage servicers to modify loans for homeowners with subprime ARM's who could afford their payments at the initial interest rate before the first reset, and for which the cost to the beneficial owner of the mortgage of modifying the loan was less than the loss that would be suffered in a foreclosure. Not every foreclosure could be prevented through a modification—after all, there were over 600,000 foreclosures in "normal" years. But we wanted to make sure that no one got foreclosed on who could afford to stay in their home under the set of circumstances above. The loan modifications were part of the solution and would be a complement to other efforts to enable homeowners to refinance into fixed rate loans, whether through the FHA or a private lender.

Through Hope Now, Treasury pushed lenders and their servicer agents to undertake a calculation that balanced the cost (in net present value) of a modification that would keep a family in their home against the loss that would be suffered from a foreclosure—the legal fees, possible damage to the house, and resale consequences for a bank that sought to sell a foreclosed house in a declining market (and knowing that putting the house up for sale after foreclosure would itself have a negative spillover effect in further depressing home prices). When this net present value calculation indicated that it made sense to modify the loan, the Treasury Department—and Secretary Paulson personally—expected lenders to do so to avoid foreclosure. Treasury also pushed servicers to ensure that the loan modification were of a long enough duration to give borrowers a chance for the income growth and home price appreciation that would allow them to refinance permanently into a conforming fixed rate loan rather than another subprime ARM. While these modifications were in everyone's best interest, they did not appear to be taking place in the scale that would be expected. The impact of second liens was one reason for this, since these make it difficult for the servicer of the first lien to get agreement for a modification—and in the case of piggyback second loans meant that the borrower was in much worse financial shape than would be indicated by the first lien alone and thus less likely to be able to sustain even a modified first mortgage. Addressing the frictions in the modification process turned out to be a ongoing project at Treasury—and one that continued even past the end of the administration in January 2009.

The goal was a modification that would lower the monthly payment to something that the borrower could afford. Some borrowers might still walk away from their homes because they were deeply underwater, while others had such a severe income problem that it made more sense from the point of view of the mortgage owner to foreclose. Servicers would structure loan modifications to lower an at-risk borrower's monthly payment in the way with the least cost to the beneficial owner of the mortgage. Simple bond math meant that servicers would first reduce the monthly payment by extending the loan term out to 30 or 40 years, then lower the payment further by cutting the interest rate, and only as a last resort would it make sense for a servicer to lower the principal amount of the mortgage in order to lower the monthly payment (and that was only if the contract governing the servicer allowed for a principal reduction, which was not always the case).

If a homeowner could not sustain payments at the initial interest rate on their mortgage, then the view at Treasury was that this person was probably in the wrong home. Treasury asked lenders to look at each situation, but we recognized that, as Secretary Paulson put it, many such homeowners would become renters.

The modification approach focused on people with payment and income problems, not on underwater borrowers, who owed more on their mortgage than the current value of their home. Since mortgages in many states do not allow the lender recourse to claim a borrower's assets beyond the house collateralizing the mortgage, this meant that many people who were underwater on their mortgage might walk away and allow foreclosure even if they could afford their monthly payment. Not everyone would do so: a person with a mortgage equal to 105 or 110 percent of their home value might well stay if they could afford the monthly payment—they might like their neighborhood or local school and so on. But it was quite rational for a person who got into a house with little or no equity and then suffered a 40 or 50 percent price decline to walk away from their home (and perhaps buy the one across the street at the current market price). Being underwater was thus a catalyst for a foreclosure but not necessarily a sufficient condition by itself. Treasury did not expect banks to modify loans where borrowers could afford the payment but might not want to do because they were underwater—quite the opposite: the view from the Secretary was that a homeowner who could afford their mortgage but chose to walk away was a speculator.

As a practical matter, servicers told us that considerations of moral hazard meant that they did not write down principal on a loan when the borrower had the resources to pay—never. They would rather take the loss in foreclosure when an underwater borrower walked away than have to take multiple losses when entire neighborhoods of homeowners asked for similar write downs of loan principal.

Such moral hazard is pervasive in foreclosure prevention proposals, since potential assistance could lead borrowers to stop making payments in order to qualify for help. There is no way to avoid moral hazard, but only to choose the screens and hurdles borrowers must pass to qualify for assistance. The tradeoff is that steps to limit moral hazard also limit take-up.

Treasury expected lenders to go up to the line of making modifications, but there was no public money on the table to get them to go further (with the possible exception that FHA-guaranteed loans would involve a public subsidy to the extent that the FHA unintentionally underpriced its insurance, as one might expect from a government insurer). Even though we realized that there was no appetite for crossing the line, Treasury economists in October 2007 developed two types of policies to put public resources into foreclosure prevention, starting from the presumption that as much as possible, all stakeholders would be required to "pitch in."

The first policy focused on underwater borrowers, with the federal government in effect writing checks in cases where lenders were willing to take a write-down. The lender had to take a haircut on the principal of the loan, after which the federal government would then subsidize the cost of a guarantee on the modified loan—this would be a subsidy because these would be loans to borrowers who were still quite risky. Borrower would be required to pay part of the annual premium for the federal guarantee and states would be invited to pitch in using tax-preferred bonds they could issue for housing-related purposes. This was broadly similar to the Hope for Homeowners program that was developed later jointly by the Fed and Congressional staff, but with more realistic parameters for servicers and without the pretense that no federal spending was involved. The plan was known at Treasury as the "GHA," a reference both to its operation through a dramatic expansion of the FHA in putting guarantees on mortgages to risky borrowers and to one of the main authors of the idea, deputy assistant secretary for microeconomics Ted Gayer, who was at Treasury for a year on leave from Georgetown University's Public Policy Institute.

The second type of policy developed by Treasury economists in October 2007 focused on affordability, and involved a matching federal subsidy to lenders willing to lower interest rates in order to reduce the monthly payments for at-risk borrowers.[3] The approach was based on the bond math above that the most cost-affordable way to lower monthly payments was to cut the interest rate, and on the straightforward notion that the government should pay servicers to do what it wanted them to do. In this case, the federal government wanted lenders (servicers) to lower interest rates to avoid foreclosures on at-risk borrowers, so it would give them a financial incentive to do so and no financial incentive to put people into foreclosure. Lenders would have to fund the first 50 basis points of the interest rate reduction to give lenders an incentive to screen out marginal cases where they should just modify loans without any subsidy, after which the federal government would pay half the cost of lowering the interest rate up to a total of 450 basis points (so the lender would fund a maximum of 250 basis points and the federal government 200 basis points). Lenders could reduce interest rates further on their own without an additional subsidy, but the presumption was that a borrower who needed more than a 450 basis point reduction in the interest rate on their mortgage was in the wrong house. If a borrower defaulted after the modification, the federal subsidy would end—the government would pay for success, not for failure. This subsidy would be in place for five years, which we saw as long enough a breathing space for borrowers to have income growth and home price appreciation and thus be in a position to refinance into a fixed rate loan. The tradeoff to this time period is clear: a longer subsidy than five years gives people more time to ensure that they can afford the house after the subsidy ends, but means a more expensive modification for the lender and thus less uptake—fewer people would get into the program but more of those that did would be saved. We saw five years as striking the right balance and did some analysis showing that several million homeowners could avoid foreclosure with this interest rate subsidy. The initial reaction among Fed staff responsible for analysis of housing policy in October 2007 was disinterest because it did not address the problem of underwater borrowers on which they were focused (as shown by the Hope for Homeowners approach the Fed helped to develop). We agreed with Fed staff that the interest rate subsidy would not be enough of an incentive to dissuade a deeply underwater borrower—say, one with a loan of 150 percent of their home value—from walking away. But our view was that there was a government budget constraint (even if many outside critics charged that the Bush administration did not act like it), and it was not a wise use of public resources to write huge checks to people who could afford their homes but might choose not to stay in them. This view was not a moralistic one such as with the Secretary's assertion that a person who would walk away was a speculator, but instead a practical one that it would be better on the margin to use taxpayer dollars to hire more preschool teachers than to subsidize deeply underwater borrowers.

While the Fed staff was focused on underwater borrowers, within the administration more broadly—among White House staff in particular, but also within Treasury—there was no desire to put public money on the line to prevent additional foreclosures. This is because any such government program would inevitably involve a bailout of some "irresponsible" homeowners. The cynical way of putting this was that spending public money on foreclosure avoidance would be asking responsible taxpayers to subsidize

[3] Credit for this idea goes to Ted Gayer and John Worth (the director of the office). Their idea was adopted by the Obama administration in 2009.

people living in McMansions they could not afford with flat screen televisions paid out of their home equity line of credit. The policy rationale to spend public money is clear in that there is a negative externality from foreclosures to home inventories and thus prices. But the public opposition to such bailouts appeared to be intense—ironically, many people were already mad at Treasury for supposedly bailing out irresponsible homeowners through Hope Now even though this did not involve explicit public spending.

Congress appeared to heed this opposition as well: there were constant calls for Treasury and the administration to do more on foreclosure prevention, but this was just rhetoric. Until the FDIC came out with a proposal late in 2008 there was not legislative support to spend public money to actually prevent foreclosures—the Congressional proposal discussed below ostensibly did not use public funds. And as discussed below in relation to the TARP, even in the Fall of 2008 the support was for Treasury to spend TARP money for foreclosure avoidance—members of Congress did not want to have to vote specifically to spend money on this, suggesting that members understood the poor optics of having the government write checks when some would find their way into the hands of "irresponsible homeowners."

In 2007 and through the middle of 2008, the focus of legislative energies was on the so-called Frank-Dodd legislation, which became law on July 30, 2008 as part of the Housing and Economic Recovery Act of 2008 (which included provisions to reform the GSEs). This proposal involved FHA-guaranteed refinances of mortgages for which lenders were willing to write down the loan principal to 87 percent of the current market value. This was a great deal for a homeowner, who would have lower payments and substantial equity (though they would have to share some of these gains with the federal government on a future sale), but a huge write-down for the lender (more than 13 percent in instances where home prices had declined substantially since origination). And there was ostensibly no government money involved, as the legislation required the GSEs to cover any costs—again demonstrating the reluctance of policymakers to be seen as writing checks to irresponsible homeowners. The Congressional Budget Office (CBO) estimated that the Frank-Dodd approach would help some 400,000 homeowners. Having heard directly from lenders about their reluctance to cut the principal of loans, we saw the CBO estimate as being optimistic by 400,000. This bill included legislation to strengthen the regulation of the GSEs, however, so President Bush signed it into law. An immense effort to implement the new "Hope for Homeowners" program was made by staff from the FHA and HUD, the Fed, Treasury, and the FDIC—and then unfortunately the Treasury estimate of participation turned out to be correct, with few loans refinanced through early 2009.

To avoid more foreclosures required someone to write a check—either the government or lenders. The attraction of the so-called bankruptcy cram down proposal, under which bankruptcy courts could retroactively change mortgage contracts by reducing the loan principal, was that it appeared to be "free"— it was to the government—but this is because the cram down is a forced transfer from lenders to homeowners. Treasury opposed the cram down proposal out of a concern that abrogating contracts in this way would have undesirable consequences for the future availability of credit, especially to low-income borrowers. Some current borrowers would benefit from having their mortgage balance reduced, but future ones would find it more difficult to obtain a loan.

What was done was that Treasury and Hope Now worked with the American Securitization Forum (ASF) to make modifications happen faster and more frequently. This turned into the "Streamlined Foreclosure and Loss Avoidance Framework" announced on December 6, 2007. This initiative focused on the approximately 1.8 million subprime 2/28 and 3/27 adjustable rate mortgages (ARMs) set to reset in 2008 and 2009. Servicers agreed to carry out a fast-tracked process to help borrowers either refinance into a fixed rate loan (the first choice for borrowers with adequate income and credit history), or failing this to provide a 5 year extension of the starter interest rate for borrowers who could afford their monthly payment at the initial rate. A five year modification did not provide a permanent fix, but would give borrowers time to experience income gains and home appreciation that would put them in position to refinance into a fixed rate loan in the future. A longer modification than five years would be more costly to a lender/investor and thus fewer modifications would pass the cost test. And even a five year horizon would be a change from industry practice, which was geared to "repayment plans"—short term modifications that would be appropriate for a borrower with a temporary income problem of a few months. Industry participants estimated that about one-third of the 1.8 million potential borrowers in the program could not afford their starter rate, and another one-third could clearly receive either a refinance or a rate freeze. The aim was to save as many as possible of the remaining 600,000 to come close to helping 1.2 million homeowners. The ASF fast track framework provided servicers with a set of "best practices" that they could use to implement modifications.

