The Credit Crisis: Where It Came From, What Happened, and How It Might End

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Massive deregulation in the United States allowed non-banks to function like banks, exposing the institutional fragility particular to banking. This unprecedented scale of deregulation and the concomitant absence of systemic risk controls were facilitated by a radically lopsided political economy in the North. This was, in turn, held up by an extremely lopsided global division of labour. Export-surplus-fuelled liquidity and excessive deregulation combined to exacerbate the cyclical nature of banking systems that follow from the credit nature of money, leading to massive booms and searing busts. Layer upon unstable layer, these interacting dynamics have imperilled our world system and brought us to the brink. Each dynamic will now have to be rebalanced, a difficult political task.

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The United States (US), and now global, financial crisis did not begin in right earnest till 14 September 2008. On that day, one of the lynchpins of the financial system, Lehman Brothers, gave signs that like its investment banking counterpart Bear Stearns in March it was facing insolvency and collapse. Although this was not known at that time, this was the signal event that foretold the beginning of the unravelling of the so-called "shadow banking system" in the short term, the US financial system in the short to medium run, and potentially the end of the long period of finance-led capitalism from 1980. Such a once-in-a generation crisis has multiple causal origins, some macroeconomic and structural, and others rooted in the more immediate political economy of deregulation and market orientation. This paper seeks to throw light on how some of these processes interacted with the endogenous instabilities of a credit economy, and trace how the current responses to perhaps the most serious economic maelstrom the world has seen since the 1930s may fare, given our reading of the systemic issues. The paper is divided into an historical and an analytical section which ask, respectively, how did we get such easy credit, and what happened when we did?

1 Historical Predicates

The early 1970s marked, in the views of many scholars, the end of what was called "the golden age of capitalism". While several features of the transition have been remarked upon, four are most central for the purpose of understanding the current financial crisis. These were the disentangling of finance from domestic constraints, the beginning of a long decline in the real wages of US workers following a crisis in profitability in the core economies of the 1970s, the concurrent growth of global imbalances in the core and periphery of the global economy, and the rise of monetary policy as the sole tool of macroeconomic management. These features have been critical predicates not only for the particular crisis but a long period of global financial instability, marked by recurring, devastating financial crises in many parts of the world. In this sense, the financial crisis of 2008 is the last in a series of crises that were enabled by the financial architecture of the neoliberal era; a set of arrangements, institutions and ideologies which have accelerated financial bubbles and panics in Latin America, east Asia, Russia, Turkey and finally, in the advanced economies themselves.

1.1 Structural Antecedents

Since the early 1970s, the post-war regime of accumulation in the global North has undergone fundamental transformation. The immediate post-war class bargain comprised a state orchestrated balance between organised labour and capital, with financial and industrial capital both being heavily regulated. Following the crisis in profitability in the late 1960s and the shocks following the 1973 crisis caused by the hike in oil prices by the Organisation of the Petroleum Exporting Countries (OPEC), by the mid-1970s the balance of class power shifted against organised labour. Decades of post-war prosperity meant that a serious problem of Northern capitalism was maintaining growth under conditions of full employment and assertive labour meant a rate of profit – and in particular a rate of return on financial capital – that was unacceptably low to rentiers (see Epstein and Jayadev 2005). Finance had to be released from its regulatory shackles and made the driving force of the economy if a new pattern of growth, more friendly to finance, was to be achieved without renewed compromise with labour and a radical reconfiguration of industry. The post-1970s balance was therefore conducted between financial capital and the State's money managers, with organised labour now utterly demoralised and on the

retreat. Finance became the driving force of an economy without an explicit or implicit capital-labour accord.

Financial deregulation started with the currency markets since dollar imbalances could no longer be contained within the fixed-exchange rate framework of Bretton Woods. The first break with the past came with the Eurodollar market in London. This was enabled by a neat piece of regulatory arbitrage designed and executed by the financial markets of the United Kingdom. It began to permit free capital flows and created a class of holdings that were entirely free of regulation. Stagflation was brought under control by more conservative central bank policy. Budgets were reigned in while interest rates became the key control variable. The other signal institutional fact was the rise of institutional investors – pension funds, mutual funds, university endowments – as the controllers of surplus. Demanding tools to professionalise the investment business, institutional investors were the first consumers and adopters of modern portfolio theory.[1]

Figures 1.1 to 1.4 provides some graphical evidence for these long-term processes. Figure 1.1 shows the decline in real wages for non-supervisory production workers between 1964 and 2008 in the US. What is of specific interest is the way in which the political economy led the State to respond to this decline in purchasing power of the majority of the population. While households in the US dug deep into personal balances (leading to sharp declines in the personal savings rates over the decades (Figure 1.2)), the State deregulated finance to enable the complex of financial institutions and the Federal Reserve to maintain current consumption to allow and even engineer a sharp increase of indebtedness. The most concise statement of this new approach to macroeconomic management was made by Robert Brenner (2007):

> Governments, led by the US, have underwritten ever greater volumes of debt, through ever more baroque channels, to subsidise purchasing power...since the mid-90s they have had to resort to more powerful and risky forms of stimulus to counter the tendency to stagnation, replacing the public deficits of traditional Keynesianism with the private deficits and asset inflation of what might be called asset-price Keynesianism – or, with equal accuracy, bubblenomics.

