

## **Presentation to Sydney PROBUS**

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### **The World Financial Crisis: How did it happen?**

#### **Introduction**

The man at the centre of the crisis, Fed Chairman Ben Bernanke described its evolution in a speech at the London School of Economics in January 2009.

He said “the proximate cause ..... was the turn of the housing cycle in the United States and the associated rise in delinquencies on subprime mortgages, which imposed substantial losses on many financial institutions and shook investor confidence in credit markets”.

He went on “However, although the subprime debacle triggered the crisis, the developments in the US mortgage market were only one aspect of a much larger and more encompassing credit boom whose impact transcended the mortgage market to affect many other forms of credit”.

“Aspects of this broader credit boom” he said “included widespread declines in underwriting standards, breakdowns in lending oversight by investors and ratings agencies, increased reliance on complex and opaque credit instruments that proved fragile under stress, and unusually low compensation for risk taking”.

It is useful to make explicit the distinction between the “causes” of the crisis and it’s “origins”.

There is general agreement that the “cause” was the turn in the US housing market late in 2007. A chain of events followed, some of which we will touch on – Northern Rock, Bear Sterns, Lehman, AIG, bank nationalisations in the US and the UK, guarantees of bank funding in Australia and so on.

There is not such a neat consensus on the causes, partly because lists are so large and many agendas are in play in compiling these lists.

In his paper “Reflections on the Global Financial Crisis”, David Gruen of the Treasury has several lists. The first list has five proximate causes of the crisis, the second has five wider causes, and a third list covers five reasons why the financial system became more highly leveraged. His is a balanced account, and he is not

defending a previous point of view or a political agenda. Those lists spiral out of control.

My own predilections or prejudices take me back into economic history as much as into economic analysis. You will be able to agree or disagree with my point of view. What is certain is that you will be able to add many influences, events or decisions which also contributed to the “origins” of the crisis.

### **The Big Picture**

The credit boom was fuelled by imbalances that grew out of the Asian financial crisis in 1997 and 1998. But, behind the credit boom, some of the roots of this crisis can be traced to policy decisions - or non decisions - over many years, most of which looked sensible in their context; to structural features in a number of important economies, some of which go back to the depression years of the 1930's; and to an intellectual climate that grew to equate financial markets with little or limited regulation with both efficiency and stability

The crisis is still in progress, and it will be years before a consensus emerges on what really brought it about. I want to give you my perspective on five large elements which were amongst those that contributed to or fostered the credit boom, which in turn may help our understanding of how and why the crisis occurred.

The first is liquidity, the loose or “accommodative” monetary policy which led to the wall of money that was available to Western financial institutions and consumers, particularly over the last ten years or so.

The second is the global imbalances, the recycled reserves of China and other exporting nations, which financed this wall of money.

The third piece is to look at what this global liquidity led to – a world of low interest rates and low cost of capital and, not surprisingly, rising asset values.

The fourth element is the intellectual and regulatory environment in which this all took place, particularly in the US and the United Kingdom.

The fifth piece covers the growth of the shadow banking system and the explosive growth in the last several years of the substantially unregulated capital markets.

There are and there will be many different perspectives, but these five ingredients are certainly material in creating the broader credit boom identified by Chairman Bernanke and the conditions for the crisis to emerge in the subprime markets in June and July 2007, and to the first run on a British bank since 1866 in August.

The rest is still unfolding.

## **Liquidity**

Monetary policy, described as “accommodative”, was used by the US authorities to deal with the 1997/98 Asian financial crisis, the threats perceived in Y2K, the 9/11 terrorist attack, and the bursting of the dot.com boom. Earlier market difficulties such as the Savings and Loans bust - when moral hazard had been

effectively removed - and the Long Term Capital Management failure – where moral hazard was not applied - were dealt with in similar fashion.

The Greenspan “put” was probably a flippant observation initially, but over the past decade the markets came to look for an asymmetric response from the US authorities. Official intervention and more liquidity could be anticipated to deal with events that threatened a downturn in the economy.