The streamlined framework formally launched in early 2008, but some servicers began to implement it in late 2007. Hope Now reported a dramatic increase in the number of homeowners receiving help in the form of a refinancing or a loan modification, from 300,000 per quarter in the first half of 2007 to over 500,000 per quarter in mid-2008 and nearly 700,000 in the last three months of 2008. The increase was especially noticeable for subprime borrowers, where the number of long-term modifications rose from less than 50,000 per quarter in the first nine months of 2007 to over 200,000 in the last quarter of 2008 alone. By the end of 2008, nearly half of homeowners receiving help got long-term modifications rather than short-term repayment plans, compared to only 20 percent previously. Hope Now was not solving the foreclosure problem, but it was performing as designed.

Treasury and Hope Now nonetheless faced continuing criticism that these efforts were inadequate and that servicers were not doing enough modifications. The Center for Responsible Lending (CRL), for example, put out a widely-cited report on January 30, 2008 that claimed that the "Paulson plan" for voluntary loan modifications would help only 3 percent of at-risk homes. What was not reported, however, was that the 3 percent figure of homes saved as a share of homes at risk was calculated using several unusual assumptions. The denominator of at-risk homes included not just owner-occupied homes but also investor properties even though the ostensible goal was to save homeowners, not investors. The numerator—the measure of success—included loan modifications but not the refinances into fixed rate mortgages that were usually better than a modification. Correcting these and other questionable assumptions in the CRL analysis changed the result to that at least 30 percent, and possibly more than half, of eligible homeowners would be helped by the Hope Now framework. The Center for Responsibility Lending did not correct their analysis when we quietly pointed out to them the flaws (which their researchers acknowledged), but neither did Treasury pro-actively go out to the media to dispel the misconception.

As criticisms continued that not enough was being done to prevent foreclosures, the focus at Treasury turned to coming up with additional actions through Hope Now that would show that more was being done. Out of this came the February 18 announcement of "Project Lifeline," under which severely delinquent borrowers would be granted a 30 day pause on foreclosure proceedings as a last ditch breathing space to allow the borrower to work with their lender of servicer to find a modification that made sense for both sides.

Some hurdles to modifications were real and more difficult to address. Servicers had varying abilities to deal with the large number of modification requests. The presence of a second lien such as a home equity line of credit or a piggyback mortgage could also present a challenge to a modification on the primary mortgage, since the owner of the second lien had an incentive to hold up a refinancing or modification unless they received a payoff—even though for a second lien on a troubled borrower was worth only pennies on the dollar since the primary mortgage holder would have the first right to the proceeds of a foreclosure sale.

Legal and accounting issues constituted two further hurdles to loan modifications. Servicers were unclear as to their legal ability to modify loans within securitization trusts, and additionally worried that undertaking too many modifications would lead to an adverse change in the accounting treatment of the mortgage backed security containing the loans. Financial Accounting Standards Board Statement number 140 provides guidance on whether a transfer of assets to a securitization trust can receive off-balance sheet treatment. The concern was that if too many loans were modified this would make the trust no longer a passive structure and therefore ineligible for off-balance sheet accounting treatment. SEC Chairman Cox indicated that having loans in an MBS trust receive the 5-year rate freeze did not preclude continued off-balance sheet treatment so long as it was "reasonably foreseeable" that the loans being modified were headed for default. Treasury economists worked with staff from the FDIC to analyze loan-level data on subprime mortgages. The results showed that for subprime borrowers in the years covered by the Hope Now streamlined approach, it was sadly straightforward to conclude that a default on their mortgage was reasonably foreseeable. These results went into a letter from the Treasury to the SEC that was meant to provide backing for Chairman Cox. The view at Treasury was then that servicers had the legal authority they needed to modify loans, and that there was no need for Congressional proposals to enact a "safe harbor" that would explicitly provide such cover. While we realized that the safe harbor provision might have avoided some lawsuits against servicers who modified loans, our concern was that it was a retroactive change to contracts—not as obviously harmful as the mortgage cram down proposal to future low-income families wanting to become homeowners, but harmful nonetheless in suggesting to lenders that they should worry about retroactive changes to contracts.

It turned out that the original motivation for the Hope Now streamlined modification protocol was incorrect, in that interest rate resets by themselves were not the fundamental driver of rising foreclosures—a point documented by Schweitzer and Venkatu (2009). This can be inferred from Figure 1, since the foreclosure rate does not have an upward kink at the point of the reset at month 24. Many subprime ARM resets started at an initial rate of 8 to 9 percent for two years and then were pegged to reset to 600 basis points above the 6-month LIBOR interest rate. By early 2008, however, the LIBOR rate had fallen to 3 percent or less, so that the step up in the interest rates and thus the payment shock was fairly modest. We nonetheless saw the ASF streamlined modification framework as useful, since it would be ready in case interest rates increased in the future, and it was driving modifications for loans even before resets.

Treasury housing policy by early 2008 had four goals:

- <u>avoid preventable foreclosures</u> as discussed above;
- <u>ensure the continued flow of capital into housing markets</u>, both through efforts to enact reform of the GSE's and by resisting proposals such as the bankruptcy cram down that would have choked off capital;
- <u>enable the necessary housing correction to proceed</u>, which meant warding off proposals for long-last foreclosure moratoriums that we saw as simply prolonging the difficulty without providing lasting help for at-risk homeowners;
- <u>support the broad economy</u>, such as through the January 2008 stimulus.

With little desire on anyone's part to put public money on the table, housing policy was to remain largely focused around the debate over modifications achieved through Hope Now and over the Frank-Dodd legislation.

A recurring theme of inbound policy proposals was that Treasury should promote shared appreciation mortgages, in which homeowners would get a modification or financing concessions in exchange for giving up part of future appreciation in their home to the lender. This was essentially a proposal for a debt-for-equity swap. We looked at these, but concluded that this type of mortgage was not common because there was little demand for it.

The one truly new proposal we heard in early 2008 was that of Martin Feldstein, who in a March 7 oped in the Wall Street Journal and in subsequent writings laid out a proposal to stabilize the housing market by offering all homeowners a government loan that would be used to reduce the principal balance on first-lien mortgages. This loan would make it less likely that homeowners will have negative mortgage equity and thereby reduce future defaults in the face of continued home price declines. Participating homeowners would not be able to walk away from the government loan because it would be a tax lien that could not be escaped in bankruptcy. The Feldstein proposal would not help borrowers already facing foreclosure, but that was not the point—it was meant to arrest the impact of future potential underwater borrowers walking away from their homes and adding to inventories and thus exacerbating the downward momentum of home prices. Intrigued, we analyzed the potential impacts, including looking at the IRS' success in collecting on tax liens to get a sense of the budget cost of the proposal. In the end, though, with little political support for spending money on risky homeowners, there was even less prospect of a massive housing program aimed at the better-off homeowners who were not in imminent danger.

Housing policy was to stay essentially static until later in 2008, when the $700 billion TARP fund became available and calls grew to spend part of it on foreclosure prevention. In the fall of 2008, the FDIC developed two initiatives aimed at foreclosure avoidance. The first was a roadmap for servicers to follow in modifying loans—a "mod in a box" as they called it of the calculations needed to implement the NPV calculation between foreclosure and loan modification. This was based on the FDIC's experience with IndyMac, which the agency had taken over on July 11. The IndyMac protocol involved steps to bring a borrower's monthly payment on their first mortgage down first to 38 percent of their pre-tax income (a figure which the FDIC later changed to 31 percent when it found that many borrowers could not stay current with 38 percent of their income devoted to their first mortgage). The steps were familiar from the bond math above: there was no principal write-down, but instead a term extension, interest rate cuts, and principal forbearance, all aimed at lowering the monthly payment so that a borrower could afford to stay in their home. The FDIC approach looked only at the monthly payment as a share of the first mortgage—the so-called "front end ratio"—and not at total loan payments including a second lien if present, and auto and credit card bills (the so-called "back-end ratio"). This focus on the front-end was done for speed; the idea was to allow for rapid modification of loans, accepting that some might well go bad since a borrower with loaded-up credit cards might ultimately still default even if the interest rate on their home loan was reduced. This streamlined approach to modifications was a natural extension of the streamlined protocol developed in late 2007 through the auspices of Hope Now, though the press did not make this connection and Treasury did not press it either (that is, Treasury did not pro-actively note that the Hope Now activities that so many people had criticized had actually provided the groundwork for the widely-acclaimed FDIC approach). The GSEs later adopted much of the approach of the IndyMac protocol in putting out their own streamlined approach to modifications on November 11, 2008.

The second FDIC proposal for foreclosure avoidance was a loss-sharing insurance plan, under which the federal government would make good on half of the loss suffered by a lender that modified a loan according to the IndyMac protocol but then had it go into default and foreclosure. This was an innovative margin on which to push: there was a great deal of anecdotal evidence, later confirmed by statistical evidence from the Office of the Comptroller of the Currency, that many loans were going bad even after they had been modified to reduce the payment. The FDIC plan provided some comfort to a lender to make a modification, since the lender would be reimbursed for half of the loss if the loan eventually defaulted. Housing activist groups such as the Center for Responsible Lending endorsed the FDIC plan, as did Elizabeth Warren, the law professor appointed by Congress to chair an oversight panel for the TARP. The proposal received a good deal of coverage in the press, some of which confused the loss-sharing insurance proposal that involved government spending to motivate more modifications with the IndyMac protocol that provided a roadmap for voluntary modifications but involved no government resources.

At Treasury, we noted that the FDIC plan gave rise to new forms of both adverse selection and moral hazard in ways that made the proposal mainly a windfall for the beneficial owners of mortgages rather than a benefit for homeowners. In other words, the public would be providing a subsidy to banks, hedge funds, and other owners of mortgage-backed securities (including foreign banks and foreign hedge funds) rather than to American families. This had to do with the incentive effects of the FDIC proposal: if a servicer modified a loan and the borrower was able to stay in the home as a result, the owner of the mortgage got nothing—zero. (The proposal would have given $1,000 to the servicer for modifying a loan, but this went to the servicer not to the owner of the loan; this payment could have put the servicer at odds with its fiduciary obligation to make modifications that were only for the benefit of the owners of the mortgage). If a loan was modified according to the FDIC's protocol and it went bad, however, the government would write a large check to the owner of the mortgage to cover half of their loss. Moreover, there was no deductible on this loss-sharing insurance coverage, so in the case of an underwater borrower, the government would have in effect been providing fire insurance on an entire house when several of the rooms were already engulfed in flames. At Treasury, we viewed the loss-sharing insurance proposal as a non-transparent way to funnel money to institutions that had made bad lending decisions and to investors who had bought the loans—a hidden bailout. Ironically, however, the New York Times on November 1, 2008, published an article by its columnist Joseph Nocera asserting that Treasury opposed the FDIC proposal because "aid is going to homeowners, not giant financial institutions." Had Treasury supported the proposal we could have received "credit" for helping homeowners when we would really be bailing out financial institutions.

The confusion in the column in the New York Times might have reflected a common difficulty in understanding the impacts of insurance proposals, since the costs are implicit at the start when the payouts are yet to be realized and thus the subsidy with the loss-sharing insurance approach is somewhat obscured—big checks get written to banks and hedge funds, but only six months or more down the road as modified loans default. In contrast, the interest rate subsidy puts the government resources to avoid foreclosure in clear daylight—it looks exactly like what it is, which is writing to checks to people who are in homes they cannot afford. The cost per incremental foreclosure avoided, however, is much less with the interest rate subsidy—this proposal is more efficient but suffers from its transparency.

