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The financial crisis in the US: key events, causes and responses

The current financial crisis started in the US housing market in 2007. The crisis spread across the world and severely damaged the economies of many countries, including the US, and reached a new level in September 2008 as a number of prominent US-based financial institutions, including AIG and Lehman Brothers, collapsed.

This Research Paper first examines the underlying causes of the crisis in the US. In particular, it examines the emergence and collapse of the housing bubble and the significance of the complex financial instruments that transformed an asset price correction into a significant domestic and global economic downturn.

The main focus is the response of governing institutions in the US. Looking at responses before and after September 2008 – drawing comparison with the UK where relevant – this Paper examines the actions of a wide range of institutions including the Federal Reserve, US Treasury, Congress, Securities and Exchange Commission and Federal Deposit Insurance Corporation.

John Marshall

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Summary of main points

In September and October 2008, the US suffered a severe financial dislocation that saw a number of large financial institutions collapse. Although this shock was of particular note, it is best understood as the culmination of a credit crunch that had begun in the summer of 2007 and continued into 2008.

The US housing market is seen by many as the root cause of the financial crisis. Since the late 1990s, house prices grew rapidly in response to a number of contributing factors including persistently low interest rates, over-generous lending and speculation. The bursting of the housing bubble, in addition to simultaneous crashes in other asset bubbles, triggered the credit crisis. However, it was the complex web of financial innovations that had purportedly been employed to reduce risk which ensured that the crisis spread across the financial markets and into the real economy. In particular, all manner of profit-seeking financial institutions used a complex financial process characterised by highly leveraged borrowing, inadequate risk analysis and limited regulation to bet on one outcome – a bet which proved to be misguided when asset prices collapsed.

Prior to September 2008, the response from governing institutions in the US primarily sought to address liquidity concerns, stimulate demand and prevent mortgage foreclosures. The main policy responses included:

- the Federal Reserve (Fed) lowering interest rates as well as a introducing number of liquidity-enhancing schemes to abate the emerging credit crisis;
- the orderly takeover of failed investment bank Bear Stearns; and
- legislation seeking to stimulate demand and mitigate mortgage foreclosure.

After the shocks of September and October 2008, where credit and risk interest rate spreads shot up and the systemic nature of the crisis became apparent, a new approach was adopted. In addition to the Fed, the US Treasury became a key body in administering the Emergency Economic Stabilization Act passed by Congress in October 2008. The central features of the post-September response included:

- the Fed and US Treasury decision not to bail out investment bank Lehman Brothers;
- Treasury-administered capital injections into troubled financial institutions in exchange for preferred stock and common equity stakes;
- a sequence of bailouts by the Fed and Treasury for the insurance giant AIG;
- continuing efforts from the Fed to lower interest rates and increase liquidity;
- the unprecedented purchase of mortgage-backed securities and Treasury bills as part of the Fed's policy of "credit easing";
- the temporary suspension of the short-selling of financial institutions by the Securities and Exchange Commission;
- the Homeowner Affordability and Stability Plan, which permitted struggling homeowners to refinance their mortgages; and
- the passage of the \$787bn American Recovery and Reinvestment Act designed to reinvigorate demand in the US economy.

This paper contains appendices providing a glossary of key concepts and a list of acronyms.

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I Introduction

The financial turmoil that engulfed the US during 2007-09 began in the mortgage lending markets. Indicators of the emerging problems came in early 2007 when, first, the Federal Home Loan Mortgage Corporation (commonly known as Freddie Mac or Freddie) announced it would no longer purchase high-risk mortgages and, second, New Century Financial Corporation – a leading mortgage lender to riskier customers – filed for bankruptcy.

The crisis set in as house prices started to fall and the number of foreclosures rose dramatically. This in turn caused credit rating agencies to downgrade their risk assessments of asset-backed financial instruments¹ in mid-2007. The increased risk restricted the ability of the issuers of these financial products to pay interest, and reflected the realisation that the bursting of the US housing and credit bubbles would entail unforeseen losses for asset-backed financial instruments. Between the third quarter of 2007 and the second quarter of 2008, \$1.9tr² of mortgage-backed securities received downgrades to reflect the reassessment of their risk.³ This represented an immediate and severe dislocation of the financial markets:

The odds are only about 1 in 10,000 that a bond will go from the highest grade, AAA, to the low-quality CCC level during a calendar year. So imagine investors' surprise on Aug. 21 when, in a single day, S&P slashed its ratings on two sets of AAA bonds backed by residential mortgage securities to CCC+ and CCC, instantly changing their status from top quality to pure junk.⁴

Amidst continuing tight credit markets,⁵ mortgage and financial firms received support from the Federal Reserve (Fed) through short-term lending facilities and auctions for the sale of mortgage-related financial products. However, such actions were unable to prevent rapid falls in asset prices as institutions sought to relieve themselves of these risky burdens and replenish their risk-weighted⁶ capital ratios. Mortgage lender Countrywide Financial was bought by Bank of America for \$4bn in January 2008, while many other firms had their credit ratings downgraded.

Bear Stearns, a large American investment bank which had engaged heavily in mortgage-backed securities, was severely damaged. Unable to recapitalise sufficiently to cover its losses, it could not survive when its stock price collapsed in March 2008 and it was ultimately acquired by Morgan Chase on 16 March 2008 in a government-assisted takeover.

¹ A financial instrument which uses some form of asset as collateral. This included commercial paper – the short-term debt issued by firms.

² Both billions and trillion are given in the widely used US terms. Please see Appendix 1 for further details.

³ [The woman who called Wall Street's meltdown](#), Fortune, 4 August 2008

⁴ [Anatomy Of A Ratings Downgrade](#), BusinessWeek, 1 October 2007

⁵ John B. Taylor, [The Financial Crisis and the Policy Responses: An Empirical Analysis of What Went Wrong](#), November 2008, p9

⁶ Please see Appendix 1 for further details.

With mortgage delinquency and default rates continuing to rise, mortgage lenders also faced problems as the value of their collateral (or the assets used to secure the loans) fell. On 11 July 2008, IndyMac – the USA’s largest mortgage lender – collapsed and its assets were taken into federal ownership. Government sponsored mortgage brokers the Federal National Mortgage Association (Fannie Mae or Fannie) and Freddie Mac – who owned \$5.1tr of US mortgages, about half of the outstanding market⁷ – sought to raise capital as the extent of the problems in the housing market became apparent. However, despite raising \$13.9bn in the spring of 2008 and later having their capital adequacy requirements relaxed, the Federal Housing Finance Agency (FHFA) took the pair under conservatorship⁸ on 7 September as their credit, dividend and strength ratings subsided.⁹

In September and October 2008 the crisis hit the broader banking industry. On 15 September, investment bank Lehman Brothers filed for Chapter 11 bankruptcy, having failed to raise the necessary capital to underwrite its downgraded securities. The failure of Lehman demonstrated that the government was not willing to bail out all banks, and this caused an immediate spike in interbank lending rates¹⁰ and runs on a number of financial institutions. On the same day, Bank of America purchased investment bank Merrill Lynch for \$50bn. The following day, the Fed authorised the Federal Reserve Bank of New York to lend up to \$85 billion to the American International Group (AIG), a leading insurer of credit defaults which suffered an acute liquidity crisis¹¹ following its downgraded credit rating, in exchange for 79.9% equity.¹² America’s remaining investment banks, Goldman Sachs and Morgan Stanley, became bank holding companies on 21 September to gain greater access to capital. On 25 September, savings and loan giant Washington Mutual was seized by the Federal Deposit Insurance Corporation and had most of its assets transferred to the bank JPMorgan Chase. Four days later Citigroup sought to acquire Wachovia, America’s fourth largest bank, although a counter-proposal by Wells Fargo eventually secured the deal in October.

In response to such news the financial markets became highly volatile. The Dow Jones Industrial Average (Dow) – an index composed of 30 of the largest publicly-listed companies, including a number of large banking institutions – saw tumultuous shifts almost daily and registered its largest ever single-day point drop in value on 29 September 2008.¹³ Such was the volatility that between September and December the Dow registered four of the five highest point gains and losses in its history.¹⁴ Investor confidence fell dramatically, which was reflected in the flight to safer assets like gold, oil and the US dollar. Most notably, US Treasury bonds ‘broke the buck’: demand for secure Treasury bills was so high that their returns almost reached zero as money market firms faced significant pressures.

⁷ [Government-Sponsored Enterprises Table L124](#), Federal Reserve, 11 December 2008

⁸ A form of administration in the US. See Appendix 1 for more details.

⁹ [Testimony Chairman James B. Lockhart III](#), US Senate Committee on Banking, Housing and Urban Affairs, Hearing on US Credit Markets: Recent Actions Regarding Government Sponsored Entities, Investment Banks and Other Financial Institutions, 23 September 2008

¹⁰ [Historical Libor Rates for 2008](#), British Bankers’ Association

¹¹ Please see Appendix 1 for a definition.

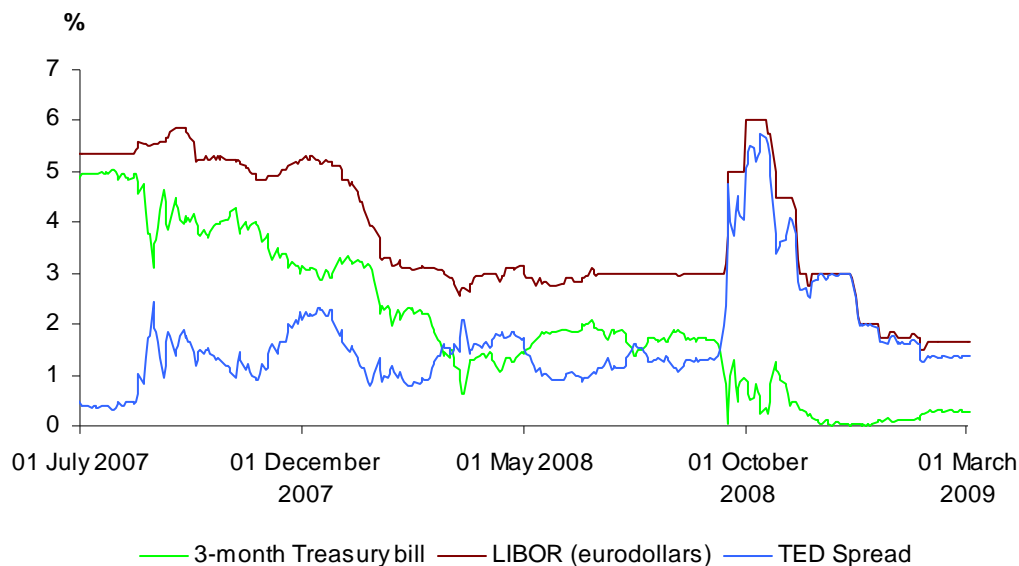
¹² [Other Press Release](#), Federal Reserve, 16 September 2008

¹³ [MSN Money](#)

¹⁴ [Dow Jones Industrial Average All-Time Largest One Day Gains and Losses](#), Wall Street Journal

Meanwhile, credit channels tightened further as the three-month London interbank offer rate (LIBOR) greatly exceeded the interest received on three-month Treasury bills. Known as the TED spread, this indicator, shown in Chart 1, captures perceived credit risk in the economy. The LIBOR also significantly exceeded the expected three-month Fed Funds rate.¹⁵ Stanford Economist John Taylor, argued that this reflected fears of growing counterparty risk,¹⁶ which also exploded in September and October.¹⁷ More pertinent to the real economy was the freezing of the commercial paper market, which prevented firms from issuing the short-term debt they required to continue functioning.

Chart 1 - TED Spread, 2007-2009



Source: Federal Reserve

Credit restrictions on both firms and consumers had serious repercussions for the real economy. The US automobile industry suffered especially badly as car sales in October fell 31.9% compared with September 2008.¹⁸ Retail sales were adversely affected, declining by 2.8% between September and October 2008 and 4.1% on the previous year. Only companies like Wal-Mart and MacDonal'd's, at the 'budget' end of their markets, escaped.¹⁹ After a short lag, unemployment rates rose every month from 6.2% in September 2008 to 7.6% in January 2009.²⁰

¹⁵ John B. Taylor, [The Financial Crisis and the Policy Responses: An Empirical Analysis of What Went Wrong](#), November 2008, p9

¹⁶ The risk that the other party to the transaction would fail to meet the agreement.

¹⁷ John B. Taylor, [The Financial Crisis and the Policy Responses: An Empirical Analysis of What Went Wrong](#), November 2008, p15

¹⁸ [A Record Decline in October's Retail Sales](#), New York Times, 14 November 2008

¹⁹ Ibid.

²⁰ [Economy at a Glance](#), Bureau of Labor Statistics, United States Department of Labor, 25 February 2009

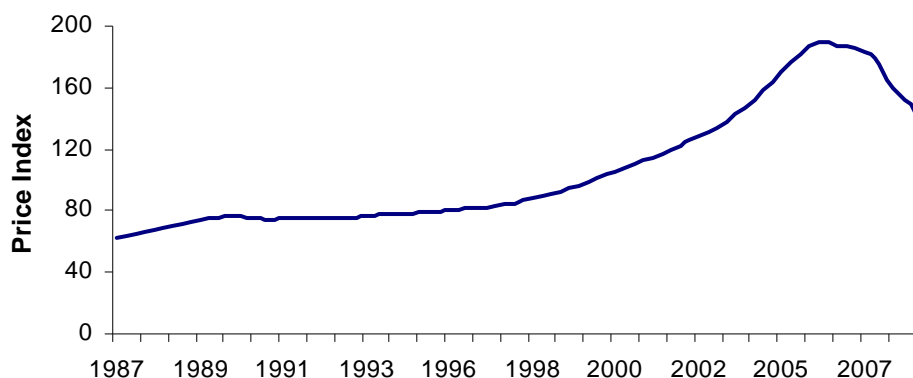
II Causes of the financial turmoil

A. The US housing market

1. Creation of a housing bubble

US house prices rose dramatically from 1998 until late 2005, more than doubling over this period (see Chart 2), and far faster than average wages. Further support for the existence of a bubble came from the ratio of house prices to renting costs which rocketed upwards around 1999.²¹ Furthermore, Yale economist Robert Shiller found that inflation-adjusted house prices had remained relatively constant over the period 1899-1995. Pointing to the escalation in house prices and marked regional disparities, Shiller correctly predicted the imminent collapse of what he believed was a housing bubble.²²

Chart 2 - S&P/Case-Shiller US National Home Price Index, 1987-2008



Source: S&P/Case-Shiller Home Price Index, Standard and Poor's

The rise in house prices reflected large increases in demand for housing and happened despite a rise in the supply of housing. The significant increase in the demand for housing is attributed to a number of factors.

a. *Low interest rates*

Sustained low interest rates from 1999 until 2004 made adjustable-rate mortgages (ARMs) appear very attractive to potential buyers. At least in part, low interest rates were driven by the large current account deficit run by the USA, mirrored by capital inflows from countries like China which avidly purchased US Treasury bonds²³, but also the decision (justified by a new economic paradigm) on the part of the Fed to keep interest

²¹ Stephen G. Cecchetti, [Monetary Policy and the Financial Crisis of 2007-2008](#), 3 April 2008, pp3-4

²² Robert Shiller, *Irrational Exuberance* (2nd Edition), Princeton University Press, 2005

²³ Lord Adair Turner, [The financial crisis and the future of financial regulation](#), The Economist's Inaugural City Lecture, 21 January 2009

rates lower than in similar previous scenarios.²⁴ The Fed – and many of the world’s other leading central banks – continued to pump liquidity into credit markets to ensure credit would continue to flow at low rates of interest.²⁵

b. Support for the subprime market

There is strong evidence to suggest that, in many parts of the US, it had become a lot easier, and cheaper, to receive a mortgage. A Federal Reserve study found that the gap between the interest rates facing the sub-prime and prime markets, America’s most and least risky borrowers, fell dramatically from 2.8% in 2001 to 1.3% in 2007.²⁶ In addition, individual-level analysis by Demyanyk and van Hemert finds that, controlling for borrower and loan characteristics as well as macroeconomic conditions, the credit quality of new subprime mortgages fell each year from 2001 to 2006.²⁷ James Lockhart, Director of the FHFA, explained in his testimony at a hearing in the US Senate that government-sponsored mortgage brokers Fannie Mae and Freddie Mac had failed to properly assess risk:

[Fannie and Freddie] bought or guaranteed many more low documentation, low verification and non-standard [adjustable-rate mortgages] mortgages than they had in the past.²⁸

A variety of explanations have been proffered for the increasingly generous credit granted to the riskiest borrowers. One explanation is that Congress, and the Clinton and Bush Administrations, through the Department of Housing and Urban Development, pressured government-sponsored enterprises (GSEs) Fannie and Freddie (as well as Ginnie Mae, a mortgage broker fully backed by the government) to lower their standards for low-income families and foster a home-ownership society.²⁹ Government deregulation has also received strong criticism: Robert Kuttner has controversially argued that the Gramm-Leach-Bliley Act of 1999, which repealed the Glass-Steagall Act of 1933, to allow banks to operate commercial *and* investment arms, created opportunities for conflicts of interest that encouraged the profitable continuation of easy credit for banks able to quickly sell-off mortgage-backed securities.³⁰

However, the flurry of lending undertaken by Fannie and Freddie – even as the bubble was starting to burst – may have reflected tough financial competition. At its lowest point in 2004, less than 10% of new mortgages were backed by the GSEs; this was primarily because regulations concerning credit quality and maximum value had restricted Fannie

²⁴ John B. Taylor, [The Financial Crisis and the Policy Responses: An Empirical Analysis of What Went Wrong](#), November 2008

²⁵ Robert Kuttner, [The Bubble Economy](#), The American Prospect, 24 September 2007

²⁶ Referenced from [Subprime mortgage crisis](#), Wikipedia

²⁷ Yuliya S. Demyanyk and Otto van Hemert, Understanding the Subprime Mortgage Crisis, SSRN, December 2008