Figure 1.3 (p 35) provides some evidence for this contention. The federal funds rate was lowered in two specific instances in 1992-93 and 2002-03, primarily in order to combat slowdowns. Two asset bubbles ensued – the first in the tech mania and crash of the late 1990s and the second in the (more dangerous) housing bubble of 2000-06. In both cases, households increased indebtedness and the economy was primed by consumption through the wealth effect. The scale of leveraging in the latter bubble however was much larger. Figure 1.4 (p 35) shows the increase in indebtedness of households in the US since 1948. Following a period of relative stability, during which the debt to personal income ratio of households held at about 50-60% for two decades, the 1980s and 1990s saw a rapid increase in indebtedness, driven primarily by increasing mortgage debt. The period 2000-06 has seen an even sharper increase in overall indebtedness and loading up of mortgage debt in particular. This latter process has fueled and in turn been fuelled by a sharp increase in real house prices precipitating what is now recognised as a serious bubble in housing.

Given the fact that household balances were already seriously strained by the middle and end of the 1990s, it would have appeared unlikely that a consumption boom was possible in the core economies. Several factors, however, combined to allow for this bubble to be generated. First, capital flows which had gone in search for yield in various regions were reoriented back to the core economies as a result of the emerging markets crises of the late 1990s. Figure 2.1 (p 36) shows the declines in equity in several key indices. Second, the sharp and continuous decline in the US current account position since the early 1990s (Figure 2.2, p 36) was matched by surpluses and savings elsewhere and in particular among major trading partners in China and east Asia. This wealth could have been utilised in productive activities domestically or in other developing economies, but the fact that the US was both the main market for east Asian exports and was the source of the global reserve currency combined to create a global division of labour that had the US consuming and financing east Asian production. This reciprocal outsourcing of finance and industry is the deep structural cause of our present "global imbalances".

A combination of (i) the need to hold defensive dollar reserves in order to combat exchange rate crises and fuel export-led growth, and (ii) the structural location of the US financial market, offering the most liquid and sound financial instruments, led to the placing of east Asian savings back into the US economy. This process was accelerated by additional savings entering the US as commodity producers, earning large amounts of wealth as commodity prices rose in the early 2000s. Figure 2.3 (p 37) shows the flows of savings into the US from abroad. It depicts the difference between foreign-owned assets in the US and US-owned assets abroad. This "savings glut" as it was called by Federal Reserve chairman Bernanke (2005) had two effects; it kept medium-term interest rates low and kept the demand for the new and innovative structured credit products being developed by Wall Street high. The International Monetary Fund's Global Financial Stability Report of May 2008 estimates that the issuance of structured

Figure 1.1: Real Wage Per Hour (in 1964 $)

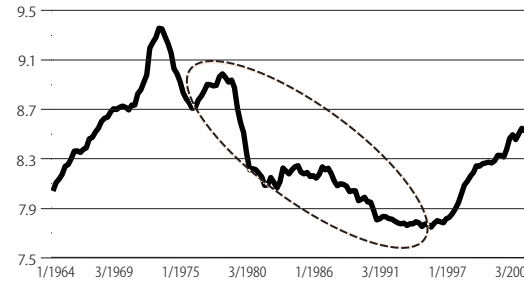


Figure 1. 2: Personal Savings Rate (in %)

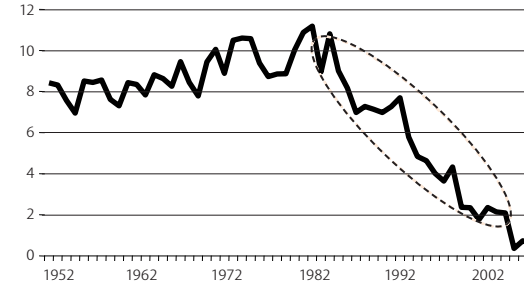
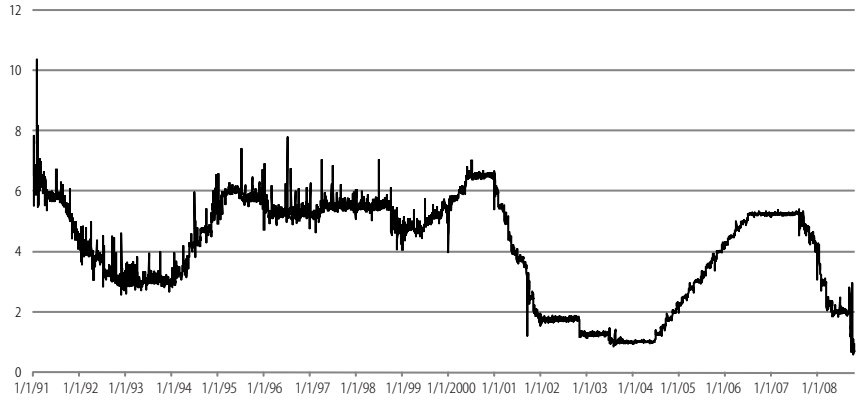


Figure 1.3: Federal Funds Rate (Overnight) (in %)



credit products in the US and Europe grew every year from 2000-06, starting from an annual issuance of half a trillion dollars in 2000 to a peak of nearly $3 trillion in 2006. In combination with the low short-term interest rates in 2002-03, this encouraged an asset price boom in the mortgage credit market at the end of which real house prices were twice as high as the level in 1991 (Figure 2.4, p 37). During the period several trillion dollars were invested in housing stock, of which nearly $2.5 trillion were in the now notorious subprime loans.

1.2 Financial Deregulation and the Search for Yield

The structural forces that gave rise to the current configuration also drove it over the edge by severely amplifying the natural cyclicality of a system built on interlocking cash commitments projected into an uncertain future. Both the political economy of deregulation in the North and the recycling of export-derived surpluses from the South were dangerously pro-cyclical, creating unprecedented growth but pushing the system to search for and embed more risk in the form of various high-yielding assets. These ranged from emerging market real estate and stock markets to commodities to microfinance operations and, of course, to evermore risky US sub-prime mortgages. International imbalances were complementary to a point. Dual and interacting effects from (a) the currency standard, and (b) the US being "consumer of last resort" locked not only the US but the world economy into an unstable dynamic. It is hard, almost by definition to disconnect from a global reserve currency. Even if one feared that the dollar would lose value, one could not disengage because dollar devaluation would compromise the "consumer of last resort" that the US became. Thus, while observers knew the bubble or at least the imbalance to be present, structural forces prevented its easy redressing.