In evaluating the FDIC proposal, Treasury economists suggested that a way to remove some of the unwanted windfall for lenders was to have the insurance payout reflect declines in the area home price index after modification rather than the lender's loss from foreclosure. Basing the payout on home price declines from modification would cover the valid concern underlying the loss-sharing insurance proposal that declining home prices gave servicers an incentive to foreclose sooner rather than giving a risky borrower another chance. While the FDIC declined to incorporate this suggestion, the Obama administration eventually incorporated it in their February 2009 foreclosure avoidance proposal. A related proposal by Treasury economist Steve Sharpe (a Fed staffer who came to Treasury for several months to help with capital markets and housing proposals) was for the federal government to sell insurance against price declines to home purchasers. At closing, buyers could pay a fee and receive insurance that compensated them five years later for any decline in the overall home price in their area—the homeowner would receive the payout, if any, without having to sell their home. The idea was to boost housing demand going forward by removing the fear among potential homebuyers of "catching a falling knife"—that is, buying a home that would lose value and leave them underwater. This proposal remains on the drawing board as of late March 2009.

The adverse selection came about because lenders would naturally want to put into the loss-sharing insurance program loans that were likely to default so that the government would cover half of a loss. At the suggestion of the Fed, the FDIC put in a six-month waiting period, which meant that a lender would have to bear the cost of modifying the loan for six months. The new form of moral hazard came about because the lender would have a financial incentive to foreclose immediately after the six month waiting period. Under the FDIC proposal, lenders would qualify for this loss-sharing insurance coverage only if they agreed to apply the IndyMac modification protocol to all loans in their portfolio—lenders could not choose, for example, only the loans in which they knew that borrowers had huge credit card debts. But this does not change the fundamental incentives; it just means that lenders would only participate in the program if the expected value of the insurance windfall they received to cover losses exceeded the total cost of the modifications they would be required to fund.

Both the interest rate subsidy developed at the Treasury and the FDIC loss-sharing insurance proposal focused on affordability rather than on underwater borrowers—which we saw as entirely appropriate from the point of view of the allocation of government resources. But the incentive effects were clearly different since the interest rate subsidy paid only when foreclosure is avoided, while the loss-sharing insurance by its nature pays out at failure—at foreclosure. Even Elizabeth Warren conceded to Treasury staff that she understood that banks rather than homeowners would most benefit from the FDIC plan. She was evidently supporting the FDIC proposal in public because she thought something had to be done about foreclosures and the FDIC plan seemed to be the only one on the table. The American Bankers Association endorsed the FDIC plan as well; presumably, this reflected their understanding of its impact.

This discussion of foreclosure avoidance policy, along with discussion of proposals aimed at boosting demand for housing going forward, is continued below in the context of the TARP.

The Stimulus of 2008

By October 2007, there were increased signs that the U.S. economy would remain weak into 2008 and that there was considerable downside risk from housing and financial markets. Work began in earnest on fiscal policy options to support growth. The idea that such action might be needed was buttressed by public calls for it by prominent economists, notably Larry Summers and Martin Feldstein. Throughout November and December, the administration economic team across Treasury, CEA, OMB, and the NEC considered various approaches, focusing on tax cuts for households and businesses. One top White House official reported that when he broached the possibility of a $100 billion tax cut with the Congressional leadership, the response was that this would be fine so long as Congress got to spend $100 billion as well. Opening the cupboard for pent-up spending would have to wait a year; the Economic Stimulus Act of 2008 as enacted was mainly tax cuts along with an extension of unemployment insurance benefits. The form of the tax cuts was remarkably similar to what CEA Chairman Eddie Lazear had sketched out as an initial proposal—rebate checks implemented as a reduction of the lowest tax rate and thus mainly an infra-marginal tax cut, along with additional expensing and bonus depreciation for businesses. Sending a one-off check to households was not the first choice in the Administration—the view in the administration was that a longer-lasting policy would have more impact than a one-off change. But there was no political prospect for a permanent tax cut or even extending the administration's 2001 and 2003 tax cuts and thus a one-off policy was adopted (though the concept of "permanent" tax cuts should be seen as a matter of degree given the regularity with which the tax code is changed in the United States). This was about tactics—supporting the broad economy while housing and credit markets continued to adjust—not a strategic approach to increased long-term growth.

The stimulus was proposed in early January and signed into law in mid-February, sped by the administration's stipulation that it would not fight for "Bush-style" tax policy and what seemed to be a determination by the Congressional leadership that they wanted to get this done quickly after an initial year in power with only modest accomplishments. The details of the tax provisions were agreed with the House leadership on a night when only that very morning the Treasury legislative affairs staff had reported that it could be weeks before a compromise was reached that would allow the stimulus legislation to be enacted.

The Internal Revenue Service and the Financial Management Service within Treasury worked wonders to push out nearly $100 billion in rebate checks and electronic payments, with most of the cash going out the door from April 28 to July 11, 2008. We (at Treasury, at least) expected the main impact of the stimulus to come from the rebate checks; with the economy weakening, it was hard to see much kick to business investment from a tax incentive that amounted to the time value of money. Our expectation was that about 30 percent would be spent in the second and third quarters, with a total of 40 percent spent by the end of 2008. Assuming a modest second-round multiplier, we tallied up a boost of $50 billion to aggregate demand. With each job corresponding to about $100,000 of income in the national accounts, a back-of-theenvelope calculation gave a boost of 500,000 jobs compared to the case without the stimulus. Simulations using the Macroeconomic Advisers model suggested roughly the same impact on employment.

In retrospect, sending out the rebate checks appears to have been the right thing for the wrong reason in that the rebates effectively served to offset the drag from higher energy prices. Looking back in January 2009, we calculated that higher energy prices in mid-2008 had meant an unexpected hit to U.S. consumers of about $40 billion—essentially the spending we expected from the stimulus. Others have disagreed, claiming that the stimulus was ineffective. This remains an important topic for future research. Negative supply shocks are never welcome, but these higher energy prices hit at precisely the wrong time, causing a downdraft to spending just as the labor market was finally feeling the impact of slower-than-potential GDP growth in the latter part of 2007.

Bear Stearns and Plans to Break the Glass

The collapse of Bear Stearns over the weekend of March 14, 2008 was a watershed event for Treasury. Until that point, Treasury had urged institutions to raise capital to provide a buffer against possible losses, but had not contemplated fiscal actions aimed directly at the financial sector. Instead, the main policy levers were seen as being the purview of the Fed, which had cut rates and developed new lending facilities in the face of events. From the Treasury side, the deliberations of that weekend were handled directly by Secretary Paulson working the phones from his home; one key staffer—Neel Kashkari—went to New York to observe some of the deliberations over the weekend as the Fed acted to provide JPMorgan with financing to purchase Bear Stearns. Moral hazard was a huge concern, but the feeling at Treasury was that even when the Bear transaction was renegotiated up from $2 per share to $10, the loss of wealth was still large enough to give pause to market participants and thus mitigate the moral hazard. Of course, there was moral hazard more broadly from the fact that Bear's bondholders and counterparties did not suffer a loss. But Treasury and the Fed saw little alternative to rescuing the firm at that time (or least cushioning its fall), simply because the speed of its collapse left markets unprepared.

A number of lessons of that weekend have received extensive discussion in the financial press and in the academic literature, including the role of liquidity (as discussed by Allen and Carletti (2008)), fragilities arising from counterparty risks embedded in the tri-party repo system and the over the counter derivative markets, and the need for a resolution mechanism for non-bank financial institutions. At Treasury, two additional lessons were learned: (1) we had better get to work on plans in case things got worse, and (2) many people in Washington, DC did not understand the implications of non-recourse lending from the Fed. This latter lesson was somewhat fortuitous, in that it took some time before the political class realized that the Fed had not just lent JP Morgan money to buy Bear Stearns, but in effect now owned the downside of a portfolio of $29 billion of possibly dodgy assets. This discovery of the lack of transparency of non-recourse lending by the Fed was to figure prominently in later financial rescue plans.

The Fed's announcement of the primary dealer credit facility (PDCF) immediately after the collapse of Bear Stearns seemed to us and many Wall Street economists to remove the tail risk of another large financial institution suffering a sudden and catastrophic collapse. This was a time to plan for further events.

Part of the planning was for the long-term, on which Treasury on March 31, 2008 released a Blueprint for a Modernized Financial Regulatory Structure with a vision for a long-term reshaping of financial sector regulation. This had long been in the works; indeed, Treasury had requested public comments on the topic in October 2007, but the timing of the Blueprint release led to press reports that this was Treasury's "response" to the crisis.

More near term in vision was work being done on so-called "break the glass" options—the reference being to what to do in case of an emergency. This work evolved from a recurring theme of input from market participants, which was that the solution to the financial crisis was for Treasury to buy up the "toxic" assets on bank balance sheets. Eventually a memo was written at Treasury that listed options to deal with a financial sector crisis arising from an undercapitalized system—the memo went through more than a dozen iterations in discussions around Treasury and with other agencies between March and April.

The options were to buy the toxic assets, turn the Treasury into a monoline and insure the assets, directly buy stakes in banks to inject capital, or use a massive scheme to refinance risky mortgages into government-guaranteed loans and thus improve asset performance and firms' capital positions from the bottom up. With estimates in mind that U.S. financial institutions would suffer $250 billion of losses from mortgage securities, we envisioned a government fund of $500 billion. A mix of asset purchases, capital injections, and additional private capital raising by banks would allow this amount to roughly offset the forthcoming losses.

These options would move the focus of financial markets policy back from the Fed to the Treasury, which would be appropriate in what was a problem reflecting inadequate capital rather than insufficient liquidity. But these actions all required Congressional action and there was no prospect of getting approval for any of this. With growth positive and the stimulus rebates only just beginning to go out in late April, it was unimaginable that Congress would give the Treasury Secretary such a fund. And it was doubly unimaginable that the fund could be enacted without immediately being put to use. Such a massive intervention in financial markets could only be proposed if Secretary Paulson and Chairman Bernanke went up to Congress and told them that the financial system and economy were on the verge of collapse. By then it could well be too late.

For several months in the second quarter of 2008, it seemed like things were improving. The housing adjustment appeared to be proceeding. Prices continued to fall and construction and sales were still in decline, but the rate of descent appeared to be slowing and our view was that by the end of 2008 housing would no longer subtract from GDP. The second half of 2008 looked to be difficult, but we expected the rebate checks to support consumption until the drags from housing and the credit disruption eased and growth rebounded in 2009.

GSEs

The relative quiet was to hold until early summer, when the effects of the housing collapse manifested in the collapse of IndyMac and severe pressures on the GSEs in the form of declining stock prices and widening spreads on Fannie and Freddie securities and thus on the mortgage interest rates for potential homebuyers. The FDIC took over IndyMac and turned the firm into a laboratory for their foreclosure prevention ideas, but the problems of the GSEs were squarely in Treasury's court. Treasury was in a difficult position. GSE debt and the mortgage-backed securities with GSE guarantees were pervasive throughout the financial system and a failure of the firms would have meant chaos in financial markets. As commentators such as Peter Wallison had long warned, the GSEs were holding the financial system and taxpayers hostage—and in mid-July it seemed like they would win the standoff.

The options were all unpleasant and all required Congressional action: to provide the GSEs with more liquidity by raising their line of credit from $2.25 billion each to something much larger; to inject capital; or to ask Congress to put them into conservatorship. This last option could be done under existing legislative authority with Congressional approval—the GSEs could fight an attempt to put them into receivership and might well win since their regulator had as recently as July said that the two firms were adequately capitalized (this was a statement referring to statutory definitions of capital including tax assets that could only be monetized in the future when the firms became profitable again, but it nonetheless carried weight). Moreover, even putting the GSEs into conservatorship raised questions about whether their $5 trillion in liabilities would be added to the public balance sheet. This did not seem to Treasury economists to be a meaningful issue, since the liabilities had always been implicitly on the U.S. government balance sheet—and in any case were matched by about the same amount of assets. But the prospect that rating agencies might downgrade U.S. sovereign debt was unappealing. The option of receivership was deemed off the table because it would have required winding down the GSE portfolios. These portfolios were the source of the systemic risk arising from the GSE activities, but the GSE purchases of mortgage-backed securities was an important way to ensure the availability of financing to potential homebuyers. Addressing the portfolios would have to wait for a longer term reform.