²⁸ [Testimony of Chairman James B. Lockhart III](#), US Senate Committee on Banking, Housing and Urban Affairs, Hearing on US Credit Markets: Recent Actions Regarding Government Sponsored Entities, Investment Banks and Other Financial Institutions, 23 September 2008

²⁹ [Pressured to Take More Risk, Fannie Reached Tipping Point](#), New York Times, 4 October 2008

³⁰ Robert Kuttner, [The Bubble Economy](#), The American Prospect, 24 September 2007

and Freddie's lending practices.³¹ It was only toward the peak of the bubble in mid-2005 that Fannie and Freddie – arguably at the behest of government³² – dramatically increased their subprime lending.³³ Chairman Waxman called to attention the fact that Freddie Mac's chief risk officer was fired in 2004 having suggested that Freddie should increase its mortgage standards and dissociate itself from situations of predatory lending.³⁴

Mortgage lenders who had previously sold their subprime loans on to Fannie and Freddie were threatening to bypass the middle-man and sell straight to the banks who sought to bundle up the loans into profitable securities.³⁵ This activity posed a serious risk of moral hazard. As mortgage lenders became more profitable, selling riskier loans became more attractive as banks could sell on these mortgages. Empirically, this process of securitisation has been associated with a decline in credit quality.³⁶ As economist Joseph Stiglitz summarises, “Mortgage originators didn't have to ask, is this a good loan, but only, is this a mortgage I can somehow pass on to others.”³⁷ Accordingly, they devised ‘teaser’ schemes with initially low-interest rates or even interest-free mortgages to attract buyers who saw it as a chance to cast a ‘bet’ on the continuation of the inexorable rise in house prices. The initial lower rate period was also attractive for the banks as it gave them time to sell on mortgages before they defaulted. In addition, down payments were reduced, mortgages increasingly required little or no documentation or proof of income, and in some cases required no income, job or asset at all to qualify for a mortgage.³⁸ In spite of its legal mandate to regulate abusive lending practices,³⁹ the Fed failed to prevent such predatory lending. It is also likely that many of the mortgages were underpinned by fraudulent activity – perhaps up to 70% in the case of some lenders.⁴⁰

c. *Speculation*

The upward rise in house prices was accentuated by property speculation. “In some markets, 10% to 15% of buyers were speculators,” estimates Bruce Karatz of KB Home.⁴¹ Harvard economist Robert Shiller adds: “Home buyers typically expect price appreciation of 10% [a year]”.⁴² Speculative activity was exacerbated by the US's comparatively generous foreclosure rules: unlike in the UK, where foreclosure is likely to

³¹ Stephen G. Cecchetti, “[Monetary Policy and the Financial Crisis of 2007-2008](#)”, 3 April 2008, pp4-5

³² Richard Syron, US House Committee on Oversight and Government Reform, Hearing on Fannie Mae and Freddie Mac Financial Collapse, 9 December 2008

³³ Ibid., [Opening Statement of Chairman Henry Waxman](#)

³⁴ Ibid.

³⁵ [Pressured to Take More Risk, Fannie Reached Tipping Point](#), New York Times, 4 October 2008

³⁶ Benjamin J. Keys, Tanmoy K. Mukherjee, Amit Seru and Vikrant Vig, “Did Securitization Lead to Lax Lending? Evidence from Subprime Loans”, SSRN, 2008

³⁷ Testimony of Joseph Stiglitz, Hearing on The Future of Financial Services Regulation, House Committee on Financial Services, 21 October 2008

³⁸ Markus Brunnermeier, “Deciphering the Liquidity and Credit Crunch 2007–2008”, *Journal of Economic Perspectives*, 23:1, Winter 2009, p82

³⁹ Homeownership Equity Protection Act of 1994, Title 15, United States Chapter 41, subchapter 1, part b, section 1639, subsection 11(2)

⁴⁰ Richard Bitner, *Confessions of a Sub-Prime Lender – An Insider's Tale of Greed, Fraud and Ignorance*, John Wiley and Sons, 2008

⁴¹ Maria Bartiromo, [Jitters on the Home Front](#), Business Week, 6 March 2006

⁴² Ibid.

result in personal bankruptcy, homeowners in the US can generally just walk away from their home and mortgage.

Under the stewardship of Federal Reserve Chairman Alan Greenspan, market speculators believed that asset bubbles would be treated with care and given a soft landing. This so-called 'Greenspan put' created a further incentive for moral hazard where investors could potentially reap large gains, while their losses would be mitigated as the Fed responded with increased liquidity.⁴³

d. Consequences

Together, these factors created a huge housing bubble. By 2005-06, the value of subprime mortgages relative to total new mortgages was estimated at 20% - as opposed to less than 7% in 2001.⁴⁴ Subprime mortgage lending rose from \$180bn in 2001 to \$625bn in 2005.⁴⁵ New Alt-A mortgages, the risk level between subprime and prime,⁴⁶ had risen from 2% in 2001 to 14% by 2006.⁴⁷ Dean Baker, co-director of the Center for Economic and Policy Research, valued the housing bubble at \$8 trillion.⁴⁸

2. The collapse of the bubble

By 2006 a number of factors had conspired to burst the bubble. First, average hourly wages in the US had remained stagnant or declined since 2002 until 2009;⁴⁹ in real terms this represented a decline. Consequently, prices could not continue to rise as housing became increasingly unaffordable. Second, growth in housing supply tracked price rises.⁵⁰ While prices were able to withstand this downward pressure until 2005, once demand had subsided excess supply exacerbated the sharp fall in prices.⁵¹ Third, as interest rates rose (see Chart 5) to a peak of 5.25%, ARMs became less attractive and effectively removed many non-prime prospective buyers from the market – in the first half of 2006, the Mortgage Bankers Association found the value, and total number, of subprime mortgages to be down 30% on the second half of 2005.⁵² Fourth, as personal saving from disposable income fell below zero, fewer households had the requisite finance to support increases in debt.⁵³

⁴³ "'Greenspan put' may be encouraging complacency", *Financial Times*, 8 December 2000

⁴⁴ [The State of the Nation's Housing 2008](#), Joint Center of Housing Studies of Harvard University, 2008, p19; Anthony Sanders, "The subprime crisis and its role in the financial crisis", *Journal of Housing Economics*, 17:4, December 2008, p257

⁴⁵ [De Larosiere Report](#), High-level Group on Financial Supervision in the EU, 25 February 2009, p7

⁴⁶ Alt-A mortgages were similar to prime mortgages, but required more limited documentary evidence. For example, no formal evidence of income was required for such a mortgage.

⁴⁷ Anthony Sanders, "The subprime crisis and its role in the financial crisis", *Journal of Housing Economics*, 17:4, December 2008, p257

⁴⁸ Dean Baker, [Beat The Press blog](#), 8 November 2008

⁴⁹ [Bureau of Labor Statistics](#)

⁵⁰ [Manufacturing, Mining and Construction Statistics](#), US Census Bureau

⁵¹ [Testimony of Robert Wescott](#), US House Committee on Oversight and Government Reform, Hearing on causes and effects of the Lehman Brothers bankruptcy, 6 October 2008

⁵² [Subprime Mortgage Originations Volume Down in the First Half of 2006](#), Mortgage Bankers Association

⁵³ [De Larosiere Report](#), High-level Group on Financial Supervision in the EU, 25 February 2009, p7

The collapse in house prices affected the ability, and the willingness, of mortgage-owners to meet their payments. In some cases, house-owners with ARMs simply could not face the rise in their payments resulting from the steep rise in the Fed funds rate. As house prices fell, the options of either selling the property or re-financing the mortgage also diminished.⁵⁴ This unfortunate position was exacerbated by the decline in the net savings rate, which meant homeowners had fewer financial reserves to help themselves.⁵⁵ In other cases, there existed an incentive to voluntarily foreclose where the value of the house (and future gains associated with a stronger credit rating) was smaller than the value of the outstanding mortgage because of generous foreclosure legislation.⁵⁶

The rise in interest rates and fall in property values had a particularly damaging impact on those with ARMs. Moody's Economy Chief Economist Mark Zandi estimated that 8.8m, or 10.3%, of homes were facing a situation of negative equity in March 2008.⁵⁷ Foreclosures tend to induce vicious cycles – a review by Kai-yan Lee of the Boston Federal Reserve Bank suggests that nearby properties may lose between 0.9 and 8.7% of their value, which in turn increases the likelihood of further foreclosures (although the marginal impact is found to be decreasing).⁵⁸

Consequently, 2007 and 2008 saw significant rises in delinquency and foreclosures.⁵⁹ Serious mortgage delinquency rates rose in both the prime and subprime markets, although the latter's rise from just over 6% in 2006 to 18% in 2008 was particularly salient.⁶⁰ The number of properties subject to foreclosure filings rose by 79% in 2006 to reach 1.3m in 2007, and increased by a further 81% to 2.3m in 2008 (a 225% increase on 2006).⁶¹ As the Joint Center for Housing Studies at Harvard University found, delinquency and foreclosures were concentrated among subprime and ARM customers:

While mortgage performance in general has been slipping since mid-2006, delinquencies in the subprime market are particularly high—especially among riskier adjustable-rate, interest-only, and payment-option mortgages.

...

Subprime loans are largely the culprit. The foreclosure rate on subprime loans soared from 4.5 percent in the fourth quarter of 2006 to 8.7 percent a year later. Over the same period, the foreclosure rate for adjustable-rate subprime loans more than doubled from 5.6 percent to 13.4 percent, while that for fixed-rate

⁵⁴ Anthony Sanders, "The subprime crisis and its role in the financial crisis", *Journal of Housing Economics*, 17:4, December 2008, p257

⁵⁵ [Comparison of Personal Saving in the National Income and Product Accounts \(NIPAs\) with Personal Saving in the Flow of Funds Accounts \(FFAs\)](#), Bureau of Economic Analysis, US Department of Commerce,

⁵⁶ This is akin to a more nuanced version of the "negative equity" problem.

⁵⁷ Mark Zandi, "Plan to Take Bolder Action on Mortgages", Moody's Economy.com, 27 February 2008

⁵⁸ Kai-yan Lee, [Foreclosure's Price-Depressing Spillover Effects on Local Properties: A Literature Review](#), September 2008

⁵⁹ These terms specific to the US mortgage market are explained in Appendix 1.

⁶⁰ Anthony Sanders, "The subprime crisis and its role in the financial crisis", *Journal of Housing Economics*, 17:4, December 2008, p256

⁶¹ [Realty Trac](#)

subprime loans nudged up from 3.2 percent to 3.8 percent. Although the rate for prime loans also increased, it remained under 1.0 percent.⁶²

The expansion of credit to risky borrowers in the US extended beyond the housing market. Although mortgages were the largest single component, the value of non-mortgage asset-backed loans also grew considerably; accordingly, the issuance of asset-backed securities⁶³ (ABSs) quadrupled from 2001 to reach \$1.3tr in 2006.⁶⁴ These ABSs had gone through the same securitisation process as mortgage-backed securities (see below) and were thus equally vulnerable to collapses in the value of their underlying assets. US-based economist Nouriel Roubini has suggested that other asset bubbles across the world, which utilised similar securitisation processes, crashed at a similar time:

This crisis is not merely the result of the U.S. housing bubble's bursting or the collapse of the United States' subprime mortgage sector. The credit excesses that created this disaster were global. There were many bubbles, and they extended beyond housing in many countries to commercial real estate mortgages and loans, to credit cards, auto loans, and student loans.⁶⁵

Many of these other bubbles had arisen from the same macroeconomic imbalances – current account deficits alongside low bond yields – that had stimulated low interest rates affecting the housing market.⁶⁶

B. The role of the financial industry

1. The web of financial instruments

The problems that arose from the housing bubble multiplied exponentially because of the manner in which they were re-packaged and distributed to the global financial markets. Complex innovations designed to maximise efficiency and profits by allocating risk to those happiest to bear it revolutionised finance in the mid 1990s.⁶⁷ The genesis of mortgage loans generally followed an intricate process where the initial loans were passed through a number of agents, and ended up scattered across financial markets. Diagram 1 provides an overview of the process.

a. *The securitisation process*

At the first stage in the process a household buys a mortgage from a mortgage lender. A rate of interest, fixed or variable, is agreed to be paid to the mortgage lender over a

⁶² [The State of the Nation's Housing 2008](#), Joint Center of Housing Studies of Harvard University, 2008, pp19-20

⁶³ Please see the Appendix 1 for a definition.

⁶⁴ [Issuances in the US Bond Market](#), Securities Industry and Financial Market Association, 25 February 2009

⁶⁵ Nouriel Roubini, [Warning: More Doom Ahead](#), Foreign Policy, January/February 2009

⁶⁶ Lord Adair Turner, [The financial crisis and the future of financial regulation](#), The Economist's Inaugural City Lecture, 21 January 2009

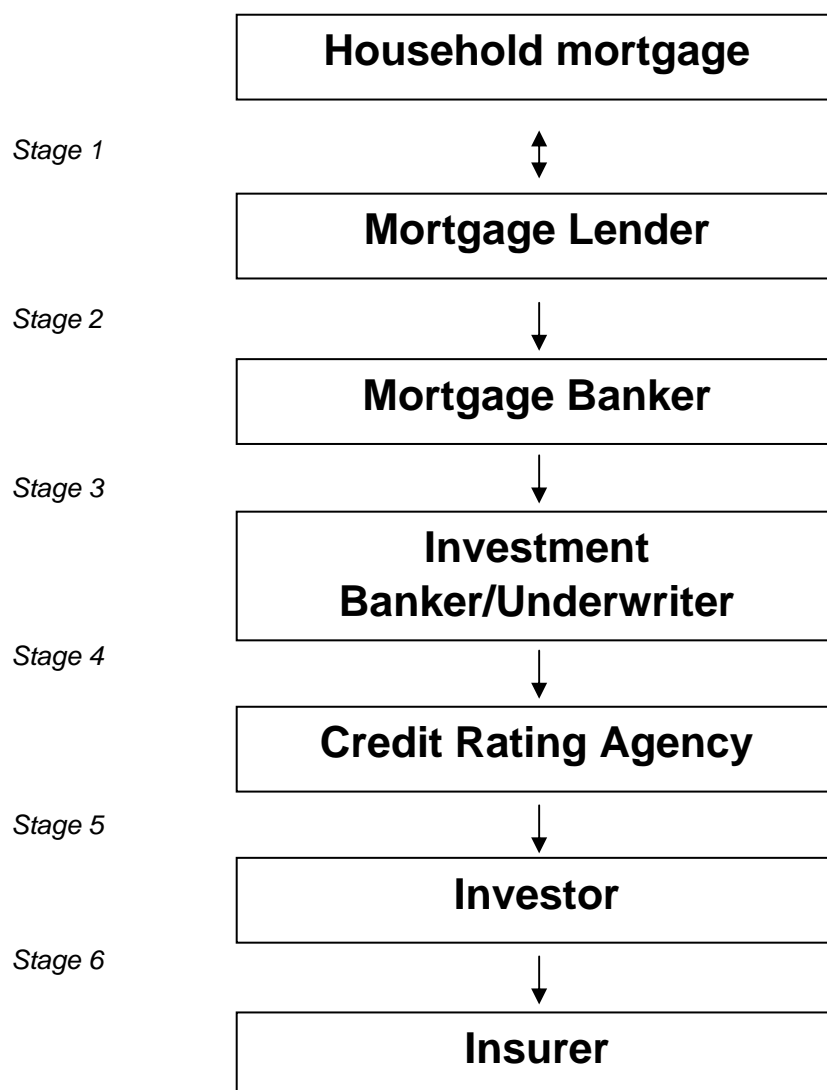
⁶⁷ Securitization had long been a part of the US financial markets, but it was not until the mid-to-late 1990s that it substantially grew in complexity and pervasiveness.

given period of time. The long-term interest rate is assessed on the basis of their credit history and score, and is greater where the risk of default is believed to be higher. At stage 2, the mortgage lender relieves himself of the risk of default by selling the mortgage on to a mortgage banker.

Traditionally, mortgage bankers like Fannie and Freddie would issue bonds to purchase mortgages and sell the loans in parcels to the market. The federally-sponsored Fannie and Freddie were created for this purpose and increasingly served as the underwriters of mortgages. However, the innovative new financial process saw the mortgage banker in turn sell the mortgage on for a profit to an investment banker. This third stage may not occur where a mortgage bank also served the function of an investment bank – as was the case with Fannie and Freddie.

Diagram 1

Overview of the financial process



At the fourth stage, the investment banker collects a large number of mortgages (or structured mortgage-based financial products) that it underwrites for the purpose of

creating a security⁶⁸ it can sell to investors. Using complicated financial instruments, investment bankers would pool together a large number (usually between 1,000 and 25,000) of mortgages into a security known as a mortgage-backed security (MBS) or a collateralised debt obligation (CDO) where the security could contain different types of assets including mortgages as collateral. By pooling together large numbers of assets, these securities dramatically reduced the risk of *total* default although maintained the same expected return (and risk-neutral credit spread⁶⁹). Even where defaults occurred the owner would still receive returns from the acquired collateral (usually the house itself). A host of more complicated synthetic products such as CDO-squareds⁷⁰ were backed by the original securities, and were sold in a similar manner.

The MBSs and CDOs varied in composition and form but yielded returns – either cash flows over time or market value – depending upon their risk profiles.⁷¹ It is at stage 5 where the risk profile was generally calculated: credit rating agencies (CRAs) would make their risk assessment of these assets and their different tranches,⁷² and this would ‘price’ the security offered to the market by the investment banks but would also serve to inform risk-weighted capital requirements under the Basel II capital framework.⁷³ Given that 80% of subprime MBSs were rated AAA (the highest credit rating level) and 95% at a least grade A,⁷⁴ the securities appeared to be highly attractive investments, liable to offer generous returns which could be marked as low-risk assets on a firm’s balance sheet.⁷⁵ Once rated, the securities were either kept by investment banks – as investments or collateral – or parcelled off and purchased by investors including other banks, hedge funds and pension funds, as part of their asset portfolios. The issuer would also receive a fee for managing the asset. Economist Markus Brunnermeier finds that pension funds generally purchased the safest tranches, hedge funds purchased riskier portions and the issuer retained the riskiest tranches for monitoring purposes.⁷⁶ Selling such a security can benefit the issuer by providing cheap and diverse financing and removing risky assets from the balance sheet.