Others see the credit expansion as being much longer, encompassing the sixty year history of the use of the US dollar as the international reserve currency.

Some traditional measures such as Marshallian K don't necessarily support this long tail view. What is clear is that from the 1990's in the United States and in Europe financial assets expanded much more than GDP. This growth in financial assets particularly took the form of derivative securities, initially related to interest rates, later to credit defaults and then to securitized loans of many types.

Proponents of the analysis of this “new money” see a vast pyramid of securitized debt and derivatives standing on top of the money supply directly affected by central banks. By their nature these derivatives offer opportunities for leverage, and attract leverage as asset markets rise in response to lower interest rates.

At the same time, the US was running an increasing current account deficit, the “Wal-Mart syndrome” – the US was driving the growth of China by purchasing more and more of China’s cheaper manufactured exports. A big picture view is that maybe two billion new workers entered the globalised economy in the last decade; this increase in the supply of cheaper labour lowered the cost of many manufactured goods and increased returns to capital, raising the price of corporate equities not directly exposed to import competition.

### **Global Imbalances**

Which brings us to the second big piece. How did America go on buying more than it sold or earned for a decade? Fairly straightforward – China (and Japan and Germany and many emerging economies) financed the US by putting the US

dollars they earned back into US securities, particularly US Treasury securities.

American “treasure” - \$US dollars – went overseas to buy all those good things from emerging markets and China and others sent all the “treasure” back. China to the tune of more than one trillion dollars over the last decade.

Part of this story is in the lessons the Asian countries drew from their experiences in the 97/98 financial crisis. Their export oriented development models require suppressed exchange rates, and these factors plus domestic policies led to the theory of a global savings glut. All these factors are very important, and the 97/98 crisis contains many precursors of this crisis. For present purposes what we need to understand is that China and others recycled their rapidly growing reserves particularly into high quality US securities – US Treasury and government agency bonds. The US was able to finance its growing deficits easily at low rates.

## **The Outcome**

The outcome of easily financed deficits became increasingly visible through the early year of this decade particularly in the US and the Anglo-Saxon countries.

Low interest rates and a low cost of capital created conditions for increasing asset values, particularly for corporate securities and for financial assets.

Credit became cheaper and more available, and cheap imports kept inflation down. The US consumer was so affected by these conditions that personal savings, already low at around 2 or 3% of GDP, went negative. US consumers in aggregate stopped saving from their current income and borrowed cheap money on their credit cards or against the equity in their increasingly valuable houses, for consumption or speculation in real estate.

Cheap credit and abundant mortgage finance led to a rise in housing prices, particularly in the Anglo-Saxon countries, where many observers saw bubble dimensions by 2003 and 2004. Yields fell, but returns could be multiplied with the leverage from cheap and easily available debt. Think of hedge funds.

So we have a mixture of liquidity in Western markets being financed cheaply, particularly by China; derivatives and securitization adding to easily available credit; asset prices rising; and cheap and easily obtained leverage applied to increase returns.

These were the “Goldilocks” years, when everything was “just right”, the product of policies that appeared to have conquered cycles, inflation and instability.

Income distribution may have become more skewed, and rising housing prices were an economic impediment to new entrants, but “Goldilocks” bestowed above average growth rates to economies right round the world.

As Walter Bagehot observed, preceding the insights of Kahneman and the behavioral economists “all people are most credulous when they are most happy”.

All people include bankers, dealers and investors and also accountants, supervisors and regulators.

## **The Regulatory Environment**

What was the regulatory environment in which this heady financial mixture was brewing? In the United States it was outmoded, often confused, and severely politicized. The Securities and Exchange Commission dates from 1934 and, despite various market crises, was not a vigorous institution by the 1990's; separate Federal and State banking regulation continues to this day, and the commodities and futures markets – also dating from the 30's - are still regulated apart from financial markets.