In the end, Secretary Paulson went to the steps of the Treasury building on Sunday, July 13 and proposed "all of the above"—the power to give the GSEs both liquidity and capital in amounts that would make clear to market participants that the U.S. government stood behind the obligations of these companies (his unfortunate phrasing about having a bazooka was to be repeated constantly in the months to come). He asked Congress to raise the lines of credit, to authorize unlimited (subject to the statutory debt ceiling) direct

Treasury purchases of GSE securities including both their mortgage-backed securities and stock through the end of 2009 to ensure that the firms could fulfill their missions with respect to housing markets, and to give their regulator the power of conservatorship and other authorities that had long been sought by the administration. Treasury would insist on terms and conditions to protect the taxpayer if money was ever put into the firms. The Federal Reserve Board authorized bridge lending to Fannie and Freddie while Congress worked on the legislation, which was enacted on July 30, 2008 (and which included the Hope for Homeowners program discussed above along with the desired GSE powers). Some market participants complained that the rescue did not distinguish between senior and subordinated debt but instead made both of them whole when many participants had expected the subordinated debt not to be included within the rubric of a guarantee. The feeling at Treasury was that simplicity and clarity were paramount (though of course clarity is sometimes in the eye of the beholder).

This effective hardening of the heretofore-implicit guarantee left distinctly mixed feelings among Treasury staff. A crisis had been forestalled with a flurry of weekend activity (soon to become a regular part of the 7-day work week at Treasury), but the outcome seemed to cement in place the awkward status of the GSEs and their ability to privatize gains and socialize risk by borrowing at advantageous terms under the shelter of a now-explicit government guarantee. Treasury Departments across administrations had sought to remove the implicit guarantee, not to harden it. At a dinner in Cambridge on Thursday July 24, 2008 to honor outgoing NBER President Martin Feldstein, many people expressed to me directly their misgivings about what looked like a bailout in which GSE bondholders and shareholders won and taxpayers lost. It was hard to disagree.

It turned out that Secretary Paulson had the same misgivings. The following Monday, July 28, he told Treasury staff to analyze the capital situations of the GSEs. To protect taxpayers in the case that an actual investment was needed in the future, he wanted to know first if these firms were solvent. Treasury's Office of Domestic Finance engaged a top-notch team from Morgan Stanley to dig into Fannie and Freddie's books and assess their financial condition. While this was happening, it became apparent that the July 13 announcement and subsequent legislation had left markets uncertain about the status of the enterprises. The GSEs had access to debt funding though with increased costs, as the spreads on 5-year Fannie benchmark agency debt above Treasuries rose from about 65 basis points in early June to 94 basis points on September 5, just before the firms were put into conservatorship. But the common stocks of the two firms continued to decline. Market participants were in effect saying that they (mostly) believed that the government stood behind the debt and guarantees on the mortgage-backed securities, but were not confident that the firms were solvent. This was not the intent of the Secretary—he did not intentionally set up the GSEs to fail and get them into conservatorship. The weeks in July and August were tense ones within Treasury, as markets deteriorated while waiting for more clarity on Fannie and Freddie. It looked to market participants as if there was no guidance, but this was because we were busy working—and Secretary Paulson was willing to suffer for a few weeks in order to have his next step come out right.

The Morgan Stanley team came back several weeks later in August with a bleak analysis of the GSEs' financial condition: both Fannie and Freddie looked to be deeply insolvent, with Freddie the worse of the two. In light of the firms' well-publicized accounting problems of the previous years, Treasury staff were especially amazed that the GSEs appeared to have made accounting decisions that minimized their problems. With receivership still an undesirable outcome because of the implication of prematurely winding down the retained portfolio, Treasury worked with the GSE regulator, renamed in the July legislation from the Office of Federal Housing Oversight (OFHEO) to the Federal Housing Finance Agency (FHFA), to set out an airtight case of insolvency that warranted putting the firms into conservatorship. The July legislation allowed FHFA to do this without consulting Congress, though no one had contemplated actually using that power so rapidly. While the analysis from Morgan Stanley was clear, it took some time to bring FHFA examiners on board—it seemed to be difficult for them to acknowledge that the firms they had long overseen had gone so wrong, and it would have been awkward for the head of FHFA to decide on the conservatorship over the objection of his senior career staff. It was also necessary to convince the management of Fannie and Freddie to acquiesce without a legal fight. There was no expectation of a problem with Freddie's management—the CEO had publicly expressed his fatigue with the whole situation—but Fannie appeared then to be in somewhat better financial shape and might reasonably have expected to be treated differently than Freddie. Ultimately, Secretary Paulson had a trump card in that he could say in public that he could not in good conscience invest taxpayer money in these firms and that would doubtless spark their demise. But he did not have to play this card. In well-publicized meetings with Secretary Paulson, Chairman Bernanke, and FHFA Director James Lockhart, both firms acceded to conservatorship, which was announced on Sunday, September 7, 2008.

Treasury announced three measures jointly with the decision of the Federal Housing Finance Agency to place Fannie Mae and Freddie Mac in conservatorship: a so-called "keepwell" under which Treasury committed to inject up to $100 billion of capital each into Fannie and Freddie as needed to ensure that they had positive net worth; a Treasury lending facility if needed; and a program under which Treasury would purchase GSE mortgage-backed securities in the open market. This last program was mainly symbolic—a demonstration by the Treasury that the obligations of the GSEs were "good enough for us" and should be seen as secure by the rest of the world. The U.S. government ended up as 79.9 percent owner of the GSEs, with preferred stock that essentially crushed the existing shareholders. (The 79.9 percent ownership was chosen in light of accounting rules that would have brought GSE assets and liabilities onto the government balance sheet at 80 percent ownership).

The real action here were the two $100 billion keepwells, which were meant to effectuate the now-explicit guarantee of GSE debt and MBS coverage—they would provide just-in-time capital injections as losses were realized and ensure that Fannie and Freddie had the financial ability to service their debt and insurance obligations. Treasury could not by law make GSE debts full-faith-and-credit-obligations of the U.S. government—this could only happen through an act of Congress that changed the GSE charters. Unfortunately, the keepwells were not well-explained by the Treasury and it took some time for market participants to understand that they were the explicit guarantee—and even then, some observers questioned whether $100 billion was even enough to cover possible losses at either firm. As with many decisions made quickly at Treasury in this period, the figure of $100 billion did not receive considered discussion across the building and was eventually revised up by the Obama administration.

The conservatorship left unanswered the question of the long-term status of Fannie and Freddie. This was by necessity, since any decisions required Congressional action to amend the firms' charters. An unfortunate consequence of this, however, was that borrowing costs for the GSEs remained above those for Treasury debt. Even though the public balance sheet was effectively behind the firms, this could change in the future and the spread over Treasuries seemed to reflect this uncertainty. The confusion over what Treasury could and could not do was evident in the writings of outside observers. In his blog on November 25, 2008, for example, Paul Krugman wrote that "the Bush administration, weirdly, has refused to declare that GSE debt is backed by the full faith and credit of the US government." Krugman wondered whether this reflected politics. No politics were involved: Treasury did not do this because it was not legal. While the criticism of the Bush administration was off target, Treasury had not explained the situation clearly.

The long-term status of the GSEs remains to be decided by Congress. The GSEs before conservatorship could be thought of as two related entities: 1) a securitization / monoline insurer that packaged and guaranteed mortgages with relatively good underwriting standards, and 2) a hedge fund that leveraged the funding advantage from its implicit guarantee. The retained portfolio was the embodiment of this positive carry and also the source of the systemic risk, since scaling up the balance sheet with MBS purchases had driven the GSEs massive borrowing. It was clear that the desired long-term outcome for the GSEs was to wind down the portfolios. Indeed, the agreements struck at the time of the conservatorship explicitly committed the firms to do so over time starting in 2010. In the meantime, however, the portfolios were a tool with which to support the housing market, and Treasury wanted there to be upward room for more MBS purchases to avoid homebuyers facing higher interest rates. As a result, Treasury officials including the Secretary did not talk directly about winding down the portfolios out of fear that this would fluster markets and cause a spike in interest rates paid by the GSEs. This tension was not resolved until later in the year with the November 25, 2008 announcement by the Fed that it would directly fund the GSEs by purchasing their debt and mortgage-backed securities.

Treasury staff did draw up sketches of long-run plans for the GSEs, and Secretary Paulson spoke on this topic in early January 2009. He favored turning the GSEs into a utility-like company, with private shareholders but government regulation. This preference seemed to be driven by a view that there would be substantial waste from the duplication involved with multiple GSEs, which was an approach favored by some at the Federal Reserve. A possible alternative would combine the two, with one or two GSEs running the automated networks by which banks originating mortgages sold conforming loans to the GSEs, and then a multitude of financial institutions eligible to securitize those loans into MBS that would receive a government-backed guarantee. This would be along the lines of the system of credit cards, in which there are a small number networks such as Visa and MasterCard, but then fierce competition among credit card issuers—the analogy would be competition by banks to securitize MBS.

The agreements struck with the GSEs took one small step in a direction of fostering future competition, in that the companies would have to pay a fee to the government for the explicit backing on securities they issued starting in 2009. The details of this remain to be determined, but one could imagine over time allowing banks to pay such a fee and receive government backing on their securitizations of conforming loans. This would allow entry that would hopefully drive innovation for the benefit of American homebuyers. Eventually the GSEs could become boutique financial firms rather than behemoths, or even one day acquire banks and become normal financial services firms. All of this, however, is for the future.

Free Markets Day

The way Congressman Barney Frank put it at a hearing at which I testified on Wednesday, September 17 was that we should celebrate, Monday, September 15, as "Free Market Day"— on that day, Lehman Brothers was allowed to fail and the free market to work. Now, the next day, Chairman Frank continued, AIG had been bailed out so "the national commitment to the free market lasted one day," but we should celebrate that day. [4]

The decision not to save Lehman Brothers is perhaps the most hotly debated decision of the crisis. Secretary Paulson and Chairman Bernanke have made the point that with the firm evidently insolvent, they did not have the authority save it—the Treasury outright had no authority, while the Fed could provide liquidity, not capital. The Fed can lend, however, against collateral to its satisfaction, so in principle the Fed could have lent against Lehman's unencumbered assets—essentially what it did with AIG. This would not have saved the Lehman—indeed, it would have concentrated losses on the rest of the firm—but it is possible that such lending could have provided time for a more orderly dissolution of the firm (indeed, there are estimates that the disorderly bankruptcy reduced the recovery value of the firm by billions of dollars). The feeling at Treasury, however, was that Lehman's management had been given abundant warning that no federal assistance was in the offing, and market participants were aware of this and had time to prepare. It was almost as if Lehman management was in a game of chicken and determined not to swerve.

Everyone got hurt from the resulting crash. On Monday, September 15, it did not look like the outcome of Lehman's bankruptcy would be the start of the third and most difficult phase of the crisis (the first being from August 2007 to the collapse of Bear Stearns). What we did not realize would occur were two things: the breaking of the

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[4] As quoted by the Wall Street Journal on http://blogs.wsj.com/economics/2008/09/17/barney-frank-celebrates-free-market-day/.

buck by the Reserve Fund, and the reaction of foreign investors to the failure of Lehman. It is hard to see how Treasury could have anticipated that the Reserve Fund money market mutual fund would have such losses from Lehman commercial paper and medium-term notes that it would break the buck, with net asset value slipping below par. We could have known better, however, that foreign investors were not prepared for Lehman to collapse—there is an evident gulf in the understanding of policy actions in moving from Washington to New York or Boston; this deficit of clarity grows only more severe across borders and oceans. The events together led to a run on money market mutual funds, and this in turn caused commercial paper markets to freeze. If left unstopped, this would have led issuers of commercial paper to turn to their backup lines of credit—meaning that banks would have needed to massively fund these lines simultaneously under circumstances that were never contemplated and then hoard capital against those lines. As discussed by Ivashina and Scharfstein (2008), banks in the fall of 2008 did fund these lines as companies drew on them as a precautionary measure, but this played out over time rather than all at once.