⁶⁸ Please see Appendix 1 for a definition.

⁶⁹ A risk neutral credit spread would be a credit spread (or the difference between the specific security and one perceived as risk free) for someone who is neither risk-averse nor risk-seeking.

⁷⁰ Please see Appendix 1 for further details.

⁷¹ A risk profile of an MBS or mortgage-backed CDO, and hence its price, can be calculated using complex mathematical models reflecting the risks of default, shifts in interest rates and prepayment. However, many were also calculated using a simple mathematical formula, called the Gaussian copula, which essentially said that a CDO could be priced on the basis of the value of a credit default swap because the market would efficiently price the risk of default.

⁷² A security is generally sliced up into different tranches, or portions of the security’s risk. Tranches are generally determined by their seniority in terms of payment, and thus carry different levels of risk. The most senior tranches, which carry the least risk, provide the lowest rates of interest.

⁷³ The Basel II capital framework contains recommendations for international capital requirements made by the Basel Committee on Banking Supervision to which most advanced financial economies adhere to.

⁷⁴ George Akerlof and Robert Shiller, *Animal Spirits: How Human Psychology Drives the Economy, and Why It Matters for Global Capitalism*, Princeton University Press, 2009, p37

⁷⁵ By way of comparison, only a very small number of firms and countries receive a rating of AAA when they issue debt.

⁷⁶ Markus Brunnermeier, “Deciphering the Liquidity and Credit Crunch 2007–2008”, *Journal of Economic Perspectives*, 23:1, Winter 2009, p80

b. The use of credit derivatives

Banks needed to manage their risk and to meet their Basel capital requirements. Consequently, they sought protection against the riskiest securities issued in stage 6. This came in the form of a financial derivative⁷⁷ called a credit default swap (CDS) which, in return for a fraction of the potentially large return, insured the holder of the MBS or CDO against the risk of default. The existence of 'naked' CDSs – CDS contracts where neither party actually held the underlying asset – created fertile ground for speculation on a firm's future creditworthiness as well as risk management.

Insurance firms like AIG could make as many CDSs as they wished given that the market was unregulated. The Commodity Futures Modernization Act of 2000 specified that CDSs were not defined as insurance, securities or futures contracts (and therefore went unregulated). As long as the insurer remained AAA-rated, they did not need to put up any collateral; moreover, CDSs could be posted as profits immediately using default probabilities based on recent experience. Given that the CDS market contained considerable speculation upon the outcomes of the insurance/swap contracts, this ensured that derivatives traders across the world spread risks across an even broader spectrum of investors.

c. Broadening the appeal of the process

The process quickly grew in popularity as it promised significant profits at each stage. It is pertinent to note that throughout this chain each actor is betting on the same favourable outcome. Robert Wescott, President of Keybridge Research, identifies that:

[Increasing house prices and easy credit] was good for new home buyers, including speculators, because they saw almost immediate price gains. It was good for mortgage brokers; they earned hefty origination fees. It was good for rating agencies; they had great business. And it was good for investment banks, because they were earning large securitization fees. The system boomed this way for many years.⁷⁸

Opportunities for involvement were magnified by a number of factors. In April 2004, a ruling by the Securities and Exchange Commission (SEC) permitted large investment banks to borrow more,⁷⁹ and thereby allowing them to purchase and sell on more of the MBSs which were believed to offer excellent low-risk returns. This saw the investment banks raise their leverage ratios⁸⁰ from the traditional level of approximately 12 dollars of debt for every 1 dollar of equity as high as 40 to 1.

⁷⁷ Please see Appendix 1 for a definition.

⁷⁸ [Testimony of Robert Wescott](#), US House Committee on Oversight and Government Reform, Hearing on causes and effects of the Lehman Brothers bankruptcy, 6 October 2008

⁷⁹ The net capital rule had previously required that the brokerage arms of investment banks hold reserve capital designed to decrease their leverage and risk exposure. However, the new capital requirements permitted investment banks with more than \$5bn in assets to start employing their own risk models to evaluate their assets in capital adequacy requirements. Furthermore, no gross leverage limit would apply.

⁸⁰ Please see Appendix 1 for further details.

In conjunction, investors began adopting a more complacent approach to risk, having seen the Fed respond to previous asset bubbles by supporting liquidity injections.⁸¹ In the words of then President Bush, “Wall Street got drunk”.⁸² Riskier prospects were particularly attractive at a time when bond yields had been driven down by low interest rates and the significant investment by China, among others, in US Treasury bonds. Testifying in the Senate, William Black explains that, even if executives recognised the inevitability of collapse, there still remained an incentive for a short-termist to partake:

So think of yourself as a potential chief financial officer three years ago. You know that this stuff has been called toxic waste. You know that you're in the midst of what's going to be the largest bubble in the history of the world, financial bubble, which is the U.S. real estate bubble. You know how badly this is going to end.

But what happens if you don't invest in subprime and Alt-A and your competitors do? During the bubble phase, there are very few defaults on subprime because you simply refinance it. There are much higher fees and somewhat higher interest rates.

So the people that do lots of subprime and Alt-A report that they have the highest earnings. Their bosses earn the biggest bonuses. Their stock appreciates. Their options become more valuable, et cetera, et cetera, et cetera.

If you as a CFO refuse to do that – the average CFO in America lasts less than three years. Think of the incentive for the short-time approach. If you don't do it, not only do you not get your bonus because you don't hit the high target figures, but your boss, the CEO, doesn't get his full bonus. And all of your peers don't get their bonus.

And so you rightfully fear that you will lose your job as well. Does everyone give in to this? Of course not. But enough people do – that's why we call it a Gresham's dynamic.⁸³

Moreover, mortgage brokers knew that the issuers of securities could sell almost any mortgage on the market, and accordingly this encouraged lenders to provide more loans. Lehman Brothers, for example, appeared to encourage generous lending standards and fraudulent activity at the mortgage lending firms (such as First Alliance) it had acquired.⁸⁴ This cycle ensured that the market in MBSs, CDOs and CDSs reached vast proportions: by 2007 MBSs valued at more than \$2tr were issued into the bond market;⁸⁵ CDOs were

⁸¹ “‘Greenspan put’ may be encouraging complacency”, Financial Times, 8 December 2000. Examples include the 1987 stock market crash, the near-collapse of Long Term Capital Management, the East Asian crisis and the dotcom crash.

⁸² [Bush: 'Wall Street got drunk and now it's got a hangover'](#), The Independent, 24 July 2008

⁸³ Dr. William Black, Senate Committee on Agriculture, Nutrition and Forestry, Hearing on the Role of Financial Derivatives in Current Financial Crisis, 14 October 2008

⁸⁴ Representative John Sarbannes, US House Committee on Oversight and Government Reform, Hearing on causes and effects of the Lehman Brothers bankruptcy, 6 October 2008

⁸⁵ [Issuances in the US Bond Market](#), Securities Industry and Financial Market Association, 25 February 2009

issued to the value of \$521bn;⁸⁶ although 80-90% of the CDS market was based on speculative bets,⁸⁷ its notional value⁸⁸ soared to \$62tr by December 2007.⁸⁹

2. The housing crash and the finance industry

As the bubble burst, two key features endangered the returns from mortgage-backed assets: first, default meant that a large cash flow was halted; second, the housing collateral on which this was based saw a significant depreciation (see Chart 2). Although the collapse of the subprime market cost the economy more than \$1tr, the damage was greatly magnified by the web of financial instruments constructed around it – or the “chain reaction” as US Treasury Secretary Henry Paulson described it.⁹⁰

Underpinning the complex financial instruments were a number of problems that broadened the collapse of the housing market to the financial sector as a whole. First, the formal and informal risk analysis underpinning the actions of each of the actors in Diagram 1 failed to accommodate the collapse of the housing bubble. Many models failed to integrate common shocks, and paid too little attention to unlikely but highly costly “tail risks”.⁹¹ Moreover, the formal statistical models used in the banks, CRAs, insurance firms and regulators made predictions which relied upon historical housing data generally only going back as far as two decades⁹² and which failed to reflect the relaxation of credit standards.

Looking in particular at subprime mortgages, Charles Calomiris finds that CRAs used data from a “brief and unrepresentative period” period where house prices had generally been rising in spite of a brief recession in 2001 and failed to make adjustments for declining lending standards.⁹³ Accordingly, CRAs assumed an expected loss of only 6% on subprime defaults. Furthermore, these models failed to seriously accommodate the possibility of a serious recession where mortgage-owners could default *en masse* nationwide. Housing economist Anthony Sanders finds that by 2005-2006 the weak inverse relationship between house prices and delinquency ratios became strongly correlated, which considerably altered the risk models of financial institutions and the hedges required for ABSs.⁹⁴ Deven Sharma, chief executive officer (CEO) of the CRA Standard and Poor’s, explained that “events have demonstrated that the historical data we used and the assumptions we made significantly underestimated the severity of what

⁸⁶ [Global CDO Market Issuance Data](#), Securities Industry and Financial Markets Association, 25 February 2009

⁸⁷ [Testimony of Eric Dinallo](#), Senate Committee on Agriculture, Nutrition and Forestry, Hearing on The Role of Financial Derivatives in the Current Financial Crisis, 14 October 2008

⁸⁸ Notional value is defined as the sum that protection sellers would owe protection buyers were all underlying credit entities defaulted and the value of their debt went to zero.

⁸⁹ [2007 Year-End Market Survey](#), International Swaps and Derivatives Association, December 2007

⁹⁰ [Testimony of Secretary Henry Paulson](#), US Senate Committee on Banking, Housing and Urban Affairs, Hearing on US Credit Markets: Recent Actions Regarding Government Sponsored Entities, Investment Banks and Other Financial Institutions, 23 September 2008

⁹¹ [De Larosiere Report](#), High-level Group on Financial Supervision in the EU, 25 February 2009, p8

⁹² [Testimony of Alan Greenspan](#), US House Committee on Oversight and Government Reform, Hearing on the role of Federal Regulators and the Financial Crisis, 23 October 2008

⁹³ Charles Calomiris, [The subprime turmoil: What's old, what's new, and what's next](#), Vox, 22 August 2008

⁹⁴ Anthony Sanders, “The subprime crisis and its role in the financial crisis”, *Journal of Housing Economics*, 17:4, December 2008, pp259

has actually occurred.”⁹⁵ More informal models used by speculators, homeowners and mortgage lenders were predicated on the view that the prevailing house price growth and expansionary monetary policies would persist.⁹⁶

A mathematical formula devised by Wall Street mathematician David Li, known as the Gaussian copula, was widely used to price the risks contained in CDOs. Across the banking system this formula made complex risk calculations easy by effectively assuming that the prices attached to CDSs – determined by what was assumed to be a perfectly efficient market – were true reflections of their risk.⁹⁷ Consequently, CDOs could be priced without explicit reference to their underlying assets and using almost no data at all.

Given that each of the players in the chain outlined in Diagram 1 relied on these models providing accurate depictions of the costs and risks of mortgage defaults, their failure induced considerable losses. In particular, the CDS insurers faced the prospect of unprecedented payouts for insurance against large-scale mortgage defaults; as these obligations grew insurance companies like AIG no longer merited top credit ratings, and were therefore required to dramatically increase their capital to meet their new collateral and capital adequacy requirements. The investment banks that paid out on the MBSs and CDOs, and the investors and speculators who saw the value of – or expected flows from – their MBSs, CDOs and CDSs fall, all suffered significant write-downs in the value of their assets, which necessitated an almost unprecedented need for new capital.

Second, the credit ratings recommended by the CRAs may have suffered from inadequate risk analysis, conflicts of interests and a lack of competition.⁹⁸ Internal communications from the US’s (and world’s) three large CRAs – Fitch, Moody’s and Standard and Poor’s – presented to the House Committee on Oversight and Government Reform suggest that analysts found problems in the models at an early stage and accurately predicted impending systemic collapse. Frank Raiter, an ex-risk analyst with Standard and Poor’s, testified that he was not happy with the changes in the collateral underpinning mortgage lending, and found that an updated and more complex model, able to distinguish between the different mortgage categories, had not been used, the reasons for which are disputed. An internal email at Moody’s criticised the refusal to factor the risk of interest rate rises into risk models.⁹⁹

Further, the CRAs made decisions based on incomplete information, and instead relied upon the details provided by the issuer. One Standard and Poor’s manager emailed a senior risk analyst to explain: “Any request for loan level tapes¹⁰⁰ is TOTALLY

⁹⁵ [Testimony of Deven Sharma](#), US House Committee on Oversight and Government Reform, Hearing on the Credit Ratings Agencies and the Financial Crisis, 22 October 2008

⁹⁶ Maria Bartiromo, [Jitters on the Home Front](#), Business Week, 6 March 2006; “‘Greenspan put’ may be encouraging complacency”, Financial Times, 8 December 2000

⁹⁷ [Recipe for Disaster: The Formula That Killed Wall Street](#), Felix Salmon, Wired Magazine, 23 February 2009

⁹⁸ Herwig Langohr and Patricia Langohr, *The rating agencies and their credit ratings*, 2008

⁹⁹ [E-mail from Yo-Tsung Chang to Joanne Rose, et al., May 25, 2004](#), US House Committee on Oversight and Government Reform, Hearing on the Credit Ratings Agencies and the Financial Crisis, 22 October 2008

¹⁰⁰ The files providing the details of the loan which are stored on computer tapes to save space.

UNREASONABLE!!! Most investors don't have it and can't provide it. Nevertheless we MUST produce a credit estimate."¹⁰¹ Moreover, CRAs increasingly advised their customers on how to tailor a product to satisfy the minimum requirements to receive a certain rating.¹⁰² One analyst concluded: "Rating agencies continue to create an even bigger monster – the CDO market. Let's hope we are all wealthy and retired by the time this house of cards falters."¹⁰³

In spite of these problems, the CRAs continued to award their top ratings to MBS and CDO tranches until 2007. Retrospectively, hedge fund manager James Simons reflected that they "allowed sows' ears to be sold as silk purses."¹⁰⁴ In a private presentation to the Moody's board in October 2007, Raymond McDaniel – then Head of Corporate ratings, but Chairman and CEO at the time of the hearing – concisely summarised the danger of a conflict of interests where a firm being paid by the issuer provides ratings for their securities:

It turns out that ratings quality has surprisingly few friends: issuers want high ratings; investors don't want rating downgrades; short-sighted bankers labor short-sightedly to game the rating agencies for a few extra basis points on execution.

...

Moody's for years has struggled with this dilemma. On the one hand, we need to win the business and maintain market share, or we cease to be relevant. On the other hand, our reputation depends on maintaining ratings quality (or at least avoiding big visible mistakes). For the most part, we hand the dilemma off to the team MDs to solve. As head of corporate ratings, I offered my managers precious few suggestions on how to address this very tough problem, just assumed that they would strike an appropriate balance.¹⁰⁵

Raiter added that the quality of ratings surveillance – the process where ratings are monitored and potentially re-graded – suffered as it could profit from resisting downgrades, and did not even employ the advanced econometric models used by the initial ratings department.¹⁰⁶ This situation was aggravated by a lack of competition – the big three CRAs controlled 94% of the global market;¹⁰⁷ particularly since many

¹⁰¹ [E-mail from Frank Raiter to Richard Gugliada et al., March 20, 2001](#), US House Committee on Oversight and Government Reform, Hearing on the Credit Ratings Agencies and the Financial Crisis, 22 October 2008

¹⁰² Markus Brunnermeier, "Deciphering the Liquidity and Credit Crunch 2007–2008", *Journal of Economic Perspectives*, 23:1, Winter 2009, p82; [Oral testimony of Luigi Zingales](#), US House Committee on Oversight and Government Reform, Hearing on causes and effects of the Lehman Brothers bankruptcy, 6 October 2008

¹⁰³ Ibid., [E-mail from Belinda Ghetti to Nicole Billick, et al., December 16, 2006](#)

¹⁰⁴ James Simons, House Committee on Oversight and Government Reform, [Hearing on Hedge Funds and the Financial Markets](#), 13 November 2008

¹⁰⁵ Ibid., [Confidential Presentation to Moody's Board of Directors, October 2007](#)

¹⁰⁶ Ibid., [Testimony of Frank Raiter](#)

¹⁰⁷ European Commission, "Commission staff working document accompanying the proposal for a regulation of the European Parliament and of the Council on Credit rating Agencies – Impact Assessment", SEC/2008/2746 final, 12 November 2008

transactions required two CRAs to make recommendations, there was a strong incentive for the leading CRAs to compete in quantity, not rating quality.

Third, the regulatory bodies failed to effectively oversee such activity and detect risks to the system. Many large, and systemically important, institutions had substantially increased their leverage both on and off their balance sheets. As leverage ratios reached 50 in some cases, the potential losses associated with even a small fall in asset values increased dramatically. The new dynamic was particularly marked among the five large US investment banks following the SEC's 2004 rule change, and especially so at Bear Stearns where its leverage ratio reached 40 to 1. It has also been suggested that Fannie and Freddie had even reached leverage ratios of 75 to 1.¹⁰⁸ Exacerbating this problem was the rise of the unregulated 'shadow' banking sector, including large financial firms like GE Capital, which bought up large numbers of assets. This significantly decreased the level of transparency in the system, and made it very difficult for even the best-informed regulators to know where risk – that was assumed to lie across a diverse range of institutions – actually lay.