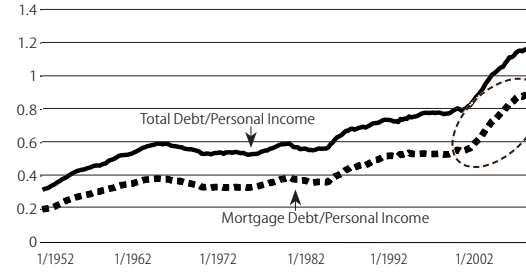
The long period of growth in the 1990s was somewhat dubiously credited at the time to the sagacity of Greenspan and the "vitality" of US financial markets. While low interest rates came from global conditions, a deregulatory political economy ensured this "vitality". Indeed, with the neoliberal zeitgeist, financial deregulation came to be seen as natural and state involvement construed as an anathema. The domestic financial architecture which had been put in place in the 1930s was consequently seen as irrelevant and a drag on the innovative capacity of the sector.

The upshot was a series of changes to the regulatory structure in the late 1990s and early 2000s. The Gramm-Leach-Bliley Act of 1999 replaced the Glass-Steagall Act and changed banking structures. The Commodity Futures Modernisation Act of 2000 was introduced in the lame duck session of Congress in 2000, was never debated, and silently replaced the Shad-Johnson Act of 1982. Among its many features, it exempted credit default insurance from regulation by terming them "swaps", a feature which, as we shall explain, permitted and encouraged the financial markets to place vast sums of money on gambling in the explosion of credit default swaps. In 2002, off-balance sheet activities which had come to the forefront of awareness following the collapse of Enron in 2000-01, were sanctified by rule 46R of the Sarbanes Oxley Act. This new legislation did not ban off-balance sheet activities but instead allowed them so long as the risks and rewards were held by other entities. This encouraged not only the "originate and distribute" model which characterised structured finance, but also the whole creation of the shadow banking apparatus.

The high point of the deregulatory bubble was to allow investment banks to increase their leverage ratios. In a closed door meeting in 2004 the Securities and Exchange Commission (SEC) allowed the five largest investment banks – Merrill Lynch, Bear Stearns, Lehman, Goldman Sachs and Morgan Stanley – to more than double the leverage they were allowed to keep on their balance sheets, i e, to lower their capital adequacy requirements (Labaton 2008). The normal debt to net-capital ratio which was fixed at a 12:1 ratio was relaxed to allow leveraging of 30:1 and 40:1, which these institutions promptly did. It is no surprise that three of these five companies, rock solid for decades, do not exist today. In all of this, oversight was more or less completely delegated to ratings agencies rife with conflicts of interest, while the paradigm for bank regulation consisted of the oxymoronic "self regulation".

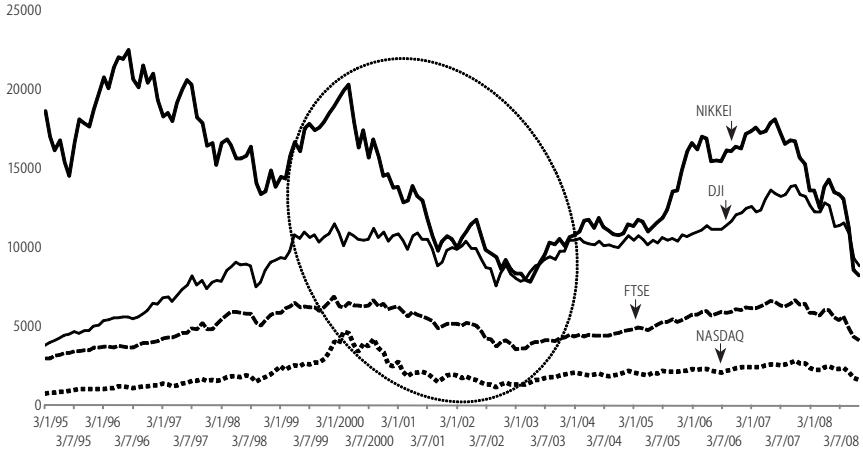
Fundamental shifts in the structure of the Northern economies worked through the political economy to produce deep distortions in the global macroeconomic fabric. The US thus saw patterns of increasing household indebtedness with financial deregulation, cheap imports and cheap

Figure 1. 4: Household Sector Debt/Personal Income



Sources: For Figure 1.1 Authors' calculation from Bureau of Economic Affairs, Figure 1.2 Authors' calculation from Bureau of Economic Affairs, Figure 1.3 Federal Reserve Bank of St Louis, Figure 1.4 Authors' calculation from Bureau of Economic Affairs and Federal Reserve Bank of St Louis.

Figure 2.1: World Equity Indices



credit, and significant increases in inequality. The authoritarian capitalists of the export-led South, in particular China, created complementary distortions, repressing domestic finance and subsidising exports with a pegged exchange rate. They traded forced savings (which were lent to the North but returned through foreign direct investment) for capacity-building gains from trade (see Fung et al 2002). This lopsided dynamic generated and continues to exacerbate the system's inherent "upward instability" (to use Hyman Minsky's phrase). What has been wound down however, since it has distended to the point of malignancy, is the most egregious outgrowth of the dynamic, the so-called "shadow-banking system".