From the Treasury perspective, there appeared to be a broad run on the financial system. The panic in the money market mutual funds led investors to pull out a net of $200 billion from these vehicles from September 5 to 19—more than 7 percent of assets in the funds. In the face of large scale redemptions, money market mutual fund companies began to hoard cash rather than investing in wholesale funding markets such as commercial paper, repo agreements, and certificates of deposit. As the wholesale funding market dried up, broker-dealers began cutting their credit lines to clients such as hedge funds and other counterparties. This in turn threatened to lead to fire sales of assets and a disorderly deleveraging with potentially catastrophic consequences across the entire financial system.

The focus at Treasury and the Fed was on the commercial paper market. While the three-month Treasury rate fell nearly to zero; the rate on overnight asset-backed commercial paper jumped from 2.4 percent on Friday September 12 to 5.7 percent on Wednesday, September 17. Firms were reporting to Treasury, however, that they could not fund at all. It is hard to know how to evaluate this; economists instinctively believe that there is some interest rate that would give blue chip industrial companies access to capital markets with highly-secured debt, so long as they were willing to pay that rate. But some companies told Treasury that they could not fund at all, while others could fund themselves with commercial paper only at very short maturities—issuance of term commercial paper (80+ days), for example, fell from $13.7 billion on Friday, September 12 to $2.4 billion on Friday, September 19 and over 70 percent of commercial paper issued by financial institutions was at a 1-4 day maturity compared to only about 50 percent previously. One possibility is that there transition costs in asset allocation decisions: once the money market mutual funds stopped buying commercial paper, there was simply no ready buyer—it would take time for other potential investors to observe rising yields, evaluate particular assets, and then actually buy. In the meantime, companies calling Treasury worried about whether they would have the liquidity to make their payroll.

Meanwhile in this chaotic week, AIG failed on Tuesday, September 16, and was kept afloat by emergency lending from the Federal Reserve (with Treasury staff sent up to the New York Fed for weeks to negotiate the terms of the support package for AIG that was eventually announced on October 8).

If Monday, September 15 felt like a good day at Treasury in that the market was allowed to work (and it was too soon to know the full adverse ramifications), Tuesday, September 16 when AIG was not allowed to fail felt much the opposite. Saving AIG was not what anyone wanted, but at the time it seemed the only possible course of action. The belief at Treasury and the Fed was that bankruptcy at AIG would have far reaching and disruptive effects on the financial system and on American families as a bankruptcy of the parent disrupted the operating companies that provide insurance in the United States and around the world. AIG had $1 trillion in assets at the time of its crisis; the firm was one of the world's largest insurance companies, the largest property and casualty insurer in the United States, and a leading provider of insurance and annuity protects and retirement services. Individual 401(k) retirement plans would have been at risk because AIG insured the returns of large mutual funds, while businesses would have come under pressure because AIG provided credit guarantees to bank loans and thus a failure would have forced capital raising by banks. Moreover, money markets had even more exposure to AIG than to Lehman. In sum, AIG was larger, more interconnected, and more "consumer facing" than Lehman. There was little time to prepare for anything but pumping in money—and at the time only the Fed had the ability to do so for AIG. Eventually the AIG deal was restructured with TARP funds being used to replace Fed lending in order to give AIG a more sustainable capital structure and avoid a rating agency downgrade that would have triggered collateral calls. As time went on, it became clear that AIG was a black hole for taxpayer money and perhaps a retrospective analysis will demonstrate that the cost-benefit analysis of the action to save AIG came out on the other side. But this was not apparent at the time.

Launching the TARP

With markets in disarray, Secretary Paulson on Wednesday, September 18, set out three principles for Treasury staff in how to deal with the crisis:

1. Simplicity. He wanted any policies to be readily understood by markets.
2. Actions should be decisive and overwhelming. This was a lesson from the experience with the GSEs, where the initial July announcement left the situation unresolved.
3. Actions must have the explicit endorsement of Congress. The Secretary made clear that a large-scale intervention would be undertaken as fiscal policy—he would not ask or expect the Fed to take on a massive bank rescue and he would not look for a statutory loophole through which to commit massive amounts of public funds. (For example, by reinterpreting the July housing bill to tap into the $300 billion that had been authorized but not used for the Hope for Homeowners program since the program was not yet in operation).

Treasury staff worked late into the night on Wednesday, September 17, together on a series of calls with staff from the Federal Reserve Board and the New York Fed to come up with options that included ways to add liquidity to the particular markets under stress and approaches to shore up the financial system broadly. That day already, the Treasury had announced the Supplementary Financing Program under which Treasury borrowed through special bill issues to soak up cash on behalf of the Fed (a program that became redundant once the Fed was given the authority to pay interest on deposits), and the SEC had put into effect an emergency ban on short-selling of stock of financial companies. Opinions of this latter action at Treasury and other government agencies differed sharply between economists and others with financial markets backgrounds—economists were skeptical that reducing liquidity in markets would be helpful, while those with market backgrounds thought it was important to short-circuit "predatory" behavior in the markets.

Liquidity options focused on money market mutual funds and the commercial paper market. After rapid consultations with industry participants, the Treasury announced on Friday morning, September 19, in a pre-market conference call a temporary guarantee program for money market mutual funds to directly stem the panicked withdrawals, while the Fed announced its Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility (AMLF) to provide funds with liquidity so that they could avoid fire sales in the face of redemption pressures. Funds were initially quite positive about the Treasury guarantee until they realized they would have to pay for it—most funds eventually participated but not happily (and with no subsequent failures, the guarantee will be a moneymaker for taxpayers). There was incoming fire at the same time from banks, who (reasonably) complained that the guarantee put them at a competitive disadvantage against money market mutual funds. After nearly every Treasury action there was some side effect or consequence that we had not expected or foreseen only imperfectly—this was a familiar story.

Other options included action by the SEC to reinstate the so-called uptick rule or require disclosure on short positions, having the Fed allow investment banks to convert rapidly to become bank holding companies (which Goldman Sachs and Morgan Stanley did the subsequent weekend), or changes in accounting or tax rules to foster bank consolidation. Guidance on a related tax issue—the so-called section 382 rule on the use of tax credits from net operating losses of acquisitions—was released by Treasury to some controversy later in September. The controversy arose because of reports that this action played a role in the acquisition of Wachovia by Wells Fargo; the guidance was repealed in the February 2009 stimulus bill. Everyone was aware that this was not the time to propose fundamental changes in the regulatory structure of the financial system, but it was important to ensure that any steps not contradict long-term goals such as had been set out in the Regulatory Blueprint.

The actions taken with respect to money market mutual funds and commercial paper seemed useful but incremental—it was a sign of the times that using Treasury's main source of emergency funding to put a blanket guarantee on heretofore unguaranteed assets seemed incremental. What was still needed was action to get ahead of the downward market dynamic and broadly stabilize the financial system. The options were familiar from the "break the glass" work back in March and April: directly buying stakes in banks, buying the toxic assets, or dramatically expanding the FHA and Hope for Homeowners programs to refinance loans and improve asset performance from the bottom up. Buying stakes in banks would constitute a "high powered" capital injection, while buying assets would add liquidity but also inject a wedge of capital to the extent that the price paid after the announcement of the program was higher than the price ex-ante (because just announcing an asset purchase program would boost asset prices).

Secretary Paulson and Chairman Bernanke went up to the Hill Thursday night, September 18, to tell Congressional leaders that the problems in financial markets posed a severe threat to the broad economy and that they wanted authority to take action by buying the illiquid assets that were creating uncertainty about the viability of firms at the core of the financial system. Equity markets had rallied strongly that day even before the meeting, evidently sparked by afternoon comments from Senator Charles Schumer (D-NY) that the Treasury and Fed were working on a "comprehensive solution" to the financial market difficulties. Senator Schumer had it exactly right—but no one at Treasury could figure out what he actually knew when he spoke.

On Saturday, September 19, Treasury sent Congress a "Legislative Proposal for Treasury Authority to Purchase Mortgage-Related Assets"—a three page request for a $700 billion fund to be used over the following two years. The proposal ensured maximum flexibility, allowing the Secretary to determine the terms and conditions for purchases of "mortgage-related assets from any financial institution having its headquarters in the United States." In doing so, Section 3 of the proposal instructed the Secretary to "take into consideration means for (1) providing stability or preventing disruption to the financial markets or banking system; and (2) protecting the taxpayer," while Section 4 required reports to Congress. Section 8 was to raise immense controversy, with its assertion that "Decisions by the Secretary pursuant to the authority of this Act are final and may not be reviewed by any court of law or by another officer or employee of the government." The eventual legislation that was enacted on October 3—the Emergency Economic Stabilization Act of 2008—showed if anything that there had been a counter-reaction with abundant layers of oversight, including by the GAO, a new inspector general specially for the TARP, and a Congressional Oversight Panel. Treasury staff were soon to venture that there would be more people working on TARP oversight than on the TARP itself. The initial proposal was meant purely as a starting point, not as a demand. In retrospect, however, the sparseness of those three pages was a communications mistake that foreshadowed later recriminations.

Eventually the lengthier Emergency Economic Stabilization Act of 2008 (EESA) was negotiated with the Congress, but the core was the same: Treasury would have broad authority to purchase $700 billion of assets through the Troubled Assets Relief Program, or TARP, though the money would be split into two equal tranches (technically Treasury had access to only the initial $250 billion, but an additional $100 billion could be obtained without a further role for Congress). Most of the time spent negotiating was on issues relating to executive compensation and warrants, where members of Congress eventually settled for fairly modest restrictions on compensation (their main focus) but Congressional staff insisted that the government should receive warrants in the firm selling assets to the government rather than warrants relating to the future performance of the specific assets purchased.

This revised proposal was voted down in the House of Representatives on September 29 and an amended bill was enacted on October 3. President Bush signed the bill on arrival, and then came over to Treasury to give a pep talk to staff assembled in the Department's Diplomatic Reception Room. Always gracious, the President reserved his warmest words for the staff from the Treasury dining room, who he realized were probably not getting recognition.

While Congress debated the legislation, markets got worse—with the S&P 500 down 9 percent the day the House rejected the bill—and conditions continued to deteriorate after the EESA was enacted. One month and three month LIBOR rates each up went up another 100 basis points, and stock market volatility as measured by the VIX went up from about 30 percent on September 19 to 45 percent on October 3 and then to 70 percent on October 10. The amount of outstanding commercial paper fell by another $160 billion, or nearly 10 percent, and financial institutions were issuing nearly 90 percent of their commercial paper on a 1-4 day basis. The Dow fell 18 percent or 1900 points the week after EESA was approved.

It is hard to remember from the vantage point of Spring 2009 when the United States and other nations are in the midst of a severe economic downturn, but six months earlier—in late September and early October of 2008, it was a challenge to explain to people that what was happening in credit markets mattered for the broad economy—that this would affect the proverbial main street not just lower Manhattan. By mid-October, however, everyone understood that the crisis was real. Families stopped spending, while firms stopped hiring and put their investment projects on hold. The U.S. economy had been deteriorating since July after having been in a sideways grind the first half of 2008—pitched slightly downward by some economic measures but still with positive GDP growth in the first and second quarters of the year, even though growth was not strong enough to maintain positive job growth or prevent rising unemployment.