Some institutions with great weight in the markets – Fannie Mae & Freddy Mac – became highly politicized as the people who ran them saw private opportunities in responding to politicians looking for political results in the housing markets. In 2005 Alan Greenspan told a Senate Committee that the enormous portfolios of these companies – nearly a quarter of the home mortgage market – posed significant risks to the nations financial system should either company face significant problems.

The ability to conduct securities underwriting and distribution alongside traditional commercial banking was, at the time, deemed to be the main culprit of the 1929 crash, and the Glass-Steagall Act of 1933 prohibited US institutions from carrying on both functions (as well as establishing the Federal Deposit Insurance Corporation). A long lobbying campaign led to the repeal of Glass-Steagall in 1999, allowing US commercial banks the freedom to underwrite the full range of equity and debt securities. Earlier deregulation had also removed the comfort of a fixed commission structure from brokers and investment bankers, who had to find new sources of revenue – which they did with astounding success.

This was all in tune with the times. The tendency towards deregulation of markets had grown from the 1970's and was given further intellectual stimulus as the doctrine of efficient markets evolved from academia and was applied in the real world of markets. It found a philosophical and political welcome in the Thatcher and Reagan years, and the “Goldilocks” years appeared to support the views that less regulation was likely to confer greater benefits to consumers.

Deregulation quickly showed many benefits in financial innovation and increased competition. New products and new institutions proliferated and costs to consumers were reduced across the spectrum of financial services. Markets expanded as the previously ineligible obtained credit and housing finance. The swap markets and the hedge markets evolved to meet the requirements of floating currencies and national interest rate policies.

The Long Term Credit Market fiasco showed that there could be miscues, but confidence grew that the benefits of markets were maximized when official intervention was minimized. The UK was particularly in tune with this intellectual climate and solidified its position as the most important financial market after the US. London also provided a platform for European institutions to participate in the rapidly broadening financial market, something their home regulators did not always permit on headquarters soil.

A couple of anecdotes illustrate the climate of the times. In 1996 Alan Greenspan warned of “irrational exuberance” in the markets when the Dow went through 6,000, but took no action, in accordance with the Central Bankers’ doctrine of cleaning up afterwards rather than seeking to prick the bubble.

In 1998 there were moves by the Commodity Futures Trading Commission to bring the massive increase in over the counter derivatives under greater regulation. Mr Greenspan – and others - successfully opposed this initiative, arguing that it risked disrupting the capital markets and was unnecessary anyway, because the self interest of the sophisticated market participants could be relied upon to maintain stability.

### **The Growth in Capital Markets**

So, the favorable conditions which provided cheap debt, low risk premiums and easy access to leverage were not going to be particularly restrained by regulators, and the abolition of Glass Steagall meant that the separate models of commercial banks and investment banks became blurred, almost certainly so in the vision of

the regulators. What we got was explosive growth in capital markets and a rapidly growing shadow banking system.

Commercial banks, in pursuit of earnings growth and improved return on capital created off balance sheet “conduit” vehicles, circumventing the Basel regulations.

These were designed to more realistically relate risk to capital, even though the

Basel approach turned out to be deeply flawed in its reliance on ratings agencies

and the banks own risk models. The banks earned fees and avoided responsibility

for risk by selling more and more of the loans they originated on a without

recourse basis to other institutions. US commercial banks and some major

European banks rapidly expanded their underwriting and securities dealing and

distribution businesses.

Investment banks responded by granting credit to hedge funds and bridge loans

to corporate acquirers. They rapidly increased their leverage and built large

portfolios of trading assets for their own proprietary trading purposes.

The end result was described by Governor Glenn Stevens in a speech in October 2008. “It suffices to say that a lot of new risk was created and, far from being widely dispersed, a good deal of it ended up on the balance sheets of the most leveraged parts of the international financial system – banks and investment banks”.