2 Structured Finance and the Financial Crisis

2.1 Regular Banking and Shadow Banking

Regular banking is made stable by two key features: regulation and emergency liquidity arrangements, both provided by the central bank. The latter feature implies the former. The centrality of the lender of last resort function, the result of institutional evolution over centuries of financial crises, indicates a simple truth about banks: they are inherently fragile because they are in the business of liquidity transformation and are therefore perpetually exposed to runs on liquidity. The emergency provision of the same entails regulation by its provider to avoid moral hazard. But because banks are competitive, profit-driven entities, they strain at the leash of regulation and seek the illiquid edge of the risk distribution. Thus light regulation and plentiful liquidity undermine the very pillars of stability even while benefiting its constituent banks. In our present crisis, this systemic trade-off took the form of the shadow banking system.

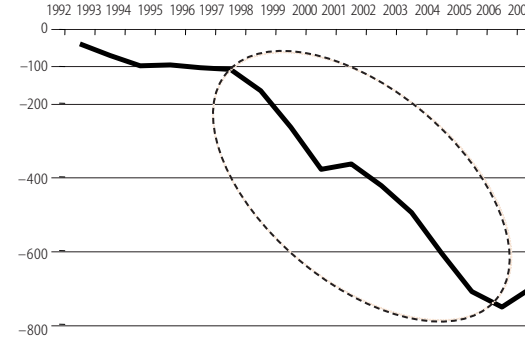
Yet there is an even more fundamental predication of system stability. The central bank is able to provide emergency liquidity because it alone can ease the refinance constraints of the banking system as a whole. In a world where bank liabilities assume the form of money, the central bank has the best "money" because it is backed by the entity with the best credit, the state. The state, in turn, has the best credit because it, uniquely, has tax claims on every economic entity in its jurisdiction going out into the foreseeable future. Using this differential power, the state's bank can move around the price of money in its key wholesale market, the interbank market, in an effort to keep this price in some stable relationship to economic activity. Together, this monetary policy and sound regulation should obviate the need for emergency refinance, but history and uncertainty combine to make such a facility crucial.

Stabilising control of the benchmark price of money in the interbank market, readiness to lend in the event of a liquidity shortfall, and prudential regulation are the therefore keystones of a sound banking and financial system. All three were compromised in the run-up to this crisis: interest rates were kept too low for too long, the shadow banking system lacked a lender of last resort function, and deregulation led to the absence of institutions capable of keeping the price of risk in meaningful relationship with underlying economic activity.

Thus, while interacting domestic political economies and a global division of labour give the current storm its vicious character, it is useful to isolate some fundamentals of the banking system in order to understand how the features discussed in the first section served to hollow out these fundamentals.

The governing paradigm of bank regulation directs behaviour by imposing risk-weighted capital requirements against a bank's loan assets as the central means of directing behaviour. Since capital charges are simply a cost of doing business for the bank, this regime of regulation sets up incentives for regulatory arbitrage focused on the circumvention of capital charges. Indeed, much financial innovation is quite rationally directed towards such regulatory arbitrage. Financial innovation makes the trade-off between regulation and profit less sharp by enabling greater lending and profits at any given level of capital charges thanks to regulatory arbitrage. Financial innovation enables de facto deregulation even in an apparently regulated system.

Figure 2.2: Current Account Deficit ($ billion)



By extension, such innovation enables the bank to take on more than the permitted level of risk on any given capital base. A second systemic trade-off therefore appears between regulatory arbitrage and systemic risk controls. Financial innovation sharpens this trade-off because, to

Figure 2.3: Net Ownership of US Assets by Foreigners ($ billion)

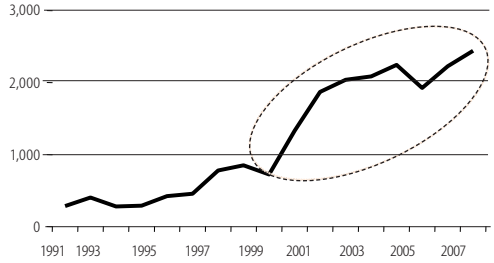
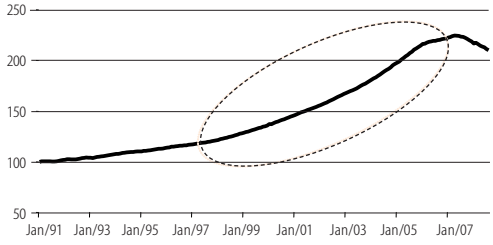


Figure 2.4: Monthly Real House Price Index for US



Sources : For Figure 2.1 Yahoo Stock Indices Data, Figure 2.2 Authors' calculation from Bureau of Economic Affairs, Figure 2.3 Authors' calculation from Bureau of Economic Affairs, Figure 2.4 Office of Federal Housing Enterprise Oversight.

the extent it enables regulatory arbitrage, innovation allows banks to expand their balance sheets beyond that which is considered prudent by regulators without the latter being able to trace and therefore counteract such expansion. The more financial innovation proceeds unchecked, the more brittle it renders the public good of systemic risk controls, entailing new methods of controlling systemic risk.

This tension between bank profitability and financial innovation, on the one hand, and systemic risk on the other lies at the heart of the present crisis. Because the entire system was being driven by the above-mentioned "search for yield", the already compromised regulatory architecture was stretched to enable banks to assume even more risk. In a self-reinforcing dynamic of risk and liquidity, the availability of borrowing on relatively easy terms meant that most assets witnessed decreasing returns as their prices were bid up, and therefore even more risk had to be assumed to achieve above-average returns. Yet these elevated risks were deemed to be manageable given the easy availability of credit. Banks and non-banks alike were compelled to find more yield thanks to easy money, and easy money allowed them to take on greater risks in ever-greater volume.

Yet regulated banks could only expand their balance sheets in mortgages so far and no further without incurring additional capital charges or raising more capital. They therefore used innovations in structured finance and took advantage of easy credit conditions and regulatory loopholes to float off-balance sheet entities that conducted the same business of borrowing short and lending long while incurring no capital charges and having no recourse to a lender of last resort. Thus financial innovation and regulatory loopholes combined with easy credit conditions and seemingly endless rises in housing prices to create an entire parallel banking structure that was free of regulations. This was the shadow banking system.