In October and on, everyone got the message to pull back on spending all at once—and the economy plunged. For some time within the Treasury we had been analyzing statistical relationships between financial markets and the real economy. Back in February, we predicted that the unemployment rate, then at only 4.9 percent in January, would reach 5.5 to 6 percent by end-year as the economy slowed, but would hit 6.5 percent or more if the problems in financial markets became worse than expected—that was the limit of our (linear) models to predict the worst, though we fully acknowledged and explained this limitation in the prose of memos. Instead, the unemployment rate reached 7.2 percent in December 2008, en route to 8.1 percent by February 2009 and with yet-higher rates likely to come.

There were many factors at work to dampen consumer and business spending, including the weak and deteriorating job market and huge wealth losses in both housing and equity markets. And yet, the way in which the TARP was proposed and eventually enacted surely must have contributed to the lockup in spending. Having long known that Treasury could not obtain the authorities to act until the Secretary and Chairman could honestly state that the (economic and financial) world seemed to be ending, they went up and said just that, first in a private meeting with Congressional leaders and then several days later in testifying to the Congress on September 23 and 24. Americans might not have understood the precise channels by which credit markets would affect the real economy, but they finally realized that it was happening—and whether or not they agreed with the proposed response of buying assets with the TARP, they could plainly see that the U.S. political system appeared insufficient to the task of a considered response to the crisis. Surely these circumstances contributed to the economic downturn—though the extent is something that will be studied in the future. A counterfactual to consider is that the Treasury and Fed could have acted incrementally, with backstops and a flood of liquidity focused on money markets and commercial paper—but not the TARP. With financial institutions beyond Lehman weakening as asset performance deteriorated, it seems likely that the lockup would have taken place, and perhaps sooner than later.

The proposal to buy assets was met with substantial criticism from academic economists, with a leading source of skepticism being faculty at the University of Chicago's Booth School of Business (where, ironically, I am teaching a course on money and banking to MBA's in the Spring of 2009). There was little public defense of the proposal—instead, Treasury efforts were aimed mainly at the 535 members of Congress whose votes were needed. These were difficult issues to explain to the vast majority of Americans who had not yet felt the direct impact of the credit market disruption in their daily lives—and yet it strikes me as a fair criticism that the Treasury did not try hard enough.

So far as I know, I provided the only detailed public defense of the Paulson plan that addressed criticisms from academic economists and market participants in a September 25, 2008 posting on Greg Mankiw's blog.[5] Noting that it is not plagiarism to repeat one's own writing, the posting addressed three common concerns about the Treasury proposal to buy assets.

The first criticism was that the only way the Treasury plan could work is to intentionally overpay for assets. Implicit in this criticism was either that Treasury would not overpay and thus the plan would not work or that Treasury intended to bail out financial institutions (starting, the cynics inevitably said, with the Secretary's former firm). This is simply wrong in both directions. At Treasury, we were already working hard to set up reverse auctions with which to buy structure financial products such as mortgage-backed securities, focusing on mechanisms to elicit market prices (on which we received a huge amount of help from auction experts in academia—an outpouring of support that to us represented the economics profession at its finest). There was no plan to overpay. The announcement of the proposal (or rather, Senator Schumer's announcement) had lifted asset prices by itself. As the blog post continued (the next sentences are taken nearly

[5] Available on http://gregmankiw.blogspot.com/2008/09/defense-of-paulson-plan.html.

verbatim from what I wrote in September), if Treasury were to get the asset prices exactly right in the reverse auctions, those prices will be higher than the prices that would have obtained before the program was announced. That difference means that by paying the correct price, Treasury would be injecting capital relative to the situation ex-ante. And the taxpayer could still see gains—say if the announcement and enactment of the TARP removes some uncertainty about the economy and asset performance, but not all. Then prices could rise further over time. But the main point is that it is not necessary to overpay to add capital.

The second criticism of the plan to buy assets was that warrants were essential to safeguarding taxpayer interests. This assertion typically meant that the government should have additional protection (a lower price ex-post) if the assets being purchased turned out to have markedly worse performance than was contemplated at the time of the transaction. This would have been a valid point had the warrants in question been specific to the assets being purchased. But this was not the case—Congressional staff had insisted instead that the warrants should be on the firms selling assets, not on the assets. This meant that the point being made by academic and other critics was a non-sequitur. Instead, warrants were a huge hassle for the auctions in that they diluted the price signal and thereby confused the bidding.

This was a straightforward application of the Modigliani-Miller Theorem. Rather than firms bidding to sell assets such as MBS at a particular price to the Treasury, they would have to bid to jointly sell both MBS and stakes in the selling firm. If the warrants and assets were identical across sellers, the price of the assets would simply adjust to net out the value of the warrants. As the blog post put it (again, the following sentences are taken nearly verbatim), Modigliani-Miller implies that the price of the asset (assuming the auction gets it right) will adjust to offset the value of any warrants Treasury receives. In this case of a reverse auction, imagine that the price is set at $10. If Treasury instead demands warrants for future gains of some sort, then the price will rise in the expected amount of the warrants. If the value of the warrant is $2, the Treasury will pay $12 total for the asset and the warrants.

Working with academic experts, we came up with a reverse auction mechanism that would go a long way to make for apples-to-apples comparison across different MBS. The auction would not be perfect—we knew that it was possible only to minimize adverse selection, not to eliminate it. Firm-specific warrants confounded this, since even if the MBS being offered by seller one were identical to the MBS offered by seller two, the warrants on firms one and two would not be identical (we considered using penny warrants—essentially common stock—to get around the problem but concluded that this was contrary to Congressional intent). All of this resulted from the insistence in Congress on this type of warrant. Ironically, critics of the September blog posting asserted that Treasury did not understand the Modigliani-Miller theorem, when in fact it was the critics who did not understand the nature of the warrants specified by Congress.

The third criticism of the original plan to purchase assets was that it would be better to inject capital into banks—to buy parts of institutions instead. As the blog post noted, capital injections were allowed in even the initial three page proposal, which allowed Treasury to purchase any mortgage-related assets, including shares of companies that originate mortgages.

The problem with the criticism on capital injections vs. asset purchases is that Secretary Paulson never would have gotten legislative authority if he had proposed from the start to inject capital into banks. The Secretary truly intended to buy assets—this was absolutely the plan; the TARP focused on asset purchases was not a bait and switch to inject capital. But Secretary Paulson would have gotten zero votes from Republican members of the House of Representatives for a proposal that would have been portrayed as having the government nationalize the banking system. And Democratic House members would not have voted for the proposal without the bipartisan cover of votes from Republicans. This is simply a political reality—it was a binding constraint on the Treasury. The calls from academics to inject capital were helpful, however, in lending support for the eventual switch from asset purchases to capital injections (even though at times the vitriolic criticism was frustrating in that it was so politically oblivious).

A similar calculus applies to suggestions that holders of bank debt should be compelled to accept a debt-for-equity swap. As Zingales (2008) notes, debt-for-equity swaps could "immediately make banks solid, by providing a large equity buffer." All that would be required, according to Zingales, would be a change in the bankruptcy code. A major change to the bankruptcy law was enacted (for better or for worse depending on one's point of view) with the Bankruptcy Abuse Prevention and Consumer Protection Act of 2005, but this was the culmination of years of legislative debate. The idea of a further instantaneous change in the bankruptcy code was unrealistic. Indeed, efforts to make such changes in the middle of the crisis would have re-opened the debate over the 2005 Act along with controversial provisions such as the mortgage cram down. The simple truth is that it was not feasible to force a debt for equity swap or to rapidly enact the laws necessary to make this feasible. To academics who made this suggestion to me directly, my response was to gently suggest that they spend more time in Washington, DC.

From Asset Purchases to Capital Injections

As noted above, Secretary Paulson truly meant to use the TARP to purchase assets. This reflected a philosophical concern with having the government buy equity stakes in banks—he saw it as fundamentally a bad idea to have the government involved in the ownership of banks. From the vantage point of early September, it still looked like buying $700 billion of assets would be enough to settle markets—there were about $1 trillion each of whole loans and structured products such as MBS and CDO's on American firms' balance sheets, so that $700 billion would have been a large enough scale to add liquidity, improve price discovery by closing bid-ask spreads, and inject some measure of capital relative to the situation ex-ante.

As markets continued to deteriorate after enactment of EESA, however, Secretary Paulson switched gears to inject capital, since he well understood that directly adding capital to the banking system provided much greater leverage in terms of providing a buffer to ensure the viability of banks against further losses from their rapidly-souring assets. Confidence in the banking system continued to deteriorate, with the 1-month LIBOR-OIS spread, for example, rising from around 250 basis points when the EESA was enacted to nearly 350 basis points in the first full week of October, just before the three day Columbus Day holiday weekend (Figure 2). With confidence rapidly ebbing in the banking system, the Secretary in consultation with the Fed Chairman and New York Fed President Timothy Geithner instructed the "deal team" to prepare term sheets to put capital into banks.

Discussions began as well with the FDIC around the middle of the week of October 9 about guarantees on bank debt—an idea that we were hearing about from Wall Street economists and which had some support at both Treasury and the Fed. As shown by Veronesi and Zingales (2009), these guarantees involved a huge benefit for market participants—most of the "gift" calculated by Veronesi and Zingales arise from the guarantees. No one at Treasury or the Fed was happy about the prospect of giving blanket guarantees, but in the midst of what appeared to be a renewed run on the banking system, this blunt instrument was seen as essential to stopping the run. This highlights a further constraint on the policymaking process, which is that it has to be done in real-time even while the rush of events continues.

Treasury staff had been working on plans for capital injections for some time, focusing on matching programs under which the Treasury would invest a dollar on terms similar to what private investors received in exchange for invests in banks. In early October, however, banks were not able and/or willing to raise private capital on the terms available from private investors—if any were to be found. Warren Buffett had extracted a premium for investing in Goldman Sachs, but other firms did not have even that possibility available to them. In the face of these circumstances, Treasury instead worked with bank regulators and outside counsel to develop term sheets for a standalone investment by the Treasury; this work went from not much past the starting line to completion from Thursday, October 9 to Monday, October 13. It was on that Monday when the CEO's of the nine largest American banks came to Treasury to meet with Secretary Paulson, Chairman Bernanke, SEC Chairman Christopher Cox, and others to be told about and ultimately accept capital injections from the TARP in the form of preferred stock purchases.

An important consideration with regard to the terms of the capital injections was that there is no authority in the United States to force a private institution to accept government capital. This is a hard legal constraint. The government can take over a failing institution, but this is done one-by-one, not en masse, and is not the same as injecting capital into an institution that is healthy in order to guard against future asset problems. In order to ensure that the capital injection was widely and rapidly accepted, the terms had to be attractive, not punitive. In a sense, this had to be the opposite of the "Sopranos"— not a threat to intimidate banks but instead a deal so attractive that banks would be unwise to refuse it. The terms of the CPP were later to lead to reports that the Treasury had "overpaid" for its stakes in banks, which of course is the case relative to the terms received by Warren Buffett. But this was for a policy purpose: to ensure broad and rapid take-up.

The terms of the Capital Purchase Program (CPP)—the TARP's program to put capital into "good banks"— allowed banks to sell preferred stock to the Treasury in an amount equal to up to 3 percent of their risk-weighted assets. The interest rate on the preferred shares was five percent for five years and then increased to 9 percent, meaning that banks would have a substantial incentive to pay back the money at that point. This made the funds more of a five-year bridge loan than high-quality capital. The EESA legislation was about distressed assets, which might have seemed at odds with the notion of the CPP as a good bank program, but the idea was that the low level of confidence between banks as indicated by the soaring LIBOR-OIS spread meant that the whole financial system was under stress. Capital injections would foster stability in banks in particular and thus in the financial system as a whole, initially by ensuring that banks had the capacity to lend against a sufficient capital buffer rather than hunker down and hoard capital. The ultimate goal was to improve confidence in the system so that over time private capital would again invest in the banking system.

Other terms were similarly aimed at ensuring broad uptake: Treasury wanted no part of running banks, so the preferred shares would be non-voting except when an issue affected an entire class of investors in a way that would adverse affect the interest of taxpayers. The Treasury received warrants with a 10 year maturity that could be exercised at any time with an aggregate market value equal to 15 percent of the amount of the preferred stock, where the strike price equaled the 20 day moving average stock price for each institution at the day of preliminary approval of the investment. Warrants in this context made sense in that they allowed the taxpayers to participate in the upside that might be engendered as a result of increased stability in the financial system. Banks were allowed to continue to pay dividends but not to increase them—this in particular drew criticism, but was aimed at ensuring wide take-up of the capital.