Treasury Secretary Henry Paulson described the regulatory structure as “hopelessly failed and outmoded and outdated”.¹⁰⁹ One example, cited by Senator Mel Martinez, was that Fannie and Freddie “did not have a world-class regulator”¹¹⁰ able to assess the risks of their expanding subprime mortgage activities. SEC Chairman Christopher Cox explains regulatory weakness with respect to investment banks:

The SEC, for its part, does not have legal authority over the entire investment banking firm. It doesn't have the authority to require that it maintain capital levels or liquidity or what have you.¹¹¹

The problems arising from a lack of regulation were particularly acute in the unregulated over-the-counter CDS market. This lack of regulation, it is argued by Senator Tom Harkin, led to a situation where “tools to manage and limit risk have turned out to magnify and amplify risk.”¹¹² William Black, an academic at the University of Missouri, identifies that “banks did credit default swaps primarily so that they could increase their leverage by taking things off of their balance sheet and reducing greatly their capital requirements”, but also as a means of selling stocks short without being encumbered by the regulations of an exchange.¹¹³

Furthermore, the SEC, which had the power to regulate the CRAs, failed to do so effectively in spite of encouragement from Congress that culminated in the Credit Rating Agency Reform Act of 2005. Moreover, the complexity of the system meant that

¹⁰⁸ Edward Pinto, US House Committee on Oversight and Government Reform, Hearing on Fannie Mae and Freddie Mac Financial Collapse, 9 December 2008

¹⁰⁹ Secretary Henry Paulson, US Senate Committee on Banking, Housing and Urban Affairs, Hearing on US Credit Markets: Recent Actions Regarding Government Sponsored Entities, Investment Banks and Other Financial Institutions, 23 September 2008

¹¹⁰ Ibid., Statement of Senator Mel Martinez

¹¹¹ Ibid., Chairman Christopher Cox

¹¹² Senator Tom Harkin, Senate Committee on Agriculture, Nutrition and Forestry, Hearing on the Role of Financial Derivatives in Current Financial Crisis, 14 October 2008

¹¹³ Ibid., William Black

regulators – where they had powers to regulate – increasingly used the same flawed risk models as the banks and CRAs.¹¹⁴ Christopher Cox suggested that some of these problems resulted from multiple regulators administering different laws to similar products, while in cases like CDSs lacking any regulator at all.¹¹⁵ In a Congressional hearing examining the role of the regulators, Democrat Chairman Henry Waxman of the House Committee on Oversight and Government Reform summarised the situation by stating:

Over and over again, ideology trumped governance. Our regulators became enablers rather than enforcers. Their trust in the wisdom of the markets was infinite. The mantra became government regulation is wrong, the market is infallible.¹¹⁶

Republican, and Ranking Member¹¹⁷ on the committee, Tom Davis, challenged this synopsis and instead argued that regulators were slow to respond to an innovative free market:

Free markets are constantly evolving and innovating. Regulators by law, bureaucratic custom or just bad habit tend to remain static. Modernization to Federal- regulatory structures have to take account of the new global dynamics to restore the transparency, confidence and critical checks and balances necessary to sustain us as a great economic power.¹¹⁸

Fourth, with the offer of large profits and low risk, risky loans pervaded the increasingly complacent and highly leveraged financial markets. The proportion of subprime loans that were securitised grew from 50.4% in 2001 to 81.2% at its peak in 2005.¹¹⁹ Reinforcing the growth of the chain outlined in Diagram 1 was the moral hazard¹²⁰ arising from a wide range of sources:

- the ability of mortgage brokers to lend almost with impunity given the existence of secondary markets demanding high-return subprime securities;¹²¹
- changes in bank capital regulation which discouraged investment banks from retaining stakes in the securities that they issued;¹²²

¹¹⁴ George Soros, The worst market crisis in 60 years, Financial Times, 22 January 2008

¹¹⁵ Chairman Christopher Cox, US House Committee on Oversight and Government Reform, [Hearing on the role of Federal Regulators and the Financial Crisis](#), 23 October 2008

¹¹⁶ Ibid., [Opening Statement of Chairman Henry Waxman](#)

¹¹⁷ The Ranking Member is the most senior member of the committee from the minority party in Congress.

¹¹⁸ [Opening Statement of Ranking Member Tom Davis](#), US House Committee on Oversight and Government Reform, Hearing on the role of Federal Regulators and the Financial Crisis, 23 October 2008

¹¹⁹ Inside Mortgage Finance, *The 2007 Mortgage Market Statistical Annual*, 2006

¹²⁰ Please see Appendix 1 for a definition.

¹²¹ Ibid., [Testimony of Alan Greenspan](#); Stephen G. Cecchetti, "[Monetary Policy and the Financial Crisis of 2007-2008](#)", 3 April 2008, p5; Testimony of Joseph Stiglitz, Hearing on The Future of Financial Services Regulation, House Committee on Financial Services, 21 October 2008; Benjamin J. Keys, Tanmoy K. Mukherjee, Amit Seru and Vikrant Vig, "Did Securitization Lead to Lax Lending? Evidence from Subprime Loans", SSRN, 2008

¹²² Charles Calomiris, [The subprime turmoil: What's old, what's new, and what's next](#), Vox, 22 August 2008

- short-term remuneration incentives that failed to effectively account for longer-term risks;¹²³
- accounting standards allowing companies to post profits before they actually existed;
- the “too big to fail problem” identified by Fed Chairman Ben Bernanke;¹²⁴
- the belief that the privileged status of Fannie and Freddie would ensure that any loans made to them were effectively federally backed;¹²⁵ and
- the experience of the Fed injecting liquidity to save asset prices.

At stages 5 and 6 in Diagram 1, the MBSs and CDOs were spread across the markets to all kinds of investors, and on, in turn, to insurance firms and speculators. This significantly magnified the reach of the bursting credit bubble.

Once a rising number of high-risk loans defaulted and the underlying collateral transpired to be worth less than expected, the CDOs backed by such loans received large rating downgrades. The losses associated with US credit securities were felt hardest by banks. The IMF reported that, as of April 2008, banks faced mark-to-market¹²⁶ losses of \$470bn. Insurance companies, pension funds, individual savings and many hedge funds also suffered severely, losing \$280bn.¹²⁷

A negative asset price spiral appears to have accentuated losses as firms seeking to maintain a constant level of leverage in the face of write-downs were forced to quickly sell off large numbers of assets.¹²⁸ It has been argued by Chairman Bernanke and Markus Brunnermeier that mark-to-market accounting contributed to rapid deleveraging.¹²⁹

In addition, the value of CDOs became increasingly difficult to calculate and saw huge drop-offs in issuance.¹³⁰ Furthermore, because the true value of many complex financial instruments relates to other market products, innovative derivative products could not be

¹²³ [Turner Review](#), FSA, 18 March 2009; [De Larosiere Report](#), High-level Group on Financial Supervision in the EU, 25 February 2009, p10; Charles Calomiris, [The subprime turmoil: What's old, what's new, and what's next](#), Vox, 22 August 2008

¹²⁴ Chairman Ben Bernanke, US Senate Committee on Banking, Housing and Urban Affairs, Hearing on US Credit Markets: Recent Actions Regarding Government Sponsored Entities, Investment Banks and Other Financial Institutions, 23 September 2008

¹²⁵ Gregory Smith, US House Committee on Oversight and Government Reform, Hearing on causes and effects of the Lehman Brothers bankruptcy, 6 October 2008

¹²⁶ Please see Appendix 1 for further details.

¹²⁷ IMF Global Financial Stability Report, October 2008

¹²⁸ Markus Brunnermeier, “Deciphering the Liquidity and Credit Crunch 2007–2008”, *Journal of Economic Perspectives*, 23:1, Winter 2009, pp92-93; David Greenlaw, Jan Hatzius, Anil Kashyap, and Hyun Song Shin, “Leveraged Losses: Lessons from the Mortgage Meltdown”, U.S. Monetary Forum Conference Draft, 29 February 2008, p47

¹²⁹ Chairman Ben Bernanke, US Senate Committee on Banking, Housing and Urban Affairs, Hearing on US Credit Markets: Recent Actions Regarding Government Sponsored Entities, Investment Banks and Other Financial Institutions, 23 September 2008; Markus Brunnermeier, “Deciphering the Liquidity and Credit Crunch 2007–2008”, *Journal of Economic Perspectives*, 23:1, Winter 2009

¹³⁰ The value of CDO issuances fell from \$482bn in 2007 to \$56bn in 2008. Data from: [Global CDO Market Issuance Data](#), Securities Industry and Financial Markets Association, 15 January 2009

valued with certainty. The consequence was a situation where risks and losses of uncertain value could not be easily located.

The financial crisis quickly spread to affect the US and world's real economy. Whether or not financial losses and uncertainty induced an irrational fear of further defaults (or hysteresis, in economic terminology), suspicion of financial firms ensured that interbank lending rates soared. In addition, banks and hedge funds experienced runs from depositors seeking to redeem their investments; this, in turn, required financial institutions to de-leverage further. Banks, without knowing the value of their assets, became uncertain of their lending capacities and became increasingly reluctant to make loans to institutions of uncertain creditworthiness. Firms that had used MBSs and CDOs as collateral for asset-backed commercial paper – essentially a short-term loan agreement engaged in by banks and corporations – could no longer receive the necessary loans as interest rate spreads spiked. Following the failure of the seemingly impregnable Lehman and AIG, money markets became highly conservative in their short-term lending. Consequently, a credit crisis developed which damaged firms in the real sector which relied upon loans for credit as well as financial firms needing large loans to increase their liquidity. Frederic Mishkin, a member of the Fed's Board of Governors, also identifies a dangerous negative feedback loop of falling asset prices and economic activity:

Because economic downturns typically result in even greater uncertainty about asset values, such episodes may involve an adverse feedback loop whereby financial disruptions cause investment and consumer spending to decline, which, in turn, causes economic activity to contract. Such contraction then increases uncertainty about the value of assets, and, as a result, the financial disruption worsens. In turn, this development causes economic activity to contract further in a perverse cycle.¹³¹

III Policy responses

A. Responses before September 2008

1. The Federal Reserve

The Federal Reserve acted as the key actor in managing financial problems under the stewardship of Alan Greenspan (Chairman between 1987 and 2006), who generally favoured the injection of liquidity and low interest rates as a response. The Fed, led by Ben Bernanke after 2006, adopted a similar although broader approach using four main tools.

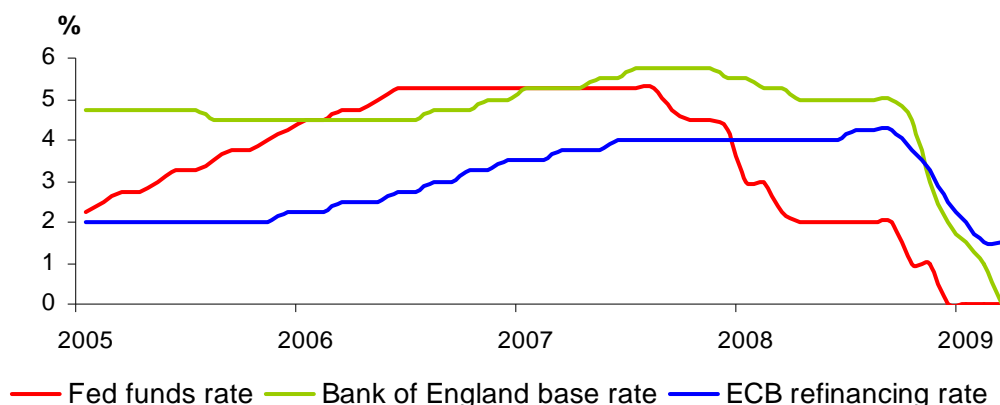
First, interest rates were a staple aspect of the Fed's response. With the Fed funds rate (broadly equivalent to the Bank of England base rate) set at 5.25% over the summer of 2007, the Federal Reserve Board – comprising seven governors who vote on interest rate decisions – rapidly lowered rates to reach 2% in August 2008 (see Chart 3).¹³² This

¹³¹ Frederic S. Mishkin, "Financial Instability and Monetary Policy", Speech at the Risk USA 2007 Conference, New York, 5 November 2007

¹³² [Monetary Policy Press Releases](#), Federal Reserve

included a dramatic cut of 1.25% (a drop of 125 basis points, bp hereafter¹³³) in January 2008. The Fed led an international drive to reduce rates: in the UK, the base rate fell much less drastically from 5.75% in December 2007 to 5% by September 2008;¹³⁴ the European Central Bank, however, acted more conservatively and actually increased its minimum refinancing rate by 25bp in July 2008 to 4.25%.¹³⁵ The Fed also decided to narrow the gap between its headline interest rate (the funds rate) and the discount rate (or primary credit rate), a rate directly available to 19 banking institutions. By lowering the cost of credit for institutions, the banking system was supposed to become more liquid. Before August 2007 the discount rate stood at 100bp above the Fed Funds rate, but this gap had narrowed to just 25bp on 16 March 2008.¹³⁶

Chart 3 - Headline Interest Rates at the Bank of England, ECB and the Fed, 2005-2009



Sources: Bank of England, ECB and Federal Reserve

However, there is little sign that either the high credit or risk spreads responded to the Fed's principal monetary tool:

Because of the specific nature of the financial distress, it became clear during the fall of 2007 that the traditional central bank tools were of limited use. While officials were able to inject liquidity into the financial system, they had no way to insure that the funds got to the institutions that needed it most.¹³⁷

John Taylor has even suggested that this aggravated the situation by raising the price of oil.¹³⁸

The second policy approach adopted by the Fed was to introduce the Term Auction Facility (TAF) on 12 December 2007 as a means of offering short-term liquidity.¹³⁹ TAF permitted depository institutions to anonymously bid to receive funds underwritten by a

¹³³ A term used to refer to interest rate points. 100 basis points equates to a 1% interest rate.

¹³⁴ [Monetary Policy Committee Decisions](#), Bank of England

¹³⁵ [Key ECB interest rates](#), ECB

¹³⁶ [Monetary Policy Press Releases](#), Federal Reserve

¹³⁷ Stephen G. Cecchetti, "[Monetary Policy and the Financial Crisis of 2007-2008](#)", 3 April 2008, p2

¹³⁸ John B. Taylor, "[The Financial Crisis and the Policy Responses: An Empirical Analysis of What Went Wrong](#)", November 2008, pp13-14

¹³⁹ [Monetary Policy Press Release](#), Federal Reserve, 12 December 2007

wide variety of collateral over a period of 28-35 days. Starting in December 2007, auctions were held every two weeks and involved large sums ranging from \$20bn to \$50bn, which rose to more than \$50bn in May 2008.¹⁴⁰ This was part of a coordinated action administered simultaneously across five institutions including the Bank of England and European Central Bank. That recipients were anonymous removed the damaging market stigma attached to using the discount window, and accordingly facilitated considerable uptake. Moreover, this approach allowed many commercial banks to directly receive funds – something that was not always achieved where only primary lenders were eligible to receive funds and expected to lend them to the wider financial system. The first few months saw some success in reducing credit spreads, although such reductions generally lasted only for a few days and had no significant lasting impact on spreads – especially after March 2008.¹⁴¹ On 30 July 2008 the Fed extended the TAF period to 84 days.¹⁴²

Third, the Term Securities Lending Facility (TSLF) announced on 11 March 2008 auctioned up to \$200bn in Treasury securities in an attempt to increase liquidity and to lower spreads on MBSs which had stopped trading due to their high risk premiums.¹⁴³ Critically, this permitted primary dealers¹⁴⁴ – including the five large investment banks – to use a broader range of assets including high-rated bonds and securities as collateral; in May 2008 the TSLF expanded to include further ABSs. The Primary Dealer Credit Facility (PDCF) extended the discount window to primary dealers on 16 March.¹⁴⁵ Again, however, both schemes failed to effectively bring the MBS risk spreads down in the longer term although did experience some initial success. Furthermore, Markus Brunnermeier has argued that the market (mistakenly) interpreted the TSLF as evidence that the investment banks were in trouble; this may, in part, explain the subsequent run on Bear Stearns from hedge funds.¹⁴⁶ Despite these problems, the Fed subsequently extended both facilities until January 2009.¹⁴⁷

Fourth, the Fed facilitated the orderly takeover of Bear Stearns.¹⁴⁸ The investment bank had been highly exposed to MBSs, and required an extraordinary loan from the Fed¹⁴⁹ to survive the weekend before being bought by JPMorgan Chase on Monday 14 March. The Federal Reserve Bank of New York insulated JPMorgan Chase against losses exceeding \$1bn in exchange for a fee – a clear indication the Fed felt that the bank could not be allowed to fail.¹⁵⁰

¹⁴⁰ [Monetary Policy Press Release](#), Federal Reserve, 2 May 2008

¹⁴¹ Stephen G. Cecchetti, "[Monetary Policy and the Financial Crisis of 2007-2008](#)", 3 April 2008, p22; John B. Taylor, "[The Financial Crisis and the Policy Responses: An Empirical Analysis of What Went Wrong](#)", November 2008, p12

¹⁴² [Monetary Policy Press Release](#), Federal Reserve, 30 July 2008

¹⁴³ [Monetary Policy Press Release](#), Federal Reserve, 11 March 2008

¹⁴⁴ Please see Appendix 1.

¹⁴⁵ [Monetary Policy Press Release](#), Federal Reserve, 16 March 2008

¹⁴⁶ Markus Brunnermeier, "Deciphering the Liquidity and Credit Crunch 2007–2008", *Journal of Economic Perspectives*, 23:1, Winter 2009, p88

¹⁴⁷ [Monetary Policy Press Release](#), Federal Reserve, 30 July 2008

¹⁴⁸ [Monetary Policy Press Release](#), Federal Reserve, 14 March 2008

¹⁴⁹ Made under Article 13.3 which had not been employed since the 1930s but permitted the Fed to lend to any institution it pleased when it could not go anywhere else.