The very features that made the regular banking system robust were missing from the shadow banking system. Indeed, they were missing by construction, as the very logic of shadow banking followed from the systemic trade-offs outlined above. And as those trade-offs suggest, once the balance between regulation, innovation, and profit had been pushed to its risk-bearing limit, the inherent fragility of banking resulted in a run on the shadow banks. This began with rising subprime defaults in late 2007 and ended with systemically unsupportable risks being borne by the only balance sheet capable of doing so, that of the state.

2.2 Mortgage Securitisation

The hidden abode of shadow banks is replete with an alphabet soup of special purpose vehicles that all essentially perform the same function as banks but through securitisation and therefore in a wholesale manner, in the total absence of regulatory oversight. Securitisation enabled the broad distribution of risks held by the banks, thus allowing banks to off-load loan assets and free up regulatory capital to create the space to generate a fresh set of loan assets. As the pressure for increased yield grew, increasingly risky assets were distributed. Liquidity came to be stretched further and further as very illiquid, opaque, and long-term assets came to be funded by ever-shorter durations of liquid liabilities. Well-regulated banks would never have been able to debase their balance sheets and jeopardise their public function in this manner, but through the unregulated shadow banking system they spawned, they were able to make huge profits without such concerns.

For various reasons, real estate offered the path of least resistance to these flows, placing mortgage originating banks at the helm of affairs. Financial deregulation meant that not only high street banks but investment banks could get into the origination business, as Lehman Brothers did in large measure. Innovations in structured finance, developed in the wake of the Savings and Loans crisis of the 1980s, allowed banks to diversify risk away from particular geographical locations in the belief that national house prices would continue to rise on average even if particular local markets failed.

Why did securitisation of mortgages as opposed to other assets come to dominate? Bank loans are illiquid assets. Being idiosyncratically tailored to the needs of the loan customer, they have particular cash flow properties. Given that banking was, historically, a relationship-based business, the offloading of a client's credit risk clearly indicated a loss of faith in the client and could jeopardise the relationship. For all these reasons, bank loans usually sat on the balance sheet of the bank till maturity. This limits a bank's profitability because it limits the scale of its business to its capital base.

However, in the case of US mortgages, the perceived public good of home ownership combined with a bank's incentive to stretch its capital to create a mechanism for making these illiquid loans into liquid securities. Early on, the government-sponsored enterprises, Fannie Mae (Federal National Mortage Association) and Freddie Mac (Federal Home Loan Mortgage Corporation) initiated the securitisation of mortgages by standing ready to buy from banks all mortgages that met certain criteria and then pooling and packaging these mortgages into structured products that were split up into securities and sold. Accompanying guarantees assured the liquidity of these securities and got this socially-beneficial market off the ground.

So while they are idiosyncratic when taken individually, mortgage loans have standardisable actuarial properties when pooled, properties that can then be borne by individual securities issued against such a pool. With securitisation, illiquid assets turns to a liquid security, and bank capital is freed to pursue the social good of providing housing finance while the actual risks of the loan are spread over a broad range of investors. Banks become mere originators in this distribution model, generating raw material for a capital market machine. Relationship banking done at a local level that creates illiquid, held-to-maturity loans is replaced by arms length national and international investing enabled by the standardisation and massing of loan pools.

As we noted, Fannie Mae and Freddie Mac could only buy "conforming" mortgages, i e, those that met certain strict criteria. Those mortgage loans that did not meet such criteria, i e, "non-conforming" loans were dubbed "subprime". Other buyers would have to be found for these risky pools. But at least two conditions would have to be fulfilled before this would be possible: the further structuring of investments and a radical increase in the risk appetite of investors. Both were enabled by the easy credit conditions of the early 2000s.

2.3 Architecture of the Shadow Banking System

If the securitisation of mortgages appeared as a shining example of how the market can be engineered to produce societal goods, it laid the basis for an explosive growth in structured credit products by loosening the link between the bank and its capital, on the one hand, and its loan customers on the other. If assets could be pooled, tranched, securitised and shipped off the balance sheet, all for handsome fees, banks could then go out and obtain more risky loans edge as long as they could find buyers for their product. Easy credit meant that banks both had to take on more risk to get yield and that they found other investors willing to do the same.

Abstracting from the wild profusion of structured forms, we can isolate two distinct forms of off-balance sheet entities that formed successive layers in the space securitisation created between the bank, its liabilities, and its loan assets. These are the collateralised debt obligations (CDO), the structured investment vehicle (SIV), with the money-market fund (MMF) bringing the shadow banks to the high street. Providing critical liquidity to the CDO market was the market for credit default swaps (CDS).

CDOs are products that give the holder a right to the cash flows generated from an underlying pool of asset-backed securities (ABS), typically mortgage-backed securities (MBS). The arranger of the CDO, usually an investment bank, assembles a pool of loans from one or more loan originators (banks) in a special purpose vehicle (SPV) and issues securities against these loan pools. These securities are then placed in tranches based on the risk properties of their cash flows, with "senior" tranches having very secure cash flows, "junior" tranches having less secure flows and so on down the line to the "equity" tranches. This tranched entity is then rated by one of the ratings agencies in order to provide some transparency and security to investors, who purchase obligations to pay a certain cash flows generated by securitised assets. The CDO is therefore the produce of two rounds of securitisation and is thus two degrees removed from an individual loan asset: this asset has first been pooled and securitised and then these securities have in turn been pooled and tranched. It is against these tranches that CDOs are issued. The complicated structure has opaque risk characteristics that could only be priced with the aid of both complex mathematical models and credit ratings.