This “shadow banking” system essentially grew outside the control of the banking regulators. Perhaps the most spectacular example of unregulated growth were in the structured finance products known as Collateralized Debt Obligations or “CDO’s” (see the Attachment “Constructing CDO’s”).

By repackaging risks, structured finance created “safe” assets from otherwise risky collateral, so that the structured securities were viewed by investors as virtually risk free and certified as such by the ratings agencies. The discovery that these securities were actually far riskier than originally advertised has been central to the recent crisis, even though they only form a small fraction of securities outstanding.

Some anecdotes illustrate the growth. In the first half of 2007 new CDO's were being issued at the rate of \$100 billion a quarter. By mid 2007, there were 37,000 structured finance issues in the US alone with the top (AAA) rating. In 2006 44% of Moody's revenue came from rating structured finance products, compared with 32% from the traditional bond rating business.

The logic underlying these securities was fundamentally flawed – partly because their structure amplifies any minor imprecision which radically changes their default risk, and partly because securitization substitutes risks that can be diversified for risks that are highly systemic.

As Chairman Bernanke observed, in the middle of 2008 these flaws became apparent; particularly in collateralized debt obligations – CDOs – backed by pools of mortgages. For example, of the 30 tranches of AAA asset backed CDOs underwritten by Merrill Lynch in 2007 27 were subsequently downgraded to junk.

Along the way, the demand for the underlying collateral assets – the mortgages – led to unprecedented reduction in borrowing costs and documentation requirements for homeowners, fueling the real estate bubble that is now unwinding. Through the chain of origination and distribution these were obvious conflicts of interest and abrogation of responsibility. Some politicians took credit for making housing finance cheaper and more accessible, neglecting to focus on the bubble in the underlying asset values, which the central banks - with the notable exception of the Reserve Bank of Australia - were loathe to identify and doctrinally opposed to pricking.

As the bubble started to deflate and as the Merrill anecdote vividly shows, it became obvious that these securities were indeed toxic and impossible to value.

Any institution that held CDOs on their Balance Sheet had an asset not just of dubious value, but an asset whose value was so opaque that there was no market.

In a crisis financial institutions whose assets cannot be valued becomes illiquid very rapidly, because no one will lend to them, and insolvency becomes the immediate prospect.

This is what emerged in June and July 2007, and in one form or another ran through Northern Rock, Bear Stearns, Lehmann, Merrill Lynch, B of A, Citigroup, Fannie Mae & Freddie Mac, UBS, Royal Bank of Scotland and Fortis and so on. The same kind of opacity in the credit default swap market brought down IAG, where 300 people in a separate unit in London regulated by New York State, have so far required more than \$180 billion of US taxpayers' money to maintain solvency. This crisis of confidence in liquidity, solvency and credit worthiness has abated and we are seen to be through the worst. What should we do about the future, to minimize the risk of the "next crisis".

**So, what are the origins of the crisis?**

As the crisis emerged it became apparent that risk had not been distributed to the degree that had been assumed, banks were not as well capitalized as it seemed, and the liquidity risk was grossly underestimated. There were failures in incentives, in regulation and in supervision, so the world underestimated the risks that developed in financial markets in the 1990's and on into the new century.

The ease with which the credit boom was financed obviously contributed to this miscalculation.

But even without the global imbalances - or the savings glut - the question remains whether these risks are inherent in substantially unregulated capital markets. This brings the real debate to the fore. Was the current crisis caused by too much government intervention or too little.

Post the repeal of Glass Steagall many – though not all – of the large US commercial banks became hybrid institutions, developing or acquiring capital markets or investment banking businesses. Major UK and European banks had already developed this model or soon followed. These developments were consistent with the underlying intellectual view that, particularly in the US, that capital markets are efficient users of information and do not require a regulatory framework that goes much beyond consumer protection.

Traditional investment banks – never subject to commercial bank regulation - made increased incursions into lending, and radically increased their leverage.