¹⁵⁰ [Statement on Financing Arrangement of JPMorgan Chase's Acquisition of Bear Stearns](#), Federal Reserve Bank of New York, 24 March 2008

Until September 2008 the Fed had primarily focused on increasing liquidity for banks. This was treated as a tool for reducing risks in the economy. Although the Fed pledged most of its balance sheet in supporting financial firms it was ultimately unable to control risk spreads – particularly when the problems escalated in September. Taylor has suggested that the Fed misdiagnosed the problems as having resulted from limited liquidity rather than counterparty risk, which would have required a different approach.¹⁵¹

2. Legislation

Prior to September 2008 two pieces of legislation were passed designed to alleviate what was perceived as an impending mortgage crisis and recession. First, the Economic Stimulus Act of 2008 was enacted on 13 February 2008.¹⁵² The legislation provided: tax rebates for lower-income families; incentives for business investment; and a broadening of the mortgages eligible for purchase by Fannie and Freddie. These measures were designed, at a cost of \$152bn for 2008, to reinvigorate the economy and reverse the downward trend in house prices. The effectiveness of the stimulus on consumer spending has been disputed: Broda and Parker's household-level analysis finds a 3.5% rise in spending (amplified among households with incomes of less than \$15,000);¹⁵³ conversely, Taylor's analysis suggests that most of the rebate was saved instead.¹⁵⁴

The second major legislative action in July 2008, the Housing and Economic Recovery Act of 2008¹⁵⁵, brought together a raft of measures aimed at easing the housing crisis. In particular, the HOPE for Homeowners program guaranteed up to \$300bn in subprime mortgages if lenders agreed to write down principal loan balances to 90% of their current value. In return the government would receive half of subsequent house price appreciation. Megan Burns of the Federal Housing Association (FHA), a body established in the summer of 2008 to administer the Hope for Homeowners program, found persistently low uptake for the scheme: as of February 2009, the "FHA has insured no loans under the program; FHA-approved lenders have taken 451 applications and 25 loans have closed."¹⁵⁶ Further, the Act offered a 10% refundable tax credit for first-time house buyers. The legislation also injected capital into Fannie and Freddie and allowed the Treasury to purchase their debt obligations.

3. US Treasury

Prior to September 2008 the Department of the Treasury played a relatively limited role in directly responding to the growing financial crisis, principally offering support to various

¹⁵¹ John B. Taylor, "[The Financial Crisis and the Policy Responses: An Empirical Analysis of What Went Wrong](#)", November 2008, pp10,18

¹⁵² [Economic Stimulus Act of 2008](#) (Public Law 110-185, STAT. 613,) 13 February 2008

¹⁵³ Christian Broda and Jonathan A. Parker, "[The Impact of the 2008 tax Rebates on Consumer Spending: A first look at the evidence](#)", Vox EU August 2008

¹⁵⁴ John B. Taylor, "[The Financial Crisis and the Policy Responses: An Empirical Analysis of What Went Wrong](#)", November 2008, p1p12-13

¹⁵⁵ [Housing and Economic Recovery Act of 2008](#) (Public Law 110-289 STAT. 2654), 30 July 2008

¹⁵⁶ [Testimony of Director Megan Burns](#), House Financial Committee, Hearing on Promoting Bank Liquidity and Lending Through Deposit Insurance, Hope for Homeowners, and other Enhancements, 3 February 2009

agencies. On 10 October 2007, the Treasury formed the HOPE NOW alliance of mortgage advisors, lenders and investors to inform and support homeowners. By August 2008, HOPE NOW claimed to have prevented 2.3m foreclosures.¹⁵⁷ In March 2008 the Treasury became more concerned and was widely believed to have strongly pushed for the rescue of Bear Stearns,¹⁵⁸ before presenting plans to expand the Fed's regulatory jurisdiction and authority to support financial institutions. Meanwhile, the Treasury pressed financial institutions to raise their capital ratios to cater for losses made on the mortgage and CDO markets. On 13 July 2008 this even extended to increasing the lines of credit available from the Treasury to Fannie and Freddie, in addition to allowing for the Treasury to purchase equity in either company if necessary.

4. Other regulatory agencies

Although a number of regulatory agencies oversaw the financial industry, the initiative largely resided with the Fed to orchestrate a response. However, on 11 July 2008 the Federal Deposit Insurance Corporation (FDIC), alongside the Office of Thrift Supervision, supervised the transfer of savings and loans and mortgage lending bank, IndyMac, into federal conservatorship (a form of administration). A run on the bank had begun after New York's Democrat Senator, Charles Schumer, had publicly released a letter questioning the bank's ability to survive the subprime crisis. Four days later the SEC, an autonomous government agency responsible for regulating the securities and some other financial markets, temporarily banned the naked short selling of shares in Fannie, Freddie and 17 investment banks. The 30-day ban on naked short selling, a bet that a stock will decrease in value often used to manipulate share prices,¹⁵⁹ stabilised their stock prices and prevented stock manipulation – the reason stated by the SEC for the ban.¹⁶⁰

5. Summary

As the prospect of an economic and financial downturn became increasingly likely, the federal response was generally one of ensuring liquidity in the financial markets, stimulating demand in the economy at large and protecting mortgage-owners from foreclosure. In some cases, financial and mortgage-orientated firms required urgent assistance. However, none of these actions effectively addressed the credit tightening and the perceived increased risk attached to a range of financial products, that was reflected in growing credit and risk interest rate spreads.¹⁶¹

¹⁵⁷ [August 2008 Data Release](#), HOPE NOW, October 2008

¹⁵⁸ For example, [JP Morgan Pays \\$2 a Share for Bear Stearns](#), New York Times, 17 March 2008

¹⁵⁹ Unlike normal short selling, naked short selling does not require that a speculator first agree to borrow shares in the company. Rather the trade remains open until a lender is found and fails if such cover is not found; this serves to drive down prices by offering a large number of shares for sale.

¹⁶⁰ [SEC's ban on short-selling Fannie, Freddie ends](#), USA Today, 13 August 2008

¹⁶¹ Please see Appendix 1 for a definition.

B. Responses after September 2008

1. Troubled Asset Recovery Program and the Economic Stabilization Act of 2008

a. *Construction of the legislation*

Amidst huge falls in stock market indices, and a rush to invest in safer bets such as gold and oil, the US Treasury consulted with Congressional leaders regarding a bailout plan. On 20 September, Secretary Paulson and the then President, George W. Bush, announced a proposal for the federal government to invest up to \$700bn in the purchase of illiquid assets including MBSs that were referred to as 'troubled' or 'toxic'. In a presidential address, George Bush emphasized the severity of the situation and the importance of passing the proposal:

I will tell our citizens and continue to remind them that the risk of doing nothing far outweighs the risk of the package, and that, over time, we're going to get a lot of the money back.¹⁶²

Chairman of the Federal Reserve, Ben Bernanke, reiterated the broader dangers of not acting:

I believe if the credit markets are not functioning, that jobs will be lost, the unemployment rate will rise, more houses will be foreclosed upon, GDP will contract, that the economy will just not be able to recover in a normal, healthy way, no matter what other policies are taken. I therefore think this is a pre-condition for a good, healthy recovery by our economy. These institutions provide credit for homeowners. They provide credit for businesses. They create jobs.¹⁶³

Bernanke also explained the unwillingness of private investors to help restore the banking system as resulting from

...the complexity of these securities and the difficulty of valuation, that nobody knows what the banks are worth, and therefore it's very difficult for private capital to come in to create more balance sheet capacity so the banks can make loans.¹⁶⁴

The scheme, which specifically sought to reduce losses at financial institutions and unfreeze the credit markets, was initially greeted with optimism and the Dow index rose by 369 points on rumours of the package on 19 September. The Treasury's explanation fact sheet released the following day stated:

¹⁶² [Administration is Seeking \\$700bn for Wall Street](#), New York Times, 20 September 2008

¹⁶³ Chairman Ben Bernanke, US Senate Committee on Banking, Housing and Urban Affairs, Hearing on US Credit Markets: Recent Actions Regarding Government Sponsored Entities, Investment Banks and Other Financial Institutions, 23 September 2008

¹⁶⁴ Ibid.

The purchases are intended to be residential and commercial mortgage-related assets, which may include mortgage-backed securities and whole loans. The Secretary will have the discretion, in consultation with the Chairman of the Federal Reserve, to purchase other assets, as deemed necessary to effectively stabilize financial markets. Removing troubled assets will begin to restore the strength of our financial system so it can again finance economic growth. The timing and scale of any purchases will be at the discretion of Treasury and its agents, subject to this total cap. The price of assets purchases will be established through market mechanisms where possible, such as reverse auctions.¹⁶⁵

Eligibility for the program required an institution be federally-regulated, and was broadened to include foreign institutions on 21 September. Once purchased, the Treasury would employ asset managers to look after the assets which could be held until maturity. It was hoped that the eventual sale of the troubled assets purchased would recoup most – or perhaps more – of what was initially invested by the Treasury.

A criticism of the plan was that it lacked clarity regarding which assets would be bought, and the means by which their price would be determined. Democrat Chairman of the Senate Banking Committee, Senator Chris Dodd, described the proposal as “stunning and unprecedented in its scope and lack of detail.”¹⁶⁶ A Forbes report also challenged the analysis underpinning the plan:

In fact, some of the most basic details, including the \$700 billion figure Treasury would use to buy up bad debt, are fuzzy.

“It’s not based on any particular data point,” a Treasury spokeswoman told Forbes.com Tuesday. “We just wanted to choose a really large number.”¹⁶⁷

The plan’s main proponents, Paulson and Bernanke, outlined the logic underpinning the plan at hearings in Congress the following week. They attended the Senate Banking, Housing and Urban Affairs Committee on 23 September, and the House Committee on Financial Services the following day. Paulson stated:

We have proposed a program to remove troubled assets from the system. We would do this through market mechanisms available to thousands of financial institutions throughout America -- big banks, small banks, savings and loans, credit unions -- to help set values of complex, illiquid mortgage and mortgage-related securities, to unclog our credit and capital markets and make it easier for private investors to purchase these securities and for the financial institutions to raise more capital after the market learns more about the underlying value of these hard-to-value, complicated mortgage-related securities on their balance sheets. This troubled asset relief program has to be properly designed for

¹⁶⁵ [Fact Sheet: Proposed Treasury Authority to Purchase Troubled Assets](#), US Treasury, 20 September 2008

¹⁶⁶ Chairman Senator Christopher Dodd, US Senate Committee on Banking, Housing and Urban Affairs, Hearing on US Credit Markets: Recent Actions Regarding Government Sponsored Entities, Investment Banks and Other Financial Institutions, 23 September 2008

¹⁶⁷ [Bad News for the Bailout](#), Forbes, 23 September 2008

immediate implementation and be sufficiently large to have maximum impact and restore market confidence.¹⁶⁸

The proposed mechanism for making asset purchases was a reverse auction – an auction where multiple sellers compete to sell to a single buyer, in this case the US Treasury. This would apply across a number of different asset classes, and would seek to involve as many sellers as possible to reduce the risk of uncompetitive practices. Both Paulson and Bernanke recommended that the Treasury not discourage participation by demanding equity stakes in the sellers. In addition, reverse auctions will have the benefit of reducing market uncertainty in the valuation of troubled assets.¹⁶⁹ The likely result of purchasing the troubled assets would be a rise in asset prices above the prevailing level described by Bernanke as “fire-sale” prices.¹⁷⁰ The net impact of the plan would benefit the economy in a number of respects:

- the rise in asset prices would reduce the pressure on capital ratios;
- market liquidity would increase through the removal of illiquid assets;
- increased information and market certainty on the value of assets would facilitate and stimulate private recapitalisation from concerned investors; and
- credit would become increasingly available.¹⁷¹

Although Paulson’s proposal met with general support from a Congress who agreed upon the need for swift action, it faced a number of criticisms. The popular view was that the Bill concentrated too much on helping ‘Wall Street’ and did nothing to help, for example, people facing mortgage foreclosure. At one point, calls from the public registering opposition to the Bill crashed the House phone system. A number of Senators and Representatives proposed that bankruptcy judges help to refinance mortgages to prevent foreclosure.

Second, the operation of the plan was characterised by Republican Senator Jim Bunning as “financial socialism”.¹⁷² Democrat Senator Jack Reed argued that participating institutions should have to pay a premium, noting that “I think the custom on Wall Street is when you assume the risk, it’s because you get paid to do that.”¹⁷³ If, as proposed, assets were purchased at a value determined by reverse auction, Democrats Senator Evan Bayh and Representative Bill Sherman questioned why equity stakes should not be

¹⁶⁸ Secretary Henry Paulson, US Senate Committee on Banking, Housing and Urban Affairs, Hearing on US Credit Markets: Recent Actions Regarding Government Sponsored Entities, Investment Banks and Other Financial Institutions, 23 September 2008

¹⁶⁹ Ibid., Chairman Ben Bernanke

¹⁷⁰ Ibid., Chairman Ben Bernanke

¹⁷¹ Ibid., Chairman Ben Bernanke and Secretary Henry Paulson; Chairman Ben Bernanke and Secretary Henry Paulson, Hearing on the Financial Markets, House Committee on Financial Services, 24 September 2008

¹⁷² Senator Jim Bunning, US Senate Committee on Banking, Housing and Urban Affairs, Hearing on US Credit Markets: Recent Actions Regarding Government Sponsored Entities, Investment Banks and Other Financial Institutions, 23 September 2008

¹⁷³ Ibid., Senator Jack Reed

purchased to allow the taxpayer to share in potential gains.¹⁷⁴ Asset valuation remained a sticking point, neatly summarised by Republican Senator Bob Bennett:

...if you end up paying too little to these institutions, which mark-to-market accounting might drive you to, you're not giving them the support that they need. If you end up paying too much, then there's no upside potential for the taxpayer when the time comes for you to liquidate these.¹⁷⁵

Both Bayh and Bennett questioned why willing private capital could not replace Treasury monies in the reverse auctions. Another Republican, Senator Crapo, presciently suggested that capital injections may be a more effective use of the funds.¹⁷⁶ The Ranking Republican on the Committee, Senator Richard Shelby, questioned the efficacy of previous federal schemes to mitigate the crisis, and suggested that “the absence of a clear and comprehensive plan for addressing this crisis has injected additional uncertainty into our markets”.¹⁷⁷

Third, the lack of proposed oversight proved a frequent complaint in Congress. Although Paulson stated that oversight provisions had been left to Congress to add, the issue caused controversy with Dodd suggesting the plan “would allow the secretary and his successors to act with utter and absolute impunity without review by any agency or a court of law.”¹⁷⁸ Senator Schumer, a New York Democrat, suggested that the \$700bn be disbursed in tranches requiring Congressional approval. Numerous Senators and Representatives raised the issue of executive compensation and parachute payments, demanding that participating institutions be required to restrict awards.

There was also criticism from financial experts and economists, most notably Luigi Zingales’s widely-read article which criticised Paulson’s bailout plan, and instead argued that restructuring, in exchange for equity (akin to filing for Chapter 11 bankruptcy), was more applicable.

If banks and financial institutions find it difficult to recapitalize (i.e., issue new equity) it is because the private sector is uncertain about the value of the assets they have in their portfolio and does not want to overpay. Would the government be better in valuing those assets? No. In a negotiation between a government official and banker with a bonus at risk, who will have more clout in determining the price? The Paulson RTC will buy toxic assets at inflated prices thereby creating a charitable institution that provides welfare to the rich—at the taxpayers’ expense. If this subsidy is large enough, it will succeed in stopping the crisis. But again, at what price? The answer: Billions of dollars in taxpayer money and, even worse, the violation of the fundamental capitalist principle that she who reaps the gains also bears the losses. Remember that in the Savings and Loan crisis, the government *had* to bail out those institutions because the deposits were federally

¹⁷⁴ Ibid., Senator Evan Bayh; Representative Bill Sherman, Hearing on the Financial Markets, House Committee on Financial Services, 24 September 2008

¹⁷⁵ Senator Bob Bennett, US Senate Committee on Banking, Housing and Urban Affairs, Hearing on US Credit Markets: Recent Actions Regarding Government Sponsored Entities, Investment Banks and Other Financial Institutions, 23 September 2008

¹⁷⁶ Ibid., Senator Mike Crapo

¹⁷⁷ Ibid., Ranking Member Senator Richard Shelby

¹⁷⁸ Ibid., Chairman Senator Christopher Dodd

insured. But in this case the government *does not have* to bail out the debtholders of Bear Sterns, AIG, or any of the other financial institutions that will benefit from the Paulson RTC.

Since we do not have time for a Chapter 11 and we do not want to bail out all the creditors, the lesser evil is to do what judges do in contentious and overextended bankruptcy processes: to cram down a restructuring plan on creditors, where part of the debt is forgiven in exchange for some equity or some warrants.¹⁷⁹

The economist Paul Krugman argued that the problem did not stem from a lack of liquidity, but a lack of capital at banks. Accordingly, banks were seeking to sell off assets in order to recapitalise, which in turn caused a vicious cycle of depreciation in the value of MBSs and other assets. Krugman concluded that the best solution was to directly inject capital into financial institutions.¹⁸⁰ An open letter to Congress from more than 100 leading economists expressed concern about the fairness, ambiguity and long-term effects of the proposal.¹⁸¹

On the evening of 23 September, a Congressional counter-proposal emerged. The proposal led by Dodd and Frank incorporated many of the criticisms voiced during the hearings. Its central elements included oversight, limits on executive compensation and – most controversially – judicial powers to refinance mortgage contracts.¹⁸² Bipartisan consensus was difficult to reach and it prompted Senator John McCain to suspend his presidential campaign to help reach an agreement. Republicans, in particular Senator Shelby, opposed plans to buy mortgages and instead proposed a mortgage insurance scheme where participants would pay a fee to participate. House Republicans sought private capital injections, a ban on Fannie and Freddie issuing mortgage securities and demanded that firms explicitly value their toxic assets.¹⁸³

After a weekend of Congressional negotiations, verbal agreement was reached on the Troubled Asset Relief Program (TARP) on Sunday 28 September.¹⁸⁴ However, the Bill was voted down by 228 votes to 205 in the House the next day. Despite their plenary majority, the Democrats failed to capture the votes of many of their own members who feared impending electoral reprisals; two-thirds of Republicans voted against the Bill. The Dow responded immediately and registered a loss of 777 points, equivalent to nearly \$1tr – its largest point loss in history.¹⁸⁵

The Bill that reached the Senate on 1 October had been re-written and became the Emergency Economic Stabilization Act of 2008 (EESA). It included a range of concessions aimed at securing political support in the House. These included another year of relief from the alternate minimum tax on individuals¹⁸⁶ and \$100bn in tax breaks

¹⁷⁹ Luigi Zingales, [Why Paulson is wrong](#), Financial Times Economist's Forum, 24 September 2008

¹⁸⁰ Paul Krugman, [Cash for Trash](#), New York Times, 21 September 2008

¹⁸¹ [Letter to Congress](#), 24 September 2008

¹⁸² [Bailout plan under fire](#), CNN, 23 September 2008

¹⁸³ [The crisis: a timeline](#), CNN

¹⁸⁴ Ibid.