The CDO structure was a bank. Instead of depositors it had investors to whom it promised a stream of cash flows. For loans it had not mortgages but mortgage-backed securities and/or other ABS. It was thus funding long-term illiquid assets with shorter-term liquid liabilities, exposing itself to liquidity risk just as a bank would.

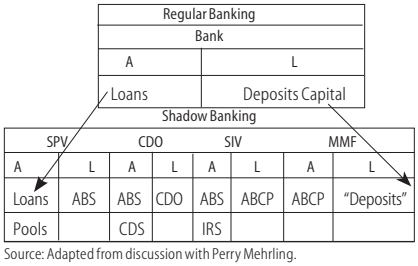
In order to further strengthen the credit-worthiness and transparency of these structures, the underwriter might purchase credit insurance against the various CDO tranches in the form of CDS. As the name suggests, a CDS is an instrument that allows the transfer from credit risk between parties and can be thought of an insurance contract against credit events such as default. The seller of the CDS agrees to make the buyer whole on the occurrence of an agreed credit event, and obligation for which the seller receives periodic payments (insurance premium). By purchasing CDS on their CDO tranches, underwriters added a layer of security and transparency to their structures that pleased both the ratings agencies and investors. At this level, the CDS market enhanced the perceived value of the underlying assets.

Yet, the CDS market played a further key role in this process. Because the typical CDS contract is an individualised product that is traded over the counter (OTC), its liquidity and therefore pricing might not adequately reflect its risk characteristics in the absence of a reliable benchmark, in the way LIBOR is a reliable benchmark in the OTC interbank market. A benchmark is made reliable by the fact that market makers stand ready to trade at prices at or around the benchmark. Market makers are sources of liquidity that enable the benchmark to perform its valuation function. If they disappear from this market, so too does market liquidity and with it the reliability of the market's valuation function. Hence the central bank stands ready to make a market in the last resort as a backstop, thereby ensuring the preservation of the valuation function of this key market and enabling it to perform its macro-prudential function.

The profusion of CDOs and CDS written on MBS led a demand for such standardisation and benchmarking to enable liquidity and better pricing. There thus emerged several indices that, in the manner of LIBOR, were constructed by polling the most significant market makers as to the most frequently traded CDO tranches. It was against these indices that most CDS came to be referenced. Indeed, thanks to these benchmarking efforts, the liquidity in the derivative (CDS) market came to outstrip that of the underlying (CDO) market, to the point where the underlying CDO tranches were being priced by referencing the price of the CDS contract on the correspondingly rated index. Because the price of a risky asset should be equal to the price of the risk-free asset plus the price of insuring a risky asset,

one could, for example, price an individual BBB-rated CDO tranche by referring to the price of insurance on the BBB index and add the price of the risk-free asset.[2]

Figure 3: Regular versus Shadow Banking



Source: Adapted from discussion with Perry Mehrling.

Key:
ABCP: Asset-backed Commercial Paper, ABS: Asset Backed Security, CDO: Collateralised Debt Obligation, CDS: Credit Default Swap, IRS: Interest Rate Swap, MMF: Money Market Fund, SIV: Structured Investment Vehicle, SPV: Special Purpose Vehicle.

This was the key structural role that the CDS market came to occupy. Notwithstanding this quasi-exchange standardisation by means of the indices, this market did not have any robust market maker of last resort. The main sellers of insurance against the highest-rated AAA CDO tranches, the implicit benchmark, were reportedly American International Group (AIG) and the monoline insurers (companies which once guaranteed municipal debt but which now saw an opportunity for easy profits). Once Lehman Brothers, invested to the hilt in subprime failed, these previously highly rated companies were shown to be an utterly inadequate liquidity backstop and their ability to fulfil their CDS commitments was deemed severely compromised by a panicked market. They had, in effect, been writing insurance against something that they and indeed no entity but the State can credibly insure systemic risk. When the systemic event occurred, the market did not deem these insurers capable of fulfilling the contracts that served as the market's benchmark, namely those which insured AAA default risk. Without a benchmark and a credible market maker of last resort, the CDS market stopped producing prices adequate to its valuation function. The pricing mechanism is the structured credit markets was broken.

The entire CDS market was in danger of collapsing given that its biggest players, the providers of its benchmark, were deemed to be insolvent or nearly so. And as we have seen, the CDS index market, being more liquid than the market for the underlying CDOs, itself formed the benchmark for the latter market. If the collapse of AIG and the monolines destroyed the pricing mechanism in the CDS market, the freezing of the CDS market would in turn debilitate pricing in the CDO market. Given that all entities had to mark their assets to market prices, the absence of a credible market maker of last resort in these key markets led to the debasement of those balance sheets holding CDS and CDOs.

While the above structures touched everyday investors only through rather complex intermediation, the off-balance sheet entity that most directly affected everyday investors was the SIV. Doing essentially the same thing as a CDO, the SIV exposed itself to even more liquidity risk by funding its assets at even shorter maturities in the commercial paper market. The explosion in the asset-backed-commercial paper market was the result, and the main buyer searching for yield in this market were MMF. The latter is not a new entity, of course, but it forms a vital final link in the shadow banking chain. MMFs are committed to holding their Net Asset Values at $1, making their liabilities look like regular savings account that bear interest. Being advertised as extremely safe and regulated by the SEC, MMFs attract significant volumes of retail investors, pension funds and other fiduciary institutions. Their track record is such that as an asset class, they have only once "broken the buck" in their entire history. That is, until 16 September of this year. Subprime-induced SIV implosions led to a freeze in the ABCP market as lenders refused to roll over SIV paper. Convulsions in the commercial paper market left several MMFs with severely impaired assets, forcing them to default on their "deposit" liabilities. In a securitised, capital market-based system, this constitutes a run on the "banks".