Thirty years before these investment banks had been partnerships, where the owners looked after their capital and distributed bonuses in good years. In the 90's they became big corporations but the bonus structure remained without the restraints of the actual owners of the capital perverse compensation structure undoubtedly fueled the boom.

No one argues that traditional commercial banking markets are efficient; indeed their information deficiencies have been identified, and there is close to 200 years experience of commercial banks susceptibility to periodic crisis. Regulation contributes to the inefficiency of the banking system, but has been accepted as a cost of systemic stability. Libertarians may argue that instability is a consequence of regulatory intervention but most of the world has created Central Banks to act as lender of last resort to preserve the integrity of the banking system when moral hazard has failed.

Adam Smith did not contend that efficient markets were stable. It has been a developing belief of the last twenty or thirty years that this tension between stability and efficiency had been satisfactorily resolved in the capital markets where regulation was increasingly light handed and where the availability of information and moral hazard would ensure growth with stability.

The crisis has shown this is not so. A succinct summary was provided by Alan Greenspan to a House Committee in October 2008. “Those of us who have looked to the self interest of lending institutions to protect shareholders equity, myself included, are in a state of shocked disbelief”.

To preserve the integrity of the financial system the Central Banks have been forced to move well beyond lenders of last resort. They have been forced to become market makers of last resort; - they are the only buyers in asset markets where prices are so opaque as to defy analysis.

Few dispute the superiority of markets in allocating capital and generating wealth, but just because regulation and other forms of government intervention have proved faulty or inefficient, it does not follow that markets are perfect. I think Paul Krugman is correct in the principle he advances; “anything that needs to be rescued in a financial crisis – because it plays an essential role in the financial mechanism – should be regulated when there isn’t a crisis, so it doesn’t take excessive risk”.

So I suggest the weight is strongly with the Keynes, Minsky, Fisher and Kindelberger schools – and maybe the George Soros School if you understand him – that the crisis is generated by the system itself, and not by any external shock or by any particular combination of villains, government or private sector.

Back to Chairman Bernanke for some of his conclusions. “We need stronger supervisory and regulatory systems under which gaps and unnecessary duplication in coverage are eliminated, lines of supervisory authority and

responsibility are clarified, and oversight powers are adequate to curb excessive leverage and risk taking” .....

He went on to summarize our central dilemma. “As we proceed with regulatory reform, however, we must take care not to take actions that forfeit the economic benefits of financial innovation and market discipline”.

I have given the last quotation to Martin Wolf of the Financial Times. “As Minsky made clear, no permanent answer exists. But recognition of the systemic frailty of a complex financial system would be a good start”.

Mark Johnson

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**Constructing CDO's**

(from “The Economics of Structural Finance”; Coval, Jurek and Stafford,  
Harvard Business School Working Paper 09-060)

- Assume two \$1.00 bonds – pay \$0 on default and \$1 otherwise.
- Combine in portfolio of \$2.00
  - junior tranche bears first \$1.00 loss
    - pays \$1.00 if both avoid default
    - pays zero if either bond defaults.
  - senior tranche
    - only defaults if both bonds default.

- If the defaults on the two bonds are imperfectly correlated the senior tranche will pay either \$1 or \$0, *except that it is less likely to default than either of the underlying\_bonds*
  - So, if the two bonds have 10% default probability and defaults are uncorrelated, senior tranche has only 1% chance of default, and junior tranche has 19% chance.
  
- Include a third bond in three tranches- if bonds have 10% default probability and defaults are uncorrelated, chances of default are:
  - senior tranche            0.1%
  - middle tranche            2.8%
  - junior tranche            27.1%

*By including a third bond in the pool two thirds of the capital can be repackaged into claims that are less risky than the underlying bonds.*

- Process can be continued by combining junior tranche with an identical junior tranche from another pool – typically called CDO squared.

- If risks of default are perfectly correlated, the senior bond inherits the risk of underlying assets at 10%. Intermediate levels of correlation allow structures to produce a senior claim with a default risk between 1% + 10%.