¹⁸⁵ [Dow Jones Industrial Average All-Time Largest One Day Gains and Losses](#), Wall Street Journal

¹⁸⁶ A broader tax that can be applied instead of standard income tax liabilities as a means of ensuring that high-income households pay relatively high taxes. The tax has often not been applied by Congress.

for small businesses and alternative energy.¹⁸⁷ The Bill was approved by the Senate, by a vote of 74-25, and by the House (263-171) two days later. In the afternoon of 3 Friday October President Bush signed the Bill into law.

The final version of the TARP element of the EESA authorised the Treasury Secretary to establish vehicles to purchase, hold, and sell troubled assets and acquire equity stakes in any financial institution using market mechanisms.¹⁸⁸ Of the possible \$700bn available, only the first \$250bn may be freely deployed; disbursement of an additional \$100bn requires Presidential certification, while the final £350bn may be vetoed by a joint resolution from Congress.¹⁸⁹ The legislation also requires the Treasury Secretary to coordinate efforts with foreign financial authorities and central banks. EESA prevents participants from profiting from the sale of troubled assets to the Treasury, and establishes a number of oversight provisions including two oversight boards and an Inspector General to report to Congress. The EESA includes rules on executive compensation for participating institutions, stating that:

- incentives should not encourage excessive risk-taking;
- compensation may be clawed back in case of statements proving materially inaccurate; and
- that no golden 'parachute' payments are permitted.¹⁹⁰

EESA made a number of other relevant financial provisions. Federal property managers including Fannie and Freddie were mandated to offer mortgage assistance and encourage servicers to use HOPE for Homeowners.¹⁹¹ Section 128 allowed the Fed to accelerate its payment of interest on bank deposits, as a means of enhancing immediate capital. The legislation also mandated the SEC to compile a report on the continued use of mark-to-market accounting. Finally, the FDIC insurance limit on deposit and share holdings was increased from \$100,000 to \$250,000.¹⁹²

b. Implementation under President Bush

TARP funds, however, were not employed in the manner that had been envisaged in September. Rather than purchase troubled assets, US Treasury followed the UK's example and pursued a strategy of capital injections.

On 14 October 2008, US Treasury announced that \$250bn of TARP funds would be made available under a Capital Purchase Program (CPP) for purchasing preferred shares in banking institutions. The non-voting senior preferred shares would count as Tier 1 capital and would not require any board representation (unlike in Belgium and the Netherlands).¹⁹³ Offering far more generous terms to banks than in the UK, senior

¹⁸⁷ [Pressure Builds on House After Senate Backs Bailout](#), New York Times, 2 October 2008

¹⁸⁸ [Emergency Economic Stabilization Act 2008, Title 1, Section 101](#)

¹⁸⁹ [Emergency Economic Stabilization Act 2008, Title 1, Section 115](#)

¹⁹⁰ [Emergency Economic Stabilization Act 2008, Title 1, Section 111](#)

¹⁹¹ [Emergency Economic Stabilization Act 2008, Title 1, Sections 109 and 110](#)

¹⁹² [Emergency Economic Stabilization Act 2008, Title 1, Section 136](#)

¹⁹³ See Appendix 1 for definitions of preferred stock and Tier 1 capital.

preferred shares will pay a cumulative dividend rate of only 5% per annum for the first five years before yielding annual interest of 9%.¹⁹⁴ Preferred stock may be redeemed with the proceeds of a private rights issue raising Tier 1 capital after less than three years, while the Treasury is free to transfer its shares to a third party. Treasury will also receive entitlements (or warrants¹⁹⁵) to purchase common stock¹⁹⁶ worth up to 15% of market value at the point of issuance. Participating institutions may not increase their share dividend or repurchase shares for the first three years. The rules for participation – in addition to the executive compensation and corporate governance requirements contained in the EESA – stated that investment must be equivalent to at least 1% of risk-weighted assets, but no more than the lesser of \$25bn or 3% of risk-weighted assets.¹⁹⁷

Uptake under the CPP has been very high. Immediately, it was announced that nine large banks – including Citigroup, JPMorgan Chase and Wells Fargo, which all received the maximum \$25bn – would collectively receive \$125bn.

On 12 November 2008, Paulson formally announced the decision not to purchase toxic assets. Paulson explained that:

...purchasing troubled assets – our initial focus – would take time to implement and would not be sufficient given the severity of the problem. In consultation with the Federal Reserve, I determined that the most timely, effective step to improve credit market conditions was to strengthen bank balance sheets quickly through direct purchases of equity in banks.

...During times like these with a slowing economy and some deterioration in credit conditions, even the healthiest banks tend to become more risk-averse and restrain lending, and regulators' actions have reinforced this lending restraint in the past. With a stronger capital base, our banks will be more confident and better positioned to play their necessary role to support economic activity. Today banking regulators issued a statement emphasizing that the extraordinary government actions taken by the Fed, Treasury and FDIC to stabilize and strengthen the banking system are not merely one-sided; all banks – not just those participating in the Capital Purchase Program – have benefited, so they all also have responsibilities in the areas of lending, dividend and compensation policies, and foreclosure mitigation.¹⁹⁸

Beginning in late November, the Treasury made weekly purchases of equity stakes in hundreds of public and private financial institutions. An updated list of the beneficiaries under the CPP is available on the Treasury website.¹⁹⁹

¹⁹⁴ In comparison, the UK government initially demanded 12% on non-cumulative preference shares for the first five years, and 7% plus the LIBOR subsequently. Please see “preferred shares” in Appendix 1 for details of these concepts.

¹⁹⁵ See Appendix 1 for definition.

¹⁹⁶ Please see Appendix 1 for further details.

¹⁹⁷ [Treasury Announces TARP Capital Purchase Program Description](#), US Treasury, 14 October 2008

¹⁹⁸ [Remarks by Secretary Henry Paulson, on Financial Rescue Package and Economic Update](#), US Treasury, 12 November 2008

¹⁹⁹ [Troubled Asset Relief Program Transaction Report](#), US Treasury

Treasury authority under TARP was interpreted broadly to encompass a number of schemes. In particular the Treasury launched the Targeted Investment Program (TIP) and Asset Guarantee Program (AGP). The TIP provided an additional \$20bn in capital investment to both Citigroup in November 2008 and Bank of America in January 2009, albeit on less generous terms than the CPP. In both cases, the banks have provided the Treasury with \$20bn in preferred shares paying a cumulative annual dividend of 8% accompanied by warrants for the purchase of common stock.²⁰⁰

The AGP was finalised on 16 January 2009 and included Bank of America and Citigroup as participants. Akin to the more substantial Asset Protection Scheme adopted in the UK three days later,²⁰¹ the AGP saw the Treasury and FDIC agree to insure the banks against potential losses over the coming ten years on a pool of assets backed by mortgages, commercial real estate, corporate debt and associated derivatives. The Treasury and FDIC agreed to insure \$306bn of Citigroup assets in return for \$7bn in preferred shares yielding annual 8% dividends. Under the deal Citigroup would be fully liable for the first \$29bn of losses, after which the Treasury and FDIC would be liable for 90% of losses. In a similar deal with Bank of America, the Treasury and FDIC agreed to insure \$118bn of assets in exchange for \$4bn in preferred stock with an 8% dividend; Bank of America is fully liable for the first \$10bn of losses, whereafter the Treasury and FDIC become liable for 90% of losses.²⁰²

In addition, the Treasury invested \$40bn in AIG, under the Systematically Significant Failing Institutions scheme, as well as significant loans for automobile manufacturers General Motors and Chrysler.²⁰³

At the end of President Bush's tenure in office, approximately \$350bn of TARP funds had been invested.

c. Implementation under President Obama

In addition to continuing investments in preferred stock under the TARP, President Barack Obama's Treasury Secretary Tim Geithner agreed, in late February 2009, to participate in a Citigroup scheme set to convert preferred stock in Citigroup into common stock, which carries greater weight under capital adequacy requirements. The Treasury specified that its commitment to convert up to \$25bn in preferred stock is contingent upon matching commitment from private investors.²⁰⁴

In response to revelations of significant compensation deals for Wall Street executives, President Obama announced, on 4 February 2009, that executive compensation would be capped at \$500,000.²⁰⁵ The restriction would apply only to those firms receiving

²⁰⁰ [Citigroup Term Sheet](#), US Treasury, 23 November 2008; [Bank of America Preferred Investment Term Sheet](#), US Treasury, 16 January 2009

²⁰¹ [Statement on financial intervention to support lending in the economy](#), HM Treasury, 19 January 2009; [Statement on the Government's Asset Protection Scheme](#), HM Treasury, 26 February 2009

²⁰² [Citigroup Term Sheet](#), US Treasury, 23 November 2008; [Bank of America Term Sheet](#), US Treasury, 16 January 2009

²⁰³ [Troubled Asset Relief Program Transaction Report](#), US Treasury

²⁰⁴ [Treasury Announces Participation in Citigroup's Exchange Offering](#), US treasury, 27 February 2009

²⁰⁵ [Treasury Announces New Restrictions On Executive Compensation](#), White House, 4 February 2009

“exceptional assistance” and TARP recipients that fail to meet public disclosure guidelines. It would not apply retroactively. Furthermore, the cap would not include share incentives, although these may only be vested once the government has been fully repaid. Obama’s rules increase the scope of the ban on parachute payments.

The executive compensation requirements attached to participation under Section 111 of the EESA were strengthened in February 2009 as an annex to the American Recovery and Reinvestment Act of 2009.²⁰⁶ The rules initiated by Senator Dodd apply to all TARP recipients, prospectively and retroactively. Incentive payments, which are restricted to one third of annual compensation, will be paid only in long-term share awards and cannot be fully vested until all federal assistance has been concluded. The definition of a parachute payment was also broadened. The restrictions on performance-related pay, parachute payments and possible clawback are updated to apply to senior executives and the next 20 best remunerated staff for the largest recipients.²⁰⁷ The legislation also requires that an independent compensation committee be set up at participating firms.

The first progress report released by the Treasury showed some grounds for optimism. Its central finding was that:

Despite the negative effects of the economic downturn and unprecedented financial markets crisis, the first survey of the top 20 recipients of government investment through the Capital Purchase Program (CPP) found that banks continued to originate, refinance and renew loans from the beginning of the program in October through December 2008.²⁰⁸

2. The Federal Reserve

The Fed’s decision in conjunction with the Treasury not to bail out Lehman Brothers had important reverberations. It demonstrated a marked shift from the attitude towards Bear Stearns and was interpreted as meaning that no bank was too big to be allowed to fail. It has been widely argued that this caused a collapse in confidence in the banks, which in turn led to spikes in interbank lending rates based upon fears of default. George Soros argues that the decision to allow Lehman to “declare bankruptcy in a disorderly way really caused a meltdown, a genuine meltdown, of the financial system, a cardiac arrest.”²⁰⁹

The Fed persisted in reducing interest rates as a means of stimulating lending (see Chart 3). Accelerating the downward trend in rates since the summer of 2007, the funds rate and primary rate were twice reduced by 50bp in October 2008 to reach 1% and 1.25% respectively. In an unprecedented step, the Fed reduced the funds target range to 0-0.25% on 16 December; the primary credit rate was reduced by 75bp to 0.5%. However, interest rates – which have failed to significantly increase lending between banks or to the economy at large – look to be an increasingly impotent policy instrument in the

²⁰⁶ [American Recovery and Reinvestment Act of 2009, Section 7001](#)

²⁰⁷ This applies only to banks receiving more than \$500m under the TARP. Where banks receive smaller quantities, fewer employees are included under these restrictions.

²⁰⁸ [Treasury Releases First Monthly Bank Lending Survey](#), US Treasury, 17 February 2009

²⁰⁹ George Soros, House Committee on Oversight and Government Reform, [Hearing on Hedge Funds and the Financial Markets](#), 13 November 2008

context of the financial crisis. In March 2009, the Fed publicly stated it “anticipates that economic conditions are likely to warrant exceptionally low levels of the federal funds rate for an extended period.”²¹⁰

The Fed’s capacity to act was empowered by the Treasury who, through its Supplementary Financing Program on 17 September 2008, made additional funds available for the Fed’s balance sheet.²¹¹ The TARP legislation also provided additional authority for the Fed to act in certain situations.

Although interest rates are the standard tool of monetary policy, the Fed also possesses a number of other instruments able to address liquidity and regulatory concerns. Continuing from its moves to enhance short-term liquidity for a range of financial institutions prior to September 2008, the Fed expanded a number of its pre-existing programs, and essentially permitted participants to receive finance at government rates. On 14 September, the Fed broadened the list of eligible collateral under the PDCF and TSLF and increased the frequency and size of loans available at Schedule 2 TSLF auctions.²¹² Later in September, the funds available at TAF auctions were increased from \$25bn to \$75bn, and two additional forward auctions were scheduled;²¹³ the size of the TAF was extended again on 6 October.²¹⁴ Inter-central bank currency swaps continue to be used extensively “to address dollar funding pressures worldwide”.²¹⁵

The Fed also introduced a number of new programs to enhance liquidity. On 25 November 2008, the Fed announced the \$200bn Term Asset-Backed Securities Loan Facility (TALF). The TALF provided loans determined by auction in exchange for AAA-rated ABSs, and sought to mitigate the rise in interest rate spreads for increasingly illiquid assets.²¹⁶ TALF has been supported by the Treasury, who have used TARP funds to underwrite the program. TALF expanded to include broader assets with longer maturities in December,²¹⁷ and increased in size to up to \$1tr on 10 February when it also relaxed asset eligibility guidelines to include MBSs. In March 2009, the Fed began extending TALF credit to households and small business, accepting a wide variety of financial assets including ABSs as collateral.²¹⁸

In response to the collapse of the commercial paper market – debt issued by firms to manage their finances – when money market funds experienced problems, the Fed first announced the Asset-Backed Commercial Paper Money Market Mutual Fund Liquidity Facility on 19 September. This was designed to provide loans for primary dealers to purchase high-grade commercial paper from illiquid money market funds. Many money market funds had suffered from the collapse of Lehman and experienced runs on their

²¹⁰ [Monetary Policy Press Release](#), Federal Reserve, 18 March 2009

²¹¹ [Treasury Announces Supplementary Financing Program](#), US Treasury, 17 September 2008

²¹² [Monetary Policy Press Release](#), Federal Reserve, 14 September 2008

²¹³ [Monetary Policy Press Release](#), Federal Reserve, 29 September 2008

²¹⁴ [Monetary Policy Press Release](#), Federal Reserve, 6 October 2008

²¹⁵ Ben Bernanke, Hearing on the Financial Markets, House Committee on Financial Services, 24 September 2008

²¹⁶ [Monetary Policy Press Release](#), Federal Reserve, 25 November 2008

²¹⁷ [Monetary Policy Press Release](#), Federal Reserve, 19 December 2008

²¹⁸ [Monetary Policy Press Release](#), Federal Reserve, 19 March 2009

holdings, which in turn caused them to cease investing in anything other than Treasury bonds (which drove their yield down to zero).²¹⁹

Second, the Commercial Paper Funding Facility (CPFF) was introduced on 7 October – seeking to address the reluctance of money market funds and others to buy commercial paper, especially with longer maturity periods, the Fed established its own special entity to buy the essential short-term debt notes from eligible firms.²²⁰ The CPFF was unlimited in size, although up to \$1.3tr in commercial paper could qualify.

Third, the Fed created the Money Market Investor Funding Facility (MMIFF). The MMIFF created special purpose vehicles for purchasing highly-rated assets such as commercial paper and debt notes from money market funds.²²¹ In January 2009 the MMIFF extended its coverage to include assets with lower yields from more institutions.²²²

In light of "continuing substantial strains in many financial markets", liquidity programs were extended late into 2009 in February 2009.²²³

Following the examples of the Bank of England and the Bank of Japan, the Fed embarked on a policy of quantitative easing on 18 March 2009. Specifically, the Fed explained that:

...to help improve conditions in private credit markets, the Committee decided to purchase up to \$300 billion of longer-term Treasury securities over the next six months.²²⁴

In addition to purchasing Treasury securities, the Fed – like the Bank of Japan²²⁵ – has dramatically expanded its balance sheet by purchasing other assets in a move described by Chairman Bernanke as "credit easing".²²⁶ These purchases have been funded by increasing commercial bank reserves, swaps with other central banks and different ways of "printing" money.²²⁷ In particular, the Fed significantly expanded its balance sheet in 2009 with the purchase of up to \$1.25tr in MBSs and \$200bn in agency loans;²²⁸ as of 11 March 2009, the Fed already held \$1.22tr in securities.²²⁹ Some analysts have suggested that although the Fed's expansion of its balance sheet via its various liquidity schemes was not the same approach adopted by Japan in the 1990s, it still represents a form of quantitative easing.²³⁰

²¹⁹ [Monetary Policy Press Release](#), Federal Reserve, 19 September 2008; [Bailout of Money Funds Seems to Stanch Outflow](#), Wall Street Journal, 20 September 2008

²²⁰ [Monetary Policy Press Release](#), Federal Reserve, 7 October 2008

²²¹ [Monetary Policy Press Release](#), Federal Reserve, 21 October 2008

²²² [Monetary Policy Press Release](#), Federal Reserve, 7 January 2009

²²³ [Monetary Policy Press Release](#), Federal Reserve, 3 February 2009

²²⁴ [Monetary Policy Press Release](#), Federal Reserve, 18 March 2009

²²⁵ The Bank of Japan has increased its balance sheet and purchased commercial paper and corporate bonds in addition to government debt.