The capital injections included rules meant to address not just the letter but also the spirit of the EESA that required participating financial institutions to meet "appropriate standards for executive compensation and corporate governance" while avoiding such burdensome restrictions that banks would not participate or would find it difficult to attract and retain key personnel. It is worth noting these restrictions in some detail to make clear that the TARP from the start had reasonable provisions to protect taxpayers—this might not have seemed the case to someone who landed in Washington, DC in March 2009 and observed the President of the United States competing with members of Congress to most angrily denounce compensation agreements at AIG (which it should be noted were outside the CPP). Each bank's compensation committee would be required to review incentive compensation features each year with the CEO, CFO, and the three highest paid executives to ensure that contracts did not encourage unnecessary and excessive risk and submit an annual certification that this had been done. Incentive payments for senior executives could be taken back after the fact if it was found that they had been made on the basis of materially inaccurate statements of earnings or gains, or performance criteria. These rules applied to more executives than section 304 of the

Sarbanes-Oxley Act and would not be limited to financial restatements. Banks could not provide senior executive officers with golden parachute payments; severance payments were capped at no more than three times base salary, calculated as prior 5-year moving average of each officer's taxable compensation. And recipients of TARP capital would have to agree with Treasury to limit the income tax deduction of compensation paid to senior executives to $500,000 instead of $1 million for as long as Treasury held a capital stake in the bank. This was not a tax rule, but instead a bilateral contract between Treasury and the firm. In sum, the TARP did not involve Treasury in the details of setting pay, and neither did it outright ban bonuses or severance pay, but there were a number of provisions aimed at ensuring that taxpayer investments were not squandered through excessive executive compensation.

As has been widely reported, most (though not all) of the nine CEO's needed little persuasion to accept the capital investments on Monday, October 13. There were nearly 8,500 banks that could potentially receive TARP funds through the CPP, but these nine alone accounted for about half of both the more than $7 trillion of deposits and the more than $11 trillion of assets in the total U.S. banking system. In contrast, the bottom 70 percent of banks all together accounted for only about 5 percent of both total assets and deposits in the U.S. system. It would take time for Treasury to inject capital into these thousands of banks. The combined actions of that Monday—the FDIC guarantee and the injections into the top 9 banks—stabilized the financial sector, with the LIBOR-OIS spread falling back to 100 basis points (as shown in Figure 2). While this seemed like progress, it was still twice the spread that had prevailed before Lehman's failure, suggesting that market participants were still not assured about the soundness of financial institutions. Subsequent events were to prove them correct in their doubts.

The EESA had created a new Office of Financial Stability within the Treasury, which Neel Kashkari was appointed to head as interim assistant secretary (he had been confirmed by the Senate earlier in 2008 to be an assistant secretary for international affairs). The office borrowed personnel from across the government and brought in experts from the private sector to help get the capital purchase program up and running. The details of the CPP process are beyond the scope of this paper, but suffice it to say that TARP staff working in concert with the federal bank regulators worked diligently and effectively, with a January 27 press release from Treasury noting that the CPP team had made $194.2 billion in 317 institutions in 43 states and Puerto Rico starting from Columbus Day. President Obama was to tell Congress on February 24, 2009 that he was "infuriated" by the "mismanagement and results" of the assistance for struggling banks. His actions, however, belied the words on the teleprompter—the Office of Financial Stability was kept essentially whole through the Presidential transition.

The Decision to Call off Asset Purchases

Of the first $350 billion of the TARP, $250 billion was allocated to the CPP, which was enough for all banks that might potentially apply to get capital equal to up to 3 percent of their risk-weighted assets. It was already clear that part of the TARP would be needed to restructure the federal rescue of AIG, since the company needed capital rather than liquidity and this implied that with the TARP now available the Treasury should substitute for the Fed (which was done on November 10, 2008).

Financial market conditions had improved since the launch of the CPP and the announcement of other actions including additional Fed facilities aimed at money markets and commercial paper issuance, but credit markets were still disrupted—and the implosion of business and household demand as output fell and the labor market sagged would make things worse.

Treasury staff turned to task of figuring out how to allocate the remainder of the TARP, a process that ultimately led Secretary Paulson to announce on November 12, 2008 that he would not use the TARP for its original purpose of purchasing assets. This decision ultimately came down to the fact that the $700 billion of the TARP looked to be insufficient to both buy assets in a scale large enough to make a difference while at the same time holding in reserve enough resources for additional capital programs that might be needed. What we did not fully see in late October and early November was that the Federal Reserve's balance sheet could be used to extend the TARP, as was done in late 2008 and early 2009 with ring fence insurance applied to assets held by Citi and Bank of America and then in larger scale with the TALF and Public-Private Investment Funds later in 2009.

We had reverse auctions to buy MBS essentially ready to go by late October 2008—including a pricing mechanism—but faced a decision as to whether we had the resources left in the TARP to implement them. We figured that at least $200 billion had to be devoted to purchasing assets for the program to make a difference. With credit markets still in worse shape than before the TARP had been proposed, it seemed more important to reserve TARP resources for future capital injections, including having the ability to act in the face of further AIG-like situations. Another factor in the decision to cancel the reverse auctions was simply time: the first reverse auction to buy mortgage-backed securities might have taken place in early December but would have been small—perhaps a few hundred million—while we became comfortable with the systems. The auctions would have ramped up in size, but still would likely have remained at $5 or 10 billion dollars per month, meaning that it could take two or more years to deploy the TARP resources in this way.

A concern of many at Treasury was that the reverse auctions would indicate prices for MBS that were so low they would make other companies appear to be insolvent if their balance sheets were revalued to the auction results.[6] This could easily be "handled" within the reverse auction framework: many of the individual securities are owned by only a small number of entities, so Treasury would not have purchased 100 percent of any security. The fraction to be purchased thus represented a demand shift—we could experiment with the share of each security to bid on; the more we purchased, presumably

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[6] In contrast to the TALF and Public-Private Investment Program announced in March 2009, the reverse auctions involved did not provide financial institutions with low-cost financing or downside risk protection, both of which effectively constitute a subsidy.

the higher would be the price that resulted from the auction. But this was yet another reason why the auctions would take time—and why to some at Treasury the whole auction setup looked like a big science project. Further delaying the auctions was a failed procurement at the front end, which left us with an outside vendor that was supposed to run the auctions but whose staff did not seem to understand that the form of the auction mattered crucially given the complexity of the MBS and the ultimate goal of protecting the taxpayer (though to be fair the vendor was receiving mixed signals from within Treasury as well). Warrants and executive compensation restrictions played havoc with setting up the auctions. For executive compensation, it was necessary for the administrative systems to be able to detect when all of the securities purchased from many parts of firms with many subsidiaries crossed the Congressionally-determined dollar amounts at which the restrictions kicked in. And finally, the firm-specific warrants complicated the auctions, since as noted above they confounded the effort made in the reverse auctions to ensure a level playing field across the assets being offered for sale by different firms.

Despite all this, by the last weekend of October, the auction team returned from a day of meetings in New York on Sunday, October 26, with the feeling that the asset purchases could be done, first for MBS and then later for whole loans (for which the idea was to create "artificial MBS" out of a random selection of the whole loans offered by banks). We would have tried two auction approaches, one static and one dynamic—the latter approach is discussed by Ausubel and Cramton (2008), who were among the academics providing enormous help to the Treasury in developing the reverse auctions.

Meeting at Treasury from 8 to 10pm on Sunday, October 26, Treasury senior staff and the Secretary focused on the key question of whether to proceed with asset purchases or instead to put that work on hold and focus on additional programs to inject capital and on the nascent securitization project that would use TARP money to directly boost key credit markets (and which eventually turned into the TALF). The following Sunday, November 2, was another meeting in which senior staff and the Secretary went through the options about the uses of the remaining money in the first part of the TARP and the $350 billion in the second tranche.

By the time of this second meeting, the economy had deteriorated and the tide of public opinion had begun to turn against the TARP, so much so that there were real doubts as to whether Congress would release the second stage of the TARP funds at all. We knew that to have a chance, there had to be a well-developed set of programs to account for the money. Treasury had to be able to explain what it was doing and how the programs fit together—never our strength. There could not be another instance of asking for money to do one thing and then using it for another as had happened with the first part of the TARP.

The objectives that needed to be accomplished with the TARP were in broad strokes to continue to stabilize financial system and avoid systemic meltdown; to improve credit markets and facilitate stronger demand by consumers and businesses; to protect taxpayers; and to help homeowners.

There were several possible uses of TARP funds in late October and early November:

1. More capital for banks and non-banks, including both one-off situations such as systemically significant failing institutions and non-failing financial firms other than banks. With regard to non-banks, there were proposals on the table to inject capital into the broader financial sector, including life insurers, municipal bond insurers, and private mortgage insurers. Resources for further capital would also constitute “dry powder” in case of situations we had not contemplated.
2. Asset purchases to buy illiquid MBS and whole loans.
3. Foreclosure prevention or forward-looking actions to lower mortgage rates and thereby boost housing demand. This latter category included ideas such as direct funding the GSEs to buy down interest rates for home buyers, something that the Fed eventually put into effect with its purchases of GSE debt and MBS.
4. Direct assistance to unplug securitization channels, which had been locked up since August 2007 but previously provided financing for auto loans, credit cards, student loans, commercial real estate, and jumbo mortgages. This nascent “securitization project” eventually grew into the TALF—a centerpiece of the bank rescue programs announced in 2009.

The TARP was looking undersized against these competing alternatives, particularly as the impact of the slowing economy began to have a noticeable second round impact on the financial system. Estimates by the New York Fed of bank losses and capital raised suggested that banks faced a capital hole above and beyond the initial $250 billion CPP of perhaps as much as $100 billion in the case of a moderate recession and perhaps $250 billion or more additional capital in the case of a severe recession. These would be in addition to hundreds of billions of dollars of losses among U.S. non-bank financial firms such as hedge funds and insurance companies.

The decision to cancel the asset purchases was made on October 26 with this in mind. Instead, the focus was to be on developing the securitization project and a second capital program with a private match. There were some continued discussions of possible whole loan purchase programs. In even a modest size, this activity would have allowed the Secretary to say that he was fulfilling his initial promise to buy toxic assets—the bad mortgages directly—and then to address foreclosures by modifying the loans. Again, however, the decision was that it was more important to husband the resources.

With the work on asset purchases set aside, Treasury staff worked intensely during the week between October 26 and November 2 to flesh out proposals for the remaining uses of the TARP: more capital, assistance for securitization, and foreclosure prevention.

To unlock the second $350 billion of the TARP, we realized that $50 billion of it would have to be used for a foreclosure prevention effort. Helping homeowners had been part of the original mandate of the TARP in the context of asset purchases. Section 109(a) of the EESA legislation specified that:

> To the extent that the Secretary acquires mortgages, mortgage-backed securities, and other assets secured by residential real estate...the Secretary shall implement a plan that seeks to maximize assistance for homeowners and use the authority of the Secretary to encourage servicers of the underlying mortgages, considering net present value to the taxpayer, to take advantage of the Hope for Homeowners Program under Section 257 of the National Housing Act or other available programs to minimize foreclosures. In addition, the Secretary may use loan guarantees and credit enhancements to facilitate loan modifications to prevent avoidable foreclosures

This language made sense in the context of buying whole loans and MBS—Treasury could modify the whole loans it purchased or encourage servicers to modify loans for mortgages in securitizations where Treasury owned a large share of the MBS structure. But the EESA language never contemplated direct spending to subsidize modifications such as with either the FDIC insurance loss-sharing proposal or the interest rate subsidy. Under the EESA, the TARP was to be used to purchase or guarantee troubled assets. Implementing a foreclosure avoidance plan under the law would require Treasury to intentionally purchase a loss-making asset, where the loss was structured with financial engineering to turn into the subsidies to parties to take the desired actions to avoid foreclosure (either as insurance payouts or interest rate subsidies). This was hugely ironic, since at the same time that Treasury was being pushed use TARP resources for foreclosure avoidance, we were being criticized for having overpaid for the preferred shares in banks.