If the failure of subprime mortgages was the match, then the absence of prudential controls and credible market makers of last resort in the structured credit markets was the desiccated forest. The run on the shadow banks had become a solvency problem for regular banks once the latter were forced to repatriate these "arms-length" entities (they after all had been the agents creating these entities) after various credit lines, the only real liquidity backstop around, were triggered by subprime losses. It was as if huge risk exposures had been smuggled into the regulated banking system, and it was swamped. The baroque nature of the asset structures fuelled panicked selling as holders of erstwhile shadow-bank assets rushed for the door. Unable to price their own assets, banks refused to lend to one another and the regular source of bank liquidity froze, leading to exploding interbank rates. Lender of last resort facilities, designed for individual conflagrations and therefore as a mechanism to prevent systemic crises rather than deal with one, were inadequate. Something radical was required, and Henry Paulson thought a $700 billion bailout was that something. As we will see in our concluding section, we believe he was asking the right question but came up with an inadequate answer.

To summarise then, with securitisation at one end and MMFs at the other, the shadow banking system as a whole performed the same function as the regular banking system. It did so with large volumes and through the intermediation of the capital markets rather than through regular banking channels. It was almost totally unregulated, because off-balance sheet, and thus lacked the emergency liquidity arrangements of a lender/market maker of last resort. Because of the easy availability of credit, each individual shadow bank thought it could stretch liquidity to unprecedented degrees, and indeed was compelled to do so for the same reasons. Given this structure, we can understand why, when the bubble burst, the US Treasury moved to brace it at its extremes: it placed Freddie and Fannie, the source of securitisation of prime mortgages, under "conservatorship" and insured the holdings of the MMFs. Having provided masses of liquidity, the next question for the authorities was how to prevent collapsing asset prices from tearing through otherwise solvent banks.

3 The Aftermath

3.1 From Bailout to Recapitalisation

From the moment it was announced, it was clear to many that the massive bailout plan was going to be tremendously cumbersome

to implement. In trying to price impaired assets and remove them from bank balance sheets, the Troubled Assets Relief Program (TARP), as it came to be known, was following the well-regarded precedents of the Reconstruction Finance Corporation following the crash of 1929, the Resolution Trust Corporation post-Savings and Loans, and the Fed-organised private sector bailout of Long Term Capital Management, all of which were centralisations of crisis-impaired assets that ultimately led to profits for the public purse, (with the exception of the last: profitable but private). The problem with the current crisis was the scale and complexity of the asset holdings. How could reverse auctions be conducted for each and every CDO or SIV tranche in anything like the time required? How could such a process be made to insure adequate prices that would feed enough capital into the system while not exposing the fisc to undue risk and causing aggravated moral hazard?

Notwithstanding these limitations, the focus on the asset side of banks balance sheets was, in hindsight, useful, given that this is where solvency problems manifest themselves. That massive liquidity injections did nothing to reverse the freezing up of the most liquid markets in the world indicated a problem deeper than the mere temporary absence of liquid funds. Liquidity was impossible to come by because the failure of the pricing mechanism in the structured credit markets meant that no one could tell good assets from bad, and therefore no one was willing to assume any counterparty risk by borrowing or lending.

As we saw above, any robust pricing mechanism is based on a credible benchmark. The benchmark in the CDS markets turned out to be rather less than credible, and there was no market maker of last resort capable of ensuring this credibility. With the ultimate source of liquidity absent from this vital value-setting market, even supposedly safe AAA CDO assets were being marked at prices that rendered the holders insolvent. Thus the problem was not liquidity per se but the robustness of the market-based valuation process, which was itself based on the credibility of the benchmarks in the key CDS markets. These benchmarks were compromised thanks to the absence of prudential oversight that would have kept the price of risk they reflected in meaningful relationship with underlying economic realities. This permitted an extreme lack of coherence in the system, i e, a bubble. With no stabilising pricing of risk, no credible backstop, and no macro-prudential regulation, the shadow banking system was a ticking time bomb.

It took a while before the problem was acknowledged to be rather more fundamental than panic-induced illiquidity, although whether the exact structural inadequacies have been diagnosed is doubtful, including in our analysis here. Yet things changed in the period between the collapse of Lehman Brothers on 15 September and the peaking of the LIBOR-OIS spread on 10 October, at the end of the worst week on Wall Street in 75 years. In that time, several banks around the world had been bailed out and/or nationalised, the investment banking industry disappeared, the world's central banks made massive coordinated rate cuts, TARP passed, the entire commercial paper market was taken on to the Fed's balance sheet, massive swap lines were opened to allow foreign central banks access to dollar liquidity (making the Fed the de facto global central bank), and the Dow Jones Industrial Average melted. Yet asset fire-sales continued as banks scrambled to secure their balance sheets, further impairing the system's collective balance sheet.

Thus although the failure of TARP has only been recently acknowledged officially, by 10 October it was clear that something else would be required. Following the British example, focus shifted to the liability side of the balance sheet. Interbank lending overnight and for longer maturities was guaranteed and, most importantly, a significant capital injection was provided to banks to ensure their solvency against unknown – and in the short-run apparently unknowable – devaluations in shadow-bank assets. This "hit and hope" strategy seemed to work because of its sheer size and the explicit assumption of significant credit risk by the sovereigns concerned.

But the fundamental problem of valuation appears to remain. How could the authorities know how much capital to give the banks if they could not value the assets on their balance sheets? They might just be giving them another layer of capital to chew through as asset prices continue to fall.