²²⁶ Ben Bernanke, "[The Crisis and the Policy Response](#)", Speech at the Stamp Lecture, London School of Economics, London, 13 January 2009

²²⁷ "Money's muddled message", The Economist, 21 March 2009

²²⁸ [Monetary Policy Press Release](#), Federal Reserve, 18 March 2009

²²⁹ [Fed Balance Sheet](#), Federal Reserve, Table 8

²³⁰ [The Fed Speaks: More on Today's Decision](#), Wall Street Journal, 16 December 2008

By virtue of Section 128 of the EESA which amended the Financial Services Regulatory Relief Act of 2006, interest payments on deposits held at the Fed were accelerated to be paid on 1 October 2008.²³¹ Subsequently, in an effort to increase the size of banks' balance sheets and further support the capacity for banks to lend, the Fed began to pay interest on reserve requirements and excess reserves.²³² Unsurprisingly, the Fed's offer (tantamount to free cash reserves) proved highly popular with banks, which rapidly accumulated additional excess reserves. Deposits registered at the Fed immediately rose from \$118bn to \$880bn by early January 2009.²³³ The ploy designed to stimulate lending backfired as banks preferred to make deposits yielding certain interest. Consequently, the Fed slowly reduced the incentive to make deposits and reiterated its desire to reduce the size of its balance sheet.²³⁴ By 11 March 2008, deposits had fallen to \$629bn.

Finally, in its role as a regulator, the Fed approved a number of applications for financial institutions to become bank holding companies. The desirable capital ratios and easier access to liquidity that comes with the change in status attracted investment banks Goldman Sachs and Morgan Stanley, American Express, CIT Group and General Motors subsidiary GMAC to successfully make the switch.

3. US Treasury

In addition to its leading role in administering the TARP, the US Treasury has instituted a number of additional schemes designed to restore financial stability. In an effort to secure investment in money market mutual firms, the Treasury unveiled the Temporary Guarantee Program on 19 September 2009 to complement the Fed's efforts to increase their liquidity. With concerns that money market firms would 'break the buck' – something the Treasury claims "exacerbated global financial market turmoil and caused severe liquidity strains in world markets" – the Treasury made available \$50bn to guarantee investments in money market funds in exchange for a fee.²³⁵ The scheme, which operated with significant input from the SEC, has successfully stabilised the run on the funds and attracted many participants, and has been expanded and extended.²³⁶ The move has been highly successful, to the extent that the Municipal Securities Rulemaking Board, which works under the auspices of the SEC, has sought a further extension from Secretary Tim Geithner beyond 30 April 2009.²³⁷

On 10 February Secretary Geithner unveiled the outline of his Financial Stability Plan. The plan's central tenets are designed to increase credit and facilitate the return the banking sector to normal practice, although it does not commit the Administration to seek financing beyond the TARP:

²³¹ [Emergency Economic Stabilization Act 2008, Title 1, Section 128](#); [Statement by the President's Working Group on Financial Markets](#), US Treasury, 6 October 2008

²³² [Monetary Policy Press Release](#), Federal Reserve, 6 October 2008

²³³ [Historical Data – Overview and Memorandum Issues](#), Federal Reserve

²³⁴ [Bernanke admits Fed struggling to revive private lending](#), Financial Week, 13 January 2009

²³⁵ [Treasury Announces Guaranty Program for Money Market Funds](#), US Treasury, 19 September 2008

²³⁶ [Treasury Announces Extension of Temporary Guarantee Program for Money Market Funds](#), US Treasury Press Release, 24 November 2008

²³⁷ [Letter to Tim Geithner](#), Municipal Securities Rulemaking Board, 3 March 2009

- employ a financial stress test for firms worth more than \$100bn;
- provide capital through convertible preferred equity to those that need it, as determined by the stress test;
- the Treasury will provide \$100bn to expand the Fed's TALF (see above);
- a public-private bank to purchase toxic assets aiming to use public financing to create \$500bn in private sector buying capacity; and
- the Fed and Treasury will commit \$50bn to reduce mortgage payments and establish loan modification guidelines, with firms receiving federal aid forced to commit to participate in foreclosure mitigation plans.²³⁸

Geithner's plan, however, was not received particularly well. CNN reports that "observers said the Obama Administration's plan is neither well-funded enough to recapitalise troubled banks, nor detailed enough to assure investors that the government can solve the toxic asset problem plaguing banks."²³⁹

The details of the public-private bank purchase of toxic (or 'legacy') loans and securities – a different and significantly smaller strategy than the UK's Asset Protection Scheme which sees the taxpayer carry greater risk – were firmed up on 23 March 2009.²⁴⁰ Using \$75-100bn of TARP funds, the Treasury will invest in the purchase of legacy assets that remain difficult to sell on the market. Reducing risk to encourage private investment, the Fed will make available low-interest loans for purchasing securities while the FDIC will offer guarantees against losses on loans. The Treasury hopes the bank will initially make \$500bn of purchases, potentially rising to \$1tr; profits will be shared equally by the Treasury and private sector. The stock market responded well, with the Dow registering a gain of 497 points, or 6.8%.²⁴¹

It may be instructive to evaluate the Treasury's decisions within the context of constraints upon policy options. Phillip Swagel, Assistant Secretary for Economic Policy under Secretary Paulson from December 2006 until January 2009, has suggested that a range of legal, political and temporal realities constrained Treasury policy.²⁴² In particular, Swagel argues that plans for loan modification, debt-for-equity swaps and forcing banks to accept Treasury capital were almost impossible.

4. Other regulatory agencies

a. SEC

Short-selling

The SEC – regulator of the securities, stock and options markets – responded to the financial crisis by temporarily restricting short selling. On 17 September 2008, the Fed

²³⁸ [Financial Stability Plan Factsheet](#), US Treasury, 10 February 2009

²³⁹ [Geithner's plan falls flat](#), CNN, 10 February 2009

²⁴⁰ [Treasury Department Releases Details on Public Private Partnership Investment Program](#), US Treasury, 23 March 2009

²⁴¹ [Market Data](#), Bloomberg, 23 March 2009

²⁴² [The Financial Crisis: An Insider's View](#), Brookings Papers on Economic Activity, 30 March 2009

responded to turmoil following the collapse of Lehman and AIG by increasing penalties for the naked short-selling of 19 financial institutions.²⁴³ The second ruling issued on 19 September, in concert with the UK's Financial Services Authority which had employed a similar measure a day earlier, was more comprehensive and prevented all short-selling of 799 financial institutions. Although the ban was initially meant to expire on 2 October, it was extended until 8 October. The ban sought to "to protect the integrity and quality of the securities market and strengthen investor confidence". Chairman Cox later explained to Congress:

...we took temporary emergency action directed at financial stocks for the purpose of stabilizing the market at a time when Congress is considering important legislation that may deal in a broader way with these problems.²⁴⁴

In addition to its short-term moves to contain negative stock price spirals, the SEC has been central in the construction of longer-term regulatory responses. In light of Cox's admission in September 2008 that the "last six months have made it abundantly clear that voluntary regulation does not work",²⁴⁵ the new approach has involved stricter standards.

Credit rating agencies

New regulations for CRAs were adopted on 3 December; the central tenets seeking to avoid the conflicts of interest arising from the 'issuer pays' model include:

- CRAs will not be able to advise investment banks on how to package securities to obtain a certain rating and will not be able to receive gifts worth more than \$25;
- CRAs will also be restricted from providing ratings to companies they have made recommendations to regarding concerning the "corporate or legal structure, assets, liabilities, or activities of the obligor or issuer of the security";
- additional information and statistics concerning initial ratings and subsequent upgrades and downgrades will be required for all assets, and a random sample of 10% of ratings must be publicly disclosed in detail; and
- investors will receive detailed information on the ratings process for complex securities.²⁴⁶

However, the reforms adopted by the SEC have received criticism for not going far enough. For example, CRAs were not required to separate their credit analysts from other employees responsible for revenues, or flag complex securities with an identifier.²⁴⁷ Furthermore, the new rules did not set out provisions for the suspension of a CRA's

²⁴³ [SEC Issues New Rules to Protect Investors Against Naked Short Selling Abuses](#), SEC, 17 September 2008

²⁴⁴ Chairman Christopher Cox, US Senate Committee on Banking, Housing and Urban Affairs, Hearing on US Credit Markets: Recent Actions Regarding Government Sponsored Entities, Investment Banks and Other Financial Institutions, 23 September 2008

²⁴⁵ [Chairman Cox Announces End of Consolidated Supervised Entities Program](#), SEC, 26 September 2008

²⁴⁶ [Open Meeting of the U.S. Securities and Exchange Commission](#), SEC, 3 December 2008

²⁴⁷ [SEC Issues Rules on Conflicts in Credit Ratings](#), New York Times, 3 December 2008

licence or go as far as EU proposals that could hold CRAs liable for their recommendations.²⁴⁸

Accounting

Under Section 133 of the TARP legislation the SEC was required to report on the use of mark-to-market accounting; Section 132 reinstated its authority to suspend mark-to-market accounting if necessary. On 30 December, the SEC concluded that suspending mark-to-market accounting – which would allow firms to assign higher values to balance sheet assets such as MBSs which were purchased at higher prices, and thereby reduce problems of solvency and capital adequacy – was not justified, although it did propose eight improvements to the rules.²⁴⁹

However, on 2 April 2009 the Financial Accounting Standards Board voted unanimously to allow banks more discretion in their valuation of toxic assets by moving away from mark-to-market accounting standards.²⁵⁰ The new regulations will see assets residing in illiquid markets valued at the expected price paid in an “orderly”, as opposed to “firesale” transaction. Furthermore, the new regulations – set to apply from 15 June 2009, with the option of starting on 15 March 2009 – require “disclosures on a quarterly basis, providing qualitative and quantitative information about fair value estimates for all those financial instruments not measured on the balance sheet at fair value.”²⁵¹

Credit default swaps

Chairman Cox made a number of recommendations for future regulation of CDSs.²⁵² In particular, he proposed closing the loophole permitting CDSs to remain unregulated and uniting the SEC and Commodity Futures Trading Commission to regulate CDSs which currently fall between their respective authorities.²⁵³ Although such moves would require legislation, the SEC has increased oversight for clearing houses responsible for the over-the-counter CDSs.²⁵⁴

b. FDIC

The FDIC increased its deposit insurance for member banks, primarily for ordinary people with relatively small savings. Section 136 of the EESA mandated the FDIC to extend insurance to \$250,000 (from \$100,000) until 2010. The rise is substantially larger

²⁴⁸ Ibid.

²⁴⁹ [Congressionally-Mandated Study Says Improve, Do Not Suspend, Fair Value Accounting Standards](#), SEC, 30 December 2008

²⁵⁰ [FASB Issues Final Staff Positions to Improve Guidance and Disclosures on Fair Value Measurements and Impairments](#), FASB News Release, 2 April 2009; [U.S. rulemaker eases mark-to-market's bite](#), Reuters, 2 April 2009

²⁵¹ [FASB Issues Final Staff Positions to Improve Guidance and Disclosures on Fair Value Measurements and Impairments](#), FASB News Release, 2 April 2009

²⁵² Chairman Cox resigned just before the new President took office in January 2009.

²⁵³ Chairman Christopher Cox, US House Committee on Oversight and Government Reform, [Hearing on the role of Federal Regulators and the Financial Crisis](#), 23 October 2008

²⁵⁴ [SEC Chairman Cox Statement on MOU With Federal Reserve, CFTC to Address Credit Default Swaps](#), SEC, 14 November 2008

than the 100% insurance provided on savings of £50,000 in the UK, which had been increased from 90% of £35,000.²⁵⁵

In October, the FDIC established the Temporary Liquidity Guarantee Program (TLGP). TLGP would increase confidence in all manner of firms and ease bank liquidity concerns by guaranteeing senior unsecured debt from FDIC members, in addition to all non-interest-bearing deposits until July 2009.²⁵⁶ FDIC members would pay a small fee, and the fund would not rely upon taxpayer monies. It is estimated that with \$400bn in Treasury bonds being injected into the commercial paper market, the FDIC will cover \$1.4tr. Many institutions, however, have chosen to opt out of one or both elements of the scheme²⁵⁷, although the scheme has been extended until October 2009.²⁵⁸

The FDIC expended considerable resources on the takeover of failing banks including IndyMac, Franklin Bank and a large number of small institutions in 2008 and 2009. The FDIC registered an increase of 81 'problem banks' in the fourth quarter of 2008, while the 25 bank failures for 2008 were the largest number since 1993.²⁵⁹ Although the FDIC is not liable to insure all deposits, it still made a \$33.5bn loss for 2008.²⁶⁰ FDIC Chairman Sheila Bair has issued a stark warning about the insurance fund's continuing viability:

Without substantial amounts of additional assessment revenue in the near future, current projections indicate that the fund balance will approach zero or even become negative.²⁶¹

In March 2009, Bair proposed an unpopular rise in the fees for member institutions.

5. Responses to AIG

AIG, whose Financial Products division had been the world's largest underwriter of CDSs, dramatically collapsed in September 2008 amidst significant declines in the value of the assets it had insured. Because, on the evening of 15 September, AIG's credit rating was dramatically reduced, it suddenly faced stricter capital requirements and more expensive debt. Given its high levels of leverage and the magnitude of its exposure to toxic assets facing write-downs, AIG had essentially become insolvent.

Former long-term Chairman, CEO and the largest single shareholder, Maurice Greenberg, has succinctly summarised his critical perception of the problems leading to AIG's failure after he left as CEO in 2005:

Here's what happened: AIG continued to write credit default protection after the loss of its AAA rating. Two, not only did AIG continue doing so, but it massively

²⁵⁵ [Compensation scheme to cover savers' claims up to £50,000](#), Financial Services Authority, 3 October 2008

²⁵⁶ [FDIC Announces Plan to Free Up Bank Liquidity](#), FDIC Press Release, 14 October 2008

²⁵⁷ [Temporary Liquidity Guarantee Program Opt-Out Lists](#), FDIC

²⁵⁸ [FDIC Extends the Debt Guarantee Component of Its Temporary Liquidity Guarantee Program](#), FDIC Press Release, 17 March 2009

²⁵⁹ [FDIC Quarterly Banking Profile](#), FDIC, 26 February 2009

²⁶⁰ [Bair Says Insurance Fund Could Be Insolvent This Year](#), Bloomberg, 4 March 2009

²⁶¹ Ibid.

increased the risk that it took on, reportedly writing more business in the nine months after I left than the previous seven years. AIG changed the nature of the business from one focused initially in providing regulatory capital for foreign banks to one focused increasingly on subprime loans. AIG decided not to hedge its risk, even after indexes that would have permitted such hedging were available and even after AIG concluded internally that the business was too risky to continue to write new contracts and after I left the management controls that I had in place to limit risk were reportedly weakened or eliminated.²⁶²

Talking specifically of the Financial Products firm, which was a fairly independent joint venture contained within AIG, Greenberg says “I think they got greedy.”²⁶³

Judged to be systemically important to the economy because of its widespread insurance obligations, the rating downgrade induced an immediate federal bailout the following day. The Fed publicly stated:

The Board determined that, in current circumstances, a disorderly failure of AIG could add to already significant levels of financial market fragility and lead to substantially higher borrowing costs, reduced household wealth, and materially weaker economic performance.²⁶⁴

In March 2009, the Fed reiterated the systemic importance of AIG:

AIG provides insurance protection to more than 100,000 entities, including small businesses, municipalities, 401(k) plans, and Fortune 500 companies who together employ over 100 million Americans. AIG has over 30 million policyholders in the U.S. and is a major source of retirement insurance for, among others, teachers and non-profit organizations. The company also is a significant counterparty to a number of major financial institutions.²⁶⁵

The federal bailout of AIG has come in four main instalments. First, on 16 September 2008, the Fed authorised the Federal Reserve Bank of New York to lend up to \$85bn to AIG. The 24-month loan at 850bp more than the LIBOR was designed to ensure repayment to the taxpayer, and would use AIG’s assets as collateral.²⁶⁶ This would provide sufficient liquidity for AIG to meet its default obligations, and thus prevent plunging financial markets into further turmoil. During this time AIG was expected to sell its assets off in an orderly fashion to repay its loan. Furthermore, the Fed will receive a 79.9% equity stake, and reserve the right to restrict dividends to common and preferred shareholders.

Using a second secured asset credit facility created by the Fed, AIG received a second loan of up to \$37.8bn on 8 October. After a large chunk of the initial loan, as well as

²⁶² Maurice Greenberg, US House Committee on Oversight and Government Reform, Hearing on AIG, 2 April 2009

²⁶³ Ibid.