From the Secretary's point of view, it was essential to husband the TARP resources to use to shore up the financial sector—by this time he was less adamant against crossing the line and using public money for foreclosure avoidance, but he did not want it to be done with TARP money. As discussed previously, however, Congress did not appear eager to record a vote that transparently spent money on foreclosure avoidance—members wanted the outcome but not any potential blame at a bailout of irresponsible homeowners (which was a reasonable thing in light of the political backlash that ensued when the Obama administration announced that it would implement the interest rate subsidy proposal).

By early November, it was becoming increasingly clear by this point that the "dry powder" category would come to include automobile companies. A group of Treasury staff had worked with the Commerce Department on auto issues starting from Columbus Day on. Indeed, I went over to the Commerce Department building that very Monday with a group from Treasury to meet with General Motors management—walking out the south side of the Treasury building around noon we walked past the television cameras that had assembled to get shots of the nine bank CEO's, whose pending arrival at Treasury had by then become known to the press.

Secretary Paulson formally announced that he would not be using TARP to buy assets at a November 12 speech to the assembled press. Secretary Paulson fully understood that cancelling the auctions would make it seem as if he was switching course yet again—first in changing from asset purchases to capital injections and then in cancelling the asset purchases altogether. He was willing to take the criticism—it was essential to keep the resources available for more capital injections. The problem was that the capital program that was slated to form the core of the second wave of TARP programs was never developed. Instead, events again overtook the Treasury as problems at Citigroup and the U.S. auto companies demanded attention.

Ring Fence Insurance Schemes

Two weeks later, on November 25, 2008, Treasury, the Fed, and the FDIC jointly announced that Citigroup was being given another $20 billion of TARP capital (on less generous terms than the CPP but not nearly as onerous as those faced by AIG before the TARP was available), and that the three federal agencies would provide guarantees against losses on a $306 billion pool of Citi assets. The Treasury put up a modest amount of TARP money as a second loss position, the FDIC took the next set of losses, and the Fed then took the rest of the downside. This position of the Treasury reflected the language of section 102 of the EESA, which counted each dollar of gross assets insured by the TARP as a dollar against the $700 billion allotment. This meant that it was most efficient from a TARP-perspective for Treasury to take an early loss position and provide coverage of a narrow band in the asset structure with a high probability of loss. The Fed could then use its balance sheet to take on the rest of the risk.

The crucial new development in this use of TARP resources was the use of the Fed's balance sheet to effectively extend the TARP beyond $700 billion—the Fed decided that having the Treasury ahead of it in a sufficient loss position provided the credit enhancement for it to take further downside risk. As had been the case with the Bear Stearns transaction, it took some time for the arrangement to be understood in Washington. The transaction, it turned out, did not appear to stabilize Citigroup. This could have reflected a number of reasons including that the pool of covered assets was still modest compare to a balance sheet of nearly $2 trillion, that Treasury did not provide details of the assets within the ring fence, and perhaps because many market participants saw the firm as deeply insolvent.

A key insight, however, is that under pricing insurance coverage is economically similar to overpaying for assets—but it turns out to be far less transparent. This insight underpins both the TALF and the bank rescue programs announced by the Obama administration in March 2009. The federal government is effectively providing potential buyers of assets in either program with a two-part subsidy of both low-cost financing and low-cost insurance. This federal contribution then helps to close the bid-ask spread and restore functioning in illiquid markets.

From the perspective at Treasury in November, the second Citi transaction meant that we had fallen behind the market and were back into reactive mode. Moreover, the downside insurance appeared to give rise to moral hazard, as Citi announced its support for the mortgage cram down proposal. Many within Treasury viewed this as an artifact of the transfer of risk to the public balance sheet inherent in the non-recourse financing behind the ring fence insurance—Citi could make this politically popular offer because taxpayers ultimately were on the hook for the losses. A feeling of resignation likewise marked the work by Treasury staff on a similar ring fence insurance scheme and additional TARP capital promised to Bank of America late in 2008. Treasury staff nonetheless worked intensely until the transaction was formalized on January 16, 2009, the last business day of the Bush administration. In contrast, the use of the TARP to support the automobile companies was straightforwardly political: Congress did not appear to want to take on the burden of writing these checks, and President Bush did not want his administration to end with the firms' bankruptcies.

TARP support for unsustainable firms is akin to burning public money while industry stakeholders arrive at a sustainable long-term arrangement. This appears to be the American approach to systemically significant "zombie" firms—to use public resources to cushion their dissolution and restructuring.

Evaluation and Conclusion

There is something of a playbook (to use a football metaphor) for dealing with a banking crisis. Translating from the metaphorical Swedish, the steps are:

1. Winnow the banking system by putting out of business insolvent institutions (including through nationalization where a buyer is not at hand). The key is to avoid supporting zombie firms that squander resources and clog credit channels. This was done to a modest degree with the decisions made by the federal bank regulators and the Treasury regarding which institutions received money from the TARP under the capital purchase program. The denial of funds to NatCity Bank and its acquisition by PNC, however, set off a firestorm of criticism that banks were using their TARP funds for mergers rather than to support lending. This criticism is misguided; it is fundamentally good for everyone when a strong bank that is in a position to boost lending and serve its community takes over a weak one that is not in that position. But this point was lost in October and onward. In any case, the furor revealed that there was no prospect for putting out of business a large number of banks.

2. Recapitalize the surviving banks to ensure that they have a buffer against further losses. The TARP was able to do this in a broad and rapid way. Notwithstanding President Obama's assertion to the contrary, the CPP appears as of this writing to be a salient success of the TARP.

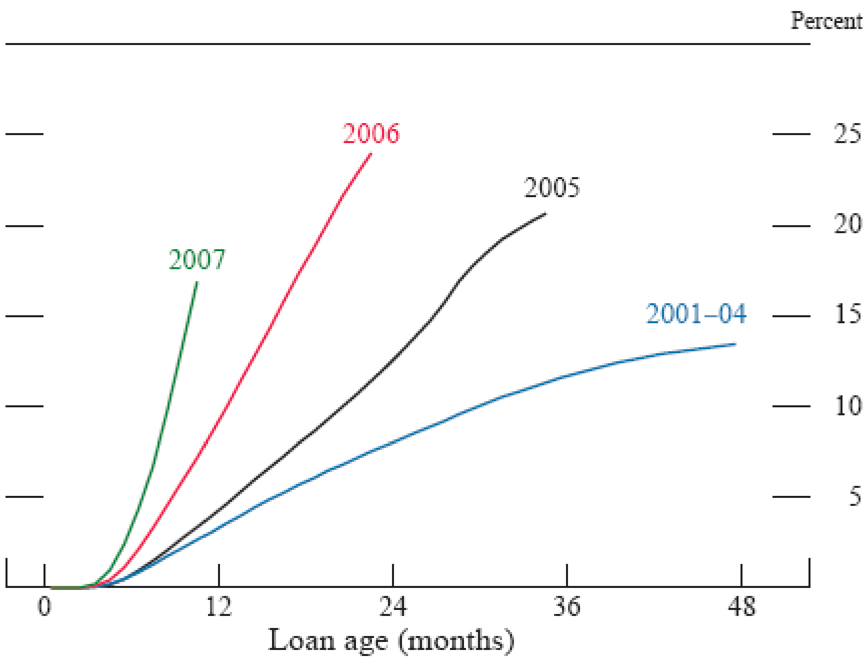
3. Resolve uncertainty about the viability of surviving banks by either taking away or "disinfecting" their toxic assets such as through ring fence insurance. The near term goal is to avoid having banks hunker down and ride out the uncertainty, but instead to give them the confidence to put capital to work. Over time, the goal

is to bring about conditions under which private capital flows back into the banking system.

I would add a fourth play, which is to ensure continued public support for the difficult decisions involved in plays one to three. An honest appraisal is that the Treasury in 2007 and 2008 took important and difficult steps to stabilize the financial system but did not succeed in explaining them to a skeptical public. An alternative approach to this challenging necessity is to use populist rhetoric and symbolic actions to create the political space under which the implicit subsidies involved in resolving the uncertainty of legacy assets can be undertaken. It remains to be seen whether this approach will be successful in 2009.

Figure 1.

Cumulative defaults on subprime 2/28 loans, by year of origination, 2001–07

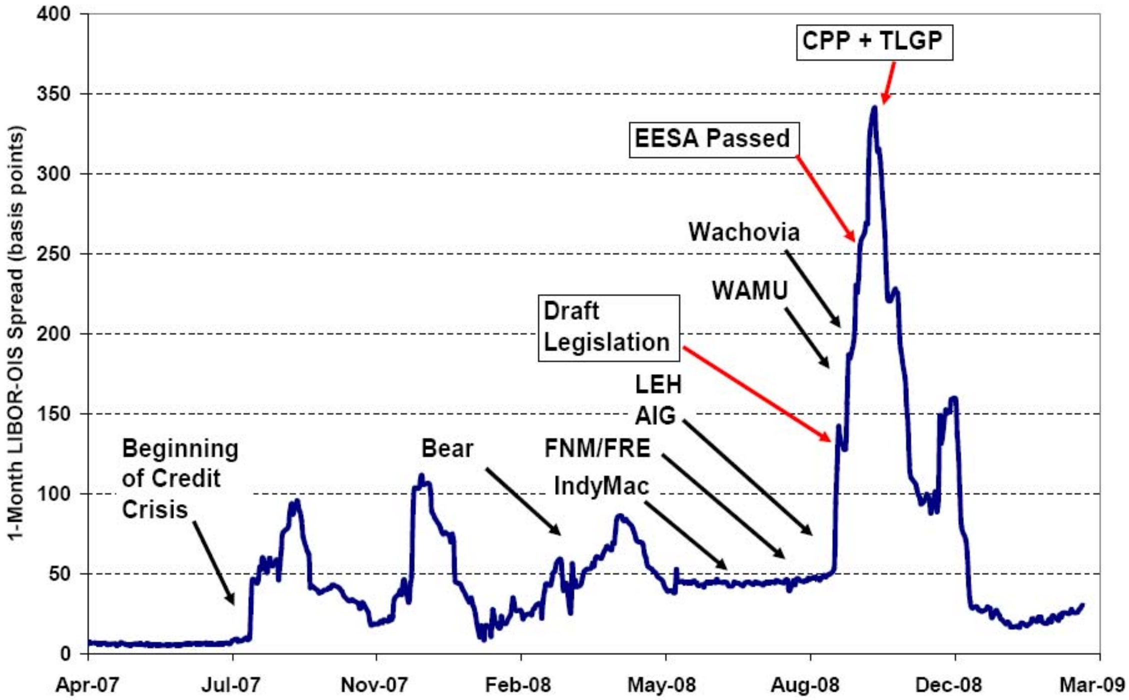


NOTE: Figure is based on monthly data through March 2008. Each curve represents the fraction of loans originated in the indicated year that had defaulted by the indicated loan age; for example, roughly 8 percent of all loans originated sometime in the years 2001 to 2004 had defaulted by the time they were 24 months old. The last 9 points of the curves for 2005 through 2007 are based on incomplete data. A 2/28 loan is a 30-year loan with a fixed rate for the first 2 years and an adjustable rate for the remaining 28 years.

SOURCE: Staff calculations based on data from First American LoanPerformance.

Figure 1 is from the Federal Reserve's July 2008 Monetary Policy Report to the Congress, page 5.

Figure 2



CPP + TLGP
EESA Passed
Wachovia
WAMU
Draft Legislation
LEH
AIG
FNM/FRE
IndyMac
Bear
Beginning of Credit Crisis
1-Month LIBOR-OIS Spread (basis points)
400
350
300
250
200
150
100
50
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