While there is undoubtedly a problem of solvency, viz, valuation and not merely liquidity, this problem is made significantly worse by the capital-market nature of the problem. Because shadow-bank structured assets are priced in a market whose inadequate benchmarks have failed, even the absolutely safest and highly-rated assets are trading well below par value, driving down the entire market and pulling the banks down with it. Even if the ratings were exaggerations, these markets still require trustworthy benchmarks if their pricing mechanisms are to be restored. Only a solidly-credible institution can provide such a benchmark by standing ready to trade in the last instance. And only such an institution can undertake the pricing of systemic risk. Thus recapitalisation does not address the still-outstanding valuation problem but wishes it away by attempting to ring-fence the banking system. This is either a fundamental misrecognition of the capital-market nature of the problem or a failure of imagination. The current response seems to follow the logic of a Japanese-style "quantitative easing" but there may be better options.

3.2 Nationalise or Insure?

In the face of such radical ("Knightian") uncertainty regarding the content of bank balance sheets, nationalisation is really the only option: only the sovereign has the balance sheet that is even approximately adequate to such risk. Yet even in the face of a near-complete meltdown, the political balance has not shifted to the extent that complete nationalisation can be countenanced. Some other method of addressing the valuation problem must therefore be found.

One suggestion is to operate within the grain of the structured credit markets to restore the impaired benchmarks in the CDS markets by having the government insure AAA CDO tranches (see Kotlikoff et al 2008). Given that the rest of the CDS market is priced as a spread off the highest-rated products, the government could, by trading in this market, set a floor on the market by giving solidity and reasonableness to its benchmark. In effect,

it would be doing the job that AIG or any other private balance sheet could not. Further, by going to the heart of the matter and establishing a liquidity and pricing backstop where there was none, this plan is both quick to implement and more permanent than other measures. By setting a floor in this market, the CDO market would recover and ipso facto bank assets would have stable marks. If paid for with bank preferred stock, this insurance would simultaneously recapitalise the banking system. Such a plan is thus addressing both liquidity and valuation issues. By pricing the systemic risk implicit in AAA products, state-backed credit insurance establishes a potential counter-cyclical tool adequate to the new nature of the system.

If macro-prudential pricing of refinance, sound regulation, and lender of last resort facilities are the pillars of the regular banking system, they have to be brought to the new capital market based system as well. Votaries of exchange-traded markets have been quick to point out that it was the OTC nature of the credit markets that was their undoing, but this reflects a partial understanding of the situation. The collapse of Long Term Capital Management in 1998 threatened the collapse of the US Treasury futures clearing house; centralised structures are by no means immune to the deluge. It is rather a question of hierarchy. The US Treasury futures clearing house did not collapse because behind it stood a bigger balance sheet, the Treasury.

In a system based on credit-money, economic entities are always in need of refinance when they face a short squeeze. Individuals have banks, banks have each other and, in a pinch, the central bank. Central banks have the sovereign, and sovereigns have other sovereigns, individual or collective. The OTC structured credit markets were not unstable because of their own structure but because they had not developed the backstops at higher levels of the credit hierarchy like that which had evolved in the banking system. Being the creatures of a credit boom, these markets could not have developed such backstops, which are by their very nature creatures of crisis. These backstops would have to be appropriate to the capital market-nature of the system and would not, therefore, take the form of emergency refinance whose price can be altered in a counter-cyclical fashion. Given the arrangement of the current system, a CDS backstop operated by the sovereign might be the appropriate instrument. Its existence would not have preempted the crisis itself, cycles being a consequence of cash commitments made on inherently uncertain investments, but it might have made it smaller. The fact of uncertainty means that this would not have been an insignificant accomplishment.

The deeper problem facing the economies of the world remain however unaddressed. The global imbalances we referred to earlier, the path dependency of 30 years of a particular pattern and structure of growth, and the highly complex negotiations which will have to occur outside the traditional realm of the nation state will all need to be addressed. Equally, the geopolitics of the time make this a particular fraught period. During the last period of rebuilding – post the second world war – there was a near hegemonic power in place which had both an interest and an ability to restructure the global economy in ways that were mutually beneficial to global macroeconomic growth and stability. The world economy has no rising leader in that way at the current moment. Nevertheless, there is a certain sense that political forces are moving to rethinking our views about finance, the state and the nature of the economy and its need for regulation. One can hope that a combination of restructuring the US economy with the new Obama administration and a coordinated set of institutional changes through the new Bretton Woods (with much more broad global representation) will be the beginnings of a long and ultimately successful transition and global rebalancing. The details of such programmes are, of course, a much larger discussion, and must be postponed for another time.

To review the argument, massive deregulation has allowed more non-banks to function like banks, exposing the institutional fragility particular to banking. This unprecedented scale of deregulation and the concomitant absence of systemic risk controls are facilitated by a radically lopsided political economy in the North. This political economy is in turn held up by an extremely lopsided global division of labour and financial repression in the South. Export-surplus-fuelled liquidity and excessive deregulation combine to exacerbate the cyclical nature of banking systems that follow from the creditary nature of money, leading to massive credit booms and searing busts. Layer upon unstable layer, these interacting dynamics have imperilled our world system and brought us to the brink. Each dynamic will now have to be rebalanced, which is a difficult political task.

Postscript: By guaranteeing $306 bn of Citi's assets on, the US government in effect became the credit insurer of last resort, and is being paid for this service in preferred stock. This is Bagehot in the structured credit markets. (See also the *Financial Times* editorial on 24 November "Lessons from the Citigroup Rescue".) The key now is to do this for all senior assets rather than just for one bank, which should, in turn, help secure the banking system.

NOTES

1 Modern finance theory's history is interesting, but beyond the purview of this paper. Being an extension of operations research, created at the RAND corporation, it, along with the IT revolution was a legacy of the cold war. This legacy was adopted to a new struggle, namely using the surplus of the post-war period without recreating the class balance.

2 We owe this point in particular to Perry Mehrling.

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