²⁶⁴ [Other Press Release](#), Federal Reserve, 16 September 2008

²⁶⁵ [U.S. Treasury and Federal Reserve Board Announce Participation in AIG Restructuring Plan](#), Federal Reserve, 2 March 2009

²⁶⁶ [Other Press Release](#), Federal Reserve, 16 September 2008

previously available liquidity, had been absorbed to settle CDSs with firms such as Goldman Sachs and Societe Generale,²⁶⁷ the Fed explained that further loans were required to maintain AIG's liquidity.²⁶⁸

Having posted a loss of \$24.5bn for the third quarter of 2008²⁶⁹ and reportedly used \$90bn of its loans,²⁷⁰ the third instalment, in November 2008, saw the Fed and US Treasury restructure their support for AIG. Under the TARP's Systematically Significant Failing Institutions scheme, the Treasury purchased \$40bn in non-voting senior preferred shares yielding annual cumulative dividends of 10%. In addition, the \$85bn loan taken out with the Federal Reserve Bank of New York would be reduced to a \$60bn Revolving Credit Facility (RCF) and the strict repayment terms would be substantially reduced to 300bp more than the LIBOR on funds actually used (0.75% more on unused funds).²⁷¹

Two additional facilities containing AIG's portfolios of MBSs and CDO insurance were established to purchase the toxic waste from institutional investors; the facilities are supported by loans from the Fed underwritten by AIG collateral.²⁷² These facilities are designed to limit the additional collateral that AIG needs to put up in insuring these risky assets, whilst also removing the liabilities from its balance sheet. In effect, the creation of the MBS and CDO facilities involved the government purchasing and partially insuring itself against losses on these assets. Although AIG had received by far the largest ever level of government support, it was claimed that the restructuring will reduce exposure from \$152bn to \$112bn.²⁷³

The fourth instalment, in March 2009, saw the Fed and Treasury again restructure AIG's terms in order to enhance its capital and liquidity positions as it seeks to sell some of its assets. This came as AIG reported the largest quarterly corporate loss in history of \$61.7bn for fourth quarter of 2008 (\$99.3bn for 2008).²⁷⁴ First, the Treasury will exchange its existing preferred stock for newly-issued preferred stock that more closely resembles common stock, and thus provides a stronger capital base for the company; the new shares will also pay a non-cumulative annual dividend of 10%. An additional \$30bn of such preferred stock will be made available from the TARP if necessary. Second, AIG's RCF with the Fed was updated, although the RCF itself will be reduced in size from \$60bn to \$25bn, and interest will be paid at the rate of the LIBOR. In exchange, \$26bn will be repaid through preferred shares in two of AIG's life insurance subsidiaries, which are eligible to receive further loans of up to \$8.5bn. With regard to this second feature, the Fed states that the Federal Reserve Bank of New York will likely suffer a 'haircut' loss associated with falling cash flows from the securities contained in the subsidiaries.²⁷⁵

²⁶⁷ [AIG Is Said to Pay \\$18.7 Billion to Goldman, SocGen for Swaps](#), Bloomberg, 10 December 2008; [Cranking up the outrage-o-meter](#), The Economist, 21 March 2009

²⁶⁸ [Other Press Release](#), Federal Reserve, 8 October 2008

²⁶⁹ [US Provides More Aid to Big Insurer](#), New York Times, 10 November 2008

²⁷⁰ [A Question for AIG: Where Did the Cash Go?](#), New York Times, 29 October 2008

²⁷¹ [Other Press Release](#), Federal Reserve, 10 November 2008

²⁷² Ibid.

²⁷³ [US Provides More Aid to Big Insurer](#), New York Times, 10 November 2008

²⁷⁴ [U.S. Treasury and Federal Reserve Board Announce Participation in AIG Restructuring Plan](#), Federal Reserve, 2 March 2009

²⁷⁵ Ibid.

In a joint statement on 2 March 2009 the Fed and Treasury have effectively refused to set any upper bound on the support offered to AIG given its central role in financial markets:

The company continues to face significant challenges, driven by the rapid deterioration in certain financial markets in the last two months of the year and continued turbulence in the markets generally. The additional resources will help stabilize the company, and in doing so help to stabilize the financial system.

As significantly, the restructuring components of the government's assistance begin to separate the major non-core businesses of AIG, as well as strengthen the company's finances. The long-term solution for the company, its customers, the U.S. taxpayer, and the financial system is the orderly restructuring and refocusing of the firm. This will take time and possibly further government support, if markets do not stabilize and improve.²⁷⁶

6. The housing market

Following the downgrading of Fannie and Freddie, the Federal Housing Finance Agency took the GSEs under federal conservatorship on 7 September 2008. Secretary Paulson supplemented this step with significant financial support for the mortgage brokers whose collapse threatened financial and housing market stability. First, the Treasury will purchase preferred stock such that both companies retain a positive net worth. Second, a secured lending facility will be available for Fannie and Freddie if the capital infusion is insufficient. Third, the Treasury will gradually purchase MBSs from Fannie and Freddie as a means of releasing liquidity and transferring risk to a body able to bear it.²⁷⁷

These initial steps proved insufficient in the face of the large losses sustained by the mortgage giants – Fannie Mae reported a \$25.2bn loss for the fourth quarter of 2008 and a \$58.7bn loss for the full year,²⁷⁸ while Freddie Mac had losses of \$23.9bn and \$50.1bn for the fourth quarter and full year of 2008 respectively.²⁷⁹ Although the Treasury updated its preferred stock investment to ensure a positive net worth, on 18 February a second package was required which increased preferred stock purchases up to £200bn for each firm.²⁸⁰

Using Fannie and Freddie, in addition to firms participating in the TARP, the US government has been able to reduce mortgage rates, and thus foreclosures. First, the Fed purchased \$600bn of MBSs and debt issued by Fannie and Freddie in November 2008 as part of an effort to reduce the interest rates and short supply of credit facing current and prospective homeowners.²⁸¹ Second, Fannie and Freddie temporarily

²⁷⁶ Ibid.

²⁷⁷ [Statement by Secretary Henry Paulson on Treasury and Federal Housing Finance Agency Action to Protect Financial Markets and Taxpayers](#), US Treasury, 7 September 2009

²⁷⁸ [Fannie Mae Reports Fourth-Quarter and Full-Year 2008 Results](#), Fannie Mae, 26 February 2009

²⁷⁹ [Freddie Mac Report Fourth Quarter and Full-Year 2008 Financial Results](#), Freddie Mac, 3 March 2009

²⁸⁰ [Statement by Secretary Tim Geithner on Treasury's Commitment to Fannie Mae and Freddie Mac](#), US Treasury, 18 February 2009

²⁸¹ [Monetary Policy Press Release](#), Federal Reserve, 25 November 2009

suspended mortgage foreclosure procedures from 26 November 2008 until 9 January 2009.²⁸² Third, the Fed announced in January 2009 that preventable foreclosures should be minimised through refinancing and other means available in the HOPE for Homeowners legislation where the Fed has a stake in the residential mortgage.²⁸³ Not only is this designed to maintain the value of the assets held by the taxpayer, but it will also support the general public and prevent precipitous declines in the housing market.

On 18 February President Obama announced the Homeowner Affordability and Stability Plan (HASP), which came into force on 4 March.²⁸⁴ HASP permits the refinancing of 4-5m mortgages owned or guaranteed by Fannie and Freddie that currently exceed 80% of the value of the house. HASP also creates a \$75bn initiative to modify the terms of home loans eligible to reduce monthly payments to benefit up to 3-4m homeowners.

7. Fiscal stimulus

The Obama Administration has been vocal in its support for fiscal stimulus as a means of reinvigorating the economy. Having passed the House and Senate with votes largely following partisan lines, the \$787bn American Recovery and Reinvestment Act was signed into law on 17 February 2009. The legislation awarded tax cuts across a wide range of areas including \$237bn for individuals and \$51bn for companies. The Act also provides \$111bn in infrastructure investment, \$59bn in additional healthcare, \$53bn for education and \$43bn for energy.²⁸⁵ The success of the stimulus is yet to be gauged.

8. Summary

After the stock market crash in September 2008, a far broader and more expensive range of tools was used to address the crisis. Rather than following the Fed's lead in enhancing liquidity, both Congress and the Treasury became key players in the evolution of a US response which involved federal conservatorships, capital injections, credit easing, liquidity measures, various insurance schemes, a fiscal stimulus and adjustments to the housing market. The success of the different programs is difficult to gauge at this stage. Although there are signs that banks are starting to make profits again and risk spreads have generally returned to pre-September levels,²⁸⁶ government policies have failed to arrest rises in unemployment and contractions in output.

²⁸² [Fannie Mae To Suspend Foreclosures Until January 2009](#), Fannie Mae, 20 November 2009; [Freddie Mac Suspends All Foreclosure Sales of Occupied Homes From Day Before Thanksgiving Until January 9, 2009](#), Freddie Mac, 20 November 2008

²⁸³ [Homeownership Preservation Policy for Residential Mortgage Assets](#), Federal Reserve, 30 January 2009

²⁸⁴ [Homeowner Affordability and Stability Plan Executive Summary](#), US Treasury, 18 February 2009

²⁸⁵ [Where is Your Money Going?](#), Recovery.gov

²⁸⁶ Chart 1; [TED Spread](#), Bloomberg, 2 April 2009; [Libor revisited](#), Financial Times, 11 March 2009

Appendix 1 – Glossary of terms

<i>AAA rating</i>		The highest possible rating provided by credit rating agencies. Accordingly, such assets are those deemed least likely to default.
<i>Alt-A mortgage</i>		Alt-A (or Alternative A) mortgages were similar to prime mortgages (see below), but required more limited documentary evidence. For example, no formal evidence of income was required for such a mortgage.
<i>Asset-backed instrument</i>	<i>financial</i>	A financial instrument which uses some form of asset as collateral.
<i>Asset-backed (ABS)</i>	<i>security</i>	A financial asset where a large number of assets are pooled together to create an asset backed by a large number of interest-yielding assets as collateral. ABSs are often divided into homogeneous or heterogeneous portions (or tranches) for sale to a number of investors. The asset, or one of its tranches, may be bought and sold on the market, or purchased to pay periodic interest in exchange for a fee. The cost of purchasing an ABS reflects its risk profile. In theory, by pooling assets the security becomes more attractive because of the fall in the risk of a substantial default. However, the expected return to the asset will remain unchanged.
<i>Basel Framework</i>		The recommendations for international capital requirements made by the Basel Committee on Banking Supervision To which most advanced financial economies adhere to. ²⁸⁷
<i>Basis points</i>		A term used to refer to interest rate points. 100 basis points equates to a 1% interest rate.
<i>Billion</i>		US billion – ie 1,000,000,000 (not UK billion of 1,000,000,000,000). ²⁸⁸
<i>Bond</i>		A note promising to repay the acquired capital, usually with interest, at a set future date.
<i>Collateralised obligation (CDO)</i>	<i>debt</i>	A financial asset where a large number of assets – often interest-yielding debts – are pooled together to create an asset backed by these underlying assets as collateral. CDOs may be divided into homogeneous or heterogeneous portions (or tranches) for sale to a number of investors. The CDO, or

²⁸⁷ For more details: [Basel II: Revised international capital framework](#), Bank for International Settlements

²⁸⁸ For further information, please see House of Commons Library, [Statistics literacy guide: What is a billion? And other units](#), January 2009

one of its tranches, may be bought and sold on the market, or purchased to pay periodic interest in exchange for a fee. The cost of purchasing a CDO reflects its risk profile. In theory, by pooling assets the security becomes more attractive because of the fall in the risk of a substantial default on payments from the underlying assets. There is a wide variety of specific structures for CDOs.

<i>CDO-squared</i>	A derivative similar in structure to a CDO except that the asset is backed by CDOs as collateral rather than more tangible assets. This products often comprised the riskiest (or 'equity') tranches of CDOs which the investment banks could not sell to the market.
<i>Collateral</i>	Assets pledged to a creditor upon default to secure a loan.
<i>Commercial paper</i>	Short-term debt issued by firms. This is often unsecured, although it can be secured in the case of asset-backed commercial paper.
<i>Common stock</i>	Standard voting shares in a listed entity.
<i>Conservatorship</i>	This is a legal concept where an entity comes under the temporary legal control of an external body, called a conservator.
<i>Counterparty risk</i>	The risk that the other party to the transaction would fail to meet the agreement.
<i>Delinquency (relating to mortgages)</i>	The process where a mortgagee falls behind on their payments to a mortgage lender.
<i>Derivative</i>	A financial contract or instrument where the value of the product is derived from an external underlying asset. For example, credit default swaps derive their value from their actual loan defaults. It is argued that derivatives increase market efficiency by allowing market participants to better hedge risks.
<i>Foreclosure (relating to mortgages)</i>	The procedure where either a homeowner, or their mortgage lender, terminates a mortgage agreement. Typically, the mortgage lender will receive the home in return.
<i>Interest rate spreads</i>	The difference between the interest rates earned and interest rate liabilities. In the US case, the TED spread which measures the difference between the 3-month LIBOR and 3-month Treasury bonds is widely used.
<i>Leverage</i>	The borrowing of funds – or issuing of debt – to support additional investments. The opposite case is of de-leveraging where a firm reduces it leverage ratio. The leverage ratio

refers to the ratio between equity and debt.

<i>Liquidity</i>	The ease and cheapness of converting an asset into cash. An asset is described as illiquid where it takes a long time and/or great expense to convert it into cash. A entity's overall liquidity refers to the collective liquidity of all its assets. <i>Funding</i> liquidity, as distinct from <i>market</i> liquidity (described above), refers to the ease and cheapness with which a firm may borrow funds – often on the back of a given asset. ²⁸⁹
<i>Mark-to-market (or fair value) accounting</i>	A widely used accounting standard that assigns financial assets their current market value.
<i>Maturity</i>	The point at which an asset receives its full set of payments.
<i>Moral hazard</i>	Derived from the 'principal-agent' problem in economics, this is the risk that one party to a contract has an incentive to behave in a manner contrary to the desire of the other party.
<i>Mortgage-backed security (MBS)</i>	A financial asset where a large number of mortgages are pooled together to create an asset backed by a large number of interest-yielding mortgages as collateral. MBSs are often divided into homogeneous or heterogeneous portions (or tranches) for sale to a number of investors. The asset, or one of its tranches, may be bought and sold on the market, or purchased to pay periodic interest in exchange for a fee. The cost of purchasing a MBS reflects its risk profile. In theory, by pooling mortgages the security becomes more attractive because of the fall in the risk of a substantial default. However, the expected return to the asset will remain unchanged.
<i>Mortgage origination</i>	The loan provided by the mortgage lender to a consumer purchasing a home.
<i>Preferred shares</i>	Shares the rank above common shares in the hierarchy of debtor for a publicly limited company. These are generally non-voting shares, and often are entitled to receive a fixed or variable dividend. Cumulative preferred shares ensure that the dividend is retrospectively paid in full where it is missed for a given year.
<i>Primary dealer</i>	A bank or broker that may trade directly with the Federal Reserve System. Although the total number of primary dealers has varied over time it has generally contained the world's largest and most significant financial institutions.

²⁸⁹ Markus Brunnermeier, "Deciphering the Liquidity and Credit Crunch 2007–2008", *Journal of Economic Perspectives*, 23:1, Winter 2009, pp91-92

Before the collapse of Bear Stearns, there were 19 such institutions. Included in this number were the five large US investment banks in addition to many of the world's largest commercial banks and securities firms.

<i>Prime mortgage</i>	The mortgage standard for lending which requires considerable documentary evidence to satisfy the view that such a mortgage is unlikely to default. Traditionally, these loans were structured as fixed-rate 30-year mortgages.
<i>Risk-weighted asset</i>	When calculating capital requirements, the capital value of an asset must reflect its level of risk. Where there is a strong possibility of default on an asset, the asset will be marked down by a larger proportion. In the case of cash reserves, there is no mark down because the asset contains no future risk to its value.
<i>Security</i>	A contract specifying the right to receive a financial asset at some point, or over some periods, in the future. These are generally long-term and include asset like government and corporate debt notes.
<i>Short selling (and naked short selling)</i>	A short bet refers to a bet that a stock price will decline. Unlike normal short selling, naked short selling does not require that a speculator first agree to borrow shares in the company.
<i>Subprime mortgage</i>	The mortgage which requires the least strict lending standards for acceptance. Although there is not precise definition of what makes a debtor subprime, it is generally assumed to entail a FICO score – a US credit rating scoring system – of less than 650. Accordingly, the interest rate on such loans was greater than that on prime loans, which satisfied more stringent lending standards.
<i>Tranche</i>	A security is generally sliced up into different tranches, or portions of the security's risk. Tranches are generally determined by their seniority in terms of payment, and thus carry different levels of risk. The most senior tranches, which carry the least risk, provide the lowest rates of interest.
<i>Tier 1 capital</i>	This is the core capital of a company. Tier 1 capital generally includes equity (common and some forms of preferred stock) and cash reserves.

<i>Trillion</i>	US trillion – ie 1,000,000,000,000. ²⁹⁰
<i>Warrants</i>	In US finance, a warrant is a certificate, often issued with the purchase of stock and bonds, that specifies an agreement by which the owner may purchase an asset in future for a pre-specified price. In the case of the Capital Purchase Program, the Treasury entered contracts to purchase preferred stock which also included the opportunity to subsequently purchase common stock if necessary.

²⁹⁰ For further information, please see House of Commons Library, [Statistics literacy guide: What is a billion? And other units](#), January 2009

Appendix 2 – List of acronyms

<i>ABS</i>	Asset-backed security
<i>AGP</i>	Asset guarantee Program
<i>AIG</i>	American International Group
<i>ARM</i>	Adjustable rate mortgage
<i>bn</i>	Billion
<i>bp</i>	Basis point
<i>CDO</i>	Collateralised debt obligation
<i>CDS</i>	Credit default swap
<i>CEO</i>	Chief executive officer
<i>CPFF</i>	Commercial paper Funding Facility
<i>CPP</i>	Capital Purchase Program
<i>CRA</i>	Credit rating agency
<i>Dow</i>	Dow Jones Industrial Average Index
<i>EESA</i>	Emergency Economic Stabilization Act of 2008
<i>Fannie or Fannie Mae</i>	Federal National Mortgage Association
<i>FDIC</i>	Federal Deposit Insurance Corporation
<i>Fed</i>	Federal Reserve
<i>FHA</i>	Federal Housing Association
<i>FHFA</i>	Federal Housing Finance Agency
<i>Freddie or Freddie Mac</i>	Federal Home Loan Mortgage Corporation
<i>GSE</i>	Government-sponsored enterprise
<i>HASP</i>	Home Affordability and Stability Plan
<i>LIBOR</i>	London interbank offer rate
<i>MBS</i>	Mortgage-backed security
<i>MMIFF</i>	Money Market Investor Funding Facility

<i>PDCF</i>	Primary Dealer Credit Facility
<i>RCF</i>	Revolving Credit Facility
<i>SEC</i>	Securities and Exchange Commission
<i>TAF</i>	Term Auction Facility
<i>TALF</i>	Term Asset-Backed Securities Loan Facility
<i>TARP</i>	Troubled Asset Relief Program
<i>TIP</i>	Targeted Investment Program
<i>tr</i>	Trillion
<i>TLGP</i>	Temporary Liquidity Guarantee Program
<i>TSLF</i>	Term Securities Lending Facility